FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT

Scal Properties Ltd.
Phase 2: Limen Head Office

Town of Whitchurch-Stouffville

Project: 5278 **March 2023**

Submission	Description	Prepared		Checked	
		By	Date	By	Date
0.	Original Report / First Submission	S. Ramsoomair	March 2023	H. Milukow	March 2023

SCHAEFFERS
CONSULTING ENGINEERS
6 Ronrose Drive
Concord, Ontario L4K 4R3

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1 INTRODUCTION

1.1 Objective and Location

Schaeffers Consulting Engineers (SCE) has been retained by Scal Properties Ltd. to prepare a Functional Servicing and Stormwater Management Report (FSWM) in support of a proposed industrial development in the Town of Whitchurch Stouffville. The subject site is located at the west end of the Fortecon Drive Cul-De-sac, east of Woodbine Avenue and south of Aurora Road. A location plan is provided in **Figure 1.1**. The proposed development consists of two phases. The following report focuses on the Phase 2 of the applicant's land highlighted in **Figure 1.2**.

This FSWM proposes a servicing scheme that demonstrates the viability of stormwater drainage, sanitary and water supply servicing for the proposed development, with consideration for applicable guidelines, policies, and design criteria.

1.2 Background

The following documents were considered in preparing the proposed functional servicing and stormwater strategy for the proposed development:

- Design Guidelines and Standard Drawings, by Town of Whitchurch-Stouffville, March 2021.
- LSRCA Technical Guidelines for Stormwater Management Submissions, April 2022.
- Geotechnical Investigation for Proposed Industrial Buildings, SWM Ponds and Septics, Woodbine Avenue and Aurora Road, dated March 2022, by Soil Engineers Ltd.

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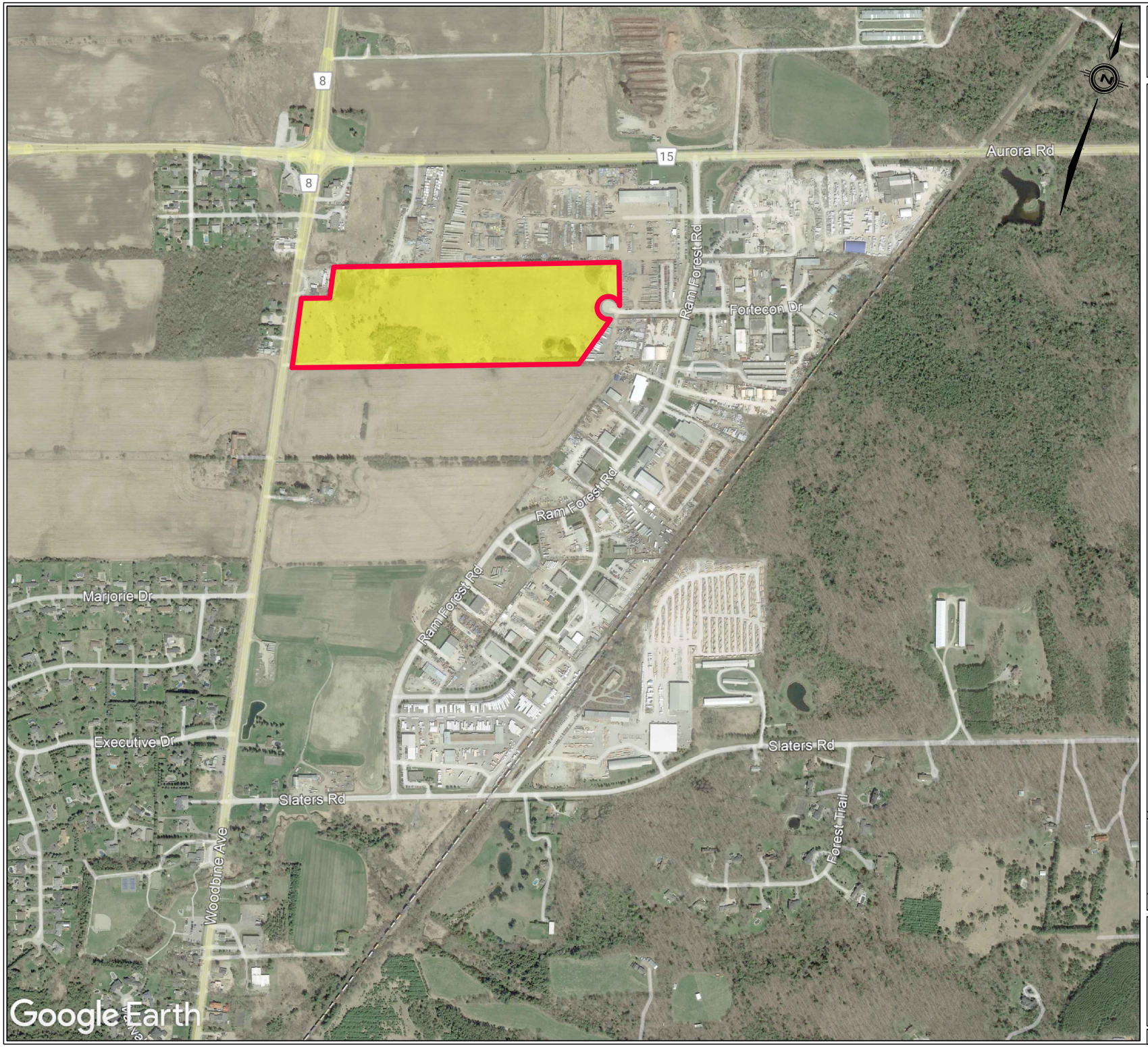

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FIGURE 1.1
LOCATION PLAN

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1.3 Proposed Development Plan and Population

The proposed development will occur in two Phases. Phase 2 of the development is approximately 4.03ha of the total 12.47ha. The area of land subject to the phase 2-2A planning application is 1.57ha, which includes Building 2A and the surrounding parking lot, a tile bed and the SWM facility. The remaining area (2.45ha), considered as Phase 2-2B lands which includes Building 2B and the surrounding parking lot, a tile bed, a yard storage area, and another proposed one storey industrial building, will be subject to future planning applications. Please refer to the draft plan provided in **Appendix A**. **Figure 1.2** presents the proposed development plan and identifies phase 1 and phase 2 lands. Please note that this report describes the servicing for the entire phase 2 lands.

1.4 Soil Conditions

A detailed Geotechnical investigation was undertaken by Soil Engineers Ltd which can be found in **Appendix A**. The investigation revealed that the site is underlain by strata of silty clay, silt and silty sand, which belongs to Hydrologic Soil Group D.

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PHASE 1 SUBJECT LANDS

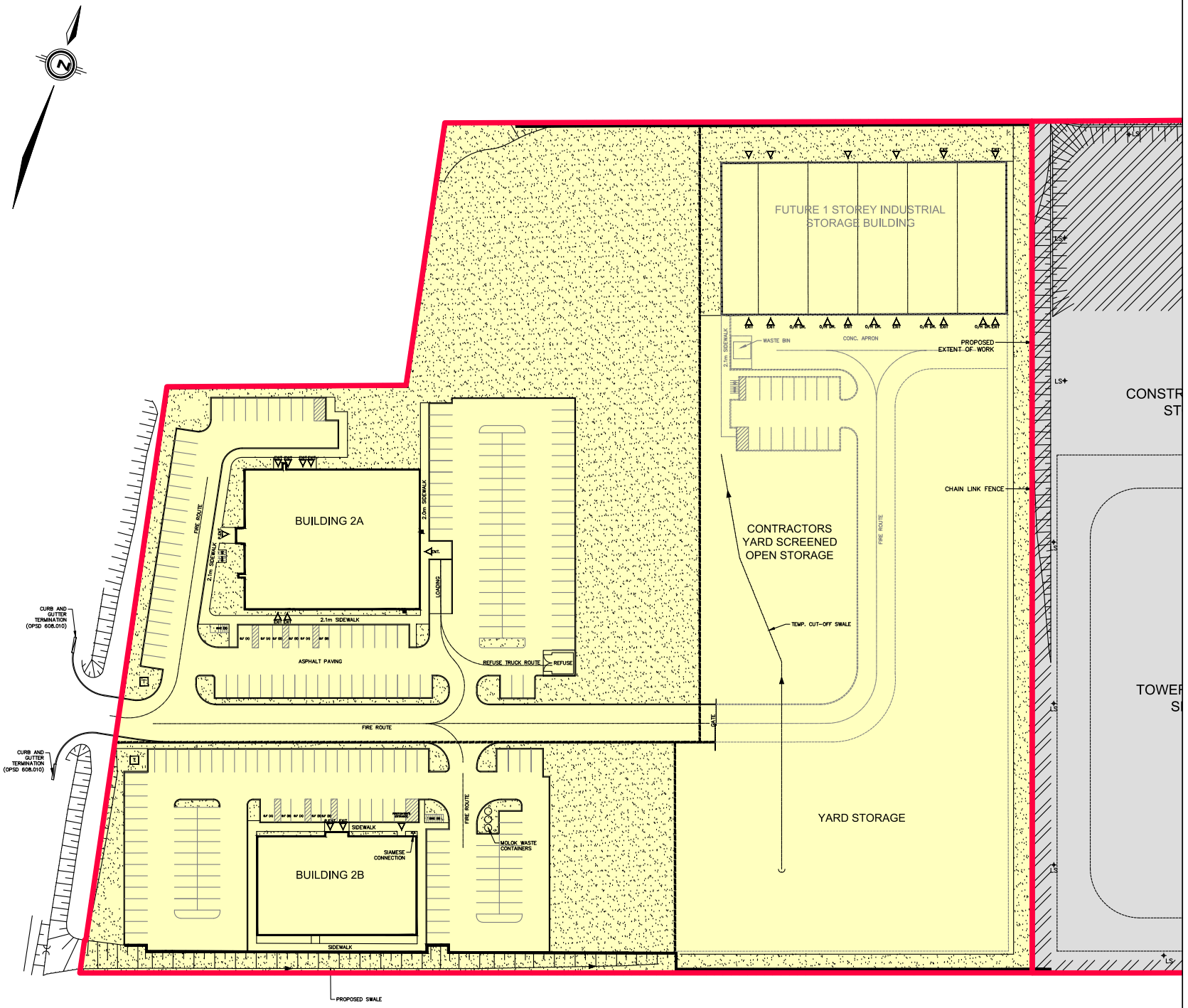

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FIGURE 1.2
PROPOSED DRAFT PLAN

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2 Stormwater Management

The following sections provide details on the SWM plan for the proposed site and is in accordance with applicable provincial guidelines, as well as municipal and conservation authority criteria.

2.1 Existing Drainage Conditions and Infrastructure

The site is located within the East Holland River watershed, under the jurisdiction of the Lake Simcoe Region Conservation Authority (LSRCA). **Figure 2.1** identifies the pre-development drainage conditions. Approximately 9.9ha of external area drains through the subject site (identified as Catchment 301 and 302) in **Figure 2.1**.

Within the vicinity of the site there are existing ditches along the cul-de-sac at Fortecon Drive with culverts, an existing ditch along Woodbine Avenue and along the subject property line on the north. Based on the land topography, the subject site drains towards the northern neighbor property and ultimately drains via a culvert towards the existing waterbody in the north.

2.2 Design Criteria

The subject site is to comply with the Stormwater Management Design Criteria for the Ministry of the Environment and Climate Change (MOECC) Stormwater Management Planning and Design Manual dated 2003 (hereon referred to as the MOECC SWM Manual) for quality, quantity and erosion control. Additional Design Criteria from the Town of Whitchurch - Stouffville and Lake Simcoe Region Conservation Authority (LSRCA) are incorporated into the design of this proposed development as discussed below.

1. Quantity Control – post to pre-peak flow controls for return periods 2 year through 100-year.
2. Volume Control – According to the LSRCA Technical guidelines, "*For new, nonlinear developments that create more than 0.5 hectares of new impervious surface on sites without restrictions, stormwater runoff volumes will be controlled and the post-construction runoff volume shall be captured and retained / treated on site from a 25 mm rainfall event from the total impervious area."*
3. Quality Control - Enhanced stormwater quality must be provided for the site with 80% TSS removal from 90% of average annual flows (MOECC SWM Manual)

4. Erosion Control - based on the detention of runoff from 25mm rain event and released over 24 hours (LSRCA) or retention of at least 5mm rain events.
5. Water Balance - pre-development levels must be maintained as per LSRCA. The site is located within the WHPA (Well Head Protection Area) Q1 and Q2, therefore pre-development infiltration volumes are to be maintained.
6. Phosphorus Loading –As per LSRCA design guidelines, removal of 80% of annual Total Phosphorus Load is required.
7. Pre-development and post-development peak flows for the site were calculated using the following 3 storm types for the 2-year -100-year storm events as follows:
    - 4Hr Chicago (as per Town of Whitchurch - Stouffville);
    - SCS Type II-24Hr (as per Town of Whitchurch - Stouffville); and
    - SCS Type II-12Hr (as per LSRCA standards)

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103
4.15 | 0.25

102
5.25 | 0.25

101
3.07 | 0.25

302
6.56 | 0.25

301
3.32 | 0.25

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- SUBJECT LAND - PHASE 2
- OTHER LAND OWNED BY APPLICANT
- EXISTING DRAINAGE WITHIN SUBJECT LANDS
- EXTERNAL DRAINAGE
- 101 / 3.07 | 0.25 — AREA ID / RUNOFF COEFFICIENT / AREA IN HECTARES
- EXISTING DITCH
- OVERLAND FLOW
- EXISTING SWALE
- EXISTING CULVERT

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FIGURE 2.1
PRE-DEVELOPMENT
DRAINAGE CONDITIONS

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2.3 Proposed Stormwater Management Plan

The proposed stormwater management scheme is illustrated in **Figure 2.2** and **Figure 2.3**. As shown in the Figure, the proposed Phase 2 area is divided into 2 catchments; Catchment 203A and Catchment 203B. Both catchments will drain to the SWM Facility located in the north west corner of the Phase 2 Lands, which consists of a filter bed and wet cell. The SWM facility has been sized to provide quantity, quality, erosion and volumetric control.

The 5-year flow will be captured by the proposed catch basins located within each catchment and conveyed through an OGS to the filter bed. The flow that is not captured by the proposed catch basins (100-year flow minus 5-year flow), will enter the wet cell through overland flow.

A temporary cut-off swale is proposed within catchment 203B to convey flow from the storage area to the proposed catch basin. During the Phase 2-2B application stage, the addition of catch basins within catchment 203B will be explored to further capture the flow.

The external area represented by Catchment 302 is conveyed through a proposed pipe to the north, while Catchment 301 follows the existing drainage pattern and drains towards the Phase 1 lands.

Table 2.1 below presents the post development schematic summary for the proposed Phase 2 lands. Please note that approximately 0.076 ha of landscaped area within catchment 203A is proposed to drain uncontrolled towards the southern external area due to grading constraints and ultimately into the by-pass pipe for catchment 302.

Table 2-1: Post- Development Catchment Area Summary

Catchment ID	Description	Area (ha)	Imperviousness (%)	SWM Scheme
203A	Roof Area	0.24	100%	• Rooftop storage to provide 42l/s/ha control; and • The catchment area will drain to the proposed SWM facility to meet SWM design criteria – erosion/quality/quantity/volume control.
	Landscaped Area	0.57	7%	
	Asphalt Paved Area	1.02	100%	
	SWM Facility	0.44	50%	
	Total	**2.27**	**67%**	

Catchment ID	Description	Area (ha)	Imperviousness (%)	SWM Scheme
203B	Gravel Area	1.68	100%	• The area comprises of gravel bed; and • The catchment area will drain to the proposed SWM facility to meet SWM design criteria – erosion/quality/quantity/volume control.
	Total	**1.68**	100%	
Uncontrolled Areas	Landscaped Area	0.076	7%	• Uncontrolled area draining to external area located outside the Southern boundary. • Conveyed to the North through the proposed pipe.
301	Existing External Area	3.32	7%	• Will remain in existing conditions and drain north through Phase 1 lands.
302	Existing External area	6.56	7%	• External area conveyed to the north through the proposed pipe within the Phase 2 lands.

The following sections will present in detail the proposed SWM facilities and the allowable release rates for Catchments 203A, 203B and external catchment 302. Catchment 301 and the Phase 1 lands is outside the scope of this report and has been discussed in detail in the Phase 1 Functional Servicing and SWM Report (March 2023).

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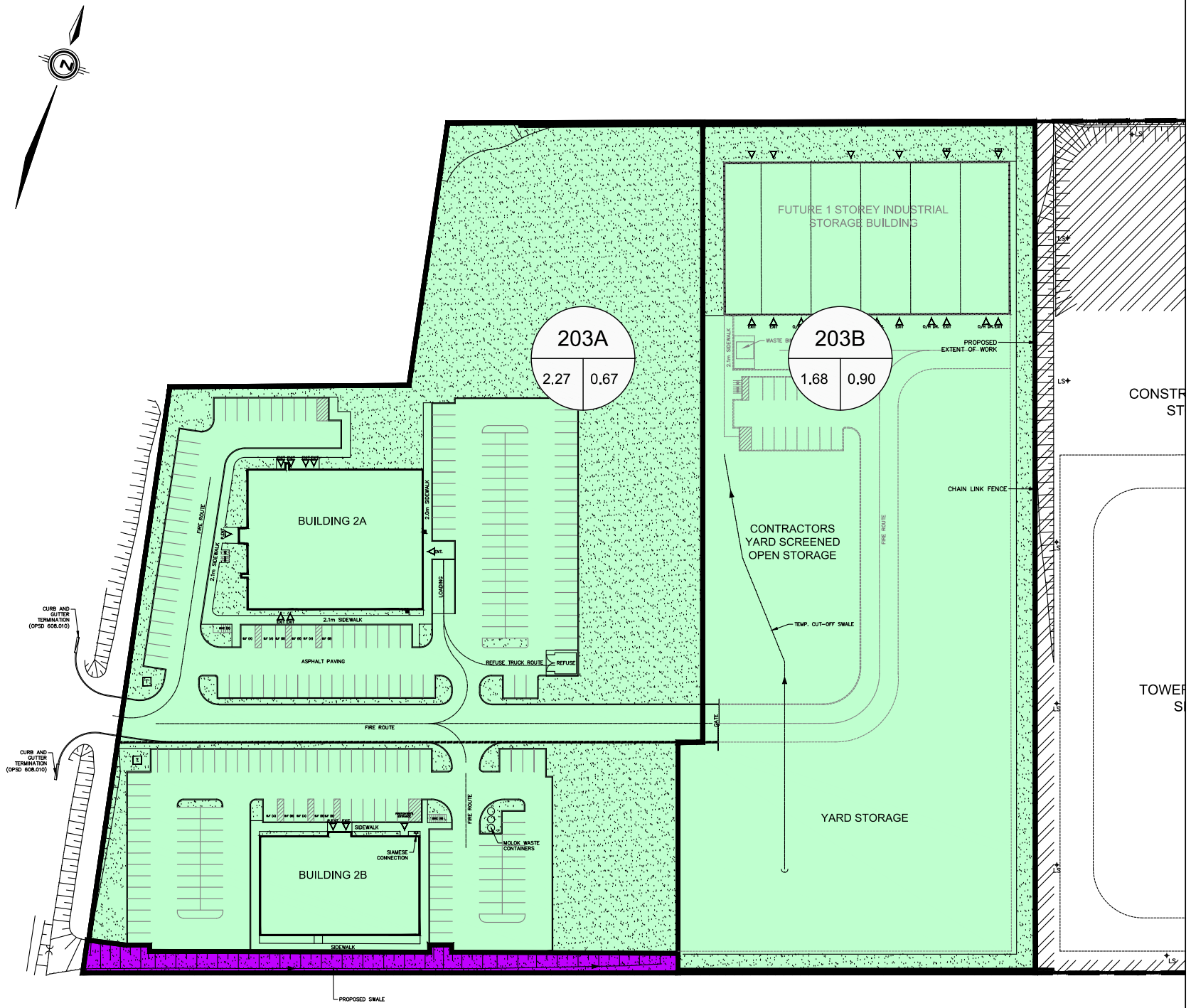

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- PHASE 2 SUBJECT LANDS
- PHASE 1 SUBJECT LANDS
- CONTROLLED DRAINAGE TO SWM POND
- UNCONTROLLED DRAINAGE AREA = 0.076ha COEFFICIENT = 0.25
- 203 (AREA ID) / 3.07 (AREA IN HECTARES) / 0.25 (RUNOFF COEFFICIENT)

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FIGURE 2.2
POST-DEVELOPMENT
DRAINAGE CONDITIONS

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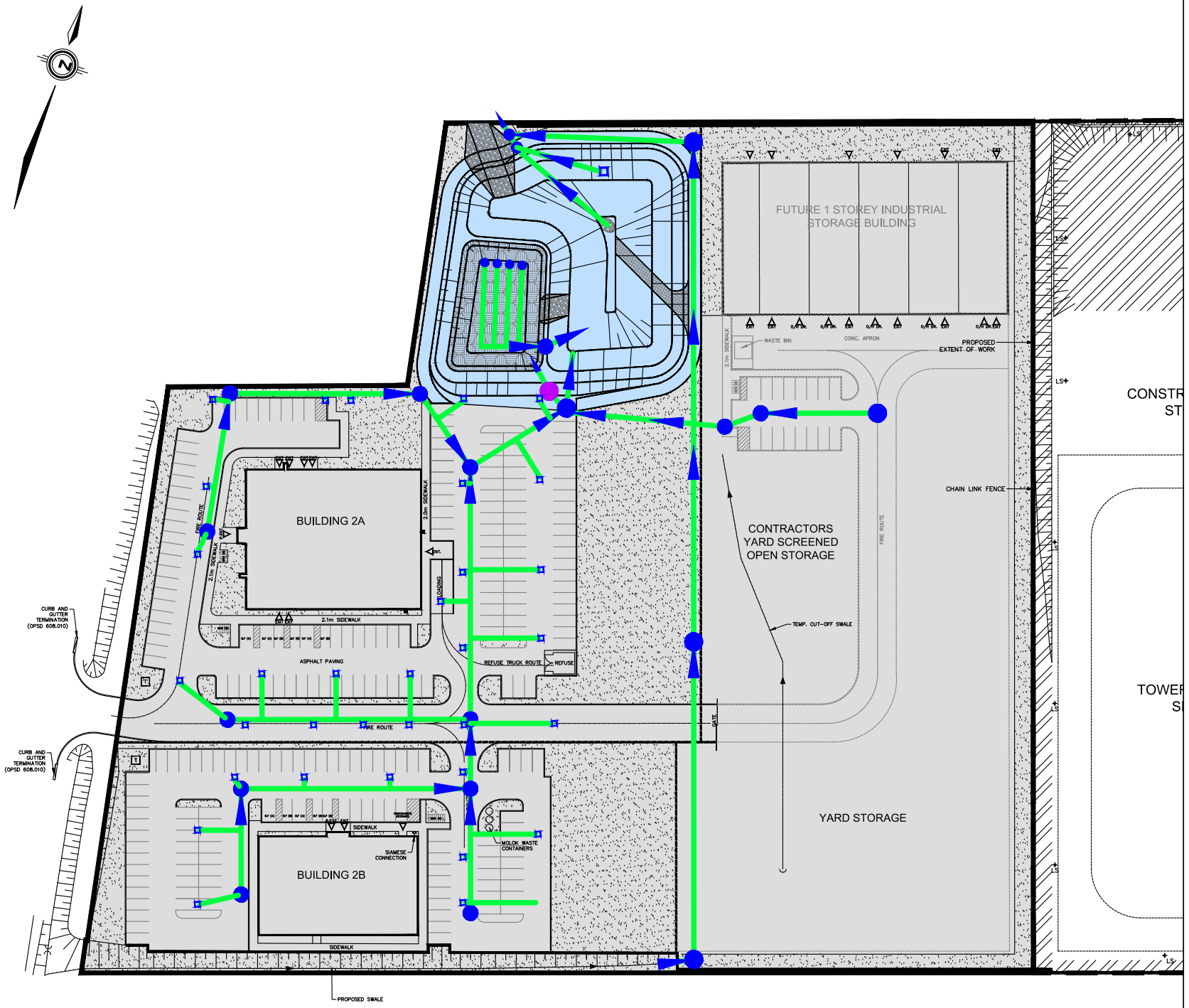

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- PHASE 2 SUBJECT LANDS
- PHASE 1 SUBJECT LANDS
- PROPOSED STORM SEWER
- PROPOSED OIL GRIT SEPARATOR
- PROPOSED SWM POND

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FIGURE 2.3
STORM SERVICING PLAN

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2.4 Allowable Release Rates

The allowable release rates for the post development scenario were calculated based on the pre-development drainage pattern using Visual OTTHYMO models for 2-year to 100-year storm events (4hr Chicago, 12hr and 24hr SCS storms). The pre-development condition was characterized via the use of five (5) distinct catchments based on drainage area, as seen in **Figure 2.1**.

NasHYD's were utilized to model the pre development catchments along with a routing channel to portray the conveyance of external flows from catchment 302. Catchments 301, 102 and 101 were not modelled as they depict other phases.

Input parameters for pre-development are summarized in **Table 2-2.** Refer to **Appendix B.1** for supporting calculations and for the pre development Visual OTTHYMO model. The time of concentration was calculated using the airport method and equivalent slope method.

Table 2-2: Summary of Pre-Development Drainage Area Parameters

Description	Area (ha)	Time to peak (min)	Time to Peak (hr)	CN	CN*	Ia (mm)
Catchment 103	4.15	16.5	0.28	80	82	8
Catchment 302	6.56	8.4	0.14	80	82	8

* CN* based on a P= 95mm for 24hr SCS Storm – Calculation in **Appendix B.1**.

Table 2-3 presents the pre-development peak flows based on Visual OTTHYMO modelling. The Visual OTTHYMO model output for pre-development conditions is also presented in **Appendix B.4.** The table below presents the pre-development release rates.

Table 2-3: Pre-Development Peak Flows for 2-year to 100-year storms

Storm Event	Pre-development Flows (m3/s)					
	Catchment 103			Catchment 103 + Catchment 302		
	4Hr Chicago	12Hr SCS	24Hr SCS	4Hr Chicago	12Hr SCS	24Hr SCS
2 Year	0.070	0.111	0.128	0.21	0.379	0.440
5 Year	0.144	0.197	0.209	0.473	0.659	0.707
10 Year	0.201	0.252	0.267	0.677	0.844	0.903
25 Year	0.284	0.335	0.343	0.943	1.107	1.15
50 Year	0.352	0.396	0.403	1.168	1.306	1.348

Storm Event	Pre-development Flows (m3/s)					
	Catchment 103			Catchment 103 + Catchment 302		
	4Hr Chicago	12Hr SCS	24Hr SCS	4Hr Chicago	12Hr SCS	24Hr SCS
100 Year	0.420	0.453	0.462	1.381	1.491	1.543

2.5 Erosion Control

Erosion control for the Catchments is proposed to be achieved by detaining the 25mm storm event and releasing it over 24 hours. As per calculations presented in **Appendix B**, for catchments 203A and 203B, approximately 732m^3 of runoff needs to be detained and released with a release rate of 0.0127 m^3/s. The sizing of the SWM Facility to provide the erosion control is discussed in detail in **Section 2.9.**

2.6 Water Quantity Control

The SWM facility design provides quantity control by restricting the post-development release rate to the pre-development levels. The proposed quantity control for each of the catchments is presented in Sections below.

A Visual OTTHYMO model was utilized to determine the required storage volumes to satisfy the allowable release rates identified in **Section 2.4**. The proposed catchments were modelled using a StandHYD.

It is proposed that the buildings located within catchment 203A is to provide roof storage using Zurn devices (roof drain) or equivalent. The roof storage was depicted in the model using a Route Reservoir with the storage curve designed based on sizing of the roof drains. Given a roof area of 0.24 ha and the minimum spacing requirements, 6 roof drains are assumed for the buildings. Each drain is designed to have one notch opening with an intake capacity of 0.25 L/s/cm head/notch. Collectively about 0.24 ha of the roofs will be used as storage to attenuate flows and slowly discharge to the storm sewer system. Based on the roof drain sizing, the required rooftop storage is 103m3. The required storage uses a ponding of 43mm across the entire roof. Please refer to Appendix B for detailed calculations.

For catchment 203B, in order to reflect the initial abstraction that will occur in a gravel bed, the available impervious area depression storage is input as 5mm in the hydrology model.

Flows from Catchment 302 will be captured and conveyed to the north via a proposed pipe.

The parameters used to depict the post development drainage for the catchments is presented below.

Table 2-4: VO Modeling Parameters

	NasHYD/ StandHYD	Area (ha)	CN (II)	CN* (II)	Initial Abstraction – Pervious Area (Ia)	Tp (hr)	Timp	Ximp
Catchment 203A – Roof Area	StandHYD	0.24	80(Loss)	80(Loss)	5	-	100%	100%
Catchment 203A- Landscaped Area + Asphalt + SWM Facility	StandHYD	2.03	80(Loss)	80(Loss)	5	-	63%	63%
Catchment 203B – Gravel Area	StandHYD	1.68	80(Loss)	80(Loss)	1.5	-	100%	100%
Catchment 302 – External Grass Area	NasHyd	6.56	80	82	8	0.14	7%	7%
Uncontrolled Area – Landscaped Area along southern boundary of the Phase 2 lands	NasHyd	0.076	80	80	5	0.11 (Assumed minimum value – Based on Town of Whitchurch-Stouffville Guidelines)	7%	7%

To meet the storage requirements, a SWM facility is proposed and is further discussed in **Section 2.9**. Detailed Storage calculations are provided in **Appendix B.2** with results summarized in **Tables 2.5-2.7** below. Please note that the proposed release rates and storages are based on the facility and outlet structure discussed in **Section 2.9**.

Table 2-5: Summary of post development VO results - 4HR Chicago

Storm Event	4 Hr Chicago Storm		
	Allowable Release Rate (m3/s) -	**Controlled Release Rate (m^3/s) from proposed facility with outlet structure**	**Storage Required (m3)**
2 Year	0.070	0.028	759
5 Year	0.144	0.066	943
10 Year	0.201	0.090	1080
25 Year	0.284	0.104	1308
50 Year	0.352	0.113	1489
100 Year	0.420	0.121	1661

Table 2-6: Summary of post development VO results - 12HR SCS

Storm Event	12 Hr SCS Storm		
	Allowable Release Rate (m3/s)	**Controlled Release Rate (m^3/s) from proposed facility with outlet structure**	**Storage Required (m3)**
2 Year	0.111	0.041	824
5 Year	0.197	0.088	1051
10 Year	0.252	0.098	1209
25 Year	0.335	0.111	1452
50 Year	0.396	0.119	1626
100 Year	0.453	0.127	1786

Table 2-7: Summary of post development VO results - 24HR SCS

Storm Event	24 Hr SCS Storm		
	Allowable Release Rate (m3/s)	**Controlled Release Rate (m^3/s) from proposed facility with outlet structure**	**Storage Required (m3)**
2 Year	0.128	0.048	856
5 Year	0.209	0.089	1067
10 Year	0.267	0.099	1238
25 Year	0.343	0.111	1462
50 Year	0.403	0.120	1633
100 Year	0.462	0.128	1799

Table 2-8: Post vs Pre-Development flows draining to the North

Storm Event	Pre-Development Flows (m3/s)			Post-Development Flows (m3/s)		
	4Hr Chicago	12Hr SCS	24Hr SCS	4Hr Chicago	12Hr SCS	24Hr SCS
2 Year	0.21	0.379	0.440	0.154	0.296	0.352
5 Year	0.473	0.659	0.707	0.383	0.547	0.592
10 Year	0.677	0.844	0.903	0.565	0.699	0.747
25 Year	0.943	1.107	1.15	0.785	0.893	0.931
50 Year	1.168	1.306	1.348	0.955	1.041	1.079
100 Year	1.381	1.491	1.543	1.161	1.177	1.224

2.7 Volumetric Control

According to the LSRCA Technical guidelines, "*For new, nonlinear developments that create more than 0.5 hectares of new impervious surface on sites without restrictions, stormwater runoff volumes will be controlled and the post-construction runoff volume shall be captured and retained / treated on site from a 25 mm rainfall event from the total impervious area."* Based on the site's imperviousness the following volumetric control volumes and alternative volumes are applicable to the site.

Table 2-9 Summary of Site Retention Requirements

Summary				
Catchment	**Criteria** **Area x Impervious Area = Total Impervious Area** **Total Impervious Area x Vol. Criteria = Required Volume**			**Required Volume**
203A & 203B	LSRCA Criteria	25mm Vol. Criteria	Imp. Area x 25mm = 3.95*0.81*25*10	**800m^3**
	Alternative #1	12.5mm Vol. Criteria	Imp. Area x 12.5mm = 3.95*0.81*12.5*10	**400m^3**
	Alternative #2	5mm Vol. Criteria	Imp. Area x 5mm = 3.95*0.81*5*10	**160m^3**
	Alternative #3	Volumetric Control Provided Off-Site		

*Please note a weighted impervious value of 81% for catchment 203A and 203B was used to determine the required volume.

In order to provide the required volume control for the subject site, a filter bed with an area of 665 m^2 is proposed for the subject site. Support calculations for the filter bed sizing is provided in **Appendix B**.

2.8 Water Quality Control

Water Quality control will be provided for the site to achieve an 'enhanced' level of TSS removal (80% TSS removal). Note that the uncontrolled drainage area consists of landscaped green areas which can be considered clean.

The enhanced level of quality treatment for the catchment areas is expected to be met by the permanent pool and the filter bed located within the SWM Facility. The filter bed and the permanent pool within the pond was sized to provide 80% TSS removal. The OGS unit will provide an additional 60% TSS removal. The captured 5-year flow from each catchment will first pass through an OGS, to the filter bed and then into the wet cell. The remaining flow that will enter the wet cell through overland flow will be treated by the permanent pool. The proposed quality treatments are summarized below.

Table 2-10: Proposed Quality control measures

Proposed Quality Measures	Area (ha)	Measure 1	Measure 2	Measure 3
Catchment 203A & 203B	3.95	SWM Pond Permanent Pool – Sized for 80% TSS removal Required permanent pool volume to achieve Level 1 – 80% TSS removal = 3.95*235m^3/ha* = **928 m^3**	Filter Bed – Sized for 80% TSS removal Required filtration volume to achieve Level 1 – 80% TSS removal = 3.95*45m^3/ha* = **178 m^3**	Oil Grit Separator – Stormceptor Model EFO10 (or approved equivalent) – Sized for 60% TSS removal

*Based on MOE Table 3.2

2.9 SWM Facility

The SWM Facility is sized to provide the required SWM criteria identified for Catchments 203A and 203B in previous sections. The facility has been designed to provide active volume to meet the quantity and erosion control.

A control structure with multiple orifice plates is proposed to control the post development release rates. The proposed structure along with the facility details are presented in **Table 2.17** below.

Table 2-11: Proposed SWM Facility

Drainage Area		3.95ha
Active Volume Component	**Active Volume Elevation/Depth**	297.70m -299.60m (1.9m Depth)
	Required 100 year volume	1799m^3
	Provided 100 year volume	3559m^3
	Proposed control structure	90mm Orifice Plate @ 297.70m 245mm Orifice Plate @ 297.80m 1.2m DICB @ 298.10
Permanent Pool Volume Component	**Provided Volume Elevation/Depth**	295.50m -297.70m (2.2 Depth)
	Required 100 year volume	972m^3
	Provided 100 year volume	978m^3

2.10 Water Balance

The subject site is located within the WHPA (Well Head Protection Area) Q1 and Q2, and significant groundwater recharge area, therefore pre-development infiltration volumes are to be maintained. A water balance report was completed by GAMAN Consultants Inc. and based on the assessment; the annual pre-development infiltration volume is **3,881m^3/year**. During the post-development condition, the infiltration volume is reduced to **1,363m^3/year**. This suggests an infiltration deficit of **2,518m^3/year** will occur as a result. Refer to **Appendix B.5** for the GAMAN Water balance and for supporting calculation details.

As per LSRCA comments received in the SPA for phase 1 of the subject site, only infiltration of clean water from rooftops is acceptable and infiltration of runoff from industrial sites in not suitable. Therefore, runoff from the gravel areas cannot be infiltrated.

Infiltration of rooftop runoff within an underground infiltration gallery was explored. However, this is not feasible due to high groundwater levels within the subject site.

As the deficit will not be met due to the reasons described above, it is proposed that the deficit is paid via cash-in-lieu. The total cost would be approximately $132,000, as per the LSRCA Recharge Compensation Fee Schedule.

2.11 Phosphorus Loading

High phosphorus loading in Lake Simcoe have led to excessive growth of plants and algae in the lake. Since the phosphorus contribution of stormwater is considerably higher in the tributaries and lakes, it needs to be controlled.

Filtration, infiltration galleries and storage chambers can reduce the phosphorus loadings into creeks and lakes. The Ontario Ministry of the Environment's Lake Simcoe Phosphorus Budget Tool was used in assessing the phosphorus budget of the proposed development. Of the total 12.47ha, only the Phase 2 development of 4.03ha was considered for the phosphorus loading calculation below.

The pre-development phosphorus loading was calculated based on 4.03ha of Cropland at a rate of 0.36kg/ha/year. An estimated total annual pre-development TP loading of **1.45 kg/year** was estimated as seen in **Table 2.21** below.

For post-development conditions, a commercial/industrial of 1.82 kg/ha/yr was used in the post-development calculations for both catchments. The uncontrolled area was estimated with an annual loading of 0.36 kg/ha/yr. Based on these amounts a total unmitigated post-development loading of **7.22kg/yr** was estimated for the 4.03ha post-development area. Please refer to **Appendix B.3** for the phosphorus loading calculation breakdown.

Table 2-12 Pre and Post Development Phosphorus Loading

	Pre-Development	Post Development (Without BMPs)	Post Development (With BMPs)	Removal Efficiency at Post Development Stage
Phosphorus Loading (kg/yr)	1.45	7.22	1.20	83%

The phosphorus removal that could not be achieved will be paid via cash-in- lieu. The cash lieu is as follows 1.2 x 2.5 x $35,770 x 1.15 = $123,407 as per *LSRCA Phosphorus Offsetting Policy*. Please note that the total cost includes the 15% administration fee.

3 Sanitary Servicing

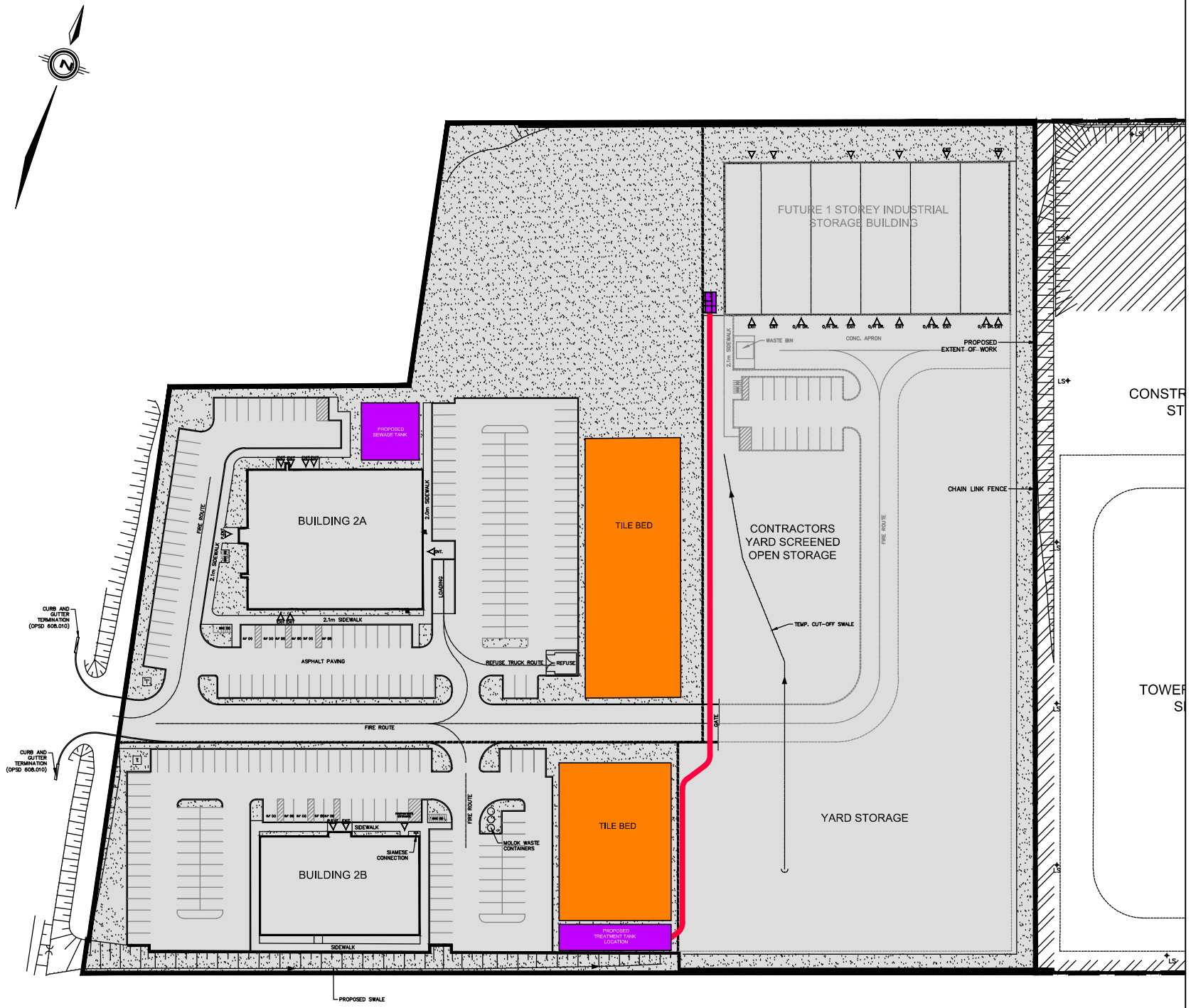
3.1 Existing Sanitary Infrastructure

Currently there are no existing Sanitary infrastructure within the vicinity of the subject site.

3.2 Proposed Sanitary Servicing

Sanitary flows will discharge from the subject site buildings to the proposed septic tank system as shown on **Figure 3.1**. The drawings and details for the septic system has been designed and provided by an external consultant (Gunnel Engineering Ltd.) and can be accessed from **Appendix C.**

Phil Gotfried



SCAL PROPERTIES LTD.
PHASE 2
LIMEN HEAD OFFICE

LEGEND

- PHASE 2 SUBJECT LANDS
- PHASE 1 SUBJECT LANDS
- PROPOSED GRAVITY SERVICE CONNECTION
- PROPOSED SCEPTIC TANKS
- PROPOSED TILE BED

SCHAEFFERS
CONSULTING ENGINEERS
6 Ronrose Drive, Concord, Ontario L4K 4R3
Tel: (905) 738-6100 Email: general@schaeffers.com
www.schaeffers.com

FIGURE 3.1
SANITARY SERVICING PLAN

2022-5278	MARCH 2023	SCALE: N.T.S.

4 Water Supply

4.1 Existing Water Supply Services

Currently, there are no existing municipal water supply within the vicinity of the subject site.

4.2 Proposed Water Supply

The proposed industrial warehouse block is proposed to be serviced via ground wells within the subject site.

5 Closing Remarks

This report provides a Functional Servicing Plan for stormwater, sanitary, and water servicing. The proposed servicing scheme can be summarized as follows:

Stormwater Management:

- Post to pre-quantity control for the 2-year through 100-year design storms using orifice controls;
- Enhanced level quality control by utilizing permanent pool volumes, a filter bed, as well as an OGS.
- Volume control met by the proposed SWM facility; and

Sanitary Servicing

- Sanitary servicing will be provided by the proposed septic tank system within the subject site.

Water Supply Servicing

- Water will be supplied to the site from groundwater wells.

We trust this report meets your satisfaction and look forward to your approval. Should you have any questions, please do not hesitate to contact our office.

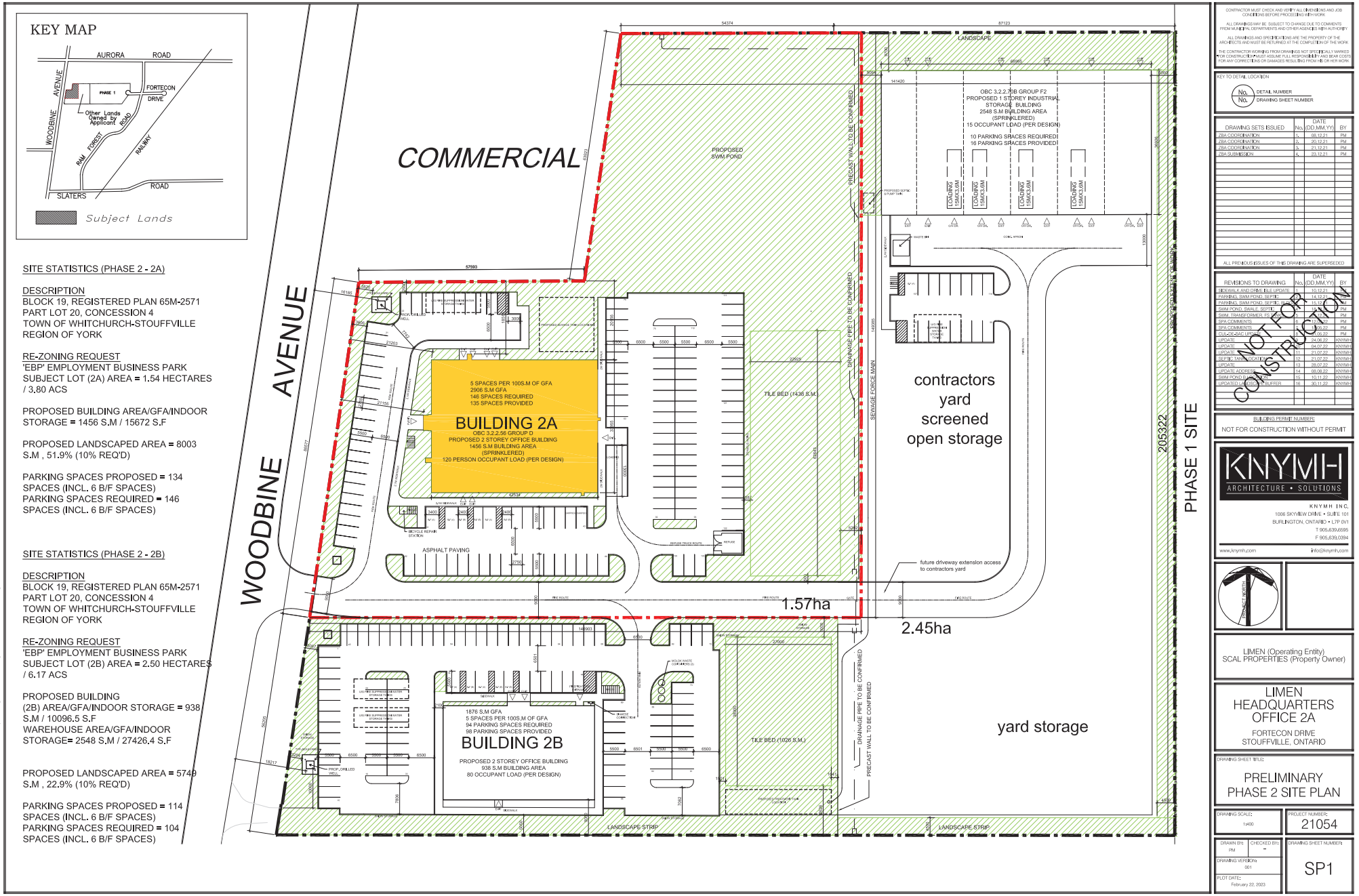
Respectfully submitted,

SCHAEFFER & ASSOCIATES LTD

Saffa Ramsoomair B.A.Sc., EIT.,
Water Resources Analyst

Heather Milukow, M. Eng., P. Eng.,
Water Resources Engineer

Appendix A – Background Information



SITE STATISTICS (PHASE 2 - 2A)

DESCRIPTION
BLOCK 19, REGISTERED PLAN 65M-2571
PART LOT 20, CONCESSION 4
TOWN OF WHITCHURCH-STOUFFVILLE
REGION OF YORK

RE-ZONING REQUEST
'EBP' EMPLOYMENT BUSINESS PARK
SUBJECT LOT (2A) AREA = 1.54 HECTARES / 3.80 ACS

PROPOSED BUILDING AREA/GFA/INDOOR STORAGE = 1456 S.M / 15672 S.F

PROPOSED LANDSCAPED AREA = 8003 S.M , 51.9% (10% REQ'D)

PARKING SPACES PROPOSED = 134 SPACES (INCL. 6 B/F SPACES)
PARKING SPACES REQUIRED = 146 SPACES (INCL. 6 B/F SPACES)

SITE STATISTICS (PHASE 2 - 2B)

DESCRIPTION
BLOCK 19, REGISTERED PLAN 65M-2571
PART LOT 20, CONCESSION 4
TOWN OF WHITCHURCH-STOUFFVILLE
REGION OF YORK

RE-ZONING REQUEST
'EBP' EMPLOYMENT BUSINESS PARK
SUBJECT LOT (2B) AREA = 2.50 HECTARES / 6.17 ACS

PROPOSED BUILDING
(2B) AREA/GFA/INDOOR STORAGE = 938 S.M / 10096.5 S.F
WAREHOUSE AREA/GFA/INDOOR STORAGE= 2548 S.M / 27426.4 S.F

PROPOSED LANDSCAPED AREA = 5749 S.M , 22.9% (10% REQ'D)

PARKING SPACES PROPOSED = 114 SPACES (INCL. 6 B/F SPACES)
PARKING SPACES REQUIRED = 104 SPACES (INCL. 6 B/F SPACES)

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No. DRAWING SHEET NUMBER

DRAWING SETS ISSUED	No.	DATE (DD.MM.YY)	BY
ZBA COORDINATION	1.	08.12.21	PM
ZBA COORDINATION	2.	20.12.21	PM
ZBA COORDINATION	3.	21.12.21	PM
ZBA SUBMISSION	4.	23.12.21	PM

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

REVISIONS TO DRAWING	No.	DATE (DD.MM.YY)	BY
SIDEWALK AND CRWC ISLE UPDATE	1	10.12.21	PM
PARKING, SWM POND, SEPTIC	2	14.12.21	PM
PARKING, SWM POND, SEPTIC, SHAPE	3	15.12.21	PM
SWM POND, SWALE, SEPTIC	4	16.12.21	PM
SWM, TRANSFORMER, FS, ADDRESS	5	17.12.21	PM
SPA COMMENTS	6	17.12.21	PM
SPA COMMENTS	7	13.06.22	PM
CUL-DE-SAC UPDATE	8	17.06.22	PM
UPDATE	9	24.06.22	NWMH
UPDATE	10	04.07.22	NWMH
UPDATE	11	21.07.22	NWMH
SEPTIC TANK LOCATION	12	21.07.22	NWMH
UPDATE	13	28.07.22	NWMH
UPDATE ADDRESS	14	08.08.22	NWMH
SWM POND BOUNDARY	15	10.11.22	NWMH
UPDATED LOT LINE BUFFER	16	30.11.22	NWMH

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BUILDING PERMIT NUMBER:
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T 905.639.8686
F 905.639.0394
www.knymh.com
info@knymh.com

LIMEN (Operating Entity)
SCAL PROPERTIES (Property Owner)

LIMEN HEADQUARTERS OFFICE 2A

FORTECON DRIVE
STOUFFVILLE, ONTARIO

DRAWING SHEET TITLE:
PRELIMINARY PHASE 2 SITE PLAN

DRAWING SCALE: 1:400
PROJECT NUMBER: 21054
DRAWN BY: PM
CHECKED BY: -
DRAWING VERSION: 001
PLOT DATE: February 22, 2023
DRAWING SHEET NUMBER: SP1

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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
LIMEN GROUP CONSTRUCTION (2019) LTD.

A GEOTECHNICAL INVESTIGATION FOR PROPOSED INDUSTRIAL BUILDLINGS, SWM PONDS AND SEPTICS

WOODBINE AVENUE AND AURORA ROAD

TOWN OF WHITCHURCH-STOUFFVILE

REFERENCE NO. 2109-S177

MARCH 2022

DISTRIBUTION

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Subsurface Profile ..... Drawing Nos. 2 and 3

1.0 INTRODUCTION

In accordance with written authorization dated September 15, 2021, from Mr. Antonio Lima, President, of Limen Group Construction (2019) Ltd., a geotechnical investigation was carried out at a parcel of land located at Woodbine Avenue and Aurora Road, in the Town of Whitchurch-Stouffville, for proposed Industrial Buildings, SWM Ponds and Septics.

The purpose of the investigation was to reveal the subsurface conditions and to determine the engineering properties of the disclosed soils for the design and construction of the proposed project.

The findings and resulting geotechnical recommendations are presented in this Report.

2.0 SITE AND PROJECT DESCRIPTION

Whitchurch-Stouffville is located on a till plain where glacial drift predominates the soil stratigraphy. In places, the drift has been modified by the depositing of lacustrine clay, silt, sand and water-laid till by the water action of Peel Ponding (glacial lake).

The investigated site is a weed covered open field, situated at the southeast sector of Woodbine Avenue and Aurora Road, in the Town of Whitchurch-Stouffville. The ground surface is relatively flat and level, with some undulations.

The proposed project consists of the construction of industrial buildings, SWM ponds and septics. The new development will be provided with municipal services, landscaped areas and roadways meeting urban standards.

3.0 FIELD WORK

The field work, consisting of 13 boreholes to depths of 5.0 m and 6.6 m, was performed on December 10, 2021, January 24 and 25, 2022, at the locations shown on the Borehole Location Plan, Drawing No. 1. A total of 3 monitoring wells were also installed at Boreholes 1, 2 and 8, for future groundwater monitoring by others.

The holes were advanced at intervals to the sampling depths by a track-mounted, continuous-flight power-auger machine equipped for soil sampling. Standard Penetration Tests, using the procedures described on the enclosed “List of Abbreviations and Terms”, were performed at the sampling depths. The test results are recorded as the Standard

Penetration Resistance (or 'N' values) of the subsoil. The relative density of the granular strata and the consistency of the cohesive strata are inferred from the 'N' values. Split-spoon samples were recovered for soil classification and laboratory testing.

The field work was supervised and the findings recorded by a Geotechnical Technician.

The geodetic elevation at each of the borehole locations was obtained by Soil Engineers Ltd. using the Global Navigation Satellite System (GNSS).

4.0 SUBSURFACE CONDITIONS

Detailed descriptions of the encountered subsurface conditions are presented on the Borehole Logs, comprising Figures 1 to 13, inclusive. The revealed stratigraphy is plotted on the Subsurface Profile, Drawing Nos. 2 and 3, and the engineering properties of the disclosed soils are discussed herein.

This investigation has disclosed that beneath either a layer of granular fill or a veneer of topsoil, the site is underlain by strata of silty clay, silt and silty sand.

4.1 Granular Fill (Borehole 2)

A layer of granular fill, 100 mm thick, was found at the ground surface. It consists of a mixture of crushed gravel and silty sand.

The granular fill should be further assessed of its suitability for reuse as bedding material, subgrade stabilization or as a general backfill material.

4.2 Topsoil (All Boreholes, except Borehole 2)

The revealed topsoil, ranging from 10 to 36 cm thick, was encountered at the ground surface. It is dark brown in colour, indicating that it contains appreciable amounts of roots and humus. These materials are unstable and compressible under loads; therefore, the topsoil is considered to be void of engineering value. Due to its humus content, it may produce volatile gases and generate an offensive odour under anaerobic conditions. Therefore, the topsoil must not be buried below any structures or deeper than 1.2 m below the finished grade, so that it will not have an adverse impact on the environmental well being of the developed areas.

Since the topsoil is considered void of engineering value, it can only be used for general landscaping and landscape contouring purposes. A fertility analysis can be carried out to determine the suitability of the topsoil as a planting material

4.3 **Silty Clay** (All Boreholes, except Boreholes 3 and 4)

The silty clay was encountered at various depths and is the predominant soil encountered on site. The clay is laminated with sand and silt seams and layers, showing that it is a glaciolacustrine deposit. The clay layer is weathered to depths from 0.7 to 2.1 m at some of the boreholes.

The obtained 'N' values range from 1 blow per 30 cm to 50 blows per 2 cm, with a median of 22 blows per 30 cm of penetration, indicating that the consistency of the clay is very soft to hard, being generally very stiff. The soft soil is generally restricted to the weathered zone.

Grain size analyses were performed on 2 representative samples of the silty clay and the results are plotted on Figure 14.

The Atterberg Limits of 1 representative sample and the water content values of all of the samples were determined. The results are plotted on the Borehole Logs and summarized below:

Liquid Limit	28%
Plastic Limit	17%
Natural Water Content	16% to 29% (median 20%)

The above results show that the clay is a cohesive material with low plasticity. The natural water content values generally lie above its plastic limit and below its liquid limit, confirming the generally very stiff consistency of the clay determined from the 'N' values.

Based on the above findings, the following engineering properties are deduced:

- High frost susceptibility and high soil-adfreezing potential.
- Low water erodibility.
- Low permeability, with an estimated coefficient of permeability of 10^{-7} cm/sec, an estimated percolation rate of over 80 min/cm, and runoff coefficients of:

Slope	
0% - 2%	0.15
2% - 6%	0.20
6% +	0.28

- A cohesive-frictional soil, its shear strength is derived from consistency and augmented by the internal friction of the silt. Its shear strength is moisture dependent.
- In excavation, the clay will be prone to sloughing if it is exposed for prolonged periods in steep cuts. This would generally be initiated by infiltrating precipitation or groundwater seeping out from the silt and fine sand layers.
- A very poor pavement-supportive material, with an estimated California Bearing Ratio (CBR) value of 3% or less.
- Moderately high corrosivity to buried metal, with an estimated electrical resistivity of 2500 ohm·cm.

4.4 **Silt** (Boreholes 1, 3, 4 and 11)

The silt deposit was encountered at various depths in localized areas and extends to the maximum investigated depth Boreholes 1, 3 and 4. The silt is embedded with seams and layers of silty clay and fine sand and contains a variable amount of clay. The laminated structure shows that the silt is a glaciolacustrine deposit. The silt layer is weathered to a depth of 2.1 m at Boreholes 3 and 4.

The natural water content of the silt samples ranges from 18% to 26%, with a median of 21%, indicating it is in a wet condition.

The obtained ‘N’ values range from 4 to 86, with a median of 24 blows per 30 cm of penetration, indicating that the relative density of the silt is loose to very dense, being generally compact. The loose soil is generally restricted to the weathered zone.

Grain size analyses were performed on 2 representative samples of the silt and the results are plotted on Figure 15.

Based on the above findings, the engineering properties are given below:

- Highly frost susceptible, with high soil-adfreezing potential.
- Highly water erodible; it is susceptible to migration through small openings under seepage pressure.

- Relatively low to low permeability, with an estimated coefficient of permeability of 10^{-5} to 10^{-6} cm/sec, depending on the clay content, an estimated percolation rate of 45 to 60 min/cm, and runoff coefficients of:

Slope	
0% - 2%	0.11 to 0.15
2% - 6%	0.16 to 0.20
6% +	0.23 to 0.28

- The soil has a high capillarity and water retention capacity.
- A frictional soil, its shear strength is density dependent. Due to the dilatancy, the strength of the wet silt is susceptible to impact disturbance; i.e., the disturbance will induce a build-up of pore pressure within the soil mantle, resulting in soil dilation and a reduction in shear strength.
- In excavation, the moist silt will be stable in relatively steep cuts, while the wet silt will slough and run slowly with seepage bleeding from the cut face, and the bottom will boil under a piezometric head of 0.3 m.
- A poor pavement-supportive material, with an estimated CBR value of 6%.
- Moderate corrosivity to buried metal, with an estimated electrical resistivity of 4500 ohm·cm.

4.5 **Silty Sand** (Boreholes 3 and 5)

The silty sand deposit was encountered below a veneer of topsoil and sample examinations show that it is non-cohesive and is embedded with silt seams. The laminated structure shows the deposit was derived from a lacustrine environment. The silty sand layer is weathered at both boreholes.

The obtained 'N' values range from 1 to 7, with a median of 5 blows per 30 cm of penetration; therefore, the relative density of the silty sand is very loose to loose.

The natural water content was determined and the results are plotted on the Borehole Logs. The values are 16% and 19%, showing that the sand deposit is in a wet condition. The wet samples are water bearing and displayed appreciable dilatancy when shaken by hand.

Accordingly, the following engineering properties are deduced:

- Highly frost susceptible with high soil-adfreezing potential.
- Highly water erodible.

- Pervious to relatively pervious, with an estimated coefficient of permeability of 10^{-3} to10^{-4} cm/sec, an estimated percolation rate of 12 to 30 min/cm, and runoff coefficients of:

Slope	
0% - 2%	0.04 to 0.07
2% - 6%	0.09 to 0.12
6% +	0.13 to 0.18

- A frictional soil, its shear strength is derived from internal friction and is density dependent. Due to its dilatancy, the shear strength of the wet sand is susceptible to impact disturbance; i.e., the disturbance will induce a build-up of pore pressure within the soil mantle, resulting in soil dilation and a reduction of shear strength.
- In relatively steep cuts, the sand will be stable in a damp to moist condition, but will slough if it is wet and run with water seepage. The bottom will boil under a piezometric head of 0.3 m.
- A fair material to support pavement, with an estimated CBR value of at least 8%.
- Moderately low corrosivity to buried metal, with an estimated electrical resistivity of 5000 ohm·cm.

4.6 Compaction Characteristics of the Revealed Soils

The obtainable degree of compaction is primarily dependent on the soil moisture and, to a lesser extent, on the type of compactor used and the effort applied. As a general guide, the typical water content values of the revealed soils for Standard Proctor compaction are presented in Table 1.

Table 1 - Estimated Water Content for Compaction

Soil Type	Determined Natural Water Content (%)	Water Content (%) for Standard Proctor Compaction	
		100% (optimum)	Range for 95% or +
Silty Clay	16 to 29 (median 20)	18	14 to 23
Silt	18 to 26 (median 21)	13	8 to 17
Silty Sand	16 and 19	11	6 to 16

The above values show that the silty clay is generally suitable for 95% or + Standard Proctor compaction; whereas, the silt and the silty sand are too wet and will require aeration or mixing with drier soils prior to compaction. Aeration of the wet soils can be effectively carried out by spreading it thinly on the ground in the dry, warm weather.

The silty clay should be compacted using a heavy-weight, kneading-type roller. The granular fill, silt and silty sand can be compacted by a smooth roller with or without vibration, depending on the water content of the soil being compacted. The lifts for compaction should be limited to 20 cm, or to a suitable thickness as assessed by test strips performed by the equipment which will be used at the time of construction.

When compacting the silty clay on the dry side of the optimum, the compactive energy will frequently bridge over the chunks in the soil and be transmitted laterally into the soil mantle. Therefore, the lifts of the soil must be limited to 20 cm or less (before compaction). It is difficult to monitor the lifts of backfill placed in deep trenches; therefore, it is preferable that the compaction of backfill at depths over 1.0 m below the road subgrade be carried out on the wet side of the optimum. This would allow a wider latitude of lift thickness. Wetting of the soil will be necessary to achieve this requirement.

One should be aware that, with considerable effort, a 90%± Standard Proctor compaction of the wet silt and silty sand is achievable. Further densification is prevented by the pore pressure induced by the compactive effort; however, large random voids will have been expelled and, with time, the pore pressure will dissipate and the percentage of compaction will increase. There are many cases on record where, after a few months of rest, the density of the compacted mantle has increased to over 95% of its maximum Standard Proctor dry density.

If the compaction of the soils is carried out with the water content within the range for 95% Standard Proctor dry density but on the wet side of the optimum, the surface of the compacted soil mantle will roll under the dynamic compactive load. This is unsuitable for road construction since each component of the pavement structure is to be placed under dynamic conditions which will induce the rolling action of the subgrade surface and cause structural failure of the new pavement. The foundations or bedding of the sewer and slab-on-grade will be placed on a subgrade which will not be subjected to impact loads. Therefore, the structurally compacted soil mantle with the water content on the wet side or dry side of the optimum will provide an adequate subgrade for the construction.

5.0 GROUNDWATER CONDITIONS

The boreholes were checked for the presence of groundwater or the occurrence of cave-in upon their completion. The data are plotted on the Borehole Logs and summarized in Table 2.

Table 2 - Groundwater Levels

Borehole No.	Borehole Depth (m)	Soil Colour Changes Brown to Grey	Measured Groundwater/ Cave-in* Level On Completion	
		Depth (m)	Depth (m)	El. (m)
1	5.0	4.0	3.7	293.7
2	5.0	5.0+	3.7	293.3
3	5.0	5.0+	4.0	293.2
4	6.6	6.1	Dry	-
5	6.6	3.0	3.0	294.2
6	5.0	4.5	3.0	293.4
7	5.0	4.5	3.0	294.5
8	5.0	2.3	3.0	294.6
9	6.6	6.1	3.0	295.2
10	5.0	4.5	4.3	293.5
11	6.6	4.0	5.5	294.0
12	5.0	4.5	Dry	-
13	5.0	3.0	3.0	295.4

Groundwater was detected at depths ranging from 3.0 to 5.5 m below the prevailing ground surface at 11 of the boreholes; the other 2 boreholes remained dry upon completion of field work. The groundwater level will fluctuate with the seasons.

The yield of groundwater from the silty clay, due to its low permeability, is expected to be small and limited. The yield from the silt and sand will be moderate to appreciable and likely persistent.

6.0 DISCUSSION AND RECOMMENDATIONS

This investigation has disclosed that beneath either a layer of granular fill or a veneer of topsoil, the site is underlain by strata of very soft to hard, generally very stiff silty clay, loose to very dense, generally compact silt and very loose to loose silty sand. The surficial soil is weathered to depths from 0.7 to 2.1 m at some of the boreholes.

Groundwater was detected at depths ranging from 3.0 to 5.5 m below the prevailing ground surface at 11 of the boreholes; the remaining 2 boreholes were dry upon completion of field work. The groundwater level will fluctuate with the seasons.

The geotechnical findings which warrant special consideration are presented below:

1. The topsoil must be stripped for the project construction. This material is unsuitable for structural applications and should be placed in the landscaped areas and should not be buried beneath any structures or 1.2 m below the finished grade.
2. The sound natural soils are suitable for normal spread and strip footing construction. Due to the presence of topsoil and weathered soils, the footing subgrade must be inspected by either a geotechnical engineer, or a geotechnical technician under the supervision of a geotechnical engineer, to ensure that its condition is compatible with the design of the foundation.
3. Slab-on-grade must be placed on sound native soils below the topsoil and weathered soils. Where weathered, soft or loose soils occur, they must be subexcavated, assessed, aerated and properly compacted prior to the placement of the slab.
4. A Class 'B' bedding consisting of compacted 20-mm Crusher-Run Limestone, is recommended for the construction of the underground services. The sewer joints should be leak-proof, or wrapped with an appropriate waterproof membrane, to prevent subgrade migration. If subgrade stabilization is required, lean concrete can be used. In areas where more extensive dewatering is required for sewer construction, a Class 'A' bedding should be considered.

The recommendations appropriate for the project described in Section 2.0 are presented herein. One must be aware that the subsurface conditions may vary between boreholes. Should this become apparent during construction, a geotechnical engineer must be consulted to determine whether the following recommendations require revision.

6.1 **Foundations**

Based on the borehole findings, the footings should be placed below the topsoil and weathered soil onto the sound natural soils. The recommended soil bearing pressures and the corresponding founding levels in the sound natural soils are presented in Table 3.

Table 3 - Founding Levels

Borehole No.	Recommended Maximum Allowable Soil Pressure (SLS)/ Factored Ultimate Soil Bearing Pressure (ULS) and Corresponding Founding Level			
	100 kPa (SLS)/160 kPa (ULS)		200 kPa (SLS)/320 kPa (ULS)	
	Depth (m)	Elevation (m)	Depth (m)	Elevation (m)
3	1.6 or +	295.6 or -	2.4 or +	294.8 or -
4	1.0 or +	297.8 or -	2.4 or +	296.4 or -
5	1.6 or +	295.6 or -	2.4 or +	294.8 or -
6	1.6 or +	294.48or -	2.4 or +	294.0 or -
9	1.0 or +	297.2 or -	1.6 or +	296.6 or -
10	-	-	1.0 or +	296.8 or -
11	1.2 or +	298.3 or -	1.6 or +	297.9 or -
12	1.0 or +	297.9 or -	1.6 or +	297.3 or -

The recommended soil pressures (SLS) for normal foundations incorporate a safety factor of 3. The total and differential settlements of the footings are estimated to be 25 mm and 15 mm, respectively.

The foundations exposed to weathering and in unheated areas should have at least 1.2 m of earth cover for protection against frost action or must be properly insulated.

The footing subgrade should be inspected by a geotechnical engineer, or a geotechnical technician under the supervision of a geotechnical engineer, to ensure that the revealed conditions are compatible with the foundation design requirements.

The foundations must meet the requirements specified by the latest Ontario Building Code, and the buildings must be designed to resist a minimum earthquake force using Site Classification ‘D’ (stiff soil).

The occurring soils are high in frost heave and soil-adfreezing potential. If these soils are to be used for the foundation backfill, the foundation walls should be shielded by a polyethylene slip-membrane for protection against soil adfreezing.

6.2 Slab-On-Grade

Slab-on-grade should be placed on well compacted inorganic earth fill and sound natural soils. After fine grading, the subgrade should be inspected and assessed by proof-rolling prior to slab-on-grade construction. Soft or loose subgrade and any weathered soil should be subexcavated, sorted free of any deleterious material, aerated and uniformly compacted to 98% or + of its maximum Standard Proctor dry density.

The slab should be constructed on a granular base, 20 cm thick, consisting of 20-mm Crusher-Run Limestone, or equivalent, compacted to its maximum Standard Proctor dry density.

A Modulus of Subgrade Reaction of 25 MPa/m can be used for the design of the floor slab on sound natural soils.

The exterior grading must be such that water is directed away from the building envelope.

6.3 Underground Services

The subgrade for the underground services should consist of sound natural soils or compacted organic-free earth fill. Where weathered, loose or soft soils are encountered, these materials must be subexcavated and replaced with properly compacted inorganic soils or bedding material.

A Class ‘B’ bedding, consisting of compacted 20-mm Crusher-Run Limestone, is recommended for the construction of the underground services. The sewer joints should be leak-proof or wrapped with an appropriate waterproof membrane to prevent subgrade migration. If subgrade stabilization is required, lean concrete can be used. In areas where more extensive dewatering is required for sewer construction, a Class ‘A’ bedding should be considered.

In order to prevent pipe floatation when the sewer trench is deluged with water, a soil cover with a thickness equal to the diameter of the pipe should be in place at all times after completion of the pipe installation.

Openings to subdrains and catch basins should be shielded with a fabric filter to prevent blockage by silting.

Since the silty clay has moderately high corrosivity to buried metal, the water main and fittings should be protected against corrosion. In determining the mode of protection, an electrical resistivity of 2500 ohm·cm should be used. This, however, should be confirmed by testing the soil along the water main alignment at the time of sewer construction.

6.4 Backfilling in Trenches and Excavated Areas

The on site inorganic soils are suitable for trench backfill. The wet soils should not be used for backfill unless they are aerated and dried to achieve the optimum moisture content. The backfill in the trenches should be compacted to at least 95% of its maximum Standard Proctor dry density, and increased to 98% or + below the floor slab. In the zone within 1.0 m below the pavement subgrade, the material should be compacted with the water content 2% or 3% drier than the optimum, and the compaction should be increased to 98% of the respective maximum Standard Proctor dry density. This is to provide the required stiffness for pavement construction. In the lower zone, the compaction should be carried out on the wet side of the optimum; this allows a wider latitude of lift thickness.

In normal construction practice, the problem areas of settlement largely occur adjacent to manholes, catch basins, services crossings, columns and foundation walls. In areas which are inaccessible to a heavy compactor, sand backfill should be used. Unless compaction of the backfill is carefully performed, the interface of the natural soils and sand backfill will have to be flooded for a period of several days.

The narrow trenches for services crossings should be cut at 1 vertical:2 or + horizontal so that the backfill can be effectively compacted. Otherwise, soil arching in the trenches will prevent achievement of the proper compaction. The lift of each backfill layer should either be limited to a thickness of 20 cm, or the thickness should be determined by test strips.

One must be aware of possible consequences during trench backfilling and exercise caution as described below:

- When construction is carried out in freezing winter weather, allowance should be made for these following conditions. Despite stringent backfill monitoring, frozen soil layers may inadvertently be mixed with the structural trench backfill. Should the in situ soil have water content on the dry side of the optimum, it would be impossible to wet the soil due to the freezing condition, rendering difficulties in obtaining uniform and proper compaction. Furthermore, the freezing condition will prevent flooding of the backfill when it is required, such as when the trench box is

removed. The above will invariably cause backfill settlement that may become evident within 1 to several years, depending on the depth of the trench which has been backfilled.

- In areas where the underground service construction is carried out during the winter months, prolonged exposure of the trench walls will result in frost heave within the soil mantle of the walls. This may result in some settlement as the frost recedes, and repair costs will be incurred prior to the final surfacing of the new pavement.
- To backfill a deep trench, one must be aware that future settlement is to be expected, unless the side of the cut is flattened to at least 1 vertical:1.5+ horizontal, and the lifts of the fill and its moisture content are stringently controlled; i.e., lifts should be no more than 20 cm (or less if the backfilling conditions dictate) and uniformly compacted to achieve at least 95% of the maximum Standard Proctor dry density, with the moisture content on the wet site of the optimum.
- It is often difficult to achieve uniform compaction of the backfill in the lower vertical section of a trench which is an open cut or is stabilized by a trench box, particularly in the sector close to the trench walls or the sides of the box. These sectors must be backfilled with sand. In a trench stabilized by a trench box, the void left after the removal of the box will be filled by the backfill. It is necessary to backfill this sector with sand, and the compacted backfill must be flooded for 1 day, prior to the placement of the backfill above this sector, i.e., in the upper sloped trench section. This measure is necessary in order to prevent consolidation of inadvertent voids and loose backfill, which will compromise the compaction of the backfill in the upper section. In areas where groundwater movement is expected in the sand fill mantle, anti-seepage collars should be provided.

6.5 **Stormwater Management Ponds** (Boreholes 2 and 7)

It is understood that the proposed bottom of the two stormwater management ponds is yet to be determined. However, due to the low permeability of the silty clay at these borehole locations, seepage of groundwater into the ponds will be minimal and the impact on the storage volume of the ponds will be negligible, as a results, clay liner will not be required for the proposed SWM ponds.

For stability, the sides of the ponds should be sloped at 1 vertical:4 or + horizontal below the wet perimeter of the ponds, and can be flattened to 1 vertical:3 or + horizontal above the wet perimeter. All the exposed side slopes must be vegetated and/or sodded to prevent erosion. A layer of rip-rap can be placed at the wet perimeter to protect against rapid drawdown and wave erosion.

A Maximum Allowable Soil Pressure (SLS) of 100 kPa and a Factored Ultimate Soil Bearing Pressure (ULS) of 160 kPa can be used for the design of the foundations of the control structures. The footings must be placed onto the sound natural soils below the scouring depth or at a depth providing a minimum earth cover of 1.2 m for protection against frost action, whichever is greater. The footing subgrade must be inspected by a geotechnical engineer, or a geotechnical technician under the supervision of a geotechnical engineer, prior to concrete pouring to ensure its conformity to the design. The inlet and outlet of the ponds must be lined with gabion mats for protection against scouring.

6.6 **Septic Tile Beds** (Boreholes 1, 8 and 13)

The limitations for normal in-ground septic tile beds construction are that the bottom of the absorption trenches, or the surface of a filter medium be located a minimum of 0.9 m above the highest groundwater level, and above rock or soils with a percolation time exceeding 50 min/cm. The soil in the treatment zone should possess acceptable effluent absorption properties expressed in a percolation time of between 1 min/cm and 50 min/cm.

As noted, the predominant in situ soil consists of silty clay, which is relatively impermeable with an estimated percolation time of 80 min/cm and is unsuitable for the in-ground absorption of sewage effluent; therefore, construction of a raised tile bed will be necessary.

The recommended percolation time ('T') for use in the design of the septic tile bed in silty clay is T=80 min/cm. A detailed design of the septic tile bed system can be obtained from the 1997 Ontario Building Code, published by the Ontario Ministry of Municipal Affairs and Housing.

To prevent effluent mounding over the silty clay (which has low permeability) the following criteria must be used for the design of a raised bed:

1. The effluent should be evenly distributed over the entire tile bed area.
2. The filter medium should have a minimum thickness of 1.1 m.

In order to enhance an efficient bed operation, the following requirements should be incorporated in the septic tile bed construction:

1. All topsoil should be stripped from the tile bed area.
2. For the raised septic tile bed, the sand filter should be keyed into the soil mantle to about 15 cm below the surface of the soil.

3. Grading of the surrounding areas should be such that it directs surface runoff away from the tile bed area.
4. The bed should be located in an unshaded area.
5. The fissured pattern of the underlying soil should not be disturbed, as this would reduce its capacity for in-ground effluent absorption.
6. In the low areas, the septic tile bed should be elevated so that surface runoff will not pond.

The above recommendations are subject to the approval of the local regulatory agency.

6.7 Pavement Design

The subgrade will generally consist of silty clay material. Accordingly, the recommended pavement design is given in Table 5.

Table 5 - Pavement Design

Course	Thickness (mm)	OPS Specifications
Asphalt Surface	40	HL-3
Asphalt Binder	50	HL-8
Granular Base	150	20-mm Crusher-Run Limestone
Granular Sub-base Light-Duty Heavy-Duty	 250 350	50-mm Crusher-Run Limestone

In preparation of the subgrade, the surface should be proof-rolled, and any soft subgrade should be subexcavated and replaced by properly compacted, organic-free earth fill or granular materials.

All the granular bases should be compacted to their maximum Standard Proctor dry density.

Earth fill to raise the grade for pavement construction should consist of organic-free soil uniformly compacted to 98% or + of its maximum Standard Proctor dry density.

The subgrade in the zone within 1.0 m below the underside of the granular sub-base should be compacted to at least 98% of its maximum Standard Proctor dry density, with a moisture content 2% to 3% drier than its optimum. Along the perimeter and at ramp-down

driveways where surface runoff may drain onto the pavement, or water may seep into the granular bases, a swale and an intercept subdrain system should be installed. Subdrains, consisting of filter-sleeved weepers, should also be installed 0.3 m below the granular sub-base, and they should be connected to the catch basins and storm manholes in the paved areas and backfilled with free-draining granular material.

6.8 Truck Loading Docks

The loading docks will need to be provided with subdrains to relieve possible ponding of water. A concrete apron is recommended at the truck loading areas where loaded trailers are to be parked. The apron should be designed using the Modulus of Subgrade Reaction given for the floor slab, and it should be insulated with 50-mm Styrofoam, or equivalent, on a compacted granular base 300 mm thick. The foundation walls at the truck loading docks should be designed as a retaining structure using the soil parameters presented in Section 6.9 of this report.

6.9 Soil Parameters

The recommended soil parameters for the project design are given in Table 6.

Table 6 - Soil Parameters

Unit Weight and Bulk Factor			
	Unit Weight (kN/m^3)	**Estimated Bulk Factor**	
	Bulk	**Loose**	**Compacted**
Weathered Soils	20.5	1.20	1.00
Silty Clay	20.5	1.30	1.00
Silt and Silty Sand	20.5	1.20	1.00
Lateral Earth Pressure Coefficients			
	Active K_a	**At Rest K_o**	**Passive K_p**
Weathered Soils/Silty Clay	0.40	0.50	2.50
Silt and Silty Sand	0.33	0.43	3.00

6.10 Excavation

Excavation should be carried out in accordance with Ontario Regulation 213/91.

Excavations should be sloped at 1 vertical:1 horizontal for stability.

For excavation purposes, the types of soils are classified in Table 7.

Table 7 - Classification of Soils for Excavation

Material	Type
Silty Clay, weathered Soils, Silt and Silty Sand above groundwater	3
Silt and Silty Sand below groundwater	4

The groundwater yield, if any, from the silty clay, due to its low permeability, will be small and can be controlled by pumping from sumps. If groundwater is encountered in the silt and silty sand, the yield is expected to be moderate to appreciable and may be persistent and groundwater may be controllable by pumping from closely spaced sumps. Or by well points.

Prospective contractors must be asked to assess the in situ subsurface conditions for soil cuts by digging test pits to at least 0.5 m below the intended bottom of excavation. These test pits should be allowed to remain open for a period of at least 4 hours to assess the trenching conditions.

7.0 LIMITATIONS OF REPORT

This report was prepared by Soil Engineers Ltd. for the account of Limen Group construction (2019) Ltd., and for review by its designated agents, financial institutions, and government agencies. Use of the report is subject to the conditions and limitations of the contractual agreement. The material in the report reflects the judgment of Frank Lee, P.Eng., and Bernard Lee, P.Eng, in light of the information available to it at the time of preparation. Any use which a Third Party makes of this report, and/or any reliance on decisions to be made based on it are the responsibility of such Third Parties. Soil Engineers Ltd. accepts no responsibility for damages, if any, suffered by any Third Party as a result of decisions made or actions based on this report.

SOIL ENGINEERS LTD.

Frank Lee, P.Eng.

Bernard Lee, P.Eng.
FL/BL:dd

LIST OF ABBREVIATIONS AND DESCRIPTION OF TERMS

The abbreviations and terms commonly employed on the borehole logs and figures, and in the text of the report, are as follows:

SAMPLE TYPES

AS Auger sample
CS Chunk sample
DO Drive open (split spoon)
DS Denison type sample
FS Foil sample
RC Rock core (with size and percentage recovery)
ST Slotted tube
TO Thin-walled, open
TP Thin-walled, piston
WS Wash sample

PENETRATION RESISTANCE

Dynamic Cone Penetration Resistance:

A continuous profile showing the number of blows for each foot of penetration of a 2-inch diameter, 90° point cone driven by a 140-pound hammer falling 30 inches.

Plotted as '—●—'

Standard Penetration Resistance or 'N' Value:

The number of blows of a 140-pound hammer falling 30 inches required to advance a 2-inch O.D. drive open sampler one foot into undisturbed soil.

Plotted as '○'

WH Sampler advanced by static weight
PH Sampler advanced by hydraulic pressure
PM Sampler advanced by manual pressure
NP No penetration

SOIL DESCRIPTION

Cohesionless Soils:

'N' (blows/ft)	Relative Density
0 to 4	very loose
4 to 10	loose
10 to 30	compact
30 to 50	dense
over 50	very dense

Cohesive Soils:

Undrained Shear Strength (ksf)	'N' (blows/ft)	Consistency
less than 0.25	0 to 2	very soft
0.25 to 0.50	2 to 4	soft
0.50 to 1.0	4 to 8	firm
1.0 to 2.0	8 to 16	stiff
2.0 to 4.0	16 to 32	very stiff
over 4.0	over 32	hard

Method of Determination of Undrained Shear Strength of Cohesive Soils:

x 0.0 Field vane test in borehole; the number denotes the sensitivity to remoulding

△ Laboratory vane test

□ Compression test in laboratory

For a saturated cohesive soil, the undrained shear strength is taken as one half of the undrained compressive strength

METRIC CONVERSION FACTORS

1 ft = 0.3048 metres
1lb = 0.454 kg
1 inch = 25.4 mm
1ksf = 47.88 kPa

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 1

FIGURE NO.: 1

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 24, 2022

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
297.4 / 0.0	Ground Surface			
	30 cm TOPSOIL Brown, firm to very stiff	1	DO	8
		2	DO	5
	weathered			
	SILTY CLAY	3	DO	14
	occ. wet sand and silt seams and layers	4	DO	24
		5	DO	24
293.4 / 4.0	Grey, compact SILT	6	DO	27
292.4 / 5.0	END OF BOREHOLE Installed 50 mm Ø monitoring well to 4.5 m Provided with a protective steel cover.			

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

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

Moisture Content values: 40, 21, 19, 23, 25, 21

WATER LEVEL

W.L. @ El. 293.7 m on completion

Soil Engineers Ltd.

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 2

FIGURE NO.: 2

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: December 10, 2021

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
297.0	Ground Surface			
0.0	100 mm GRANULAR FILL	1	DO	9
	Brown, stiff to very stiff weathered	2	DO	14
		3	DO	20
	SILTY CLAY	4	DO	28
	occ. wet sand and silt seams and layers	5	DO	22
		6	DO	18
292.0 / 5.0	END OF BOREHOLE			
	Installed 50 mm Ø monitoring well to 4.5 m Provided with a protective steel cover.			

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

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

Moisture Content (%): 20, 21, 23, 19, 22, 21

WATER LEVEL

W.L. @ El. 293.3 m on completion

Soil Engineers Ltd.

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 3

FIGURE NO.: 3

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 24, 2022

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
297.2	Ground Surface			
0.0	30 cm TOPSOIL	1	DO	7
	Brown, loose, weathered			
	SILTY SAND	2	DO	4
295.8				
1.4	Brown, loose to compact	3	DO	8
	weathered			
		4	DO	21
	SILT	5	DO	24
		6	DO	17
292.2				
5.0	END OF BOREHOLE			

Depth Scale (m): 0 1 2 3 4 5 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

Moisture Content values: 38, 16, 24, 19, 21, 22

WATER LEVEL: W.L. @ El. 293.2 m on completion

Soil Engineers Ltd.

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 4

FIGURE NO.: 4

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 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
298.8	Ground Surface							
0.0	30 cm TOPSOIL	1	DO	4	0		38	Dry on completion
	Loose to dense	2	DO	10	1		21	
		3	DO	7	2		26	
	weathered	4	DO	35	3		22	
	SILT	5	DO	27	4		19	
		6	DO	42	5		22	
	brown grey	7	DO	33	6		18	
292.2					7			
6.6	END OF BOREHOLE				8			
					9			
					10			
					11			
					12			
					13			
					14			

Soil Engineers Ltd.

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 5

FIGURE NO.: 5

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 24, 2022

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
297.2	Ground Surface			
0.0	30 cm TOPSOIL	1	DO	5
	Brown, very loose to loose, weathered			
	SILTY SAND	2	DO	1
295.8				
1.4	Stiff to hard	3	DO	13
	weathered			
		4	DO	22
	brown grey	5	DO	15
	SILTY CLAY			
	occ. wet sand and silt seams and layers	6	DO	33
290.6				
6.6	END OF BOREHOLE	7	DO	9

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

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

Moisture Content values: 50, 19, 25, 22, 29, 17, 17.34774

WATER LEVEL

W.L. @ El. 294.2 m on completion

Soil Engineers Ltd.

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 6

FIGURE NO.: 6

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 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
296.4	Ground Surface							
0.0	15 cm TOPSOIL	1	DO	2	0		37	
	Very soft to hard	2	DO	6	1		25	
		3	DO	7	2		28	
	SILTY CLAY weathered							
	occ. wet sand and silt seams and layers	4	DO	24	3		23	
		5	DO	43			18	
	brown grey	6	DO	38	4		17	
291.4					5			
5.0	END OF BOREHOLE				6			
					7			
					8			
					9			
					10			
					11			
					12			
					13			
					14			

W.L. @ El. 293.4 m on completion

Soil Engineers Ltd.

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 7

FIGURE NO.: 7

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 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
297.5	Ground Surface							
0.0	10 cm TOPSOIL	1	DO	1	0		46	
	Very soft to hard	2	DO	7	1		23	
		3	DO	8	2		21	
	weathered SILTY CLAY occ. wet sand and silt seams and layers	4	DO	22	3		19	
		5	DO	28			19	
	brown grey	6	DO	38	4		16	
292.5					5			
5.0	END OF BOREHOLE				6			
					7			
					8			
					9			
					10			
					11			
					12			
					13			
					14			

W.L. @ El. 294.5 m on completion

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 8

FIGURE NO.: 8

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 25, 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
297.6	Ground Surface							
0.0	36 cm TOPSOIL	1	DO	2	0		36	
	Very soft to very stiff							
		2	DO	12	1		24	
	weathered							
		3	DO	23			24	
	SILTY CLAY				2			
	brown grey							
	occ. wet sand and silt seams and layers	4	DO	28			19	
					3			
		5	DO	28			20	
					4			
		6	DO	26			18	
292.6					5			
5.0	END OF BOREHOLE							
	Installed 50 mm Ø monitoring well to 4.5 m Provided with a protective steel cover.				6			
					7			
					8			
					9			
					10			

Soil Engineers Ltd.

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 9

FIGURE NO.: 9

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 25, 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
298.2	Ground Surface							
0.0	25 cm TOPSOIL	1	DO	4	0		41	
	Soft to hard weathered	2	DO	15	1		21	
		3	DO	21	2		20	
		4	DO	20			20	
	SILTY CLAY occ. wet sand and silt seams and layers	5	DO	36	3		21	▽ W.L. @ El. 295.2 m on completion
		6	DO	50/15	4		18	
	brown grey	7	DO	50	5		17	
291.6					6			
6.6	END OF BOREHOLE				7			
					8			
					9			
					10			

Soil Engineers Ltd.

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 10

FIGURE NO.: 10

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 25, 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
297.8	Ground Surface							
0.0	25 cm TOPSOIL	1	DO	3	0		40	
	Very soft to hard weathered	2	DO	20	1		21	
		3	DO	54	2		18	
	SILTY CLAY occ. wet sand and silt seams and layers	4	DO	42	2		17	
		5	DO	32	3		18	
	brown grey	6	DO	48	4		18	W.L. @ El. 293.5 m on completion ▽
292.8					5			
5.0	END OF BOREHOLE				6			
					7			
					8			
					9			
					10			

Soil Engineers Ltd.

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 11

FIGURE NO.: 11

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 25, 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
299.5	Ground Surface							
0.0	25 cm TOPSOIL	1	DO	6	0		47	
	Brown, firm to hard							
		2	DO	8	1		23	
	SILTY CLAY weathered							
	occ. wet sand and silt seams and layers	3	DO	19	2		20	
		4	DO	52			16	
296.6								
2.9	Brown, very dense	5	DO	86	3		18	
	SILT							
295.5					4			
4.0	Grey, hard	6	DO	50/2			17	
	SILTY CLAY				5			
		7	DO	38	6		16	
292.9								
6.6	END OF BOREHOLE				7			
					8			
					9			
					10			

W.L. @ El. 294.0 m on completion

Soil Engineers Ltd.

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 12

FIGURE NO.: 12

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 25, 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
298.9	Ground Surface							
298.6	25 cm TOPSOIL	1	DO	4	0		50	Dry on completion
	Soft to hard weathered	2	DO	14	1		20	
		3	DO	36	2		18	
	SILTY CLAY occ. wet sand and silt seams and layers	4	DO	58			18	
		5	DO	54	3		18	
	brown grey	6	DO	56	4		18	
293.9 / 5.0	END OF BOREHOLE				5			
					6			
					7			
					8			
					9			
					10			

Soil Engineers Ltd.

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 13

FIGURE NO.: 13

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 25, 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
298.4	Ground Surface							
0.0	30 cm TOPSOIL	1	DO	7	0		50	
	Firm to hard							
		2	DO	12	1		24	
	weathered							
		3	DO	26	2		21	
	SILTY CLAY							
	occ. wet sand and silt seams and layers	4	DO	36			20	
	brown grey	5	DO	31	3		18	▽
					4			W.L. @ El. 295.4 m on completion
		6	DO	50			16	
293.4					5			
5.0	END OF BOREHOLE				6			
					7			
					8			
					9			
					10			

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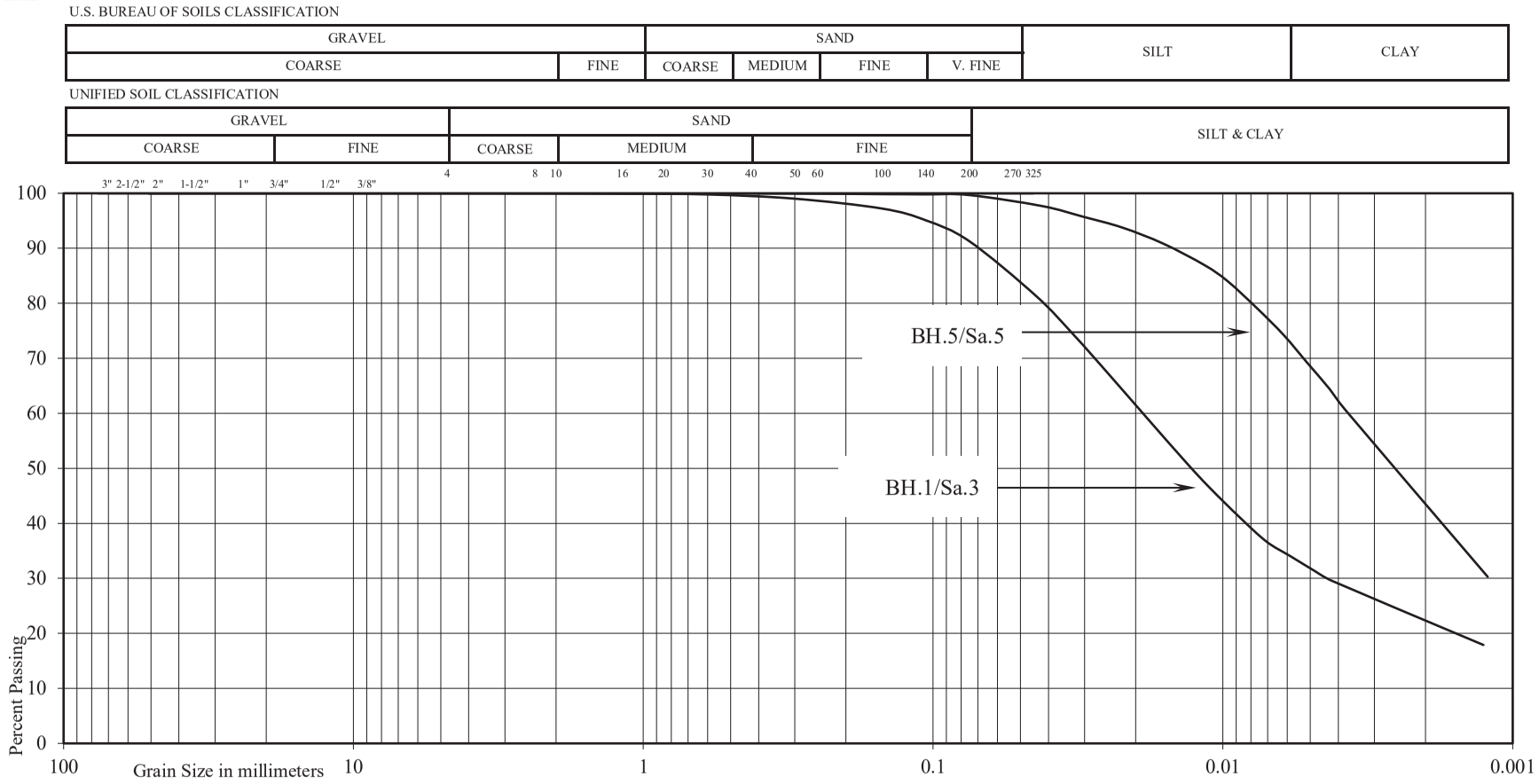
GRAIN SIZE DISTRIBUTION

Reference No: 2109-S177



Project:	Proposed Industrial Buildings, SWM Ponds and Septics	
Location:	Woodbine Avenue and Aurora Road, Town of Whitchurch-Stouffville	
Borehole No:	1	5
Sample No:	3	5
Depth (m):	1.7	3.3
Elevation (m):	295.7	293.9

BH./Sa.	1/3	5/5
Liquid Limit (%) =	28	-
Plastic Limit (%) =	17	-
Plasticity Index (%) =	11	-
Moisture Content (%) =	19	29
Estimated Permeability (cm./sec.) =	10^{-7}	10^{-7}

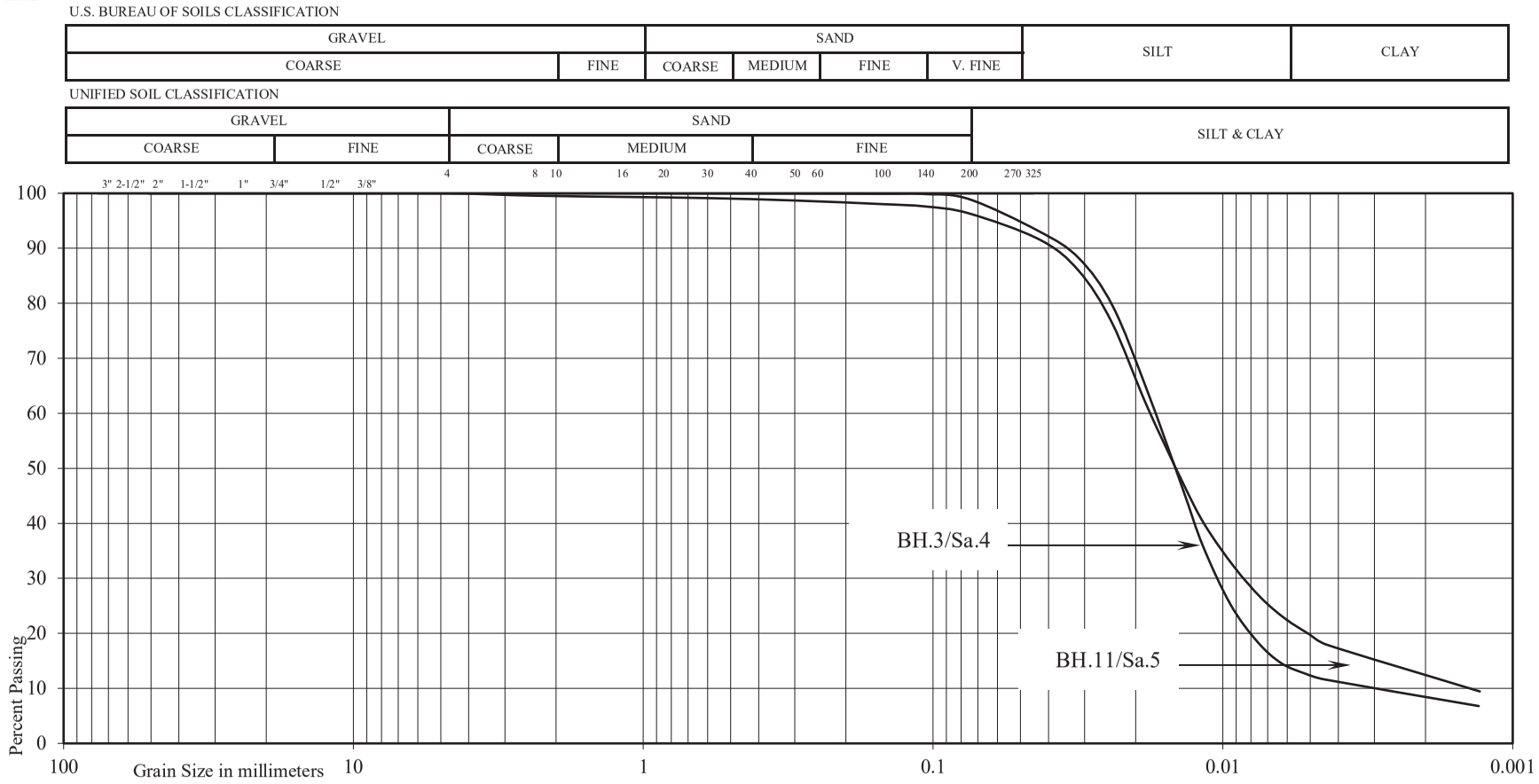
Classification of Sample [& Group Symbol]: SILTY CLAY, a trace of fine sand

Figure: 14

Soil Engineers Ltd.

GRAIN SIZE DISTRIBUTION

Reference No: 2109-S177



Project:	Proposed Industrial Buildings, SWM Ponds and Septics	
Location:	Woodbine Avenue and Aurora Road, Town of Whitchurch-Stouffville	
Borehole No:	3	11
Sample No:	4	5
Depth (m):	2.5	3.3
Elevation (m):	295.7	296.2

BH./Sa.	3/4	11/5
Liquid Limit (%) =	-	-
Plastic Limit (%) =	-	-
Plasticity Index (%) =	-	-
Moisture Content (%) =	19	18
Estimated Permeability (cm./sec.) =	10^{-5}	10^{-6}

Classification of Sample [& Group Symbol]: SILT, a trace to some clay, a trace of fine sand

Figure: 15

BH Location Plan
Soil Engineers Ltd.
Reference No. 2109-S117
Drawing No. 1
Legend
Aurora Rd & Woodbine Ave
BH
Wesley United Church Cemetery
Aurora Rd & Woodbine Ave
15
Ampot Portable Toilets
Petro-Canada
Wesley's Burgers and Wings
BH 1
BH 2
BH 3
BH 4
BH 5
BH 6
BH 7
BH 8
BH 9
BH 10
BH 11
BH 12
BH 13
Apple Self Storage - Aurora
Kerr Forest Rd
GFL Environm
British Sports Car Ctr
Google Earth
600 ft
N

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SUBSURFACE PROFILE
DRAWING NO. 2
SCALE: AS SHOWN

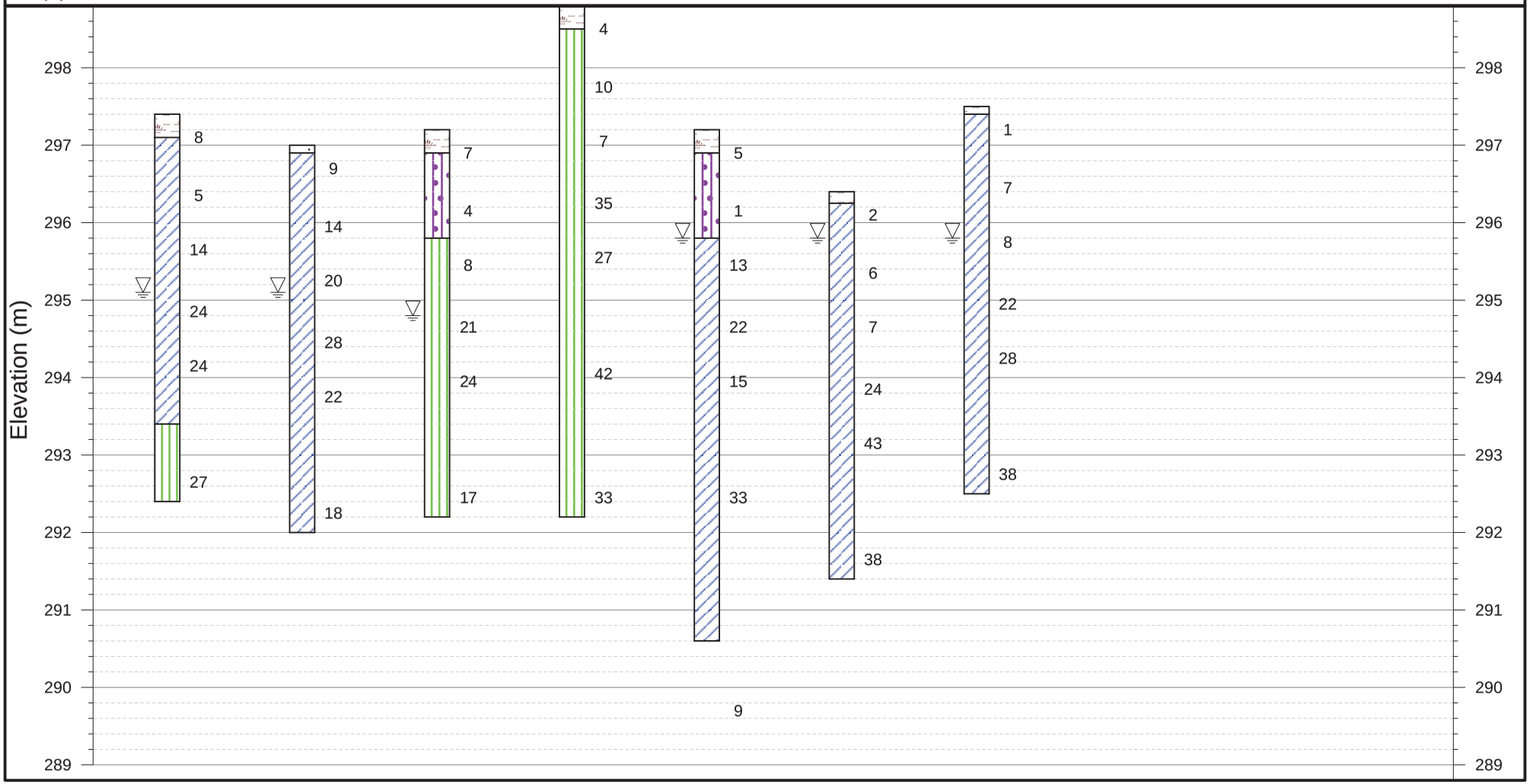
JOB NO.: 2109-S177
REPORT DATE: March 2022
PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

LEGEND

TOPSOIL | SILTY SAND | SILT | SILTY CLAY | GRANULAR

WATER LEVEL (END OF DRILLING)



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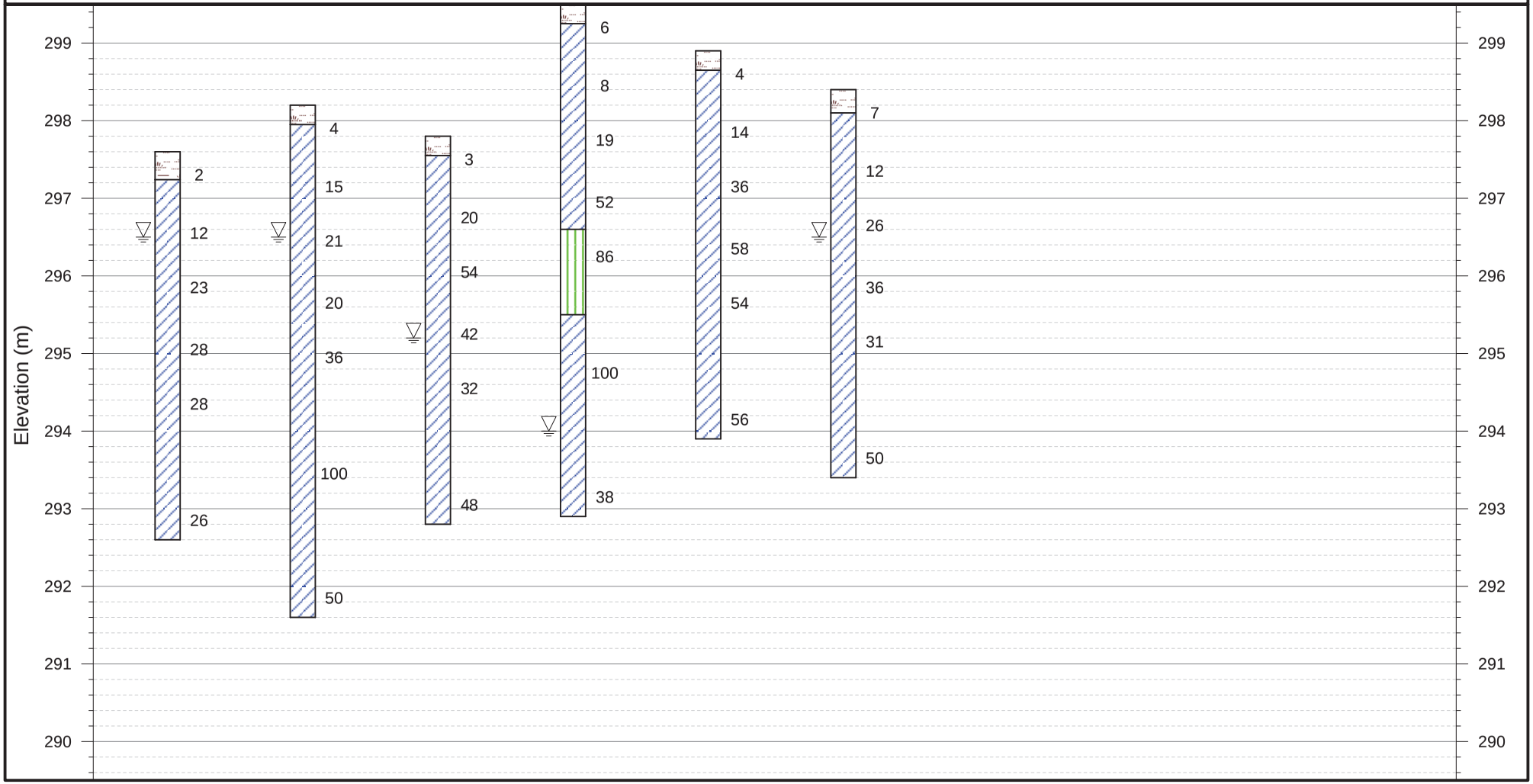
SUBSURFACE PROFILE
DRAWING NO. 3
SCALE: AS SHOWN

JOB NO.: 2109-S177
REPORT DATE: March 2022
PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

LEGEND
TOPSOIL SILT SILTY CLAY
WATER LEVEL (END OF DRILLING)



Appendix B - Stormwater Management Calculations

Appendix B.1 – Pre-Development Calculations

Pre-development CN Calculations*

PROJECT NO.: 5125
PROJECT NAME: Phase 2: Limen Head Office
LOCATION: Woodbine Avenue
DATE: Mar-23

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Pre-development										
	Input Values				Output Values					
Catchment	CN(AMC II)	CN(*AMC III)	100 Year Rainfall (mm)	Intial Abstraction	S	Ia	Q	S*	CN* (AMC III)	CN* (AMC II)
103	80	91	95	8	24.51	4.90	70.83	19.86	92.75	84
302	80	91	95	8	24.51	4.90	70.83	19.86	92.75	84

Equations:

$$S = \left(\frac{25400}{CN}\right) - 254$$

$$I_a = 0.2S$$

$$Q = \frac{(P - I_a)^2}{(P - I_a + S)}$$

$$S^* = \frac{(P - I_a^*)^2}{Q} - P + I_a$$

$$CN^* = \frac{25400}{(254 + S^*)}$$

CN ≤ 70 IA = 0.075S

CN > 70 ≤ 80 IA = 0.10S

CN > 80 ≤ 90 IA = 0.15S

CN > 90 IA = 0.2S

PROJECT NO.: 5125
PROJECT NAME: Phase 2: Limen Head Office
LOCATION: Woodbine Avenue
DATE: Mar-23

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Table 1: Pre-development Catchment Area Drainage Characteristics

Catchment	Area	Soil Characteristics	Hydrologic Soil Group	Soil Conservation Science Curve Number (SCS CN)	Initial Abstraction	Watershed Slope, S_w	Overland Flow Length, L	Runoff Coefficient, C	Time of Concentration, t_c (Airport)	Time of Concentration (Upland)	Time to Peak, tp = 0.67tc (Airport)	Time to Peak tp = 0.67tc (Upland)	Time to Peak, tp = 0.67tc (Airport)	Time to Peak, tp = 0.67tc (Upland)
	(ha)				*(mm)*	*(%)*	*(m)*		minutes	minutes	minutes	minutes	(hrs)	(hrs)
103	4.15	Silty Clay	D	80	8.00	**2.7**	**151.0**	0.25	24.7	5.4	16.5	3.6	0.28	0.06
302	6.56	Silty Clay	D	80	8.00	**1.6**	**262.0**	0.25	38.5	12.5	25.8	8.4	0.43	0.14
Total	**20.34**													

Airport Equation:

Assumptions: Runoff Coefficient, C, is less than or equal to 0.4

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

Where:
t_c is the time of concentration (minutes);
C is the runoff coefficient;
L is the watershed length (m); and
S_w is the watershed slope (%).

Bransby Williams Equations:

Assumptions: Runoff Coefficient, C, is greater than 0.4

$$t_c = 0.057 * L * S_w^{-0.2} * A^{-0.1}$$

Where:

PROJECT NO.: 5125
PROJECT NAME: Phase 2: Limen Head Office
LOCATION: Woodbine Avenue
DATE: Mar-23

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Table 2: Watershed Slope Calculations

Catchment	Location	Length	Upstream Elevation	Downstream Elevation	Difference in Elevation	Slope	Slope to the power of -0.5	Sum of Length	Sum of Slope to the power of -0.5	Watershed Slope, Sw
103	1	30.2	301.7	300	1.7	0.056	4.2	151.0	30.7	2.7
	2	30.2	300	298.95	1.05	0.035	5.4			
	3	30.2	298.95	298.2	0.75	0.025	6.3			
	4	30.2	298.2	297.41	0.79	0.026	6.2			
	5	30.2	297.41	297	0.41	0.014	8.6			
302	1	52.4	306.5	304	2.5	0.048	4.6	262.0	39.6	1.6
	2	52.4	304	303.75	0.25	0.005	14.5			
	3	52.4	303.75	303.2	0.55	0.010	9.8			
	4	52.4	303.2	300.2	3	0.057	4.2			
	5	52.4	300.2	299	1.2	0.023	6.6			
203B	1	25.6	301.7	300.13	1.57	0.061	4.0	128.0	31.7	2.5
	2	25.6	300.13	298.9	1.23	0.048	4.6			
	3	25.6	298.9	297.98	0.92	0.036	5.3			
	4	25.6	297.98	297.55	0.43	0.017	7.7			
	5	25.6	297.55	297.3	0.25	0.010	10.1			

Notes:
1. The watershed slope is calculated using the Equivalent Slope Method using the Ministry of Transportation (MTO, 1997) Drainage Manual guidelines in Chapter 8 (page 27). The Equalivent Slope Method equation is provided below.

Equivalent Slope Method:

$$S_w = 100 * \left[\frac{n}{\Sigma(S_n{}^{-0.5})}\right]^2$$

Where:
S_w is the watershed slope (%);
n is the number of divisions of equal length; and
S_n is the slope of the individual divisions (m/m).

Source: (MTO, 1997)

References:
1. Ministry of Transportation (MTO). 1997. Drainage Management Manual Part 3. Drainage and Hydrology Section. Transportation Engineering Branch. Quality and Standards Division. Government of Ontario.

Pre-development Catchment - Curve Number Calculations

PROJECT NO.: 5125
PROJECT NAME: Phase 2: Limen Head Office
LOCATION: Woodbine Avenue
DATE: Mar-23

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Catchment	Land Type	Area (ha)	Soil Type	Hydrologic Soil Group	Hydrologic Condition	CN (based on Land Type and Soil Type)	Weighted Curve Number
103	Pasture/Meadow	4.15	Silty Clay	D	Good	80.0	80
302	Pasture/Meadow	6.56	Silty Clay	D	Good	80.0	80

Reference: LSRCA 2016 guidelines, Appendix C1 - 11.0 Typical Curve Numbers, Table 2-2a

Pre-development Catchment - Initial Abstraction Calculations

PROJECT NO.: 5125
PROJECT NAME: Phase 2: Limen Head Office
LOCATION: Woodbine Avenue
DATE: Mar-23

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Catchment	Land Type	Area	Initial Abstraction(mm)	Weighted Initial Abstraction Value (mm)
101	Pervious Areas - i.e. Meadows	4.15	8	8.00
102	Pervious Areas - i.e. Meadows	6.56	8	8.00

Reference: LSRCA 2016 guidelines, Appendix C1 - 11.0 Typical Initial Abstraction (Ia) Values

Appendix B.2 – Post Development Calculations

22-Feb-23

Post-Development Drainage Area & Runoff Coefficient

SUBJECT SITE CONDITIONS

A= 4.03 ha

Catchment 203A

Composite Runoff Coefficient

	Area (ha)	Runoff Coeff	Impervious	A*R	A*Imp	Ximp	A*Ximp
Building Roof Area	0.24	0.90	1.00	0.22	0.24	1.00	0.24
Landscaped Area	0.57	0.25	0.07	0.14	0.04	0.07	0.04
SWM Block	0.44	0.55	0.50	0.24	0.22	0.50	0.22
Remaining Area - assuming asphalt	1.02	0.90	1.00	0.92	1.02	1.00	1.02
Total Area	2.27	0.67	0.67	1.52	1.52	0.67	1.52
Landscape + SWM Block + Asphalt	2.03	0.64	0.63	1.31	1.29	0.63	1.29

For Catchment 203B

Composite Runoff Coefficient

	Area (ha)	Runoff Coeff	Impervious	A*R	A*Imp	Ximp	A*Ximp
Gravel Area	1.68	0.90	1.00	1.51	1.68	1.00	1.68
Total Area	1.68	0.90	1.00	1.51	1.68	1.00	1.68
Uncontrolled Area (In catchment 203A)	0.076	0.25	0.07	0.02	0.01	0.07	0.01
Total Area	0.076						

Allowable Release Rates

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PROJECT NO.: 5278
PROJECT NAME: Phase 2: Limen Head Office
LOCATION: Town of Whitchurch and
DATE: 2023-03-08

Storm Event	Pre-development Flows (m3/s)								
	To North [103] A = 4.15 ha			To North [302] A = 6.56 ha			To North [103 + 302]		
	4Hr Chicago	12Hr SCS	24Hr SCS	4Hr Chicago	12Hr SCS	24Hr SCS	4Hr Chicago	12Hr SCS	24Hr SCS
2 Year	0.070	0.111	0.128	0.156	0.274	0.319	0.21	0.379	0.440
5 Year	0.144	0.197	0.209	0.336	0.483	0.519	0.473	0.659	0.707
10 Year	0.201	0.252	0.267	0.478	0.614	0.661	0.677	0.844	0.903
25 Year	0.284	0.335	0.343	0.68	0.814	0.849	0.943	1.107	1.15
50 Year	0.352	0.396	0.403	0.846	0.959	0.995	1.168	1.306	1.348
100 Year	0.420	0.453	0.462	1.009	1.094	1.141	1.381	1.491	1.543

Phase 2: Limen Head Office

PROJECT NO: 5278

EROSION CONTROL VOLUME CALCULATIONS

Run	NHYD	FlowType	DT [hr]	AREA [ha]	PKFW [m^3/s]	TP [hr]	RV [mm]
00 - 25mmchi	46	Outflow	0.083	3.950	0.325	1.500	18.543

Results of 4 hr 25 mm Design Storm

Input:

Area =	3.95	ha
R.V =	18.543	mm
Draw Down Time =	24	hrs

Calculations:

Storage =	732.4	m^3
Average Outflow =	0.0085	m^3/s
Peak Outflow =	0.0127	m^3/s

12.7 L/s

Note: Estimated at 1.5 times Average Outflow

Storage required = 732 m^3

Phase 2: Limen Head Office

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PROJECT NO: 5278
Filter Bed for only Catchment 203A
Filter Bed Calculations

P' =	40	mm/hr
Req'd Storage (Based on voumetric control) =	800	m3
Drawdown Time =	24	hr
Ponding Depth =	0.3	m

Erosion Storage = (P'/1000) x Drawdown time x Area + (Ponding Depth x Area)

Solve for Req'd Area:

Area =	635	m2

Project #5278

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Limen Head Office
WATER QUALITY REQUIREMENT CALCULATIONS

Table: Water Quality Storage Requirements Based on Receiving Waters

Protection Level	SWMP Type	Storage Volume (m^3/ha) for Impervious Level					
		0%	35%	55%	70%	85%	100%
Level 1	Wet Pond	53	140	190	225	250	275

* For wet ponds, all of the storage, except for 40 m^3/ha represents the permanent pool volume.
The 40 m^3/ha represents extended detention storage.

Input:

Estimated Imperviousness =	100%	
Area =	3.95	ha
Level of Protection:	1	
SWMP Type :	Wet Pond	

Calculation:

Total Storage Volume Required =	275	m^3/ha →	1,086	m^3	
Permanent Pool Volume =	235	m^3/ha →	928	m^3	975 w 5% SF
Active Storage Volume =	40	m^3/ha →	158	m^3	

Project #5278

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Limen Head Office
WATER QUALITY REQUIREMENT CALCULATIONS

Table: Water Quality Storage Requirements Based on Receiving Waters

Protection Level	SWMP Type	Storage Volume (m^3/ha) for Impervious Level					
		0%	35%	55%	70%	85%	100%
Level 1 (80%)	Infiltration		25	30	35	40	45

* For wet ponds, all of the storage, except for 40 m^3/ha represents the permanent pool volume. The 40 m^3/ha represents extended detention storage.

Input:

Estimated Imperviousness =	100%			
Area =	3.95	ha		
Level of Protection:	1			
SWMP Type :	Filter Bed			

Calculation:

Total Storage Volume Required =	45	m^3/ha →	178	m^3
Permanent Pool Volume =	45	m^3/ha →	178	m^3
Active Storage Volume =	0	m^3/ha →	0	m^3

Volumetric Control

	Area (ha)	IMP	Vol. Criteria (mm)	Req'd Vol
Catchment 203A	2.27	67%	25	380
Catchment 203B	1.68	100%	25	420
Catchment 203A & 203B	3.95	81%	25	800

Project : Phase 2: Limen Head Office
Project No.: 5278

Storage Volume Calculation for Roof

Modified Rational Method

100 Year Storm

Design Storm =	Town of Witchurch-Stoufille	
A =	2051.707	
B =	6.23	
C =	-0.86	

Roof Drainage Area

Roof Area (ha) =	0.240	
C =	1.00	
Maximum Release Rate (L/s) =	10.08	(42 L/s/ha)

	100 Year			Total	Maximum	Required
	Intensity	Rooftop	Total	Runoff	Release	Storage
Time	100 year	Runoff	Runoff	Volume	Volume	Volume
(min)	(mm/hr)	(L/s)	(L/s)	(m^3)	(m^3)	(m^3)
10	186.74	124.59	124.59	74.76	6.05	68.71
11	177.38	118.35	118.35	78.11	6.65	71.46
12	168.98	112.74	112.74	81.18	7.26	73.92
13	161.40	107.68	107.68	83.99	7.86	76.13
14	154.51	103.09	103.09	86.60	8.47	78.13
15	148.23	98.90	98.90	89.01	9.07	79.94
16	142.48	95.06	95.06	91.26	9.68	81.58
17	137.19	91.53	91.53	93.36	10.28	83.08
18	132.30	88.27	88.27	95.33	10.89	84.45
19	127.78	85.26	85.26	97.19	11.49	85.70
20	123.58	82.45	82.45	98.94	12.10	86.85
21	119.67	79.84	79.84	100.60	12.70	87.90
22	116.01	77.40	77.40	102.17	13.31	88.87
23	112.59	75.12	75.12	103.67	13.91	89.76
24	109.38	72.98	72.98	105.09	14.52	90.57
25	106.36	70.96	70.96	106.45	15.12	91.33
30	93.61	62.46	62.46	112.42	18.14	94.28
35	83.76	55.88	55.88	117.36	21.17	96.19
40	75.91	50.65	50.65	121.55	24.19	97.36
45	69.49	46.36	46.36	125.18	27.22	97.97
50	64.14	42.80	42.80	128.39	30.24	98.15
60	55.72	37.18	37.18	133.83	36.29	97.55
70	49.37	32.94	32.94	138.35	42.34	96.02
80	44.41	29.63	29.63	142.22	48.38	93.83
90	40.41	26.96	26.96	145.59	54.43	91.15
100	37.11	24.76	24.76	148.58	60.48	88.10
110	34.35	22.92	22.92	151.27	66.53	84.74
120	32.00	21.35	21.35	153.71	72.58	81.13
130	29.97	19.99	19.99	155.95	78.62	77.33

Required Storage (m^3):	**98.1**
Provided Storage (m^3):	**103.2**

Zurn-Z105 control Flo Drain

Available Rooftop Storage Area (m^2)	2400	m^2	(See Figure 2-4)
Rooftop Release Rate (L/s)	**12.82**	**L/s**	
Notch Rating (L/s/cm head/notch)	0.25	L/s/cm/Notch	(10GPM/inch/Notch)
Number of Roof Drains	6.00		
Number of Notches per Drain	2.00	Notch/Drain	
Depth of Ponding (mm)	43.00	mm	
Provided Storage Volume Calculation = 2400m2 x 43mm/(1000mm/m)			
Average Provided Rooftop Storage (m^3)	103.2	m^3	

PHASE 1 LIMEN YARD FACILITY
MULTIPLE ORIFICE OUTLET CONTROL
Catchment 202

	Extended Detention	Outlet 1	DICB 1	Outlet 2	DICB 2
Invert Elevation / Lip Elevation	297.70	297.80	298.10	400.00	400.00
Diameter (mm) / Length (m)	90	245	1.2	0	0
Max Area (m^2)	0.006	0.047	-	0.000	-
Coefficient.	0.62	0.62	-	0.62	-
Starting Flow Elevation.(m)	297.70	298.10	-	400.00	-
Top Elevation (m)	299.60	299.60	299.60	299.60	299.60

Theo Curve:

0	0.0000
0.013	732
0.069	819
0.143	1004
0.198	1130
0.282	1283
0.348	1403
0.412	1511

*Q Based on Sharp Creste
Q=C*(L)*(H)^(3/2)

Stage-Storage-Discharge:

Stage		Extended Detention		Outlet 1		DICB 1			Outlet 2		DICB 2			Pond	Total Flow
Water Elevation	Water Elevation Above Perm. Pool	Head	Q	Head	Q	Head	Q / m width*	Q	Head	Q	Head	Q / m width*	Q	Storage	
(m)	(m)	(m)	(m^3/s)	(m)	(m^3/s)	(m)	($m^3/s/m$)	(m^3/s)	(m)	(m^3/s)	(m)	($m^3/s/m$)	(m^3/s)	(m^3)	(m^3/s)
297.70	0.00	na	0.000	na	na	na	na	na	na	na	na	na	na	**0**	0.000
297.72	0.02	na	0.001	na	na	na	na	na	na	na	na	na	na	37	0.001
297.74	0.04	na	0.002	na	na	na	na	na	na	na	na	na	na	75	0.002
297.76	0.06	0.02	0.003	na	na	na	na	na	na	na	na	na	na	112	0.003
297.78	0.08	0.03	0.005	na	na	na	na	na	na	na	na	na	na	150	0.005
297.80	0.10	0.06	0.004	na	na	na	na	na	na	na	na	na	na	187	0.004
297.82	0.12	0.08	0.005	na	na	na	na	na	na	na	na	na	na	225	0.005
297.84	0.14	0.09	0.005	na	na	na	na	na	na	na	na	na	na	262	0.005
297.86	0.16	0.12	0.006	na	na	na	na	na	na	na	na	na	na	300	0.006
297.88	0.18	0.14	0.006	na	na	na	na	na	na	na	na	na	na	337	0.006
297.90	0.20	0.15	0.007	na	na	na	na	na	na	na	na	na	na	375	0.007
297.92	0.22	0.18	0.007	na	na	na	na	na	na	na	na	na	na	412	0.007
297.94	0.24	0.20	0.008	0.02	na	na	na	na	na	na	na	na	na	450	0.008
297.96	0.26	0.21	0.008	0.04	na	na	na	na	na	na	na	na	na	487	0.008
297.98	0.28	0.23	0.008	0.06	na	na	na	na	na	na	na	na	na	524	0.008
298.00	0.30	0.26	0.009	0.08	na	na	na	na	na	na	na	na	na	562	0.009
298.02	0.32	0.27	0.009	0.10	na	na	na	na	na	na	na	na	na	599	0.009
298.04	0.34	0.29	0.009	0.12	na	na	na	na	na	na	na	na	na	637	0.009
298.06	0.36	0.32	0.010	0.14	na	na	na	na	na	na	na	na	na	674	0.010
298.08	0.38	0.33	0.010	0.16	na	na	na	na	na	na	na	na	na	712	0.010
298.10	0.40	0.35	0.010	0.18	0.000	na	na	na	na	na	na	na	na	749	0.010
298.12	0.42	0.38	0.011	0.20	0.058	0.02	0.016	0.010	na	na	na	na	na	787	0.020
298.14	0.44	0.39	0.011	0.22	0.060	0.04	0.033	0.020	na	na	na	na	na	824	0.031
298.16	0.46	0.41	0.011	0.24	0.063	0.06	0.055	0.033	na	na	na	na	na	862	0.044
298.18	0.48	0.44	0.012	0.26	0.066	0.08	0.082	0.049	na	na	na	na	na	899	0.061
298.20	0.50	0.46	0.012	0.28	0.068	0.10	0.114	0.068	na	na	na	na	na	937	0.080
298.22	0.52	0.47	0.012	0.30	0.071	0.12	0.150	0.203	na	na	na	na	na	974	0.083
298.24	0.54	0.50	0.012	0.32	0.073	0.14	0.192	0.234	na	na	na	na	na	1,012	0.085
298.26	0.56	0.52	0.013	0.34	0.075	0.16	0.238	0.261	na	na	na	na	na	1,049	0.088
298.28	0.58	0.53	0.013	0.36	0.077	0.18	0.289	0.286	na	na	na	na	na	1,086	0.090
298.30	0.60	0.56	0.013	0.38	0.080	0.20	0.345	0.308	na	na	na	na	na	1,124	0.093
298.32	0.62	0.58	0.013	0.40	0.082	0.22	0.406	0.329	na	na	na	na	na	1,161	0.095
298.34	0.64	0.59	0.013	0.42	0.084	0.24	0.472	0.349	na	na	na	na	na	1,199	0.097
298.36	0.66	0.62	0.014	0.44	0.086	0.26	0.542	0.368	na	na	na	na	na	1,236	0.099
298.38	0.68	0.64	0.014	0.46	0.088	0.28	0.618	0.386	na	na	na	na	na	1,274	0.101
298.40	0.70	0.65	0.014	0.48	0.089	0.30	0.698	0.403	na	na	na	na	na	1,311	0.104
298.52	0.82	0.77	0.015	0.60	0.100	0.42	1.282	0.493	na	na	na	na	na	1,536	0.115
298.54	0.84	0.79	0.016	0.62	0.102	0.44	1.397	0.507	na	na	na	na	na	1,573	0.117
298.56	0.86	0.82	0.016	0.64	0.103	0.46	1.516	0.520	na	na	na	na	na	1,611	0.119
298.58	0.88	0.83	0.016	0.66	0.105	0.48	1.640	0.533	na	na	na	na	na	1,648	0.121
298.60	0.90	0.85	0.016	0.68	0.107	0.50	1.769	0.545	na	na	na	na	na	1,686	0.123
298.62	0.92	0.88	0.016	0.70	0.108	0.52	1.903	0.557	na	na	na	na	na	1,723	0.124
298.64	0.94	0.89	0.017	0.72	0.110	0.54	2.042	0.569	na	na	na	na	na	1,761	0.126
298.66	0.96	0.91	0.017	0.74	0.111	0.56	2.185	0.581	na	na	na	na	na	1,798	0.128
298.68	0.98	0.94	0.017	0.76	0.113	0.58	2.334	0.592	na	na	na	na	na	1,836	0.130
298.80	1.10	1.06	0.018	0.88	0.121	0.70	3.327	0.657	na	na	na	na	na	2,060	0.139
298.82	1.12	1.08	0.018	0.90	0.123	0.72	3.509	0.667	na	na	na	na	na	2,098	0.141
298.84	1.14	1.09	0.018	0.92	0.124	0.74	3.697	0.677	na	na	na	na	na	2,135	0.142
298.90	1.20	1.15	0.019	0.98	0.128	0.80	4.288	0.706	na	na	na	na	na	2,248	0.147
298.92	1.22	1.18	0.019	1.00	0.129	0.82	4.495	0.716	na	na	na	na	na	2,285	0.148
298.94	1.24	1.20	0.019	1.02	0.131	0.84	4.707	0.725	na	na	na	na	na	2,323	0.150
298.96	1.26	1.21	0.019	1.04	0.132	0.86	4.924	0.734	na	na	na	na	na	2,360	0.151
298.98	1.28	1.23	0.019	1.06	0.133	0.88	5.145	0.744	na	na	na	na	na	2,398	0.153
299.00	1.30	1.26	0.020	1.08	0.134	0.90	5.371	0.753	na	na	na	na	na	2,435	0.154
299.02	1.32	1.27	0.020	1.10	0.136	0.92	5.603	0.761	na	na	na	na	na	2,473	0.155
299.04	1.34	1.29	0.020	1.12	0.137	0.94	5.839	0.770	na	na	na	na	na	2,510	0.157
299.06	1.36	1.32	0.020	1.14	0.138	0.96	6.080	0.779	na	na	na	na	na	2,547	0.158
299.08	1.38	1.34	0.020	1.16	0.139	0.98	6.326	0.788	na	na	na	na	na	2,585	0.159
299.10	1.40	1.35	0.020	1.18	0.140	1.00	6.576	0.796	na	na	na	na	na	2,622	0.161
299.12	1.42	1.38	0.020	1.20	0.142	1.02	6.832	0.804	na	na	na	na	na	2,660	0.162
299.14	1.44	1.40	0.021	1.22	0.143	1.04	7.092	0.813	na	na	na	na	na	2,697	0.163
299.16	1.46	1.41	0.021	1.24	0.144	1.06	7.358	0.821	na	na	na	na	na	2,735	0.165
299.18	1.48	1.44	0.021	1.26	0.145	1.08	7.628	0.829	na	na	na	na	na	2,772	0.166
299.20	1.50	1.46	0.021	1.28	0.146	1.10	7.903	0.837	na	na	na	na	na	2,810	0.167
299.22	1.52	1.47	0.021	1.30	0.147	1.12	8.183	0.845	na	na	na	na	na	2,847	0.169
299.24	1.54	1.50	0.021	1.32	0.149	1.14	8.467	0.853	na	na	na	na	na	2,885	0.170
299.26	1.56	1.52	0.022	1.34	0.150	1.16	8.757	0.861	na	na	na	na	na	2,922	0.171
299.28	1.58	1.53	0.022	1.36	0.151	1.18	9.052	0.869	na	na	na	na	na	2,960	0.172
299.30	1.60	1.56	0.022	1.38	0.152	1.20	9.351	0.877	na	na	na	na	na	2,997	0.174
299.32	1.62	1.58	0.022	1.40	0.153	1.22	9.655	0.884	na	na	na	na	na	3,035	0.175
299.34	1.64	1.59	0.022	1.42	0.154	1.24	9.964	0.892	na	na	na	na	na	3,072	0.176
299.36	1.66	1.62	0.022	1.44	0.155	1.26	10.278	0.899	na	na	na	na	na	3,109	0.177
299.38	1.68	1.64	0.022	1.46	0.156	1.28	10.597	0.907	na	na	na	na	na	3,147	0.179
299.40	1.70	1.65	0.022	1.48	0.157	1.30	10.921	0.914	na	na	na	na	na	3,184	0.180
299.42	1.72	1.68	0.023	1.50	0.158	1.32	11.249	0.922	na	na	na	na	na	3,222	0.181
299.44	1.74	1.70	0.023	1.52	0.159	1.34	11.583	0.929	na	na	na	na	na	3,259	0.182
299.46	1.76	1.71	0.023	1.54	0.161	1.36	11.921	0.936	na	na	na	na	na	3,297	0.183
299.48	1.78	1.74	0.023	1.56	0.162	1.38	12.264	0.943	na	na	na	na	na	3,334	0.185
299.50	1.80	1.76	0.023	1.58	0.163	1.40	12.612	0.950	na	na	na	na	na	3,372	0.186
299.52	1.82	1.77	0.023	1.60	0.164	1.42	12.965	0.957	na	na	na	na	na	3,409	0.187
299.54	1.84	1.79	0.023	1.62	0.165	1.44	13.323	0.964	na	na	na	na	na	3,447	0.188
299.56	1.86	1.82	0.024	1.64	0.166	1.46	13.686	0.971	na	na	na	na	na	3,484	0.189
299.58	1.88	1.84	0.024	1.66	0.167	1.48	14.053	0.978	na	na	na	na	na	3,522	0.190
299.60	1.90	1.85	0.024	1.68	0.168	1.50	14.426	0.985	na	na	na	na	na	3,559	0.191

	Chicago		
	Pre	Post	
	Q	Q	Volume
2yr	0.070	0.028	759
5yr	0.144	0.066	943
10yr	0.201	0.090	1080
25yr	0.284	0.104	1308
50yr	0.352	0.113	1489
100yr	0.420	0.121	1661

	12hr SCS		
	Pre	Post	
	Q	Q	Volume
2yr	0.111	0.041	824
5yr	0.197	0.088	1051
10yr	0.252	0.098	1209
25yr	0.335	0.111	1452
50yr	0.396	0.119	1626
100yr	0.453	0.127	1786

	24hr SCS		
	Pre	Post	
	Q	Q	Volume
2yr	0.128	0.048	856
5yr	0.209	0.089	1067
10yr	0.267	0.099	1238
25yr	0.343	0.111	1462
50yr	0.403	0.120	1633
100yr	0.462	0.128	1799

EROSION:	
Q	Volume
0.0100	628

	Post Development Flows at Addhyd (Includes external area)		
	Chicago	12hr SCS	24hr SCS
2yr	0.154	0.296	0.352
5yr	0.383	0.547	0.592
10yr	0.565	0.699	0.747
25yr	0.785	0.893	0.931
50yr	0.955	1.041	1.079
100yr	1.161	1.177	1.224

	Allowable Release Rates		
	Chicago	12hr SCS	24hr SCS
2yr	0.210	0.379	0.440
5yr	0.473	0.659	0.707
10yr	0.677	0.844	0.903
25yr	0.943	1.107	1.150
50yr	1.168	1.306	1.348
100yr	1.381	1.491	1.543

File: 5278
Town of Whitchurch-Stouffville
Date: December 2023

Custom Hickenbottom Calculations

Calculate Maximum Number of Holes

Input:			
	Pipe Diameter	200	mm
	Pipe Length	1.50	m
	Size of holes	25	mm
	Spacing of holes	100	mm
Output:	Number of Holes	**20**	
Check Area:	Area of holes	9817	mm^2
	Interpolated Diam	112	mm
	Orifice Diam Req'd	90	mm
	Therefore O.K.		

Available PVC Pipe sizes (ipex.com Feb 2001)

100	mm
135	mm
150	mm
200	mm
250	mm
300	mm
375	mm
450	mm
525	mm
600	mm
675	mm
750	mm
900	mm
1050	mm

Common Drill Bit Sizes

Inches	mm
1/4	6
1/2	13
3/4	19
1	25
1 1/4	32
1 1/2	38
1 3/4	44
2	51
2 1/4	57
2 1/2	64
2 3/4	70
3	76
3 1/4	83
3 1/2	89

5278
Mar-23

Proposed Temporary Cut-Off Swale Calculations

Rational Method Flow Calculation - 100 year

Drainage Area (A) =	0.4177	ha
Run-off Coefficient (C) =	0.25	
Antecedent Precipitation Factor (Ca) =	1.25	
C x Ca	0.3125	
I =	186.7	mm/hr
Q =	**68**	**L/s**

I = A / (t+B)^C	
A =	2051.707
B =	6.23
C =	0.86
tc =	10
I =	186.7

5278 Limen Head Office
Spillway Weir
(Broad Crested Weir)

Weir Parameters

Weir Length (L)	(Longitudinal)	4.0	m
Crest bottom Length (B)	(Perp. to Flow)	11.0	m
Crest Elevation		299.60	m
Top of Weir		299.90	m
Side Slope		3	:1 (h:v)

Weir Calculations ($Q = Cd * b * H^{3/2}$)

Water Elevation	Water Level (H)	H/L	Cd	Q
299.65	0.05	0.01	1.70	0.21
299.70	0.10	0.03	1.70	0.61
299.75	0.15	0.04	1.70	1.13
299.80	**0.20**	**0.05**	**1.70**	**1.76**
299.85	0.25	0.06	1.70	2.50
299.90	0.30	0.08	1.70	3.32

Maximum Flow at Elevation 299.90 **3.32** **m^3/s**

100-year Inflow **1.64** **m^3/s**

Limen Head Office
Town of Whitchurch Stouville

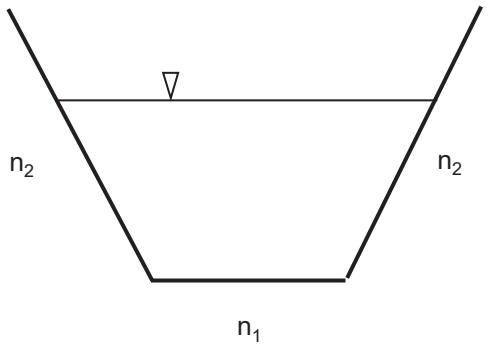
PROJECT NO. 5278
Mar-23

Rip Rap Stone Sizing

Determine Shear Stress Based on Outflow Velocity

Input:

Bottom Width =	11.00	m
Bottom 'n_1' =	0.035	
Side Slope =	3	:1
Side 'n_2' =	0.035	
Long. Slope =	0.25	m/m
Depth =	0.064	m



Output:

Flow =	1.64	m^3/s
Velocity =	2.28	m/s
Top Width=	11.39	m
Area A =	0.72	m^2
Wetted Perimeter P =	11.14	m
Hydraulic Radius R =	0.06	m
1/R =	15.47	
Tractive force, τ =	15.86	kg/m^2

(From MTO Design Chart 2.24)

Determine Shear Stress Capactiy of Stone Size

Input:

Stone Size, D_{50} =	250	mm

Output:

Critical Shear Stress, τ_{cb} = 0.0642 x D50 (MTO, Equation 5.31)

= 16.05 kg/m^2

Conclusion

Shear stress of 250mm stone is greater than the tractive force of the flow.

5278 Limen Head Office
Spillway Weir for Filter Bed
(Broad Crested Weir)

Weir Parameters

Weir Length (L)	(Longitudinal)	4.0	m
Crest bottom Length (B)	(Perp. to Flow)	5.0	m
Crest Elevation		298.60	m
Top of Weir		298.90	m
Side Slope		3	:1 (h:v)

Weir Calculations ($Q = Cd * b * H^{3/2}$)

Water Elevation	Water Level (H)	H/L	Cd	Q
298.65	0.05	0.01	1.70	0.10
298.70	0.10	0.03	1.70	0.28
298.75	0.15	0.04	1.70	0.54
298.80	0.20	0.05	1.70	0.85
298.85	0.25	0.06	1.70	1.22
298.90	0.30	0.08	1.70	1.65

Maximum Flow at Elevation 298.90 **1.65** **m^3/s**

25mm Inflow **0.34** **m^3/s**

Limen Head Office
Town of Whitchurch Stouville

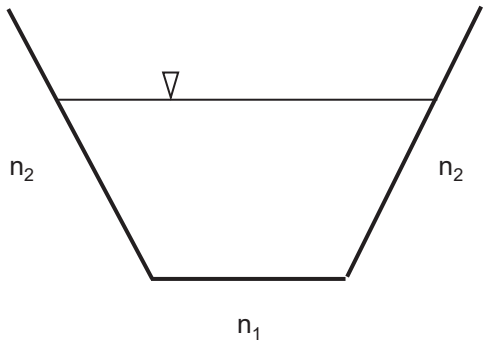
PROJECT NO. 5278
Mar-23

Rip Rap Stone Sizing
Emergency Spillway - Filter Bed

Determine Shear Stress Based on Outflow Velocity

Input:

Bottom Width =	5.00	m
Bottom 'n_1' =	0.035	
Side Slope =	3	:1
Side 'n_2' =	0.035	
Long. Slope =	0.25	m/m
Depth =	0.040	m



Output:

Flow =	0.34	m^3/s
Velocity =	1.66	m/s
Top Width=	5.24	m
Area A =	0.21	m^2
Wetted Perimeter P =	5.08	m
Hydraulic Radius R =	0.04	m
1/R =	24.74	
Tractive force, τ =	9.84	kg/m^2

(From MTO Design Chart 2.24)

Determine Shear Stress Capactiy of Stone Size

Input:

Stone Size, D_{50} =	200	mm

Output:

Critical Shear Stress, τ_{cb} = 0.0642 x D50 (MTO, Equation 5.31)

= 12.84 kg/m^2

Conclusion

Shear stress of 200mm stone is greater than the tractive force of the flow.

5278 Limen Head Office
Catchment 203A
Overland Flow Entry Spillway

Length (L)	(Longitudinal)	0.95	m
Crest bottom Length (B)	(Perp. to Flow)	7.0	m
Crest Elevation (bottom of curb)		300.35	m
Top Elevation		300.50	m
Side Slope		3	:1 (h:v)

Water Elevation	Water Level (H)	H/L	Cd	Q
300.40	0.05	0.05	1.70	0.14
300.45	0.10	0.11	1.70	0.39
300.50	0.15	0.16	1.70	0.74

100-year Inflow	0.778	m3/s
5-year Inflow	0.394	m3/s
100-year - 5-year Inflow	**0.384**	**m3/s**

Limen Head Office
Town of Whitchurch Stouville

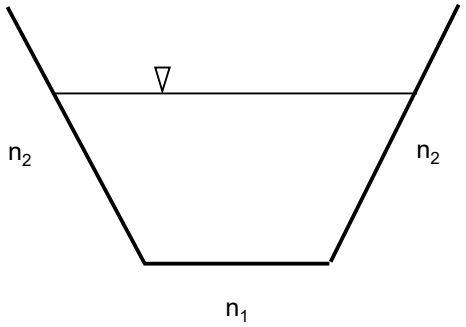
PROJECT NO. 5278
Mar-23

Rip Rap Stone Sizing
Catchment 203A
Overland Flow Entry Spillway

Determine Shear Stress Based on Outflow Velocity

Input:

Bottom Width =	7.00	m
Bottom 'n_1' =	0.035	
Side Slope =	3	:1
Side 'n_2' =	0.035	
Long. Slope =	0.25	m/m
Depth =	0.035	m



Output:

Flow =	0.38	m^3/s
Velocity =	1.53	m/s
Top Width=	7.21	m
Area A =	0.25	m^2
Wetted Perimeter P =	7.07	m
Hydraulic Radius R =	0.04	m
1/R =	28.17	
Tractive force, τ =	8.73	kg/m^2

(From MTO Design Chart 2.24)

Determine Shear Stress Capactiy of Stone Size

Input:

Stone Size, D_{50} =	150	mm

Output:

Critical Shear Stress, τ_{cb} = 0.0642 x D50 (MTO, Equation 5.31)

= 9.63 kg/m^2

Conclusion

Shear stress of 150mm stone is greater than the tractive force of the flow.

5278 Limen Head Office
Catchment 203B
Overland Flow Entry Spillway

Length (L)	(Longitudinal)	0.95	m
Crest bottom Length (B)	(Perp. to Flow)	7.0	m
Crest Elevation (bottom of curb)		299.75	m
Top Elevation		299.90	m
Side Slope		3	:1 (h:v)

Water Elevation	Water Level (H)	H/L	Cd	Q
299.80	0.05	0.05	1.70	0.14
299.85	0.10	0.11	1.70	0.39
299.90	0.15	0.16	1.70	0.74

100-year Inflow	0.863	m3/s
5-year Inflow	0.490	m3/s
100-year - 5-year Inflow	**0.373**	**m3/s**

Limen Head Office
Town of Whitchurch Stouville

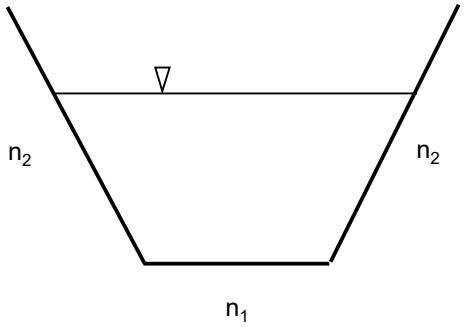
PROJECT NO. 5278
Mar-23

Rip Rap Stone Sizing
Catchment 203B
Overland Flow Entry Spillway

Determine Shear Stress Based on Outflow Velocity

Input:

Bottom Width =	7.00	m
Bottom 'n_1' =	0.035	
Side Slope =	3	:1
Side 'n_2' =	0.035	
Long. Slope =	0.25	m/m
Depth =	0.035	m



Output:

Flow =	0.37	m^3/s
Velocity =	1.51	m/s
Top Width=	7.21	m
Area A =	0.25	m^2
Wetted Perimeter P =	7.07	m
Hydraulic Radius R =	0.03	m
1/R =	28.67	
Tractive force, τ =	8.58	kg/m^2

(From MTO Design Chart 2.24)

Determine Shear Stress Capactiy of Stone Size

Input:

Stone Size, D_{50} =	150	mm

Output:

Critical Shear Stress, τ_{cb} = 0.0642 x D50 (MTO, Equation 5.31)

= 9.63 kg/m^2

Conclusion

Shear stress of 150mm stone is greater than the tractive force of the flow.

Stormceptor®

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Stormceptor® EF Sizing Report

STORMCEPTOR®
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

03/10/2023

Province:	Ontario
City:	Stouffville
Nearest Rainfall Station:	TORONTO CITY
Climate Station Id:	6158355
Years of Rainfall Data:	20

Site Name:	Catchment 203B

Drainage Area (ha):	1.68
% Imperviousness:	100.00

Runoff Coefficient 'c': 0.90

Particle Size Distribution:	CA ETV
Target TSS Removal (%):	60.0

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	48.85
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	490.00
Site Sediment Transport Rate (kg/ha/yr):	

Project Name:	Phase 2: Limen Head Office - 203B
Project Number:	5278
Designer Name:	Saffa Ramsoomair
Designer Company:	Schaeffers
Designer Email:	sramsoomair@schaeffers.com
Designer Phone:	905-738-6100
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	41
EFO6	51
EFO8	57
EFO10	61
EFO12	64

Recommended Stormceptor EFO Model: EFO10

Estimated Net Annual Sediment (TSS) Load Reduction (%): 61

Water Quality Runoff Volume Capture (%): > 90

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THIRD-PARTY TESTING AND VERIFICATION

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

PERFORMANCE

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

PARTICLE SIZE DISTRIBUTION (PSD)

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

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

Stormceptor® EF Sizing Report

Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.5	8.7	8.7	2.10	126.0	17.0	70	6.1	6.1
1	20.2	28.9	4.20	252.0	35.0	70	14.2	20.4
2	16.4	45.3	8.41	504.0	69.0	66	10.8	31.1
3	11.8	57.1	12.61	757.0	104.0	62	7.3	38.5
4	8.1	65.2	16.81	1009.0	138.0	60	4.9	43.3
5	6.6	71.9	21.02	1261.0	173.0	57	3.8	47.1
6	5.2	77.1	25.22	1513.0	207.0	54	2.8	49.9
7	2.7	79.8	29.42	1765.0	242.0	53	1.4	51.3
8	3.6	83.4	33.63	2018.0	276.0	52	1.9	53.2
9	2.0	85.4	37.83	2270.0	311.0	51	1.0	54.2
10	1.9	87.3	42.03	2522.0	345.0	50	1.0	55.1
11	1.6	88.9	46.24	2774.0	380.0	49	0.8	55.9
12	1.8	90.7	50.44	3026.0	415.0	48	0.9	56.8
13	1.0	91.6	54.64	3279.0	449.0	47	0.4	57.2
14	1.0	92.7	58.85	3531.0	484.0	46	0.5	57.7
15	1.3	93.9	63.05	3783.0	518.0	45	0.6	58.3
16	1.0	95.0	67.25	4035.0	553.0	44	0.4	58.7
17	0.4	95.3	71.46	4287.0	587.0	43	0.2	58.9
18	0.4	95.7	75.66	4540.0	622.0	42	0.2	59.0
19	0.2	95.9	79.86	4792.0	656.0	42	0.1	59.1
20	0.6	96.5	84.07	5044.0	691.0	42	0.3	59.4
21	0.0	96.5	88.27	5296.0	726.0	41	0.0	59.4
22	0.5	97.0	92.47	5548.0	760.0	41	0.2	59.6
23	0.7	97.7	96.68	5801.0	795.0	41	0.3	59.9
24	0.0	97.7	100.88	6053.0	829.0	41	0.0	59.9
25	0.3	98.0	105.08	6305.0	864.0	41	0.1	60.0
30	0.3	98.3	126.10	7566.0	1036.0	40	0.1	60.1
35	0.8	99.1	147.12	8827.0	1209.0	37	0.3	60.4
40	0.4	99.5	168.13	10088.0	1382.0	34	0.1	60.5
45	0.5	100.0	189.15	11349.0	1555.0	31	0.2	60.7
Estimated Net Annual Sediment (TSS) Load Reduction =								**61 %**

Climate Station ID: 6158355 *Years of Rainfall Data*: 20

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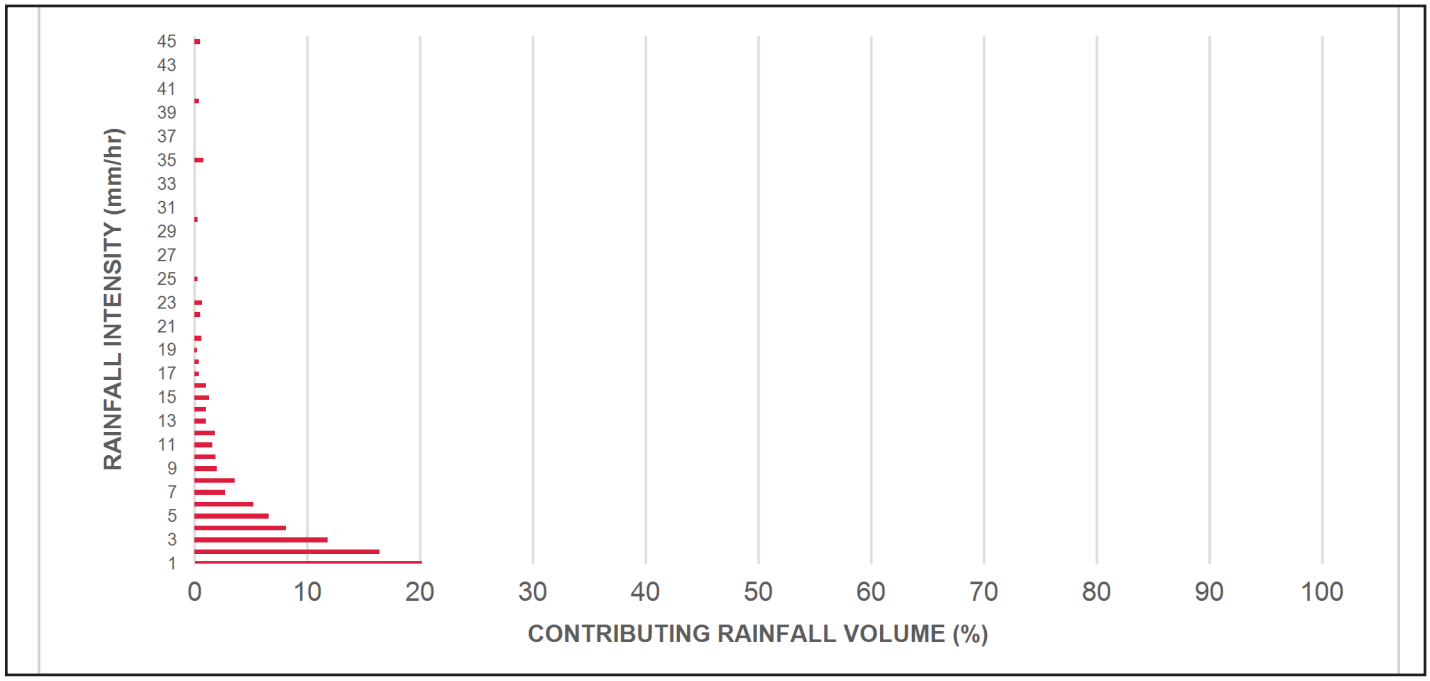
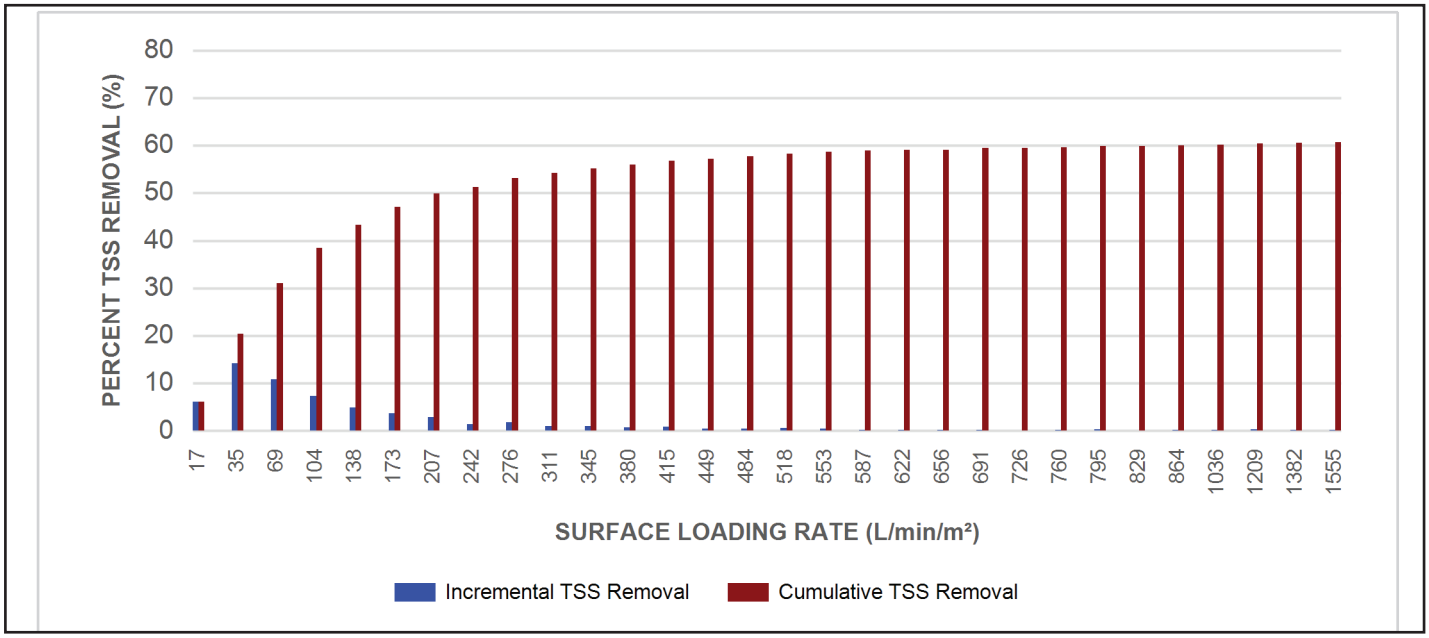
RAINFALL DATA FROM TORONTO CITY RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



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Maximum Pipe Diameter / Peak Conveyance

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

SCOUR PREVENTION AND ONLINE CONFIGURATION

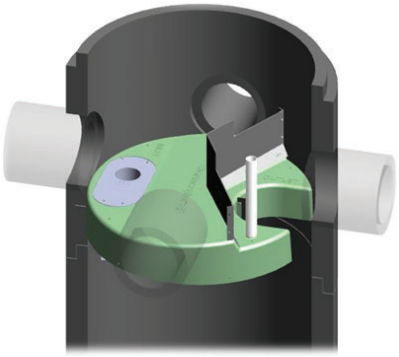
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test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

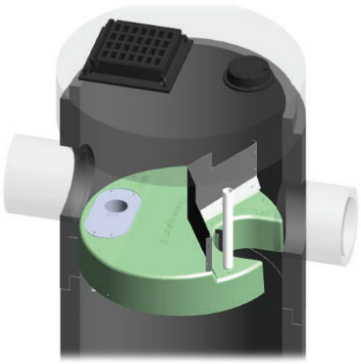
DESIGN FLEXIBILITY

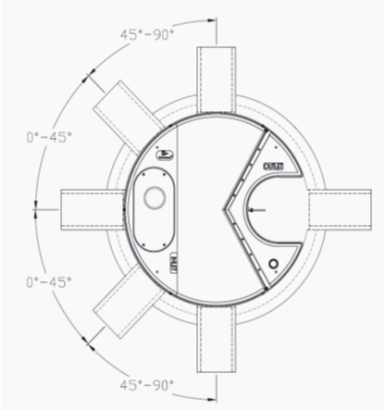
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend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

OIL CAPTURE AND RETENTION

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







INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

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

Pollutant Capacity

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

*Increased sump depth may be added to increase sediment storage capacity

** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft^3)

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

STANDARD STORMCEPTOR EF/EFO DRAWINGS

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

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

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

Table of TSS Removal vs Surface Loading Rate Based on Third-Party Test Results
Stormceptor® EFO

SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL
1	70	660	42	1320	35	1980	24
30	70	690	42	1350	35	2010	24
60	67	720	41	1380	34	2040	23
90	63	750	41	1410	34	2070	23
120	61	780	41	1440	33	2100	23
150	58	810	41	1470	32	2130	22
180	56	840	41	1500	32	2160	22
210	54	870	41	1530	31	2190	22
240	53	900	41	1560	31	2220	21
270	52	930	40	1590	30	2250	21
300	51	960	40	1620	29	2280	21
330	50	990	40	1650	29	2310	21
360	49	1020	40	1680	28	2340	20
390	48	1050	39	1710	28	2370	20
420	47	1080	39	1740	27	2400	20
450	47	1110	38	1770	27	2430	20
480	46	1140	38	1800	26	2460	19
510	45	1170	37	1830	26	2490	19
540	44	1200	37	1860	26	2520	19
570	43	1230	37	1890	25	2550	19
600	42	1260	36	1920	25	2580	18
630	42	1290	36	1950	24		

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

PART 1 – GENERAL

1.1 WORK INCLUDED

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

1.2 REFERENCE STANDARDS & PROCEDURES

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

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

1.3 SUBMITTALS

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

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

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

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

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

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

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall

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

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m^2 to 1400 L/min/m^2, and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m^2 and 1400 L/min/m^2 shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m^2 shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m^2. No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m^2.

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m^2 shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m^2, and shall be calculated using a simple proportioning formula, with 1400 L/min/m^2 in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m^2.

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

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

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

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

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

assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m^2 to 2600 L/min/m^2) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.** However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

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Stormceptor® EF Sizing Report

STORMCEPTOR®
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

03/10/2023

Province:	Ontario
City:	Stouffville
Nearest Rainfall Station:	TORONTO CITY
Climate Station Id:	6158355
Years of Rainfall Data:	20

Site Name:	Catchment 203A

Drainage Area (ha):	2.27
% Imperviousness:	67.00

Runoff Coefficient 'c': 0.70

Particle Size Distribution:	CA ETV
Target TSS Removal (%):	60.0

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	51.49
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	394.00
Site Sediment Transport Rate (kg/ha/yr):	

Project Name:	Phase 2: Limen Head Office - 203A
Project Number:	5278
Designer Name:	Saffa Ramsoomair
Designer Company:	Schaeffers
Designer Email:	sramsoomair@schaeffers.com
Designer Phone:	905-738-6100
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	41
EFO6	50
EFO8	57
EFO10	60
EFO12	63

Recommended Stormceptor EFO Model: EFO10

Estimated Net Annual Sediment (TSS) Load Reduction (%): 60

Water Quality Runoff Volume Capture (%): > 90

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THIRD-PARTY TESTING AND VERIFICATION

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

PERFORMANCE

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

PARTICLE SIZE DISTRIBUTION (PSD)

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

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

Stormceptor® EF Sizing Report

Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.5	8.7	8.7	2.22	133.0	18.0	70	6.1	6.1
1	20.2	28.9	4.43	266.0	36.0	70	14.2	20.4
2	16.4	45.3	8.86	532.0	73.0	66	10.8	31.1
3	11.8	57.1	13.29	797.0	109.0	62	7.2	38.4
4	8.1	65.2	17.72	1063.0	146.0	59	4.8	43.2
5	6.6	71.9	22.15	1329.0	182.0	56	3.7	46.9
6	5.2	77.1	26.58	1595.0	218.0	54	2.8	49.7
7	2.7	79.8	31.01	1861.0	255.0	53	1.4	51.1
8	3.6	83.4	35.44	2126.0	291.0	51	1.9	52.9
9	2.0	85.4	39.87	2392.0	328.0	50	1.0	53.9
10	1.9	87.3	44.30	2658.0	364.0	49	0.9	54.9
11	1.6	88.9	48.73	2924.0	401.0	48	0.8	55.6
12	1.8	90.7	53.16	3190.0	437.0	47	0.8	56.5
13	1.0	91.6	57.59	3455.0	473.0	46	0.4	56.9
14	1.0	92.7	62.02	3721.0	510.0	45	0.5	57.4
15	1.3	93.9	66.45	3987.0	546.0	44	0.6	57.9
16	1.0	95.0	70.88	4253.0	583.0	43	0.4	58.4
17	0.4	95.3	75.31	4519.0	619.0	42	0.1	58.5
18	0.4	95.7	79.74	4784.0	655.0	42	0.2	58.7
19	0.2	95.9	84.17	5050.0	692.0	42	0.1	58.8
20	0.6	96.5	88.60	5316.0	728.0	41	0.3	59.0
21	0.0	96.5	93.03	5582.0	765.0	41	0.0	59.0
22	0.5	97.0	97.46	5848.0	801.0	41	0.2	59.2
23	0.7	97.7	101.89	6113.0	837.0	41	0.3	59.5
24	0.0	97.7	106.32	6379.0	874.0	41	0.0	59.5
25	0.3	98.0	110.75	6645.0	910.0	40	0.1	59.6
30	0.3	98.3	132.90	7974.0	1092.0	39	0.1	59.7
35	0.8	99.1	155.05	9303.0	1274.0	36	0.3	60.0
40	0.4	99.5	177.20	10632.0	1456.0	33	0.1	60.1
45	0.5	100.0	199.35	11961.0	1639.0	29	0.2	60.3
Estimated Net Annual Sediment (TSS) Load Reduction =								**60 %**

Climate Station ID: 6158355 *Years of Rainfall Data*: 20

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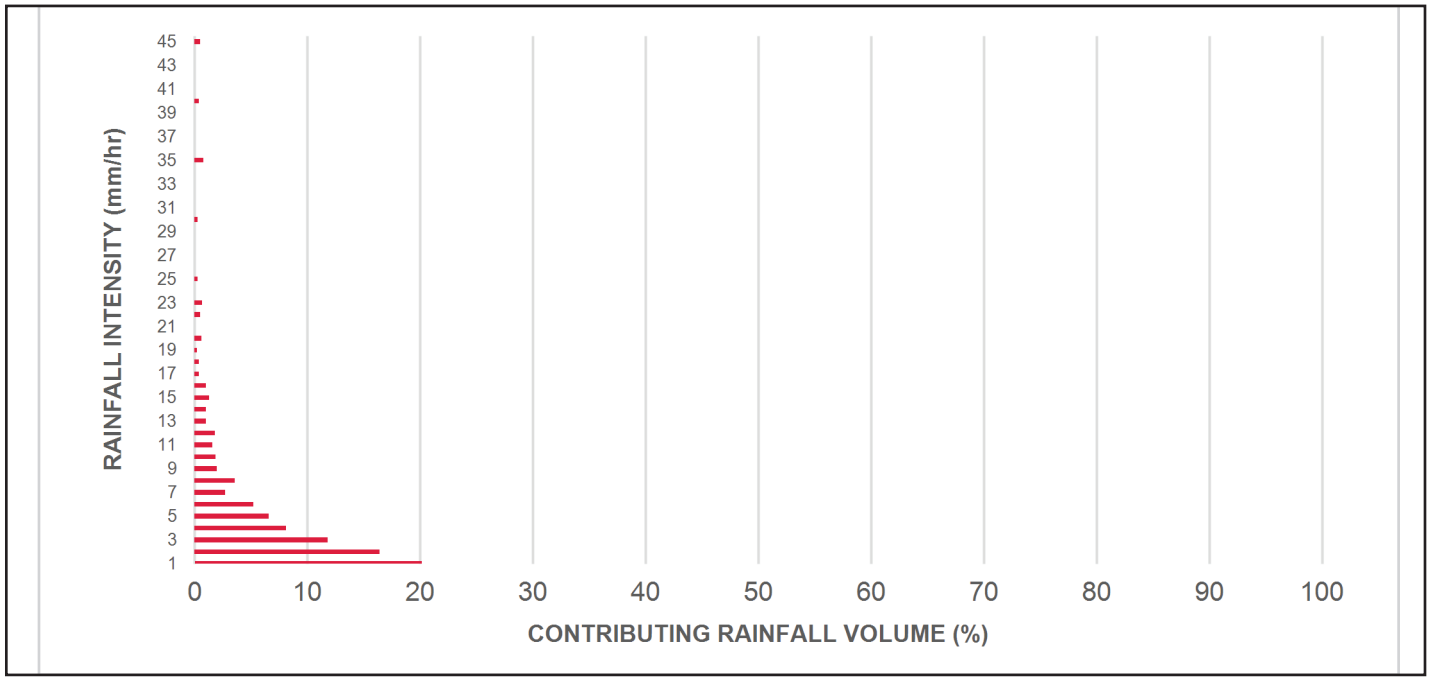
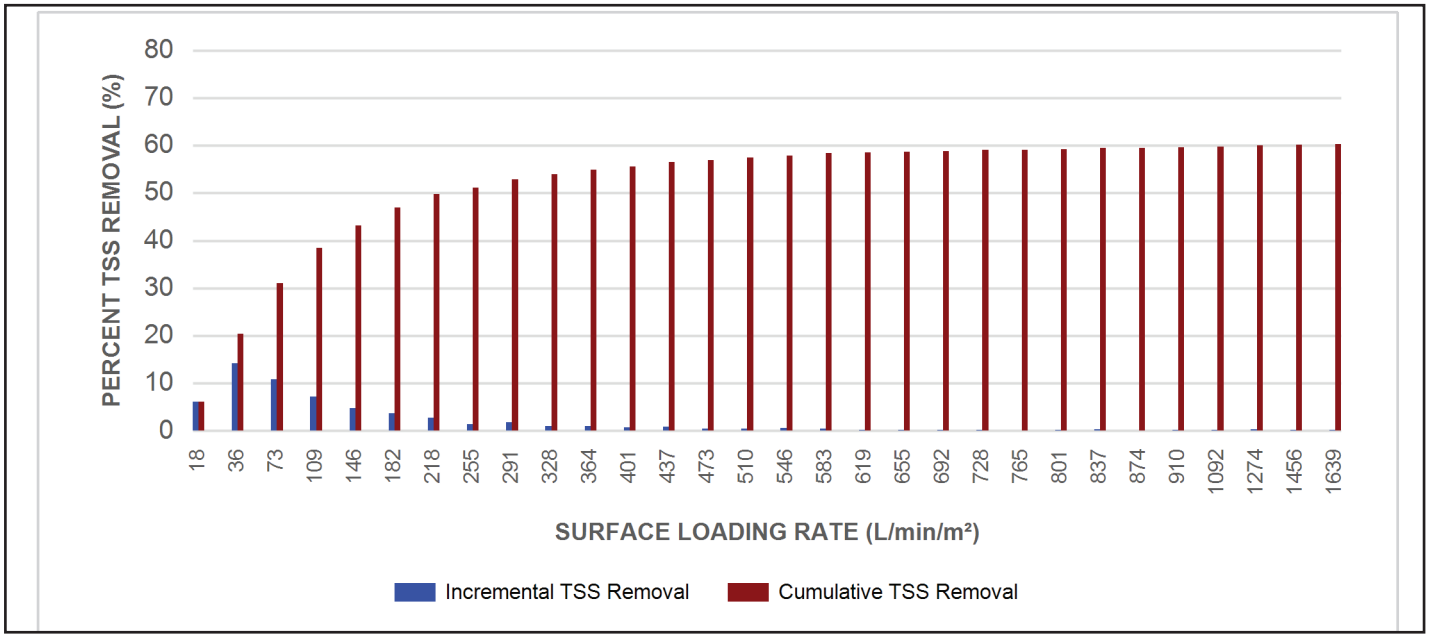
RAINFALL DATA FROM TORONTO CITY RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Maximum Pipe Diameter / Peak Conveyance

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

SCOUR PREVENTION AND ONLINE CONFIGURATION

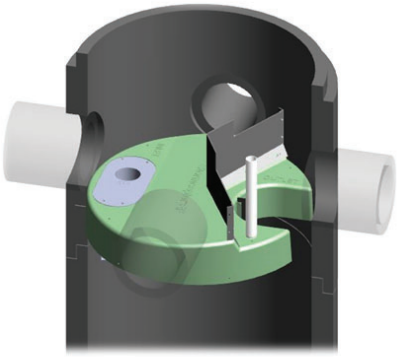
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test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

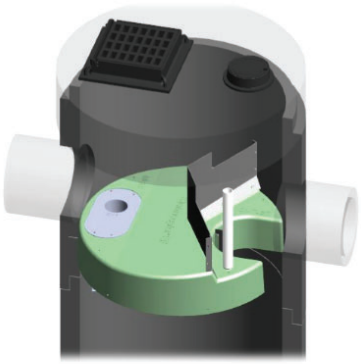
DESIGN FLEXIBILITY

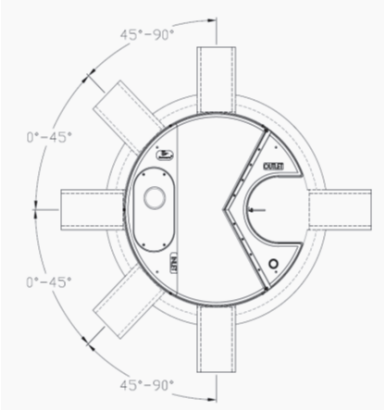
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend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

OIL CAPTURE AND RETENTION

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







INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

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

Pollutant Capacity

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

*Increased sump depth may be added to increase sediment storage capacity

** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft^3)

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

STANDARD STORMCEPTOR EF/EFO DRAWINGS

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

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

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

Table of TSS Removal vs Surface Loading Rate Based on Third-Party Test Results
Stormceptor® EFO

SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL
1	70	660	42	1320	35	1980	24
30	70	690	42	1350	35	2010	24
60	67	720	41	1380	34	2040	23
90	63	750	41	1410	34	2070	23
120	61	780	41	1440	33	2100	23
150	58	810	41	1470	32	2130	22
180	56	840	41	1500	32	2160	22
210	54	870	41	1530	31	2190	22
240	53	900	41	1560	31	2220	21
270	52	930	40	1590	30	2250	21
300	51	960	40	1620	29	2280	21
330	50	990	40	1650	29	2310	21
360	49	1020	40	1680	28	2340	20
390	48	1050	39	1710	28	2370	20
420	47	1080	39	1740	27	2400	20
450	47	1110	38	1770	27	2430	20
480	46	1140	38	1800	26	2460	19
510	45	1170	37	1830	26	2490	19
540	44	1200	37	1860	26	2520	19
570	43	1230	37	1890	25	2550	19
600	42	1260	36	1920	25	2580	18
630	42	1290	36	1950	24		

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

PART 1 – GENERAL

1.1 WORK INCLUDED

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

1.2 REFERENCE STANDARDS & PROCEDURES

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

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

1.3 SUBMITTALS

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

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

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

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

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

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

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall

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

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m^2 to 1400 L/min/m^2, and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m^2 and 1400 L/min/m^2 shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m^2 shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m^2. No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m^2.

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m^2 shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m^2, and shall be calculated using a simple proportioning formula, with 1400 L/min/m^2 in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m^2.

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

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

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

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

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

assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m^2 to 2600 L/min/m^2) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.** However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

Appendix B.3 – Phosphorus Loading

Phosphorous Loading Calculations

PROJECT NO.: 5278
PROJECT NAME: Phase 2: Limen Head Office
LOCATION: Town of New Market
DATE: Mar-23

SCHAEFFERS
CONSULTING ENGINEERS

Pre-development Phosphorus Loading

Area ID	Area (ha)	P_{Rate} (Kg/ha/yr)*	P_{Load} (Kg/yr)
Cropland	4.03	0.36	1.45
Hay/pastures	0.00	0.12	0.00
Sod Farm/ Golf	0.00	0.24	0.00
Commercial/Industerial	0.00	1.82	0.00
Urban Residential	0.00	1.32	0.00
Low Desnity Development (Estate Residential)	0.00	0.13	0.00
Quarry	0.00	0.08	0.00
Unpaved Road	0.00	0.83	0.00
Forest	0.00	0.10	0.00
Transitional	0.00	0.16	0.00
Open Wetland	0.00	0.10	0.00
Water	0.00	0.26	0.00
Total	4.03		1.45

TOTAL Area **4.03** ha
Total P load **1.45** kg/yr

* Landuse/Watershed Based Loading Rates Obtained from Berger 2010 Study

Phosphorus Loading (Post-development)

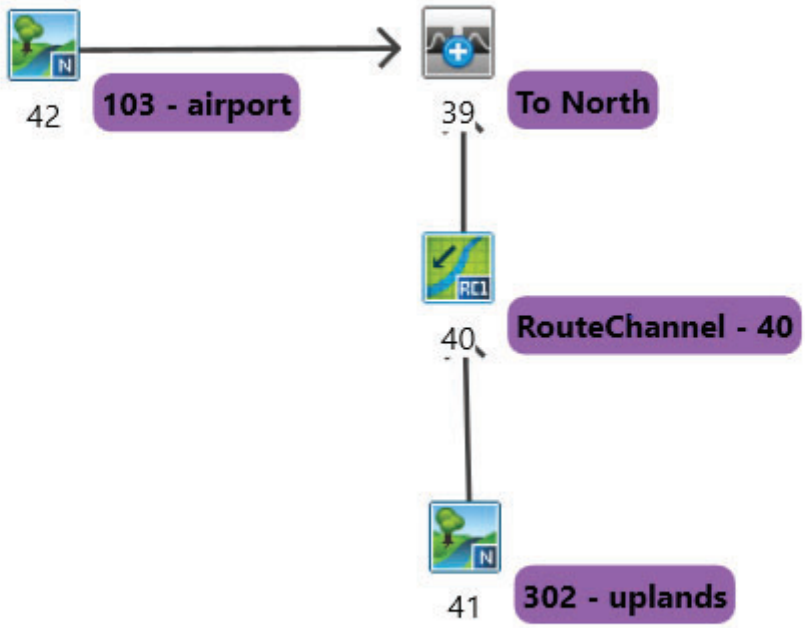
Catchment 203A				Catchment 203B				Uncontrolled Area							
Area ID	Area (ha)	P_{Rate} (Kg/ha/yr)*	P_{Load} (Kg/yr)	Area ID	Area (ha)	P_{Rate} (Kg/ha/yr)*	P_{Load} (Kg/yr)	Area ID	Area (ha)	P_{Rate} (Kg/ha/yr)*	P_{Load} (Kg/yr)	Area ID	Area (ha)	P_{Rate} (Kg/ha/yr)*	P_{Load} (Kg/yr)
Cropland	0	0.36	0.00	Cropland	0	0.36	0.00	Cropland	0.076	0.36	0.03	Cropland	0	0.36	0.00
Hay/pastures	0	0.12	0.00	Hay/pastures	0	0.12	0.00	Hay/pastures	0	0.12	0.00	Hay/pastures	0	0.12	0.00
Sod Farm/ Golf	0	0.24	0.00	Sod Farm/ Golf	0	0.24	0.00	Sod Farm/ Golf	0	0.24	0.00	Sod Farm/ Golf	0	0.24	0.00
Commercial/Industerial	2.27	1.82	4.13	Commercial/Industerial	1.68	1.82	3.06	Commercial/Industerial	0	1.82	0.00	Commercial/Industerial	0	1.82	0.00
Urban Residential	0	1.32	0.00	Urban Residential	0	1.32	0.00	Urban Residential	0	1.32	0.00	Urban Residential	0	1.32	0.00
Low Density Development	0	0.13	0.00	Low Density Development	0	0.13	0.00	Low Density Development	0	0.13	0.00	Low Density Development	0	0.13	0.00
Quarry	0	0.08	0.00	Quarry	0	0.08	0.00	Quarry	0	0.08	0.00	Quarry	0	0.08	0.00
Unpaved Road	0	0.83	0.00	Unpaved Road	0	0.83	0.00	Unpaved Road	0	0.83	0.00	Unpaved Road	0	0.83	0.00
Forest	0	0.1	0.00	Forest	0	0.1	0.00	Forest	0	0.1	0.00	Forest	0	0.1	0.00
Transitional	0	0.16	0.00	Transitional	0	0.16	0.00	Transitional	0	0.16	0.00	Transitional	0	0.16	0.00
Open Wetland	0	0.1	0.00	Open Wetland	0	0.1	0.00	Open Wetland	0	0.1	0.00	Open Wetland	0	0.1	0.00
Water	0	0.26	0.00	Water	0	0.26	0.00	Water	0	0.26	0.00	Water	0	0.26	0.00
Total	2.270		4.13	Total	1.68		3.06	Total	0.076		0.03	Total	0		0.00
Measure 1 - OGS			20%	Measure 1 - OGS			20%	Measure 1			0%	Measure 1			0%
Mitigated Pload (kg/yr)			3.31	Mitigated Pload (kg/yr)			2.45	Mitigated Pload (kg/yr)			0.03	Mitigated Pload (kg/yr)			0.00
Measure 2 - Filter Bed			45%	Measure 2 - Filter Bed			45%	Measure 2			0%	Measure 2			0%
Mitigated Pload (kg/yr)			1.82	Mitigated Pload (kg/yr)			1.35	Mitigated Pload (kg/yr)			0.03	Mitigated Pload (kg/yr)			0.00
Measure 3 - SWM Pond			63%	Measure 3 - SWM Pond			63%	Measure 3			0%	Measure 3			0%
Mitigated Pload (kg/yr)			0.67	Mitigated Pload (kg/yr)			0.50	Mitigated Pload (kg/yr)			0.03	Mitigated Pload (kg/yr)			0.00
Measure 4			0%	Measure 4			0%	Measure 4			0%	Measure 4 -			0%
Mitigated Pload (kg/yr)			0.67	Mitigated Pload (kg/yr)			0.50	Mitigated Pload (kg/yr)			0.03	Mitigated Pload (kg/yr)			0.00

* Table 3 - Phosphorus Removal Efficiencies for Major Classes of BMPs Using the Decision Tree, Phosphorus Budget Tool in Support of Sustainable Development for the Lake Simcoe Watershed, MOE

TP load		
Predevelopment	Post development Without Mitigation	Post development With Mitigation Measures
Total Area Pre (ha)	Total Area Post (ha)	Total Area Post (ha)
4.03	4.03	4.03
P Load Pre (kg/yr)	P Load Post (kg/yr)	P Load Post (kg/yr) Mit
1.45	7.22	1.20

Removal Efficiency at Post Development Stage	83%
Ratio (post /Pre)	83%

Appendix B.4 – VO Schematics



SCHAEFFERS
CONSULTING ENGINEERS

Visual OTTHYMO Schematic
Pre-Development Flows

Job #: 5278	**Date: March 2023**

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

       V    V   I    SSSSS  U   U    A    L             (v 6.2.2010)
       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 *****


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  Output  filename: C:\Users\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\0d061267-a307-4e70-bda2-04ffbf5caabb\
  Summary filename: C:\Users\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\0d061267-a307-4e70-bda2-04ffbf5caabb\


DATE: 03-08-2023                          TIME: 01:23:07

USER:



COMMENTS: _____________________________________________________


--------------------------------------------------------------------------------
---------------------------
  ***********************************************
  ** SIMULATION : 01 - 2 YR - SCS TYPE II 12HR  **
  ***********************************************

--------------------
| MASS STORM       |    Filename: C:\Users\sramsoomair\AppD
|                  |              ata\Local\Temp\
|                  |              61ab631c-6e40-482e-984d-eb141678c1e0\230bb9d3
| Ptotal= 40.00 mm |    Comments: SCS TYPE II MASS CURVE
--------------------
                       Duration of storm    = 12.00 hrs
                       Mass curve time step = 15.00 min

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    1.00 |  3.00    1.60 |  6.00    7.20 |  9.00    1.40
                0.25    1.00 |  3.25    1.60 |  6.25    7.20 |  9.25    1.40
                0.50    1.00 |  3.50    1.60 |  6.50    3.20 |  9.50    1.40
                0.75    1.00 |  3.75    1.60 |  6.75    3.20 |  9.75    1.40
                1.00    1.00 |  4.00    2.40 |  7.00    2.40 | 10.00    0.80
                1.25    1.00 |  4.25    2.40 |  7.25    2.40 | 10.25    0.80
                1.50    1.00 |  4.50    3.20 |  7.50    2.40 | 10.50    0.80
                1.75    1.00 |  4.75    3.20 |  7.75    2.40 | 10.75    0.80
                2.00    1.20 |  5.00    4.80 |  8.00    1.40 | 11.00    0.80
                2.25    1.20 |  5.25    4.80 |  8.25    1.40 | 11.25    0.80
                2.50    1.20 |  5.50   19.20 |  8.50    1.40 | 11.50    0.80
                2.75    1.20 |  5.75   52.80 |  8.75    1.40 | 11.75    0.80

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0041)|   Area     (ha)=   6.56   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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


                                  ---- TRANSFORMED HYETOGRAPH ----
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.083    1.00 | 3.083    1.60 | 6.083    7.20 |  9.08    1.40
                0.167    1.00 | 3.167    1.60 | 6.167    7.20 |  9.17    1.40
                0.250    1.00 | 3.250    1.60 | 6.250    7.20 |  9.25    1.40
                0.333    1.00 | 3.333    1.60 | 6.333    7.20 |  9.33    1.40
                0.417    1.00 | 3.417    1.60 | 6.417    7.20 |  9.42    1.40
                0.500    1.00 | 3.500    1.60 | 6.500    7.20 |  9.50    1.40
                0.583    1.00 | 3.583    1.60 | 6.583    3.20 |  9.58    1.40
                0.667    1.00 | 3.667    1.60 | 6.667    3.20 |  9.67    1.40
                0.750    1.00 | 3.750    1.60 | 6.750    3.20 |  9.75    1.40
                0.833    1.00 | 3.833    1.60 | 6.833    3.20 |  9.83    1.40
                0.917    1.00 | 3.917    1.60 | 6.917    3.20 |  9.92    1.40
                1.000    1.00 | 4.000    1.60 | 7.000    3.20 | 10.00    1.40
                1.083    1.00 | 4.083    2.40 | 7.083    2.40 | 10.08    0.80
                1.167    1.00 | 4.167    2.40 | 7.167    2.40 | 10.17    0.80
                1.250    1.00 | 4.250    2.40 | 7.250    2.40 | 10.25    0.80
                1.333    1.00 | 4.333    2.40 | 7.333    2.40 | 10.33    0.80
                1.417    1.00 | 4.417    2.40 | 7.417    2.40 | 10.42    0.80
                1.500    1.00 | 4.500    2.40 | 7.500    2.40 | 10.50    0.80
                1.583    1.00 | 4.583    3.20 | 7.583    2.40 | 10.58    0.80
                1.667    1.00 | 4.667    3.20 | 7.667    2.40 | 10.67    0.80
                1.750    1.00 | 4.750    3.20 | 7.750    2.40 | 10.75    0.80
                1.833    1.00 | 4.833    3.20 | 7.833    2.40 | 10.83    0.80
                1.917    1.00 | 4.917    3.20 | 7.917    2.40 | 10.92    0.80
                2.000    1.00 | 5.000    3.20 | 8.000    2.40 | 11.00    0.80
                2.083    1.20 | 5.083    4.80 | 8.083    1.40 | 11.08    0.80
                2.167    1.20 | 5.167    4.80 | 8.167    1.40 | 11.17    0.80
                2.250    1.20 | 5.250    4.80 | 8.250    1.40 | 11.25    0.80
                2.333    1.20 | 5.333    4.80 | 8.333    1.40 | 11.33    0.80
                2.417    1.20 | 5.417    4.80 | 8.417    1.40 | 11.42    0.80
                2.500    1.20 | 5.500    4.80 | 8.500    1.40 | 11.50    0.80
                2.583    1.20 | 5.583   19.20 | 8.583    1.40 | 11.58    0.80
                2.667    1.20 | 5.667   19.20 | 8.667    1.40 | 11.67    0.80
                2.750    1.20 | 5.750   19.20 | 8.750    1.40 | 11.75    0.80
                2.833    1.20 | 5.833   52.80 | 8.833    1.40 | 11.83    0.80
                2.917    1.20 | 5.917   52.80 | 8.917    1.40 | 11.92    0.80
                3.000    1.20 | 6.000   52.80 | 9.000    1.40 | 12.00    0.80

     Unit Hyd Qpeak  (cms)=   1.790

     PEAK FLOW       (cms)=   0.274 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  11.581
     TOTAL RAINFALL   (mm)=  40.000
     RUNOFF COEFFICIENT   =   0.290

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

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

```
--------------------
| ROUTE CHN(  0040)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         101.50        0.0500
                   1.00         100.70        0.0500
                   1.50         100.55    0.0500 /0.0300  Main Channel
                   2.00          99.50        0.0300      Main Channel
                   3.50          99.60        0.0300      Main Channel
                   4.50         100.65    0.0300 /0.0500  Main Channel
                   6.00         101.45        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)       (cms)         (m/s)      (min)
       0.10    99.60    .185E+02        0.0          0.54       8.09
       0.19    99.69    .587E+02        0.2          1.04       4.22
       0.29    99.79    .102E+03        0.5          1.38       3.16
       0.38    99.88    .149E+03        0.9          1.66       2.64
       0.48    99.98    .200E+03        1.4          1.88       2.32
       0.57   100.07    .254E+03        2.0          2.08       2.10
       0.67   100.17    .311E+03        2.7          2.26       1.93
       0.76   100.26    .372E+03        3.4          2.42       1.81
       0.86   100.36    .436E+03        4.3          2.57       1.70
       0.95   100.45    .503E+03        5.2          2.70       1.61
       1.05   100.55    .574E+03        6.2          2.83       1.54
       1.16   100.66    .667E+03        7.7          3.02       1.45
       1.28   100.78    .774E+03        9.5          3.22       1.35
       1.39   100.89    .892E+03       11.6          3.40       1.29
       1.50   101.00    .102E+04       13.8          3.54       1.23
       1.61   101.11    .116E+04       16.3          3.67       1.19
       1.72   101.22    .131E+04       18.9          3.79       1.15
       1.84   101.34    .147E+04       21.8          3.90       1.12
       1.95   101.45    .164E+04       25.0          4.00       1.09

                                  <---- hydrograph ---->   <-pipe / channel->
                             AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                             (ha)    (cms)   (hrs)   (mm)      (m)       (m/s)
   INFLOW : ID= 2 (  0041)    6.56     0.27    6.00  11.58      0.20      1.07
   OUTFLOW: ID= 1 (  0040)    6.56     0.27    6.08  11.58      0.20      1.07
```

```
--------------------
| CALIB            |
| NASHYD   (  0042)|   Area     (ha)=   4.15   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.28

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

                        ---- TRANSFORMED HYETOGRAPH ----
              TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
               hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
             0.083    1.00 | 3.083    1.60 | 6.083    7.20 |  9.08    1.40
             0.167    1.00 | 3.167    1.60 | 6.167    7.20 |  9.17    1.40
             0.250    1.00 | 3.250    1.60 | 6.250    7.20 |  9.25    1.40
             0.333    1.00 | 3.333    1.60 | 6.333    7.20 |  9.33    1.40
             0.417    1.00 | 3.417    1.60 | 6.417    7.20 |  9.42    1.40
             0.500    1.00 | 3.500    1.60 | 6.500    7.20 |  9.50    1.40
             0.583    1.00 | 3.583    1.60 | 6.583    3.20 |  9.58    1.40
             0.667    1.00 | 3.667    1.60 | 6.667    3.20 |  9.67    1.40
             0.750    1.00 | 3.750    1.60 | 6.750    3.20 |  9.75    1.40
             0.833    1.00 | 3.833    1.60 | 6.833    3.20 |  9.83    1.40
             0.917    1.00 | 3.917    1.60 | 6.917    3.20 |  9.92    1.40
             1.000    1.00 | 4.000    1.60 | 7.000    3.20 | 10.00    1.40
             1.083    1.00 | 4.083    2.40 | 7.083    2.40 | 10.08    0.80
             1.167    1.00 | 4.167    2.40 | 7.167    2.40 | 10.17    0.80
             1.250    1.00 | 4.250    2.40 | 7.250    2.40 | 10.25    0.80
             1.333    1.00 | 4.333    2.40 | 7.333    2.40 | 10.33    0.80
             1.417    1.00 | 4.417    2.40 | 7.417    2.40 | 10.42    0.80
             1.500    1.00 | 4.500    2.40 | 7.500    2.40 | 10.50    0.80
             1.583    1.00 | 4.583    3.20 | 7.583    2.40 | 10.58    0.80
             1.667    1.00 | 4.667    3.20 | 7.667    2.40 | 10.67    0.80
             1.750    1.00 | 4.750    3.20 | 7.750    2.40 | 10.75    0.80
             1.833    1.00 | 4.833    3.20 | 7.833    2.40 | 10.83    0.80
             1.917    1.00 | 4.917    3.20 | 7.917    2.40 | 10.92    0.80
             2.000    1.00 | 5.000    3.20 | 8.000    2.40 | 11.00    0.80
             2.083    1.20 | 5.083    4.80 | 8.083    1.40 | 11.08    0.80
             2.167    1.20 | 5.167    4.80 | 8.167    1.40 | 11.17    0.80
             2.250    1.20 | 5.250    4.80 | 8.250    1.40 | 11.25    0.80
             2.333    1.20 | 5.333    4.80 | 8.333    1.40 | 11.33    0.80
             2.417    1.20 | 5.417    4.80 | 8.417    1.40 | 11.42    0.80
             2.500    1.20 | 5.500    4.80 | 8.500    1.40 | 11.50    0.80
             2.583    1.20 | 5.583   19.20 | 8.583    1.40 | 11.58    0.80
             2.667    1.20 | 5.667   19.20 | 8.667    1.40 | 11.67    0.80
             2.750    1.20 | 5.750   19.20 | 8.750    1.40 | 11.75    0.80
             2.833    1.20 | 5.833   52.80 | 8.833    1.40 | 11.83    0.80
             2.917    1.20 | 5.917   52.80 | 8.917    1.40 | 11.92    0.80
             3.000    1.20 | 6.000   52.80 | 9.000    1.40 | 12.00    0.80

     Unit Hyd Qpeak  (cms)=   0.566

     PEAK FLOW       (cms)=   0.111 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  11.663
     TOTAL RAINFALL   (mm)=  40.000
     RUNOFF COEFFICIENT   =   0.292

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

```
--------------------
| ADD HYD  (  0039)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
       ID1= 1 (  0040):      6.56    0.274     6.08     11.58
     + ID2= 2 (  0042):      4.15    0.111     6.17     11.66
       ================================================
       ID = 3 (  0039):     10.71    0.379     6.08     11.61

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

```
       V    V   I    SSSSS  U   U    A    L                (v 6.2.2010)
       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 *****


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  Summary filename: C:\Users\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
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DATE: 03-08-2023                          TIME: 01:23:08

USER:



COMMENTS: _____________________________________________________________

--------------------------------------------------------------------------------
----------------------------
  ***********************************************
  ** SIMULATION : 02 - 5 YR - SCS TYPE II 12HR  **
  ***********************************************

---------------------
| MASS STORM        |    Filename: C:\Users\sramsoomair\AppD
|                   |              ata\Local\Temp\
|                   |              61ab631c-6e40-482e-984d-eb141678c1e0\42aab81d
| Ptotal= 52.90 mm  |    Comments: SCS TYPE II MASS CURVE
---------------------
                        Duration of storm    = 12.00 hrs
                        Mass curve time step = 15.00 min

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    1.32 |  3.00    2.12 |  6.00    9.52 |  9.00    1.85
                0.25    1.32 |  3.25    2.12 |  6.25    9.52 |  9.25    1.85
                0.50    1.32 |  3.50    2.12 |  6.50    4.23 |  9.50    1.85
                0.75    1.32 |  3.75    2.12 |  6.75    4.23 |  9.75    1.85
                1.00    1.32 |  4.00    3.17 |  7.00    3.17 | 10.00    1.06
                1.25    1.32 |  4.25    3.17 |  7.25    3.17 | 10.25    1.06
                1.50    1.32 |  4.50    4.23 |  7.50    3.17 | 10.50    1.06
                1.75    1.32 |  4.75    4.23 |  7.75    3.17 | 10.75    1.06
                2.00    1.59 |  5.00    6.35 |  8.00    1.85 | 11.00    1.06
                2.25    1.59 |  5.25    6.35 |  8.25    1.85 | 11.25    1.06
                2.50    1.59 |  5.50   25.39 |  8.50    1.85 | 11.50    1.06
                2.75    1.59 |  5.75   69.83 |  8.75    1.85 | 11.75    1.06

--------------------------------------------------------------------------------
---------------------
| CALIB             |
| NASHYD   (  0041)|   Area     (ha)=   6.56   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=   0.14

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


                        ---- TRANSFORMED HYETOGRAPH ----
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.083    1.32 | 3.083    2.12 | 6.083    9.52 |  9.08    1.85
                0.167    1.32 | 3.167    2.12 | 6.167    9.52 |  9.17    1.85
                0.250    1.32 | 3.250    2.12 | 6.250    9.52 |  9.25    1.85
                0.333    1.32 | 3.333    2.12 | 6.333    9.52 |  9.33    1.85
                0.417    1.32 | 3.417    2.12 | 6.417    9.52 |  9.42    1.85
                0.500    1.32 | 3.500    2.12 | 6.500    9.52 |  9.50    1.85
                0.583    1.32 | 3.583    2.12 | 6.583    4.23 |  9.58    1.85
                0.667    1.32 | 3.667    2.12 | 6.667    4.23 |  9.67    1.85
                0.750    1.32 | 3.750    2.12 | 6.750    4.23 |  9.75    1.85
                0.833    1.32 | 3.833    2.12 | 6.833    4.23 |  9.83    1.85
                0.917    1.32 | 3.917    2.12 | 6.917    4.23 |  9.92    1.85
                1.000    1.32 | 4.000    2.12 | 7.000    4.23 | 10.00    1.85
                1.083    1.32 | 4.083    3.17 | 7.083    3.17 | 10.08    1.06
                1.167    1.32 | 4.167    3.17 | 7.167    3.17 | 10.17    1.06
                1.250    1.32 | 4.250    3.17 | 7.250    3.17 | 10.25    1.06
                1.333    1.32 | 4.333    3.17 | 7.333    3.17 | 10.33    1.06
                1.417    1.32 | 4.417    3.17 | 7.417    3.17 | 10.42    1.06
                1.500    1.32 | 4.500    3.17 | 7.500    3.17 | 10.50    1.06
                1.583    1.32 | 4.583    4.23 | 7.583    3.17 | 10.58    1.06
                1.667    1.32 | 4.667    4.23 | 7.667    3.17 | 10.67    1.06
                1.750    1.32 | 4.750    4.23 | 7.750    3.17 | 10.75    1.06
                1.833    1.32 | 4.833    4.23 | 7.833    3.17 | 10.83    1.06
                1.917    1.32 | 4.917    4.23 | 7.917    3.17 | 10.92    1.06
                2.000    1.32 | 5.000    4.23 | 8.000    3.17 | 11.00    1.06
                2.083    1.59 | 5.083    6.35 | 8.083    1.85 | 11.08    1.06
                2.167    1.59 | 5.167    6.35 | 8.167    1.85 | 11.17    1.06
                2.250    1.59 | 5.250    6.35 | 8.250    1.85 | 11.25    1.06
                2.333    1.59 | 5.333    6.35 | 8.333    1.85 | 11.33    1.06
                2.417    1.59 | 5.417    6.35 | 8.417    1.85 | 11.42    1.06
                2.500    1.59 | 5.500    6.35 | 8.500    1.85 | 11.50    1.06
                2.583    1.59 | 5.583   25.39 | 8.583    1.85 | 11.58    1.06
                2.667    1.59 | 5.667   25.39 | 8.667    1.85 | 11.67    1.06
                2.750    1.59 | 5.750   25.39 | 8.750    1.85 | 11.75    1.06
                2.833    1.59 | 5.833   69.83 | 8.833    1.85 | 11.83    1.06
                2.917    1.59 | 5.917   69.83 | 8.917    1.85 | 11.92    1.06
                3.000    1.59 | 6.000   69.83 | 9.000    1.85 | 12.00    1.06

     Unit Hyd Qpeak  (cms)=   1.790

     PEAK FLOW       (cms)=   0.483 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  19.879
     TOTAL RAINFALL   (mm)=  52.900
     RUNOFF COEFFICIENT   =   0.376

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

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---------------------
| ROUTE CHN(  0040)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
---------------------
                <------ DATA FOR SECTION (   1.1) ------>
                Distance      Elevation       Manning
                    0.00         101.50        0.0500
                    1.00         100.70        0.0500
                    1.50         100.55    0.0500 /0.0300  Main Channel
                    2.00          99.50        0.0300      Main Channel
```

3.50	99.60	0.0300 Main Channel
4.50	100.65	0.0300 /0.0500 Main Channel
6.00	101.45	0.0500

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	99.60	.185E+02	0.0	0.54	8.09
0.19	99.69	.587E+02	0.2	1.04	4.22
0.29	99.79	.102E+03	0.5	1.38	3.16
0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	0.48	6.00	19.88	0.27	1.30
OUTFLOW: ID= 1 (0040)	6.56	0.47	6.08	19.88	0.26	1.28

CALIB					
NASHYD (0042)	Area (ha)=	4.15	Curve Number (CN)=	82.0	
ID= 1 DT= 5.0 min	Ia (mm)=	8.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.28			

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.32	3.083	2.12	6.083	9.52	9.08	1.85
0.167	1.32	3.167	2.12	6.167	9.52	9.17	1.85
0.250	1.32	3.250	2.12	6.250	9.52	9.25	1.85
0.333	1.32	3.333	2.12	6.333	9.52	9.33	1.85
0.417	1.32	3.417	2.12	6.417	9.52	9.42	1.85
0.500	1.32	3.500	2.12	6.500	9.52	9.50	1.85
0.583	1.32	3.583	2.12	6.583	4.23	9.58	1.85
0.667	1.32	3.667	2.12	6.667	4.23	9.67	1.85
0.750	1.32	3.750	2.12	6.750	4.23	9.75	1.85
0.833	1.32	3.833	2.12	6.833	4.23	9.83	1.85
0.917	1.32	3.917	2.12	6.917	4.23	9.92	1.85
1.000	1.32	4.000	2.12	7.000	4.23	10.00	1.85
1.083	1.32	4.083	3.17	7.083	3.17	10.08	1.06
1.167	1.32	4.167	3.17	7.167	3.17	10.17	1.06
1.250	1.32	4.250	3.17	7.250	3.17	10.25	1.06
1.333	1.32	4.333	3.17	7.333	3.17	10.33	1.06
1.417	1.32	4.417	3.17	7.417	3.17	10.42	1.06
1.500	1.32	4.500	3.17	7.500	3.17	10.50	1.06
1.583	1.32	4.583	4.23	7.583	3.17	10.58	1.06
1.667	1.32	4.667	4.23	7.667	3.17	10.67	1.06
1.750	1.32	4.750	4.23	7.750	3.17	10.75	1.06
1.833	1.32	4.833	4.23	7.833	3.17	10.83	1.06
1.917	1.32	4.917	4.23	7.917	3.17	10.92	1.06
2.000	1.32	5.000	4.23	8.000	3.17	11.00	1.06
2.083	1.59	5.083	6.35	8.083	1.85	11.08	1.06
2.167	1.59	5.167	6.35	8.167	1.85	11.17	1.06
2.250	1.59	5.250	6.35	8.250	1.85	11.25	1.06
2.333	1.59	5.333	6.35	8.333	1.85	11.33	1.06
2.417	1.59	5.417	6.35	8.417	1.85	11.42	1.06
2.500	1.59	5.500	6.35	8.500	1.85	11.50	1.06
2.583	1.59	5.583	25.39	8.583	1.85	11.58	1.06
2.667	1.59	5.667	25.39	8.667	1.85	11.67	1.06
2.750	1.59	5.750	25.39	8.750	1.85	11.75	1.06
2.833	1.59	5.833	69.83	8.833	1.85	11.83	1.06
2.917	1.59	5.917	69.83	8.917	1.85	11.92	1.06
3.000	1.59	6.000	69.83	9.000	1.85	12.00	1.06

Unit Hyd Qpeak (cms)= 0.566

PEAK FLOW (cms)= 0.197 (i)
TIME TO PEAK (hrs)= 6.167
RUNOFF VOLUME (mm)= 20.018
TOTAL RAINFALL (mm)= 52.900
RUNOFF COEFFICIENT = 0.378

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

ADD HYD (0039)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0040):	6.56	0.469	6.08	19.88
	+ ID2= 2 (0042):	4.15	0.197	6.17	20.02
	ID = 3 (0039):	10.71	0.659	6.08	19.93

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
       V    V   I    SSSSS  U   U    A    L                (v 6.2.2010)
       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 *****

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DATE: 03-08-2023                          TIME: 01:23:07

USER:



COMMENTS: _____________________________________________________

--------------------------------------------------------------------------------
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  ***********************************************
  ** SIMULATION : 03 - 10 YR - SCS TYPE II 12HR **
  ***********************************************

--------------------
| MASS STORM       |    Filename: C:\Users\sramsoomair\AppD
|                  |              ata\Local\Temp\
|                  |              61ab631c-6e40-482e-984d-eb141678c1e0\4e347f07
| Ptotal= 60.30 mm |    Comments: SCS TYPE II MASS CURVE
--------------------
                         Duration of storm    = 12.00 hrs
                         Mass curve time step = 15.00 min

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    1.51 |  3.00    2.41 |  6.00   10.85 |  9.00    2.11
                0.25    1.51 |  3.25    2.41 |  6.25   10.85 |  9.25    2.11
                0.50    1.51 |  3.50    2.41 |  6.50    4.82 |  9.50    2.11
                0.75    1.51 |  3.75    2.41 |  6.75    4.82 |  9.75    2.11
                1.00    1.51 |  4.00    3.62 |  7.00    3.62 | 10.00    1.21
                1.25    1.51 |  4.25    3.62 |  7.25    3.62 | 10.25    1.21
                1.50    1.51 |  4.50    4.82 |  7.50    3.62 | 10.50    1.21
                1.75    1.51 |  4.75    4.82 |  7.75    3.62 | 10.75    1.21
                2.00    1.81 |  5.00    7.24 |  8.00    2.11 | 11.00    1.21
                2.25    1.81 |  5.25    7.24 |  8.25    2.11 | 11.25    1.21
                2.50    1.81 |  5.50   28.94 |  8.50    2.11 | 11.50    1.21
                2.75    1.81 |  5.75   79.60 |  8.75    2.11 | 11.75    1.21

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--------------------
| CALIB            |
| NASHYD   (  0041)|   Area     (ha)=   6.56   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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


                        ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    1.51 | 3.083    2.41 | 6.083   10.85 |  9.08    2.11
               0.167    1.51 | 3.167    2.41 | 6.167   10.85 |  9.17    2.11
               0.250    1.51 | 3.250    2.41 | 6.250   10.85 |  9.25    2.11
               0.333    1.51 | 3.333    2.41 | 6.333   10.85 |  9.33    2.11
               0.417    1.51 | 3.417    2.41 | 6.417   10.85 |  9.42    2.11
               0.500    1.51 | 3.500    2.41 | 6.500   10.85 |  9.50    2.11
               0.583    1.51 | 3.583    2.41 | 6.583    4.82 |  9.58    2.11
               0.667    1.51 | 3.667    2.41 | 6.667    4.82 |  9.67    2.11
               0.750    1.51 | 3.750    2.41 | 6.750    4.82 |  9.75    2.11
               0.833    1.51 | 3.833    2.41 | 6.833    4.82 |  9.83    2.11
               0.917    1.51 | 3.917    2.41 | 6.917    4.82 |  9.92    2.11
               1.000    1.51 | 4.000    2.41 | 7.000    4.82 | 10.00    2.11
               1.083    1.51 | 4.083    3.62 | 7.083    3.62 | 10.08    1.21
               1.167    1.51 | 4.167    3.62 | 7.167    3.62 | 10.17    1.21
               1.250    1.51 | 4.250    3.62 | 7.250    3.62 | 10.25    1.21
               1.333    1.51 | 4.333    3.62 | 7.333    3.62 | 10.33    1.21
               1.417    1.51 | 4.417    3.62 | 7.417    3.62 | 10.42    1.21
               1.500    1.51 | 4.500    3.62 | 7.500    3.62 | 10.50    1.21
               1.583    1.51 | 4.583    4.82 | 7.583    3.62 | 10.58    1.21
               1.667    1.51 | 4.667    4.82 | 7.667    3.62 | 10.67    1.21
               1.750    1.51 | 4.750    4.82 | 7.750    3.62 | 10.75    1.21
               1.833    1.51 | 4.833    4.82 | 7.833    3.62 | 10.83    1.21
               1.917    1.51 | 4.917    4.82 | 7.917    3.62 | 10.92    1.21
               2.000    1.51 | 5.000    4.82 | 8.000    3.62 | 11.00    1.21
               2.083    1.81 | 5.083    7.24 | 8.083    2.11 | 11.08    1.21
               2.167    1.81 | 5.167    7.24 | 8.167    2.11 | 11.17    1.21
               2.250    1.81 | 5.250    7.24 | 8.250    2.11 | 11.25    1.21
               2.333    1.81 | 5.333    7.24 | 8.333    2.11 | 11.33    1.21
               2.417    1.81 | 5.417    7.24 | 8.417    2.11 | 11.42    1.21
               2.500    1.81 | 5.500    7.24 | 8.500    2.11 | 11.50    1.21
               2.583    1.81 | 5.583   28.94 | 8.583    2.11 | 11.58    1.21
               2.667    1.81 | 5.667   28.94 | 8.667    2.11 | 11.67    1.21
               2.750    1.81 | 5.750   28.94 | 8.750    2.11 | 11.75    1.21
               2.833    1.81 | 5.833   79.60 | 8.833    2.11 | 11.83    1.21
               2.917    1.81 | 5.917   79.60 | 8.917    2.11 | 11.92    1.21
               3.000    1.81 | 6.000   79.59 | 9.000    2.11 | 12.00    1.21

    Unit Hyd Qpeak  (cms)=   1.790

    PEAK FLOW       (cms)=   0.614 (i)
    TIME TO PEAK    (hrs)=   6.000
    RUNOFF VOLUME    (mm)=  25.124
    TOTAL RAINFALL   (mm)=  60.300
    RUNOFF COEFFICIENT   =   0.417

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

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0040)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
             <------ DATA FOR SECTION (   1.1) ------>
             Distance      Elevation       Manning
                 0.00        101.50        0.0500
                 1.00        100.70        0.0500
                 1.50        100.55    0.0500 /0.0300  Main Channel
                 2.00         99.50        0.0300      Main Channel
                 3.50         99.60        0.0300      Main Channel
                 4.50        100.65    0.0300 /0.0500  Main Channel
                 6.00        101.45        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)        (m/s)       (min)
        0.10    99.60    .185E+02         0.0         0.54        8.09
        0.19    99.69    .587E+02         0.2         1.04        4.22
        0.29    99.79    .102E+03         0.5         1.38        3.16
```

0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

	<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	0.61	6.00	25.12	0.30	1.43
OUTFLOW: ID= 1 (0040)	6.56	0.60	6.08	25.12	0.30	1.42

| CALIB |			
| NASHYD (0042)|	Area (ha)= 4.15	Curve Number (CN)= 82.0	
|ID= 1 DT= 5.0 min |	Ia (mm)= 8.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.28		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.51	3.083	2.41	6.083	10.85	9.08	2.11
0.167	1.51	3.167	2.41	6.167	10.85	9.17	2.11
0.250	1.51	3.250	2.41	6.250	10.85	9.25	2.11
0.333	1.51	3.333	2.41	6.333	10.85	9.33	2.11
0.417	1.51	3.417	2.41	6.417	10.85	9.42	2.11
0.500	1.51	3.500	2.41	6.500	10.85	9.50	2.11
0.583	1.51	3.583	2.41	6.583	4.82	9.58	2.11
0.667	1.51	3.667	2.41	6.667	4.82	9.67	2.11
0.750	1.51	3.750	2.41	6.750	4.82	9.75	2.11
0.833	1.51	3.833	2.41	6.833	4.82	9.83	2.11
0.917	1.51	3.917	2.41	6.917	4.82	9.92	2.11
1.000	1.51	4.000	2.41	7.000	4.82	10.00	2.11
1.083	1.51	4.083	3.62	7.083	3.62	10.08	1.21
1.167	1.51	4.167	3.62	7.167	3.62	10.17	1.21
1.250	1.51	4.250	3.62	7.250	3.62	10.25	1.21
1.333	1.51	4.333	3.62	7.333	3.62	10.33	1.21
1.417	1.51	4.417	3.62	7.417	3.62	10.42	1.21
1.500	1.51	4.500	3.62	7.500	3.62	10.50	1.21
1.583	1.51	4.583	4.82	7.583	3.62	10.58	1.21
1.667	1.51	4.667	4.82	7.667	3.62	10.67	1.21
1.750	1.51	4.750	4.82	7.750	3.62	10.75	1.21
1.833	1.51	4.833	4.82	7.833	3.62	10.83	1.21
1.917	1.51	4.917	4.82	7.917	3.62	10.92	1.21
2.000	1.51	5.000	4.82	8.000	3.62	11.00	1.21
2.083	1.81	5.083	7.24	8.083	2.11	11.08	1.21
2.167	1.81	5.167	7.24	8.167	2.11	11.17	1.21
2.250	1.81	5.250	7.24	8.250	2.11	11.25	1.21
2.333	1.81	5.333	7.24	8.333	2.11	11.33	1.21
2.417	1.81	5.417	7.24	8.417	2.11	11.42	1.21
2.500	1.81	5.500	7.24	8.500	2.11	11.50	1.21
2.583	1.81	5.583	28.94	8.583	2.11	11.58	1.21
2.667	1.81	5.667	28.94	8.667	2.11	11.67	1.21
2.750	1.81	5.750	28.94	8.750	2.11	11.75	1.21
2.833	1.81	5.833	79.60	8.833	2.11	11.83	1.21
2.917	1.81	5.917	79.60	8.917	2.11	11.92	1.21
3.000	1.81	6.000	79.59	9.000	2.11	12.00	1.21

Unit Hyd Qpeak (cms)= 0.566

PEAK FLOW (cms)= 0.252 (i)
TIME TO PEAK (hrs)= 6.167
RUNOFF VOLUME (mm)= 25.301
TOTAL RAINFALL (mm)= 60.300
RUNOFF COEFFICIENT = 0.420

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

| ADD HYD (0039)|				
| 1 + 2 = 3 |	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0040):	6.56	0.600	6.08	25.12
+ ID2= 2 (0042):	4.15	0.252	6.17	25.30
ID = 3 (0039):	10.71	0.844	6.08	25.19

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
       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\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\a235dae9-3468-41f2-97bc-229640db483f\
  Summary filename: C:\Users\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\a235dae9-3468-41f2-97bc-229640db483f\


DATE: 03-08-2023                          TIME: 01:23:08
```

USER:

COMMENTS: _____

```
  ***********************************************
  ** SIMULATION : 04 - 25 YR - SCS TYPE II 12HR **
  ***********************************************

--------------------
| MASS STORM       |    Filename: C:\Users\sramsoomair\AppD
|                  |              ata\Local\Temp\
|                  |              61ab631c-6e40-482e-984d-eb141678c1e0\420551ed
| Ptotal= 71.00 mm |    Comments: SCS TYPE II MASS CURVE
--------------------
                       Duration of storm    = 12.00 hrs
                       Mass curve time step = 15.00 min

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    1.78 |  3.00    2.84 |  6.00   12.78 |  9.00    2.48
                0.25    1.78 |  3.25    2.84 |  6.25   12.78 |  9.25    2.49
                0.50    1.78 |  3.50    2.84 |  6.50    5.68 |  9.50    2.49
                0.75    1.77 |  3.75    2.84 |  6.75    5.68 |  9.75    2.48
                1.00    1.77 |  4.00    4.26 |  7.00    4.26 | 10.00    1.42
                1.25    1.78 |  4.25    4.26 |  7.25    4.26 | 10.25    1.42
                1.50    1.77 |  4.50    5.68 |  7.50    4.26 | 10.50    1.42
                1.75    1.78 |  4.75    5.68 |  7.75    4.26 | 10.75    1.42
                2.00    2.13 |  5.00    8.52 |  8.00    2.49 | 11.00    1.42
                2.25    2.13 |  5.25    8.52 |  8.25    2.49 | 11.25    1.42
                2.50    2.13 |  5.50   34.08 |  8.50    2.48 | 11.50    1.42
                2.75    2.13 |  5.75   93.72 |  8.75    2.49 | 11.75    1.42

--------------------
| CALIB            |
| NASHYD   (  0041)|   Area     (ha)=   6.56   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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

                        ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    1.78 | 3.083    2.84 | 6.083   12.78 |  9.08    2.48
               0.167    1.78 | 3.167    2.84 | 6.167   12.78 |  9.17    2.48
               0.250    1.78 | 3.250    2.84 | 6.250   12.78 |  9.25    2.48
               0.333    1.78 | 3.333    2.84 | 6.333   12.78 |  9.33    2.49
               0.417    1.78 | 3.417    2.84 | 6.417   12.78 |  9.42    2.49
               0.500    1.78 | 3.500    2.84 | 6.500   12.78 |  9.50    2.49
               0.583    1.78 | 3.583    2.84 | 6.583    5.68 |  9.58    2.48
               0.667    1.78 | 3.667    2.84 | 6.667    5.68 |  9.67    2.49
               0.750    1.78 | 3.750    2.84 | 6.750    5.68 |  9.75    2.49
               0.833    1.77 | 3.833    2.84 | 6.833    5.68 |  9.83    2.48
               0.917    1.77 | 3.917    2.84 | 6.917    5.68 |  9.92    2.48
               1.000    1.77 | 4.000    2.84 | 7.000    5.68 | 10.00    2.48
               1.083    1.77 | 4.083    4.26 | 7.083    4.26 | 10.08    1.42
               1.167    1.77 | 4.167    4.26 | 7.167    4.26 | 10.17    1.42
               1.250    1.77 | 4.250    4.26 | 7.250    4.26 | 10.25    1.42
               1.333    1.78 | 4.333    4.26 | 7.333    4.26 | 10.33    1.42
               1.417    1.78 | 4.417    4.26 | 7.417    4.26 | 10.42    1.42
               1.500    1.78 | 4.500    4.26 | 7.500    4.26 | 10.50    1.42
               1.583    1.77 | 4.583    5.68 | 7.583    4.26 | 10.58    1.42
               1.667    1.77 | 4.667    5.68 | 7.667    4.26 | 10.67    1.42
               1.750    1.78 | 4.750    5.68 | 7.750    4.26 | 10.75    1.42
               1.833    1.78 | 4.833    5.68 | 7.833    4.26 | 10.83    1.42
               1.917    1.78 | 4.917    5.68 | 7.917    4.26 | 10.92    1.42
               2.000    1.78 | 5.000    5.68 | 8.000    4.26 | 11.00    1.42
               2.083    2.13 | 5.083    8.52 | 8.083    2.49 | 11.08    1.42
               2.167    2.13 | 5.167    8.52 | 8.167    2.49 | 11.17    1.42
               2.250    2.13 | 5.250    8.52 | 8.250    2.48 | 11.25    1.42
               2.333    2.13 | 5.333    8.52 | 8.333    2.49 | 11.33    1.42
               2.417    2.13 | 5.417    8.52 | 8.417    2.49 | 11.42    1.42
               2.500    2.13 | 5.500    8.52 | 8.500    2.48 | 11.50    1.42
               2.583    2.13 | 5.583   34.08 | 8.583    2.48 | 11.58    1.42
               2.667    2.13 | 5.667   34.08 | 8.667    2.48 | 11.67    1.42
               2.750    2.13 | 5.750   34.08 | 8.750    2.48 | 11.75    1.42
               2.833    2.13 | 5.833   93.72 | 8.833    2.49 | 11.83    1.42
               2.917    2.13 | 5.917   93.72 | 8.917    2.49 | 11.92    1.42
               3.000    2.13 | 6.000   93.72 | 9.000    2.48 | 12.00    1.42

     Unit Hyd Qpeak  (cms)=   1.790

     PEAK FLOW       (cms)=   0.814 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  33.171
     TOTAL RAINFALL   (mm)=  71.000
     RUNOFF COEFFICIENT   =   0.467

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

--------------------
| ROUTE CHN(  0040)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
                <------ DATA FOR SECTION (   1.1) ------>
                Distance      Elevation       Manning
                    0.00         101.50        0.0500
                    1.00         100.70        0.0500
                    1.50         100.55    0.0500 /0.0300  Main Channel
                    2.00          99.50        0.0300      Main Channel
                    3.50          99.60        0.0300      Main Channel
                    4.50         100.65    0.0300 /0.0500  Main Channel
                    6.00         101.45        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)       (m)     (cu.m.)      (cms)        (m/s)       (min)
       0.10     99.60    .185E+02       0.0         0.54        8.09
       0.19     99.69    .587E+02       0.2         1.04        4.22
       0.29     99.79    .102E+03       0.5         1.38        3.16
       0.38     99.88    .149E+03       0.9         1.66        2.64
       0.48     99.98    .200E+03       1.4         1.88        2.32
       0.57    100.07    .254E+03       2.0         2.08        2.10
       0.67    100.17    .311E+03       2.7         2.26        1.93
       0.76    100.26    .372E+03       3.4         2.42        1.81
       0.86    100.36    .436E+03       4.3         2.57        1.70
       0.95    100.45    .503E+03       5.2         2.70        1.61
       1.05    100.55    .574E+03       6.2         2.83        1.54
       1.16    100.66    .667E+03       7.7         3.02        1.45
       1.28    100.78    .774E+03       9.5         3.22        1.35
```

1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

	<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	0.81	6.00	33.17	0.35	1.56
OUTFLOW: ID= 1 (0040)	6.56	0.78	6.08	33.17	0.34	1.53

CALIB					
NASHYD (0042)	Area (ha)=	4.15	Curve Number (CN)=	82.0
ID= 1 DT= 5.0 min	Ia (mm)=	8.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.28		

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

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.78	3.083	2.84	6.083	12.78	9.08	2.48
0.167	1.78	3.167	2.84	6.167	12.78	9.17	2.48
0.250	1.78	3.250	2.84	6.250	12.78	9.25	2.48
0.333	1.78	3.333	2.84	6.333	12.78	9.33	2.49
0.417	1.78	3.417	2.84	6.417	12.78	9.42	2.49
0.500	1.78	3.500	2.84	6.500	12.78	9.50	2.49
0.583	1.78	3.583	2.84	6.583	5.68	9.58	2.48
0.667	1.78	3.667	2.84	6.667	5.68	9.67	2.49
0.750	1.78	3.750	2.84	6.750	5.68	9.75	2.49
0.833	1.77	3.833	2.84	6.833	5.68	9.83	2.48
0.917	1.77	3.917	2.84	6.917	5.68	9.92	2.48
1.000	1.77	4.000	2.84	7.000	5.68	10.00	2.48
1.083	1.77	4.083	4.26	7.083	4.26	10.08	1.42
1.167	1.77	4.167	4.26	7.167	4.26	10.17	1.42
1.250	1.77	4.250	4.26	7.250	4.26	10.25	1.42
1.333	1.78	4.333	4.26	7.333	4.26	10.33	1.42
1.417	1.78	4.417	4.26	7.417	4.26	10.42	1.42
1.500	1.78	4.500	4.26	7.500	4.26	10.50	1.42
1.583	1.77	4.583	5.68	7.583	4.26	10.58	1.42
1.667	1.77	4.667	5.68	7.667	4.26	10.67	1.42
1.750	1.78	4.750	5.68	7.750	4.26	10.75	1.42
1.833	1.78	4.833	5.68	7.833	4.26	10.83	1.42
1.917	1.78	4.917	5.68	7.917	4.26	10.92	1.42
2.000	1.78	5.000	5.68	8.000	4.26	11.00	1.42
2.083	2.13	5.083	8.52	8.083	2.49	11.08	1.42
2.167	2.13	5.167	8.52	8.167	2.49	11.17	1.42
2.250	2.13	5.250	8.52	8.250	2.48	11.25	1.42
2.333	2.13	5.333	8.52	8.333	2.49	11.33	1.42
2.417	2.13	5.417	8.52	8.417	2.49	11.42	1.42
2.500	2.13	5.500	8.52	8.500	2.48	11.50	1.42
2.583	2.13	5.583	34.08	8.583	2.48	11.58	1.42
2.667	2.13	5.667	34.08	8.667	2.48	11.67	1.42
2.750	2.13	5.750	34.08	8.750	2.48	11.75	1.42
2.833	2.13	5.833	93.72	8.833	2.49	11.83	1.42
2.917	2.13	5.917	93.72	8.917	2.49	11.92	1.42
3.000	2.13	6.000	93.72	9.000	2.48	12.00	1.42

Unit Hyd Qpeak (cms)= 0.566

PEAK FLOW (cms)= 0.335 (i)
TIME TO PEAK (hrs)= 6.167
RUNOFF VOLUME (mm)= 33.404
TOTAL RAINFALL (mm)= 71.000
RUNOFF COEFFICIENT = 0.470

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

ADD HYD (0039)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0040):	6.56	0.780	6.08	33.17
	+ ID2= 2 (0042):	4.15	0.335	6.17	33.40
	ID = 3 (0039):	10.71	1.107	6.08	33.26

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
       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\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-42e5-99bc-6f706f925a0e\b378272c-2e71-4739-ac1e-ed4a01a6b209\
Summary filename: C:\Users\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-42e5-99bc-6f706f925a0e\b378272c-2e71-4739-ac1e-ed4a01a6b209\

DATE: 03-08-2023 TIME: 01:23:08

USER:

COMMENTS: _____

****

```
  ** SIMULATION : 05 - 50 YR - SCS TYPE II 12HR **
  ************************************************

--------------------
| MASS STORM       |    Filename: C:\Users\sramsoomair\AppD
|                  |              ata\Local\Temp\
|                  |              61ab631c-6e40-482e-984d-eb141678c1e0\e1c45111
| Ptotal= 78.50 mm |    Comments: SCS TYPE II MASS CURVE
--------------------
                       Duration of storm    = 12.00 hrs
                       Mass curve time step = 15.00 min

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    1.96 |  3.00    3.14 |  6.00   14.13 |  9.00    2.75
                0.25    1.96 |  3.25    3.14 |  6.25   14.13 |  9.25    2.75
                0.50    1.96 |  3.50    3.14 |  6.50    6.28 |  9.50    2.75
                0.75    1.96 |  3.75    3.14 |  6.75    6.28 |  9.75    2.75
                1.00    1.96 |  4.00    4.71 |  7.00    4.71 | 10.00    1.57
                1.25    1.96 |  4.25    4.71 |  7.25    4.71 | 10.25    1.57
                1.50    1.96 |  4.50    6.28 |  7.50    4.71 | 10.50    1.57
                1.75    1.96 |  4.75    6.28 |  7.75    4.71 | 10.75    1.57
                2.00    2.35 |  5.00    9.42 |  8.00    2.75 | 11.00    1.57
                2.25    2.35 |  5.25    9.42 |  8.25    2.75 | 11.25    1.57
                2.50    2.35 |  5.50   37.68 |  8.50    2.75 | 11.50    1.57
                2.75    2.35 |  5.75  103.62 |  8.75    2.75 | 11.75    1.57

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0041)|   Area     (ha)=   6.56   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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

                     ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    1.96 | 3.083    3.14 | 6.083   14.13 |  9.08    2.75
               0.167    1.96 | 3.167    3.14 | 6.167   14.13 |  9.17    2.75
               0.250    1.96 | 3.250    3.14 | 6.250   14.13 |  9.25    2.75
               0.333    1.96 | 3.333    3.14 | 6.333   14.13 |  9.33    2.75
               0.417    1.96 | 3.417    3.14 | 6.417   14.13 |  9.42    2.75
               0.500    1.96 | 3.500    3.14 | 6.500   14.13 |  9.50    2.75
               0.583    1.96 | 3.583    3.14 | 6.583    6.28 |  9.58    2.75
               0.667    1.96 | 3.667    3.14 | 6.667    6.28 |  9.67    2.75
               0.750    1.96 | 3.750    3.14 | 6.750    6.28 |  9.75    2.75
               0.833    1.96 | 3.833    3.14 | 6.833    6.28 |  9.83    2.75
               0.917    1.96 | 3.917    3.14 | 6.917    6.28 |  9.92    2.75
               1.000    1.96 | 4.000    3.14 | 7.000    6.28 | 10.00    2.75
               1.083    1.96 | 4.083    4.71 | 7.083    4.71 | 10.08    1.57
               1.167    1.96 | 4.167    4.71 | 7.167    4.71 | 10.17    1.57
               1.250    1.96 | 4.250    4.71 | 7.250    4.71 | 10.25    1.57
               1.333    1.96 | 4.333    4.71 | 7.333    4.71 | 10.33    1.57
               1.417    1.96 | 4.417    4.71 | 7.417    4.71 | 10.42    1.57
               1.500    1.96 | 4.500    4.71 | 7.500    4.71 | 10.50    1.57
               1.583    1.96 | 4.583    6.28 | 7.583    4.71 | 10.58    1.57
               1.667    1.96 | 4.667    6.28 | 7.667    4.71 | 10.67    1.57
               1.750    1.96 | 4.750    6.28 | 7.750    4.71 | 10.75    1.57
               1.833    1.96 | 4.833    6.28 | 7.833    4.71 | 10.83    1.57
               1.917    1.96 | 4.917    6.28 | 7.917    4.71 | 10.92    1.57
               2.000    1.96 | 5.000    6.28 | 8.000    4.71 | 11.00    1.57
               2.083    2.35 | 5.083    9.42 | 8.083    2.75 | 11.08    1.57
               2.167    2.35 | 5.167    9.42 | 8.167    2.75 | 11.17    1.57
               2.250    2.35 | 5.250    9.42 | 8.250    2.75 | 11.25    1.57
               2.333    2.35 | 5.333    9.42 | 8.333    2.75 | 11.33    1.57
               2.417    2.35 | 5.417    9.42 | 8.417    2.75 | 11.42    1.57
               2.500    2.35 | 5.500    9.42 | 8.500    2.75 | 11.50    1.57
               2.583    2.35 | 5.583   37.68 | 8.583    2.75 | 11.58    1.57
               2.667    2.35 | 5.667   37.68 | 8.667    2.75 | 11.67    1.57
               2.750    2.35 | 5.750   37.68 | 8.750    2.75 | 11.75    1.57
               2.833    2.35 | 5.833  103.62 | 8.833    2.75 | 11.83    1.57
               2.917    2.35 | 5.917  103.62 | 8.917    2.75 | 11.92    1.57
               3.000    2.35 | 6.000  103.62 | 9.000    2.75 | 12.00    1.57

     Unit Hyd Qpeak  (cms)=   1.790

     PEAK FLOW       (cms)=   0.959 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  39.071
     TOTAL RAINFALL   (mm)=  78.500
     RUNOFF COEFFICIENT   =   0.498

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

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0040)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
                <------ DATA FOR SECTION (   1.1) ------>
                Distance      Elevation       Manning
                    0.00        101.50        0.0500
                    1.00        100.70        0.0500
                    1.50        100.55    0.0500 /0.0300  Main Channel
                    2.00         99.50        0.0300      Main Channel
                    3.50         99.60        0.0300      Main Channel
                    4.50        100.65    0.0300 /0.0500  Main Channel
                    6.00        101.45        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY    TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)       (min)
        0.10    99.60    .185E+02        0.0         0.54        8.09
        0.19    99.69    .587E+02        0.2         1.04        4.22
        0.29    99.79    .102E+03        0.5         1.38        3.16
        0.38    99.88    .149E+03        0.9         1.66        2.64
        0.48    99.98    .200E+03        1.4         1.88        2.32
        0.57   100.07    .254E+03        2.0         2.08        2.10
        0.67   100.17    .311E+03        2.7         2.26        1.93
        0.76   100.26    .372E+03        3.4         2.42        1.81
        0.86   100.36    .436E+03        4.3         2.57        1.70
        0.95   100.45    .503E+03        5.2         2.70        1.61
        1.05   100.55    .574E+03        6.2         2.83        1.54
        1.16   100.66    .667E+03        7.7         3.02        1.45
        1.28   100.78    .774E+03        9.5         3.22        1.35
        1.39   100.89    .892E+03       11.6         3.40        1.29
        1.50   101.00    .102E+04       13.8         3.54        1.23
        1.61   101.11    .116E+04       16.3         3.67        1.19
        1.72   101.22    .131E+04       18.9         3.79        1.15
        1.84   101.34    .147E+04       21.8         3.90        1.12
        1.95   101.45    .164E+04       25.0         4.00        1.09

                                    <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK    TPEAK    R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)    (hrs)    (mm)       (m)      (m/s)
```

```
   INFLOW : ID= 2 (  0041)    6.56     0.96    6.00  39.07      0.38      1.66
   OUTFLOW: ID= 1 (  0040)    6.56     0.92    6.08  39.07      0.38      1.63


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0042)|   Area     (ha)=   4.15   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.28

        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     1.96 | 3.083     3.14 | 6.083    14.13 |  9.08     2.75
             0.167     1.96 | 3.167     3.14 | 6.167    14.13 |  9.17     2.75
             0.250     1.96 | 3.250     3.14 | 6.250    14.13 |  9.25     2.75
             0.333     1.96 | 3.333     3.14 | 6.333    14.13 |  9.33     2.75
             0.417     1.96 | 3.417     3.14 | 6.417    14.13 |  9.42     2.75
             0.500     1.96 | 3.500     3.14 | 6.500    14.13 |  9.50     2.75
             0.583     1.96 | 3.583     3.14 | 6.583     6.28 |  9.58     2.75
             0.667     1.96 | 3.667     3.14 | 6.667     6.28 |  9.67     2.75
             0.750     1.96 | 3.750     3.14 | 6.750     6.28 |  9.75     2.75
             0.833     1.96 | 3.833     3.14 | 6.833     6.28 |  9.83     2.75
             0.917     1.96 | 3.917     3.14 | 6.917     6.28 |  9.92     2.75
             1.000     1.96 | 4.000     3.14 | 7.000     6.28 | 10.00     2.75
             1.083     1.96 | 4.083     4.71 | 7.083     4.71 | 10.08     1.57
             1.167     1.96 | 4.167     4.71 | 7.167     4.71 | 10.17     1.57
             1.250     1.96 | 4.250     4.71 | 7.250     4.71 | 10.25     1.57
             1.333     1.96 | 4.333     4.71 | 7.333     4.71 | 10.33     1.57
             1.417     1.96 | 4.417     4.71 | 7.417     4.71 | 10.42     1.57
             1.500     1.96 | 4.500     4.71 | 7.500     4.71 | 10.50     1.57
             1.583     1.96 | 4.583     6.28 | 7.583     4.71 | 10.58     1.57
             1.667     1.96 | 4.667     6.28 | 7.667     4.71 | 10.67     1.57
             1.750     1.96 | 4.750     6.28 | 7.750     4.71 | 10.75     1.57
             1.833     1.96 | 4.833     6.28 | 7.833     4.71 | 10.83     1.57
             1.917     1.96 | 4.917     6.28 | 7.917     4.71 | 10.92     1.57
             2.000     1.96 | 5.000     6.28 | 8.000     4.71 | 11.00     1.57
             2.083     2.35 | 5.083     9.42 | 8.083     2.75 | 11.08     1.57
             2.167     2.35 | 5.167     9.42 | 8.167     2.75 | 11.17     1.57
             2.250     2.35 | 5.250     9.42 | 8.250     2.75 | 11.25     1.57
             2.333     2.35 | 5.333     9.42 | 8.333     2.75 | 11.33     1.57
             2.417     2.35 | 5.417     9.42 | 8.417     2.75 | 11.42     1.57
             2.500     2.35 | 5.500     9.42 | 8.500     2.75 | 11.50     1.57
             2.583     2.35 | 5.583    37.68 | 8.583     2.75 | 11.58     1.57
             2.667     2.35 | 5.667    37.68 | 8.667     2.75 | 11.67     1.57
             2.750     2.35 | 5.750    37.68 | 8.750     2.75 | 11.75     1.57
             2.833     2.35 | 5.833   103.62 | 8.833     2.75 | 11.83     1.57
             2.917     2.35 | 5.917   103.62 | 8.917     2.75 | 11.92     1.57
             3.000     2.35 | 6.000   103.62 | 9.000     2.75 | 12.00     1.57

    Unit Hyd Qpeak  (cms)=   0.566

    PEAK FLOW       (cms)=   0.396 (i)
    TIME TO PEAK    (hrs)=   6.167
    RUNOFF VOLUME    (mm)=  39.346
    TOTAL RAINFALL   (mm)=  78.500
    RUNOFF COEFFICIENT   =   0.501

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

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

--------------------
| ADD HYD  (  0039)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0040):      6.56    0.919     6.08    39.07
     + ID2= 2 (  0042):      4.15    0.396     6.17    39.35
       ================================================
       ID = 3 (  0039):     10.71    1.306     6.08    39.18

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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================================================================================
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       V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
       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 *****


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DATE: 03-08-2023                          TIME: 01:23:07

USER:



COMMENTS: _____________________________________________________________


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  **********************************************
  ** SIMULATION : 06 - 100 YR - SCS TYPE II 12H **
  **********************************************

--------------------
| MASS STORM       |    Filename: C:\Users\sramsoomair\AppD
|                  |              ata\Local\Temp\
|                  |              61ab631c-6e40-482e-984d-eb141678c1e0\504622f2
| Ptotal= 85.30 mm |    Comments: SCS TYPE II MASS CURVE
--------------------
                           Duration of storm    = 12.00 hrs
```

Mass curve time step = 15.00 min

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	2.13	3.00	3.41	6.00	15.35	9.00	2.99
0.25	2.13	3.25	3.41	6.25	15.35	9.25	2.99
0.50	2.13	3.50	3.41	6.50	6.82	9.50	2.99
0.75	2.13	3.75	3.41	6.75	6.82	9.75	2.99
1.00	2.13	4.00	5.12	7.00	5.12	10.00	1.71
1.25	2.13	4.25	5.12	7.25	5.12	10.25	1.71
1.50	2.13	4.50	6.82	7.50	5.12	10.50	1.71
1.75	2.13	4.75	6.82	7.75	5.12	10.75	1.71
2.00	2.56	5.00	10.24	8.00	2.99	11.00	1.71
2.25	2.56	5.25	10.24	8.25	2.99	11.25	1.71
2.50	2.56	5.50	40.94	8.50	2.99	11.50	1.71
2.75	2.56	5.75	112.60	8.75	2.99	11.75	1.71
2.917	2.56	5.917	112.60	8.917	2.99	11.92	1.71
3.000	2.56	6.000	112.59	9.000	2.99	12.00	1.71

CALIB / NASHYD (0041) / ID= 1 DT= 5.0 min					
	Area	(ha)=	6.56	Curve Number (CN)=	82.0
	Ia	(mm)=	8.00	# of Linear Res.(N)=	3.00
	U.H. Tp	(hrs)=	0.14		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.13	3.083	3.41	6.083	15.35	9.08	2.99
0.167	2.13	3.167	3.41	6.167	15.35	9.17	2.99
0.250	2.13	3.250	3.41	6.250	15.35	9.25	2.99
0.333	2.13	3.333	3.41	6.333	15.35	9.33	2.99
0.417	2.13	3.417	3.41	6.417	15.35	9.42	2.99
0.500	2.13	3.500	3.41	6.500	15.35	9.50	2.99
0.583	2.13	3.583	3.41	6.583	6.82	9.58	2.99
0.667	2.13	3.667	3.41	6.667	6.82	9.67	2.99
0.750	2.13	3.750	3.41	6.750	6.82	9.75	2.99
0.833	2.13	3.833	3.41	6.833	6.82	9.83	2.99
0.917	2.13	3.917	3.41	6.917	6.82	9.92	2.99
1.000	2.13	4.000	3.41	7.000	6.82	10.00	2.99
1.083	2.13	4.083	5.12	7.083	5.12	10.08	1.71
1.167	2.13	4.167	5.12	7.167	5.12	10.17	1.71
1.250	2.13	4.250	5.12	7.250	5.12	10.25	1.71
1.333	2.13	4.333	5.12	7.333	5.12	10.33	1.71
1.417	2.13	4.417	5.12	7.417	5.12	10.42	1.71
1.500	2.13	4.500	5.12	7.500	5.12	10.50	1.71
1.583	2.13	4.583	6.82	7.583	5.12	10.58	1.71
1.667	2.13	4.667	6.82	7.667	5.12	10.67	1.71
1.750	2.13	4.750	6.82	7.750	5.12	10.75	1.71
1.833	2.13	4.833	6.82	7.833	5.12	10.83	1.71
1.917	2.13	4.917	6.82	7.917	5.12	10.92	1.71
2.000	2.13	5.000	6.82	8.000	5.12	11.00	1.71
2.083	2.56	5.083	10.24	8.083	2.99	11.08	1.71
2.167	2.56	5.167	10.24	8.167	2.99	11.17	1.71
2.250	2.56	5.250	10.24	8.250	2.99	11.25	1.71
2.333	2.56	5.333	10.24	8.333	2.99	11.33	1.71
2.417	2.56	5.417	10.24	8.417	2.99	11.42	1.71
2.500	2.56	5.500	10.24	8.500	2.99	11.50	1.71
2.583	2.56	5.583	40.94	8.583	2.99	11.58	1.71
2.667	2.56	5.667	40.94	8.667	2.99	11.67	1.71
2.750	2.56	5.750	40.95	8.750	2.99	11.75	1.71
2.833	2.56	5.833	112.60	8.833	2.99	11.83	1.71
2.917	2.56	5.917	112.60	8.917	2.99	11.92	1.71
3.000	2.56	6.000	112.59	9.000	2.99	12.00	1.71

Unit Hyd Qpeak (cms)= 1.790

PEAK FLOW (cms)= 1.094 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 44.571
TOTAL RAINFALL (mm)= 85.300
RUNOFF COEFFICIENT = 0.523

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

ROUTE CHN(0040) / IN= 2---> OUT= 1	Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	101.50	0.0500	
1.00	100.70	0.0500	
1.50	100.55	0.0500 /0.0300	Main Channel
2.00	99.50	0.0300	Main Channel
3.50	99.60	0.0300	Main Channel
4.50	100.65	0.0300 /0.0500	Main Channel
6.00	101.45	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	99.60	.185E+02	0.0	0.54	8.09
0.19	99.69	.587E+02	0.2	1.04	4.22
0.29	99.79	.102E+03	0.5	1.38	3.16
0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	1.09	6.00	44.57	0.41	1.72
OUTFLOW: ID= 1 (0040)	6.56	1.05	6.08	44.57	0.40	1.70

CALIB / NASHYD (0042) / ID= 1 DT= 5.0 min					
	Area	(ha)=	4.15	Curve Number (CN)=	82.0
	Ia	(mm)=	8.00	# of Linear Res.(N)=	3.00

---------- U.H. Tp(hrs)= 0.28

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.13	3.083	3.41	6.083	15.35	9.08	2.99
0.167	2.13	3.167	3.41	6.167	15.35	9.17	2.99
0.250	2.13	3.250	3.41	6.250	15.35	9.25	2.99
0.333	2.13	3.333	3.41	6.333	15.35	9.33	2.99
0.417	2.13	3.417	3.41	6.417	15.35	9.42	2.99
0.500	2.13	3.500	3.41	6.500	15.35	9.50	2.99
0.583	2.13	3.583	3.41	6.583	6.82	9.58	2.99
0.667	2.13	3.667	3.41	6.667	6.82	9.67	2.99
0.750	2.13	3.750	3.41	6.750	6.82	9.75	2.99
0.833	2.13	3.833	3.41	6.833	6.82	9.83	2.99
0.917	2.13	3.917	3.41	6.917	6.82	9.92	2.99
1.000	2.13	4.000	3.41	7.000	6.82	10.00	2.99
1.083	2.13	4.083	5.12	7.083	5.12	10.08	1.71
1.167	2.13	4.167	5.12	7.167	5.12	10.17	1.71
1.250	2.13	4.250	5.12	7.250	5.12	10.25	1.71
1.333	2.13	4.333	5.12	7.333	5.12	10.33	1.71
1.417	2.13	4.417	5.12	7.417	5.12	10.42	1.71
1.500	2.13	4.500	5.12	7.500	5.12	10.50	1.71
1.583	2.13	4.583	6.82	7.583	5.12	10.58	1.71
1.667	2.13	4.667	6.82	7.667	5.12	10.67	1.71
1.750	2.13	4.750	6.82	7.750	5.12	10.75	1.71
1.833	2.13	4.833	6.82	7.833	5.12	10.83	1.71
1.917	2.13	4.917	6.82	7.917	5.12	10.92	1.71
2.000	2.13	5.000	6.82	8.000	5.12	11.00	1.71
2.083	2.56	5.083	10.24	8.083	2.99	11.08	1.71
2.167	2.56	5.167	10.24	8.167	2.99	11.17	1.71
2.250	2.56	5.250	10.24	8.250	2.99	11.25	1.71
2.333	2.56	5.333	10.24	8.333	2.99	11.33	1.71
2.417	2.56	5.417	10.24	8.417	2.99	11.42	1.71
2.500	2.56	5.500	10.24	8.500	2.99	11.50	1.71
2.583	2.56	5.583	40.94	8.583	2.99	11.58	1.71
2.667	2.56	5.667	40.94	8.667	2.99	11.67	1.71
2.750	2.56	5.750	40.95	8.750	2.99	11.75	1.71
2.833	2.56	5.833	112.60	8.833	2.99	11.83	1.71
2.917	2.56	5.917	112.60	8.917	2.99	11.92	1.71
3.000	2.56	6.000	112.59	9.000	2.99	12.00	1.71

Unit Hyd Qpeak (cms)= 0.566

PEAK FLOW (cms)= 0.453 (i)
TIME TO PEAK (hrs)= 6.167
RUNOFF VOLUME (mm)= 44.885
TOTAL RAINFALL (mm)= 85.300
RUNOFF COEFFICIENT = 0.526

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

ADD HYD (0039) | 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0040):	6.56	1.047	6.08	44.57
+ ID2= 2 (0042):	4.15	0.453	6.17	44.89
ID = 3 (0039):	10.71	1.491	6.08	44.69

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M M M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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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: 01:23:07

USER:

COMMENTS: _____

** SIMULATION : 11 - 2-YR - SCS TYPE II 24HR **

MASS STORM | Ptotal= 45.90 mm	Filename: C:\Users\sramsoomair\AppData\Local\Temp\61ab631c-6e40-482e-984d-eb141678c1e0\9cbcd136
	Comments: SCS TYPE II MASS CURVE

Duration of storm = 24.00 hrs
Mass curve time step = 15.00 min

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.50	6.00	0.83	12.00	6.61	18.00	0.83
0.25	0.50	6.25	0.83	12.25	6.61	18.25	0.83
0.50	0.50	6.50	0.83	12.50	3.40	18.50	0.83
0.75	0.50	6.75	0.83	12.75	3.40	18.75	0.83
1.00	0.50	7.00	1.01	13.00	2.48	19.00	0.83
1.25	0.50	7.25	1.01	13.25	2.48	19.25	0.83

1.50	0.50	7.50	1.01	13.50	1.93	19.50	0.83
1.75	0.50	7.75	1.01	13.75	1.93	19.75	0.83
2.00	0.60	8.00	1.19	14.00	1.38	20.00	0.55
2.25	0.60	8.25	1.19	14.25	1.38	20.25	0.55
2.50	0.60	8.50	1.29	14.50	1.38	20.50	0.55
2.75	0.60	8.75	1.29	14.75	1.38	20.75	0.55
3.00	0.60	9.00	1.47	15.00	1.38	21.00	0.55
3.25	0.60	9.25	1.47	15.25	1.38	21.25	0.55
3.50	0.60	9.50	1.65	15.50	1.38	21.50	0.55
3.75	0.60	9.75	1.65	15.75	1.38	21.75	0.55
4.00	0.73	10.00	2.11	16.00	0.83	22.00	0.55
4.25	0.73	10.25	2.11	16.25	0.83	22.25	0.55
4.50	0.73	10.50	2.85	16.50	0.83	22.50	0.55
4.75	0.73	10.75	2.85	16.75	0.83	22.75	0.55
5.00	0.73	11.00	4.41	17.00	0.83	23.00	0.55
5.25	0.73	11.25	4.41	17.25	0.83	23.25	0.55
5.50	0.73	11.50	13.59	17.50	0.83	23.50	0.55
5.75	0.73	11.75	56.18	17.75	0.83	23.75	0.55

CALIB			
NASHYD (0041)	Area (ha)=	6.56	Curve Number (CN)= 82.0
ID= 1 DT= 5.0 min	Ia (mm)=	8.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.14	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.50	6.083	0.83	12.083	6.62	18.08	0.83
0.167	0.50	6.167	0.83	12.167	6.61	18.17	0.83
0.250	0.50	6.250	0.83	12.250	6.61	18.25	0.83
0.333	0.50	6.333	0.83	12.333	6.61	18.33	0.83
0.417	0.50	6.417	0.83	12.417	6.61	18.42	0.83
0.500	0.50	6.500	0.83	12.500	6.61	18.50	0.83
0.583	0.50	6.583	0.83	12.583	3.40	18.58	0.83
0.667	0.50	6.667	0.83	12.667	3.40	18.67	0.83
0.750	0.50	6.750	0.83	12.750	3.40	18.75	0.83
0.833	0.50	6.833	0.83	12.833	3.40	18.83	0.83
0.917	0.50	6.917	0.83	12.917	3.40	18.92	0.83
1.000	0.50	7.000	0.83	13.000	3.40	19.00	0.83
1.083	0.50	7.083	1.01	13.083	2.48	19.08	0.83
1.167	0.50	7.167	1.01	13.167	2.48	19.17	0.83
1.250	0.50	7.250	1.01	13.250	2.48	19.25	0.83
1.333	0.50	7.333	1.01	13.333	2.48	19.33	0.83
1.417	0.50	7.417	1.01	13.417	2.48	19.42	0.83
1.500	0.50	7.500	1.01	13.500	2.48	19.50	0.83
1.583	0.50	7.583	1.01	13.583	1.93	19.58	0.83
1.667	0.50	7.667	1.01	13.667	1.93	19.67	0.83
1.750	0.50	7.750	1.01	13.750	1.93	19.75	0.83
1.833	0.50	7.833	1.01	13.833	1.93	19.83	0.83
1.917	0.50	7.917	1.01	13.917	1.93	19.92	0.83
2.000	0.50	8.000	1.01	14.000	1.93	20.00	0.83
2.083	0.60	8.083	1.19	14.083	1.38	20.08	0.55
2.167	0.60	8.167	1.19	14.167	1.38	20.17	0.55
2.250	0.60	8.250	1.19	14.250	1.38	20.25	0.55
2.333	0.60	8.333	1.19	14.333	1.38	20.33	0.55
2.417	0.60	8.417	1.19	14.417	1.38	20.42	0.55
2.500	0.60	8.500	1.19	14.500	1.38	20.50	0.55
2.583	0.60	8.583	1.29	14.583	1.38	20.58	0.55
2.667	0.60	8.667	1.29	14.667	1.38	20.67	0.55
2.750	0.60	8.750	1.29	14.750	1.38	20.75	0.55
2.833	0.60	8.833	1.29	14.833	1.38	20.83	0.55
2.917	0.60	8.917	1.29	14.917	1.38	20.92	0.55
3.000	0.60	9.000	1.29	15.000	1.38	21.00	0.55
3.083	0.60	9.083	1.47	15.083	1.38	21.08	0.55
3.167	0.60	9.167	1.47	15.167	1.38	21.17	0.55
3.250	0.60	9.250	1.47	15.250	1.38	21.25	0.55
3.333	0.60	9.333	1.47	15.333	1.38	21.33	0.55
3.417	0.60	9.417	1.47	15.417	1.38	21.42	0.55
3.500	0.60	9.500	1.47	15.500	1.38	21.50	0.55
3.583	0.60	9.583	1.65	15.583	1.38	21.58	0.55
3.667	0.60	9.667	1.65	15.667	1.38	21.67	0.55
3.750	0.60	9.750	1.65	15.750	1.38	21.75	0.55
3.833	0.60	9.833	1.65	15.833	1.38	21.83	0.55
3.917	0.60	9.917	1.65	15.917	1.38	21.92	0.55
4.000	0.60	10.000	1.65	16.000	1.38	22.00	0.55
4.083	0.73	10.083	2.11	16.083	0.83	22.08	0.55
4.167	0.73	10.167	2.11	16.167	0.83	22.17	0.55
4.250	0.73	10.250	2.11	16.250	0.83	22.25	0.55
4.333	0.73	10.333	2.11	16.333	0.83	22.33	0.55
4.417	0.73	10.417	2.11	16.417	0.83	22.42	0.55
4.500	0.73	10.500	2.11	16.500	0.83	22.50	0.55
4.583	0.73	10.583	2.85	16.583	0.83	22.58	0.55
4.667	0.73	10.667	2.85	16.667	0.83	22.67	0.55
4.750	0.73	10.750	2.85	16.750	0.83	22.75	0.55
4.833	0.73	10.833	2.85	16.833	0.83	22.83	0.55
4.917	0.73	10.917	2.85	16.917	0.83	22.92	0.55
5.000	0.73	11.000	2.85	17.000	0.83	23.00	0.55
5.083	0.73	11.083	4.41	17.083	0.83	23.08	0.55
5.167	0.73	11.167	4.41	17.167	0.83	23.17	0.55
5.250	0.73	11.250	4.41	17.250	0.83	23.25	0.55
5.333	0.73	11.333	4.41	17.333	0.83	23.33	0.55
5.417	0.73	11.417	4.41	17.417	0.83	23.42	0.55
5.500	0.73	11.500	4.41	17.500	0.83	23.50	0.55
5.583	0.73	11.583	13.59	17.583	0.83	23.58	0.55
5.667	0.73	11.667	13.59	17.667	0.83	23.67	0.55
5.750	0.73	11.750	13.59	17.750	0.83	23.75	0.55
5.833	0.73	11.833	56.18	17.833	0.83	23.83	0.55
5.917	0.73	11.917	56.18	17.917	0.83	23.92	0.55
6.000	0.73	12.000	56.18	18.000	0.83	24.00	0.55

Unit Hyd Qpeak (cms)= 1.790

PEAK FLOW (cms)= 0.319 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 15.222
TOTAL RAINFALL (mm)= 45.900
RUNOFF COEFFICIENT = 0.332

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

ROUTE CHN(0040)		
IN= 2---> OUT= 1	Routing time step (min)'=	5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	101.50	0.0500	
1.00	100.70	0.0500	
1.50	100.55	0.0500 /0.0300	Main Channel
2.00	99.50	0.0300	Main Channel
3.50	99.60	0.0300	Main Channel
4.50	100.65	0.0300 /0.0500	Main Channel

6.00	101.45	0.0500

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	99.60	.185E+02	0.0	0.54	8.09
0.19	99.69	.587E+02	0.2	1.04	4.22
0.29	99.79	.102E+03	0.5	1.38	3.16
0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	0.32	12.00	15.22	0.22	1.11
OUTFLOW: ID= 1 (0040)	6.56	0.32	12.08	15.22	0.22	1.11

CALIB			
NASHYD (0042)	Area (ha)= 4.15	Curve Number (CN)= 82.0	
ID= 1 DT= 5.0 min	Ia (mm)= 8.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.28		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.50	6.083	0.83	12.083	6.62	18.08	0.83
0.167	0.50	6.167	0.83	12.167	6.61	18.17	0.83
0.250	0.50	6.250	0.83	12.250	6.61	18.25	0.83
0.333	0.50	6.333	0.83	12.333	6.61	18.33	0.83
0.417	0.50	6.417	0.83	12.417	6.61	18.42	0.83
0.500	0.50	6.500	0.83	12.500	6.61	18.50	0.83
0.583	0.50	6.583	0.83	12.583	3.40	18.58	0.83
0.667	0.50	6.667	0.83	12.667	3.40	18.67	0.83
0.750	0.50	6.750	0.83	12.750	3.40	18.75	0.83
0.833	0.50	6.833	0.83	12.833	3.40	18.83	0.83
0.917	0.50	6.917	0.83	12.917	3.40	18.92	0.83
1.000	0.50	7.000	0.83	13.000	3.40	19.00	0.83
1.083	0.50	7.083	1.01	13.083	2.48	19.08	0.83
1.167	0.50	7.167	1.01	13.167	2.48	19.17	0.83
1.250	0.50	7.250	1.01	13.250	2.48	19.25	0.83
1.333	0.50	7.333	1.01	13.333	2.48	19.33	0.83
1.417	0.50	7.417	1.01	13.417	2.48	19.42	0.83
1.500	0.50	7.500	1.01	13.500	2.48	19.50	0.83
1.583	0.50	7.583	1.01	13.583	1.93	19.58	0.83
1.667	0.50	7.667	1.01	13.667	1.93	19.67	0.83
1.750	0.50	7.750	1.01	13.750	1.93	19.75	0.83
1.833	0.50	7.833	1.01	13.833	1.93	19.83	0.83
1.917	0.50	7.917	1.01	13.917	1.93	19.92	0.83
2.000	0.50	8.000	1.01	14.000	1.93	20.00	0.83
2.083	0.60	8.083	1.19	14.083	1.38	20.08	0.55
2.167	0.60	8.167	1.19	14.167	1.38	20.17	0.55
2.250	0.60	8.250	1.19	14.250	1.38	20.25	0.55
2.333	0.60	8.333	1.19	14.333	1.38	20.33	0.55
2.417	0.60	8.417	1.19	14.417	1.38	20.42	0.55
2.500	0.60	8.500	1.19	14.500	1.38	20.50	0.55
2.583	0.60	8.583	1.29	14.583	1.38	20.58	0.55
2.667	0.60	8.667	1.29	14.667	1.38	20.67	0.55
2.750	0.60	8.750	1.29	14.750	1.38	20.75	0.55
2.833	0.60	8.833	1.29	14.833	1.38	20.83	0.55
2.917	0.60	8.917	1.29	14.917	1.38	20.92	0.55
3.000	0.60	9.000	1.29	15.000	1.38	21.00	0.55
3.083	0.60	9.083	1.47	15.083	1.38	21.08	0.55
3.167	0.60	9.167	1.47	15.167	1.38	21.17	0.55
3.250	0.60	9.250	1.47	15.250	1.38	21.25	0.55
3.333	0.60	9.333	1.47	15.333	1.38	21.33	0.55
3.417	0.60	9.417	1.47	15.417	1.38	21.42	0.55
3.500	0.60	9.500	1.47	15.500	1.38	21.50	0.55
3.583	0.60	9.583	1.65	15.583	1.38	21.58	0.55
3.667	0.60	9.667	1.65	15.667	1.38	21.67	0.55
3.750	0.60	9.750	1.65	15.750	1.38	21.75	0.55
3.833	0.60	9.833	1.65	15.833	1.38	21.83	0.55
3.917	0.60	9.917	1.65	15.917	1.38	21.92	0.55
4.000	0.60	10.000	1.65	16.000	1.38	22.00	0.55
4.083	0.73	10.083	2.11	16.083	0.83	22.08	0.55
4.167	0.73	10.167	2.11	16.167	0.83	22.17	0.55
4.250	0.73	10.250	2.11	16.250	0.83	22.25	0.55
4.333	0.73	10.333	2.11	16.333	0.83	22.33	0.55
4.417	0.73	10.417	2.11	16.417	0.83	22.42	0.55
4.500	0.73	10.500	2.11	16.500	0.83	22.50	0.55
4.583	0.73	10.583	2.85	16.583	0.83	22.58	0.55
4.667	0.73	10.667	2.85	16.667	0.83	22.67	0.55
4.750	0.73	10.750	2.85	16.750	0.83	22.75	0.55
4.833	0.73	10.833	2.85	16.833	0.83	22.83	0.55
4.917	0.73	10.917	2.85	16.917	0.83	22.92	0.55
5.000	0.73	11.000	2.85	17.000	0.83	23.00	0.55
5.083	0.73	11.083	4.41	17.083	0.83	23.08	0.55
5.167	0.73	11.167	4.41	17.167	0.83	23.17	0.55
5.250	0.73	11.250	4.41	17.250	0.83	23.25	0.55
5.333	0.73	11.333	4.41	17.333	0.83	23.33	0.55
5.417	0.73	11.417	4.41	17.417	0.83	23.42	0.55
5.500	0.73	11.500	4.41	17.500	0.83	23.50	0.55
5.583	0.73	11.583	13.59	17.583	0.83	23.58	0.55
5.667	0.73	11.667	13.59	17.667	0.83	23.67	0.55
5.750	0.73	11.750	13.59	17.750	0.83	23.75	0.55
5.833	0.73	11.833	56.18	17.833	0.83	23.83	0.55
5.917	0.73	11.917	56.18	17.917	0.83	23.92	0.55
6.000	0.73	12.000	56.18	18.000	0.83	24.00	0.55

Unit Hyd Qpeak (cms)= 0.566

PEAK FLOW (cms)= 0.128 (i)
TIME TO PEAK (hrs)= 12.167
RUNOFF VOLUME (mm)= 15.329
TOTAL RAINFALL (mm)= 45.900
RUNOFF COEFFICIENT = 0.334

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

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--------------------
| ADD HYD  (  0039)|
|   1 +  2 =  3    |          AREA     QPEAK     TPEAK      R.V.
--------------------          (ha)      (cms)     (hrs)      (mm)
       ID1= 1 (  0040):      6.56    0.318     12.08     15.22
     + ID2= 2 (  0042):      4.15    0.128     12.17     15.33
       ================================================
       ID = 3 (  0039):     10.71    0.440     12.08     15.26

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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================================================================================
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       V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
       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 *****


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DATE: 03-08-2023                          TIME: 01:23:07

USER:



COMMENTS: _____________________________________________________________


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  ***********************************************
  ** SIMULATION : 12 - 5-YR - SCS TYPE II 24HR  **
  ***********************************************

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| MASS STORM       |    Filename: C:\Users\sramsoomair\AppD
|                  |              ata\Local\Temp\
|                  |              61ab631c-6e40-482e-984d-eb141678c1e0\aafba492
| Ptotal= 59.00 mm |    Comments: SCS TYPE II MASS CURVE
--------------------
                       Duration of storm    = 24.00 hrs

                  Mass curve time step = 15.00 min

      TIME    RAIN |   TIME    RAIN |'  TIME    RAIN |   TIME    RAIN
       hrs   mm/hr |    hrs   mm/hr |'   hrs   mm/hr |    hrs   mm/hr
      0.00    0.65 |   6.00    1.06 | 12.00    8.50 | 18.00    1.06
      0.25    0.65 |   6.25    1.06 | 12.25    8.50 | 18.25    1.06
      0.50    0.65 |   6.50    1.06 | 12.50    4.37 | 18.50    1.06
      0.75    0.65 |   6.75    1.06 | 12.75    4.37 | 18.75    1.06
      1.00    0.65 |   7.00    1.30 | 13.00    3.19 | 19.00    1.06
      1.25    0.65 |   7.25    1.30 | 13.25    3.19 | 19.25    1.06
      1.50    0.65 |   7.50    1.30 | 13.50    2.48 | 19.50    1.06
      1.75    0.65 |   7.75    1.30 | 13.75    2.48 | 19.75    1.06
      2.00    0.77 |   8.00    1.53 | 14.00    1.77 | 20.00    0.71
      2.25    0.77 |   8.25    1.53 | 14.25    1.77 | 20.25    0.71
      2.50    0.77 |   8.50    1.65 | 14.50    1.77 | 20.50    0.71
      2.75    0.77 |   8.75    1.65 | 14.75    1.77 | 20.75    0.71
      3.00    0.77 |   9.00    1.89 | 15.00    1.77 | 21.00    0.71
      3.25    0.77 |   9.25    1.89 | 15.25    1.77 | 21.25    0.71
      3.50    0.77 |   9.50    2.12 | 15.50    1.77 | 21.50    0.71
      3.75    0.77 |   9.75    2.12 | 15.75    1.77 | 21.75    0.71
      4.00    0.94 |  10.00    2.71 | 16.00    1.06 | 22.00    0.71
      4.25    0.94 |  10.25    2.71 | 16.25    1.06 | 22.25    0.71
      4.50    0.94 |  10.50    3.66 | 16.50    1.06 | 22.50    0.71
      4.75    0.94 |  10.75    3.66 | 16.75    1.06 | 22.75    0.71
      5.00    0.94 |  11.00    5.66 | 17.00    1.06 | 23.00    0.71
      5.25    0.94 |  11.25    5.66 | 17.25    1.06 | 23.25    0.71
      5.50    0.94 |  11.50   17.46 | 17.50    1.06 | 23.50    0.71
      5.75    0.94 |  11.75   72.22 | 17.75    1.06 | 23.75    0.71

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--------------------
| CALIB            |
| NASHYD   (  0041)|   Area     (ha)=   6.56   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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


                        ---- TRANSFORMED HYETOGRAPH ----
      TIME    RAIN |   TIME    RAIN |'  TIME    RAIN |   TIME    RAIN
       hrs   mm/hr |    hrs   mm/hr |'   hrs   mm/hr |    hrs   mm/hr
     0.083    0.65 |  6.083    1.06 |12.083    8.50 | 18.08    1.06
     0.167    0.65 |  6.167    1.06 |12.167    8.50 | 18.17    1.06
     0.250    0.65 |  6.250    1.06 |12.250    8.50 | 18.25    1.06
     0.333    0.65 |  6.333    1.06 |12.333    8.50 | 18.33    1.06
     0.417    0.65 |  6.417    1.06 |12.417    8.50 | 18.42    1.06
     0.500    0.65 |  6.500    1.06 |12.500    8.50 | 18.50    1.06
     0.583    0.65 |  6.583    1.06 |12.583    4.37 | 18.58    1.06
     0.667    0.65 |  6.667    1.06 |12.667    4.37 | 18.67    1.06
     0.750    0.65 |  6.750    1.06 |12.750    4.37 | 18.75    1.06
     0.833    0.65 |  6.833    1.06 |12.833    4.37 | 18.83    1.06
     0.917    0.65 |  6.917    1.06 |12.917    4.37 | 18.92    1.06
     1.000    0.65 |  7.000    1.06 |13.000    4.37 | 19.00    1.06
     1.083    0.65 |  7.083    1.30 |13.083    3.19 | 19.08    1.06
     1.167    0.65 |  7.167    1.30 |13.167    3.19 | 19.17    1.06
     1.250    0.65 |  7.250    1.30 |13.250    3.19 | 19.25    1.06
     1.333    0.65 |  7.333    1.30 |13.333    3.19 | 19.33    1.06
     1.417    0.65 |  7.417    1.30 |13.417    3.19 | 19.42    1.06
     1.500    0.65 |  7.500    1.30 |13.500    3.19 | 19.50    1.06
     1.583    0.65 |  7.583    1.30 |13.583    2.48 | 19.58    1.06
     1.667    0.65 |  7.667    1.30 |13.667    2.48 | 19.67    1.06
     1.750    0.65 |  7.750    1.30 |13.750    2.48 | 19.75    1.06
     1.833    0.65 |  7.833    1.30 |13.833    2.48 | 19.83    1.06
```

1.917	0.65	7.917	1.30	13.917	2.48	19.92	1.06
2.000	0.65	8.000	1.30	14.000	2.48	20.00	1.06
2.083	0.77	8.083	1.53	14.083	1.77	20.08	0.71
2.167	0.77	8.167	1.53	14.167	1.77	20.17	0.71
2.250	0.77	8.250	1.53	14.250	1.77	20.25	0.71
2.333	0.77	8.333	1.53	14.333	1.77	20.33	0.71
2.417	0.77	8.417	1.53	14.417	1.77	20.42	0.71
2.500	0.77	8.500	1.53	14.500	1.77	20.50	0.71
2.583	0.77	8.583	1.65	14.583	1.77	20.58	0.71
2.667	0.77	8.667	1.65	14.667	1.77	20.67	0.71
2.750	0.77	8.750	1.65	14.750	1.77	20.75	0.71
2.833	0.77	8.833	1.65	14.833	1.77	20.83	0.71
2.917	0.77	8.917	1.65	14.917	1.77	20.92	0.71
3.000	0.77	9.000	1.65	15.000	1.77	21.00	0.71
3.083	0.77	9.083	1.89	15.083	1.77	21.08	0.71
3.167	0.77	9.167	1.89	15.167	1.77	21.17	0.71
3.250	0.77	9.250	1.89	15.250	1.77	21.25	0.71
3.333	0.77	9.333	1.89	15.333	1.77	21.33	0.71
3.417	0.77	9.417	1.89	15.417	1.77	21.42	0.71
3.500	0.77	9.500	1.89	15.500	1.77	21.50	0.71
3.583	0.77	9.583	2.12	15.583	1.77	21.58	0.71
3.667	0.77	9.667	2.12	15.667	1.77	21.67	0.71
3.750	0.77	9.750	2.12	15.750	1.77	21.75	0.71
3.833	0.77	9.833	2.12	15.833	1.77	21.83	0.71
3.917	0.77	9.917	2.12	15.917	1.77	21.92	0.71
4.000	0.77	10.000	2.12	16.000	1.77	22.00	0.71
4.083	0.94	10.083	2.71	16.083	1.06	22.08	0.71
4.167	0.94	10.167	2.71	16.167	1.06	22.17	0.71
4.250	0.94	10.250	2.71	16.250	1.06	22.25	0.71
4.333	0.94	10.333	2.71	16.333	1.06	22.33	0.71
4.417	0.94	10.417	2.71	16.417	1.06	22.42	0.71
4.500	0.94	10.500	2.71	16.500	1.06	22.50	0.71
4.583	0.94	10.583	3.66	16.583	1.06	22.58	0.71
4.667	0.94	10.667	3.66	16.667	1.06	22.67	0.71
4.750	0.94	10.750	3.66	16.750	1.06	22.75	0.71
4.833	0.94	10.833	3.66	16.833	1.06	22.83	0.71
4.917	0.94	10.917	3.66	16.917	1.06	22.92	0.71
5.000	0.94	11.000	3.66	17.000	1.06	23.00	0.71
5.083	0.94	11.083	5.66	17.083	1.06	23.08	0.71
5.167	0.94	11.167	5.66	17.167	1.06	23.17	0.71
5.250	0.94	11.250	5.66	17.250	1.06	23.25	0.71
5.333	0.94	11.333	5.66	17.333	1.06	23.33	0.71
5.417	0.94	11.417	5.66	17.417	1.06	23.42	0.71
5.500	0.94	11.500	5.66	17.500	1.06	23.50	0.71
5.583	0.94	11.583	17.46	17.583	1.06	23.58	0.71
5.667	0.94	11.667	17.46	17.667	1.06	23.67	0.71
5.750	0.94	11.750	17.46	17.750	1.06	23.75	0.71
5.833	0.94	11.833	72.21	17.833	1.06	23.83	0.71
5.917	0.94	11.917	72.22	17.917	1.06	23.92	0.71
6.000	0.94	12.000	72.22	18.000	1.06	24.00	0.71

Unit Hyd Qpeak (cms)= 1.790

PEAK FLOW (cms)= 0.519 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 24.181
TOTAL RAINFALL (mm)= 59.000
RUNOFF COEFFICIENT = 0.410

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

| ROUTE CHN(0040)|

| IN= 2---> OUT= 1 | Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	101.50	0.0500	
1.00	100.70	0.0500	
1.50	100.55	0.0500 /0.0300	Main Channel
2.00	99.50	0.0300	Main Channel
3.50	99.60	0.0300	Main Channel
4.50	100.65	0.0300 /0.0500	Main Channel
6.00	101.45	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	99.60	.185E+02	0.0	0.54	8.09
0.19	99.69	.587E+02	0.2	1.04	4.22
0.29	99.79	.102E+03	0.5	1.38	3.16
0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

	AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	0.52	12.00	24.18	0.28	1.35
OUTFLOW: ID= 1 (0040)	6.56	0.51	12.08	24.18	0.27	1.33

CALIB	
NASHYD (0042)	Area (ha)= 4.15 Curve Number (CN)= 82.0
ID= 1 DT= 5.0 min	Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.28

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.65	6.083	1.06	12.083	8.50	18.08	1.06
0.167	0.65	6.167	1.06	12.167	8.50	18.17	1.06
0.250	0.65	6.250	1.06	12.250	8.50	18.25	1.06
0.333	0.65	6.333	1.06	12.333	8.50	18.33	1.06
0.417	0.65	6.417	1.06	12.417	8.50	18.42	1.06
0.500	0.65	6.500	1.06	12.500	8.50	18.50	1.06
0.583	0.65	6.583	1.06	12.583	4.37	18.58	1.06
0.667	0.65	6.667	1.06	12.667	4.37	18.67	1.06

0.750	0.65	6.750	1.06	12.750	4.37	18.75	1.06
0.833	0.65	6.833	1.06	12.833	4.37	18.83	1.06
0.917	0.65	6.917	1.06	12.917	4.37	18.92	1.06
1.000	0.65	7.000	1.06	13.000	4.37	19.00	1.06
1.083	0.65	7.083	1.30	13.083	3.19	19.08	1.06
1.167	0.65	7.167	1.30	13.167	3.19	19.17	1.06
1.250	0.65	7.250	1.30	13.250	3.19	19.25	1.06
1.333	0.65	7.333	1.30	13.333	3.19	19.33	1.06
1.417	0.65	7.417	1.30	13.417	3.19	19.42	1.06
1.500	0.65	7.500	1.30	13.500	3.19	19.50	1.06
1.583	0.65	7.583	1.30	13.583	2.48	19.58	1.06
1.667	0.65	7.667	1.30	13.667	2.48	19.67	1.06
1.750	0.65	7.750	1.30	13.750	2.48	19.75	1.06
1.833	0.65	7.833	1.30	13.833	2.48	19.83	1.06
1.917	0.65	7.917	1.30	13.917	2.48	19.92	1.06
2.000	0.65	8.000	1.30	14.000	2.48	20.00	1.06
2.083	0.77	8.083	1.53	14.083	1.77	20.08	0.71
2.167	0.77	8.167	1.53	14.167	1.77	20.17	0.71
2.250	0.77	8.250	1.53	14.250	1.77	20.25	0.71
2.333	0.77	8.333	1.53	14.333	1.77	20.33	0.71
2.417	0.77	8.417	1.53	14.417	1.77	20.42	0.71
2.500	0.77	8.500	1.53	14.500	1.77	20.50	0.71
2.583	0.77	8.583	1.65	14.583	1.77	20.58	0.71
2.667	0.77	8.667	1.65	14.667	1.77	20.67	0.71
2.750	0.77	8.750	1.65	14.750	1.77	20.75	0.71
2.833	0.77	8.833	1.65	14.833	1.77	20.83	0.71
2.917	0.77	8.917	1.65	14.917	1.77	20.92	0.71
3.000	0.77	9.000	1.65	15.000	1.77	21.00	0.71
3.083	0.77	9.083	1.89	15.083	1.77	21.08	0.71
3.167	0.77	9.167	1.89	15.167	1.77	21.17	0.71
3.250	0.77	9.250	1.89	15.250	1.77	21.25	0.71
3.333	0.77	9.333	1.89	15.333	1.77	21.33	0.71
3.417	0.77	9.417	1.89	15.417	1.77	21.42	0.71
3.500	0.77	9.500	1.89	15.500	1.77	21.50	0.71
3.583	0.77	9.583	2.12	15.583	1.77	21.58	0.71
3.667	0.77	9.667	2.12	15.667	1.77	21.67	0.71
3.750	0.77	9.750	2.12	15.750	1.77	21.75	0.71
3.833	0.77	9.833	2.12	15.833	1.77	21.83	0.71
3.917	0.77	9.917	2.12	15.917	1.77	21.92	0.71
4.000	0.77	10.000	2.12	16.000	1.77	22.00	0.71
4.083	0.94	10.083	2.71	16.083	1.06	22.08	0.71
4.167	0.94	10.167	2.71	16.167	1.06	22.17	0.71
4.250	0.94	10.250	2.71	16.250	1.06	22.25	0.71
4.333	0.94	10.333	2.71	16.333	1.06	22.33	0.71
4.417	0.94	10.417	2.71	16.417	1.06	22.42	0.71
4.500	0.94	10.500	2.71	16.500	1.06	22.50	0.71
4.583	0.94	10.583	3.66	16.583	1.06	22.58	0.71
4.667	0.94	10.667	3.66	16.667	1.06	22.67	0.71
4.750	0.94	10.750	3.66	16.750	1.06	22.75	0.71
4.833	0.94	10.833	3.66	16.833	1.06	22.83	0.71
4.917	0.94	10.917	3.66	16.917	1.06	22.92	0.71
5.000	0.94	11.000	3.66	17.000	1.06	23.00	0.71
5.083	0.94	11.083	5.66	17.083	1.06	23.08	0.71
5.167	0.94	11.167	5.66	17.167	1.06	23.17	0.71
5.250	0.94	11.250	5.66	17.250	1.06	23.25	0.71
5.333	0.94	11.333	5.66	17.333	1.06	23.33	0.71
5.417	0.94	11.417	5.66	17.417	1.06	23.42	0.71
5.500	0.94	11.500	5.66	17.500	1.06	23.50	0.71
5.583	0.94	11.583	17.46	17.583	1.06	23.58	0.71
5.667	0.94	11.667	17.46	17.667	1.06	23.67	0.71
5.750	0.94	11.750	17.46	17.750	1.06	23.75	0.71
5.833	0.94	11.833	72.21	17.833	1.06	23.83	0.71
5.917	0.94	11.917	72.22	17.917	1.06	23.92	0.71
6.000	0.94	12.000	72.22	18.000	1.06	24.00	0.71

```
     Unit Hyd Qpeak  (cms)=   0.566

     PEAK FLOW       (cms)=   0.209 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  24.352
     TOTAL RAINFALL   (mm)=  59.000
     RUNOFF COEFFICIENT   =   0.413

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

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--------------------
| ADD HYD  (  0039)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0040):     6.56   0.506    12.08    24.18
      + ID2= 2 (  0042):     4.15   0.209    12.17    24.35
        ==========================================================
        ID = 3 (  0039):    10.71   0.707    12.08    24.25

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

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
       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\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
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DATE: 03-08-2023                          TIME: 01:23:08

USER:



COMMENTS: _____________________________________________________________


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```
  ** SIMULATION : 13 - 10-YR - SCS TYPE II 24HR **
  ************************************************

--------------------
| MASS STORM       |    Filename: C:\Users\sramsoomair\AppD
|                  |              ata\Local\Temp\
|                  |              61ab631c-6e40-482e-984d-eb141678c1e0\a9fc7592
| Ptotal= 67.60 mm |    Comments: SCS TYPE II MASS CURVE
--------------------
                       Duration of storm    = 24.00 hrs
                       Mass curve time step = 15.00 min
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.74	6.00	1.22	12.00	9.73	18.00	1.22
0.25	0.74	6.25	1.22	12.25	9.73	18.25	1.22
0.50	0.74	6.50	1.22	12.50	5.00	18.50	1.22
0.75	0.74	6.75	1.22	12.75	5.00	18.75	1.22
1.00	0.74	7.00	1.49	13.00	3.65	19.00	1.22
1.25	0.74	7.25	1.49	13.25	3.65	19.25	1.22
1.50	0.74	7.50	1.49	13.50	2.84	19.50	1.22
1.75	0.74	7.75	1.49	13.75	2.84	19.75	1.22
2.00	0.88	8.00	1.76	14.00	2.03	20.00	0.81
2.25	0.88	8.25	1.76	14.25	2.03	20.25	0.81
2.50	0.88	8.50	1.89	14.50	2.03	20.50	0.81
2.75	0.88	8.75	1.89	14.75	2.03	20.75	0.81
3.00	0.88	9.00	2.16	15.00	2.03	21.00	0.81
3.25	0.88	9.25	2.16	15.25	2.03	21.25	0.81
3.50	0.88	9.50	2.43	15.50	2.03	21.50	0.81
3.75	0.88	9.75	2.43	15.75	2.03	21.75	0.81
4.00	1.08	10.00	3.11	16.00	1.22	22.00	0.81
4.25	1.08	10.25	3.11	16.25	1.22	22.25	0.81
4.50	1.08	10.50	4.19	16.50	1.22	22.50	0.81
4.75	1.08	10.75	4.19	16.75	1.22	22.75	0.81
5.00	1.08	11.00	6.49	17.00	1.22	23.00	0.81
5.25	1.08	11.25	6.49	17.25	1.22	23.25	0.81
5.50	1.08	11.50	20.01	17.50	1.22	23.50	0.81
5.75	1.08	11.75	82.74	17.75	1.22	23.75	0.81

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--------------------
| CALIB            |
| NASHYD   (  0041)|   Area     (ha)=   6.56   Curve Number   (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.74	6.083	1.22	12.083	9.74	18.08	1.22
0.167	0.74	6.167	1.22	12.167	9.73	18.17	1.22
0.250	0.74	6.250	1.22	12.250	9.73	18.25	1.22
0.333	0.74	6.333	1.22	12.333	9.73	18.33	1.22
0.417	0.74	6.417	1.22	12.417	9.73	18.42	1.22
0.500	0.74	6.500	1.22	12.500	9.73	18.50	1.22
0.583	0.74	6.583	1.22	12.583	5.00	18.58	1.22
0.667	0.74	6.667	1.22	12.667	5.00	18.67	1.22
0.750	0.74	6.750	1.22	12.750	5.00	18.75	1.22
0.833	0.74	6.833	1.22	12.833	5.00	18.83	1.22
0.917	0.74	6.917	1.22	12.917	5.00	18.92	1.22
1.000	0.74	7.000	1.22	13.000	5.00	19.00	1.22
1.083	0.74	7.083	1.49	13.083	3.65	19.08	1.22
1.167	0.74	7.167	1.49	13.167	3.65	19.17	1.22
1.250	0.74	7.250	1.49	13.250	3.65	19.25	1.22
1.333	0.74	7.333	1.49	13.333	3.65	19.33	1.22
1.417	0.74	7.417	1.49	13.417	3.65	19.42	1.22
1.500	0.74	7.500	1.49	13.500	3.65	19.50	1.22
1.583	0.74	7.583	1.49	13.583	2.84	19.58	1.22
1.667	0.74	7.667	1.49	13.667	2.84	19.67	1.22
1.750	0.74	7.750	1.49	13.750	2.84	19.75	1.22
1.833	0.74	7.833	1.49	13.833	2.84	19.83	1.22
1.917	0.74	7.917	1.49	13.917	2.84	19.92	1.22
2.000	0.74	8.000	1.49	14.000	2.84	20.00	1.22
2.083	0.88	8.083	1.76	14.083	2.03	20.08	0.81
2.167	0.88	8.167	1.76	14.167	2.03	20.17	0.81
2.250	0.88	8.250	1.76	14.250	2.03	20.25	0.81
2.333	0.88	8.333	1.76	14.333	2.03	20.33	0.81
2.417	0.88	8.417	1.76	14.417	2.03	20.42	0.81
2.500	0.88	8.500	1.76	14.500	2.03	20.50	0.81
2.583	0.88	8.583	1.89	14.583	2.03	20.58	0.81
2.667	0.88	8.667	1.89	14.667	2.03	20.67	0.81
2.750	0.88	8.750	1.89	14.750	2.03	20.75	0.81
2.833	0.88	8.833	1.89	14.833	2.03	20.83	0.81
2.917	0.88	8.917	1.89	14.917	2.03	20.92	0.81
3.000	0.88	9.000	1.89	15.000	2.03	21.00	0.81
3.083	0.88	9.083	2.16	15.083	2.03	21.08	0.81
3.167	0.88	9.167	2.16	15.167	2.03	21.17	0.81
3.250	0.88	9.250	2.16	15.250	2.03	21.25	0.81
3.333	0.88	9.333	2.16	15.333	2.03	21.33	0.81
3.417	0.88	9.417	2.16	15.417	2.03	21.42	0.81
3.500	0.88	9.500	2.16	15.500	2.03	21.50	0.81
3.583	0.88	9.583	2.43	15.583	2.03	21.58	0.81
3.667	0.88	9.667	2.43	15.667	2.03	21.67	0.81
3.750	0.88	9.750	2.43	15.750	2.03	21.75	0.81
3.833	0.88	9.833	2.43	15.833	2.03	21.83	0.81
3.917	0.88	9.917	2.43	15.917	2.03	21.92	0.81
4.000	0.88	10.000	2.43	16.000	2.03	22.00	0.81
4.083	1.08	10.083	3.11	16.083	1.22	22.08	0.81
4.167	1.08	10.167	3.11	16.167	1.22	22.17	0.81
4.250	1.08	10.250	3.11	16.250	1.22	22.25	0.81
4.333	1.08	10.333	3.11	16.333	1.22	22.33	0.81
4.417	1.08	10.417	3.11	16.417	1.22	22.42	0.81
4.500	1.08	10.500	3.11	16.500	1.22	22.50	0.81
4.583	1.08	10.583	4.19	16.583	1.22	22.58	0.81
4.667	1.08	10.667	4.19	16.667	1.22	22.67	0.81
4.750	1.08	10.750	4.19	16.750	1.22	22.75	0.81
4.833	1.08	10.833	4.19	16.833	1.22	22.83	0.81
4.917	1.08	10.917	4.19	16.917	1.22	22.92	0.81
5.000	1.08	11.000	4.19	17.000	1.22	23.00	0.81
5.083	1.08	11.083	6.49	17.083	1.22	23.08	0.81
5.167	1.08	11.167	6.49	17.167	1.22	23.17	0.81
5.250	1.08	11.250	6.49	17.250	1.22	23.25	0.81
5.333	1.08	11.333	6.49	17.333	1.22	23.33	0.81
5.417	1.08	11.417	6.49	17.417	1.22	23.42	0.81
5.500	1.08	11.500	6.49	17.500	1.22	23.50	0.81
5.583	1.08	11.583	20.01	17.583	1.22	23.58	0.81
5.667	1.08	11.667	20.01	17.667	1.22	23.67	0.81
5.750	1.08	11.750	20.01	17.750	1.22	23.75	0.81
5.833	1.08	11.833	82.74	17.833	1.22	23.83	0.81
5.917	1.08	11.917	82.74	17.917	1.22	23.92	0.81
6.000	1.08	12.000	82.74	18.000	1.22	24.00	0.81

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Unit Hyd Qpeak  (cms)=   1.790

PEAK FLOW       (cms)=   0.661 (i)
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     TIME TO PEAK     (hrs)=  12.000
     RUNOFF VOLUME     (mm)=  30.562
     TOTAL RAINFALL    (mm)=  67.600
     RUNOFF COEFFICIENT   =   0.452

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

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--------------------
| ROUTE CHN(  0040)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         101.50        0.0500
                   1.00         100.70        0.0500
                   1.50         100.55    0.0500 /0.0300  Main Channel
                   2.00          99.50        0.0300      Main Channel
                   3.50          99.60        0.0300      Main Channel
                   4.50         100.65    0.0300 /0.0500  Main Channel
                   6.00         101.45        0.0500

      <--------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.10    99.60    .185E+02        0.0         0.54       8.09
        0.19    99.69    .587E+02        0.2         1.04       4.22
        0.29    99.79    .102E+03        0.5         1.38       3.16
        0.38    99.88    .149E+03        0.9         1.66       2.64
        0.48    99.98    .200E+03        1.4         1.88       2.32
        0.57   100.07    .254E+03        2.0         2.08       2.10
        0.67   100.17    .311E+03        2.7         2.26       1.93
        0.76   100.26    .372E+03        3.4         2.42       1.81
        0.86   100.36    .436E+03        4.3         2.57       1.70
        0.95   100.45    .503E+03        5.2         2.70       1.61
        1.05   100.55    .574E+03        6.2         2.83       1.54
        1.16   100.66    .667E+03        7.7         3.02       1.45
        1.28   100.78    .774E+03        9.5         3.22       1.35
        1.39   100.89    .892E+03       11.6         3.40       1.29
        1.50   101.00    .102E+04       13.8         3.54       1.23
        1.61   101.11    .116E+04       16.3         3.67       1.19
        1.72   101.22    .131E+04       18.9         3.79       1.15
        1.84   101.34    .147E+04       21.8         3.90       1.12
        1.95   101.45    .164E+04       25.0         4.00       1.09

                                  <---- hydrograph ---->   <-pipe / channel->
                           AREA    QPEAK    TPEAK    R.V.   MAX DEPTH  MAX VEL
                           (ha)    (cms)    (hrs)    (mm)       (m)      (m/s)
   INFLOW : ID= 2 (  0041)    6.56     0.66   12.00   30.56      0.31      1.46
   OUTFLOW: ID= 1 (  0040)    6.56     0.64   12.08   30.56      0.31      1.44



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--------------------
| CALIB            |
| NASHYD   (  0042)|   Area     (ha)=   4.15   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.28

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


                           ---- TRANSFORMED HYETOGRAPH ----
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.74	6.083	1.22	12.083	9.74	18.08	1.22
0.167	0.74	6.167	1.22	12.167	9.73	18.17	1.22
0.250	0.74	6.250	1.22	12.250	9.73	18.25	1.22
0.333	0.74	6.333	1.22	12.333	9.73	18.33	1.22
0.417	0.74	6.417	1.22	12.417	9.73	18.42	1.22
0.500	0.74	6.500	1.22	12.500	9.73	18.50	1.22
0.583	0.74	6.583	1.22	12.583	5.00	18.58	1.22
0.667	0.74	6.667	1.22	12.667	5.00	18.67	1.22
0.750	0.74	6.750	1.22	12.750	5.00	18.75	1.22
0.833	0.74	6.833	1.22	12.833	5.00	18.83	1.22
0.917	0.74	6.917	1.22	12.917	5.00	18.92	1.22
1.000	0.74	7.000	1.22	13.000	5.00	19.00	1.22
1.083	0.74	7.083	1.49	13.083	3.65	19.08	1.22
1.167	0.74	7.167	1.49	13.167	3.65	19.17	1.22
1.250	0.74	7.250	1.49	13.250	3.65	19.25	1.22
1.333	0.74	7.333	1.49	13.333	3.65	19.33	1.22
1.417	0.74	7.417	1.49	13.417	3.65	19.42	1.22
1.500	0.74	7.500	1.49	13.500	3.65	19.50	1.22
1.583	0.74	7.583	1.49	13.583	2.84	19.58	1.22
1.667	0.74	7.667	1.49	13.667	2.84	19.67	1.22
1.750	0.74	7.750	1.49	13.750	2.84	19.75	1.22
1.833	0.74	7.833	1.49	13.833	2.84	19.83	1.22
1.917	0.74	7.917	1.49	13.917	2.84	19.92	1.22
2.000	0.74	8.000	1.49	14.000	2.84	20.00	1.22
2.083	0.88	8.083	1.76	14.083	2.03	20.08	0.81
2.167	0.88	8.167	1.76	14.167	2.03	20.17	0.81
2.250	0.88	8.250	1.76	14.250	2.03	20.25	0.81
2.333	0.88	8.333	1.76	14.333	2.03	20.33	0.81
2.417	0.88	8.417	1.76	14.417	2.03	20.42	0.81
2.500	0.88	8.500	1.76	14.500	2.03	20.50	0.81
2.583	0.88	8.583	1.89	14.583	2.03	20.58	0.81
2.667	0.88	8.667	1.89	14.667	2.03	20.67	0.81
2.750	0.88	8.750	1.89	14.750	2.03	20.75	0.81
2.833	0.88	8.833	1.89	14.833	2.03	20.83	0.81
2.917	0.88	8.917	1.89	14.917	2.03	20.92	0.81
3.000	0.88	9.000	1.89	15.000	2.03	21.00	0.81
3.083	0.88	9.083	2.16	15.083	2.03	21.08	0.81
3.167	0.88	9.167	2.16	15.167	2.03	21.17	0.81
3.250	0.88	9.250	2.16	15.250	2.03	21.25	0.81
3.333	0.88	9.333	2.16	15.333	2.03	21.33	0.81
3.417	0.88	9.417	2.16	15.417	2.03	21.42	0.81
3.500	0.88	9.500	2.16	15.500	2.03	21.50	0.81
3.583	0.88	9.583	2.43	15.583	2.03	21.58	0.81
3.667	0.88	9.667	2.43	15.667	2.03	21.67	0.81
3.750	0.88	9.750	2.43	15.750	2.03	21.75	0.81
3.833	0.88	9.833	2.43	15.833	2.03	21.83	0.81
3.917	0.88	9.917	2.43	15.917	2.03	21.92	0.81
4.000	0.88	10.000	2.43	16.000	2.03	22.00	0.81
4.083	1.08	10.083	3.11	16.083	1.22	22.08	0.81
4.167	1.08	10.167	3.11	16.167	1.22	22.17	0.81
4.250	1.08	10.250	3.11	16.250	1.22	22.25	0.81
4.333	1.08	10.333	3.11	16.333	1.22	22.33	0.81
4.417	1.08	10.417	3.11	16.417	1.22	22.42	0.81
4.500	1.08	10.500	3.11	16.500	1.22	22.50	0.81
4.583	1.08	10.583	4.19	16.583	1.22	22.58	0.81
4.667	1.08	10.667	4.19	16.667	1.22	22.67	0.81
4.750	1.08	10.750	4.19	16.750	1.22	22.75	0.81
4.833	1.08	10.833	4.19	16.833	1.22	22.83	0.81
4.917	1.08	10.917	4.19	16.917	1.22	22.92	0.81
5.000	1.08	11.000	4.19	17.000	1.22	23.00	0.81
5.083	1.08	11.083	6.49	17.083	1.22	23.08	0.81
5.167	1.08	11.167	6.49	17.167	1.22	23.17	0.81

5.250	1.08	11.250	6.49	17.250	1.22	23.25	0.81
5.333	1.08	11.333	6.49	17.333	1.22	23.33	0.81
5.417	1.08	11.417	6.49	17.417	1.22	23.42	0.81
5.500	1.08	11.500	6.49	17.500	1.22	23.50	0.81
5.583	1.08	11.583	20.01	17.583	1.22	23.58	0.81
5.667	1.08	11.667	20.01	17.667	1.22	23.67	0.81
5.750	1.08	11.750	20.01	17.750	1.22	23.75	0.81
5.833	1.08	11.833	82.74	17.833	1.22	23.83	0.81
5.917	1.08	11.917	82.74	17.917	1.22	23.92	0.81
6.000	1.08	12.000	82.74	18.000	1.22	24.00	0.81

Unit Hyd Qpeak (cms)= 0.566

PEAK FLOW (cms)= 0.267 (i)
TIME TO PEAK (hrs)= 12.167
RUNOFF VOLUME (mm)= 30.777
TOTAL RAINFALL (mm)= 67.600
RUNOFF COEFFICIENT = 0.455

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

ADD HYD (0039)		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0040):		6.56	0.645	12.08	30.56
+ ID2= 2 (0042):		4.15	0.267	12.17	30.78
ID = 3 (0039):		10.71	0.903	12.08	30.64

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
       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 *****

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DATE: 03-08-2023 TIME: 01:23:07

USER:

COMMENTS: _____

****

0.250	0.86	6.250	1.41	12.250	11.30	18.25	1.41
0.333	0.86	6.333	1.41	12.333	11.30	18.33	1.41
0.417	0.86	6.417	1.41	12.417	11.30	18.42	1.41
0.500	0.86	6.500	1.41	12.500	11.30	18.50	1.41
0.583	0.86	6.583	1.41	12.583	5.81	18.58	1.41
0.667	0.86	6.667	1.41	12.667	5.81	18.67	1.41
0.750	0.86	6.750	1.41	12.750	5.81	18.75	1.41
0.833	0.86	6.833	1.41	12.833	5.81	18.83	1.41
0.917	0.86	6.917	1.41	12.917	5.81	18.92	1.41
1.000	0.86	7.000	1.41	13.000	5.81	19.00	1.41
1.083	0.86	7.083	1.73	13.083	4.24	19.08	1.41
1.167	0.86	7.167	1.73	13.167	4.24	19.17	1.41
1.250	0.86	7.250	1.73	13.250	4.24	19.25	1.41
1.333	0.86	7.333	1.73	13.333	4.24	19.33	1.41
1.417	0.86	7.417	1.73	13.417	4.24	19.42	1.41
1.500	0.86	7.500	1.73	13.500	4.24	19.50	1.41
1.583	0.86	7.583	1.73	13.583	3.30	19.58	1.41
1.667	0.86	7.667	1.73	13.667	3.30	19.67	1.41
1.750	0.86	7.750	1.73	13.750	3.30	19.75	1.41
1.833	0.86	7.833	1.73	13.833	3.30	19.83	1.41
1.917	0.86	7.917	1.73	13.917	3.30	19.92	1.41
2.000	0.86	8.000	1.73	14.000	3.30	20.00	1.41
2.083	1.02	8.083	2.04	14.083	2.36	20.08	0.94
2.167	1.02	8.167	2.04	14.167	2.35	20.17	0.94
2.250	1.02	8.250	2.04	14.250	2.35	20.25	0.94
2.333	1.02	8.333	2.04	14.333	2.35	20.33	0.94
2.417	1.02	8.417	2.04	14.417	2.35	20.42	0.94
2.500	1.02	8.500	2.04	14.500	2.35	20.50	0.94
2.583	1.02	8.583	2.20	14.583	2.35	20.58	0.94
2.667	1.02	8.667	2.20	14.667	2.35	20.67	0.94
2.750	1.02	8.750	2.20	14.750	2.35	20.75	0.94
2.833	1.02	8.833	2.20	14.833	2.36	20.83	0.94
2.917	1.02	8.917	2.20	14.917	2.36	20.92	0.94
3.000	1.02	9.000	2.20	15.000	2.36	21.00	0.94
3.083	1.02	9.083	2.51	15.083	2.35	21.08	0.94
3.167	1.02	9.167	2.51	15.167	2.35	21.17	0.94
3.250	1.02	9.250	2.51	15.250	2.35	21.25	0.94
3.333	1.02	9.333	2.51	15.333	2.35	21.33	0.94
3.417	1.02	9.417	2.51	15.417	2.35	21.42	0.94
3.500	1.02	9.500	2.51	15.500	2.35	21.50	0.94
3.583	1.02	9.583	2.83	15.583	2.35	21.58	0.94
3.667	1.02	9.667	2.83	15.667	2.35	21.67	0.94
3.750	1.02	9.750	2.83	15.750	2.35	21.75	0.94
3.833	1.02	9.833	2.83	15.833	2.35	21.83	0.94
3.917	1.02	9.917	2.83	15.917	2.35	21.92	0.94
4.000	1.02	10.000	2.83	16.000	2.35	22.00	0.94
4.083	1.26	10.083	3.61	16.083	1.41	22.08	0.94
4.167	1.26	10.167	3.61	16.167	1.41	22.17	0.94
4.250	1.26	10.250	3.61	16.250	1.41	22.25	0.94
4.333	1.26	10.333	3.61	16.333	1.41	22.33	0.94
4.417	1.26	10.417	3.61	16.417	1.41	22.42	0.94
4.500	1.26	10.500	3.61	16.500	1.41	22.50	0.94
4.583	1.26	10.583	4.87	16.583	1.41	22.58	0.94
4.667	1.26	10.667	4.87	16.667	1.41	22.67	0.94
4.750	1.26	10.750	4.87	16.750	1.41	22.75	0.94
4.833	1.26	10.833	4.87	16.833	1.41	22.83	0.94
4.917	1.26	10.917	4.87	16.917	1.41	22.92	0.94
5.000	1.26	11.000	4.87	17.000	1.41	23.00	0.94
5.083	1.26	11.083	7.54	17.083	1.41	23.08	0.94
5.167	1.26	11.167	7.54	17.167	1.41	23.17	0.94
5.250	1.26	11.250	7.54	17.250	1.41	23.25	0.94
5.333	1.26	11.333	7.54	17.333	1.41	23.33	0.94
5.417	1.26	11.417	7.54	17.417	1.41	23.42	0.94
5.500	1.26	11.500	7.54	17.500	1.41	23.50	0.94
5.583	1.26	11.583	23.23	17.583	1.41	23.58	0.94
5.667	1.26	11.667	23.24	17.667	1.41	23.67	0.94
5.750	1.26	11.750	23.24	17.750	1.41	23.75	0.94
5.833	1.26	11.833	96.08	17.833	1.41	23.83	0.94
5.917	1.26	11.917	96.08	17.917	1.41	23.92	0.94
6.000	1.26	12.000	96.08	18.000	1.41	24.00	0.94

Unit Hyd Qpeak (cms)= 1.790

PEAK FLOW (cms)= 0.849 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 39.072
TOTAL RAINFALL (mm)= 78.500
RUNOFF COEFFICIENT = 0.498

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

| ROUTE CHN(0040)|
| IN= 2---> OUT= 1 |

Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	101.50	0.0500	
1.00	100.70	0.0500	
1.50	100.55	0.0500 /0.0300	Main Channel
2.00	99.50	0.0300	Main Channel
3.50	99.60	0.0300	Main Channel
4.50	100.65	0.0300 /0.0500	Main Channel
6.00	101.45	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	99.60	.185E+02	0.0	0.54	8.09
0.19	99.69	.587E+02	0.2	1.04	4.22
0.29	99.79	.102E+03	0.5	1.38	3.16
0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	0.85	12.00	39.07	0.36	1.58
OUTFLOW: ID= 1 (0040)	6.56	0.82	12.08	39.07	0.35	1.56

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| CALIB            |
| NASHYD   (  0042)|   Area     (ha)=   4.15   Curve Number   (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.28

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.86	6.083	1.41	12.083	11.31	18.08	1.41
0.167	0.86	6.167	1.41	12.167	11.30	18.17	1.41
0.250	0.86	6.250	1.41	12.250	11.30	18.25	1.41
0.333	0.86	6.333	1.41	12.333	11.30	18.33	1.41
0.417	0.86	6.417	1.41	12.417	11.30	18.42	1.41
0.500	0.86	6.500	1.41	12.500	11.30	18.50	1.41
0.583	0.86	6.583	1.41	12.583	5.81	18.58	1.41
0.667	0.86	6.667	1.41	12.667	5.81	18.67	1.41
0.750	0.86	6.750	1.41	12.750	5.81	18.75	1.41
0.833	0.86	6.833	1.41	12.833	5.81	18.83	1.41
0.917	0.86	6.917	1.41	12.917	5.81	18.92	1.41
1.000	0.86	7.000	1.41	13.000	5.81	19.00	1.41
1.083	0.86	7.083	1.73	13.083	4.24	19.08	1.41
1.167	0.86	7.167	1.73	13.167	4.24	19.17	1.41
1.250	0.86	7.250	1.73	13.250	4.24	19.25	1.41
1.333	0.86	7.333	1.73	13.333	4.24	19.33	1.41
1.417	0.86	7.417	1.73	13.417	4.24	19.42	1.41
1.500	0.86	7.500	1.73	13.500	4.24	19.50	1.41
1.583	0.86	7.583	1.73	13.583	3.30	19.58	1.41
1.667	0.86	7.667	1.73	13.667	3.30	19.67	1.41
1.750	0.86	7.750	1.73	13.750	3.30	19.75	1.41
1.833	0.86	7.833	1.73	13.833	3.30	19.83	1.41
1.917	0.86	7.917	1.73	13.917	3.30	19.92	1.41
2.000	0.86	8.000	1.73	14.000	3.30	20.00	1.41
2.083	1.02	8.083	2.04	14.083	2.36	20.08	0.94
2.167	1.02	8.167	2.04	14.167	2.35	20.17	0.94
2.250	1.02	8.250	2.04	14.250	2.35	20.25	0.94
2.333	1.02	8.333	2.04	14.333	2.35	20.33	0.94
2.417	1.02	8.417	2.04	14.417	2.35	20.42	0.94
2.500	1.02	8.500	2.04	14.500	2.35	20.50	0.94
2.583	1.02	8.583	2.20	14.583	2.35	20.58	0.94
2.667	1.02	8.667	2.20	14.667	2.35	20.67	0.94
2.750	1.02	8.750	2.20	14.750	2.35	20.75	0.94
2.833	1.02	8.833	2.20	14.833	2.36	20.83	0.94
2.917	1.02	8.917	2.20	14.917	2.36	20.92	0.94
3.000	1.02	9.000	2.20	15.000	2.36	21.00	0.94
3.083	1.02	9.083	2.51	15.083	2.35	21.08	0.94
3.167	1.02	9.167	2.51	15.167	2.35	21.17	0.94
3.250	1.02	9.250	2.51	15.250	2.35	21.25	0.94
3.333	1.02	9.333	2.51	15.333	2.35	21.33	0.94
3.417	1.02	9.417	2.51	15.417	2.35	21.42	0.94
3.500	1.02	9.500	2.51	15.500	2.35	21.50	0.94
3.583	1.02	9.583	2.83	15.583	2.35	21.58	0.94
3.667	1.02	9.667	2.83	15.667	2.35	21.67	0.94
3.750	1.02	9.750	2.83	15.750	2.35	21.75	0.94
3.833	1.02	9.833	2.83	15.833	2.35	21.83	0.94
3.917	1.02	9.917	2.83	15.917	2.35	21.92	0.94
4.000	1.02	10.000	2.83	16.000	2.35	22.00	0.94
4.083	1.26	10.083	3.61	16.083	1.41	22.08	0.94
4.167	1.26	10.167	3.61	16.167	1.41	22.17	0.94
4.250	1.26	10.250	3.61	16.250	1.41	22.25	0.94
4.333	1.26	10.333	3.61	16.333	1.41	22.33	0.94
4.417	1.26	10.417	3.61	16.417	1.41	22.42	0.94
4.500	1.26	10.500	3.61	16.500	1.41	22.50	0.94
4.583	1.26	10.583	4.87	16.583	1.41	22.58	0.94
4.667	1.26	10.667	4.87	16.667	1.41	22.67	0.94
4.750	1.26	10.750	4.87	16.750	1.41	22.75	0.94
4.833	1.26	10.833	4.87	16.833	1.41	22.83	0.94
4.917	1.26	10.917	4.87	16.917	1.41	22.92	0.94
5.000	1.26	11.000	4.87	17.000	1.41	23.00	0.94
5.083	1.26	11.083	7.54	17.083	1.41	23.08	0.94
5.167	1.26	11.167	7.54	17.167	1.41	23.17	0.94
5.250	1.26	11.250	7.54	17.250	1.41	23.25	0.94
5.333	1.26	11.333	7.54	17.333	1.41	23.33	0.94
5.417	1.26	11.417	7.54	17.417	1.41	23.42	0.94
5.500	1.26	11.500	7.54	17.500	1.41	23.50	0.94
5.583	1.26	11.583	23.23	17.583	1.41	23.58	0.94
5.667	1.26	11.667	23.24	17.667	1.41	23.67	0.94
5.750	1.26	11.750	23.24	17.750	1.41	23.75	0.94
5.833	1.26	11.833	96.08	17.833	1.41	23.83	0.94
5.917	1.26	11.917	96.08	17.917	1.41	23.92	0.94
6.000	1.26	12.000	96.08	18.000	1.41	24.00	0.94

```
     Unit Hyd Qpeak  (cms)=   0.566

     PEAK FLOW       (cms)=   0.343 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  39.346
     TOTAL RAINFALL   (mm)=  78.500
     RUNOFF COEFFICIENT   =   0.501

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

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--------------------
| ADD HYD  (  0039)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0040):     6.56   0.816    12.08    39.07
     + ID2= 2 (  0042):     4.15   0.343    12.17    39.35
       ==========================================
       ID = 3 (  0039):    10.71   1.150    12.08    39.18

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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================================================================================
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       V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
       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 *****
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  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\5cfb9796-ec1d-4589-9b59-2ee898ceff76\
  Summary filename: C:\Users\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\5cfb9796-ec1d-4589-9b59-2ee898ceff76\

DATE: 03-08-2023                          TIME: 01:23:08

USER:



COMMENTS: _____________________________________________________

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  ***********************************************
  ** SIMULATION : 15 - 50-YR - SCS TYPE II 24HR **
  ***********************************************

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| MASS STORM       |    Filename: C:\Users\sramsoomair\AppD
|                  |              ata\Local\Temp\
|                  |              61ab631c-6e40-482e-984d-eb141678c1e0\8343046c
| Ptotal= 86.70 mm |    Comments: SCS TYPE II MASS CURVE
--------------------
                       Duration of storm    = 24.00 hrs
                       Mass curve time step = 15.00 min
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.95	6.00	1.56	12.00	12.48	18.00	1.56
0.25	0.95	6.25	1.56	12.25	12.48	18.25	1.56
0.50	0.95	6.50	1.56	12.50	6.42	18.50	1.56
0.75	0.95	6.75	1.56	12.75	6.42	18.75	1.56
1.00	0.95	7.00	1.91	13.00	4.68	19.00	1.56
1.25	0.95	7.25	1.91	13.25	4.68	19.25	1.56
1.50	0.95	7.50	1.91	13.50	3.64	19.50	1.56
1.75	0.95	7.75	1.91	13.75	3.64	19.75	1.56
2.00	1.13	8.00	2.25	14.00	2.60	20.00	1.04
2.25	1.13	8.25	2.25	14.25	2.60	20.25	1.04
2.50	1.13	8.50	2.43	14.50	2.60	20.50	1.04
2.75	1.13	8.75	2.43	14.75	2.60	20.75	1.04
3.00	1.13	9.00	2.77	15.00	2.60	21.00	1.04
3.25	1.13	9.25	2.77	15.25	2.60	21.25	1.04
3.50	1.13	9.50	3.12	15.50	2.60	21.50	1.04
3.75	1.13	9.75	3.12	15.75	2.60	21.75	1.04
4.00	1.39	10.00	3.99	16.00	1.56	22.00	1.04
4.25	1.39	10.25	3.99	16.25	1.56	22.25	1.04
4.50	1.39	10.50	5.38	16.50	1.56	22.50	1.04
4.75	1.39	10.75	5.38	16.75	1.56	22.75	1.04
5.00	1.39	11.00	8.32	17.00	1.56	23.00	1.04
5.25	1.39	11.25	8.32	17.25	1.56	23.25	1.04
5.50	1.39	11.50	25.66	17.50	1.56	23.50	1.04
5.75	1.39	11.75	106.12	17.75	1.56	23.75	1.04

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--------------------
| CALIB            |
| NASHYD   (  0041)|   Area    (ha)=   6.56   Curve Number   (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------  U.H. Tp(hrs)=   0.14

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.95	6.083	1.56	12.083	12.50	18.08	1.56
0.167	0.95	6.167	1.56	12.167	12.48	18.17	1.56
0.250	0.95	6.250	1.56	12.250	12.48	18.25	1.56
0.333	0.95	6.333	1.56	12.333	12.48	18.33	1.56
0.417	0.95	6.417	1.56	12.417	12.48	18.42	1.56
0.500	0.95	6.500	1.56	12.500	12.48	18.50	1.56
0.583	0.95	6.583	1.56	12.583	6.42	18.58	1.56
0.667	0.95	6.667	1.56	12.667	6.42	18.67	1.56
0.750	0.95	6.750	1.56	12.750	6.42	18.75	1.56
0.833	0.95	6.833	1.56	12.833	6.42	18.83	1.56
0.917	0.95	6.917	1.56	12.917	6.42	18.92	1.56
1.000	0.95	7.000	1.56	13.000	6.42	19.00	1.56
1.083	0.95	7.083	1.91	13.083	4.68	19.08	1.56
1.167	0.95	7.167	1.91	13.167	4.68	19.17	1.56
1.250	0.95	7.250	1.91	13.250	4.68	19.25	1.56
1.333	0.95	7.333	1.91	13.333	4.68	19.33	1.56
1.417	0.95	7.417	1.91	13.417	4.68	19.42	1.56
1.500	0.95	7.500	1.91	13.500	4.68	19.50	1.56
1.583	0.95	7.583	1.91	13.583	3.64	19.58	1.56
1.667	0.95	7.667	1.91	13.667	3.64	19.67	1.56
1.750	0.95	7.750	1.91	13.750	3.64	19.75	1.56
1.833	0.95	7.833	1.91	13.833	3.64	19.83	1.56
1.917	0.95	7.917	1.91	13.917	3.64	19.92	1.56
2.000	0.95	8.000	1.91	14.000	3.64	20.00	1.56
2.083	1.13	8.083	2.25	14.083	2.60	20.08	1.04
2.167	1.13	8.167	2.25	14.167	2.60	20.17	1.04
2.250	1.13	8.250	2.25	14.250	2.60	20.25	1.04
2.333	1.13	8.333	2.25	14.333	2.60	20.33	1.04
2.417	1.13	8.417	2.25	14.417	2.60	20.42	1.04
2.500	1.13	8.500	2.25	14.500	2.60	20.50	1.04
2.583	1.13	8.583	2.43	14.583	2.60	20.58	1.04
2.667	1.13	8.667	2.43	14.667	2.60	20.67	1.04
2.750	1.13	8.750	2.43	14.750	2.60	20.75	1.04
2.833	1.13	8.833	2.43	14.833	2.60	20.83	1.04
2.917	1.13	8.917	2.43	14.917	2.60	20.92	1.04
3.000	1.13	9.000	2.43	15.000	2.60	21.00	1.04
3.083	1.13	9.083	2.77	15.083	2.60	21.08	1.04
3.167	1.13	9.167	2.77	15.167	2.60	21.17	1.04
3.250	1.13	9.250	2.77	15.250	2.60	21.25	1.04
3.333	1.13	9.333	2.77	15.333	2.60	21.33	1.04
3.417	1.13	9.417	2.77	15.417	2.60	21.42	1.04
3.500	1.13	9.500	2.77	15.500	2.60	21.50	1.04
3.583	1.13	9.583	3.12	15.583	2.60	21.58	1.04
3.667	1.13	9.667	3.12	15.667	2.60	21.67	1.04
3.750	1.13	9.750	3.12	15.750	2.60	21.75	1.04
3.833	1.13	9.833	3.12	15.833	2.60	21.83	1.04
3.917	1.13	9.917	3.12	15.917	2.60	21.92	1.04
4.000	1.13	10.000	3.12	16.000	2.60	22.00	1.04
4.083	1.39	10.083	3.99	16.083	1.56	22.08	1.04
4.167	1.39	10.167	3.99	16.167	1.56	22.17	1.04
4.250	1.39	10.250	3.99	16.250	1.56	22.25	1.04
4.333	1.39	10.333	3.99	16.333	1.56	22.33	1.04
4.417	1.39	10.417	3.99	16.417	1.56	22.42	1.04
4.500	1.39	10.500	3.99	16.500	1.56	22.50	1.04
4.583	1.39	10.583	5.38	16.583	1.56	22.58	1.04
4.667	1.39	10.667	5.38	16.667	1.56	22.67	1.04

4.750	1.39	10.750	5.38	16.750	1.56	22.75	1.04
4.833	1.39	10.833	5.38	16.833	1.56	22.83	1.04
4.917	1.39	10.917	5.38	16.917	1.56	22.92	1.04
5.000	1.39	11.000	5.38	17.000	1.56	23.00	1.04
5.083	1.39	11.083	8.32	17.083	1.56	23.08	1.04
5.167	1.39	11.167	8.32	17.167	1.56	23.17	1.04
5.250	1.39	11.250	8.32	17.250	1.56	23.25	1.04
5.333	1.39	11.333	8.32	17.333	1.56	23.33	1.04
5.417	1.39	11.417	8.32	17.417	1.56	23.42	1.04
5.500	1.39	11.500	8.32	17.500	1.56	23.50	1.04
5.583	1.39	11.583	25.66	17.583	1.56	23.58	1.04
5.667	1.39	11.667	25.66	17.667	1.56	23.67	1.04
5.750	1.39	11.750	25.66	17.750	1.56	23.75	1.04
5.833	1.39	11.833	106.11	17.833	1.56	23.83	1.04
5.917	1.39	11.917	106.12	17.917	1.56	23.92	1.04
6.000	1.39	12.000	106.12	18.000	1.56	24.00	1.04

Unit Hyd Qpeak (cms)= 1.790

PEAK FLOW (cms)= 0.995 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 45.720
TOTAL RAINFALL (mm)= 86.700
RUNOFF COEFFICIENT = 0.527

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

ROUTE CHN(0040)	
IN= 2---> OUT= 1	Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	101.50	0.0500	
1.00	100.70	0.0500	
1.50	100.55	0.0500 /0.0300	Main Channel
2.00	99.50	0.0300	Main Channel
3.50	99.60	0.0300	Main Channel
4.50	100.65	0.0300 /0.0500	Main Channel
6.00	101.45	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	99.60	.185E+02	0.0	0.54	8.09
0.19	99.69	.587E+02	0.2	1.04	4.22
0.29	99.79	.102E+03	0.5	1.38	3.16
0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	1.00	12.00	45.72	0.39	1.68
OUTFLOW: ID= 1 (0040)	6.56	0.96	12.08	45.72	0.38	1.66

CALIB				
NASHYD (0042)	Area (ha)= 4.15	Curve Number (CN)= 82.0		
ID= 1 DT= 5.0 min	Ia (mm)= 8.00	# of Linear Res.(N)= 3.00		
	U.H. Tp(hrs)= 0.28			

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.95	6.083	1.56	12.083	12.50	18.08	1.56
0.167	0.95	6.167	1.56	12.167	12.48	18.17	1.56
0.250	0.95	6.250	1.56	12.250	12.48	18.25	1.56
0.333	0.95	6.333	1.56	12.333	12.48	18.33	1.56
0.417	0.95	6.417	1.56	12.417	12.48	18.42	1.56
0.500	0.95	6.500	1.56	12.500	12.48	18.50	1.56
0.583	0.95	6.583	1.56	12.583	6.42	18.58	1.56
0.667	0.95	6.667	1.56	12.667	6.42	18.67	1.56
0.750	0.95	6.750	1.56	12.750	6.42	18.75	1.56
0.833	0.95	6.833	1.56	12.833	6.42	18.83	1.56
0.917	0.95	6.917	1.56	12.917	6.42	18.92	1.56
1.000	0.95	7.000	1.56	13.000	6.42	19.00	1.56
1.083	0.95	7.083	1.91	13.083	4.68	19.08	1.56
1.167	0.95	7.167	1.91	13.167	4.68	19.17	1.56
1.250	0.95	7.250	1.91	13.250	4.68	19.25	1.56
1.333	0.95	7.333	1.91	13.333	4.68	19.33	1.56
1.417	0.95	7.417	1.91	13.417	4.68	19.42	1.56
1.500	0.95	7.500	1.91	13.500	4.68	19.50	1.56
1.583	0.95	7.583	1.91	13.583	3.64	19.58	1.56
1.667	0.95	7.667	1.91	13.667	3.64	19.67	1.56
1.750	0.95	7.750	1.91	13.750	3.64	19.75	1.56
1.833	0.95	7.833	1.91	13.833	3.64	19.83	1.56
1.917	0.95	7.917	1.91	13.917	3.64	19.92	1.56
2.000	0.95	8.000	1.91	14.000	3.64	20.00	1.56
2.083	1.13	8.083	2.25	14.083	2.60	20.08	1.04
2.167	1.13	8.167	2.25	14.167	2.60	20.17	1.04
2.250	1.13	8.250	2.25	14.250	2.60	20.25	1.04
2.333	1.13	8.333	2.25	14.333	2.60	20.33	1.04
2.417	1.13	8.417	2.25	14.417	2.60	20.42	1.04
2.500	1.13	8.500	2.25	14.500	2.60	20.50	1.04
2.583	1.13	8.583	2.43	14.583	2.60	20.58	1.04
2.667	1.13	8.667	2.43	14.667	2.60	20.67	1.04
2.750	1.13	8.750	2.43	14.750	2.60	20.75	1.04
2.833	1.13	8.833	2.43	14.833	2.60	20.83	1.04
2.917	1.13	8.917	2.43	14.917	2.60	20.92	1.04
3.000	1.13	9.000	2.43	15.000	2.60	21.00	1.04
3.083	1.13	9.083	2.77	15.083	2.60	21.08	1.04
3.167	1.13	9.167	2.77	15.167	2.60	21.17	1.04
3.250	1.13	9.250	2.77	15.250	2.60	21.25	1.04
3.333	1.13	9.333	2.77	15.333	2.60	21.33	1.04
3.417	1.13	9.417	2.77	15.417	2.60	21.42	1.04
3.500	1.13	9.500	2.77	15.500	2.60	21.50	1.04

3.583	1.13	9.583	3.12	15.583	2.60	21.58	1.04
3.667	1.13	9.667	3.12	15.667	2.60	21.67	1.04
3.750	1.13	9.750	3.12	15.750	2.60	21.75	1.04
3.833	1.13	9.833	3.12	15.833	2.60	21.83	1.04
3.917	1.13	9.917	3.12	15.917	2.60	21.92	1.04
4.000	1.13	10.000	3.12	16.000	2.60	22.00	1.04
4.083	1.39	10.083	3.99	16.083	1.56	22.08	1.04
4.167	1.39	10.167	3.99	16.167	1.56	22.17	1.04
4.250	1.39	10.250	3.99	16.250	1.56	22.25	1.04
4.333	1.39	10.333	3.99	16.333	1.56	22.33	1.04
4.417	1.39	10.417	3.99	16.417	1.56	22.42	1.04
4.500	1.39	10.500	3.99	16.500	1.56	22.50	1.04
4.583	1.39	10.583	5.38	16.583	1.56	22.58	1.04
4.667	1.39	10.667	5.38	16.667	1.56	22.67	1.04
4.750	1.39	10.750	5.38	16.750	1.56	22.75	1.04
4.833	1.39	10.833	5.38	16.833	1.56	22.83	1.04
4.917	1.39	10.917	5.38	16.917	1.56	22.92	1.04
5.000	1.39	11.000	5.38	17.000	1.56	23.00	1.04
5.083	1.39	11.083	8.32	17.083	1.56	23.08	1.04
5.167	1.39	11.167	8.32	17.167	1.56	23.17	1.04
5.250	1.39	11.250	8.32	17.250	1.56	23.25	1.04
5.333	1.39	11.333	8.32	17.333	1.56	23.33	1.04
5.417	1.39	11.417	8.32	17.417	1.56	23.42	1.04
5.500	1.39	11.500	8.32	17.500	1.56	23.50	1.04
5.583	1.39	11.583	25.66	17.583	1.56	23.58	1.04
5.667	1.39	11.667	25.66	17.667	1.56	23.67	1.04
5.750	1.39	11.750	25.66	17.750	1.56	23.75	1.04
5.833	1.39	11.833	106.11	17.833	1.56	23.83	1.04
5.917	1.39	11.917	106.12	17.917	1.56	23.92	1.04
6.000	1.39	12.000	106.12	18.000	1.56	24.00	1.04

Unit Hyd Qpeak (cms)= 0.566

PEAK FLOW (cms)= 0.403 (i)
TIME TO PEAK (hrs)= 12.167
RUNOFF VOLUME (mm)= 46.041
TOTAL RAINFALL (mm)= 86.700
RUNOFF COEFFICIENT = 0.531

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

ADD HYD (0039)		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
1 + 2 = 3	ID1= 1 (0040):	6.56	0.955	12.08	45.72
	+ ID2= 2 (0042):	4.15	0.403	12.17	46.04
	ID = 3 (0039):	10.71	1.348	12.08	45.84

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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       V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
       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\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-42e5-99bc-6f706f925a0e\1753976d-5291-42f8-88b4-3c65e3a5664d\
Summary filename: C:\Users\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-42e5-99bc-6f706f925a0e\1753976d-5291-42f8-88b4-3c65e3a5664d\

DATE: 03-08-2023 TIME: 01:23:07

USER:

COMMENTS: _____

****
** SIMULATION : 16 - 100-YR - SCS TYPE II 24H **
****

MASS STORM	Filename: C:\Users\sramsoomair\AppData\Local\Temp\61ab631c-6e40-482e-984d-eb141678c1e0\aed835c3
Ptotal= 94.70 mm	Comments: SCS TYPE II MASS CURVE

Duration of storm = 24.00 hrs
Mass curve time step = 15.00 min

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	1.04	6.00	1.70	12.00	13.64	18.00	1.70
0.25	1.04	6.25	1.70	12.25	13.64	18.25	1.70
0.50	1.04	6.50	1.70	12.50	7.01	18.50	1.70
0.75	1.04	6.75	1.70	12.75	7.01	18.75	1.70
1.00	1.04	7.00	2.08	13.00	5.11	19.00	1.70
1.25	1.04	7.25	2.08	13.25	5.11	19.25	1.70
1.50	1.04	7.50	2.08	13.50	3.98	19.50	1.70
1.75	1.04	7.75	2.08	13.75	3.98	19.75	1.70
2.00	1.23	8.00	2.46	14.00	2.84	20.00	1.14
2.25	1.23	8.25	2.46	14.25	2.84	20.25	1.14
2.50	1.23	8.50	2.65	14.50	2.84	20.50	1.14
2.75	1.23	8.75	2.65	14.75	2.84	20.75	1.14
3.00	1.23	9.00	3.03	15.00	2.84	21.00	1.14
3.25	1.23	9.25	3.03	15.25	2.84	21.25	1.14
3.50	1.23	9.50	3.41	15.50	2.84	21.50	1.14
3.75	1.23	9.75	3.41	15.75	2.84	21.75	1.14
4.00	1.52	10.00	4.36	16.00	1.70	22.00	1.14
4.25	1.52	10.25	4.36	16.25	1.70	22.25	1.14
4.50	1.52	10.50	5.87	16.50	1.70	22.50	1.14
4.75	1.52	10.75	5.87	16.75	1.70	22.75	1.14

5.00	1.52	11.00	9.09	17.00	1.70	23.00	1.14
5.25	1.52	11.25	9.09	17.25	1.70	23.25	1.14
5.50	1.52	11.50	28.03	17.50	1.70	23.50	1.14
5.75	1.52	11.75	115.91	17.75	1.70	23.75	1.14

CALIB			
NASHYD (0041)	Area (ha)=	6.56	Curve Number (CN)= 82.0
ID= 1 DT= 5.0 min	Ia (mm)=	8.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.14	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.04	6.083	1.70	12.083	13.65	18.08	1.70
0.167	1.04	6.167	1.70	12.167	13.64	18.17	1.70
0.250	1.04	6.250	1.70	12.250	13.64	18.25	1.70
0.333	1.04	6.333	1.70	12.333	13.64	18.33	1.70
0.417	1.04	6.417	1.70	12.417	13.64	18.42	1.70
0.500	1.04	6.500	1.70	12.500	13.64	18.50	1.70
0.583	1.04	6.583	1.70	12.583	7.01	18.58	1.70
0.667	1.04	6.667	1.70	12.667	7.01	18.67	1.70
0.750	1.04	6.750	1.70	12.750	7.01	18.75	1.70
0.833	1.04	6.833	1.70	12.833	7.01	18.83	1.70
0.917	1.04	6.917	1.70	12.917	7.01	18.92	1.70
1.000	1.04	7.000	1.70	13.000	7.01	19.00	1.70
1.083	1.04	7.083	2.08	13.083	5.11	19.08	1.70
1.167	1.04	7.167	2.08	13.167	5.11	19.17	1.70
1.250	1.04	7.250	2.08	13.250	5.11	19.25	1.70
1.333	1.04	7.333	2.08	13.333	5.11	19.33	1.70
1.417	1.04	7.417	2.08	13.417	5.11	19.42	1.70
1.500	1.04	7.500	2.08	13.500	5.11	19.50	1.70
1.583	1.04	7.583	2.08	13.583	3.98	19.58	1.70
1.667	1.04	7.667	2.08	13.667	3.98	19.67	1.70
1.750	1.04	7.750	2.08	13.750	3.98	19.75	1.70
1.833	1.04	7.833	2.08	13.833	3.98	19.83	1.70
1.917	1.04	7.917	2.08	13.917	3.98	19.92	1.70
2.000	1.04	8.000	2.08	14.000	3.98	20.00	1.70
2.083	1.23	8.083	2.46	14.083	2.84	20.08	1.14
2.167	1.23	8.167	2.46	14.167	2.84	20.17	1.14
2.250	1.23	8.250	2.46	14.250	2.84	20.25	1.14
2.333	1.23	8.333	2.46	14.333	2.84	20.33	1.14
2.417	1.23	8.417	2.46	14.417	2.84	20.42	1.14
2.500	1.23	8.500	2.46	14.500	2.84	20.50	1.14
2.583	1.23	8.583	2.65	14.583	2.84	20.58	1.14
2.667	1.23	8.667	2.65	14.667	2.84	20.67	1.14
2.750	1.23	8.750	2.65	14.750	2.84	20.75	1.14
2.833	1.23	8.833	2.65	14.833	2.84	20.83	1.14
2.917	1.23	8.917	2.65	14.917	2.84	20.92	1.14
3.000	1.23	9.000	2.65	15.000	2.84	21.00	1.14
3.083	1.23	9.083	3.03	15.083	2.84	21.08	1.14
3.167	1.23	9.167	3.03	15.167	2.84	21.17	1.14
3.250	1.23	9.250	3.03	15.250	2.84	21.25	1.14
3.333	1.23	9.333	3.03	15.333	2.84	21.33	1.14
3.417	1.23	9.417	3.03	15.417	2.84	21.42	1.14
3.500	1.23	9.500	3.03	15.500	2.84	21.50	1.14
3.583	1.23	9.583	3.41	15.583	2.84	21.58	1.14
3.667	1.23	9.667	3.41	15.667	2.84	21.67	1.14
3.750	1.23	9.750	3.41	15.750	2.84	21.75	1.14
3.833	1.23	9.833	3.41	15.833	2.84	21.83	1.14
3.917	1.23	9.917	3.41	15.917	2.84	21.92	1.14
4.000	1.23	10.000	3.41	16.000	2.84	22.00	1.14
4.083	1.52	10.083	4.36	16.083	1.70	22.08	1.14
4.167	1.52	10.167	4.36	16.167	1.70	22.17	1.14
4.250	1.52	10.250	4.36	16.250	1.70	22.25	1.14
4.333	1.52	10.333	4.36	16.333	1.70	22.33	1.14
4.417	1.52	10.417	4.36	16.417	1.70	22.42	1.14
4.500	1.52	10.500	4.36	16.500	1.70	22.50	1.14
4.583	1.52	10.583	5.87	16.583	1.70	22.58	1.14
4.667	1.52	10.667	5.87	16.667	1.70	22.67	1.14
4.750	1.52	10.750	5.87	16.750	1.70	22.75	1.14
4.833	1.52	10.833	5.87	16.833	1.70	22.83	1.14
4.917	1.52	10.917	5.87	16.917	1.70	22.92	1.14
5.000	1.52	11.000	5.87	17.000	1.70	23.00	1.14
5.083	1.52	11.083	9.09	17.083	1.70	23.08	1.14
5.167	1.52	11.167	9.09	17.167	1.70	23.17	1.14
5.250	1.52	11.250	9.09	17.250	1.70	23.25	1.14
5.333	1.52	11.333	9.09	17.333	1.70	23.33	1.14
5.417	1.52	11.417	9.09	17.417	1.70	23.42	1.14
5.500	1.52	11.500	9.09	17.500	1.70	23.50	1.14
5.583	1.52	11.583	28.03	17.583	1.70	23.58	1.14
5.667	1.52	11.667	28.03	17.667	1.70	23.67	1.14
5.750	1.52	11.750	28.03	17.750	1.70	23.75	1.14
5.833	1.52	11.833	115.90	17.833	1.70	23.83	1.14
5.917	1.52	11.917	115.91	17.917	1.70	23.92	1.14
6.000	1.52	12.000	115.91	18.000	1.70	24.00	1.14

Unit Hyd Qpeak (cms)= 1.790

PEAK FLOW (cms)= 1.141 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 52.371
TOTAL RAINFALL (mm)= 94.700
RUNOFF COEFFICIENT = 0.553

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

ROUTE CHN(0040)	
IN= 2---> OUT= 1	Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	101.50	0.0500	
1.00	100.70	0.0500	
1.50	100.55	0.0500 /0.0300	Main Channel
2.00	99.50	0.0300	Main Channel
3.50	99.60	0.0300	Main Channel
4.50	100.65	0.0300 /0.0500	Main Channel
6.00	101.45	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	99.60	.185E+02	0.0	0.54	8.09
0.19	99.69	.587E+02	0.2	1.04	4.22
0.29	99.79	.102E+03	0.5	1.38	3.16
0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70

0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

	<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	1.14	12.00	52.37	0.42	1.74
OUTFLOW: ID= 1 (0040)	6.56	1.09	12.08	52.37	0.41	1.72

CALIB					
NASHYD (0042)	Area (ha)=	4.15	Curve Number (CN)=	82.0	
ID= 1 DT= 5.0 min	Ia (mm)=	8.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.28			

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.04	6.083	1.70	12.083	13.65	18.08	1.70
0.167	1.04	6.167	1.70	12.167	13.64	18.17	1.70
0.250	1.04	6.250	1.70	12.250	13.64	18.25	1.70
0.333	1.04	6.333	1.70	12.333	13.64	18.33	1.70
0.417	1.04	6.417	1.70	12.417	13.64	18.42	1.70
0.500	1.04	6.500	1.70	12.500	13.64	18.50	1.70
0.583	1.04	6.583	1.70	12.583	7.01	18.58	1.70
0.667	1.04	6.667	1.70	12.667	7.01	18.67	1.70
0.750	1.04	6.750	1.70	12.750	7.01	18.75	1.70
0.833	1.04	6.833	1.70	12.833	7.01	18.83	1.70
0.917	1.04	6.917	1.70	12.917	7.01	18.92	1.70
1.000	1.04	7.000	1.70	13.000	7.01	19.00	1.70
1.083	1.04	7.083	2.08	13.083	5.11	19.08	1.70
1.167	1.04	7.167	2.08	13.167	5.11	19.17	1.70
1.250	1.04	7.250	2.08	13.250	5.11	19.25	1.70
1.333	1.04	7.333	2.08	13.333	5.11	19.33	1.70
1.417	1.04	7.417	2.08	13.417	5.11	19.42	1.70
1.500	1.04	7.500	2.08	13.500	5.11	19.50	1.70
1.583	1.04	7.583	2.08	13.583	3.98	19.58	1.70
1.667	1.04	7.667	2.08	13.667	3.98	19.67	1.70
1.750	1.04	7.750	2.08	13.750	3.98	19.75	1.70
1.833	1.04	7.833	2.08	13.833	3.98	19.83	1.70
1.917	1.04	7.917	2.08	13.917	3.98	19.92	1.70
2.000	1.04	8.000	2.08	14.000	3.98	20.00	1.70
2.083	1.23	8.083	2.46	14.083	2.84	20.08	1.14
2.167	1.23	8.167	2.46	14.167	2.84	20.17	1.14
2.250	1.23	8.250	2.46	14.250	2.84	20.25	1.14
2.333	1.23	8.333	2.46	14.333	2.84	20.33	1.14
2.417	1.23	8.417	2.46	14.417	2.84	20.42	1.14
2.500	1.23	8.500	2.46	14.500	2.84	20.50	1.14
2.583	1.23	8.583	2.65	14.583	2.84	20.58	1.14
2.667	1.23	8.667	2.65	14.667	2.84	20.67	1.14
2.750	1.23	8.750	2.65	14.750	2.84	20.75	1.14
2.833	1.23	8.833	2.65	14.833	2.84	20.83	1.14
2.917	1.23	8.917	2.65	14.917	2.84	20.92	1.14
3.000	1.23	9.000	2.65	15.000	2.84	21.00	1.14
3.083	1.23	9.083	3.03	15.083	2.84	21.08	1.14
3.167	1.23	9.167	3.03	15.167	2.84	21.17	1.14
3.250	1.23	9.250	3.03	15.250	2.84	21.25	1.14
3.333	1.23	9.333	3.03	15.333	2.84	21.33	1.14
3.417	1.23	9.417	3.03	15.417	2.84	21.42	1.14
3.500	1.23	9.500	3.03	15.500	2.84	21.50	1.14
3.583	1.23	9.583	3.41	15.583	2.84	21.58	1.14
3.667	1.23	9.667	3.41	15.667	2.84	21.67	1.14
3.750	1.23	9.750	3.41	15.750	2.84	21.75	1.14
3.833	1.23	9.833	3.41	15.833	2.84	21.83	1.14
3.917	1.23	9.917	3.41	15.917	2.84	21.92	1.14
4.000	1.23	10.000	3.41	16.000	2.84	22.00	1.14
4.083	1.52	10.083	4.36	16.083	1.70	22.08	1.14
4.167	1.52	10.167	4.36	16.167	1.70	22.17	1.14
4.250	1.52	10.250	4.36	16.250	1.70	22.25	1.14
4.333	1.52	10.333	4.36	16.333	1.70	22.33	1.14
4.417	1.52	10.417	4.36	16.417	1.70	22.42	1.14
4.500	1.52	10.500	4.36	16.500	1.70	22.50	1.14
4.583	1.52	10.583	5.87	16.583	1.70	22.58	1.14
4.667	1.52	10.667	5.87	16.667	1.70	22.67	1.14
4.750	1.52	10.750	5.87	16.750	1.70	22.75	1.14
4.833	1.52	10.833	5.87	16.833	1.70	22.83	1.14
4.917	1.52	10.917	5.87	16.917	1.70	22.92	1.14
5.000	1.52	11.000	5.87	17.000	1.70	23.00	1.14
5.083	1.52	11.083	9.09	17.083	1.70	23.08	1.14
5.167	1.52	11.167	9.09	17.167	1.70	23.17	1.14
5.250	1.52	11.250	9.09	17.250	1.70	23.25	1.14
5.333	1.52	11.333	9.09	17.333	1.70	23.33	1.14
5.417	1.52	11.417	9.09	17.417	1.70	23.42	1.14
5.500	1.52	11.500	9.09	17.500	1.70	23.50	1.14
5.583	1.52	11.583	28.03	17.583	1.70	23.58	1.14
5.667	1.52	11.667	28.03	17.667	1.70	23.67	1.14
5.750	1.52	11.750	28.03	17.750	1.70	23.75	1.14
5.833	1.52	11.833	115.90	17.833	1.70	23.83	1.14
5.917	1.52	11.917	115.91	17.917	1.70	23.92	1.14
6.000	1.52	12.000	115.91	18.000	1.70	24.00	1.14

Unit Hyd Qpeak (cms)= 0.566

PEAK FLOW (cms)= 0.462 (i)
TIME TO PEAK (hrs)= 12.167
RUNOFF VOLUME (mm)= 52.740
TOTAL RAINFALL (mm)= 94.700
RUNOFF COEFFICIENT = 0.557

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

ADD HYD (0039)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0040):	6.56	1.092	12.08	52.37
+ ID2= 2 (0042):	4.15	0.462	12.17	52.74
ID = 3 (0039):	10.71	1.543	12.08	52.51

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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       V    V   I    SSSSS  U   U    A    L             (v 6.2.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M M M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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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: 01:23:08

USER:


COMMENTS: _____________________________________________________

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  ***********************************************
  ** SIMULATION : 21 - 2-YR Chicago W-S         **
  ***********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 696.679
| Ptotal= 32.17 mm |                          B=   4.957
--------------------                          C=   0.811
                       used in:   INTENSITY =  A / (t + B)^C

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

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    1.90 |  1.00   16.52 |  2.00    4.64 |  3.00    2.27
                0.17    2.19 |  1.17   77.67 |  2.17    3.92 |  3.17    2.10
                0.33    2.59 |  1.33   21.92 |  2.33    3.41 |  3.33    1.96
                0.50    3.21 |  1.50   11.14 |  2.50    3.02 |  3.50    1.84
                0.67    4.28 |  1.67    7.52 |  2.67    2.72 |  3.67    1.73
                0.83    6.61 |  1.83    5.72 |  2.83    2.47 |  3.83    1.64


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0041)|   Area    (ha)=   6.56   Curve Number   (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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


                                ---- TRANSFORMED HYETOGRAPH ----
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.083    1.90 | 1.083   16.52 | 2.083    4.64 |  3.08    2.27
                0.167    1.90 | 1.167   16.52 | 2.167    4.64 |  3.17    2.27
                0.250    2.19 | 1.250   77.67 | 2.250    3.92 |  3.25    2.10
                0.333    2.19 | 1.333   77.67 | 2.333    3.92 |  3.33    2.10
                0.417    2.59 | 1.417   21.92 | 2.417    3.41 |  3.42    1.96
                0.500    2.59 | 1.500   21.92 | 2.500    3.41 |  3.50    1.96
                0.583    3.21 | 1.583   11.14 | 2.583    3.02 |  3.58    1.84
                0.667    3.21 | 1.667   11.14 | 2.667    3.02 |  3.67    1.84
                0.750    4.28 | 1.750    7.52 | 2.750    2.72 |  3.75    1.73
                0.833    4.28 | 1.833    7.52 | 2.833    2.72 |  3.83    1.73
                0.917    6.61 | 1.917    5.72 | 2.917    2.47 |  3.92    1.64
                1.000    6.61 | 2.000    5.72 | 3.000    2.47 |  4.00    1.64

    Unit Hyd Qpeak  (cms)=   1.790

    PEAK FLOW       (cms)=   0.156 (i)
    TIME TO PEAK    (hrs)=   1.500
    RUNOFF VOLUME    (mm)=   7.253
    TOTAL RAINFALL   (mm)=  32.167
    RUNOFF COEFFICIENT   =   0.225

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

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0040)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00         101.50        0.0500
                  1.00         100.70        0.0500
                  1.50         100.55    0.0500 /0.0300  Main Channel
                  2.00          99.50        0.0300      Main Channel
                  3.50          99.60        0.0300      Main Channel
                  4.50         100.65    0.0300 /0.0500  Main Channel
                  6.00         101.45        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)       (m)     (cu.m.)       (cms)        (m/s)       (min)
      0.10     99.60    .185E+02         0.0         0.54        8.09
      0.19     99.69    .587E+02         0.2         1.04        4.22
      0.29     99.79    .102E+03         0.5         1.38        3.16
      0.38     99.88    .149E+03         0.9         1.66        2.64
      0.48     99.98    .200E+03         1.4         1.88        2.32
      0.57    100.07    .254E+03         2.0         2.08        2.10
      0.67    100.17    .311E+03         2.7         2.26        1.93
      0.76    100.26    .372E+03         3.4         2.42        1.81
      0.86    100.36    .436E+03         4.3         2.57        1.70
      0.95    100.45    .503E+03         5.2         2.70        1.61
      1.05    100.55    .574E+03         6.2         2.83        1.54
```

1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

	<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	0.16	1.50	7.25	0.15	0.76
OUTFLOW: ID= 1 (0040)	6.56	0.14	1.58	7.25	0.15	0.73

CALIB					
NASHYD (0042)	Area (ha)=	4.15	Curve Number (CN)=	82.0
ID= 1 DT= 5.0 min	Ia (mm)=	8.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.28		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.90	1.083	16.52	2.083	4.64	3.08	2.27
0.167	1.90	1.167	16.52	2.167	4.64	3.17	2.27
0.250	2.19	1.250	77.67	2.250	3.92	3.25	2.10
0.333	2.19	1.333	77.67	2.333	3.92	3.33	2.10
0.417	2.59	1.417	21.92	2.417	3.41	3.42	1.96
0.500	2.59	1.500	21.92	2.500	3.41	3.50	1.96
0.583	3.21	1.583	11.14	2.583	3.02	3.58	1.84
0.667	3.21	1.667	11.14	2.667	3.02	3.67	1.84
0.750	4.28	1.750	7.52	2.750	2.72	3.75	1.73
0.833	4.28	1.833	7.52	2.833	2.72	3.83	1.73
0.917	6.61	1.917	5.72	2.917	2.47	3.92	1.64
1.000	6.61	2.000	5.72	3.000	2.47	4.00	1.64

Unit Hyd Qpeak (cms)= 0.566

PEAK FLOW (cms)= 0.070 (i)
TIME TO PEAK (hrs)= 1.667
RUNOFF VOLUME (mm)= 7.304
TOTAL RAINFALL (mm)= 32.167
RUNOFF COEFFICIENT = 0.227

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

ADD HYD (0039)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0040):	6.56	0.143	1.58	7.25
+ ID2= 2 (0042):	4.15	0.070	1.67	7.30
ID = 3 (0039):	10.71	0.210	1.58	7.27

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
       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 *****

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Output filename: C:\Users\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-42e5-99bc-6f706f925a0e\3278fa3d-2aeb-433a-a17f-d572fbf213d2\
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DATE: 03-08-2023 TIME: 01:23:07

USER:

COMMENTS: _____

```
  ********************************************
  ** SIMULATION : 22 - 5-YR Chicago W-S      **
  ********************************************
```

CHICAGO STORM	IDF curve parameters: A=1015.963
Ptotal= 43.15 mm	B= 5.255
	C= 0.826
	used in: INTENSITY = A / (t + B)^C

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	2.39	1.00	22.43	2.00	6.02	3.00	2.87
0.17	2.76	1.17	107.00	2.17	5.05	3.17	2.65
0.33	3.29	1.33	29.97	2.33	4.37	3.33	2.47
0.50	4.10	1.50	14.93	2.50	3.85	3.50	2.31
0.67	5.53	1.67	9.93	2.67	3.45	3.67	2.17
0.83	8.69	1.83	7.48	2.83	3.13	3.83	2.05

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0041)|   Area     (ha)=   6.56   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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

                          ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    2.39 | 1.083   22.43 | 2.083    6.02 |  3.08    2.87
               0.167    2.39 | 1.167   22.43 | 2.167    6.02 |  3.17    2.87
               0.250    2.76 | 1.250  107.00 | 2.250    5.05 |  3.25    2.65
               0.333    2.76 | 1.333  107.00 | 2.333    5.05 |  3.33    2.65
               0.417    3.29 | 1.417   29.97 | 2.417    4.37 |  3.42    2.47
               0.500    3.29 | 1.500   29.97 | 2.500    4.37 |  3.50    2.47
               0.583    4.10 | 1.583   14.93 | 2.583    3.85 |  3.58    2.31
               0.667    4.10 | 1.667   14.93 | 2.667    3.85 |  3.67    2.31
               0.750    5.53 | 1.750    9.93 | 2.750    3.45 |  3.75    2.17
               0.833    5.53 | 1.833    9.93 | 2.833    3.45 |  3.83    2.17
               0.917    8.69 | 1.917    7.48 | 2.917    3.13 |  3.92    2.05
               1.000    8.69 | 2.000    7.48 | 3.000    3.13 |  4.00    2.05

     Unit Hyd Qpeak  (cms)=   1.790

     PEAK FLOW       (cms)=   0.336 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=  13.489
     TOTAL RAINFALL   (mm)=  43.150
     RUNOFF COEFFICIENT   =   0.313

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

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0040)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         101.50        0.0500
                   1.00         100.70        0.0500
                   1.50         100.55    0.0500 /0.0300  Main Channel
                   2.00          99.50        0.0300      Main Channel
                   3.50          99.60        0.0300      Main Channel
                   4.50         100.65    0.0300 /0.0500  Main Channel
                   6.00         101.45        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.10    99.60    .185E+02        0.0         0.54       8.09
        0.19    99.69    .587E+02        0.2         1.04       4.22
        0.29    99.79    .102E+03        0.5         1.38       3.16
        0.38    99.88    .149E+03        0.9         1.66       2.64
        0.48    99.98    .200E+03        1.4         1.88       2.32
        0.57   100.07    .254E+03        2.0         2.08       2.10
        0.67   100.17    .311E+03        2.7         2.26       1.93
        0.76   100.26    .372E+03        3.4         2.42       1.81
        0.86   100.36    .436E+03        4.3         2.57       1.70
        0.95   100.45    .503E+03        5.2         2.70       1.61
        1.05   100.55    .574E+03        6.2         2.83       1.54
        1.16   100.66    .667E+03        7.7         3.02       1.45
        1.28   100.78    .774E+03        9.5         3.22       1.35
        1.39   100.89    .892E+03       11.6         3.40       1.29
        1.50   101.00    .102E+04       13.8         3.54       1.23
        1.61   101.11    .116E+04       16.3         3.67       1.19
        1.72   101.22    .131E+04       18.9         3.79       1.15
        1.84   101.34    .147E+04       21.8         3.90       1.12
        1.95   101.45    .164E+04       25.0         4.00       1.09

                                    <---- hydrograph ---->   <-pipe / channel->
                                  AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                  (ha)    (cms)   (hrs)   (mm)       (m)      (m/s)
     INFLOW : ID= 2 (  0041)     6.56     0.34    1.42  13.49       0.22      1.13
     OUTFLOW: ID= 1 (  0040)     6.56     0.35    1.50  13.49       0.23      1.14

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0042)|   Area     (ha)=   4.15   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.28

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

                          ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    2.39 | 1.083   22.43 | 2.083    6.02 |  3.08    2.87
               0.167    2.39 | 1.167   22.43 | 2.167    6.02 |  3.17    2.87
               0.250    2.76 | 1.250  107.00 | 2.250    5.05 |  3.25    2.65
               0.333    2.76 | 1.333  107.00 | 2.333    5.05 |  3.33    2.65
               0.417    3.29 | 1.417   29.97 | 2.417    4.37 |  3.42    2.47
               0.500    3.29 | 1.500   29.97 | 2.500    4.37 |  3.50    2.47
               0.583    4.10 | 1.583   14.93 | 2.583    3.85 |  3.58    2.31
               0.667    4.10 | 1.667   14.93 | 2.667    3.85 |  3.67    2.31
               0.750    5.53 | 1.750    9.93 | 2.750    3.45 |  3.75    2.17
               0.833    5.53 | 1.833    9.93 | 2.833    3.45 |  3.83    2.17
               0.917    8.69 | 1.917    7.48 | 2.917    3.13 |  3.92    2.05
               1.000    8.69 | 2.000    7.48 | 3.000    3.13 |  4.00    2.05

     Unit Hyd Qpeak  (cms)=   0.566

     PEAK FLOW       (cms)=   0.144 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  13.584
     TOTAL RAINFALL   (mm)=  43.150
     RUNOFF COEFFICIENT   =   0.315

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

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

--------------------
| ADD HYD  (  0039)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK      R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
       ID1= 1 (  0040):      6.56   0.347     1.50     13.49
     + ID2= 2 (  0042):      4.15   0.144     1.67     13.58
       ================================================
```

```
        ID = 3 (  0039):    10.71   0.473     1.50    13.52

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

       V    V   I    SSSSS  U   U    A    L             (v 6.2.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M M M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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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: 01:23:07

USER:


COMMENTS: _____

--------------------------------------------------------------------------------
---------------------------
  ***********************************************
  ** SIMULATION : 23 - 10-YR Chicago W-S        **
  ***********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1279.709
| Ptotal= 49.97 mm |                          B=   5.715
--------------------                          C=   0.841
                       used in:   INTENSITY =  A / (t + B)^C

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

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    2.59 |  1.00   26.46 |  2.00    6.76 |  3.00    3.13
                0.17    3.01 |  1.17  126.19 |  2.17    5.63 |  3.17    2.89
                0.33    3.61 |  1.33   35.58 |  2.33    4.84 |  3.33    2.68
                0.50    4.54 |  1.50   17.38 |  2.50    4.25 |  3.50    2.50
                0.67    6.19 |  1.67   11.39 |  2.67    3.79 |  3.67    2.35
                0.83    9.92 |  1.83    8.47 |  2.83    3.43 |  3.83    2.21

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0041)|   Area     (ha)=   6.56   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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


                              ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    2.59 | 1.083   26.46 | 2.083    6.76 |  3.08    3.13
               0.167    2.59 | 1.167   26.46 | 2.167    6.76 |  3.17    3.13
               0.250    3.01 | 1.250  126.19 | 2.250    5.63 |  3.25    2.89
               0.333    3.01 | 1.333  126.19 | 2.333    5.63 |  3.33    2.89
               0.417    3.61 | 1.417   35.58 | 2.417    4.84 |  3.42    2.68
               0.500    3.61 | 1.500   35.58 | 2.500    4.84 |  3.50    2.68
               0.583    4.54 | 1.583   17.38 | 2.583    4.25 |  3.58    2.50
               0.667    4.54 | 1.667   17.38 | 2.667    4.25 |  3.67    2.50
               0.750    6.19 | 1.750   11.39 | 2.750    3.79 |  3.75    2.35
               0.833    6.19 | 1.833   11.39 | 2.833    3.79 |  3.83    2.35
               0.917    9.92 | 1.917    8.47 | 2.917    3.43 |  3.92    2.21
               1.000    9.92 | 2.000    8.47 | 3.000    3.43 |  4.00    2.21

    Unit Hyd Qpeak  (cms)=   1.790

    PEAK FLOW       (cms)=   0.478 (i)
    TIME TO PEAK    (hrs)=   1.417
    RUNOFF VOLUME    (mm)=  17.888
    TOTAL RAINFALL   (mm)=  49.968
    RUNOFF COEFFICIENT   =   0.358

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

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0040)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00         101.50        0.0500
                  1.00         100.70        0.0500
                  1.50         100.55    0.0500 /0.0300  Main Channel
                  2.00          99.50        0.0300      Main Channel
                  3.50          99.60        0.0300      Main Channel
                  4.50         100.65    0.0300 /0.0500  Main Channel
                  6.00         101.45        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)       (m)     (cu.m.)      (cms)        (m/s)       (min)
      0.10     99.60    .185E+02        0.0         0.54        8.09
      0.19     99.69    .587E+02        0.2         1.04        4.22
      0.29     99.79    .102E+03        0.5         1.38        3.16
      0.38     99.88    .149E+03        0.9         1.66        2.64
      0.48     99.98    .200E+03        1.4         1.88        2.32
      0.57    100.07    .254E+03        2.0         2.08        2.10
      0.67    100.17    .311E+03        2.7         2.26        1.93
```

```
       0.76   100.26    .372E+03       3.4          2.42       1.81
       0.86   100.36    .436E+03       4.3          2.57       1.70
       0.95   100.45    .503E+03       5.2          2.70       1.61
       1.05   100.55    .574E+03       6.2          2.83       1.54
       1.16   100.66    .667E+03       7.7          3.02       1.45
       1.28   100.78    .774E+03       9.5          3.22       1.35
       1.39   100.89    .892E+03      11.6          3.40       1.29
       1.50   101.00    .102E+04      13.8          3.54       1.23
       1.61   101.11    .116E+04      16.3          3.67       1.19
       1.72   101.22    .131E+04      18.9          3.79       1.15
       1.84   101.34    .147E+04      21.8          3.90       1.12
       1.95   101.45    .164E+04      25.0          4.00       1.09

                                  <---- hydrograph ---->   <-pipe / channel->
                           AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                           (ha)    (cms)   (hrs)   (mm)       (m)       (m/s)
   INFLOW : ID= 2 (  0041)    6.56     0.48    1.42  17.89      0.27      1.29
   OUTFLOW: ID= 1 (  0040)    6.56     0.50    1.50  17.88      0.27      1.31



--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0042)|   Area     (ha)=   4.15   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.28

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


                         ---- TRANSFORMED HYETOGRAPH ----
              TIME     RAIN |  TIME     RAIN |'  TIME     RAIN |  TIME     RAIN
               hrs    mm/hr |   hrs    mm/hr |'   hrs    mm/hr |   hrs    mm/hr
             0.083     2.59 | 1.083    26.46 | 2.083     6.76 |  3.08     3.13
             0.167     2.59 | 1.167    26.46 | 2.167     6.76 |  3.17     3.13
             0.250     3.01 | 1.250   126.19 | 2.250     5.63 |  3.25     2.89
             0.333     3.01 | 1.333   126.19 | 2.333     5.63 |  3.33     2.89
             0.417     3.61 | 1.417    35.58 | 2.417     4.84 |  3.42     2.68
             0.500     3.61 | 1.500    35.58 | 2.500     4.84 |  3.50     2.68
             0.583     4.54 | 1.583    17.38 | 2.583     4.25 |  3.58     2.50
             0.667     4.54 | 1.667    17.38 | 2.667     4.25 |  3.67     2.50
             0.750     6.19 | 1.750    11.39 | 2.750     3.79 |  3.75     2.35
             0.833     6.19 | 1.833    11.39 | 2.833     3.79 |  3.83     2.35
             0.917     9.92 | 1.917     8.47 | 2.917     3.43 |  3.92     2.21
             1.000     9.92 | 2.000     8.47 | 3.000     3.43 |  4.00     2.21

     Unit Hyd Qpeak  (cms)=   0.566

     PEAK FLOW       (cms)=   0.201 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  18.014
     TOTAL RAINFALL   (mm)=  49.968
     RUNOFF COEFFICIENT   =   0.361

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

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

--------------------
| ADD HYD  (  0039)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
        ID1= 1 (  0040):     6.56   0.497     1.50    17.88
      + ID2= 2 (  0042):     4.15   0.201     1.67    18.01
        ================================================
        ID = 3 (  0039):    10.71   0.677     1.50    17.93

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


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
       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 *****


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DATE: 03-08-2023                           TIME: 01:23:08

USER:



COMMENTS: _____________________________________________________________


--------------------------------------------------------------------------------
----------------------------
  ***********************************************
  ** SIMULATION : 24 - 25-YR Chicago W-S        **
  ***********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1546.810
| Ptotal= 59.08 mm |                          B=   5.746
--------------------                          C=   0.845
                       used in:   INTENSITY =  A / (t + B)^C

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

              TIME     RAIN |  TIME     RAIN |'  TIME     RAIN |  TIME     RAIN
               hrs    mm/hr |   hrs    mm/hr |'   hrs    mm/hr |   hrs    mm/hr
              0.00     3.00 |  1.00    31.33 |  2.00     7.90 |  3.00     3.64
              0.17     3.49 |  1.17   150.60 |  2.17     6.57 |  3.17     3.35
              0.33     4.19 |  1.33    42.20 |  2.33     5.64 |  3.33     3.11
```

0.50	5.28	1.50	20.50	2.50	4.94	3.50	2.90
0.67	7.22	1.67	13.38	2.67	4.41	3.67	2.72
0.83	11.64	1.83	9.92	2.83	3.98	3.83	2.56

CALIB					
NASHYD (0041)	Area (ha)=	6.56	Curve Number (CN)=	82.0	
ID= 1 DT= 5.0 min	Ia (mm)=	8.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.14			

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	3.00	1.083	31.33	2.083	7.90	3.08	3.64
0.167	3.00	1.167	31.33	2.167	7.90	3.17	3.64
0.250	3.49	1.250	150.60	2.250	6.57	3.25	3.35
0.333	3.49	1.333	150.60	2.333	6.57	3.33	3.35
0.417	4.19	1.417	42.20	2.417	5.64	3.42	3.11
0.500	4.19	1.500	42.20	2.500	5.64	3.50	3.11
0.583	5.28	1.583	20.50	2.583	4.94	3.58	2.90
0.667	5.28	1.667	20.50	2.667	4.94	3.67	2.90
0.750	7.22	1.750	13.38	2.750	4.41	3.75	2.72
0.833	7.22	1.833	13.38	2.833	4.41	3.83	2.72
0.917	11.64	1.917	9.92	2.917	3.98	3.92	2.56
1.000	11.64	2.000	9.92	3.000	3.98	4.00	2.56

Unit Hyd Qpeak (cms)= 1.790

PEAK FLOW (cms)= 0.680 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 24.236
TOTAL RAINFALL (mm)= 59.076
RUNOFF COEFFICIENT = 0.410

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

ROUTE CHN(0040)		
IN= 2---> OUT= 1	Routing time step (min)'=	5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	101.50	0.0500	
1.00	100.70	0.0500	
1.50	100.55	0.0500 /0.0300	Main Channel
2.00	99.50	0.0300	Main Channel
3.50	99.60	0.0300	Main Channel
4.50	100.65	0.0300 /0.0500	Main Channel
6.00	101.45	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	99.60	.185E+02	0.0	0.54	8.09
0.19	99.69	.587E+02	0.2	1.04	4.22
0.29	99.79	.102E+03	0.5	1.38	3.16
0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

	<---- hydrograph ---->				<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	0.68	1.42	24.24	0.32	1.47
OUTFLOW: ID= 1 (0040)	6.56	0.68	1.50	24.23	0.32	1.47

CALIB					
NASHYD (0042)	Area (ha)=	4.15	Curve Number (CN)=	82.0	
ID= 1 DT= 5.0 min	Ia (mm)=	8.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.28			

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	3.00	1.083	31.33	2.083	7.90	3.08	3.64
0.167	3.00	1.167	31.33	2.167	7.90	3.17	3.64
0.250	3.49	1.250	150.60	2.250	6.57	3.25	3.35
0.333	3.49	1.333	150.60	2.333	6.57	3.33	3.35
0.417	4.19	1.417	42.20	2.417	5.64	3.42	3.11
0.500	4.19	1.500	42.20	2.500	5.64	3.50	3.11
0.583	5.28	1.583	20.50	2.583	4.94	3.58	2.90
0.667	5.28	1.667	20.50	2.667	4.94	3.67	2.90
0.750	7.22	1.750	13.38	2.750	4.41	3.75	2.72
0.833	7.22	1.833	13.38	2.833	4.41	3.83	2.72
0.917	11.64	1.917	9.92	2.917	3.98	3.92	2.56
1.000	11.64	2.000	9.92	3.000	3.98	4.00	2.56

Unit Hyd Qpeak (cms)= 0.566

PEAK FLOW (cms)= 0.284 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 24.407
TOTAL RAINFALL (mm)= 59.076
RUNOFF COEFFICIENT = 0.413

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

ADD HYD (0039)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.

```
--------------------          (ha)     (cms)     (hrs)      (mm)
        ID1= 1 (  0040):     6.56   0.684     1.50    24.23
      + ID2= 2 (  0042):     4.15   0.284     1.58    24.41
        ================================================
        ID = 3 (  0039):    10.71   0.943     1.50    24.30

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
================================================================================
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       V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
       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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DATE: 03-08-2023                          TIME: 01:23:08

USER:


COMMENTS: _____________________________________________________________


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  ***********************************************
  ** SIMULATION : 25 - 50-YR Chicago W-S        **
  ***********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1802.604
| Ptotal= 65.82 mm |                          B=   6.029
--------------------                          C=   0.853
                       used in:   INTENSITY =  A / (t + B)^C

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

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    3.22 |  1.00   35.30 |  2.00    8.66 |  3.00    3.92
                0.17    3.76 |  1.17  169.09 |  2.17    7.18 |  3.17    3.60
                0.33    4.53 |  1.33   47.71 |  2.33    6.14 |  3.33    3.34
                0.50    5.74 |  1.50   22.94 |  2.50    5.37 |  3.50    3.11
                0.67    7.91 |  1.67   14.85 |  2.67    4.77 |  3.67    2.91
                0.83   12.88 |  1.83   10.94 |  2.83    4.30 |  3.83    2.74

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0041)|   Area     (ha)=   6.56   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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


                              ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    3.22 | 1.083   35.30 | 2.083    8.66 |  3.08    3.92
               0.167    3.22 | 1.167   35.30 | 2.167    8.66 |  3.17    3.92
               0.250    3.76 | 1.250  169.09 | 2.250    7.18 |  3.25    3.60
               0.333    3.76 | 1.333  169.09 | 2.333    7.18 |  3.33    3.60
               0.417    4.53 | 1.417   47.71 | 2.417    6.14 |  3.42    3.34
               0.500    4.53 | 1.500   47.71 | 2.500    6.14 |  3.50    3.34
               0.583    5.74 | 1.583   22.94 | 2.583    5.37 |  3.58    3.11
               0.667    5.74 | 1.667   22.94 | 2.667    5.37 |  3.67    3.11
               0.750    7.91 | 1.750   14.85 | 2.750    4.77 |  3.75    2.91
               0.833    7.91 | 1.833   14.85 | 2.833    4.77 |  3.83    2.91
               0.917   12.88 | 1.917   10.94 | 2.917    4.30 |  3.92    2.74
               1.000   12.88 | 2.000   10.94 | 3.000    4.30 |  4.00    2.74

    Unit Hyd Qpeak  (cms)=   1.790

    PEAK FLOW       (cms)=   0.846 (i)
    TIME TO PEAK    (hrs)=   1.417
    RUNOFF VOLUME    (mm)=  29.211
    TOTAL RAINFALL   (mm)=  65.815
    RUNOFF COEFFICIENT   =   0.444

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

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0040)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
             <------ DATA FOR SECTION (   1.1) ------>
             Distance      Elevation       Manning
                 0.00        101.50        0.0500
                 1.00        100.70        0.0500
                 1.50        100.55    0.0500 /0.0300  Main Channel
                 2.00         99.50        0.0300      Main Channel
                 3.50         99.60        0.0300      Main Channel
                 4.50        100.65    0.0300 /0.0500  Main Channel
                 6.00        101.45        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)       (m)     (cu.m.)       (cms)        (m/s)       (min)
      0.10     99.60    .185E+02         0.0         0.54        8.09
      0.19     99.69    .587E+02         0.2         1.04        4.22
      0.29     99.79    .102E+03         0.5         1.38        3.16
```

0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

	<---- hydrograph ---->				<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	0.85	1.42	29.21	0.36	1.58
OUTFLOW: ID= 1 (0040)	6.56	0.85	1.42	29.21	0.36	1.58

CALIB	
NASHYD (0042)	Area (ha)= 4.15 Curve Number (CN)= 82.0
ID= 1 DT= 5.0 min	Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.28

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	3.22	1.083	35.30	2.083	8.66	3.08	3.92
0.167	3.22	1.167	35.30	2.167	8.66	3.17	3.92
0.250	3.76	1.250	169.09	2.250	7.18	3.25	3.60
0.333	3.76	1.333	169.09	2.333	7.18	3.33	3.60
0.417	4.53	1.417	47.71	2.417	6.14	3.42	3.34
0.500	4.53	1.500	47.71	2.500	6.14	3.50	3.34
0.583	5.74	1.583	22.94	2.583	5.37	3.58	3.11
0.667	5.74	1.667	22.94	2.667	5.37	3.67	3.11
0.750	7.91	1.750	14.85	2.750	4.77	3.75	2.91
0.833	7.91	1.833	14.85	2.833	4.77	3.83	2.91
0.917	12.88	1.917	10.94	2.917	4.30	3.92	2.74
1.000	12.88	2.000	10.94	3.000	4.30	4.00	2.74

Unit Hyd Qpeak (cms)= 0.566

PEAK FLOW (cms)= 0.352 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 29.417
TOTAL RAINFALL (mm)= 65.815
RUNOFF COEFFICIENT = 0.447

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

ADD HYD (0039)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0040):	6.56	0.850	1.42	29.21
+ ID2= 2 (0042):	4.15	0.352	1.58	29.42
ID = 3 (0039):	10.71	1.168	1.50	29.29

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
 V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
 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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USER:

COMMENTS: _____

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  ***********************************************
  ** SIMULATION : 26 - 100-YR Chicago W-S       **
  ***********************************************
```

CHICAGO STORM	IDF curve parameters: A=2051.707
Ptotal= 72.03 mm	B= 6.230
	C= 0.860
	used in: INTENSITY = A / (t + B)^C

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

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN

hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	3.40	1.00	38.94	2.00	9.33	3.00	4.16
0.17	3.98	1.17	186.74	2.17	7.70	3.17	3.82
0.33	4.82	1.33	52.78	2.33	6.56	3.33	3.53
0.50	6.14	1.50	25.16	2.50	5.72	3.50	3.28
0.67	8.50	1.67	16.16	2.67	5.08	3.67	3.07
0.83	13.98	1.83	11.84	2.83	4.57	3.83	2.89

CALIB					
NASHYD (0041)	Area (ha)=	6.56	Curve Number (CN)=	82.0
ID= 1 DT= 5.0 min	Ia (mm)=	8.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.14		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	3.40	1.083	38.94	2.083	9.33	3.08	4.16
0.167	3.40	1.167	38.94	2.167	9.33	3.17	4.16
0.250	3.98	1.250	186.74	2.250	7.70	3.25	3.82
0.333	3.98	1.333	186.74	2.333	7.70	3.33	3.82
0.417	4.82	1.417	52.78	2.417	6.56	3.42	3.53
0.500	4.82	1.500	52.78	2.500	6.56	3.50	3.53
0.583	6.14	1.583	25.16	2.583	5.72	3.58	3.28
0.667	6.14	1.667	25.16	2.667	5.72	3.67	3.28
0.750	8.50	1.750	16.16	2.750	5.08	3.75	3.07
0.833	8.50	1.833	16.16	2.833	5.08	3.83	3.07
0.917	13.98	1.917	11.84	2.917	4.57	3.92	2.89
1.000	13.98	2.000	11.84	3.000	4.57	4.00	2.89

Unit Hyd Qpeak (cms)= 1.790

PEAK FLOW (cms)= 1.009 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 33.968
TOTAL RAINFALL (mm)= 72.028
RUNOFF COEFFICIENT = 0.472

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

ROUTE CHN(0040)		
IN= 2---> OUT= 1	Routing time step (min)'=	5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	101.50	0.0500	
1.00	100.70	0.0500	
1.50	100.55	0.0500 /0.0300	Main Channel
2.00	99.50	0.0300	Main Channel
3.50	99.60	0.0300	Main Channel
4.50	100.65	0.0300 /0.0500	Main Channel
6.00	101.45	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	99.60	.185E+02	0.0	0.54	8.09
0.19	99.69	.587E+02	0.2	1.04	4.22
0.29	99.79	.102E+03	0.5	1.38	3.16
0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

	<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	1.01	1.42	33.97	0.39	1.68
OUTFLOW: ID= 1 (0040)	6.56	1.05	1.42	33.97	0.40	1.70

CALIB					
NASHYD (0042)	Area (ha)=	4.15	Curve Number (CN)=	82.0
ID= 1 DT= 5.0 min	Ia (mm)=	8.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.28		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	3.40	1.083	38.94	2.083	9.33	3.08	4.16
0.167	3.40	1.167	38.94	2.167	9.33	3.17	4.16
0.250	3.98	1.250	186.74	2.250	7.70	3.25	3.82
0.333	3.98	1.333	186.74	2.333	7.70	3.33	3.82
0.417	4.82	1.417	52.78	2.417	6.56	3.42	3.53
0.500	4.82	1.500	52.78	2.500	6.56	3.50	3.53
0.583	6.14	1.583	25.16	2.583	5.72	3.58	3.28
0.667	6.14	1.667	25.16	2.667	5.72	3.67	3.28
0.750	8.50	1.750	16.16	2.750	5.08	3.75	3.07
0.833	8.50	1.833	16.16	2.833	5.08	3.83	3.07
0.917	13.98	1.917	11.84	2.917	4.57	3.92	2.89
1.000	13.98	2.000	11.84	3.000	4.57	4.00	2.89

Unit Hyd Qpeak (cms)= 0.566

PEAK FLOW (cms)= 0.420 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 34.207
TOTAL RAINFALL (mm)= 72.028
RUNOFF COEFFICIENT = 0.475

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

```
--------------------
| ADD HYD  (  0039)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK      R.V.
--------------------          (ha)     (cms)    (hrs)      (mm)
        ID1= 1 (  0040):      6.56   1.046     1.42     33.97
      + ID2= 2 (  0042):      4.15   0.420     1.58     34.21
        ================================================
        ID = 3 (  0039):     10.71   1.381     1.50     34.06

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

 FINISH
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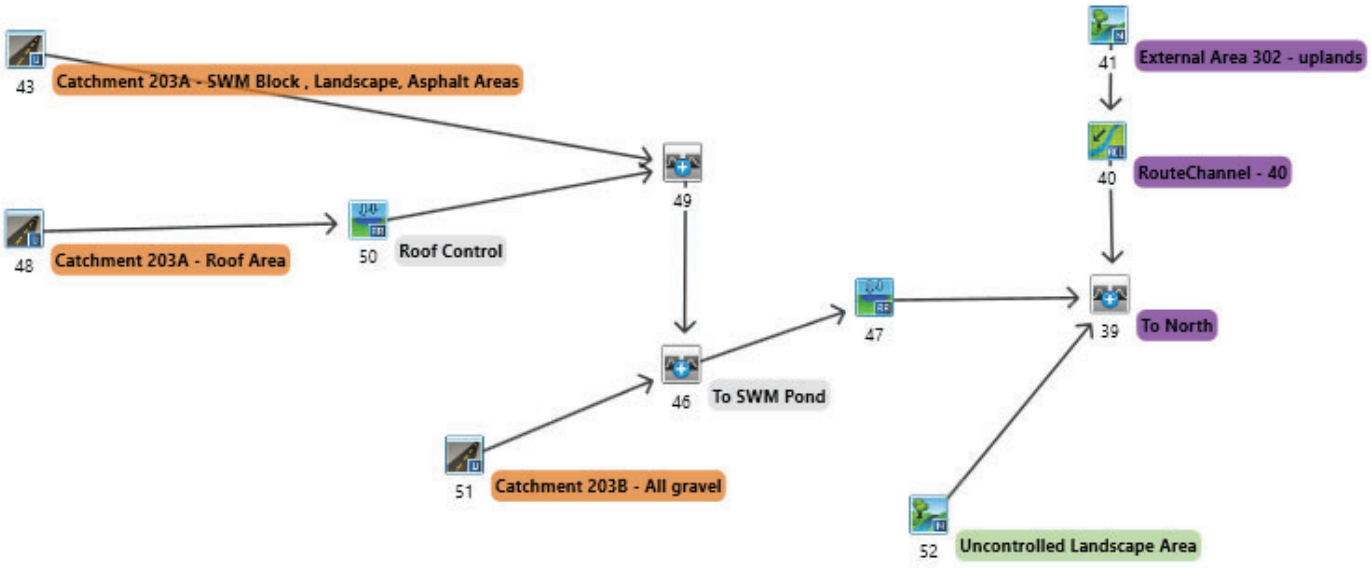

SCHAEFFERS
CONSULTING ENGINEERS

Visual OTTHYMO Schematic
Post-Development Flows with Control Structure
Catchments 203A and 203B

Job #: 5278	**Date: March 2023**

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================================================================================
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       V    V   I    SSSSS  U   U    A    L             (v 6.2.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M M M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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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: 01:45:26

USER:


COMMENTS: _____________________________________________________

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  ***********************************************
  ** SIMULATION : 00 - 25mmchi                 **
  ***********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\sramsoomair\AppD
|                  |              ata\Local\Temp\
|                  |              72e98174-9551-451b-b568-e4dbecda99d3\b941cf82
| Ptotal= 25.02 mm |    Comments: 25mmchi
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    2.17 |  1.00    6.20 |  2.00    5.62 |  3.00    2.95
                0.17    2.38 |  1.17   12.18 |  2.17    4.80 |  3.17    2.76
                0.33    2.66 |  1.33   41.67 |  2.33    4.21 |  3.33    2.62
                0.50    3.03 |  1.50   15.28 |  2.50    3.78 |  3.50    2.47
                0.67    3.58 |  1.67    9.22 |  2.67    3.45 |  3.67    2.35
                0.83    4.47 |  1.83    6.88 |  2.83    3.18 |  3.83    2.23


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--------------------
| CALIB            |
| NASHYD   (  0041)|   Area    (ha)=   6.56   Curve Number   (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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


                              ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.083   2.17 | 1.083    6.20 | 2.083    5.62 |  3.08    2.95
                0.167   2.17 | 1.167    6.20 | 2.167    5.62 |  3.17    2.95
                0.250   2.38 | 1.250   12.18 | 2.250    4.80 |  3.25    2.76
                0.333   2.38 | 1.333   12.18 | 2.333    4.80 |  3.33    2.76
                0.417   2.66 | 1.417   41.67 | 2.417    4.21 |  3.42    2.62
                0.500   2.66 | 1.500   41.67 | 2.500    4.21 |  3.50    2.62
                0.583   3.03 | 1.583   15.28 | 2.583    3.78 |  3.58    2.47
                0.667   3.03 | 1.667   15.28 | 2.667    3.78 |  3.67    2.47
                0.750   3.58 | 1.750    9.22 | 2.750    3.45 |  3.75    2.35
                0.833   3.58 | 1.833    9.22 | 2.833    3.45 |  3.83    2.35
                0.917   4.47 | 1.917    6.88 | 2.917    3.18 |  3.92    2.23
                1.000   4.47 | 2.000    6.88 | 3.000    3.18 |  4.00    2.23

    Unit Hyd Qpeak  (cms)=   1.790

    PEAK FLOW       (cms)=   0.049 (i)
    TIME TO PEAK    (hrs)=   1.667
    RUNOFF VOLUME    (mm)=   3.952
    TOTAL RAINFALL   (mm)=  25.023
    RUNOFF COEFFICIENT   =   0.158

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

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0040)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00         101.50        0.0500
                  1.00         100.70        0.0500
                  1.50         100.55    0.0500 /0.0300  Main Channel
                  2.00          99.50        0.0300      Main Channel
                  3.50          99.60        0.0300      Main Channel
                  4.50         100.65    0.0300 /0.0500  Main Channel
                  6.00         101.45        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE     VELOCITY   TRAV.TIME
       (m)       (m)     (cu.m.)       (cms)        (m/s)       (min)
      0.10     99.60    .185E+02         0.0         0.54        8.09
      0.19     99.69    .587E+02         0.2         1.04        4.22
      0.29     99.79    .102E+03         0.5         1.38        3.16
      0.38     99.88    .149E+03         0.9         1.66        2.64
      0.48     99.98    .200E+03         1.4         1.88        2.32
      0.57    100.07    .254E+03         2.0         2.08        2.10
      0.67    100.17    .311E+03         2.7         2.26        1.93
      0.76    100.26    .372E+03         3.4         2.42        1.81
      0.86    100.36    .436E+03         4.3         2.57        1.70
      0.95    100.45    .503E+03         5.2         2.70        1.61
      1.05    100.55    .574E+03         6.2         2.83        1.54
      1.16    100.66    .667E+03         7.7         3.02        1.45
      1.28    100.78    .774E+03         9.5         3.22        1.35
      1.39    100.89    .892E+03        11.6         3.40        1.29
```

1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

	<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0041)	6.56	0.05	1.67	3.95	0.10	0.55
OUTFLOW: ID= 1 (0040)	6.56	0.04	1.92	3.95	0.10	0.55

CALIB			
NASHYD (0052)	Area (ha)=	0.08	Curve Number (CN)= 80.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.11	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.17	1.083	6.20	2.083	5.62	3.08	2.95
0.167	2.17	1.167	6.20	2.167	5.62	3.17	2.95
0.250	2.38	1.250	12.18	2.250	4.80	3.25	2.76
0.333	2.38	1.333	12.18	2.333	4.80	3.33	2.76
0.417	2.66	1.417	41.67	2.417	4.21	3.42	2.62
0.500	2.66	1.500	41.67	2.500	4.21	3.50	2.62
0.583	3.03	1.583	15.28	2.583	3.78	3.58	2.47
0.667	3.03	1.667	15.28	2.667	3.78	3.67	2.47
0.750	3.58	1.750	9.22	2.750	3.45	3.75	2.35
0.833	3.58	1.833	9.22	2.833	3.45	3.83	2.35
0.917	4.47	1.917	6.88	2.917	3.18	3.92	2.23
1.000	4.47	2.000	6.88	3.000	3.18	4.00	2.23

Unit Hyd Qpeak	(cms)=	0.026	
PEAK FLOW	(cms)=	0.001	(i)
TIME TO PEAK	(hrs)=	1.583	
RUNOFF VOLUME	(mm)=	4.707	
TOTAL RAINFALL	(mm)=	25.023	
RUNOFF COEFFICIENT	=	0.188	

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

CALIB			
STANDHYD (0043)	Area (ha)=	2.03	
ID= 1 DT= 5.0 min	Total Imp(%)=	63.00	Dir. Conn.(%)= 63.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.28	0.75
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.30	2.00
Length	(m)=	116.33	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.17	1.083	6.20	2.083	5.62	3.08	2.95
0.167	2.17	1.167	6.20	2.167	5.62	3.17	2.95
0.250	2.38	1.250	12.18	2.250	4.80	3.25	2.76
0.333	2.38	1.333	12.18	2.333	4.80	3.33	2.76
0.417	2.66	1.417	41.67	2.417	4.21	3.42	2.62
0.500	2.66	1.500	41.67	2.500	4.21	3.50	2.62
0.583	3.03	1.583	15.28	2.583	3.78	3.58	2.47
0.667	3.03	1.667	15.28	2.667	3.78	3.67	2.47
0.750	3.58	1.750	9.22	2.750	3.45	3.75	2.35
0.833	3.58	1.833	9.22	2.833	3.45	3.83	2.35
0.917	4.47	1.917	6.88	2.917	3.18	3.92	2.23
1.000	4.47	2.000	6.88	3.000	3.18	4.00	2.23

Max.Eff.Inten.	(mm/hr)=	41.67	3.86	
	over (min)	5.00	30.00	
Storage Coeff.	(min)=	3.67 (ii)	29.62 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	30.00	
Unit Hyd. peak	(cms)=	0.25	0.04	
				TOTALS
PEAK FLOW	(cms)=	0.14	0.00	0.142 (iii)
TIME TO PEAK	(hrs)=	1.50	2.08	1.50
RUNOFF VOLUME	(mm)=	24.02	4.80	16.90
TOTAL RAINFALL	(mm)=	25.02	25.02	25.02
RUNOFF COEFFICIENT	=	0.96	0.19	0.68

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0048)	Area (ha)=	0.24	
ID= 1 DT= 5.0 min	Total Imp(%)=	99.00	Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.24	0.00
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	40.00	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.17	1.083	6.20	2.083	5.62	3.08	2.95
0.167	2.17	1.167	6.20	2.167	5.62	3.17	2.95
0.250	2.38	1.250	12.18	2.250	4.80	3.25	2.76
0.333	2.38	1.333	12.18	2.333	4.80	3.33	2.76
0.417	2.66	1.417	41.67	2.417	4.21	3.42	2.62
0.500	2.66	1.500	41.67	2.500	4.21	3.50	2.62
0.583	3.03	1.583	15.28	2.583	3.78	3.58	2.47

```
              0.667    3.03 | 1.667   15.28 | 2.667    3.78 |  3.67    2.47
              0.750    3.58 | 1.750    9.22 | 2.750    3.45 |  3.75    2.35
              0.833    3.58 | 1.833    9.22 | 2.833    3.45 |  3.83    2.35
              0.917    4.47 | 1.917    6.88 | 2.917    3.18 |  3.92    2.23
              1.000    4.47 | 2.000    6.88 | 3.000    3.18 |  4.00    2.23

     Max.Eff.Inten.(mm/hr)=      41.67         5.33
               over (min)         5.00         5.00
     Storage Coeff.  (min)=       2.09 (ii)    3.69 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.31         0.25
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.00        0.027 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=      24.02         4.80         23.83
     TOTAL RAINFALL   (mm)=      25.02        25.02         25.02
     RUNOFF COEFFICIENT   =       0.96         0.19          0.95

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  80.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0050)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.0128     0.0103

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0048)    0.240     0.027      1.50      23.83
   OUTFLOW: ID= 1 (  0050)    0.240     0.004      2.08      23.02

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 14.31
                  TIME SHIFT OF PEAK FLOW         (min)= 35.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0032

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--------------------
| ADD HYD  (  0049)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0043):     2.03   0.142     1.50    16.90
     + ID2= 2 (  0050):     0.24   0.004     2.08    23.02
       ================================================
       ID = 3 (  0049):     2.27   0.144     1.50    17.55

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0051)|   Area     (ha)=   1.68
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.66         0.02
     Dep. Storage     (mm)=       5.00         1.50

     Average Slope    (%)=       1.20         2.00
     Length           (m)=     105.83        40.00
     Mannings n          =      0.013        0.250

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

                              ---- TRANSFORMED HYETOGRAPH ----
       TIME    RAIN |   TIME    RAIN |'  TIME    RAIN |   TIME    RAIN
        hrs   mm/hr |    hrs   mm/hr |'   hrs   mm/hr |    hrs   mm/hr
      0.083    2.17 | 1.083    6.20 | 2.083    5.62 |  3.08    2.95
      0.167    2.17 | 1.167    6.20 | 2.167    5.62 |  3.17    2.95
      0.250    2.38 | 1.250   12.18 | 2.250    4.80 |  3.25    2.76
      0.333    2.38 | 1.333   12.18 | 2.333    4.80 |  3.33    2.76
      0.417    2.66 | 1.417   41.67 | 2.417    4.21 |  3.42    2.62
      0.500    2.66 | 1.500   41.67 | 2.500    4.21 |  3.50    2.62
      0.583    3.03 | 1.583   15.28 | 2.583    3.78 |  3.58    2.47
      0.667    3.03 | 1.667   15.28 | 2.667    3.78 |  3.67    2.47
      0.750    3.58 | 1.750    9.22 | 2.750    3.45 |  3.75    2.35
      0.833    3.58 | 1.833    9.22 | 2.833    3.45 |  3.83    2.35
      0.917    4.47 | 1.917    6.88 | 2.917    3.18 |  3.92    2.23
      1.000    4.47 | 2.000    6.88 | 3.000    3.18 |  4.00    2.23

     Max.Eff.Inten.(mm/hr)=      41.67         8.80
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       3.55 (ii)    5.15 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.26         0.16
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.18         0.00        0.184 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.58          1.50
     RUNOFF VOLUME    (mm)=      20.02         6.36         19.89
     TOTAL RAINFALL   (mm)=      25.02        25.02         25.02
     RUNOFF COEFFICIENT   =       0.80         0.25          0.79

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  80.0    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  (  0046)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0049):     2.27   0.144     1.50    17.55
     + ID2= 2 (  0051):     1.68   0.184     1.50    19.89
       ================================================
       ID = 3 (  0046):     3.95   0.328     1.50    18.54

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0047)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.1630     0.2697
                         0.0080     0.0487   |   0.1700     0.2885
                         0.0100     0.0674   |   0.1720     0.2960
```

```
                        0.0880     0.1049   |   0.1760      0.3072
                        0.1040     0.1311   |   0.1770      0.3109
                        0.1170     0.1573   |   0.1800      0.3184
                        0.1260     0.1761   |   0.1870      0.3409
                        0.1300     0.1836   |   0.1880      0.3447
                        0.1570     0.2510   |   0.1910      0.3559

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0046)    3.950      0.328      1.50      18.54
   OUTFLOW: ID= 1 (  0047)    3.950      0.010      4.08      18.15

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.90
                  TIME SHIFT OF PEAK FLOW          (min)=155.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0628

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

--------------------
| ADD HYD  (  0039)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0040):     6.56   0.044     1.92     3.95
      + ID2= 2 (  0047):     3.95   0.010     4.08    18.15
        ================================================
        ID = 3 (  0039):    10.51   0.050     1.92     9.29

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

--------------------
| ADD HYD  (  0039)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0039):    10.51   0.050     1.92     9.29
      + ID2= 2 (  0052):     0.08   0.001     1.58     4.71
        ================================================
        ID = 1 (  0039):    10.59   0.051     1.92     9.25

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

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
       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\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\a547580b-3228-4aac-849d-536df6c6a5ec\
  Summary filename: C:\Users\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\a547580b-3228-4aac-849d-536df6c6a5ec\


DATE: 03-08-2023                          TIME: 01:45:26

USER:



COMMENTS: _____________________________________________________

--------------------------------------------------------------------------------
---------------------------
  *********************************************
  ** SIMULATION : 01 - 2 YR - SCS TYPE II 12HR  **
  *********************************************

--------------------
| MASS STORM       |    Filename: C:\Users\sramsoomair\AppD
|                  |              ata\Local\Temp\
|                  |              72e98174-9551-451b-b568-e4dbecda99d3\230bb9d3
| Ptotal= 40.00 mm |    Comments: SCS TYPE II MASS CURVE
--------------------
                       Duration of storm    = 12.00 hrs
                       Mass curve time step = 15.00 min

                TIME     RAIN |  TIME     RAIN |'  TIME     RAIN |  TIME     RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00     1.00 |  3.00     1.60 |  6.00     7.20 |  9.00     1.40
                0.25     1.00 |  3.25     1.60 |  6.25     7.20 |  9.25     1.40
                0.50     1.00 |  3.50     1.60 |  6.50     3.20 |  9.50     1.40
                0.75     1.00 |  3.75     1.60 |  6.75     3.20 |  9.75     1.40
                1.00     1.00 |  4.00     2.40 |  7.00     2.40 | 10.00     0.80
                1.25     1.00 |  4.25     2.40 |  7.25     2.40 | 10.25     0.80
                1.50     1.00 |  4.50     3.20 |  7.50     2.40 | 10.50     0.80
                1.75     1.00 |  4.75     3.20 |  7.75     2.40 | 10.75     0.80
                2.00     1.20 |  5.00     4.80 |  8.00     1.40 | 11.00     0.80
                2.25     1.20 |  5.25     4.80 |  8.25     1.40 | 11.25     0.80
                2.50     1.20 |  5.50    19.20 |  8.50     1.40 | 11.50     0.80
                2.75     1.20 |  5.75    52.80 |  8.75     1.40 | 11.75     0.80

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0041)|   Area     (ha)=   6.56   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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


                          ---- TRANSFORMED HYETOGRAPH ----
                TIME     RAIN |  TIME     RAIN |'  TIME     RAIN |  TIME     RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083     1.00 | 3.083     1.60 | 6.083     7.20 |  9.08     1.40
               0.167     1.00 | 3.167     1.60 | 6.167     7.20 |  9.17     1.40
               0.250     1.00 | 3.250     1.60 | 6.250     7.20 |  9.25     1.40
               0.333     1.00 | 3.333     1.60 | 6.333     7.20 |  9.33     1.40
               0.417     1.00 | 3.417     1.60 | 6.417     7.20 |  9.42     1.40
               0.500     1.00 | 3.500     1.60 | 6.500     7.20 |  9.50     1.40
```

0.583	1.00	3.583	1.60	6.583	3.20	9.58	1.40
0.667	1.00	3.667	1.60	6.667	3.20	9.67	1.40
0.750	1.00	3.750	1.60	6.750	3.20	9.75	1.40
0.833	1.00	3.833	1.60	6.833	3.20	9.83	1.40
0.917	1.00	3.917	1.60	6.917	3.20	9.92	1.40
1.000	1.00	4.000	1.60	7.000	3.20	10.00	1.40
1.083	1.00	4.083	2.40	7.083	2.40	10.08	0.80
1.167	1.00	4.167	2.40	7.167	2.40	10.17	0.80
1.250	1.00	4.250	2.40	7.250	2.40	10.25	0.80
1.333	1.00	4.333	2.40	7.333	2.40	10.33	0.80
1.417	1.00	4.417	2.40	7.417	2.40	10.42	0.80
1.500	1.00	4.500	2.40	7.500	2.40	10.50	0.80
1.583	1.00	4.583	3.20	7.583	2.40	10.58	0.80
1.667	1.00	4.667	3.20	7.667	2.40	10.67	0.80
1.750	1.00	4.750	3.20	7.750	2.40	10.75	0.80
1.833	1.00	4.833	3.20	7.833	2.40	10.83	0.80
1.917	1.00	4.917	3.20	7.917	2.40	10.92	0.80
2.000	1.00	5.000	3.20	8.000	2.40	11.00	0.80
2.083	1.20	5.083	4.80	8.083	1.40	11.08	0.80
2.167	1.20	5.167	4.80	8.167	1.40	11.17	0.80
2.250	1.20	5.250	4.80	8.250	1.40	11.25	0.80
2.333	1.20	5.333	4.80	8.333	1.40	11.33	0.80
2.417	1.20	5.417	4.80	8.417	1.40	11.42	0.80
2.500	1.20	5.500	4.80	8.500	1.40	11.50	0.80
2.583	1.20	5.583	19.20	8.583	1.40	11.58	0.80
2.667	1.20	5.667	19.20	8.667	1.40	11.67	0.80
2.750	1.20	5.750	19.20	8.750	1.40	11.75	0.80
2.833	1.20	5.833	52.80	8.833	1.40	11.83	0.80
2.917	1.20	5.917	52.80	8.917	1.40	11.92	0.80
3.000	1.20	6.000	52.80	9.000	1.40	12.00	0.80

Unit Hyd Qpeak (cms)= 1.790

PEAK FLOW (cms)= 0.274 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 11.581
TOTAL RAINFALL (mm)= 40.000
RUNOFF COEFFICIENT = 0.290

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

ROUTE CHN(0040)	
IN= 2---> OUT= 1	Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	101.50	0.0500	
1.00	100.70	0.0500	
1.50	100.55	0.0500 /0.0300	Main Channel
2.00	99.50	0.0300	Main Channel
3.50	99.60	0.0300	Main Channel
4.50	100.65	0.0300 /0.0500	Main Channel
6.00	101.45	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	99.60	.185E+02	0.0	0.54	8.09
0.19	99.69	.587E+02	0.2	1.04	4.22
0.29	99.79	.102E+03	0.5	1.38	3.16
0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	0.27	6.00	11.58	0.20	1.07
OUTFLOW: ID= 1 (0040)	6.56	0.27	6.08	11.58	0.20	1.07

CALIB			
NASHYD (0052)	Area (ha)= 0.08	Curve Number (CN)= 80.0	
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.11		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.00	3.083	1.60	6.083	7.20	9.08	1.40
0.167	1.00	3.167	1.60	6.167	7.20	9.17	1.40
0.250	1.00	3.250	1.60	6.250	7.20	9.25	1.40
0.333	1.00	3.333	1.60	6.333	7.20	9.33	1.40
0.417	1.00	3.417	1.60	6.417	7.20	9.42	1.40
0.500	1.00	3.500	1.60	6.500	7.20	9.50	1.40
0.583	1.00	3.583	1.60	6.583	3.20	9.58	1.40
0.667	1.00	3.667	1.60	6.667	3.20	9.67	1.40
0.750	1.00	3.750	1.60	6.750	3.20	9.75	1.40
0.833	1.00	3.833	1.60	6.833	3.20	9.83	1.40
0.917	1.00	3.917	1.60	6.917	3.20	9.92	1.40
1.000	1.00	4.000	1.60	7.000	3.20	10.00	1.40
1.083	1.00	4.083	2.40	7.083	2.40	10.08	0.80
1.167	1.00	4.167	2.40	7.167	2.40	10.17	0.80
1.250	1.00	4.250	2.40	7.250	2.40	10.25	0.80
1.333	1.00	4.333	2.40	7.333	2.40	10.33	0.80
1.417	1.00	4.417	2.40	7.417	2.40	10.42	0.80
1.500	1.00	4.500	2.40	7.500	2.40	10.50	0.80
1.583	1.00	4.583	3.20	7.583	2.40	10.58	0.80
1.667	1.00	4.667	3.20	7.667	2.40	10.67	0.80
1.750	1.00	4.750	3.20	7.750	2.40	10.75	0.80
1.833	1.00	4.833	3.20	7.833	2.40	10.83	0.80
1.917	1.00	4.917	3.20	7.917	2.40	10.92	0.80
2.000	1.00	5.000	3.20	8.000	2.40	11.00	0.80
2.083	1.20	5.083	4.80	8.083	1.40	11.08	0.80
2.167	1.20	5.167	4.80	8.167	1.40	11.17	0.80
2.250	1.20	5.250	4.80	8.250	1.40	11.25	0.80
2.333	1.20	5.333	4.80	8.333	1.40	11.33	0.80

2.417	1.20	5.417	4.80	8.417	1.40	11.42	0.80
2.500	1.20	5.500	4.80	8.500	1.40	11.50	0.80
2.583	1.20	5.583	19.20	8.583	1.40	11.58	0.80
2.667	1.20	5.667	19.20	8.667	1.40	11.67	0.80
2.750	1.20	5.750	19.20	8.750	1.40	11.75	0.80
2.833	1.20	5.833	52.80	8.833	1.40	11.83	0.80
2.917	1.20	5.917	52.80	8.917	1.40	11.92	0.80
3.000	1.20	6.000	52.80	9.000	1.40	12.00	0.80

Unit Hyd Qpeak (cms)= 0.026

PEAK FLOW (cms)= 0.004 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 12.202
TOTAL RAINFALL (mm)= 40.000
RUNOFF COEFFICIENT = 0.305

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

CALIB	
STANDHYD (0043)	Area (ha)= 2.03
ID= 1 DT= 5.0 min	Total Imp(%)= 63.00 Dir. Conn.(%)= 63.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.28	0.75
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.30	2.00
Length	(m)=	116.33	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	1.00	3.083	1.60	6.083	7.20	9.08	1.40
0.167	1.00	3.167	1.60	6.167	7.20	9.17	1.40
0.250	1.00	3.250	1.60	6.250	7.20	9.25	1.40
0.333	1.00	3.333	1.60	6.333	7.20	9.33	1.40
0.417	1.00	3.417	1.60	6.417	7.20	9.42	1.40
0.500	1.00	3.500	1.60	6.500	7.20	9.50	1.40
0.583	1.00	3.583	1.60	6.583	3.20	9.58	1.40
0.667	1.00	3.667	1.60	6.667	3.20	9.67	1.40
0.750	1.00	3.750	1.60	6.750	3.20	9.75	1.40
0.833	1.00	3.833	1.60	6.833	3.20	9.83	1.40
0.917	1.00	3.917	1.60	6.917	3.20	9.92	1.40
1.000	1.00	4.000	1.60	7.000	3.20	10.00	1.40
1.083	1.00	4.083	2.40	7.083	2.40	10.08	0.80
1.167	1.00	4.167	2.40	7.167	2.40	10.17	0.80
1.250	1.00	4.250	2.40	7.250	2.40	10.25	0.80
1.333	1.00	4.333	2.40	7.333	2.40	10.33	0.80
1.417	1.00	4.417	2.40	7.417	2.40	10.42	0.80
1.500	1.00	4.500	2.40	7.500	2.40	10.50	0.80
1.583	1.00	4.583	3.20	7.583	2.40	10.58	0.80
1.667	1.00	4.667	3.20	7.667	2.40	10.67	0.80
1.750	1.00	4.750	3.20	7.750	2.40	10.75	0.80
1.833	1.00	4.833	3.20	7.833	2.40	10.83	0.80
1.917	1.00	4.917	3.20	7.917	2.40	10.92	0.80
2.000	1.00	5.000	3.20	8.000	2.40	11.00	0.80
2.083	1.20	5.083	4.80	8.083	1.40	11.08	0.80
2.167	1.20	5.167	4.80	8.167	1.40	11.17	0.80
2.250	1.20	5.250	4.80	8.250	1.40	11.25	0.80
2.333	1.20	5.333	4.80	8.333	1.40	11.33	0.80
2.417	1.20	5.417	4.80	8.417	1.40	11.42	0.80
2.500	1.20	5.500	4.80	8.500	1.40	11.50	0.80
2.583	1.20	5.583	19.20	8.583	1.40	11.58	0.80
2.667	1.20	5.667	19.20	8.667	1.40	11.67	0.80
2.750	1.20	5.750	19.20	8.750	1.40	11.75	0.80
2.833	1.20	5.833	52.80	8.833	1.40	11.83	0.80
2.917	1.20	5.917	52.80	8.917	1.40	11.92	0.80
3.000	1.20	6.000	52.80	9.000	1.40	12.00	0.80

Max.Eff.Inten.(mm/hr)=	52.80	19.22		
over (min)	5.00	20.00		
Storage Coeff. (min)=	3.34 (ii)	16.99 (ii)		
Unit Hyd. Tpeak (min)=	5.00	20.00		
Unit Hyd. peak (cms)=	0.26	0.06		
			TOTALS	
PEAK FLOW (cms)=	0.19	0.02	0.200 (iii)	
TIME TO PEAK (hrs)=	6.00	6.17	6.00	
RUNOFF VOLUME (mm)=	39.00	12.44	29.17	
TOTAL RAINFALL (mm)=	40.00	40.00	40.00	
RUNOFF COEFFICIENT =	0.97	0.31	0.73	

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0048)	Area (ha)= 0.24
ID= 1 DT= 5.0 min	Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.24	0.00
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	40.00	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	1.00	3.083	1.60	6.083	7.20	9.08	1.40
0.167	1.00	3.167	1.60	6.167	7.20	9.17	1.40
0.250	1.00	3.250	1.60	6.250	7.20	9.25	1.40
0.333	1.00	3.333	1.60	6.333	7.20	9.33	1.40
0.417	1.00	3.417	1.60	6.417	7.20	9.42	1.40
0.500	1.00	3.500	1.60	6.500	7.20	9.50	1.40
0.583	1.00	3.583	1.60	6.583	3.20	9.58	1.40
0.667	1.00	3.667	1.60	6.667	3.20	9.67	1.40
0.750	1.00	3.750	1.60	6.750	3.20	9.75	1.40
0.833	1.00	3.833	1.60	6.833	3.20	9.83	1.40
0.917	1.00	3.917	1.60	6.917	3.20	9.92	1.40
1.000	1.00	4.000	1.60	7.000	3.20	10.00	1.40
1.083	1.00	4.083	2.40	7.083	2.40	10.08	0.80
1.167	1.00	4.167	2.40	7.167	2.40	10.17	0.80

1.250	1.00	4.250	2.40	7.250	2.40	10.25	0.80
1.333	1.00	4.333	2.40	7.333	2.40	10.33	0.80
1.417	1.00	4.417	2.40	7.417	2.40	10.42	0.80
1.500	1.00	4.500	2.40	7.500	2.40	10.50	0.80
1.583	1.00	4.583	3.20	7.583	2.40	10.58	0.80
1.667	1.00	4.667	3.20	7.667	2.40	10.67	0.80
1.750	1.00	4.750	3.20	7.750	2.40	10.75	0.80
1.833	1.00	4.833	3.20	7.833	2.40	10.83	0.80
1.917	1.00	4.917	3.20	7.917	2.40	10.92	0.80
2.000	1.00	5.000	3.20	8.000	2.40	11.00	0.80
2.083	1.20	5.083	4.80	8.083	1.40	11.08	0.80
2.167	1.20	5.167	4.80	8.167	1.40	11.17	0.80
2.250	1.20	5.250	4.80	8.250	1.40	11.25	0.80
2.333	1.20	5.333	4.80	8.333	1.40	11.33	0.80
2.417	1.20	5.417	4.80	8.417	1.40	11.42	0.80
2.500	1.20	5.500	4.80	8.500	1.40	11.50	0.80
2.583	1.20	5.583	19.20	8.583	1.40	11.58	0.80
2.667	1.20	5.667	19.20	8.667	1.40	11.67	0.80
2.750	1.20	5.750	19.20	8.750	1.40	11.75	0.80
2.833	1.20	5.833	52.80	8.833	1.40	11.83	0.80
2.917	1.20	5.917	52.80	8.917	1.40	11.92	0.80
3.000	1.20	6.000	52.80	9.000	1.40	12.00	0.80

Max.Eff.Inten.(mm/hr)=	52.80	21.12	
over (min)	5.00	5.00	
Storage Coeff. (min)=	1.90 (ii)	3.35 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.32	0.26	
			TOTALS
PEAK FLOW (cms)=	0.03	0.00	0.035 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00
RUNOFF VOLUME (mm)=	39.00	12.44	38.73
TOTAL RAINFALL (mm)=	40.00	40.00	40.00
RUNOFF COEFFICIENT =	0.97	0.31	0.97

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0050)	OVERFLOW IS OFF
IN= 2---> OUT= 1	
DT= 5.0 min	OUTFLOW (cms) / STORAGE (ha.m.)	OUTFLOW (cms) / STORAGE (ha.m.)
	0.0000 / 0.0000	0.0128 / 0.0103

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0048)	0.240	0.035	6.00	38.73
OUTFLOW: ID= 1 (0050)	0.240	0.006	6.08	37.91

PEAK FLOW REDUCTION [Qout/Qin](%)= 17.30
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0049

ADD HYD (0049)

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0043):	2.03	0.200	6.00	29.17
+ ID2= 2 (0050):	0.24	0.006	6.08	37.91
ID = 3 (0049):	2.27	0.206	6.00	30.09

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	Area (ha)= 1.68
STANDHYD (0051)	Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00
ID= 1 DT= 5.0 min	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.66	0.02
Dep. Storage	(mm)=	5.00	1.50
Average Slope	(%)=	1.20	2.00
Length	(m)=	105.83	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.00	3.083	1.60	6.083	7.20	9.08	1.40
0.167	1.00	3.167	1.60	6.167	7.20	9.17	1.40
0.250	1.00	3.250	1.60	6.250	7.20	9.25	1.40
0.333	1.00	3.333	1.60	6.333	7.20	9.33	1.40
0.417	1.00	3.417	1.60	6.417	7.20	9.42	1.40
0.500	1.00	3.500	1.60	6.500	7.20	9.50	1.40
0.583	1.00	3.583	1.60	6.583	3.20	9.58	1.40
0.667	1.00	3.667	1.60	6.667	3.20	9.67	1.40
0.750	1.00	3.750	1.60	6.750	3.20	9.75	1.40
0.833	1.00	3.833	1.60	6.833	3.20	9.83	1.40
0.917	1.00	3.917	1.60	6.917	3.20	9.92	1.40
1.000	1.00	4.000	1.60	7.000	3.20	10.00	1.40
1.083	1.00	4.083	2.40	7.083	2.40	10.08	0.80
1.167	1.00	4.167	2.40	7.167	2.40	10.17	0.80
1.250	1.00	4.250	2.40	7.250	2.40	10.25	0.80
1.333	1.00	4.333	2.40	7.333	2.40	10.33	0.80
1.417	1.00	4.417	2.40	7.417	2.40	10.42	0.80
1.500	1.00	4.500	2.40	7.500	2.40	10.50	0.80
1.583	1.00	4.583	3.20	7.583	2.40	10.58	0.80
1.667	1.00	4.667	3.20	7.667	2.40	10.67	0.80
1.750	1.00	4.750	3.20	7.750	2.40	10.75	0.80
1.833	1.00	4.833	3.20	7.833	2.40	10.83	0.80
1.917	1.00	4.917	3.20	7.917	2.40	10.92	0.80
2.000	1.00	5.000	3.20	8.000	2.40	11.00	0.80
2.083	1.20	5.083	4.80	8.083	1.40	11.08	0.80
2.167	1.20	5.167	4.80	8.167	1.40	11.17	0.80
2.250	1.20	5.250	4.80	8.250	1.40	11.25	0.80
2.333	1.20	5.333	4.80	8.333	1.40	11.33	0.80
2.417	1.20	5.417	4.80	8.417	1.40	11.42	0.80
2.500	1.20	5.500	4.80	8.500	1.40	11.50	0.80
2.583	1.20	5.583	19.20	8.583	1.40	11.58	0.80
2.667	1.20	5.667	19.20	8.667	1.40	11.67	0.80
2.750	1.20	5.750	19.20	8.750	1.40	11.75	0.80
2.833	1.20	5.833	52.80	8.833	1.40	11.83	0.80
2.917	1.20	5.917	52.80	8.917	1.40	11.92	0.80
3.000	1.20	6.000	52.80	9.000	1.40	12.00	0.80

```
     Max.Eff.Inten.(mm/hr)=      52.80        23.67
                 over (min)       5.00         5.00
     Storage Coeff.  (min)=       3.23 (ii)    4.68 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.27         0.22
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.24         0.00       0.244 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00         6.00
     RUNOFF VOLUME    (mm)=      35.00        14.53        34.79
     TOTAL RAINFALL   (mm)=      40.00        40.00        40.00
     RUNOFF COEFFICIENT   =       0.87         0.36         0.87

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  80.0    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  (  0046)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)      (mm)
        ID1= 1 (  0049):     2.27   0.206     6.00    30.09
      + ID2= 2 (  0051):     1.68   0.244     6.00    34.79
        ================================================
        ID = 3 (  0046):     3.95   0.449     6.00    32.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0047)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.1630      0.2697
                          0.0080     0.0487   |   0.1700      0.2885
                          0.0100     0.0674   |   0.1720      0.2960
                          0.0880     0.1049   |   0.1760      0.3072
                          0.1040     0.1311   |   0.1770      0.3109
                          0.1170     0.1573   |   0.1800      0.3184
                          0.1260     0.1761   |   0.1870      0.3409
                          0.1300     0.1836   |   0.1880      0.3447
                          0.1570     0.2510   |   0.1910      0.3559

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0046)     3.950      0.449      6.00      32.09
   OUTFLOW: ID= 1 (  0047)     3.950      0.041      6.75      31.70

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  9.16
                  TIME SHIFT OF PEAK FLOW          (min)= 45.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0824

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

--------------------
| ADD HYD  (  0039)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)      (mm)
        ID1= 1 (  0040):     6.56   0.274     6.08    11.58
      + ID2= 2 (  0047):     3.95   0.041     6.75    31.70
        ================================================
        ID = 3 (  0039):    10.51   0.293     6.08    19.14

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

--------------------
| ADD HYD  (  0039)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)      (mm)
        ID1= 3 (  0039):    10.51   0.293     6.08    19.14
      + ID2= 2 (  0052):     0.08   0.004     6.00    12.20
        ================================================
        ID = 1 (  0039):    10.59   0.296     6.08    19.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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================================================================================
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       V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
       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\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\e45fbe39-142c-4cdf-aa21-b6f7c43411ce\
  Summary filename: C:\Users\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\e45fbe39-142c-4cdf-aa21-b6f7c43411ce\


DATE: 03-08-2023                          TIME: 01:45:27

USER:



COMMENTS: _____________________________________________________

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  ********************************************
  ** SIMULATION : 02 - 5 YR - SCS TYPE II 12HR  **
  ********************************************

--------------------
| MASS STORM       |    Filename: C:\Users\sramsoomair\AppD
|                  |              ata\Local\Temp\
```

		72e98174-9551-451b-b568-e4dbecda99d3\42aab81d
Ptotal= 52.90 mm	Comments: SCS TYPE II MASS CURVE	

Duration of storm = 12.00 hrs
Mass curve time step = 15.00 min

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	1.32	3.00	2.12	6.00	9.52	9.00	1.85
0.25	1.32	3.25	2.12	6.25	9.52	9.25	1.85
0.50	1.32	3.50	2.12	6.50	4.23	9.50	1.85
0.75	1.32	3.75	2.12	6.75	4.23	9.75	1.85
1.00	1.32	4.00	3.17	7.00	3.17	10.00	1.06
1.25	1.32	4.25	3.17	7.25	3.17	10.25	1.06
1.50	1.32	4.50	4.23	7.50	3.17	10.50	1.06
1.75	1.32	4.75	4.23	7.75	3.17	10.75	1.06
2.00	1.59	5.00	6.35	8.00	1.85	11.00	1.06
2.25	1.59	5.25	6.35	8.25	1.85	11.25	1.06
2.50	1.59	5.50	25.39	8.50	1.85	11.50	1.06
2.75	1.59	5.75	69.83	8.75	1.85	11.75	1.06

CALIB NASHYD (0041) | ID= 1 DT= 5.0 min	Area (ha)= 6.56	Curve Number (CN)= 82.0
	Ia (mm)= 8.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.14	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.32	3.083	2.12	6.083	9.52	9.08	1.85
0.167	1.32	3.167	2.12	6.167	9.52	9.17	1.85
0.250	1.32	3.250	2.12	6.250	9.52	9.25	1.85
0.333	1.32	3.333	2.12	6.333	9.52	9.33	1.85
0.417	1.32	3.417	2.12	6.417	9.52	9.42	1.85
0.500	1.32	3.500	2.12	6.500	9.52	9.50	1.85
0.583	1.32	3.583	2.12	6.583	4.23	9.58	1.85
0.667	1.32	3.667	2.12	6.667	4.23	9.67	1.85
0.750	1.32	3.750	2.12	6.750	4.23	9.75	1.85
0.833	1.32	3.833	2.12	6.833	4.23	9.83	1.85
0.917	1.32	3.917	2.12	6.917	4.23	9.92	1.85
1.000	1.32	4.000	2.12	7.000	4.23	10.00	1.85
1.083	1.32	4.083	3.17	7.083	3.17	10.08	1.06
1.167	1.32	4.167	3.17	7.167	3.17	10.17	1.06
1.250	1.32	4.250	3.17	7.250	3.17	10.25	1.06
1.333	1.32	4.333	3.17	7.333	3.17	10.33	1.06
1.417	1.32	4.417	3.17	7.417	3.17	10.42	1.06
1.500	1.32	4.500	3.17	7.500	3.17	10.50	1.06
1.583	1.32	4.583	4.23	7.583	3.17	10.58	1.06
1.667	1.32	4.667	4.23	7.667	3.17	10.67	1.06
1.750	1.32	4.750	4.23	7.750	3.17	10.75	1.06
1.833	1.32	4.833	4.23	7.833	3.17	10.83	1.06
1.917	1.32	4.917	4.23	7.917	3.17	10.92	1.06
2.000	1.32	5.000	4.23	8.000	3.17	11.00	1.06
2.083	1.59	5.083	6.35	8.083	1.85	11.08	1.06
2.167	1.59	5.167	6.35	8.167	1.85	11.17	1.06
2.250	1.59	5.250	6.35	8.250	1.85	11.25	1.06
2.333	1.59	5.333	6.35	8.333	1.85	11.33	1.06
2.417	1.59	5.417	6.35	8.417	1.85	11.42	1.06
2.500	1.59	5.500	6.35	8.500	1.85	11.50	1.06
2.583	1.59	5.583	25.39	8.583	1.85	11.58	1.06
2.667	1.59	5.667	25.39	8.667	1.85	11.67	1.06
2.750	1.59	5.750	25.39	8.750	1.85	11.75	1.06
2.833	1.59	5.833	69.83	8.833	1.85	11.83	1.06
2.917	1.59	5.917	69.83	8.917	1.85	11.92	1.06
3.000	1.59	6.000	69.83	9.000	1.85	12.00	1.06

Unit Hyd Qpeak (cms)= 1.790

PEAK FLOW (cms)= 0.483 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 19.879
TOTAL RAINFALL (mm)= 52.900
RUNOFF COEFFICIENT = 0.376

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

ROUTE CHN(0040) | IN= 2---> OUT= 1	Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	101.50	0.0500	
1.00	100.70	0.0500	
1.50	100.55	0.0500 /0.0300	Main Channel
2.00	99.50	0.0300	Main Channel
3.50	99.60	0.0300	Main Channel
4.50	100.65	0.0300 /0.0500	Main Channel
6.00	101.45	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	99.60	.185E+02	0.0	0.54	8.09
0.19	99.69	.587E+02	0.2	1.04	4.22
0.29	99.79	.102E+03	0.5	1.38	3.16
0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	0.48	6.00	19.88	0.27	1.30
OUTFLOW: ID= 1 (0040)	6.56	0.47	6.08	19.88	0.26	1.28

```
--------------------
| CALIB            |
| NASHYD   (  0052)|   Area     (ha)=   0.08   Curve Number    (CN)= 80.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.32	3.083	2.12	6.083	9.52	9.08	1.85
0.167	1.32	3.167	2.12	6.167	9.52	9.17	1.85
0.250	1.32	3.250	2.12	6.250	9.52	9.25	1.85
0.333	1.32	3.333	2.12	6.333	9.52	9.33	1.85
0.417	1.32	3.417	2.12	6.417	9.52	9.42	1.85
0.500	1.32	3.500	2.12	6.500	9.52	9.50	1.85
0.583	1.32	3.583	2.12	6.583	4.23	9.58	1.85
0.667	1.32	3.667	2.12	6.667	4.23	9.67	1.85
0.750	1.32	3.750	2.12	6.750	4.23	9.75	1.85
0.833	1.32	3.833	2.12	6.833	4.23	9.83	1.85
0.917	1.32	3.917	2.12	6.917	4.23	9.92	1.85
1.000	1.32	4.000	2.12	7.000	4.23	10.00	1.85
1.083	1.32	4.083	3.17	7.083	3.17	10.08	1.06
1.167	1.32	4.167	3.17	7.167	3.17	10.17	1.06
1.250	1.32	4.250	3.17	7.250	3.17	10.25	1.06
1.333	1.32	4.333	3.17	7.333	3.17	10.33	1.06
1.417	1.32	4.417	3.17	7.417	3.17	10.42	1.06
1.500	1.32	4.500	3.17	7.500	3.17	10.50	1.06
1.583	1.32	4.583	4.23	7.583	3.17	10.58	1.06
1.667	1.32	4.667	4.23	7.667	3.17	10.67	1.06
1.750	1.32	4.750	4.23	7.750	3.17	10.75	1.06
1.833	1.32	4.833	4.23	7.833	3.17	10.83	1.06
1.917	1.32	4.917	4.23	7.917	3.17	10.92	1.06
2.000	1.32	5.000	4.23	8.000	3.17	11.00	1.06
2.083	1.59	5.083	6.35	8.083	1.85	11.08	1.06
2.167	1.59	5.167	6.35	8.167	1.85	11.17	1.06
2.250	1.59	5.250	6.35	8.250	1.85	11.25	1.06
2.333	1.59	5.333	6.35	8.333	1.85	11.33	1.06
2.417	1.59	5.417	6.35	8.417	1.85	11.42	1.06
2.500	1.59	5.500	6.35	8.500	1.85	11.50	1.06
2.583	1.59	5.583	25.39	8.583	1.85	11.58	1.06
2.667	1.59	5.667	25.39	8.667	1.85	11.67	1.06
2.750	1.59	5.750	25.39	8.750	1.85	11.75	1.06
2.833	1.59	5.833	69.83	8.833	1.85	11.83	1.06
2.917	1.59	5.917	69.83	8.917	1.85	11.92	1.06
3.000	1.59	6.000	69.83	9.000	1.85	12.00	1.06

```
     Unit Hyd Qpeak  (cms)=   0.026

     PEAK FLOW       (cms)=   0.006 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  20.214
     TOTAL RAINFALL   (mm)=  52.900
     RUNOFF COEFFICIENT   =   0.382

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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| CALIB            |
| STANDHYD (  0043)|   Area     (ha)=   2.03
|ID= 1 DT= 5.0 min |   Total Imp(%)=  63.00   Dir. Conn.(%)=  63.00
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                                IMPERVIOUS     PERVIOUS (i)
     Surface Area     (ha)=        1.28          0.75
     Dep. Storage     (mm)=        1.00          5.00
     Average Slope     (%)=        1.30          2.00
     Length            (m)=      116.33         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	1.32	3.083	2.12	6.083	9.52	9.08	1.85
0.167	1.32	3.167	2.12	6.167	9.52	9.17	1.85
0.250	1.32	3.250	2.12	6.250	9.52	9.25	1.85
0.333	1.32	3.333	2.12	6.333	9.52	9.33	1.85
0.417	1.32	3.417	2.12	6.417	9.52	9.42	1.85
0.500	1.32	3.500	2.12	6.500	9.52	9.50	1.85
0.583	1.32	3.583	2.12	6.583	4.23	9.58	1.85
0.667	1.32	3.667	2.12	6.667	4.23	9.67	1.85
0.750	1.32	3.750	2.12	6.750	4.23	9.75	1.85
0.833	1.32	3.833	2.12	6.833	4.23	9.83	1.85
0.917	1.32	3.917	2.12	6.917	4.23	9.92	1.85
1.000	1.32	4.000	2.12	7.000	4.23	10.00	1.85
1.083	1.32	4.083	3.17	7.083	3.17	10.08	1.06
1.167	1.32	4.167	3.17	7.167	3.17	10.17	1.06
1.250	1.32	4.250	3.17	7.250	3.17	10.25	1.06
1.333	1.32	4.333	3.17	7.333	3.17	10.33	1.06
1.417	1.32	4.417	3.17	7.417	3.17	10.42	1.06
1.500	1.32	4.500	3.17	7.500	3.17	10.50	1.06
1.583	1.32	4.583	4.23	7.583	3.17	10.58	1.06
1.667	1.32	4.667	4.23	7.667	3.17	10.67	1.06
1.750	1.32	4.750	4.23	7.750	3.17	10.75	1.06
1.833	1.32	4.833	4.23	7.833	3.17	10.83	1.06
1.917	1.32	4.917	4.23	7.917	3.17	10.92	1.06
2.000	1.32	5.000	4.23	8.000	3.17	11.00	1.06
2.083	1.59	5.083	6.35	8.083	1.85	11.08	1.06
2.167	1.59	5.167	6.35	8.167	1.85	11.17	1.06
2.250	1.59	5.250	6.35	8.250	1.85	11.25	1.06
2.333	1.59	5.333	6.35	8.333	1.85	11.33	1.06
2.417	1.59	5.417	6.35	8.417	1.85	11.42	1.06
2.500	1.59	5.500	6.35	8.500	1.85	11.50	1.06
2.583	1.59	5.583	25.39	8.583	1.85	11.58	1.06
2.667	1.59	5.667	25.39	8.667	1.85	11.67	1.06
2.750	1.59	5.750	25.39	8.750	1.85	11.75	1.06
2.833	1.59	5.833	69.83	8.833	1.85	11.83	1.06
2.917	1.59	5.917	69.83	8.917	1.85	11.92	1.06
3.000	1.59	6.000	69.83	9.000	1.85	12.00	1.06

```
     Max.Eff.Inten.(mm/hr)=      69.83         32.08
               over (min)        5.00         15.00
     Storage Coeff.  (min)=      2.99 (ii)    14.11 (ii)
     Unit Hyd. Tpeak (min)=      5.00         15.00
     Unit Hyd. peak  (cms)=      0.28          0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.25          0.04        0.282 (iii)
     TIME TO PEAK    (hrs)=      6.00          6.08         6.00
     RUNOFF VOLUME    (mm)=     51.90         20.60        40.31
     TOTAL RAINFALL   (mm)=     52.90         52.90        52.90
     RUNOFF COEFFICIENT   =      0.98          0.39         0.76

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
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       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  80.0     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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--------------------
| CALIB            |
| STANDHYD (  0048)|   Area     (ha)=   0.24
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.00
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      40.00        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     1.32 | 3.083     2.12 | 6.083     9.52 |  9.08     1.85
              0.167     1.32 | 3.167     2.12 | 6.167     9.52 |  9.17     1.85
              0.250     1.32 | 3.250     2.12 | 6.250     9.52 |  9.25     1.85
              0.333     1.32 | 3.333     2.12 | 6.333     9.52 |  9.33     1.85
              0.417     1.32 | 3.417     2.12 | 6.417     9.52 |  9.42     1.85
              0.500     1.32 | 3.500     2.12 | 6.500     9.52 |  9.50     1.85
              0.583     1.32 | 3.583     2.12 | 6.583     4.23 |  9.58     1.85
              0.667     1.32 | 3.667     2.12 | 6.667     4.23 |  9.67     1.85
              0.750     1.32 | 3.750     2.12 | 6.750     4.23 |  9.75     1.85
              0.833     1.32 | 3.833     2.12 | 6.833     4.23 |  9.83     1.85
              0.917     1.32 | 3.917     2.12 | 6.917     4.23 |  9.92     1.85
              1.000     1.32 | 4.000     2.12 | 7.000     4.23 | 10.00     1.85
              1.083     1.32 | 4.083     3.17 | 7.083     3.17 | 10.08     1.06
              1.167     1.32 | 4.167     3.17 | 7.167     3.17 | 10.17     1.06
              1.250     1.32 | 4.250     3.17 | 7.250     3.17 | 10.25     1.06
              1.333     1.32 | 4.333     3.17 | 7.333     3.17 | 10.33     1.06
              1.417     1.32 | 4.417     3.17 | 7.417     3.17 | 10.42     1.06
              1.500     1.32 | 4.500     3.17 | 7.500     3.17 | 10.50     1.06
              1.583     1.32 | 4.583     4.23 | 7.583     3.17 | 10.58     1.06
              1.667     1.32 | 4.667     4.23 | 7.667     3.17 | 10.67     1.06
              1.750     1.32 | 4.750     4.23 | 7.750     3.17 | 10.75     1.06
              1.833     1.32 | 4.833     4.23 | 7.833     3.17 | 10.83     1.06
              1.917     1.32 | 4.917     4.23 | 7.917     3.17 | 10.92     1.06
              2.000     1.32 | 5.000     4.23 | 8.000     3.17 | 11.00     1.06
              2.083     1.59 | 5.083     6.35 | 8.083     1.85 | 11.08     1.06
              2.167     1.59 | 5.167     6.35 | 8.167     1.85 | 11.17     1.06
              2.250     1.59 | 5.250     6.35 | 8.250     1.85 | 11.25     1.06
              2.333     1.59 | 5.333     6.35 | 8.333     1.85 | 11.33     1.06
              2.417     1.59 | 5.417     6.35 | 8.417     1.85 | 11.42     1.06
              2.500     1.59 | 5.500     6.35 | 8.500     1.85 | 11.50     1.06
              2.583     1.59 | 5.583    25.39 | 8.583     1.85 | 11.58     1.06
              2.667     1.59 | 5.667    25.39 | 8.667     1.85 | 11.67     1.06
              2.750     1.59 | 5.750    25.39 | 8.750     1.85 | 11.75     1.06
              2.833     1.59 | 5.833    69.83 | 8.833     1.85 | 11.83     1.06
              2.917     1.59 | 5.917    69.83 | 8.917     1.85 | 11.92     1.06
              3.000     1.59 | 6.000    69.83 | 9.000     1.85 | 12.00     1.06

     Max.Eff.Inten.(mm/hr)=      69.83        34.69
                   over (min)        5.00         5.00
     Storage Coeff.  (min)=        1.70 (ii)    3.00 (ii)
     Unit Hyd. Tpeak (min)=        5.00         5.00
     Unit Hyd. peak  (cms)=        0.32         0.28
                                                          *TOTALS*
     PEAK FLOW       (cms)=        0.05         0.00          0.046 (iii)
     TIME TO PEAK    (hrs)=        6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=       51.90        20.60          51.58
     TOTAL RAINFALL   (mm)=       52.90        52.90          52.90
     RUNOFF COEFFICIENT   =        0.98         0.39           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  80.0     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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--------------------
| RESERVOIR(  0050)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |  0.0128     0.0103

                                 AREA     QPEAK     TPEAK       R.V.
                                 (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0048)      0.240     0.046      6.00      51.58
   OUTFLOW: ID= 1 (  0050)      0.240     0.008      6.08      50.77

                 PEAK   FLOW   REDUCTION [Qout/Qin](%)= 17.35
                 TIME SHIFT OF PEAK FLOW          (min)=  5.00
                 MAXIMUM  STORAGE   USED       (ha.m.)=  0.0065

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--------------------
| ADD HYD  (  0049)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0043):     2.03   0.282     6.00    40.31
      + ID2= 2 (  0050):     0.24   0.008     6.08    50.77
        ================================================
        ID = 3 (  0049):     2.27   0.289     6.00    41.42

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0051)|   Area     (ha)=   1.68
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.66         0.02
     Dep. Storage     (mm)=       5.00         1.50
     Average Slope     (%)=       1.20         2.00
     Length            (m)=     105.83        40.00
     Mannings n           =      0.013        0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.32	3.083	2.12	6.083	9.52	9.08	1.85
0.167	1.32	3.167	2.12	6.167	9.52	9.17	1.85
0.250	1.32	3.250	2.12	6.250	9.52	9.25	1.85
0.333	1.32	3.333	2.12	6.333	9.52	9.33	1.85
0.417	1.32	3.417	2.12	6.417	9.52	9.42	1.85
0.500	1.32	3.500	2.12	6.500	9.52	9.50	1.85
0.583	1.32	3.583	2.12	6.583	4.23	9.58	1.85
0.667	1.32	3.667	2.12	6.667	4.23	9.67	1.85
0.750	1.32	3.750	2.12	6.750	4.23	9.75	1.85
0.833	1.32	3.833	2.12	6.833	4.23	9.83	1.85
0.917	1.32	3.917	2.12	6.917	4.23	9.92	1.85
1.000	1.32	4.000	2.12	7.000	4.23	10.00	1.85
1.083	1.32	4.083	3.17	7.083	3.17	10.08	1.06
1.167	1.32	4.167	3.17	7.167	3.17	10.17	1.06
1.250	1.32	4.250	3.17	7.250	3.17	10.25	1.06
1.333	1.32	4.333	3.17	7.333	3.17	10.33	1.06
1.417	1.32	4.417	3.17	7.417	3.17	10.42	1.06
1.500	1.32	4.500	3.17	7.500	3.17	10.50	1.06
1.583	1.32	4.583	4.23	7.583	3.17	10.58	1.06
1.667	1.32	4.667	4.23	7.667	3.17	10.67	1.06
1.750	1.32	4.750	4.23	7.750	3.17	10.75	1.06
1.833	1.32	4.833	4.23	7.833	3.17	10.83	1.06
1.917	1.32	4.917	4.23	7.917	3.17	10.92	1.06
2.000	1.32	5.000	4.23	8.000	3.17	11.00	1.06
2.083	1.59	5.083	6.35	8.083	1.85	11.08	1.06
2.167	1.59	5.167	6.35	8.167	1.85	11.17	1.06
2.250	1.59	5.250	6.35	8.250	1.85	11.25	1.06
2.333	1.59	5.333	6.35	8.333	1.85	11.33	1.06
2.417	1.59	5.417	6.35	8.417	1.85	11.42	1.06
2.500	1.59	5.500	6.35	8.500	1.85	11.50	1.06
2.583	1.59	5.583	25.39	8.583	1.85	11.58	1.06
2.667	1.59	5.667	25.39	8.667	1.85	11.67	1.06
2.750	1.59	5.750	25.39	8.750	1.85	11.75	1.06
2.833	1.59	5.833	69.83	8.833	1.85	11.83	1.06
2.917	1.59	5.917	69.83	8.917	1.85	11.92	1.06
3.000	1.59	6.000	69.83	9.000	1.85	12.00	1.06

Max.Eff.Inten.(mm/hr)=	69.83	37.29	
over (min)	5.00	5.00	
Storage Coeff. (min)=	2.89 (ii)	4.19 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.28	0.24	
			TOTALS
PEAK FLOW (cms)=	0.32	0.00	0.323 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00
RUNOFF VOLUME (mm)=	47.90	22.99	47.65
TOTAL RAINFALL (mm)=	52.90	52.90	52.90
RUNOFF COEFFICIENT =	0.91	0.43	0.90

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 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 (0046)|

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0049):	2.27	0.289	6.00	41.42
+ ID2= 2 (0051):	1.68	0.323	6.00	47.65
ID = 3 (0046):	3.95	0.613	6.00	44.07

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0047)	IN= 2---> OUT= 1	DT= 5.0 min	OVERFLOW IS OFF			
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.1630	0.2697
	0.0080	0.0487	0.1700	0.2885
	0.0100	0.0674	0.1720	0.2960
	0.0880	0.1049	0.1760	0.3072
	0.1040	0.1311	0.1770	0.3109
	0.1170	0.1573	0.1800	0.3184
	0.1260	0.1761	0.1870	0.3409
	0.1300	0.1836	0.1880	0.3447
	0.1570	0.2510	0.1910	0.3559

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0046)	3.950	0.613	6.00	44.07
OUTFLOW: ID= 1 (0047)	3.950	0.088	6.50	43.68

PEAK FLOW REDUCTION [Qout/Qin](%)= 14.35
TIME SHIFT OF PEAK FLOW (min)= 30.00
MAXIMUM STORAGE USED (ha.m.)= 0.1051

ADD HYD (0039)| 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0040):	6.56	0.469	6.08	19.88
+ ID2= 2 (0047):	3.95	0.088	6.50	43.68
ID = 3 (0039):	10.51	0.543	6.08	28.82

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0039)| 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0039):	10.51	0.543	6.08	28.82
+ ID2= 2 (0052):	0.08	0.006	6.00	20.21
ID = 1 (0039):	10.59	0.547	6.08	28.76

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

V V I SSSSS U U A L (v 6.2.2010)
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\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\f8418e21-237d-46d1-8f1e-6ec9b6962fa7\
  Summary filename: C:\Users\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\f8418e21-237d-46d1-8f1e-6ec9b6962fa7\


DATE: 03-08-2023                          TIME: 01:45:27

USER:



COMMENTS: _____________________________________________________________


--------------------------------------------------------------------------------
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  ***********************************************
  ** SIMULATION : 03 - 10 YR - SCS TYPE II 12HR **
  ***********************************************

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| MASS STORM       |    Filename: C:\Users\sramsoomair\AppD
|                  |              ata\Local\Temp\
|                  |              72e98174-9551-451b-b568-e4dbecda99d3\4e347f07
| Ptotal= 60.30 mm |    Comments: SCS TYPE II MASS CURVE
--------------------
                       Duration of storm    = 12.00 hrs
                       Mass curve time step = 15.00 min

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    1.51 |  3.00    2.41 |  6.00   10.85 |  9.00    2.11
                0.25    1.51 |  3.25    2.41 |  6.25   10.85 |  9.25    2.11
                0.50    1.51 |  3.50    2.41 |  6.50    4.82 |  9.50    2.11
                0.75    1.51 |  3.75    2.41 |  6.75    4.82 |  9.75    2.11
                1.00    1.51 |  4.00    3.62 |  7.00    3.62 | 10.00    1.21
                1.25    1.51 |  4.25    3.62 |  7.25    3.62 | 10.25    1.21
                1.50    1.51 |  4.50    4.82 |  7.50    3.62 | 10.50    1.21
                1.75    1.51 |  4.75    4.82 |  7.75    3.62 | 10.75    1.21
                2.00    1.81 |  5.00    7.24 |  8.00    2.11 | 11.00    1.21
                2.25    1.81 |  5.25    7.24 |  8.25    2.11 | 11.25    1.21
                2.50    1.81 |  5.50   28.94 |  8.50    2.11 | 11.50    1.21
                2.75    1.81 |  5.75   79.60 |  8.75    2.11 | 11.75    1.21

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--------------------
| CALIB            |
| NASHYD   (  0041)|   Area     (ha)=   6.56   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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


                              ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    1.51 | 3.083    2.41 | 6.083   10.85 |  9.08    2.11
               0.167    1.51 | 3.167    2.41 | 6.167   10.85 |  9.17    2.11
               0.250    1.51 | 3.250    2.41 | 6.250   10.85 |  9.25    2.11
               0.333    1.51 | 3.333    2.41 | 6.333   10.85 |  9.33    2.11
               0.417    1.51 | 3.417    2.41 | 6.417   10.85 |  9.42    2.11
               0.500    1.51 | 3.500    2.41 | 6.500   10.85 |  9.50    2.11
               0.583    1.51 | 3.583    2.41 | 6.583    4.82 |  9.58    2.11
               0.667    1.51 | 3.667    2.41 | 6.667    4.82 |  9.67    2.11
               0.750    1.51 | 3.750    2.41 | 6.750    4.82 |  9.75    2.11
               0.833    1.51 | 3.833    2.41 | 6.833    4.82 |  9.83    2.11
               0.917    1.51 | 3.917    2.41 | 6.917    4.82 |  9.92    2.11
               1.000    1.51 | 4.000    2.41 | 7.000    4.82 | 10.00    2.11
               1.083    1.51 | 4.083    3.62 | 7.083    3.62 | 10.08    1.21
               1.167    1.51 | 4.167    3.62 | 7.167    3.62 | 10.17    1.21
               1.250    1.51 | 4.250    3.62 | 7.250    3.62 | 10.25    1.21
               1.333    1.51 | 4.333    3.62 | 7.333    3.62 | 10.33    1.21
               1.417    1.51 | 4.417    3.62 | 7.417    3.62 | 10.42    1.21
               1.500    1.51 | 4.500    3.62 | 7.500    3.62 | 10.50    1.21
               1.583    1.51 | 4.583    4.82 | 7.583    3.62 | 10.58    1.21
               1.667    1.51 | 4.667    4.82 | 7.667    3.62 | 10.67    1.21
               1.750    1.51 | 4.750    4.82 | 7.750    3.62 | 10.75    1.21
               1.833    1.51 | 4.833    4.82 | 7.833    3.62 | 10.83    1.21
               1.917    1.51 | 4.917    4.82 | 7.917    3.62 | 10.92    1.21
               2.000    1.51 | 5.000    4.82 | 8.000    3.62 | 11.00    1.21
               2.083    1.81 | 5.083    7.24 | 8.083    2.11 | 11.08    1.21
               2.167    1.81 | 5.167    7.24 | 8.167    2.11 | 11.17    1.21
               2.250    1.81 | 5.250    7.24 | 8.250    2.11 | 11.25    1.21
               2.333    1.81 | 5.333    7.24 | 8.333    2.11 | 11.33    1.21
               2.417    1.81 | 5.417    7.24 | 8.417    2.11 | 11.42    1.21
               2.500    1.81 | 5.500    7.24 | 8.500    2.11 | 11.50    1.21
               2.583    1.81 | 5.583   28.94 | 8.583    2.11 | 11.58    1.21
               2.667    1.81 | 5.667   28.94 | 8.667    2.11 | 11.67    1.21
               2.750    1.81 | 5.750   28.94 | 8.750    2.11 | 11.75    1.21
               2.833    1.81 | 5.833   79.60 | 8.833    2.11 | 11.83    1.21
               2.917    1.81 | 5.917   79.60 | 8.917    2.11 | 11.92    1.21
               3.000    1.81 | 6.000   79.59 | 9.000    2.11 | 12.00    1.21

     Unit Hyd Qpeak  (cms)=   1.790

     PEAK FLOW       (cms)=   0.614 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  25.124
     TOTAL RAINFALL   (mm)=  60.300
     RUNOFF COEFFICIENT   =   0.417

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

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| ROUTE CHN(  0040)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
```

0.00	101.50	0.0500	
1.00	100.70	0.0500	
1.50	100.55	0.0500 /0.0300	Main Channel
2.00	99.50	0.0300	Main Channel
3.50	99.60	0.0300	Main Channel
4.50	100.65	0.0300 /0.0500	Main Channel
6.00	101.45	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	99.60	.185E+02	0.0	0.54	8.09
0.19	99.69	.587E+02	0.2	1.04	4.22
0.29	99.79	.102E+03	0.5	1.38	3.16
0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	0.61	6.00	25.12	0.30	1.43
OUTFLOW: ID= 1 (0040)	6.56	0.60	6.08	25.12	0.30	1.42

| CALIB |			
| NASHYD (0052)|	Area (ha)=	0.08	Curve Number (CN)= 80.0
|ID= 1 DT= 5.0 min |	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.11	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.51	3.083	2.41	6.083	10.85	9.08	2.11
0.167	1.51	3.167	2.41	6.167	10.85	9.17	2.11
0.250	1.51	3.250	2.41	6.250	10.85	9.25	2.11
0.333	1.51	3.333	2.41	6.333	10.85	9.33	2.11
0.417	1.51	3.417	2.41	6.417	10.85	9.42	2.11
0.500	1.51	3.500	2.41	6.500	10.85	9.50	2.11
0.583	1.51	3.583	2.41	6.583	4.82	9.58	2.11
0.667	1.51	3.667	2.41	6.667	4.82	9.67	2.11
0.750	1.51	3.750	2.41	6.750	4.82	9.75	2.11
0.833	1.51	3.833	2.41	6.833	4.82	9.83	2.11
0.917	1.51	3.917	2.41	6.917	4.82	9.92	2.11
1.000	1.51	4.000	2.41	7.000	4.82	10.00	2.11
1.083	1.51	4.083	3.62	7.083	3.62	10.08	1.21
1.167	1.51	4.167	3.62	7.167	3.62	10.17	1.21
1.250	1.51	4.250	3.62	7.250	3.62	10.25	1.21
1.333	1.51	4.333	3.62	7.333	3.62	10.33	1.21
1.417	1.51	4.417	3.62	7.417	3.62	10.42	1.21
1.500	1.51	4.500	3.62	7.500	3.62	10.50	1.21
1.583	1.51	4.583	4.82	7.583	3.62	10.58	1.21
1.667	1.51	4.667	4.82	7.667	3.62	10.67	1.21
1.750	1.51	4.750	4.82	7.750	3.62	10.75	1.21
1.833	1.51	4.833	4.82	7.833	3.62	10.83	1.21
1.917	1.51	4.917	4.82	7.917	3.62	10.92	1.21
2.000	1.51	5.000	4.82	8.000	3.62	11.00	1.21
2.083	1.81	5.083	7.24	8.083	2.11	11.08	1.21
2.167	1.81	5.167	7.24	8.167	2.11	11.17	1.21
2.250	1.81	5.250	7.24	8.250	2.11	11.25	1.21
2.333	1.81	5.333	7.24	8.333	2.11	11.33	1.21
2.417	1.81	5.417	7.24	8.417	2.11	11.42	1.21
2.500	1.81	5.500	7.24	8.500	2.11	11.50	1.21
2.583	1.81	5.583	28.94	8.583	2.11	11.58	1.21
2.667	1.81	5.667	28.94	8.667	2.11	11.67	1.21
2.750	1.81	5.750	28.94	8.750	2.11	11.75	1.21
2.833	1.81	5.833	79.60	8.833	2.11	11.83	1.21
2.917	1.81	5.917	79.60	8.917	2.11	11.92	1.21
3.000	1.81	6.000	79.59	9.000	2.11	12.00	1.21

Unit Hyd Qpeak (cms)= 0.026

PEAK FLOW (cms)= 0.008 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 25.264
TOTAL RAINFALL (mm)= 60.300
RUNOFF COEFFICIENT = 0.419

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

| CALIB |			
| STANDHYD (0043)|	Area (ha)=	2.03	
|ID= 1 DT= 5.0 min |	Total Imp(%)=	63.00	Dir. Conn.(%)= 63.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.28	0.75
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.30	2.00
Length	(m)=	116.33	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	1.51	3.083	2.41	6.083	10.85	9.08	2.11
0.167	1.51	3.167	2.41	6.167	10.85	9.17	2.11
0.250	1.51	3.250	2.41	6.250	10.85	9.25	2.11
0.333	1.51	3.333	2.41	6.333	10.85	9.33	2.11
0.417	1.51	3.417	2.41	6.417	10.85	9.42	2.11
0.500	1.51	3.500	2.41	6.500	10.85	9.50	2.11
0.583	1.51	3.583	2.41	6.583	4.82	9.58	2.11
0.667	1.51	3.667	2.41	6.667	4.82	9.67	2.11
0.750	1.51	3.750	2.41	6.750	4.82	9.75	2.11
0.833	1.51	3.833	2.41	6.833	4.82	9.83	2.11

0.917	1.51	3.917	2.41	6.917	4.82	9.92	2.11
1.000	1.51	4.000	2.41	7.000	4.82	10.00	2.11
1.083	1.51	4.083	3.62	7.083	3.62	10.08	1.21
1.167	1.51	4.167	3.62	7.167	3.62	10.17	1.21
1.250	1.51	4.250	3.62	7.250	3.62	10.25	1.21
1.333	1.51	4.333	3.62	7.333	3.62	10.33	1.21
1.417	1.51	4.417	3.62	7.417	3.62	10.42	1.21
1.500	1.51	4.500	3.62	7.500	3.62	10.50	1.21
1.583	1.51	4.583	4.82	7.583	3.62	10.58	1.21
1.667	1.51	4.667	4.82	7.667	3.62	10.67	1.21
1.750	1.51	4.750	4.82	7.750	3.62	10.75	1.21
1.833	1.51	4.833	4.82	7.833	3.62	10.83	1.21
1.917	1.51	4.917	4.82	7.917	3.62	10.92	1.21
2.000	1.51	5.000	4.82	8.000	3.62	11.00	1.21
2.083	1.81	5.083	7.24	8.083	2.11	11.08	1.21
2.167	1.81	5.167	7.24	8.167	2.11	11.17	1.21
2.250	1.81	5.250	7.24	8.250	2.11	11.25	1.21
2.333	1.81	5.333	7.24	8.333	2.11	11.33	1.21
2.417	1.81	5.417	7.24	8.417	2.11	11.42	1.21
2.500	1.81	5.500	7.24	8.500	2.11	11.50	1.21
2.583	1.81	5.583	28.94	8.583	2.11	11.58	1.21
2.667	1.81	5.667	28.94	8.667	2.11	11.67	1.21
2.750	1.81	5.750	28.94	8.750	2.11	11.75	1.21
2.833	1.81	5.833	79.60	8.833	2.11	11.83	1.21
2.917	1.81	5.917	79.60	8.917	2.11	11.92	1.21
3.000	1.81	6.000	79.59	9.000	2.11	12.00	1.21

Max.Eff.Inten.(mm/hr)=	79.60	43.15	
over (min)	5.00	15.00	
Storage Coeff. (min)=	2.83 (ii)	12.71 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.28	0.08	
			TOTALS
PEAK FLOW (cms)=	0.28	0.05	0.329 (iii)
TIME TO PEAK (hrs)=	6.00	6.08	6.00
RUNOFF VOLUME (mm)=	59.30	25.74	46.88
TOTAL RAINFALL (mm)=	60.30	60.30	60.30
RUNOFF COEFFICIENT =	0.98	0.43	0.78

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0048)	Area (ha)= 0.24
ID= 1 DT= 5.0 min	Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.24	0.00
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	40.00	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	1.51	3.083	2.41	6.083	10.85	9.08	2.11
0.167	1.51	3.167	2.41	6.167	10.85	9.17	2.11
0.250	1.51	3.250	2.41	6.250	10.85	9.25	2.11
0.333	1.51	3.333	2.41	6.333	10.85	9.33	2.11
0.417	1.51	3.417	2.41	6.417	10.85	9.42	2.11
0.500	1.51	3.500	2.41	6.500	10.85	9.50	2.11
0.583	1.51	3.583	2.41	6.583	4.82	9.58	2.11
0.667	1.51	3.667	2.41	6.667	4.82	9.67	2.11
0.750	1.51	3.750	2.41	6.750	4.82	9.75	2.11
0.833	1.51	3.833	2.41	6.833	4.82	9.83	2.11
0.917	1.51	3.917	2.41	6.917	4.82	9.92	2.11
1.000	1.51	4.000	2.41	7.000	4.82	10.00	2.11
1.083	1.51	4.083	3.62	7.083	3.62	10.08	1.21
1.167	1.51	4.167	3.62	7.167	3.62	10.17	1.21
1.250	1.51	4.250	3.62	7.250	3.62	10.25	1.21
1.333	1.51	4.333	3.62	7.333	3.62	10.33	1.21
1.417	1.51	4.417	3.62	7.417	3.62	10.42	1.21
1.500	1.51	4.500	3.62	7.500	3.62	10.50	1.21
1.583	1.51	4.583	4.82	7.583	3.62	10.58	1.21
1.667	1.51	4.667	4.82	7.667	3.62	10.67	1.21
1.750	1.51	4.750	4.82	7.750	3.62	10.75	1.21
1.833	1.51	4.833	4.82	7.833	3.62	10.83	1.21
1.917	1.51	4.917	4.82	7.917	3.62	10.92	1.21
2.000	1.51	5.000	4.82	8.000	3.62	11.00	1.21
2.083	1.81	5.083	7.24	8.083	2.11	11.08	1.21
2.167	1.81	5.167	7.24	8.167	2.11	11.17	1.21
2.250	1.81	5.250	7.24	8.250	2.11	11.25	1.21
2.333	1.81	5.333	7.24	8.333	2.11	11.33	1.21
2.417	1.81	5.417	7.24	8.417	2.11	11.42	1.21
2.500	1.81	5.500	7.24	8.500	2.11	11.50	1.21
2.583	1.81	5.583	28.94	8.583	2.11	11.58	1.21
2.667	1.81	5.667	28.94	8.667	2.11	11.67	1.21
2.750	1.81	5.750	28.94	8.750	2.11	11.75	1.21
2.833	1.81	5.833	79.60	8.833	2.11	11.83	1.21
2.917	1.81	5.917	79.60	8.917	2.11	11.92	1.21
3.000	1.81	6.000	79.59	9.000	2.11	12.00	1.21

Max.Eff.Inten.(mm/hr)=	79.60	43.15	
over (min)	5.00	5.00	
Storage Coeff. (min)=	1.62 (ii)	2.85 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.32	0.28	
			TOTALS
PEAK FLOW (cms)=	0.05	0.00	0.053 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00
RUNOFF VOLUME (mm)=	59.30	25.74	58.96
TOTAL RAINFALL (mm)=	60.30	60.30	60.30
RUNOFF COEFFICIENT =	0.98	0.43	0.98

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0050)	OVERFLOW IS OFF
IN= 2---> OUT= 1	
DT= 5.0 min	OUTFLOW STORAGE | OUTFLOW STORAGE

```
--------------------      (cms)      (ha.m.)   |   (cms)      (ha.m.)
                         0.0000      0.0000   |   0.0128      0.0103

                                 AREA     QPEAK     TPEAK       R.V.
                                 (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0048)      0.240     0.053      6.00      58.96
   OUTFLOW: ID= 1 (  0050)      0.240     0.009      6.08      58.14

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 17.37
                  TIME SHIFT OF PEAK FLOW          (min)=  5.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0074

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

--------------------
| ADD HYD  (  0049)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0043):      2.03   0.329     6.00    46.88
     + ID2= 2 (  0050):      0.24   0.009     6.08    58.14
       ================================================
       ID = 3 (  0049):      2.27   0.337     6.00    48.07

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0051)|   Area     (ha)=   1.68
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.66          0.02
     Dep. Storage     (mm)=       5.00          1.50
     Average Slope     (%)=       1.20          2.00
     Length            (m)=     105.83         40.00
     Mannings n           =      0.013         0.250

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

                          ---- TRANSFORMED HYETOGRAPH ----
  TIME     RAIN |  TIME     RAIN |'  TIME     RAIN |  TIME     RAIN
   hrs    mm/hr |   hrs    mm/hr |'   hrs    mm/hr |   hrs    mm/hr
 0.083     1.51 | 3.083     2.41 | 6.083    10.85 |  9.08     2.11
 0.167     1.51 | 3.167     2.41 | 6.167    10.85 |  9.17     2.11
 0.250     1.51 | 3.250     2.41 | 6.250    10.85 |  9.25     2.11
 0.333     1.51 | 3.333     2.41 | 6.333    10.85 |  9.33     2.11
 0.417     1.51 | 3.417     2.41 | 6.417    10.85 |  9.42     2.11
 0.500     1.51 | 3.500     2.41 | 6.500    10.85 |  9.50     2.11
 0.583     1.51 | 3.583     2.41 | 6.583     4.82 |  9.58     2.11
 0.667     1.51 | 3.667     2.41 | 6.667     4.82 |  9.67     2.11
 0.750     1.51 | 3.750     2.41 | 6.750     4.82 |  9.75     2.11
 0.833     1.51 | 3.833     2.41 | 6.833     4.82 |  9.83     2.11
 0.917     1.51 | 3.917     2.41 | 6.917     4.82 |  9.92     2.11
 1.000     1.51 | 4.000     2.41 | 7.000     4.82 | 10.00     2.11
 1.083     1.51 | 4.083     3.62 | 7.083     3.62 | 10.08     1.21
 1.167     1.51 | 4.167     3.62 | 7.167     3.62 | 10.17     1.21
 1.250     1.51 | 4.250     3.62 | 7.250     3.62 | 10.25     1.21
 1.333     1.51 | 4.333     3.62 | 7.333     3.62 | 10.33     1.21
 1.417     1.51 | 4.417     3.62 | 7.417     3.62 | 10.42     1.21
 1.500     1.51 | 4.500     3.62 | 7.500     3.62 | 10.50     1.21
 1.583     1.51 | 4.583     4.82 | 7.583     3.62 | 10.58     1.21
 1.667     1.51 | 4.667     4.82 | 7.667     3.62 | 10.67     1.21
 1.750     1.51 | 4.750     4.82 | 7.750     3.62 | 10.75     1.21
 1.833     1.51 | 4.833     4.82 | 7.833     3.62 | 10.83     1.21
 1.917     1.51 | 4.917     4.82 | 7.917     3.62 | 10.92     1.21
 2.000     1.51 | 5.000     4.82 | 8.000     3.62 | 11.00     1.21
 2.083     1.81 | 5.083     7.24 | 8.083     2.11 | 11.08     1.21
 2.167     1.81 | 5.167     7.24 | 8.167     2.11 | 11.17     1.21
 2.250     1.81 | 5.250     7.24 | 8.250     2.11 | 11.25     1.21
 2.333     1.81 | 5.333     7.24 | 8.333     2.11 | 11.33     1.21
 2.417     1.81 | 5.417     7.24 | 8.417     2.11 | 11.42     1.21
 2.500     1.81 | 5.500     7.24 | 8.500     2.11 | 11.50     1.21
 2.583     1.81 | 5.583    28.94 | 8.583     2.11 | 11.58     1.21
 2.667     1.81 | 5.667    28.94 | 8.667     2.11 | 11.67     1.21
 2.750     1.81 | 5.750    28.94 | 8.750     2.11 | 11.75     1.21
 2.833     1.81 | 5.833    79.60 | 8.833     2.11 | 11.83     1.21
 2.917     1.81 | 5.917    79.60 | 8.917     2.11 | 11.92     1.21
 3.000     1.81 | 6.000    79.59 | 9.000     2.11 | 12.00     1.21

     Max.Eff.Inten.(mm/hr)=      79.60         45.73
               over (min)        5.00          5.00
     Storage Coeff.  (min)=      2.74 (ii)     3.97 (ii)
     Unit Hyd. Tpeak (min)=      5.00          5.00
     Unit Hyd. peak  (cms)=      0.28          0.24
                                                          *TOTALS*
     PEAK FLOW       (cms)=      0.37          0.00          0.369 (iii)
     TIME TO PEAK    (hrs)=      6.00          6.00           6.00
     RUNOFF VOLUME    (mm)=     55.30         28.27          55.03
     TOTAL RAINFALL   (mm)=     60.30         60.30          60.30
     RUNOFF COEFFICIENT   =      0.92          0.47           0.91

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  80.0    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  (  0046)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0049):      2.27   0.337     6.00    48.07
     + ID2= 2 (  0051):      1.68   0.369     6.00    55.03
       ================================================
       ID = 3 (  0046):      3.95   0.706     6.00    51.03

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0047)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                        0.0000     0.0000    |   0.1630     0.2697
                        0.0080     0.0487    |   0.1700     0.2885
                        0.0100     0.0674    |   0.1720     0.2960
                        0.0880     0.1049    |   0.1760     0.3072
                        0.1040     0.1311    |   0.1770     0.3109
                        0.1170     0.1573    |   0.1800     0.3184
                        0.1260     0.1761    |   0.1870     0.3409
                        0.1300     0.1836    |   0.1880     0.3447
                        0.1570     0.2510    |   0.1910     0.3559
```

```
                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0046)     3.950     0.706      6.00      51.03
   OUTFLOW: ID= 1 (  0047)     3.950     0.098      6.58      50.64

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 13.82
                  TIME SHIFT OF PEAK FLOW          (min)= 35.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1209

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

--------------------
| ADD HYD  (  0039)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0040):     6.56   0.600     6.08    25.12
     + ID2= 2 (  0047):     3.95   0.098     6.58    50.64
       ================================================
       ID = 3 (  0039):    10.51   0.693     6.08    34.71

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

--------------------
| ADD HYD  (  0039)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0039):    10.51   0.693     6.08    34.71
     + ID2= 2 (  0052):     0.08   0.008     6.00    25.26
       ================================================
       ID = 1 (  0039):    10.59   0.699     6.08    34.64

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

      V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
      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\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\50563a96-a198-4d5f-8aa2-95c979248748\
  Summary filename: C:\Users\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\50563a96-a198-4d5f-8aa2-95c979248748\


DATE: 03-08-2023                          TIME: 01:45:26

USER:


COMMENTS: _____________________________________________________

--------------------------------------------------------------------------------
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  ********************************************
  ** SIMULATION : 04 - 25 YR - SCS TYPE II 12HR **
  ********************************************

--------------------
| MASS STORM       |    Filename: C:\Users\sramsoomair\AppD
|                  |              ata\Local\Temp\
|                  |              72e98174-9551-451b-b568-e4dbecda99d3\420551ed
| Ptotal= 71.00 mm |    Comments: SCS TYPE II MASS CURVE
--------------------
                         Duration of storm    = 12.00 hrs
                         Mass curve time step = 15.00 min

      TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
       hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
      0.00    1.78 |  3.00    2.84 |  6.00   12.78 |  9.00    2.48
      0.25    1.78 |  3.25    2.84 |  6.25   12.78 |  9.25    2.49
      0.50    1.78 |  3.50    2.84 |  6.50    5.68 |  9.50    2.49
      0.75    1.77 |  3.75    2.84 |  6.75    5.68 |  9.75    2.48
      1.00    1.77 |  4.00    4.26 |  7.00    4.26 | 10.00    1.42
      1.25    1.78 |  4.25    4.26 |  7.25    4.26 | 10.25    1.42
      1.50    1.77 |  4.50    5.68 |  7.50    4.26 | 10.50    1.42
      1.75    1.78 |  4.75    5.68 |  7.75    4.26 | 10.75    1.42
      2.00    2.13 |  5.00    8.52 |  8.00    2.49 | 11.00    1.42
      2.25    2.13 |  5.25    8.52 |  8.25    2.49 | 11.25    1.42
      2.50    2.13 |  5.50   34.08 |  8.50    2.48 | 11.50    1.42
      2.75    2.13 |  5.75   93.72 |  8.75    2.49 | 11.75    1.42

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0041)|   Area     (ha)=   6.56   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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


                        ---- TRANSFORMED HYETOGRAPH ----
      TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
       hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
     0.083    1.78 | 3.083    2.84 | 6.083   12.78 |  9.08    2.48
     0.167    1.78 | 3.167    2.84 | 6.167   12.78 |  9.17    2.48
     0.250    1.78 | 3.250    2.84 | 6.250   12.78 |  9.25    2.48
     0.333    1.78 | 3.333    2.84 | 6.333   12.78 |  9.33    2.49
     0.417    1.78 | 3.417    2.84 | 6.417   12.78 |  9.42    2.49
     0.500    1.78 | 3.500    2.84 | 6.500   12.78 |  9.50    2.49
     0.583    1.78 | 3.583    2.84 | 6.583    5.68 |  9.58    2.48
     0.667    1.78 | 3.667    2.84 | 6.667    5.68 |  9.67    2.49
     0.750    1.78 | 3.750    2.84 | 6.750    5.68 |  9.75    2.49
     0.833    1.77 | 3.833    2.84 | 6.833    5.68 |  9.83    2.48
     0.917    1.77 | 3.917    2.84 | 6.917    5.68 |  9.92    2.48
     1.000    1.77 | 4.000    2.84 | 7.000    5.68 | 10.00    2.48
     1.083    1.77 | 4.083    4.26 | 7.083    4.26 | 10.08    1.42
     1.167    1.77 | 4.167    4.26 | 7.167    4.26 | 10.17    1.42
```

1.250	1.77	4.250	4.26	7.250	4.26	10.25	1.42
1.333	1.78	4.333	4.26	7.333	4.26	10.33	1.42
1.417	1.78	4.417	4.26	7.417	4.26	10.42	1.42
1.500	1.78	4.500	4.26	7.500	4.26	10.50	1.42
1.583	1.77	4.583	5.68	7.583	4.26	10.58	1.42
1.667	1.77	4.667	5.68	7.667	4.26	10.67	1.42
1.750	1.78	4.750	5.68	7.750	4.26	10.75	1.42
1.833	1.78	4.833	5.68	7.833	4.26	10.83	1.42
1.917	1.78	4.917	5.68	7.917	4.26	10.92	1.42
2.000	1.78	5.000	5.68	8.000	4.26	11.00	1.42
2.083	2.13	5.083	8.52	8.083	2.49	11.08	1.42
2.167	2.13	5.167	8.52	8.167	2.49	11.17	1.42
2.250	2.13	5.250	8.52	8.250	2.48	11.25	1.42
2.333	2.13	5.333	8.52	8.333	2.49	11.33	1.42
2.417	2.13	5.417	8.52	8.417	2.49	11.42	1.42
2.500	2.13	5.500	8.52	8.500	2.48	11.50	1.42
2.583	2.13	5.583	34.08	8.583	2.48	11.58	1.42
2.667	2.13	5.667	34.08	8.667	2.48	11.67	1.42
2.750	2.13	5.750	34.08	8.750	2.48	11.75	1.42
2.833	2.13	5.833	93.72	8.833	2.49	11.83	1.42
2.917	2.13	5.917	93.72	8.917	2.49	11.92	1.42
3.000	2.13	6.000	93.72	9.000	2.48	12.00	1.42

Unit Hyd Qpeak (cms)= 1.790

PEAK FLOW (cms)= 0.814 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 33.171
TOTAL RAINFALL (mm)= 71.000
RUNOFF COEFFICIENT = 0.467

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

ROUTE CHN(0040)	
IN= 2---> OUT= 1	Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	101.50	0.0500	
1.00	100.70	0.0500	
1.50	100.55	0.0500 /0.0300	Main Channel
2.00	99.50	0.0300	Main Channel
3.50	99.60	0.0300	Main Channel
4.50	100.65	0.0300 /0.0500	Main Channel
6.00	101.45	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	99.60	.185E+02	0.0	0.54	8.09
0.19	99.69	.587E+02	0.2	1.04	4.22
0.29	99.79	.102E+03	0.5	1.38	3.16
0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	0.81	6.00	33.17	0.35	1.56
OUTFLOW: ID= 1 (0040)	6.56	0.78	6.08	33.17	0.34	1.53

CALIB					
NASHYD (0052)|	Area (ha)=	0.08	Curve Number (CN)=	80.0	
ID= 1 DT= 5.0 min |	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.11			

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.78	3.083	2.84	6.083	12.78	9.08	2.48
0.167	1.78	3.167	2.84	6.167	12.78	9.17	2.48
0.250	1.78	3.250	2.84	6.250	12.78	9.25	2.48
0.333	1.78	3.333	2.84	6.333	12.78	9.33	2.49
0.417	1.78	3.417	2.84	6.417	12.78	9.42	2.49
0.500	1.78	3.500	2.84	6.500	12.78	9.50	2.49
0.583	1.78	3.583	2.84	6.583	5.68	9.58	2.48
0.667	1.78	3.667	2.84	6.667	5.68	9.67	2.49
0.750	1.78	3.750	2.84	6.750	5.68	9.75	2.49
0.833	1.77	3.833	2.84	6.833	5.68	9.83	2.48
0.917	1.77	3.917	2.84	6.917	5.68	9.92	2.48
1.000	1.77	4.000	2.84	7.000	5.68	10.00	2.48
1.083	1.77	4.083	4.26	7.083	4.26	10.08	1.42
1.167	1.77	4.167	4.26	7.167	4.26	10.17	1.42
1.250	1.77	4.250	4.26	7.250	4.26	10.25	1.42
1.333	1.78	4.333	4.26	7.333	4.26	10.33	1.42
1.417	1.78	4.417	4.26	7.417	4.26	10.42	1.42
1.500	1.78	4.500	4.26	7.500	4.26	10.50	1.42
1.583	1.77	4.583	5.68	7.583	4.26	10.58	1.42
1.667	1.77	4.667	5.68	7.667	4.26	10.67	1.42
1.750	1.78	4.750	5.68	7.750	4.26	10.75	1.42
1.833	1.78	4.833	5.68	7.833	4.26	10.83	1.42
1.917	1.78	4.917	5.68	7.917	4.26	10.92	1.42
2.000	1.78	5.000	5.68	8.000	4.26	11.00	1.42
2.083	2.13	5.083	8.52	8.083	2.49	11.08	1.42
2.167	2.13	5.167	8.52	8.167	2.49	11.17	1.42
2.250	2.13	5.250	8.52	8.250	2.48	11.25	1.42
2.333	2.13	5.333	8.52	8.333	2.49	11.33	1.42
2.417	2.13	5.417	8.52	8.417	2.49	11.42	1.42
2.500	2.13	5.500	8.52	8.500	2.48	11.50	1.42
2.583	2.13	5.583	34.08	8.583	2.48	11.58	1.42
2.667	2.13	5.667	34.08	8.667	2.48	11.67	1.42
2.750	2.13	5.750	34.08	8.750	2.48	11.75	1.42
2.833	2.13	5.833	93.72	8.833	2.49	11.83	1.42
2.917	2.13	5.917	93.72	8.917	2.49	11.92	1.42
3.000	2.13	6.000	93.72	9.000	2.48	12.00	1.42

```
     Unit Hyd Qpeak  (cms)=   0.026

     PEAK FLOW       (cms)=   0.010 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  33.014
     TOTAL RAINFALL   (mm)=  71.000
     RUNOFF COEFFICIENT   =   0.465

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0043)|   Area     (ha)=   2.03
|ID= 1 DT= 5.0 min |   Total Imp(%)=  63.00   Dir. Conn.(%)=  63.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.28         0.75
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.30         2.00
     Length            (m)=     116.33        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     1.78 | 3.083     2.84 | 6.083    12.78 |  9.08     2.48
     0.167     1.78 | 3.167     2.84 | 6.167    12.78 |  9.17     2.48
     0.250     1.78 | 3.250     2.84 | 6.250    12.78 |  9.25     2.48
     0.333     1.78 | 3.333     2.84 | 6.333    12.78 |  9.33     2.49
     0.417     1.78 | 3.417     2.84 | 6.417    12.78 |  9.42     2.49
     0.500     1.78 | 3.500     2.84 | 6.500    12.78 |  9.50     2.49
     0.583     1.78 | 3.583     2.84 | 6.583     5.68 |  9.58     2.48
     0.667     1.78 | 3.667     2.84 | 6.667     5.68 |  9.67     2.49
     0.750     1.78 | 3.750     2.84 | 6.750     5.68 |  9.75     2.49
     0.833     1.77 | 3.833     2.84 | 6.833     5.68 |  9.83     2.48
     0.917     1.77 | 3.917     2.84 | 6.917     5.68 |  9.92     2.48
     1.000     1.77 | 4.000     2.84 | 7.000     5.68 | 10.00     2.48
     1.083     1.77 | 4.083     4.26 | 7.083     4.26 | 10.08     1.42
     1.167     1.77 | 4.167     4.26 | 7.167     4.26 | 10.17     1.42
     1.250     1.77 | 4.250     4.26 | 7.250     4.26 | 10.25     1.42
     1.333     1.78 | 4.333     4.26 | 7.333     4.26 | 10.33     1.42
     1.417     1.78 | 4.417     4.26 | 7.417     4.26 | 10.42     1.42
     1.500     1.78 | 4.500     4.26 | 7.500     4.26 | 10.50     1.42
     1.583     1.77 | 4.583     5.68 | 7.583     4.26 | 10.58     1.42
     1.667     1.77 | 4.667     5.68 | 7.667     4.26 | 10.67     1.42
     1.750     1.78 | 4.750     5.68 | 7.750     4.26 | 10.75     1.42
     1.833     1.78 | 4.833     5.68 | 7.833     4.26 | 10.83     1.42
     1.917     1.78 | 4.917     5.68 | 7.917     4.26 | 10.92     1.42
     2.000     1.78 | 5.000     5.68 | 8.000     4.26 | 11.00     1.42
     2.083     2.13 | 5.083     8.52 | 8.083     2.49 | 11.08     1.42
     2.167     2.13 | 5.167     8.52 | 8.167     2.49 | 11.17     1.42
     2.250     2.13 | 5.250     8.52 | 8.250     2.48 | 11.25     1.42
     2.333     2.13 | 5.333     8.52 | 8.333     2.49 | 11.33     1.42
     2.417     2.13 | 5.417     8.52 | 8.417     2.49 | 11.42     1.42
     2.500     2.13 | 5.500     8.52 | 8.500     2.48 | 11.50     1.42
     2.583     2.13 | 5.583    34.08 | 8.583     2.48 | 11.58     1.42
     2.667     2.13 | 5.667    34.08 | 8.667     2.48 | 11.67     1.42
     2.750     2.13 | 5.750    34.08 | 8.750     2.48 | 11.75     1.42
     2.833     2.13 | 5.833    93.72 | 8.833     2.49 | 11.83     1.42
     2.917     2.13 | 5.917    93.72 | 8.917     2.49 | 11.92     1.42
     3.000     2.13 | 6.000    93.72 | 9.000     2.48 | 12.00     1.42

     Max.Eff.Inten.(mm/hr)=      93.72         55.99
               over (min)        5.00         15.00
     Storage Coeff.  (min)=      2.65 (ii)    11.55 (ii)
     Unit Hyd. Tpeak (min)=      5.00         15.00
     Unit Hyd. peak  (cms)=      0.29          0.09
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.33          0.07        0.397 (iii)
     TIME TO PEAK    (hrs)=      6.00          6.08         6.00
     RUNOFF VOLUME    (mm)=     70.00         33.64        56.54
     TOTAL RAINFALL   (mm)=     71.00         71.00        71.00
     RUNOFF COEFFICIENT   =      0.99          0.47         0.80

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  80.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0048)|   Area     (ha)=   0.24
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.00
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      40.00        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     1.78 | 3.083     2.84 | 6.083    12.78 |  9.08     2.48
     0.167     1.78 | 3.167     2.84 | 6.167    12.78 |  9.17     2.48
     0.250     1.78 | 3.250     2.84 | 6.250    12.78 |  9.25     2.48
     0.333     1.78 | 3.333     2.84 | 6.333    12.78 |  9.33     2.49
     0.417     1.78 | 3.417     2.84 | 6.417    12.78 |  9.42     2.49
     0.500     1.78 | 3.500     2.84 | 6.500    12.78 |  9.50     2.49
     0.583     1.78 | 3.583     2.84 | 6.583     5.68 |  9.58     2.48
     0.667     1.78 | 3.667     2.84 | 6.667     5.68 |  9.67     2.49
     0.750     1.78 | 3.750     2.84 | 6.750     5.68 |  9.75     2.49
     0.833     1.77 | 3.833     2.84 | 6.833     5.68 |  9.83     2.48
     0.917     1.77 | 3.917     2.84 | 6.917     5.68 |  9.92     2.48
     1.000     1.77 | 4.000     2.84 | 7.000     5.68 | 10.00     2.48
     1.083     1.77 | 4.083     4.26 | 7.083     4.26 | 10.08     1.42
     1.167     1.77 | 4.167     4.26 | 7.167     4.26 | 10.17     1.42
     1.250     1.77 | 4.250     4.26 | 7.250     4.26 | 10.25     1.42
     1.333     1.78 | 4.333     4.26 | 7.333     4.26 | 10.33     1.42
     1.417     1.78 | 4.417     4.26 | 7.417     4.26 | 10.42     1.42
     1.500     1.78 | 4.500     4.26 | 7.500     4.26 | 10.50     1.42
     1.583     1.77 | 4.583     5.68 | 7.583     4.26 | 10.58     1.42
     1.667     1.77 | 4.667     5.68 | 7.667     4.26 | 10.67     1.42
     1.750     1.78 | 4.750     5.68 | 7.750     4.26 | 10.75     1.42
     1.833     1.78 | 4.833     5.68 | 7.833     4.26 | 10.83     1.42
```

1.917	1.78	4.917	5.68	7.917	4.26	10.92	1.42
2.000	1.78	5.000	5.68	8.000	4.26	11.00	1.42
2.083	2.13	5.083	8.52	8.083	2.49	11.08	1.42
2.167	2.13	5.167	8.52	8.167	2.49	11.17	1.42
2.250	2.13	5.250	8.52	8.250	2.48	11.25	1.42
2.333	2.13	5.333	8.52	8.333	2.49	11.33	1.42
2.417	2.13	5.417	8.52	8.417	2.49	11.42	1.42
2.500	2.13	5.500	8.52	8.500	2.48	11.50	1.42
2.583	2.13	5.583	34.08	8.583	2.48	11.58	1.42
2.667	2.13	5.667	34.08	8.667	2.48	11.67	1.42
2.750	2.13	5.750	34.08	8.750	2.48	11.75	1.42
2.833	2.13	5.833	93.72	8.833	2.49	11.83	1.42
2.917	2.13	5.917	93.72	8.917	2.49	11.92	1.42
3.000	2.13	6.000	93.72	9.000	2.48	12.00	1.42

Max.Eff.Inten.(mm/hr)=	93.72	55.99	
over (min)	5.00	5.00	
Storage Coeff. (min)=	1.51 (ii)	2.67 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.33	0.29	
			TOTALS
PEAK FLOW (cms)=	0.06	0.00	0.062 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00
RUNOFF VOLUME (mm)=	70.00	33.64	69.63
TOTAL RAINFALL (mm)=	71.00	71.00	71.00
RUNOFF COEFFICIENT =	0.99	0.47	0.98

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0050)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0128	0.0103

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0048)	0.240	0.062	6.00	69.63
OUTFLOW: ID= 1 (0050)	0.240	0.011	6.08	68.80

PEAK FLOW REDUCTION [Qout/Qin](%)= 17.39
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0087

ADD HYD (0049)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0043):	2.03	0.397	6.00	56.54
	+ ID2= 2 (0050):	0.24	0.011	6.08	68.80
	ID = 3 (0049):	2.27	0.407	6.00	57.84

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	
STANDHYD (0051)	Area (ha)= 1.68
ID= 1 DT= 5.0 min	Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.66	0.02
Dep. Storage	(mm)=	5.00	1.50
Average Slope	(%)=	1.20	2.00
Length	(m)=	105.83	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.78	3.083	2.84	6.083	12.78	9.08	2.48
0.167	1.78	3.167	2.84	6.167	12.78	9.17	2.48
0.250	1.78	3.250	2.84	6.250	12.78	9.25	2.48
0.333	1.78	3.333	2.84	6.333	12.78	9.33	2.49
0.417	1.78	3.417	2.84	6.417	12.78	9.42	2.49
0.500	1.78	3.500	2.84	6.500	12.78	9.50	2.49
0.583	1.78	3.583	2.84	6.583	5.68	9.58	2.48
0.667	1.78	3.667	2.84	6.667	5.68	9.67	2.49
0.750	1.78	3.750	2.84	6.750	5.68	9.75	2.49
0.833	1.77	3.833	2.84	6.833	5.68	9.83	2.48
0.917	1.77	3.917	2.84	6.917	5.68	9.92	2.48
1.000	1.77	4.000	2.84	7.000	5.68	10.00	2.48
1.083	1.77	4.083	4.26	7.083	4.26	10.08	1.42
1.167	1.77	4.167	4.26	7.167	4.26	10.17	1.42
1.250	1.77	4.250	4.26	7.250	4.26	10.25	1.42
1.333	1.78	4.333	4.26	7.333	4.26	10.33	1.42
1.417	1.78	4.417	4.26	7.417	4.26	10.42	1.42
1.500	1.78	4.500	4.26	7.500	4.26	10.50	1.42
1.583	1.77	4.583	5.68	7.583	4.26	10.58	1.42
1.667	1.77	4.667	5.68	7.667	4.26	10.67	1.42
1.750	1.78	4.750	5.68	7.750	4.26	10.75	1.42
1.833	1.78	4.833	5.68	7.833	4.26	10.83	1.42
1.917	1.78	4.917	5.68	7.917	4.26	10.92	1.42
2.000	1.78	5.000	5.68	8.000	4.26	11.00	1.42
2.083	2.13	5.083	8.52	8.083	2.49	11.08	1.42
2.167	2.13	5.167	8.52	8.167	2.49	11.17	1.42
2.250	2.13	5.250	8.52	8.250	2.48	11.25	1.42
2.333	2.13	5.333	8.52	8.333	2.49	11.33	1.42
2.417	2.13	5.417	8.52	8.417	2.49	11.42	1.42
2.500	2.13	5.500	8.52	8.500	2.48	11.50	1.42
2.583	2.13	5.583	34.08	8.583	2.48	11.58	1.42
2.667	2.13	5.667	34.08	8.667	2.48	11.67	1.42
2.750	2.13	5.750	34.08	8.750	2.48	11.75	1.42
2.833	2.13	5.833	93.72	8.833	2.49	11.83	1.42
2.917	2.13	5.917	93.72	8.917	2.49	11.92	1.42
3.000	2.13	6.000	93.72	9.000	2.48	12.00	1.42

Max.Eff.Inten.(mm/hr)=	93.72	58.51	
over (min)	5.00	5.00	
Storage Coeff. (min)=	2.57 (ii)	3.72 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.29	0.25	
			TOTALS
PEAK FLOW (cms)=	0.43	0.00	0.435 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00

```
     RUNOFF VOLUME     (mm)=      66.00        36.32          65.70
     TOTAL RAINFALL    (mm)=      71.00        71.00          71.00
     RUNOFF COEFFICIENT   =       0.93         0.51           0.93

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  80.0     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  (  0046)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
        ID1= 1 (  0049):     2.27   0.407     6.00    57.84
      + ID2= 2 (  0051):     1.68   0.435     6.00    65.70
        ================================================
        ID = 3 (  0046):     3.95   0.842     6.00    61.18

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0047)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000    |   0.1630      0.2697
                         0.0080     0.0487    |   0.1700      0.2885
                         0.0100     0.0674    |   0.1720      0.2960
                         0.0880     0.1049    |   0.1760      0.3072
                         0.1040     0.1311    |   0.1770      0.3109
                         0.1170     0.1573    |   0.1800      0.3184
                         0.1260     0.1761    |   0.1870      0.3409
                         0.1300     0.1836    |   0.1880      0.3447
                         0.1570     0.2510    |   0.1910      0.3559

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0046)    3.950      0.842      6.00      61.18
   OUTFLOW: ID= 1 (  0047)    3.950      0.111      6.58      60.79

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 13.17
                  TIME SHIFT OF PEAK FLOW         (min)= 35.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1452

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

--------------------
| ADD HYD  (  0039)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
        ID1= 1 (  0040):     6.56   0.780     6.08    33.17
      + ID2= 2 (  0047):     3.95   0.111     6.58    60.79
        ================================================
        ID = 3 (  0039):    10.51   0.886     6.08    43.55

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

--------------------
| ADD HYD  (  0039)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
        ID1= 3 (  0039):     10.51   0.886     6.08    43.55
      + ID2= 2 (  0052):      0.08   0.010     6.00    33.01
        ================================================
        ID = 1 (  0039):     10.59   0.893     6.08    43.47

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
================================================================================
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       V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
       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 *****


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DATE: 03-08-2023                          TIME: 01:45:27

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COMMENTS: _____________________________________________________________


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  ** SIMULATION : 05 - 50 YR - SCS TYPE II 12HR **
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| MASS STORM       |    Filename: C:\Users\sramsoomair\AppD
|                  |              ata\Local\Temp\
|                  |              72e98174-9551-451b-b568-e4dbecda99d3\e1c45111
| Ptotal= 78.50 mm |    Comments: SCS TYPE II MASS CURVE
--------------------
                         Duration of storm    = 12.00 hrs
                         Mass curve time step = 15.00 min

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
```

0.00	1.96	3.00	3.14	6.00	14.13	9.00	2.75
0.25	1.96	3.25	3.14	6.25	14.13	9.25	2.75
0.50	1.96	3.50	3.14	6.50	6.28	9.50	2.75
0.75	1.96	3.75	3.14	6.75	6.28	9.75	2.75
1.00	1.96	4.00	4.71	7.00	4.71	10.00	1.57
1.25	1.96	4.25	4.71	7.25	4.71	10.25	1.57
1.50	1.96	4.50	6.28	7.50	4.71	10.50	1.57
1.75	1.96	4.75	6.28	7.75	4.71	10.75	1.57
2.00	2.35	5.00	9.42	8.00	2.75	11.00	1.57
2.25	2.35	5.25	9.42	8.25	2.75	11.25	1.57
2.50	2.35	5.50	37.68	8.50	2.75	11.50	1.57
2.75	2.35	5.75	103.62	8.75	2.75	11.75	1.57

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--------------------
| CALIB            |
| NASHYD   (  0041)|   Area     (ha)=   6.56   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14
```

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.96	3.083	3.14	6.083	14.13	9.08	2.75
0.167	1.96	3.167	3.14	6.167	14.13	9.17	2.75
0.250	1.96	3.250	3.14	6.250	14.13	9.25	2.75
0.333	1.96	3.333	3.14	6.333	14.13	9.33	2.75
0.417	1.96	3.417	3.14	6.417	14.13	9.42	2.75
0.500	1.96	3.500	3.14	6.500	14.13	9.50	2.75
0.583	1.96	3.583	3.14	6.583	6.28	9.58	2.75
0.667	1.96	3.667	3.14	6.667	6.28	9.67	2.75
0.750	1.96	3.750	3.14	6.750	6.28	9.75	2.75
0.833	1.96	3.833	3.14	6.833	6.28	9.83	2.75
0.917	1.96	3.917	3.14	6.917	6.28	9.92	2.75
1.000	1.96	4.000	3.14	7.000	6.28	10.00	2.75
1.083	1.96	4.083	4.71	7.083	4.71	10.08	1.57
1.167	1.96	4.167	4.71	7.167	4.71	10.17	1.57
1.250	1.96	4.250	4.71	7.250	4.71	10.25	1.57
1.333	1.96	4.333	4.71	7.333	4.71	10.33	1.57
1.417	1.96	4.417	4.71	7.417	4.71	10.42	1.57
1.500	1.96	4.500	4.71	7.500	4.71	10.50	1.57
1.583	1.96	4.583	6.28	7.583	4.71	10.58	1.57
1.667	1.96	4.667	6.28	7.667	4.71	10.67	1.57
1.750	1.96	4.750	6.28	7.750	4.71	10.75	1.57
1.833	1.96	4.833	6.28	7.833	4.71	10.83	1.57
1.917	1.96	4.917	6.28	7.917	4.71	10.92	1.57
2.000	1.96	5.000	6.28	8.000	4.71	11.00	1.57
2.083	2.35	5.083	9.42	8.083	2.75	11.08	1.57
2.167	2.35	5.167	9.42	8.167	2.75	11.17	1.57
2.250	2.35	5.250	9.42	8.250	2.75	11.25	1.57
2.333	2.35	5.333	9.42	8.333	2.75	11.33	1.57
2.417	2.35	5.417	9.42	8.417	2.75	11.42	1.57
2.500	2.35	5.500	9.42	8.500	2.75	11.50	1.57
2.583	2.35	5.583	37.68	8.583	2.75	11.58	1.57
2.667	2.35	5.667	37.68	8.667	2.75	11.67	1.57
2.750	2.35	5.750	37.68	8.750	2.75	11.75	1.57
2.833	2.35	5.833	103.62	8.833	2.75	11.83	1.57
2.917	2.35	5.917	103.62	8.917	2.75	11.92	1.57
3.000	2.35	6.000	103.62	9.000	2.75	12.00	1.57

```
Unit Hyd Qpeak  (cms)=   1.790

     PEAK FLOW       (cms)=   0.959 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  39.071
     TOTAL RAINFALL   (mm)=  78.500
     RUNOFF COEFFICIENT   =   0.498

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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| ROUTE CHN(  0040)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
```

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	101.50	0.0500	
1.00	100.70	0.0500	
1.50	100.55	0.0500 /0.0300	Main Channel
2.00	99.50	0.0300	Main Channel
3.50	99.60	0.0300	Main Channel
4.50	100.65	0.0300 /0.0500	Main Channel
6.00	101.45	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	99.60	.185E+02	0.0	0.54	8.09
0.19	99.69	.587E+02	0.2	1.04	4.22
0.29	99.79	.102E+03	0.5	1.38	3.16
0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	0.96	6.00	39.07	0.38	1.66
OUTFLOW: ID= 1 (0040)	6.56	0.92	6.08	39.07	0.38	1.63

```
--------------------
| CALIB            |
| NASHYD   (  0052)|   Area     (ha)=   0.08   Curve Number    (CN)= 80.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11
```

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.96	3.083	3.14	6.083	14.13	9.08	2.75
0.167	1.96	3.167	3.14	6.167	14.13	9.17	2.75
0.250	1.96	3.250	3.14	6.250	14.13	9.25	2.75
0.333	1.96	3.333	3.14	6.333	14.13	9.33	2.75
0.417	1.96	3.417	3.14	6.417	14.13	9.42	2.75
0.500	1.96	3.500	3.14	6.500	14.13	9.50	2.75
0.583	1.96	3.583	3.14	6.583	6.28	9.58	2.75
0.667	1.96	3.667	3.14	6.667	6.28	9.67	2.75
0.750	1.96	3.750	3.14	6.750	6.28	9.75	2.75
0.833	1.96	3.833	3.14	6.833	6.28	9.83	2.75
0.917	1.96	3.917	3.14	6.917	6.28	9.92	2.75
1.000	1.96	4.000	3.14	7.000	6.28	10.00	2.75
1.083	1.96	4.083	4.71	7.083	4.71	10.08	1.57
1.167	1.96	4.167	4.71	7.167	4.71	10.17	1.57
1.250	1.96	4.250	4.71	7.250	4.71	10.25	1.57
1.333	1.96	4.333	4.71	7.333	4.71	10.33	1.57
1.417	1.96	4.417	4.71	7.417	4.71	10.42	1.57
1.500	1.96	4.500	4.71	7.500	4.71	10.50	1.57
1.583	1.96	4.583	6.28	7.583	4.71	10.58	1.57
1.667	1.96	4.667	6.28	7.667	4.71	10.67	1.57
1.750	1.96	4.750	6.28	7.750	4.71	10.75	1.57
1.833	1.96	4.833	6.28	7.833	4.71	10.83	1.57
1.917	1.96	4.917	6.28	7.917	4.71	10.92	1.57
2.000	1.96	5.000	6.28	8.000	4.71	11.00	1.57
2.083	2.35	5.083	9.42	8.083	2.75	11.08	1.57
2.167	2.35	5.167	9.42	8.167	2.75	11.17	1.57
2.250	2.35	5.250	9.42	8.250	2.75	11.25	1.57
2.333	2.35	5.333	9.42	8.333	2.75	11.33	1.57
2.417	2.35	5.417	9.42	8.417	2.75	11.42	1.57
2.500	2.35	5.500	9.42	8.500	2.75	11.50	1.57
2.583	2.35	5.583	37.68	8.583	2.75	11.58	1.57
2.667	2.35	5.667	37.68	8.667	2.75	11.67	1.57
2.750	2.35	5.750	37.68	8.750	2.75	11.75	1.57
2.833	2.35	5.833	103.62	8.833	2.75	11.83	1.57
2.917	2.35	5.917	103.62	8.917	2.75	11.92	1.57
3.000	2.35	6.000	103.62	9.000	2.75	12.00	1.57

Unit Hyd Qpeak (cms)= 0.026

PEAK FLOW (cms)= 0.012 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 38.702
TOTAL RAINFALL (mm)= 78.500
RUNOFF COEFFICIENT = 0.493

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

CALIB
STANDHYD (0043)
ID= 1 DT= 5.0 min

Area (ha)= 2.03
Total Imp(%)= 63.00 Dir. Conn.(%)= 63.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.28	0.75
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.30	2.00
Length	(m)=	116.33	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	1.96	3.083	3.14	6.083	14.13	9.08	2.75
0.167	1.96	3.167	3.14	6.167	14.13	9.17	2.75
0.250	1.96	3.250	3.14	6.250	14.13	9.25	2.75
0.333	1.96	3.333	3.14	6.333	14.13	9.33	2.75
0.417	1.96	3.417	3.14	6.417	14.13	9.42	2.75
0.500	1.96	3.500	3.14	6.500	14.13	9.50	2.75
0.583	1.96	3.583	3.14	6.583	6.28	9.58	2.75
0.667	1.96	3.667	3.14	6.667	6.28	9.67	2.75
0.750	1.96	3.750	3.14	6.750	6.28	9.75	2.75
0.833	1.96	3.833	3.14	6.833	6.28	9.83	2.75
0.917	1.96	3.917	3.14	6.917	6.28	9.92	2.75
1.000	1.96	4.000	3.14	7.000	6.28	10.00	2.75
1.083	1.96	4.083	4.71	7.083	4.71	10.08	1.57
1.167	1.96	4.167	4.71	7.167	4.71	10.17	1.57
1.250	1.96	4.250	4.71	7.250	4.71	10.25	1.57
1.333	1.96	4.333	4.71	7.333	4.71	10.33	1.57
1.417	1.96	4.417	4.71	7.417	4.71	10.42	1.57
1.500	1.96	4.500	4.71	7.500	4.71	10.50	1.57
1.583	1.96	4.583	6.28	7.583	4.71	10.58	1.57
1.667	1.96	4.667	6.28	7.667	4.71	10.67	1.57
1.750	1.96	4.750	6.28	7.750	4.71	10.75	1.57
1.833	1.96	4.833	6.28	7.833	4.71	10.83	1.57
1.917	1.96	4.917	6.28	7.917	4.71	10.92	1.57
2.000	1.96	5.000	6.28	8.000	4.71	11.00	1.57
2.083	2.35	5.083	9.42	8.083	2.75	11.08	1.57
2.167	2.35	5.167	9.42	8.167	2.75	11.17	1.57
2.250	2.35	5.250	9.42	8.250	2.75	11.25	1.57
2.333	2.35	5.333	9.42	8.333	2.75	11.33	1.57
2.417	2.35	5.417	9.42	8.417	2.75	11.42	1.57
2.500	2.35	5.500	9.42	8.500	2.75	11.50	1.57
2.583	2.35	5.583	37.68	8.583	2.75	11.58	1.57
2.667	2.35	5.667	37.68	8.667	2.75	11.67	1.57
2.750	2.35	5.750	37.68	8.750	2.75	11.75	1.57
2.833	2.35	5.833	103.62	8.833	2.75	11.83	1.57
2.917	2.35	5.917	103.62	8.917	2.75	11.92	1.57
3.000	2.35	6.000	103.62	9.000	2.75	12.00	1.57

Max.Eff.Inten.(mm/hr)=	103.62	65.33		
over (min)	5.00	15.00		
Storage Coeff. (min)=	2.55 (ii)	10.92 (ii)		
Unit Hyd. Tpeak (min)=	5.00	15.00		
Unit Hyd. peak (cms)=	0.29	0.09		
			TOTALS	
PEAK FLOW (cms)=	0.37	0.09	0.446 (iii)	
TIME TO PEAK (hrs)=	6.00	6.08	6.00	
RUNOFF VOLUME (mm)=	77.50	39.43	63.41	
TOTAL RAINFALL (mm)=	78.50	78.50	78.50	
RUNOFF COEFFICIENT =	0.99	0.50	0.81	

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 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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--------------------
| CALIB            |
| STANDHYD (  0048)|   Area     (ha)=   0.24
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.00
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      40.00        40.00
     Mannings n            =      0.013        0.250

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.96	3.083	3.14	6.083	14.13	9.08	2.75
0.167	1.96	3.167	3.14	6.167	14.13	9.17	2.75
0.250	1.96	3.250	3.14	6.250	14.13	9.25	2.75
0.333	1.96	3.333	3.14	6.333	14.13	9.33	2.75
0.417	1.96	3.417	3.14	6.417	14.13	9.42	2.75
0.500	1.96	3.500	3.14	6.500	14.13	9.50	2.75
0.583	1.96	3.583	3.14	6.583	6.28	9.58	2.75
0.667	1.96	3.667	3.14	6.667	6.28	9.67	2.75
0.750	1.96	3.750	3.14	6.750	6.28	9.75	2.75
0.833	1.96	3.833	3.14	6.833	6.28	9.83	2.75
0.917	1.96	3.917	3.14	6.917	6.28	9.92	2.75
1.000	1.96	4.000	3.14	7.000	6.28	10.00	2.75
1.083	1.96	4.083	4.71	7.083	4.71	10.08	1.57
1.167	1.96	4.167	4.71	7.167	4.71	10.17	1.57
1.250	1.96	4.250	4.71	7.250	4.71	10.25	1.57
1.333	1.96	4.333	4.71	7.333	4.71	10.33	1.57
1.417	1.96	4.417	4.71	7.417	4.71	10.42	1.57
1.500	1.96	4.500	4.71	7.500	4.71	10.50	1.57
1.583	1.96	4.583	6.28	7.583	4.71	10.58	1.57
1.667	1.96	4.667	6.28	7.667	4.71	10.67	1.57
1.750	1.96	4.750	6.28	7.750	4.71	10.75	1.57
1.833	1.96	4.833	6.28	7.833	4.71	10.83	1.57
1.917	1.96	4.917	6.28	7.917	4.71	10.92	1.57
2.000	1.96	5.000	6.28	8.000	4.71	11.00	1.57
2.083	2.35	5.083	9.42	8.083	2.75	11.08	1.57
2.167	2.35	5.167	9.42	8.167	2.75	11.17	1.57
2.250	2.35	5.250	9.42	8.250	2.75	11.25	1.57
2.333	2.35	5.333	9.42	8.333	2.75	11.33	1.57
2.417	2.35	5.417	9.42	8.417	2.75	11.42	1.57
2.500	2.35	5.500	9.42	8.500	2.75	11.50	1.57
2.583	2.35	5.583	37.68	8.583	2.75	11.58	1.57
2.667	2.35	5.667	37.68	8.667	2.75	11.67	1.57
2.750	2.35	5.750	37.68	8.750	2.75	11.75	1.57
2.833	2.35	5.833	103.62	8.833	2.75	11.83	1.57
2.917	2.35	5.917	103.62	8.917	2.75	11.92	1.57
3.000	2.35	6.000	103.62	9.000	2.75	12.00	1.57

```
     Max.Eff.Inten.(mm/hr)=     103.62        65.33
               over (min)          5.00         5.00
     Storage Coeff.  (min)=       1.45 (ii)    2.56 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.33         0.29
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.07         0.00          0.069 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00            6.00
     RUNOFF VOLUME    (mm)=      77.50        39.43           77.11
     TOTAL RAINFALL   (mm)=      78.50        78.50           78.50
     RUNOFF COEFFICIENT   =       0.99         0.50            0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  80.0    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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--------------------
| RESERVOIR(  0050)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000     0.0000   |   0.0128     0.0103

                                  AREA     QPEAK     TPEAK       R.V.
                                  (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0048)       0.240     0.069      6.00       77.11
   OUTFLOW: ID= 1 (  0050)       0.240     0.012      6.08       76.29

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 17.41
                  TIME SHIFT OF PEAK FLOW          (min)=  5.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0096

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

--------------------
| ADD HYD  (  0049)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0043):     2.03   0.446     6.00    63.41
      + ID2= 2 (  0050):     0.24   0.012     6.08    76.29
        ================================================
        ID = 3 (  0049):     2.27   0.457     6.00    64.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0051)|   Area     (ha)=   1.68
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.66         0.02
     Dep. Storage     (mm)=       5.00         1.50
     Average Slope     (%)=       1.20         2.00
     Length            (m)=     105.83        40.00
     Mannings n            =      0.013        0.250

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.96	3.083	3.14	6.083	14.13	9.08	2.75
0.167	1.96	3.167	3.14	6.167	14.13	9.17	2.75
0.250	1.96	3.250	3.14	6.250	14.13	9.25	2.75
0.333	1.96	3.333	3.14	6.333	14.13	9.33	2.75
0.417	1.96	3.417	3.14	6.417	14.13	9.42	2.75

0.500	1.96	3.500	3.14	6.500	14.13	9.50	2.75
0.583	1.96	3.583	3.14	6.583	6.28	9.58	2.75
0.667	1.96	3.667	3.14	6.667	6.28	9.67	2.75
0.750	1.96	3.750	3.14	6.750	6.28	9.75	2.75
0.833	1.96	3.833	3.14	6.833	6.28	9.83	2.75
0.917	1.96	3.917	3.14	6.917	6.28	9.92	2.75
1.000	1.96	4.000	3.14	7.000	6.28	10.00	2.75
1.083	1.96	4.083	4.71	7.083	4.71	10.08	1.57
1.167	1.96	4.167	4.71	7.167	4.71	10.17	1.57
1.250	1.96	4.250	4.71	7.250	4.71	10.25	1.57
1.333	1.96	4.333	4.71	7.333	4.71	10.33	1.57
1.417	1.96	4.417	4.71	7.417	4.71	10.42	1.57
1.500	1.96	4.500	4.71	7.500	4.71	10.50	1.57
1.583	1.96	4.583	6.28	7.583	4.71	10.58	1.57
1.667	1.96	4.667	6.28	7.667	4.71	10.67	1.57
1.750	1.96	4.750	6.28	7.750	4.71	10.75	1.57
1.833	1.96	4.833	6.28	7.833	4.71	10.83	1.57
1.917	1.96	4.917	6.28	7.917	4.71	10.92	1.57
2.000	1.96	5.000	6.28	8.000	4.71	11.00	1.57
2.083	2.35	5.083	9.42	8.083	2.75	11.08	1.57
2.167	2.35	5.167	9.42	8.167	2.75	11.17	1.57
2.250	2.35	5.250	9.42	8.250	2.75	11.25	1.57
2.333	2.35	5.333	9.42	8.333	2.75	11.33	1.57
2.417	2.35	5.417	9.42	8.417	2.75	11.42	1.57
2.500	2.35	5.500	9.42	8.500	2.75	11.50	1.57
2.583	2.35	5.583	37.68	8.583	2.75	11.58	1.57
2.667	2.35	5.667	37.68	8.667	2.75	11.67	1.57
2.750	2.35	5.750	37.68	8.750	2.75	11.75	1.57
2.833	2.35	5.833	103.62	8.833	2.75	11.83	1.57
2.917	2.35	5.917	103.62	8.917	2.75	11.92	1.57
3.000	2.35	6.000	103.62	9.000	2.75	12.00	1.57

Max.Eff.Inten.(mm/hr)=	103.62	67.78	
over (min)	5.00	5.00	
Storage Coeff. (min)=	2.47 (ii)	3.57 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.30	0.26	
			TOTALS
PEAK FLOW (cms)=	0.48	0.00	0.481 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00
RUNOFF VOLUME (mm)=	73.50	42.20	73.19
TOTAL RAINFALL (mm)=	78.50	78.50	78.50
RUNOFF COEFFICIENT =	0.94	0.54	0.93

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 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 (0046)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0049):	2.27	0.457	6.00	64.77
+ ID2= 2 (0051):	1.68	0.481	6.00	73.19
ID = 3 (0046):	3.95	0.938	6.00	68.35

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0047)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.1630	0.2697
	0.0080	0.0487	0.1700	0.2885
	0.0100	0.0674	0.1720	0.2960
	0.0880	0.1049	0.1760	0.3072
	0.1040	0.1311	0.1770	0.3109
	0.1170	0.1573	0.1800	0.3184
	0.1260	0.1761	0.1870	0.3409
	0.1300	0.1836	0.1880	0.3447
	0.1570	0.2510	0.1910	0.3559

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0046)	3.950	0.938	6.00	68.35
OUTFLOW: ID= 1 (0047)	3.950	0.119	6.58	67.96

PEAK FLOW REDUCTION [Qout/Qin](%)= 12.73
TIME SHIFT OF PEAK FLOW (min)= 35.00
MAXIMUM STORAGE USED (ha.m.)= 0.1626

ADD HYD (0039)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0040):	6.56	0.919	6.08	39.07
+ ID2= 2 (0047):	3.95	0.119	6.58	67.96
ID = 3 (0039):	10.51	1.032	6.08	49.93

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0039)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0039):	10.51	1.032	6.08	49.93
+ ID2= 2 (0052):	0.08	0.012	6.00	38.70
ID = 1 (0039):	10.59	1.041	6.08	49.85

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
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\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-42e5-99bc-6f706f925a0e\0158215b-6b92-4d01-a730-fef5ccd56505\
Summary filename: C:\Users\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-42e5-99bc-6f706f925a0e\0158215b-6b92-4d01-a730-fef5ccd56505\

DATE: 03-08-2023 TIME: 01:45:25

USER:

COMMENTS: _____

** SIMULATION : 06 - 100 YR - SCS TYPE II 12H **

MASS STORM	Filename: C:\Users\sramsoomair\AppData\Local\Temp\72e98174-9551-451b-b568-e4dbecda99d3\504622f2
Ptotal= 85.30 mm	Comments: SCS TYPE II MASS CURVE

Duration of storm = 12.00 hrs
Mass curve time step = 15.00 min

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	2.13	3.00	3.41	6.00	15.35	9.00	2.99
0.25	2.13	3.25	3.41	6.25	15.35	9.25	2.99
0.50	2.13	3.50	3.41	6.50	6.82	9.50	2.99
0.75	2.13	3.75	3.41	6.75	6.82	9.75	2.99
1.00	2.13	4.00	5.12	7.00	5.12	10.00	1.71
1.25	2.13	4.25	5.12	7.25	5.12	10.25	1.71
1.50	2.13	4.50	6.82	7.50	5.12	10.50	1.71
1.75	2.13	4.75	6.82	7.75	5.12	10.75	1.71
2.00	2.56	5.00	10.24	8.00	2.99	11.00	1.71
2.25	2.56	5.25	10.24	8.25	2.99	11.25	1.71
2.50	2.56	5.50	40.94	8.50	2.99	11.50	1.71
2.75	2.56	5.75	112.60	8.75	2.99	11.75	1.71
3.00	2.56	6.00	112.59	9.00	2.99	12.00	1.71

CALIB	
NASHYD (0041)	Area (ha)= 6.56 Curve Number (CN)= 82.0
ID= 1 DT= 5.0 min	Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.14

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.13	3.083	3.41	6.083	15.35	9.08	2.99
0.167	2.13	3.167	3.41	6.167	15.35	9.17	2.99
0.250	2.13	3.250	3.41	6.250	15.35	9.25	2.99
0.333	2.13	3.333	3.41	6.333	15.35	9.33	2.99
0.417	2.13	3.417	3.41	6.417	15.35	9.42	2.99
0.500	2.13	3.500	3.41	6.500	15.35	9.50	2.99
0.583	2.13	3.583	3.41	6.583	6.82	9.58	2.99
0.667	2.13	3.667	3.41	6.667	6.82	9.67	2.99
0.750	2.13	3.750	3.41	6.750	6.82	9.75	2.99
0.833	2.13	3.833	3.41	6.833	6.82	9.83	2.99
0.917	2.13	3.917	3.41	6.917	6.82	9.92	2.99
1.000	2.13	4.000	3.41	7.000	6.82	10.00	2.99
1.083	2.13	4.083	5.12	7.083	5.12	10.08	1.71
1.167	2.13	4.167	5.12	7.167	5.12	10.17	1.71
1.250	2.13	4.250	5.12	7.250	5.12	10.25	1.71
1.333	2.13	4.333	5.12	7.333	5.12	10.33	1.71
1.417	2.13	4.417	5.12	7.417	5.12	10.42	1.71
1.500	2.13	4.500	5.12	7.500	5.12	10.50	1.71
1.583	2.13	4.583	6.82	7.583	5.12	10.58	1.71
1.667	2.13	4.667	6.82	7.667	5.12	10.67	1.71
1.750	2.13	4.750	6.82	7.750	5.12	10.75	1.71
1.833	2.13	4.833	6.82	7.833	5.12	10.83	1.71
1.917	2.13	4.917	6.82	7.917	5.12	10.92	1.71
2.000	2.13	5.000	6.82	8.000	5.12	11.00	1.71
2.083	2.56	5.083	10.24	8.083	2.99	11.08	1.71
2.167	2.56	5.167	10.24	8.167	2.99	11.17	1.71
2.250	2.56	5.250	10.24	8.250	2.99	11.25	1.71
2.333	2.56	5.333	10.24	8.333	2.99	11.33	1.71
2.417	2.56	5.417	10.24	8.417	2.99	11.42	1.71
2.500	2.56	5.500	10.24	8.500	2.99	11.50	1.71
2.583	2.56	5.583	40.94	8.583	2.99	11.58	1.71
2.667	2.56	5.667	40.94	8.667	2.99	11.67	1.71
2.750	2.56	5.750	40.95	8.750	2.99	11.75	1.71
2.833	2.56	5.833	112.60	8.833	2.99	11.83	1.71
2.917	2.56	5.917	112.60	8.917	2.99	11.92	1.71
3.000	2.56	6.000	112.59	9.000	2.99	12.00	1.71

Unit Hyd Qpeak (cms)= 1.790

PEAK FLOW (cms)= 1.094 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 44.571
TOTAL RAINFALL (mm)= 85.300
RUNOFF COEFFICIENT = 0.523

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

ROUTE CHN(0040)	
IN= 2---> OUT= 1	Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	101.50	0.0500	
1.00	100.70	0.0500	
1.50	100.55	0.0500 /0.0300	Main Channel
2.00	99.50	0.0300	Main Channel
3.50	99.60	0.0300	Main Channel
4.50	100.65	0.0300 /0.0500	Main Channel
6.00	101.45	0.0500	

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	99.60	.185E+02	0.0	0.54	8.09
0.19	99.69	.587E+02	0.2	1.04	4.22
0.29	99.79	.102E+03	0.5	1.38	3.16
0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	1.09	6.00	44.57	0.41	1.72
OUTFLOW: ID= 1 (0040)	6.56	1.05	6.08	44.57	0.40	1.70

CALIB					
NASHYD (0052)	Area (ha)=	0.08	Curve Number (CN)=	80.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.11		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.13	3.083	3.41	6.083	15.35	9.08	2.99
0.167	2.13	3.167	3.41	6.167	15.35	9.17	2.99
0.250	2.13	3.250	3.41	6.250	15.35	9.25	2.99
0.333	2.13	3.333	3.41	6.333	15.35	9.33	2.99
0.417	2.13	3.417	3.41	6.417	15.35	9.42	2.99
0.500	2.13	3.500	3.41	6.500	15.35	9.50	2.99
0.583	2.13	3.583	3.41	6.583	6.82	9.58	2.99
0.667	2.13	3.667	3.41	6.667	6.82	9.67	2.99
0.750	2.13	3.750	3.41	6.750	6.82	9.75	2.99
0.833	2.13	3.833	3.41	6.833	6.82	9.83	2.99
0.917	2.13	3.917	3.41	6.917	6.82	9.92	2.99
1.000	2.13	4.000	3.41	7.000	6.82	10.00	2.99
1.083	2.13	4.083	5.12	7.083	5.12	10.08	1.71
1.167	2.13	4.167	5.12	7.167	5.12	10.17	1.71
1.250	2.13	4.250	5.12	7.250	5.12	10.25	1.71
1.333	2.13	4.333	5.12	7.333	5.12	10.33	1.71
1.417	2.13	4.417	5.12	7.417	5.12	10.42	1.71
1.500	2.13	4.500	5.12	7.500	5.12	10.50	1.71
1.583	2.13	4.583	6.82	7.583	5.12	10.58	1.71
1.667	2.13	4.667	6.82	7.667	5.12	10.67	1.71
1.750	2.13	4.750	6.82	7.750	5.12	10.75	1.71
1.833	2.13	4.833	6.82	7.833	5.12	10.83	1.71
1.917	2.13	4.917	6.82	7.917	5.12	10.92	1.71
2.000	2.13	5.000	6.82	8.000	5.12	11.00	1.71
2.083	2.56	5.083	10.24	8.083	2.99	11.08	1.71
2.167	2.56	5.167	10.24	8.167	2.99	11.17	1.71
2.250	2.56	5.250	10.24	8.250	2.99	11.25	1.71
2.333	2.56	5.333	10.24	8.333	2.99	11.33	1.71
2.417	2.56	5.417	10.24	8.417	2.99	11.42	1.71
2.500	2.56	5.500	10.24	8.500	2.99	11.50	1.71
2.583	2.56	5.583	40.94	8.583	2.99	11.58	1.71
2.667	2.56	5.667	40.94	8.667	2.99	11.67	1.71
2.750	2.56	5.750	40.95	8.750	2.99	11.75	1.71
2.833	2.56	5.833	112.60	8.833	2.99	11.83	1.71
2.917	2.56	5.917	112.60	8.917	2.99	11.92	1.71
3.000	2.56	6.000	112.59	9.000	2.99	12.00	1.71

Unit Hyd Qpeak (cms)= 0.026

PEAK FLOW (cms)= 0.014 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 44.010
TOTAL RAINFALL (mm)= 85.300
RUNOFF COEFFICIENT = 0.516

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

CALIB			
STANDHYD (0043)	Area (ha)=	2.03	
ID= 1 DT= 5.0 min	Total Imp(%)=	63.00	Dir. Conn.(%)= 63.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.28	0.75
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.30	2.00
Length	(m)=	116.33	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.13	3.083	3.41	6.083	15.35	9.08	2.99
0.167	2.13	3.167	3.41	6.167	15.35	9.17	2.99
0.250	2.13	3.250	3.41	6.250	15.35	9.25	2.99
0.333	2.13	3.333	3.41	6.333	15.35	9.33	2.99
0.417	2.13	3.417	3.41	6.417	15.35	9.42	2.99
0.500	2.13	3.500	3.41	6.500	15.35	9.50	2.99
0.583	2.13	3.583	3.41	6.583	6.82	9.58	2.99
0.667	2.13	3.667	3.41	6.667	6.82	9.67	2.99
0.750	2.13	3.750	3.41	6.750	6.82	9.75	2.99
0.833	2.13	3.833	3.41	6.833	6.82	9.83	2.99
0.917	2.13	3.917	3.41	6.917	6.82	9.92	2.99
1.000	2.13	4.000	3.41	7.000	6.82	10.00	2.99
1.083	2.13	4.083	5.12	7.083	5.12	10.08	1.71
1.167	2.13	4.167	5.12	7.167	5.12	10.17	1.71
1.250	2.13	4.250	5.12	7.250	5.12	10.25	1.71
1.333	2.13	4.333	5.12	7.333	5.12	10.33	1.71
1.417	2.13	4.417	5.12	7.417	5.12	10.42	1.71
1.500	2.13	4.500	5.12	7.500	5.12	10.50	1.71

1.583	2.13	4.583	6.82	7.583	5.12	10.58	1.71
1.667	2.13	4.667	6.82	7.667	5.12	10.67	1.71
1.750	2.13	4.750	6.82	7.750	5.12	10.75	1.71
1.833	2.13	4.833	6.82	7.833	5.12	10.83	1.71
1.917	2.13	4.917	6.82	7.917	5.12	10.92	1.71
2.000	2.13	5.000	6.82	8.000	5.12	11.00	1.71
2.083	2.56	5.083	10.24	8.083	2.99	11.08	1.71
2.167	2.56	5.167	10.24	8.167	2.99	11.17	1.71
2.250	2.56	5.250	10.24	8.250	2.99	11.25	1.71
2.333	2.56	5.333	10.24	8.333	2.99	11.33	1.71
2.417	2.56	5.417	10.24	8.417	2.99	11.42	1.71
2.500	2.56	5.500	10.24	8.500	2.99	11.50	1.71
2.583	2.56	5.583	40.94	8.583	2.99	11.58	1.71
2.667	2.56	5.667	40.94	8.667	2.99	11.67	1.71
2.750	2.56	5.750	40.95	8.750	2.99	11.75	1.71
2.833	2.56	5.833	112.60	8.833	2.99	11.83	1.71
2.917	2.56	5.917	112.60	8.917	2.99	11.92	1.71
3.000	2.56	6.000	112.59	9.000	2.99	12.00	1.71

Max.Eff.Inten.(mm/hr)=	112.60	73.97		
over (min)	5.00	15.00		
Storage Coeff. (min)=	2.47 (ii)	10.43 (ii)		
Unit Hyd. Tpeak (min)=	5.00	15.00		
Unit Hyd. peak (cms)=	0.30	0.09		
			TOTALS	
PEAK FLOW (cms)=	0.40	0.10	0.491 (iii)	
TIME TO PEAK (hrs)=	6.00	6.08	6.00	
RUNOFF VOLUME (mm)=	84.30	44.84	69.70	
TOTAL RAINFALL (mm)=	85.30	85.30	85.30	
RUNOFF COEFFICIENT =	0.99	0.53	0.82	

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0048)	Area (ha)= 0.24		
ID= 1 DT= 5.0 min	Total Imp(%)= 99.00	Dir. Conn.(%)= 99.00	
	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	0.24	0.00	
Dep. Storage (mm)=	1.00	5.00	
Average Slope (%)=	1.00	2.00	
Length (m)=	40.00	40.00	
Mannings n =	0.013	0.250	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.13	3.083	3.41	6.083	15.35	9.08	2.99
0.167	2.13	3.167	3.41	6.167	15.35	9.17	2.99
0.250	2.13	3.250	3.41	6.250	15.35	9.25	2.99
0.333	2.13	3.333	3.41	6.333	15.35	9.33	2.99
0.417	2.13	3.417	3.41	6.417	15.35	9.42	2.99
0.500	2.13	3.500	3.41	6.500	15.35	9.50	2.99
0.583	2.13	3.583	3.41	6.583	6.82	9.58	2.99
0.667	2.13	3.667	3.41	6.667	6.82	9.67	2.99
0.750	2.13	3.750	3.41	6.750	6.82	9.75	2.99
0.833	2.13	3.833	3.41	6.833	6.82	9.83	2.99
0.917	2.13	3.917	3.41	6.917	6.82	9.92	2.99
1.000	2.13	4.000	3.41	7.000	6.82	10.00	2.99
1.083	2.13	4.083	5.12	7.083	5.12	10.08	1.71
1.167	2.13	4.167	5.12	7.167	5.12	10.17	1.71
1.250	2.13	4.250	5.12	7.250	5.12	10.25	1.71
1.333	2.13	4.333	5.12	7.333	5.12	10.33	1.71
1.417	2.13	4.417	5.12	7.417	5.12	10.42	1.71
1.500	2.13	4.500	5.12	7.500	5.12	10.50	1.71
1.583	2.13	4.583	6.82	7.583	5.12	10.58	1.71
1.667	2.13	4.667	6.82	7.667	5.12	10.67	1.71
1.750	2.13	4.750	6.82	7.750	5.12	10.75	1.71
1.833	2.13	4.833	6.82	7.833	5.12	10.83	1.71
1.917	2.13	4.917	6.82	7.917	5.12	10.92	1.71
2.000	2.13	5.000	6.82	8.000	5.12	11.00	1.71
2.083	2.56	5.083	10.24	8.083	2.99	11.08	1.71
2.167	2.56	5.167	10.24	8.167	2.99	11.17	1.71
2.250	2.56	5.250	10.24	8.250	2.99	11.25	1.71
2.333	2.56	5.333	10.24	8.333	2.99	11.33	1.71
2.417	2.56	5.417	10.24	8.417	2.99	11.42	1.71
2.500	2.56	5.500	10.24	8.500	2.99	11.50	1.71
2.583	2.56	5.583	40.94	8.583	2.99	11.58	1.71
2.667	2.56	5.667	40.94	8.667	2.99	11.67	1.71
2.750	2.56	5.750	40.95	8.750	2.99	11.75	1.71
2.833	2.56	5.833	112.60	8.833	2.99	11.83	1.71
2.917	2.56	5.917	112.60	8.917	2.99	11.92	1.71
3.000	2.56	6.000	112.59	9.000	2.99	12.00	1.71

Max.Eff.Inten.(mm/hr)=	112.60	73.97		
over (min)	5.00	5.00		
Storage Coeff. (min)=	1.41 (ii)	2.48 (ii)		
Unit Hyd. Tpeak (min)=	5.00	5.00		
Unit Hyd. peak (cms)=	0.33	0.29		
			TOTALS	
PEAK FLOW (cms)=	0.07	0.00	0.075 (iii)	
TIME TO PEAK (hrs)=	6.00	6.00	6.00	
RUNOFF VOLUME (mm)=	84.30	44.84	83.90	
TOTAL RAINFALL (mm)=	85.30	85.30	85.30	
RUNOFF COEFFICIENT =	0.99	0.53	0.98	

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0050)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0128	0.0103

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0048)	0.240	0.075	6.00	83.90
OUTFLOW: ID= 1 (0050)	0.240	0.013	6.08	83.07

```
                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 17.42
                TIME SHIFT OF PEAK FLOW          (min)=  5.00
                MAXIMUM  STORAGE   USED        (ha.m.)=  0.0105

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--------------------
| ADD HYD  (  0049)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0043):      2.03   0.491     6.00    69.70
     + ID2= 2 (  0050):      0.24   0.013     6.08    83.07
       ================================================
       ID = 3 (  0049):      2.27   0.503     6.00    71.11

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0051)|   Area     (ha)=   1.68
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       1.66         0.02
    Dep. Storage     (mm)=       5.00         1.50
    Average Slope     (%)=       1.20         2.00
    Length            (m)=     105.83        40.00
    Mannings n           =      0.013        0.250

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


                      ---- TRANSFORMED HYETOGRAPH ----
 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
0.083    2.13 | 3.083    3.41 | 6.083   15.35 |  9.08    2.99
0.167    2.13 | 3.167    3.41 | 6.167   15.35 |  9.17    2.99
0.250    2.13 | 3.250    3.41 | 6.250   15.35 |  9.25    2.99
0.333    2.13 | 3.333    3.41 | 6.333   15.35 |  9.33    2.99
0.417    2.13 | 3.417    3.41 | 6.417   15.35 |  9.42    2.99
0.500    2.13 | 3.500    3.41 | 6.500   15.35 |  9.50    2.99
0.583    2.13 | 3.583    3.41 | 6.583    6.82 |  9.58    2.99
0.667    2.13 | 3.667    3.41 | 6.667    6.82 |  9.67    2.99
0.750    2.13 | 3.750    3.41 | 6.750    6.82 |  9.75    2.99
0.833    2.13 | 3.833    3.41 | 6.833    6.82 |  9.83    2.99
0.917    2.13 | 3.917    3.41 | 6.917    6.82 |  9.92    2.99
1.000    2.13 | 4.000    3.41 | 7.000    6.82 | 10.00    2.99
1.083    2.13 | 4.083    5.12 | 7.083    5.12 | 10.08    1.71
1.167    2.13 | 4.167    5.12 | 7.167    5.12 | 10.17    1.71
1.250    2.13 | 4.250    5.12 | 7.250    5.12 | 10.25    1.71
1.333    2.13 | 4.333    5.12 | 7.333    5.12 | 10.33    1.71
1.417    2.13 | 4.417    5.12 | 7.417    5.12 | 10.42    1.71
1.500    2.13 | 4.500    5.12 | 7.500    5.12 | 10.50    1.71
1.583    2.13 | 4.583    6.82 | 7.583    5.12 | 10.58    1.71
1.667    2.13 | 4.667    6.82 | 7.667    5.12 | 10.67    1.71
1.750    2.13 | 4.750    6.82 | 7.750    5.12 | 10.75    1.71
1.833    2.13 | 4.833    6.82 | 7.833    5.12 | 10.83    1.71
1.917    2.13 | 4.917    6.82 | 7.917    5.12 | 10.92    1.71
2.000    2.13 | 5.000    6.82 | 8.000    5.12 | 11.00    1.71
2.083    2.56 | 5.083   10.24 | 8.083    2.99 | 11.08    1.71
2.167    2.56 | 5.167   10.24 | 8.167    2.99 | 11.17    1.71
2.250    2.56 | 5.250   10.24 | 8.250    2.99 | 11.25    1.71
2.333    2.56 | 5.333   10.24 | 8.333    2.99 | 11.33    1.71
2.417    2.56 | 5.417   10.24 | 8.417    2.99 | 11.42    1.71
2.500    2.56 | 5.500   10.24 | 8.500    2.99 | 11.50    1.71
2.583    2.56 | 5.583   40.94 | 8.583    2.99 | 11.58    1.71
2.667    2.56 | 5.667   40.94 | 8.667    2.99 | 11.67    1.71
2.750    2.56 | 5.750   40.95 | 8.750    2.99 | 11.75    1.71
2.833    2.56 | 5.833  112.60 | 8.833    2.99 | 11.83    1.71
2.917    2.56 | 5.917  112.60 | 8.917    2.99 | 11.92    1.71
3.000    2.56 | 6.000  112.59 | 9.000    2.99 | 12.00    1.71

    Max.Eff.Inten.(mm/hr)=     112.60         76.36
                over (min)        5.00          5.00
    Storage Coeff.  (min)=       2.39 (ii)     3.46 (ii)
    Unit Hyd. Tpeak (min)=       5.00          5.00
    Unit Hyd. peak  (cms)=       0.30          0.26
                                                          *TOTALS*
    PEAK FLOW       (cms)=       0.52          0.00          0.523 (iii)
    TIME TO PEAK    (hrs)=       6.00          6.00          6.00
    RUNOFF VOLUME    (mm)=      80.30         47.67         79.97
    TOTAL RAINFALL   (mm)=      85.30         85.30         85.30
    RUNOFF COEFFICIENT   =       0.94          0.56          0.94

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN*  =  80.0    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  (  0046)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0049):      2.27   0.503     6.00    71.11
     + ID2= 2 (  0051):      1.68   0.523     6.00    79.97
       ================================================
       ID = 3 (  0046):      3.95   1.026     6.00    74.88

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0047)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                         0.0000     0.0000    |   0.1630     0.2697
                         0.0080     0.0487    |   0.1700     0.2885
                         0.0100     0.0674    |   0.1720     0.2960
                         0.0880     0.1049    |   0.1760     0.3072
                         0.1040     0.1311    |   0.1770     0.3109
                         0.1170     0.1573    |   0.1800     0.3184
                         0.1260     0.1761    |   0.1870     0.3409
                         0.1300     0.1836    |   0.1880     0.3447
                         0.1570     0.2510    |   0.1910     0.3559

                                  AREA     QPEAK     TPEAK       R.V.
                                  (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0046)       3.950     1.026      6.00       74.88
   OUTFLOW: ID= 1 (  0047)       3.950     0.127      6.58       74.49

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 12.39
                TIME SHIFT OF PEAK FLOW          (min)= 35.00
                MAXIMUM  STORAGE   USED        (ha.m.)=  0.1786
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--------------------
| ADD HYD  (  0039)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK      R.V.
-------------------           (ha)    (cms)    (hrs)      (mm)
       ID1= 1 (  0040):      6.56    1.047     6.08     44.57
     + ID2= 2 (  0047):      3.95    0.127     6.58     74.49
       ================================================
       ID = 3 (  0039):     10.51    1.167     6.08     55.81

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

--------------------
| ADD HYD  (  0039)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK      R.V.
-------------------           (ha)    (cms)    (hrs)      (mm)
       ID1= 3 (  0039):     10.51    1.167     6.08     55.81
     + ID2= 2 (  0052):      0.08    0.014     6.00     44.01
       ================================================
       ID = 1 (  0039):     10.59    1.177     6.08     55.73

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

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
       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\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\1d957dd0-3444-4b63-bfd5-0002452ac188\
  Summary filename: C:\Users\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\1d957dd0-3444-4b63-bfd5-0002452ac188\


DATE: 03-08-2023                          TIME: 01:45:25

USER:



COMMENTS: _____
```

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  ******************************************
  ** SIMULATION : 11 - 2-YR - SCS TYPE II 24HR  **
  ******************************************

--------------------
| MASS STORM       |    Filename: C:\Users\sramsoomair\AppD
|                  |              ata\Local\Temp\
|                  |              72e98174-9551-451b-b568-e4dbecda99d3\9cbcd136
| Ptotal= 45.90 mm |    Comments: SCS TYPE II MASS CURVE
--------------------

                         Duration of storm    = 24.00 hrs
                         Mass curve time step = 15.00 min

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    0.50 |  6.00    0.83 | 12.00    6.61 | 18.00    0.83
                0.25    0.50 |  6.25    0.83 | 12.25    6.61 | 18.25    0.83
                0.50    0.50 |  6.50    0.83 | 12.50    3.40 | 18.50    0.83
                0.75    0.50 |  6.75    0.83 | 12.75    3.40 | 18.75    0.83
                1.00    0.50 |  7.00    1.01 | 13.00    2.48 | 19.00    0.83
                1.25    0.50 |  7.25    1.01 | 13.25    2.48 | 19.25    0.83
                1.50    0.50 |  7.50    1.01 | 13.50    1.93 | 19.50    0.83
                1.75    0.50 |  7.75    1.01 | 13.75    1.93 | 19.75    0.83
                2.00    0.60 |  8.00    1.19 | 14.00    1.38 | 20.00    0.55
                2.25    0.60 |  8.25    1.19 | 14.25    1.38 | 20.25    0.55
                2.50    0.60 |  8.50    1.29 | 14.50    1.38 | 20.50    0.55
                2.75    0.60 |  8.75    1.29 | 14.75    1.38 | 20.75    0.55
                3.00    0.60 |  9.00    1.47 | 15.00    1.38 | 21.00    0.55
                3.25    0.60 |  9.25    1.47 | 15.25    1.38 | 21.25    0.55
                3.50    0.60 |  9.50    1.65 | 15.50    1.38 | 21.50    0.55
                3.75    0.60 |  9.75    1.65 | 15.75    1.38 | 21.75    0.55
                4.00    0.73 | 10.00    2.11 | 16.00    0.83 | 22.00    0.55
                4.25    0.73 | 10.25    2.11 | 16.25    0.83 | 22.25    0.55
                4.50    0.73 | 10.50    2.85 | 16.50    0.83 | 22.50    0.55
                4.75    0.73 | 10.75    2.85 | 16.75    0.83 | 22.75    0.55
                5.00    0.73 | 11.00    4.41 | 17.00    0.83 | 23.00    0.55
                5.25    0.73 | 11.25    4.41 | 17.25    0.83 | 23.25    0.55
                5.50    0.73 | 11.50   13.59 | 17.50    0.83 | 23.50    0.55
                5.75    0.73 | 11.75   56.18 | 17.75    0.83 | 23.75    0.55

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0041)|   Area    (ha)=   6.56   Curve Number   (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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


                        ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    0.50 | 6.083    0.83 |12.083    6.62 | 18.08    0.83
               0.167    0.50 | 6.167    0.83 |12.167    6.61 | 18.17    0.83
               0.250    0.50 | 6.250    0.83 |12.250    6.61 | 18.25    0.83
               0.333    0.50 | 6.333    0.83 |12.333    6.61 | 18.33    0.83
               0.417    0.50 | 6.417    0.83 |12.417    6.61 | 18.42    0.83
               0.500    0.50 | 6.500    0.83 |12.500    6.61 | 18.50    0.83
               0.583    0.50 | 6.583    0.83 |12.583    3.40 | 18.58    0.83
               0.667    0.50 | 6.667    0.83 |12.667    3.40 | 18.67    0.83
               0.750    0.50 | 6.750    0.83 |12.750    3.40 | 18.75    0.83
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0.833	0.50	6.833	0.83	12.833	3.40	18.83	0.83
0.917	0.50	6.917	0.83	12.917	3.40	18.92	0.83
1.000	0.50	7.000	0.83	13.000	3.40	19.00	0.83
1.083	0.50	7.083	1.01	13.083	2.48	19.08	0.83
1.167	0.50	7.167	1.01	13.167	2.48	19.17	0.83
1.250	0.50	7.250	1.01	13.250	2.48	19.25	0.83
1.333	0.50	7.333	1.01	13.333	2.48	19.33	0.83
1.417	0.50	7.417	1.01	13.417	2.48	19.42	0.83
1.500	0.50	7.500	1.01	13.500	2.48	19.50	0.83
1.583	0.50	7.583	1.01	13.583	1.93	19.58	0.83
1.667	0.50	7.667	1.01	13.667	1.93	19.67	0.83
1.750	0.50	7.750	1.01	13.750	1.93	19.75	0.83
1.833	0.50	7.833	1.01	13.833	1.93	19.83	0.83
1.917	0.50	7.917	1.01	13.917	1.93	19.92	0.83
2.000	0.50	8.000	1.01	14.000	1.93	20.00	0.83
2.083	0.60	8.083	1.19	14.083	1.38	20.08	0.55
2.167	0.60	8.167	1.19	14.167	1.38	20.17	0.55
2.250	0.60	8.250	1.19	14.250	1.38	20.25	0.55
2.333	0.60	8.333	1.19	14.333	1.38	20.33	0.55
2.417	0.60	8.417	1.19	14.417	1.38	20.42	0.55
2.500	0.60	8.500	1.19	14.500	1.38	20.50	0.55
2.583	0.60	8.583	1.29	14.583	1.38	20.58	0.55
2.667	0.60	8.667	1.29	14.667	1.38	20.67	0.55
2.750	0.60	8.750	1.29	14.750	1.38	20.75	0.55
2.833	0.60	8.833	1.29	14.833	1.38	20.83	0.55
2.917	0.60	8.917	1.29	14.917	1.38	20.92	0.55
3.000	0.60	9.000	1.29	15.000	1.38	21.00	0.55
3.083	0.60	9.083	1.47	15.083	1.38	21.08	0.55
3.167	0.60	9.167	1.47	15.167	1.38	21.17	0.55
3.250	0.60	9.250	1.47	15.250	1.38	21.25	0.55
3.333	0.60	9.333	1.47	15.333	1.38	21.33	0.55
3.417	0.60	9.417	1.47	15.417	1.38	21.42	0.55
3.500	0.60	9.500	1.47	15.500	1.38	21.50	0.55
3.583	0.60	9.583	1.65	15.583	1.38	21.58	0.55
3.667	0.60	9.667	1.65	15.667	1.38	21.67	0.55
3.750	0.60	9.750	1.65	15.750	1.38	21.75	0.55
3.833	0.60	9.833	1.65	15.833	1.38	21.83	0.55
3.917	0.60	9.917	1.65	15.917	1.38	21.92	0.55
4.000	0.60	10.000	1.65	16.000	1.38	22.00	0.55
4.083	0.73	10.083	2.11	16.083	0.83	22.08	0.55
4.167	0.73	10.167	2.11	16.167	0.83	22.17	0.55
4.250	0.73	10.250	2.11	16.250	0.83	22.25	0.55
4.333	0.73	10.333	2.11	16.333	0.83	22.33	0.55
4.417	0.73	10.417	2.11	16.417	0.83	22.42	0.55
4.500	0.73	10.500	2.11	16.500	0.83	22.50	0.55
4.583	0.73	10.583	2.85	16.583	0.83	22.58	0.55
4.667	0.73	10.667	2.85	16.667	0.83	22.67	0.55
4.750	0.73	10.750	2.85	16.750	0.83	22.75	0.55
4.833	0.73	10.833	2.85	16.833	0.83	22.83	0.55
4.917	0.73	10.917	2.85	16.917	0.83	22.92	0.55
5.000	0.73	11.000	2.85	17.000	0.83	23.00	0.55
5.083	0.73	11.083	4.41	17.083	0.83	23.08	0.55
5.167	0.73	11.167	4.41	17.167	0.83	23.17	0.55
5.250	0.73	11.250	4.41	17.250	0.83	23.25	0.55
5.333	0.73	11.333	4.41	17.333	0.83	23.33	0.55
5.417	0.73	11.417	4.41	17.417	0.83	23.42	0.55
5.500	0.73	11.500	4.41	17.500	0.83	23.50	0.55
5.583	0.73	11.583	13.59	17.583	0.83	23.58	0.55
5.667	0.73	11.667	13.59	17.667	0.83	23.67	0.55
5.750	0.73	11.750	13.59	17.750	0.83	23.75	0.55
5.833	0.73	11.833	56.18	17.833	0.83	23.83	0.55
5.917	0.73	11.917	56.18	17.917	0.83	23.92	0.55
6.000	0.73	12.000	56.18	18.000	0.83	24.00	0.55

```
      Unit Hyd Qpeak  (cms)=   1.790

      PEAK FLOW       (cms)=   0.319 (i)
      TIME TO PEAK    (hrs)=  12.000
      RUNOFF VOLUME    (mm)=  15.222
      TOTAL RAINFALL   (mm)=  45.900
      RUNOFF COEFFICIENT   =   0.332

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

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--------------------
| ROUTE CHN(  0040)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         101.50        0.0500
                   1.00         100.70        0.0500
                   1.50         100.55    0.0500 /0.0300  Main Channel
                   2.00          99.50        0.0300      Main Channel
                   3.50          99.60        0.0300      Main Channel
                   4.50         100.65    0.0300 /0.0500  Main Channel
                   6.00         101.45        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)         (m/s)      (min)
        0.10    99.60    .185E+02        0.0          0.54       8.09
        0.19    99.69    .587E+02        0.2          1.04       4.22
        0.29    99.79    .102E+03        0.5          1.38       3.16
        0.38    99.88    .149E+03        0.9          1.66       2.64
        0.48    99.98    .200E+03        1.4          1.88       2.32
        0.57   100.07    .254E+03        2.0          2.08       2.10
        0.67   100.17    .311E+03        2.7          2.26       1.93
        0.76   100.26    .372E+03        3.4          2.42       1.81
        0.86   100.36    .436E+03        4.3          2.57       1.70
        0.95   100.45    .503E+03        5.2          2.70       1.61
        1.05   100.55    .574E+03        6.2          2.83       1.54
        1.16   100.66    .667E+03        7.7          3.02       1.45
        1.28   100.78    .774E+03        9.5          3.22       1.35
        1.39   100.89    .892E+03       11.6          3.40       1.29
        1.50   101.00    .102E+04       13.8          3.54       1.23
        1.61   101.11    .116E+04       16.3          3.67       1.19
        1.72   101.22    .131E+04       18.9          3.79       1.15
        1.84   101.34    .147E+04       21.8          3.90       1.12
        1.95   101.45    .164E+04       25.0          4.00       1.09

                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)       (m)      (m/s)
   INFLOW : ID= 2 (  0041)     6.56     0.32   12.00  15.22       0.22      1.11
   OUTFLOW: ID= 1 (  0040)     6.56     0.32   12.08  15.22       0.22      1.11



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--------------------
| CALIB            |
| NASHYD   (  0052)|   Area     (ha)=   0.08   Curve Number    (CN)= 80.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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	0.50	6.083	0.83	12.083	6.62	18.08	0.83
0.167	0.50	6.167	0.83	12.167	6.61	18.17	0.83
0.250	0.50	6.250	0.83	12.250	6.61	18.25	0.83
0.333	0.50	6.333	0.83	12.333	6.61	18.33	0.83
0.417	0.50	6.417	0.83	12.417	6.61	18.42	0.83
0.500	0.50	6.500	0.83	12.500	6.61	18.50	0.83
0.583	0.50	6.583	0.83	12.583	3.40	18.58	0.83
0.667	0.50	6.667	0.83	12.667	3.40	18.67	0.83
0.750	0.50	6.750	0.83	12.750	3.40	18.75	0.83
0.833	0.50	6.833	0.83	12.833	3.40	18.83	0.83
0.917	0.50	6.917	0.83	12.917	3.40	18.92	0.83
1.000	0.50	7.000	0.83	13.000	3.40	19.00	0.83
1.083	0.50	7.083	1.01	13.083	2.48	19.08	0.83
1.167	0.50	7.167	1.01	13.167	2.48	19.17	0.83
1.250	0.50	7.250	1.01	13.250	2.48	19.25	0.83
1.333	0.50	7.333	1.01	13.333	2.48	19.33	0.83
1.417	0.50	7.417	1.01	13.417	2.48	19.42	0.83
1.500	0.50	7.500	1.01	13.500	2.48	19.50	0.83
1.583	0.50	7.583	1.01	13.583	1.93	19.58	0.83
1.667	0.50	7.667	1.01	13.667	1.93	19.67	0.83
1.750	0.50	7.750	1.01	13.750	1.93	19.75	0.83
1.833	0.50	7.833	1.01	13.833	1.93	19.83	0.83
1.917	0.50	7.917	1.01	13.917	1.93	19.92	0.83
2.000	0.50	8.000	1.01	14.000	1.93	20.00	0.83
2.083	0.60	8.083	1.19	14.083	1.38	20.08	0.55
2.167	0.60	8.167	1.19	14.167	1.38	20.17	0.55
2.250	0.60	8.250	1.19	14.250	1.38	20.25	0.55
2.333	0.60	8.333	1.19	14.333	1.38	20.33	0.55
2.417	0.60	8.417	1.19	14.417	1.38	20.42	0.55
2.500	0.60	8.500	1.19	14.500	1.38	20.50	0.55
2.583	0.60	8.583	1.29	14.583	1.38	20.58	0.55
2.667	0.60	8.667	1.29	14.667	1.38	20.67	0.55
2.750	0.60	8.750	1.29	14.750	1.38	20.75	0.55
2.833	0.60	8.833	1.29	14.833	1.38	20.83	0.55
2.917	0.60	8.917	1.29	14.917	1.38	20.92	0.55
3.000	0.60	9.000	1.29	15.000	1.38	21.00	0.55
3.083	0.60	9.083	1.47	15.083	1.38	21.08	0.55
3.167	0.60	9.167	1.47	15.167	1.38	21.17	0.55
3.250	0.60	9.250	1.47	15.250	1.38	21.25	0.55
3.333	0.60	9.333	1.47	15.333	1.38	21.33	0.55
3.417	0.60	9.417	1.47	15.417	1.38	21.42	0.55
3.500	0.60	9.500	1.47	15.500	1.38	21.50	0.55
3.583	0.60	9.583	1.65	15.583	1.38	21.58	0.55
3.667	0.60	9.667	1.65	15.667	1.38	21.67	0.55
3.750	0.60	9.750	1.65	15.750	1.38	21.75	0.55
3.833	0.60	9.833	1.65	15.833	1.38	21.83	0.55
3.917	0.60	9.917	1.65	15.917	1.38	21.92	0.55
4.000	0.60	10.000	1.65	16.000	1.38	22.00	0.55
4.083	0.73	10.083	2.11	16.083	0.83	22.08	0.55
4.167	0.73	10.167	2.11	16.167	0.83	22.17	0.55
4.250	0.73	10.250	2.11	16.250	0.83	22.25	0.55
4.333	0.73	10.333	2.11	16.333	0.83	22.33	0.55
4.417	0.73	10.417	2.11	16.417	0.83	22.42	0.55
4.500	0.73	10.500	2.11	16.500	0.83	22.50	0.55
4.583	0.73	10.583	2.85	16.583	0.83	22.58	0.55
4.667	0.73	10.667	2.85	16.667	0.83	22.67	0.55
4.750	0.73	10.750	2.85	16.750	0.83	22.75	0.55
4.833	0.73	10.833	2.85	16.833	0.83	22.83	0.55
4.917	0.73	10.917	2.85	16.917	0.83	22.92	0.55
5.000	0.73	11.000	2.85	17.000	0.83	23.00	0.55
5.083	0.73	11.083	4.41	17.083	0.83	23.08	0.55
5.167	0.73	11.167	4.41	17.167	0.83	23.17	0.55
5.250	0.73	11.250	4.41	17.250	0.83	23.25	0.55
5.333	0.73	11.333	4.41	17.333	0.83	23.33	0.55
5.417	0.73	11.417	4.41	17.417	0.83	23.42	0.55
5.500	0.73	11.500	4.41	17.500	0.83	23.50	0.55
5.583	0.73	11.583	13.59	17.583	0.83	23.58	0.55
5.667	0.73	11.667	13.59	17.667	0.83	23.67	0.55
5.750	0.73	11.750	13.59	17.750	0.83	23.75	0.55
5.833	0.73	11.833	56.18	17.833	0.83	23.83	0.55
5.917	0.73	11.917	56.18	17.917	0.83	23.92	0.55
6.000	0.73	12.000	56.18	18.000	0.83	24.00	0.55

Unit Hyd Qpeak (cms)= 0.026

PEAK FLOW (cms)= 0.004 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 15.724
TOTAL RAINFALL (mm)= 45.900
RUNOFF COEFFICIENT = 0.343

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

CALIB					
STANDHYD (0043)	Area (ha)= 2.03				
ID= 1 DT= 5.0 min	Total Imp(%)= 63.00	Dir. Conn.(%)= 63.00			

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.28	0.75
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.30	2.00
Length	(m)=	116.33	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	0.50	6.083	0.83	12.083	6.62	18.08	0.83
0.167	0.50	6.167	0.83	12.167	6.61	18.17	0.83
0.250	0.50	6.250	0.83	12.250	6.61	18.25	0.83
0.333	0.50	6.333	0.83	12.333	6.61	18.33	0.83
0.417	0.50	6.417	0.83	12.417	6.61	18.42	0.83
0.500	0.50	6.500	0.83	12.500	6.61	18.50	0.83
0.583	0.50	6.583	0.83	12.583	3.40	18.58	0.83
0.667	0.50	6.667	0.83	12.667	3.40	18.67	0.83
0.750	0.50	6.750	0.83	12.750	3.40	18.75	0.83
0.833	0.50	6.833	0.83	12.833	3.40	18.83	0.83
0.917	0.50	6.917	0.83	12.917	3.40	18.92	0.83
1.000	0.50	7.000	0.83	13.000	3.40	19.00	0.83
1.083	0.50	7.083	1.01	13.083	2.48	19.08	0.83
1.167	0.50	7.167	1.01	13.167	2.48	19.17	0.83
1.250	0.50	7.250	1.01	13.250	2.48	19.25	0.83
1.333	0.50	7.333	1.01	13.333	2.48	19.33	0.83
1.417	0.50	7.417	1.01	13.417	2.48	19.42	0.83
1.500	0.50	7.500	1.01	13.500	2.48	19.50	0.83
1.583	0.50	7.583	1.01	13.583	1.93	19.58	0.83
1.667	0.50	7.667	1.01	13.667	1.93	19.67	0.83
1.750	0.50	7.750	1.01	13.750	1.93	19.75	0.83

1.833	0.50	7.833	1.01	13.833	1.93	19.83	0.83
1.917	0.50	7.917	1.01	13.917	1.93	19.92	0.83
2.000	0.50	8.000	1.01	14.000	1.93	20.00	0.83
2.083	0.60	8.083	1.19	14.083	1.38	20.08	0.55
2.167	0.60	8.167	1.19	14.167	1.38	20.17	0.55
2.250	0.60	8.250	1.19	14.250	1.38	20.25	0.55
2.333	0.60	8.333	1.19	14.333	1.38	20.33	0.55
2.417	0.60	8.417	1.19	14.417	1.38	20.42	0.55
2.500	0.60	8.500	1.19	14.500	1.38	20.50	0.55
2.583	0.60	8.583	1.29	14.583	1.38	20.58	0.55
2.667	0.60	8.667	1.29	14.667	1.38	20.67	0.55
2.750	0.60	8.750	1.29	14.750	1.38	20.75	0.55
2.833	0.60	8.833	1.29	14.833	1.38	20.83	0.55
2.917	0.60	8.917	1.29	14.917	1.38	20.92	0.55
3.000	0.60	9.000	1.29	15.000	1.38	21.00	0.55
3.083	0.60	9.083	1.47	15.083	1.38	21.08	0.55
3.167	0.60	9.167	1.47	15.167	1.38	21.17	0.55
3.250	0.60	9.250	1.47	15.250	1.38	21.25	0.55
3.333	0.60	9.333	1.47	15.333	1.38	21.33	0.55
3.417	0.60	9.417	1.47	15.417	1.38	21.42	0.55
3.500	0.60	9.500	1.47	15.500	1.38	21.50	0.55
3.583	0.60	9.583	1.65	15.583	1.38	21.58	0.55
3.667	0.60	9.667	1.65	15.667	1.38	21.67	0.55
3.750	0.60	9.750	1.65	15.750	1.38	21.75	0.55
3.833	0.60	9.833	1.65	15.833	1.38	21.83	0.55
3.917	0.60	9.917	1.65	15.917	1.38	21.92	0.55
4.000	0.60	10.000	1.65	16.000	1.38	22.00	0.55
4.083	0.73	10.083	2.11	16.083	0.83	22.08	0.55
4.167	0.73	10.167	2.11	16.167	0.83	22.17	0.55
4.250	0.73	10.250	2.11	16.250	0.83	22.25	0.55
4.333	0.73	10.333	2.11	16.333	0.83	22.33	0.55
4.417	0.73	10.417	2.11	16.417	0.83	22.42	0.55
4.500	0.73	10.500	2.11	16.500	0.83	22.50	0.55
4.583	0.73	10.583	2.85	16.583	0.83	22.58	0.55
4.667	0.73	10.667	2.85	16.667	0.83	22.67	0.55
4.750	0.73	10.750	2.85	16.750	0.83	22.75	0.55
4.833	0.73	10.833	2.85	16.833	0.83	22.83	0.55
4.917	0.73	10.917	2.85	16.917	0.83	22.92	0.55
5.000	0.73	11.000	2.85	17.000	0.83	23.00	0.55
5.083	0.73	11.083	4.41	17.083	0.83	23.08	0.55
5.167	0.73	11.167	4.41	17.167	0.83	23.17	0.55
5.250	0.73	11.250	4.41	17.250	0.83	23.25	0.55
5.333	0.73	11.333	4.41	17.333	0.83	23.33	0.55
5.417	0.73	11.417	4.41	17.417	0.83	23.42	0.55
5.500	0.73	11.500	4.41	17.500	0.83	23.50	0.55
5.583	0.73	11.583	13.59	17.583	0.83	23.58	0.55
5.667	0.73	11.667	13.59	17.667	0.83	23.67	0.55
5.750	0.73	11.750	13.59	17.750	0.83	23.75	0.55
5.833	0.73	11.833	56.18	17.833	0.83	23.83	0.55
5.917	0.73	11.917	56.18	17.917	0.83	23.92	0.55
6.000	0.73	12.000	56.18	18.000	0.83	24.00	0.55

			TOTALS
Max.Eff.Inten.(mm/hr)=	56.18	22.16	
over (min)	5.00	20.00	
Storage Coeff. (min)=	3.26 (ii)	16.15 (ii)	
Unit Hyd. Tpeak (min)=	5.00	20.00	
Unit Hyd. peak (cms)=	0.27	0.06	
PEAK FLOW (cms)=	0.20	0.02	0.214 (iii)
TIME TO PEAK (hrs)=	12.00	12.17	12.00
RUNOFF VOLUME (mm)=	44.90	16.02	34.21
TOTAL RAINFALL (mm)=	45.90	45.90	45.90
RUNOFF COEFFICIENT =	0.98	0.35	0.75

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0048)	Area (ha)=	0.24	
ID= 1 DT= 5.0 min	Total Imp(%)=	99.00	Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.24	0.00
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	40.00	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	0.50	6.083	0.83	12.083	6.62	18.08	0.83
0.167	0.50	6.167	0.83	12.167	6.61	18.17	0.83
0.250	0.50	6.250	0.83	12.250	6.61	18.25	0.83
0.333	0.50	6.333	0.83	12.333	6.61	18.33	0.83
0.417	0.50	6.417	0.83	12.417	6.61	18.42	0.83
0.500	0.50	6.500	0.83	12.500	6.61	18.50	0.83
0.583	0.50	6.583	0.83	12.583	3.40	18.58	0.83
0.667	0.50	6.667	0.83	12.667	3.40	18.67	0.83
0.750	0.50	6.750	0.83	12.750	3.40	18.75	0.83
0.833	0.50	6.833	0.83	12.833	3.40	18.83	0.83
0.917	0.50	6.917	0.83	12.917	3.40	18.92	0.83
1.000	0.50	7.000	0.83	13.000	3.40	19.00	0.83
1.083	0.50	7.083	1.01	13.083	2.48	19.08	0.83
1.167	0.50	7.167	1.01	13.167	2.48	19.17	0.83
1.250	0.50	7.250	1.01	13.250	2.48	19.25	0.83
1.333	0.50	7.333	1.01	13.333	2.48	19.33	0.83
1.417	0.50	7.417	1.01	13.417	2.48	19.42	0.83
1.500	0.50	7.500	1.01	13.500	2.48	19.50	0.83
1.583	0.50	7.583	1.01	13.583	1.93	19.58	0.83
1.667	0.50	7.667	1.01	13.667	1.93	19.67	0.83
1.750	0.50	7.750	1.01	13.750	1.93	19.75	0.83
1.833	0.50	7.833	1.01	13.833	1.93	19.83	0.83
1.917	0.50	7.917	1.01	13.917	1.93	19.92	0.83
2.000	0.50	8.000	1.01	14.000	1.93	20.00	0.83
2.083	0.60	8.083	1.19	14.083	1.38	20.08	0.55
2.167	0.60	8.167	1.19	14.167	1.38	20.17	0.55
2.250	0.60	8.250	1.19	14.250	1.38	20.25	0.55
2.333	0.60	8.333	1.19	14.333	1.38	20.33	0.55
2.417	0.60	8.417	1.19	14.417	1.38	20.42	0.55
2.500	0.60	8.500	1.19	14.500	1.38	20.50	0.55
2.583	0.60	8.583	1.29	14.583	1.38	20.58	0.55
2.667	0.60	8.667	1.29	14.667	1.38	20.67	0.55
2.750	0.60	8.750	1.29	14.750	1.38	20.75	0.55
2.833	0.60	8.833	1.29	14.833	1.38	20.83	0.55
2.917	0.60	8.917	1.29	14.917	1.38	20.92	0.55
3.000	0.60	9.000	1.29	15.000	1.38	21.00	0.55
3.083	0.60	9.083	1.47	15.083	1.38	21.08	0.55

3.167	0.60	9.167	1.47	15.167	1.38	21.17	0.55
3.250	0.60	9.250	1.47	15.250	1.38	21.25	0.55
3.333	0.60	9.333	1.47	15.333	1.38	21.33	0.55
3.417	0.60	9.417	1.47	15.417	1.38	21.42	0.55
3.500	0.60	9.500	1.47	15.500	1.38	21.50	0.55
3.583	0.60	9.583	1.65	15.583	1.38	21.58	0.55
3.667	0.60	9.667	1.65	15.667	1.38	21.67	0.55
3.750	0.60	9.750	1.65	15.750	1.38	21.75	0.55
3.833	0.60	9.833	1.65	15.833	1.38	21.83	0.55
3.917	0.60	9.917	1.65	15.917	1.38	21.92	0.55
4.000	0.60	10.000	1.65	16.000	1.38	22.00	0.55
4.083	0.73	10.083	2.11	16.083	0.83	22.08	0.55
4.167	0.73	10.167	2.11	16.167	0.83	22.17	0.55
4.250	0.73	10.250	2.11	16.250	0.83	22.25	0.55
4.333	0.73	10.333	2.11	16.333	0.83	22.33	0.55
4.417	0.73	10.417	2.11	16.417	0.83	22.42	0.55
4.500	0.73	10.500	2.11	16.500	0.83	22.50	0.55
4.583	0.73	10.583	2.85	16.583	0.83	22.58	0.55
4.667	0.73	10.667	2.85	16.667	0.83	22.67	0.55
4.750	0.73	10.750	2.85	16.750	0.83	22.75	0.55
4.833	0.73	10.833	2.85	16.833	0.83	22.83	0.55
4.917	0.73	10.917	2.85	16.917	0.83	22.92	0.55
5.000	0.73	11.000	2.85	17.000	0.83	23.00	0.55
5.083	0.73	11.083	4.41	17.083	0.83	23.08	0.55
5.167	0.73	11.167	4.41	17.167	0.83	23.17	0.55
5.250	0.73	11.250	4.41	17.250	0.83	23.25	0.55
5.333	0.73	11.333	4.41	17.333	0.83	23.33	0.55
5.417	0.73	11.417	4.41	17.417	0.83	23.42	0.55
5.500	0.73	11.500	4.41	17.500	0.83	23.50	0.55
5.583	0.73	11.583	13.59	17.583	0.83	23.58	0.55
5.667	0.73	11.667	13.59	17.667	0.83	23.67	0.55
5.750	0.73	11.750	13.59	17.750	0.83	23.75	0.55
5.833	0.73	11.833	56.18	17.833	0.83	23.83	0.55
5.917	0.73	11.917	56.18	17.917	0.83	23.92	0.55
6.000	0.73	12.000	56.18	18.000	0.83	24.00	0.55

Max.Eff.Inten.(mm/hr)=	56.18	24.17		
over (min)	5.00	5.00		
Storage Coeff. (min)=	1.86 (ii)	3.27 (ii)		
Unit Hyd. Tpeak (min)=	5.00	5.00		
Unit Hyd. peak (cms)=	0.32	0.27		
			TOTALS	
PEAK FLOW (cms)=	0.04	0.00	0.037 (iii)	
TIME TO PEAK (hrs)=	12.00	12.00	12.00	
RUNOFF VOLUME (mm)=	44.90	16.02	44.61	
TOTAL RAINFALL (mm)=	45.90	45.90	45.90	
RUNOFF COEFFICIENT =	0.98	0.35	0.97	

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0050)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0128	0.0103

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0048)	0.240	0.037	12.00	44.61
OUTFLOW: ID= 1 (0050)	0.240	0.006	12.08	43.80

PEAK FLOW REDUCTION [Qout/Qin](%)= 15.82
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0047

ADD HYD (0049)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0043):	2.03	0.214	12.00	34.21
	+ ID2= 2 (0050):	0.24	0.006	12.08	43.80
	ID = 3 (0049):	2.27	0.219	12.00	35.23

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0051)	Area (ha)= 1.68		
ID= 1 DT= 5.0 min	Total Imp(%)= 99.00	Dir. Conn.(%)= 99.00	
		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.66	0.02
Dep. Storage	(mm)=	5.00	1.50
Average Slope	(%)=	1.20	2.00
Length	(m)=	105.83	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.50	6.083	0.83	12.083	6.62	18.08	0.83
0.167	0.50	6.167	0.83	12.167	6.61	18.17	0.83
0.250	0.50	6.250	0.83	12.250	6.61	18.25	0.83
0.333	0.50	6.333	0.83	12.333	6.61	18.33	0.83
0.417	0.50	6.417	0.83	12.417	6.61	18.42	0.83
0.500	0.50	6.500	0.83	12.500	6.61	18.50	0.83
0.583	0.50	6.583	0.83	12.583	3.40	18.58	0.83
0.667	0.50	6.667	0.83	12.667	3.40	18.67	0.83
0.750	0.50	6.750	0.83	12.750	3.40	18.75	0.83
0.833	0.50	6.833	0.83	12.833	3.40	18.83	0.83
0.917	0.50	6.917	0.83	12.917	3.40	18.92	0.83
1.000	0.50	7.000	0.83	13.000	3.40	19.00	0.83
1.083	0.50	7.083	1.01	13.083	2.48	19.08	0.83
1.167	0.50	7.167	1.01	13.167	2.48	19.17	0.83
1.250	0.50	7.250	1.01	13.250	2.48	19.25	0.83
1.333	0.50	7.333	1.01	13.333	2.48	19.33	0.83
1.417	0.50	7.417	1.01	13.417	2.48	19.42	0.83
1.500	0.50	7.500	1.01	13.500	2.48	19.50	0.83
1.583	0.50	7.583	1.01	13.583	1.93	19.58	0.83
1.667	0.50	7.667	1.01	13.667	1.93	19.67	0.83
1.750	0.50	7.750	1.01	13.750	1.93	19.75	0.83
1.833	0.50	7.833	1.01	13.833	1.93	19.83	0.83
1.917	0.50	7.917	1.01	13.917	1.93	19.92	0.83
2.000	0.50	8.000	1.01	14.000	1.93	20.00	0.83

2.083	0.60	8.083	1.19	14.083	1.38	20.08	0.55
2.167	0.60	8.167	1.19	14.167	1.38	20.17	0.55
2.250	0.60	8.250	1.19	14.250	1.38	20.25	0.55
2.333	0.60	8.333	1.19	14.333	1.38	20.33	0.55
2.417	0.60	8.417	1.19	14.417	1.38	20.42	0.55
2.500	0.60	8.500	1.19	14.500	1.38	20.50	0.55
2.583	0.60	8.583	1.29	14.583	1.38	20.58	0.55
2.667	0.60	8.667	1.29	14.667	1.38	20.67	0.55
2.750	0.60	8.750	1.29	14.750	1.38	20.75	0.55
2.833	0.60	8.833	1.29	14.833	1.38	20.83	0.55
2.917	0.60	8.917	1.29	14.917	1.38	20.92	0.55
3.000	0.60	9.000	1.29	15.000	1.38	21.00	0.55
3.083	0.60	9.083	1.47	15.083	1.38	21.08	0.55
3.167	0.60	9.167	1.47	15.167	1.38	21.17	0.55
3.250	0.60	9.250	1.47	15.250	1.38	21.25	0.55
3.333	0.60	9.333	1.47	15.333	1.38	21.33	0.55
3.417	0.60	9.417	1.47	15.417	1.38	21.42	0.55
3.500	0.60	9.500	1.47	15.500	1.38	21.50	0.55
3.583	0.60	9.583	1.65	15.583	1.38	21.58	0.55
3.667	0.60	9.667	1.65	15.667	1.38	21.67	0.55
3.750	0.60	9.750	1.65	15.750	1.38	21.75	0.55
3.833	0.60	9.833	1.65	15.833	1.38	21.83	0.55
3.917	0.60	9.917	1.65	15.917	1.38	21.92	0.55
4.000	0.60	10.000	1.65	16.000	1.38	22.00	0.55
4.083	0.73	10.083	2.11	16.083	0.83	22.08	0.55
4.167	0.73	10.167	2.11	16.167	0.83	22.17	0.55
4.250	0.73	10.250	2.11	16.250	0.83	22.25	0.55
4.333	0.73	10.333	2.11	16.333	0.83	22.33	0.55
4.417	0.73	10.417	2.11	16.417	0.83	22.42	0.55
4.500	0.73	10.500	2.11	16.500	0.83	22.50	0.55
4.583	0.73	10.583	2.85	16.583	0.83	22.58	0.55
4.667	0.73	10.667	2.85	16.667	0.83	22.67	0.55
4.750	0.73	10.750	2.85	16.750	0.83	22.75	0.55
4.833	0.73	10.833	2.85	16.833	0.83	22.83	0.55
4.917	0.73	10.917	2.85	16.917	0.83	22.92	0.55
5.000	0.73	11.000	2.85	17.000	0.83	23.00	0.55
5.083	0.73	11.083	4.41	17.083	0.83	23.08	0.55
5.167	0.73	11.167	4.41	17.167	0.83	23.17	0.55
5.250	0.73	11.250	4.41	17.250	0.83	23.25	0.55
5.333	0.73	11.333	4.41	17.333	0.83	23.33	0.55
5.417	0.73	11.417	4.41	17.417	0.83	23.42	0.55
5.500	0.73	11.500	4.41	17.500	0.83	23.50	0.55
5.583	0.73	11.583	13.59	17.583	0.83	23.58	0.55
5.667	0.73	11.667	13.59	17.667	0.83	23.67	0.55
5.750	0.73	11.750	13.59	17.750	0.83	23.75	0.55
5.833	0.73	11.833	56.18	17.833	0.83	23.83	0.55
5.917	0.73	11.917	56.18	17.917	0.83	23.92	0.55
6.000	0.73	12.000	56.18	18.000	0.83	24.00	0.55

			TOTALS
Max.Eff.Inten.(mm/hr)=	56.18	26.68	
over (min)	5.00	5.00	
Storage Coeff. (min)=	3.15 (ii)	4.57 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.27	0.23	
PEAK FLOW (cms)=	0.26	0.00	0.259 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	40.90	18.27	40.67
TOTAL RAINFALL (mm)=	45.90	45.90	45.90
RUNOFF COEFFICIENT =	0.89	0.40	0.89

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 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 (0046)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0049):	2.27	0.219	12.00	35.23
+ ID2= 2 (0051):	1.68	0.259	12.00	40.67
ID = 3 (0046):	3.95	0.478	12.00	37.54

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0047)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.1630	0.2697
	0.0080	0.0487	0.1700	0.2885
	0.0100	0.0674	0.1720	0.2960
	0.0880	0.1049	0.1760	0.3072
	0.1040	0.1311	0.1770	0.3109
	0.1170	0.1573	0.1800	0.3184
	0.1260	0.1761	0.1870	0.3409
	0.1300	0.1836	0.1880	0.3447
	0.1570	0.2510	0.1910	0.3559

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0046)	3.950	0.478	12.00	37.54
OUTFLOW: ID= 1 (0047)	3.950	0.048	12.58	37.15

PEAK FLOW REDUCTION [Qout/Qin](%)= 10.00
TIME SHIFT OF PEAK FLOW (min)= 35.00
MAXIMUM STORAGE USED (ha.m.)= 0.0856

ADD HYD (0039)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0040):	6.56	0.318	12.08	15.22
+ ID2= 2 (0047):	3.95	0.048	12.58	37.15
ID = 3 (0039):	10.51	0.349	12.08	23.46

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0039)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0039):	10.51	0.349	12.08	23.46
+ ID2= 2 (0052):	0.08	0.004	12.00	15.72
ID = 1 (0039):	10.59	0.352	12.08	23.41

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

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
       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\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\903af6c1-380c-4ae2-9193-4716256ab5f8\
  Summary filename: C:\Users\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\903af6c1-380c-4ae2-9193-4716256ab5f8\


DATE: 03-08-2023                          TIME: 01:45:26

USER:



COMMENTS: _____________________________________________________


--------------------------------------------------------------------------------
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  ***********************************************
  ** SIMULATION : 12 - 5-YR - SCS TYPE II 24HR  **
  ***********************************************

--------------------
| MASS STORM       |    Filename: C:\Users\sramsoomair\AppD
|                  |              ata\Local\Temp\
|                  |              72e98174-9551-451b-b568-e4dbecda99d3\aafba492
| Ptotal= 59.00 mm |    Comments: SCS TYPE II MASS CURVE
--------------------
                       Duration of storm    = 24.00 hrs
                       Mass curve time step = 15.00 min

               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.00    0.65 |  6.00    1.06 | 12.00    8.50 | 18.00    1.06
               0.25    0.65 |  6.25    1.06 | 12.25    8.50 | 18.25    1.06
               0.50    0.65 |  6.50    1.06 | 12.50    4.37 | 18.50    1.06
               0.75    0.65 |  6.75    1.06 | 12.75    4.37 | 18.75    1.06
               1.00    0.65 |  7.00    1.30 | 13.00    3.19 | 19.00    1.06
               1.25    0.65 |  7.25    1.30 | 13.25    3.19 | 19.25    1.06
               1.50    0.65 |  7.50    1.30 | 13.50    2.48 | 19.50    1.06
               1.75    0.65 |  7.75    1.30 | 13.75    2.48 | 19.75    1.06
               2.00    0.77 |  8.00    1.53 | 14.00    1.77 | 20.00    0.71
               2.25    0.77 |  8.25    1.53 | 14.25    1.77 | 20.25    0.71
               2.50    0.77 |  8.50    1.65 | 14.50    1.77 | 20.50    0.71
               2.75    0.77 |  8.75    1.65 | 14.75    1.77 | 20.75    0.71
               3.00    0.77 |  9.00    1.89 | 15.00    1.77 | 21.00    0.71
               3.25    0.77 |  9.25    1.89 | 15.25    1.77 | 21.25    0.71
               3.50    0.77 |  9.50    2.12 | 15.50    1.77 | 21.50    0.71
               3.75    0.77 |  9.75    2.12 | 15.75    1.77 | 21.75    0.71
               4.00    0.94 | 10.00    2.71 | 16.00    1.06 | 22.00    0.71
               4.25    0.94 | 10.25    2.71 | 16.25    1.06 | 22.25    0.71
               4.50    0.94 | 10.50    3.66 | 16.50    1.06 | 22.50    0.71
               4.75    0.94 | 10.75    3.66 | 16.75    1.06 | 22.75    0.71
               5.00    0.94 | 11.00    5.66 | 17.00    1.06 | 23.00    0.71
               5.25    0.94 | 11.25    5.66 | 17.25    1.06 | 23.25    0.71
               5.50    0.94 | 11.50   17.46 | 17.50    1.06 | 23.50    0.71
               5.75    0.94 | 11.75   72.22 | 17.75    1.06 | 23.75    0.71

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| CALIB            |
| NASHYD   (  0041)|   Area     (ha)=   6.56   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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


                                ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    0.65 | 6.083    1.06 |12.083    8.50 | 18.08    1.06
               0.167    0.65 | 6.167    1.06 |12.167    8.50 | 18.17    1.06
               0.250    0.65 | 6.250    1.06 |12.250    8.50 | 18.25    1.06
               0.333    0.65 | 6.333    1.06 |12.333    8.50 | 18.33    1.06
               0.417    0.65 | 6.417    1.06 |12.417    8.50 | 18.42    1.06
               0.500    0.65 | 6.500    1.06 |12.500    8.50 | 18.50    1.06
               0.583    0.65 | 6.583    1.06 |12.583    4.37 | 18.58    1.06
               0.667    0.65 | 6.667    1.06 |12.667    4.37 | 18.67    1.06
               0.750    0.65 | 6.750    1.06 |12.750    4.37 | 18.75    1.06
               0.833    0.65 | 6.833    1.06 |12.833    4.37 | 18.83    1.06
               0.917    0.65 | 6.917    1.06 |12.917    4.37 | 18.92    1.06
               1.000    0.65 | 7.000    1.06 |13.000    4.37 | 19.00    1.06
               1.083    0.65 | 7.083    1.30 |13.083    3.19 | 19.08    1.06
               1.167    0.65 | 7.167    1.30 |13.167    3.19 | 19.17    1.06
               1.250    0.65 | 7.250    1.30 |13.250    3.19 | 19.25    1.06
               1.333    0.65 | 7.333    1.30 |13.333    3.19 | 19.33    1.06
               1.417    0.65 | 7.417    1.30 |13.417    3.19 | 19.42    1.06
               1.500    0.65 | 7.500    1.30 |13.500    3.19 | 19.50    1.06
               1.583    0.65 | 7.583    1.30 |13.583    2.48 | 19.58    1.06
               1.667    0.65 | 7.667    1.30 |13.667    2.48 | 19.67    1.06
               1.750    0.65 | 7.750    1.30 |13.750    2.48 | 19.75    1.06
               1.833    0.65 | 7.833    1.30 |13.833    2.48 | 19.83    1.06
               1.917    0.65 | 7.917    1.30 |13.917    2.48 | 19.92    1.06
               2.000    0.65 | 8.000    1.30 |14.000    2.48 | 20.00    1.06
               2.083    0.77 | 8.083    1.53 |14.083    1.77 | 20.08    0.71
               2.167    0.77 | 8.167    1.53 |14.167    1.77 | 20.17    0.71
               2.250    0.77 | 8.250    1.53 |14.250    1.77 | 20.25    0.71
               2.333    0.77 | 8.333    1.53 |14.333    1.77 | 20.33    0.71
               2.417    0.77 | 8.417    1.53 |14.417    1.77 | 20.42    0.71
               2.500    0.77 | 8.500    1.53 |14.500    1.77 | 20.50    0.71
               2.583    0.77 | 8.583    1.65 |14.583    1.77 | 20.58    0.71
               2.667    0.77 | 8.667    1.65 |14.667    1.77 | 20.67    0.71
               2.750    0.77 | 8.750    1.65 |14.750    1.77 | 20.75    0.71
```

2.833	0.77	8.833	1.65	14.833	1.77	20.83	0.71
2.917	0.77	8.917	1.65	14.917	1.77	20.92	0.71
3.000	0.77	9.000	1.65	15.000	1.77	21.00	0.71
3.083	0.77	9.083	1.89	15.083	1.77	21.08	0.71
3.167	0.77	9.167	1.89	15.167	1.77	21.17	0.71
3.250	0.77	9.250	1.89	15.250	1.77	21.25	0.71
3.333	0.77	9.333	1.89	15.333	1.77	21.33	0.71
3.417	0.77	9.417	1.89	15.417	1.77	21.42	0.71
3.500	0.77	9.500	1.89	15.500	1.77	21.50	0.71
3.583	0.77	9.583	2.12	15.583	1.77	21.58	0.71
3.667	0.77	9.667	2.12	15.667	1.77	21.67	0.71
3.750	0.77	9.750	2.12	15.750	1.77	21.75	0.71
3.833	0.77	9.833	2.12	15.833	1.77	21.83	0.71
3.917	0.77	9.917	2.12	15.917	1.77	21.92	0.71
4.000	0.77	10.000	2.12	16.000	1.77	22.00	0.71
4.083	0.94	10.083	2.71	16.083	1.06	22.08	0.71
4.167	0.94	10.167	2.71	16.167	1.06	22.17	0.71
4.250	0.94	10.250	2.71	16.250	1.06	22.25	0.71
4.333	0.94	10.333	2.71	16.333	1.06	22.33	0.71
4.417	0.94	10.417	2.71	16.417	1.06	22.42	0.71
4.500	0.94	10.500	2.71	16.500	1.06	22.50	0.71
4.583	0.94	10.583	3.66	16.583	1.06	22.58	0.71
4.667	0.94	10.667	3.66	16.667	1.06	22.67	0.71
4.750	0.94	10.750	3.66	16.750	1.06	22.75	0.71
4.833	0.94	10.833	3.66	16.833	1.06	22.83	0.71
4.917	0.94	10.917	3.66	16.917	1.06	22.92	0.71
5.000	0.94	11.000	3.66	17.000	1.06	23.00	0.71
5.083	0.94	11.083	5.66	17.083	1.06	23.08	0.71
5.167	0.94	11.167	5.66	17.167	1.06	23.17	0.71
5.250	0.94	11.250	5.66	17.250	1.06	23.25	0.71
5.333	0.94	11.333	5.66	17.333	1.06	23.33	0.71
5.417	0.94	11.417	5.66	17.417	1.06	23.42	0.71
5.500	0.94	11.500	5.66	17.500	1.06	23.50	0.71
5.583	0.94	11.583	17.46	17.583	1.06	23.58	0.71
5.667	0.94	11.667	17.46	17.667	1.06	23.67	0.71
5.750	0.94	11.750	17.46	17.750	1.06	23.75	0.71
5.833	0.94	11.833	72.21	17.833	1.06	23.83	0.71
5.917	0.94	11.917	72.22	17.917	1.06	23.92	0.71
6.000	0.94	12.000	72.22	18.000	1.06	24.00	0.71

Unit Hyd Qpeak (cms)= 1.790

PEAK FLOW (cms)= 0.519 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 24.181
TOTAL RAINFALL (mm)= 59.000
RUNOFF COEFFICIENT = 0.410

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

ROUTE CHN(0040)	
IN= 2---> OUT= 1	Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	101.50	0.0500	
1.00	100.70	0.0500	
1.50	100.55	0.0500 /0.0300	Main Channel
2.00	99.50	0.0300	Main Channel
3.50	99.60	0.0300	Main Channel
4.50	100.65	0.0300 /0.0500	Main Channel
6.00	101.45	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	99.60	.185E+02	0.0	0.54	8.09
0.19	99.69	.587E+02	0.2	1.04	4.22
0.29	99.79	.102E+03	0.5	1.38	3.16
0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

	AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	0.52	12.00	24.18	0.28	1.35
OUTFLOW: ID= 1 (0040)	6.56	0.51	12.08	24.18	0.27	1.33

CALIB					
NASHYD (0052)	Area (ha)=	0.08	Curve Number (CN)=	80.0	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.11			

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.65	6.083	1.06	12.083	8.50	18.08	1.06
0.167	0.65	6.167	1.06	12.167	8.50	18.17	1.06
0.250	0.65	6.250	1.06	12.250	8.50	18.25	1.06
0.333	0.65	6.333	1.06	12.333	8.50	18.33	1.06
0.417	0.65	6.417	1.06	12.417	8.50	18.42	1.06
0.500	0.65	6.500	1.06	12.500	8.50	18.50	1.06
0.583	0.65	6.583	1.06	12.583	4.37	18.58	1.06
0.667	0.65	6.667	1.06	12.667	4.37	18.67	1.06
0.750	0.65	6.750	1.06	12.750	4.37	18.75	1.06
0.833	0.65	6.833	1.06	12.833	4.37	18.83	1.06
0.917	0.65	6.917	1.06	12.917	4.37	18.92	1.06
1.000	0.65	7.000	1.06	13.000	4.37	19.00	1.06
1.083	0.65	7.083	1.30	13.083	3.19	19.08	1.06
1.167	0.65	7.167	1.30	13.167	3.19	19.17	1.06
1.250	0.65	7.250	1.30	13.250	3.19	19.25	1.06
1.333	0.65	7.333	1.30	13.333	3.19	19.33	1.06
1.417	0.65	7.417	1.30	13.417	3.19	19.42	1.06
1.500	0.65	7.500	1.30	13.500	3.19	19.50	1.06
1.583	0.65	7.583	1.30	13.583	2.48	19.58	1.06

1.667	0.65	7.667	1.30	13.667	2.48	19.67	1.06
1.750	0.65	7.750	1.30	13.750	2.48	19.75	1.06
1.833	0.65	7.833	1.30	13.833	2.48	19.83	1.06
1.917	0.65	7.917	1.30	13.917	2.48	19.92	1.06
2.000	0.65	8.000	1.30	14.000	2.48	20.00	1.06
2.083	0.77	8.083	1.53	14.083	1.77	20.08	0.71
2.167	0.77	8.167	1.53	14.167	1.77	20.17	0.71
2.250	0.77	8.250	1.53	14.250	1.77	20.25	0.71
2.333	0.77	8.333	1.53	14.333	1.77	20.33	0.71
2.417	0.77	8.417	1.53	14.417	1.77	20.42	0.71
2.500	0.77	8.500	1.53	14.500	1.77	20.50	0.71
2.583	0.77	8.583	1.65	14.583	1.77	20.58	0.71
2.667	0.77	8.667	1.65	14.667	1.77	20.67	0.71
2.750	0.77	8.750	1.65	14.750	1.77	20.75	0.71
2.833	0.77	8.833	1.65	14.833	1.77	20.83	0.71
2.917	0.77	8.917	1.65	14.917	1.77	20.92	0.71
3.000	0.77	9.000	1.65	15.000	1.77	21.00	0.71
3.083	0.77	9.083	1.89	15.083	1.77	21.08	0.71
3.167	0.77	9.167	1.89	15.167	1.77	21.17	0.71
3.250	0.77	9.250	1.89	15.250	1.77	21.25	0.71
3.333	0.77	9.333	1.89	15.333	1.77	21.33	0.71
3.417	0.77	9.417	1.89	15.417	1.77	21.42	0.71
3.500	0.77	9.500	1.89	15.500	1.77	21.50	0.71
3.583	0.77	9.583	2.12	15.583	1.77	21.58	0.71
3.667	0.77	9.667	2.12	15.667	1.77	21.67	0.71
3.750	0.77	9.750	2.12	15.750	1.77	21.75	0.71
3.833	0.77	9.833	2.12	15.833	1.77	21.83	0.71
3.917	0.77	9.917	2.12	15.917	1.77	21.92	0.71
4.000	0.77	10.000	2.12	16.000	1.77	22.00	0.71
4.083	0.94	10.083	2.71	16.083	1.06	22.08	0.71
4.167	0.94	10.167	2.71	16.167	1.06	22.17	0.71
4.250	0.94	10.250	2.71	16.250	1.06	22.25	0.71
4.333	0.94	10.333	2.71	16.333	1.06	22.33	0.71
4.417	0.94	10.417	2.71	16.417	1.06	22.42	0.71
4.500	0.94	10.500	2.71	16.500	1.06	22.50	0.71
4.583	0.94	10.583	3.66	16.583	1.06	22.58	0.71
4.667	0.94	10.667	3.66	16.667	1.06	22.67	0.71
4.750	0.94	10.750	3.66	16.750	1.06	22.75	0.71
4.833	0.94	10.833	3.66	16.833	1.06	22.83	0.71
4.917	0.94	10.917	3.66	16.917	1.06	22.92	0.71
5.000	0.94	11.000	3.66	17.000	1.06	23.00	0.71
5.083	0.94	11.083	5.66	17.083	1.06	23.08	0.71
5.167	0.94	11.167	5.66	17.167	1.06	23.17	0.71
5.250	0.94	11.250	5.66	17.250	1.06	23.25	0.71
5.333	0.94	11.333	5.66	17.333	1.06	23.33	0.71
5.417	0.94	11.417	5.66	17.417	1.06	23.42	0.71
5.500	0.94	11.500	5.66	17.500	1.06	23.50	0.71
5.583	0.94	11.583	17.46	17.583	1.06	23.58	0.71
5.667	0.94	11.667	17.46	17.667	1.06	23.67	0.71
5.750	0.94	11.750	17.46	17.750	1.06	23.75	0.71
5.833	0.94	11.833	72.21	17.833	1.06	23.83	0.71
5.917	0.94	11.917	72.22	17.917	1.06	23.92	0.71
6.000	0.94	12.000	72.22	18.000	1.06	24.00	0.71

Unit Hyd Qpeak (cms)= 0.026

PEAK FLOW (cms)= 0.007 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 24.359
TOTAL RAINFALL (mm)= 59.000
RUNOFF COEFFICIENT = 0.413

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

CALIB	
STANDHYD (0043)	Area (ha)= 2.03
ID= 1 DT= 5.0 min	Total Imp(%)= 63.00 Dir. Conn.(%)= 63.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.28	0.75
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.30	2.00
Length	(m)=	116.33	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	0.65	6.083	1.06	12.083	8.50	18.08	1.06
0.167	0.65	6.167	1.06	12.167	8.50	18.17	1.06
0.250	0.65	6.250	1.06	12.250	8.50	18.25	1.06
0.333	0.65	6.333	1.06	12.333	8.50	18.33	1.06
0.417	0.65	6.417	1.06	12.417	8.50	18.42	1.06
0.500	0.65	6.500	1.06	12.500	8.50	18.50	1.06
0.583	0.65	6.583	1.06	12.583	4.37	18.58	1.06
0.667	0.65	6.667	1.06	12.667	4.37	18.67	1.06
0.750	0.65	6.750	1.06	12.750	4.37	18.75	1.06
0.833	0.65	6.833	1.06	12.833	4.37	18.83	1.06
0.917	0.65	6.917	1.06	12.917	4.37	18.92	1.06
1.000	0.65	7.000	1.06	13.000	4.37	19.00	1.06
1.083	0.65	7.083	1.30	13.083	3.19	19.08	1.06
1.167	0.65	7.167	1.30	13.167	3.19	19.17	1.06
1.250	0.65	7.250	1.30	13.250	3.19	19.25	1.06
1.333	0.65	7.333	1.30	13.333	3.19	19.33	1.06
1.417	0.65	7.417	1.30	13.417	3.19	19.42	1.06
1.500	0.65	7.500	1.30	13.500	3.19	19.50	1.06
1.583	0.65	7.583	1.30	13.583	2.48	19.58	1.06
1.667	0.65	7.667	1.30	13.667	2.48	19.67	1.06
1.750	0.65	7.750	1.30	13.750	2.48	19.75	1.06
1.833	0.65	7.833	1.30	13.833	2.48	19.83	1.06
1.917	0.65	7.917	1.30	13.917	2.48	19.92	1.06
2.000	0.65	8.000	1.30	14.000	2.48	20.00	1.06
2.083	0.77	8.083	1.53	14.083	1.77	20.08	0.71
2.167	0.77	8.167	1.53	14.167	1.77	20.17	0.71
2.250	0.77	8.250	1.53	14.250	1.77	20.25	0.71
2.333	0.77	8.333	1.53	14.333	1.77	20.33	0.71
2.417	0.77	8.417	1.53	14.417	1.77	20.42	0.71
2.500	0.77	8.500	1.53	14.500	1.77	20.50	0.71
2.583	0.77	8.583	1.65	14.583	1.77	20.58	0.71
2.667	0.77	8.667	1.65	14.667	1.77	20.67	0.71
2.750	0.77	8.750	1.65	14.750	1.77	20.75	0.71
2.833	0.77	8.833	1.65	14.833	1.77	20.83	0.71
2.917	0.77	8.917	1.65	14.917	1.77	20.92	0.71
3.000	0.77	9.000	1.65	15.000	1.77	21.00	0.71
3.083	0.77	9.083	1.89	15.083	1.77	21.08	0.71
3.167	0.77	9.167	1.89	15.167	1.77	21.17	0.71
3.250	0.77	9.250	1.89	15.250	1.77	21.25	0.71
3.333	0.77	9.333	1.89	15.333	1.77	21.33	0.71
3.417	0.77	9.417	1.89	15.417	1.77	21.42	0.71
3.500	0.77	9.500	1.89	15.500	1.77	21.50	0.71
3.583	0.77	9.583	2.12	15.583	1.77	21.58	0.71
3.667	0.77	9.667	2.12	15.667	1.77	21.67	0.71
3.750	0.77	9.750	2.12	15.750	1.77	21.75	0.71

3.833	0.77	9.833	2.12	15.833	1.77	21.83	0.71
3.917	0.77	9.917	2.12	15.917	1.77	21.92	0.71
4.000	0.77	10.000	2.12	16.000	1.77	22.00	0.71
4.083	0.94	10.083	2.71	16.083	1.06	22.08	0.71
4.167	0.94	10.167	2.71	16.167	1.06	22.17	0.71
4.250	0.94	10.250	2.71	16.250	1.06	22.25	0.71
4.333	0.94	10.333	2.71	16.333	1.06	22.33	0.71
4.417	0.94	10.417	2.71	16.417	1.06	22.42	0.71
4.500	0.94	10.500	2.71	16.500	1.06	22.50	0.71
4.583	0.94	10.583	3.66	16.583	1.06	22.58	0.71
4.667	0.94	10.667	3.66	16.667	1.06	22.67	0.71
4.750	0.94	10.750	3.66	16.750	1.06	22.75	0.71
4.833	0.94	10.833	3.66	16.833	1.06	22.83	0.71
4.917	0.94	10.917	3.66	16.917	1.06	22.92	0.71
5.000	0.94	11.000	3.66	17.000	1.06	23.00	0.71
5.083	0.94	11.083	5.66	17.083	1.06	23.08	0.71
5.167	0.94	11.167	5.66	17.167	1.06	23.17	0.71
5.250	0.94	11.250	5.66	17.250	1.06	23.25	0.71
5.333	0.94	11.333	5.66	17.333	1.06	23.33	0.71
5.417	0.94	11.417	5.66	17.417	1.06	23.42	0.71
5.500	0.94	11.500	5.66	17.500	1.06	23.50	0.71
5.583	0.94	11.583	17.46	17.583	1.06	23.58	0.71
5.667	0.94	11.667	17.46	17.667	1.06	23.67	0.71
5.750	0.94	11.750	17.46	17.750	1.06	23.75	0.71
5.833	0.94	11.833	72.21	17.833	1.06	23.83	0.71
5.917	0.94	11.917	72.22	17.917	1.06	23.92	0.71
6.000	0.94	12.000	72.22	18.000	1.06	24.00	0.71

Max.Eff.Inten.(mm/hr)=	72.22	34.72	
over (min)	5.00	15.00	
Storage Coeff. (min)=	2.95 (ii)	13.72 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.28	0.08	
			TOTALS
PEAK FLOW (cms)=	0.26	0.04	0.292 (iii)
TIME TO PEAK (hrs)=	12.00	12.08	12.00
RUNOFF VOLUME (mm)=	58.00	24.82	45.72
TOTAL RAINFALL (mm)=	59.00	59.00	59.00
RUNOFF COEFFICIENT =	0.98	0.42	0.77

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0048)	Area (ha)=	0.24	
ID= 1 DT= 5.0 min	Total Imp(%)=	99.00	Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.24	0.00
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	40.00	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	0.65	6.083	1.06	12.083	8.50	18.08	1.06
0.167	0.65	6.167	1.06	12.167	8.50	18.17	1.06
0.250	0.65	6.250	1.06	12.250	8.50	18.25	1.06
0.333	0.65	6.333	1.06	12.333	8.50	18.33	1.06
0.417	0.65	6.417	1.06	12.417	8.50	18.42	1.06
0.500	0.65	6.500	1.06	12.500	8.50	18.50	1.06
0.583	0.65	6.583	1.06	12.583	4.37	18.58	1.06
0.667	0.65	6.667	1.06	12.667	4.37	18.67	1.06
0.750	0.65	6.750	1.06	12.750	4.37	18.75	1.06
0.833	0.65	6.833	1.06	12.833	4.37	18.83	1.06
0.917	0.65	6.917	1.06	12.917	4.37	18.92	1.06
1.000	0.65	7.000	1.06	13.000	4.37	19.00	1.06
1.083	0.65	7.083	1.30	13.083	3.19	19.08	1.06
1.167	0.65	7.167	1.30	13.167	3.19	19.17	1.06
1.250	0.65	7.250	1.30	13.250	3.19	19.25	1.06
1.333	0.65	7.333	1.30	13.333	3.19	19.33	1.06
1.417	0.65	7.417	1.30	13.417	3.19	19.42	1.06
1.500	0.65	7.500	1.30	13.500	3.19	19.50	1.06
1.583	0.65	7.583	1.30	13.583	2.48	19.58	1.06
1.667	0.65	7.667	1.30	13.667	2.48	19.67	1.06
1.750	0.65	7.750	1.30	13.750	2.48	19.75	1.06
1.833	0.65	7.833	1.30	13.833	2.48	19.83	1.06
1.917	0.65	7.917	1.30	13.917	2.48	19.92	1.06
2.000	0.65	8.000	1.30	14.000	2.48	20.00	1.06
2.083	0.77	8.083	1.53	14.083	1.77	20.08	0.71
2.167	0.77	8.167	1.53	14.167	1.77	20.17	0.71
2.250	0.77	8.250	1.53	14.250	1.77	20.25	0.71
2.333	0.77	8.333	1.53	14.333	1.77	20.33	0.71
2.417	0.77	8.417	1.53	14.417	1.77	20.42	0.71
2.500	0.77	8.500	1.53	14.500	1.77	20.50	0.71
2.583	0.77	8.583	1.65	14.583	1.77	20.58	0.71
2.667	0.77	8.667	1.65	14.667	1.77	20.67	0.71
2.750	0.77	8.750	1.65	14.750	1.77	20.75	0.71
2.833	0.77	8.833	1.65	14.833	1.77	20.83	0.71
2.917	0.77	8.917	1.65	14.917	1.77	20.92	0.71
3.000	0.77	9.000	1.65	15.000	1.77	21.00	0.71
3.083	0.77	9.083	1.89	15.083	1.77	21.08	0.71
3.167	0.77	9.167	1.89	15.167	1.77	21.17	0.71
3.250	0.77	9.250	1.89	15.250	1.77	21.25	0.71
3.333	0.77	9.333	1.89	15.333	1.77	21.33	0.71
3.417	0.77	9.417	1.89	15.417	1.77	21.42	0.71
3.500	0.77	9.500	1.89	15.500	1.77	21.50	0.71
3.583	0.77	9.583	2.12	15.583	1.77	21.58	0.71
3.667	0.77	9.667	2.12	15.667	1.77	21.67	0.71
3.750	0.77	9.750	2.12	15.750	1.77	21.75	0.71
3.833	0.77	9.833	2.12	15.833	1.77	21.83	0.71
3.917	0.77	9.917	2.12	15.917	1.77	21.92	0.71
4.000	0.77	10.000	2.12	16.000	1.77	22.00	0.71
4.083	0.94	10.083	2.71	16.083	1.06	22.08	0.71
4.167	0.94	10.167	2.71	16.167	1.06	22.17	0.71
4.250	0.94	10.250	2.71	16.250	1.06	22.25	0.71
4.333	0.94	10.333	2.71	16.333	1.06	22.33	0.71
4.417	0.94	10.417	2.71	16.417	1.06	22.42	0.71
4.500	0.94	10.500	2.71	16.500	1.06	22.50	0.71
4.583	0.94	10.583	3.66	16.583	1.06	22.58	0.71
4.667	0.94	10.667	3.66	16.667	1.06	22.67	0.71
4.750	0.94	10.750	3.66	16.750	1.06	22.75	0.71
4.833	0.94	10.833	3.66	16.833	1.06	22.83	0.71
4.917	0.94	10.917	3.66	16.917	1.06	22.92	0.71
5.000	0.94	11.000	3.66	17.000	1.06	23.00	0.71
5.083	0.94	11.083	5.66	17.083	1.06	23.08	0.71

5.167	0.94	11.167	5.66	17.167	1.06	23.17	0.71
5.250	0.94	11.250	5.66	17.250	1.06	23.25	0.71
5.333	0.94	11.333	5.66	17.333	1.06	23.33	0.71
5.417	0.94	11.417	5.66	17.417	1.06	23.42	0.71
5.500	0.94	11.500	5.66	17.500	1.06	23.50	0.71
5.583	0.94	11.583	17.46	17.583	1.06	23.58	0.71
5.667	0.94	11.667	17.46	17.667	1.06	23.67	0.71
5.750	0.94	11.750	17.46	17.750	1.06	23.75	0.71
5.833	0.94	11.833	72.21	17.833	1.06	23.83	0.71
5.917	0.94	11.917	72.22	17.917	1.06	23.92	0.71
6.000	0.94	12.000	72.22	18.000	1.06	24.00	0.71

Max.Eff.Inten.(mm/hr)=	72.22	37.36	
over (min)	5.00	5.00	
Storage Coeff. (min)=	1.68 (ii)	2.96 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.32	0.28	
			TOTALS
PEAK FLOW (cms)=	0.05	0.00	0.048 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	58.00	24.82	57.67
TOTAL RAINFALL (mm)=	59.00	59.00	59.00
RUNOFF COEFFICIENT =	0.98	0.42	0.98

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0050)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0128	0.0103

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0048)	0.240	0.048	12.00	57.67
OUTFLOW: ID= 1 (0050)	0.240	0.008	12.08	56.84

PEAK FLOW REDUCTION [Qout/Qin](%)= 15.85
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0061

ADD HYD (0049)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0043):	2.03	0.292	12.00	45.72
+ ID2= 2 (0050):	0.24	0.008	12.08	56.84
ID = 3 (0049):	2.27	0.299	12.00	46.89

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB

STANDHYD (0051)	Area (ha)= 1.68		
ID= 1 DT= 5.0 min	Total Imp(%)= 99.00	Dir. Conn.(%)= 99.00	
	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	1.66	0.02	
Dep. Storage (mm)=	5.00	1.50	
Average Slope (%)=	1.20	2.00	
Length (m)=	105.83	40.00	
Mannings n =	0.013	0.250	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.65	6.083	1.06	12.083	8.50	18.08	1.06
0.167	0.65	6.167	1.06	12.167	8.50	18.17	1.06
0.250	0.65	6.250	1.06	12.250	8.50	18.25	1.06
0.333	0.65	6.333	1.06	12.333	8.50	18.33	1.06
0.417	0.65	6.417	1.06	12.417	8.50	18.42	1.06
0.500	0.65	6.500	1.06	12.500	8.50	18.50	1.06
0.583	0.65	6.583	1.06	12.583	4.37	18.58	1.06
0.667	0.65	6.667	1.06	12.667	4.37	18.67	1.06
0.750	0.65	6.750	1.06	12.750	4.37	18.75	1.06
0.833	0.65	6.833	1.06	12.833	4.37	18.83	1.06
0.917	0.65	6.917	1.06	12.917	4.37	18.92	1.06
1.000	0.65	7.000	1.06	13.000	4.37	19.00	1.06
1.083	0.65	7.083	1.30	13.083	3.19	19.08	1.06
1.167	0.65	7.167	1.30	13.167	3.19	19.17	1.06
1.250	0.65	7.250	1.30	13.250	3.19	19.25	1.06
1.333	0.65	7.333	1.30	13.333	3.19	19.33	1.06
1.417	0.65	7.417	1.30	13.417	3.19	19.42	1.06
1.500	0.65	7.500	1.30	13.500	3.19	19.50	1.06
1.583	0.65	7.583	1.30	13.583	2.48	19.58	1.06
1.667	0.65	7.667	1.30	13.667	2.48	19.67	1.06
1.750	0.65	7.750	1.30	13.750	2.48	19.75	1.06
1.833	0.65	7.833	1.30	13.833	2.48	19.83	1.06
1.917	0.65	7.917	1.30	13.917	2.48	19.92	1.06
2.000	0.65	8.000	1.30	14.000	2.48	20.00	1.06
2.083	0.77	8.083	1.53	14.083	1.77	20.08	0.71
2.167	0.77	8.167	1.53	14.167	1.77	20.17	0.71
2.250	0.77	8.250	1.53	14.250	1.77	20.25	0.71
2.333	0.77	8.333	1.53	14.333	1.77	20.33	0.71
2.417	0.77	8.417	1.53	14.417	1.77	20.42	0.71
2.500	0.77	8.500	1.53	14.500	1.77	20.50	0.71
2.583	0.77	8.583	1.65	14.583	1.77	20.58	0.71
2.667	0.77	8.667	1.65	14.667	1.77	20.67	0.71
2.750	0.77	8.750	1.65	14.750	1.77	20.75	0.71
2.833	0.77	8.833	1.65	14.833	1.77	20.83	0.71
2.917	0.77	8.917	1.65	14.917	1.77	20.92	0.71
3.000	0.77	9.000	1.65	15.000	1.77	21.00	0.71
3.083	0.77	9.083	1.89	15.083	1.77	21.08	0.71
3.167	0.77	9.167	1.89	15.167	1.77	21.17	0.71
3.250	0.77	9.250	1.89	15.250	1.77	21.25	0.71
3.333	0.77	9.333	1.89	15.333	1.77	21.33	0.71
3.417	0.77	9.417	1.89	15.417	1.77	21.42	0.71
3.500	0.77	9.500	1.89	15.500	1.77	21.50	0.71
3.583	0.77	9.583	2.12	15.583	1.77	21.58	0.71
3.667	0.77	9.667	2.12	15.667	1.77	21.67	0.71
3.750	0.77	9.750	2.12	15.750	1.77	21.75	0.71
3.833	0.77	9.833	2.12	15.833	1.77	21.83	0.71
3.917	0.77	9.917	2.12	15.917	1.77	21.92	0.71
4.000	0.77	10.000	2.12	16.000	1.77	22.00	0.71

4.083	0.94	10.083	2.71	16.083	1.06	22.08	0.71
4.167	0.94	10.167	2.71	16.167	1.06	22.17	0.71
4.250	0.94	10.250	2.71	16.250	1.06	22.25	0.71
4.333	0.94	10.333	2.71	16.333	1.06	22.33	0.71
4.417	0.94	10.417	2.71	16.417	1.06	22.42	0.71
4.500	0.94	10.500	2.71	16.500	1.06	22.50	0.71
4.583	0.94	10.583	3.66	16.583	1.06	22.58	0.71
4.667	0.94	10.667	3.66	16.667	1.06	22.67	0.71
4.750	0.94	10.750	3.66	16.750	1.06	22.75	0.71
4.833	0.94	10.833	3.66	16.833	1.06	22.83	0.71
4.917	0.94	10.917	3.66	16.917	1.06	22.92	0.71
5.000	0.94	11.000	3.66	17.000	1.06	23.00	0.71
5.083	0.94	11.083	5.66	17.083	1.06	23.08	0.71
5.167	0.94	11.167	5.66	17.167	1.06	23.17	0.71
5.250	0.94	11.250	5.66	17.250	1.06	23.25	0.71
5.333	0.94	11.333	5.66	17.333	1.06	23.33	0.71
5.417	0.94	11.417	5.66	17.417	1.06	23.42	0.71
5.500	0.94	11.500	5.66	17.500	1.06	23.50	0.71
5.583	0.94	11.583	17.46	17.583	1.06	23.58	0.71
5.667	0.94	11.667	17.46	17.667	1.06	23.67	0.71
5.750	0.94	11.750	17.46	17.750	1.06	23.75	0.71
5.833	0.94	11.833	72.21	17.833	1.06	23.83	0.71
5.917	0.94	11.917	72.22	17.917	1.06	23.92	0.71
6.000	0.94	12.000	72.22	18.000	1.06	24.00	0.71

Max.Eff.Inten.(mm/hr)=	72.22	39.89	
over (min)	5.00	5.00	
Storage Coeff. (min)=	2.85 (ii)	4.13 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.28	0.24	
			TOTALS
PEAK FLOW (cms)=	0.33	0.00	0.334 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	54.00	27.32	53.73
TOTAL RAINFALL (mm)=	59.00	59.00	59.00
RUNOFF COEFFICIENT =	0.92	0.46	0.91

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 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 (0046)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0049):		2.27	0.299	12.00	46.89
+ ID2= 2 (0051):		1.68	0.334	12.00	53.73
ID = 3 (0046):		3.95	0.633	12.00	49.80

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0047)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.1630	0.2697
	0.0080	0.0487	0.1700	0.2885
	0.0100	0.0674	0.1720	0.2960
	0.0880	0.1049	0.1760	0.3072
	0.1040	0.1311	0.1770	0.3109
	0.1170	0.1573	0.1800	0.3184
	0.1260	0.1761	0.1870	0.3409
	0.1300	0.1836	0.1880	0.3447
	0.1570	0.2510	0.1910	0.3559

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0046)	3.950	0.633	12.00	49.80
OUTFLOW: ID= 1 (0047)	3.950	0.089	12.50	49.41

PEAK FLOW REDUCTION [Qout/Qin](%)= 14.05
TIME SHIFT OF PEAK FLOW (min)= 30.00
MAXIMUM STORAGE USED (ha.m.)= 0.1067

ADD HYD (0039)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0040):		6.56	0.506	12.08	24.18
+ ID2= 2 (0047):		3.95	0.089	12.50	49.41
ID = 3 (0039):		10.51	0.587	12.08	33.66

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0039)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0039):		10.51	0.587	12.08	33.66
+ ID2= 2 (0052):		0.08	0.007	12.00	24.36
ID = 1 (0039):		10.59	0.592	12.08	33.60

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

==========

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 V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
 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\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\00efe294-2d5c-4509-a69b-53ea1effd78c\
  Summary filename: C:\Users\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\00efe294-2d5c-4509-a69b-53ea1effd78c\

DATE: 03-08-2023                          TIME: 01:45:25

USER:


COMMENTS: _____________________________________________________

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  ***********************************************
  ** SIMULATION : 13 - 10-YR - SCS TYPE II 24HR **
  ***********************************************

--------------------
| MASS STORM       |    Filename: C:\Users\sramsoomair\AppD
|                  |              ata\Local\Temp\
|                  |              72e98174-9551-451b-b568-e4dbecda99d3\a9fc7592
| Ptotal= 67.60 mm |    Comments: SCS TYPE II MASS CURVE
--------------------
                       Duration of storm    = 24.00 hrs
                       Mass curve time step = 15.00 min

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    0.74 |  6.00    1.22 | 12.00    9.73 | 18.00    1.22
                0.25    0.74 |  6.25    1.22 | 12.25    9.73 | 18.25    1.22
                0.50    0.74 |  6.50    1.22 | 12.50    5.00 | 18.50    1.22
                0.75    0.74 |  6.75    1.22 | 12.75    5.00 | 18.75    1.22
                1.00    0.74 |  7.00    1.49 | 13.00    3.65 | 19.00    1.22
                1.25    0.74 |  7.25    1.49 | 13.25    3.65 | 19.25    1.22
                1.50    0.74 |  7.50    1.49 | 13.50    2.84 | 19.50    1.22
                1.75    0.74 |  7.75    1.49 | 13.75    2.84 | 19.75    1.22
                2.00    0.88 |  8.00    1.76 | 14.00    2.03 | 20.00    0.81
                2.25    0.88 |  8.25    1.76 | 14.25    2.03 | 20.25    0.81
                2.50    0.88 |  8.50    1.89 | 14.50    2.03 | 20.50    0.81
                2.75    0.88 |  8.75    1.89 | 14.75    2.03 | 20.75    0.81
                3.00    0.88 |  9.00    2.16 | 15.00    2.03 | 21.00    0.81
                3.25    0.88 |  9.25    2.16 | 15.25    2.03 | 21.25    0.81
                3.50    0.88 |  9.50    2.43 | 15.50    2.03 | 21.50    0.81
                3.75    0.88 |  9.75    2.43 | 15.75    2.03 | 21.75    0.81
                4.00    1.08 | 10.00    3.11 | 16.00    1.22 | 22.00    0.81
                4.25    1.08 | 10.25    3.11 | 16.25    1.22 | 22.25    0.81
                4.50    1.08 | 10.50    4.19 | 16.50    1.22 | 22.50    0.81
                4.75    1.08 | 10.75    4.19 | 16.75    1.22 | 22.75    0.81
                5.00    1.08 | 11.00    6.49 | 17.00    1.22 | 23.00    0.81
                5.25    1.08 | 11.25    6.49 | 17.25    1.22 | 23.25    0.81
                5.50    1.08 | 11.50   20.01 | 17.50    1.22 | 23.50    0.81
                5.75    1.08 | 11.75   82.74 | 17.75    1.22 | 23.75    0.81

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0041)|   Area    (ha)=   6.56   Curve Number   (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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

                    ---- TRANSFORMED HYETOGRAPH ----
 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
0.083    0.74 |  6.083    1.22 |12.083    9.74 | 18.08    1.22
0.167    0.74 |  6.167    1.22 |12.167    9.73 | 18.17    1.22
0.250    0.74 |  6.250    1.22 |12.250    9.73 | 18.25    1.22
0.333    0.74 |  6.333    1.22 |12.333    9.73 | 18.33    1.22
0.417    0.74 |  6.417    1.22 |12.417    9.73 | 18.42    1.22
0.500    0.74 |  6.500    1.22 |12.500    9.73 | 18.50    1.22
0.583    0.74 |  6.583    1.22 |12.583    5.00 | 18.58    1.22
0.667    0.74 |  6.667    1.22 |12.667    5.00 | 18.67    1.22
0.750    0.74 |  6.750    1.22 |12.750    5.00 | 18.75    1.22
0.833    0.74 |  6.833    1.22 |12.833    5.00 | 18.83    1.22
0.917    0.74 |  6.917    1.22 |12.917    5.00 | 18.92    1.22
1.000    0.74 |  7.000    1.22 |13.000    5.00 | 19.00    1.22
1.083    0.74 |  7.083    1.49 |13.083    3.65 | 19.08    1.22
1.167    0.74 |  7.167    1.49 |13.167    3.65 | 19.17    1.22
1.250    0.74 |  7.250    1.49 |13.250    3.65 | 19.25    1.22
1.333    0.74 |  7.333    1.49 |13.333    3.65 | 19.33    1.22
1.417    0.74 |  7.417    1.49 |13.417    3.65 | 19.42    1.22
1.500    0.74 |  7.500    1.49 |13.500    3.65 | 19.50    1.22
1.583    0.74 |  7.583    1.49 |13.583    2.84 | 19.58    1.22
1.667    0.74 |  7.667    1.49 |13.667    2.84 | 19.67    1.22
1.750    0.74 |  7.750    1.49 |13.750    2.84 | 19.75    1.22
1.833    0.74 |  7.833    1.49 |13.833    2.84 | 19.83    1.22
1.917    0.74 |  7.917    1.49 |13.917    2.84 | 19.92    1.22
2.000    0.74 |  8.000    1.49 |14.000    2.84 | 20.00    1.22
2.083    0.88 |  8.083    1.76 |14.083    2.03 | 20.08    0.81
2.167    0.88 |  8.167    1.76 |14.167    2.03 | 20.17    0.81
2.250    0.88 |  8.250    1.76 |14.250    2.03 | 20.25    0.81
2.333    0.88 |  8.333    1.76 |14.333    2.03 | 20.33    0.81
2.417    0.88 |  8.417    1.76 |14.417    2.03 | 20.42    0.81
2.500    0.88 |  8.500    1.76 |14.500    2.03 | 20.50    0.81
2.583    0.88 |  8.583    1.89 |14.583    2.03 | 20.58    0.81
2.667    0.88 |  8.667    1.89 |14.667    2.03 | 20.67    0.81
2.750    0.88 |  8.750    1.89 |14.750    2.03 | 20.75    0.81
2.833    0.88 |  8.833    1.89 |14.833    2.03 | 20.83    0.81
2.917    0.88 |  8.917    1.89 |14.917    2.03 | 20.92    0.81
3.000    0.88 |  9.000    1.89 |15.000    2.03 | 21.00    0.81
3.083    0.88 |  9.083    2.16 |15.083    2.03 | 21.08    0.81
3.167    0.88 |  9.167    2.16 |15.167    2.03 | 21.17    0.81
3.250    0.88 |  9.250    2.16 |15.250    2.03 | 21.25    0.81
3.333    0.88 |  9.333    2.16 |15.333    2.03 | 21.33    0.81
3.417    0.88 |  9.417    2.16 |15.417    2.03 | 21.42    0.81
3.500    0.88 |  9.500    2.16 |15.500    2.03 | 21.50    0.81
3.583    0.88 |  9.583    2.43 |15.583    2.03 | 21.58    0.81
3.667    0.88 |  9.667    2.43 |15.667    2.03 | 21.67    0.81
3.750    0.88 |  9.750    2.43 |15.750    2.03 | 21.75    0.81
3.833    0.88 |  9.833    2.43 |15.833    2.03 | 21.83    0.81
3.917    0.88 |  9.917    2.43 |15.917    2.03 | 21.92    0.81
4.000    0.88 |10.000    2.43 |16.000    2.03 | 22.00    0.81
4.083    1.08 |10.083    3.11 |16.083    1.22 | 22.08    0.81
4.167    1.08 |10.167    3.11 |16.167    1.22 | 22.17    0.81
4.250    1.08 |10.250    3.11 |16.250    1.22 | 22.25    0.81
4.333    1.08 |10.333    3.11 |16.333    1.22 | 22.33    0.81
4.417    1.08 |10.417    3.11 |16.417    1.22 | 22.42    0.81
4.500    1.08 |10.500    3.11 |16.500    1.22 | 22.50    0.81
4.583    1.08 |10.583    4.19 |16.583    1.22 | 22.58    0.81
4.667    1.08 |10.667    4.19 |16.667    1.22 | 22.67    0.81
4.750    1.08 |10.750    4.19 |16.750    1.22 | 22.75    0.81
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4.833	1.08	10.833	4.19	16.833	1.22	22.83	0.81
4.917	1.08	10.917	4.19	16.917	1.22	22.92	0.81
5.000	1.08	11.000	4.19	17.000	1.22	23.00	0.81
5.083	1.08	11.083	6.49	17.083	1.22	23.08	0.81
5.167	1.08	11.167	6.49	17.167	1.22	23.17	0.81
5.250	1.08	11.250	6.49	17.250	1.22	23.25	0.81
5.333	1.08	11.333	6.49	17.333	1.22	23.33	0.81
5.417	1.08	11.417	6.49	17.417	1.22	23.42	0.81
5.500	1.08	11.500	6.49	17.500	1.22	23.50	0.81
5.583	1.08	11.583	20.01	17.583	1.22	23.58	0.81
5.667	1.08	11.667	20.01	17.667	1.22	23.67	0.81
5.750	1.08	11.750	20.01	17.750	1.22	23.75	0.81
5.833	1.08	11.833	82.74	17.833	1.22	23.83	0.81
5.917	1.08	11.917	82.74	17.917	1.22	23.92	0.81
6.000	1.08	12.000	82.74	18.000	1.22	24.00	0.81

Unit Hyd Qpeak (cms)= 1.790

PEAK FLOW (cms)= 0.661 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 30.562
TOTAL RAINFALL (mm)= 67.600
RUNOFF COEFFICIENT = 0.452

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

ROUTE CHN(0040)
IN= 2---> OUT= 1	Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	101.50	0.0500	
1.00	100.70	0.0500	
1.50	100.55	0.0500 /0.0300	Main Channel
2.00	99.50	0.0300	Main Channel
3.50	99.60	0.0300	Main Channel
4.50	100.65	0.0300 /0.0500	Main Channel
6.00	101.45	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	99.60	.185E+02	0.0	0.54	8.09
0.19	99.69	.587E+02	0.2	1.04	4.22
0.29	99.79	.102E+03	0.5	1.38	3.16
0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

<---- hydrograph ----> <-pipe / channel->

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	0.66	12.00	30.56	0.31	1.46
OUTFLOW: ID= 1 (0040)	6.56	0.64	12.08	30.56	0.31	1.44

CALIB					
NASHYD (0052)	Area (ha)=	0.08	Curve Number (CN)=	80.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.11		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.74	6.083	1.22	12.083	9.74	18.08	1.22
0.167	0.74	6.167	1.22	12.167	9.73	18.17	1.22
0.250	0.74	6.250	1.22	12.250	9.73	18.25	1.22
0.333	0.74	6.333	1.22	12.333	9.73	18.33	1.22
0.417	0.74	6.417	1.22	12.417	9.73	18.42	1.22
0.500	0.74	6.500	1.22	12.500	9.73	18.50	1.22
0.583	0.74	6.583	1.22	12.583	5.00	18.58	1.22
0.667	0.74	6.667	1.22	12.667	5.00	18.67	1.22
0.750	0.74	6.750	1.22	12.750	5.00	18.75	1.22
0.833	0.74	6.833	1.22	12.833	5.00	18.83	1.22
0.917	0.74	6.917	1.22	12.917	5.00	18.92	1.22
1.000	0.74	7.000	1.22	13.000	5.00	19.00	1.22
1.083	0.74	7.083	1.49	13.083	3.65	19.08	1.22
1.167	0.74	7.167	1.49	13.167	3.65	19.17	1.22
1.250	0.74	7.250	1.49	13.250	3.65	19.25	1.22
1.333	0.74	7.333	1.49	13.333	3.65	19.33	1.22
1.417	0.74	7.417	1.49	13.417	3.65	19.42	1.22
1.500	0.74	7.500	1.49	13.500	3.65	19.50	1.22
1.583	0.74	7.583	1.49	13.583	2.84	19.58	1.22
1.667	0.74	7.667	1.49	13.667	2.84	19.67	1.22
1.750	0.74	7.750	1.49	13.750	2.84	19.75	1.22
1.833	0.74	7.833	1.49	13.833	2.84	19.83	1.22
1.917	0.74	7.917	1.49	13.917	2.84	19.92	1.22
2.000	0.74	8.000	1.49	14.000	2.84	20.00	1.22
2.083	0.88	8.083	1.76	14.083	2.03	20.08	0.81
2.167	0.88	8.167	1.76	14.167	2.03	20.17	0.81
2.250	0.88	8.250	1.76	14.250	2.03	20.25	0.81
2.333	0.88	8.333	1.76	14.333	2.03	20.33	0.81
2.417	0.88	8.417	1.76	14.417	2.03	20.42	0.81
2.500	0.88	8.500	1.76	14.500	2.03	20.50	0.81
2.583	0.88	8.583	1.89	14.583	2.03	20.58	0.81
2.667	0.88	8.667	1.89	14.667	2.03	20.67	0.81
2.750	0.88	8.750	1.89	14.750	2.03	20.75	0.81
2.833	0.88	8.833	1.89	14.833	2.03	20.83	0.81
2.917	0.88	8.917	1.89	14.917	2.03	20.92	0.81
3.000	0.88	9.000	1.89	15.000	2.03	21.00	0.81
3.083	0.88	9.083	2.16	15.083	2.03	21.08	0.81
3.167	0.88	9.167	2.16	15.167	2.03	21.17	0.81
3.250	0.88	9.250	2.16	15.250	2.03	21.25	0.81
3.333	0.88	9.333	2.16	15.333	2.03	21.33	0.81
3.417	0.88	9.417	2.16	15.417	2.03	21.42	0.81
3.500	0.88	9.500	2.16	15.500	2.03	21.50	0.81
3.583	0.88	9.583	2.43	15.583	2.03	21.58	0.81

3.667	0.88	9.667	2.43	15.667	2.03	21.67	0.81
3.750	0.88	9.750	2.43	15.750	2.03	21.75	0.81
3.833	0.88	9.833	2.43	15.833	2.03	21.83	0.81
3.917	0.88	9.917	2.43	15.917	2.03	21.92	0.81
4.000	0.88	10.000	2.43	16.000	2.03	22.00	0.81
4.083	1.08	10.083	3.11	16.083	1.22	22.08	0.81
4.167	1.08	10.167	3.11	16.167	1.22	22.17	0.81
4.250	1.08	10.250	3.11	16.250	1.22	22.25	0.81
4.333	1.08	10.333	3.11	16.333	1.22	22.33	0.81
4.417	1.08	10.417	3.11	16.417	1.22	22.42	0.81
4.500	1.08	10.500	3.11	16.500	1.22	22.50	0.81
4.583	1.08	10.583	4.19	16.583	1.22	22.58	0.81
4.667	1.08	10.667	4.19	16.667	1.22	22.67	0.81
4.750	1.08	10.750	4.19	16.750	1.22	22.75	0.81
4.833	1.08	10.833	4.19	16.833	1.22	22.83	0.81
4.917	1.08	10.917	4.19	16.917	1.22	22.92	0.81
5.000	1.08	11.000	4.19	17.000	1.22	23.00	0.81
5.083	1.08	11.083	6.49	17.083	1.22	23.08	0.81
5.167	1.08	11.167	6.49	17.167	1.22	23.17	0.81
5.250	1.08	11.250	6.49	17.250	1.22	23.25	0.81
5.333	1.08	11.333	6.49	17.333	1.22	23.33	0.81
5.417	1.08	11.417	6.49	17.417	1.22	23.42	0.81
5.500	1.08	11.500	6.49	17.500	1.22	23.50	0.81
5.583	1.08	11.583	20.01	17.583	1.22	23.58	0.81
5.667	1.08	11.667	20.01	17.667	1.22	23.67	0.81
5.750	1.08	11.750	20.01	17.750	1.22	23.75	0.81
5.833	1.08	11.833	82.74	17.833	1.22	23.83	0.81
5.917	1.08	11.917	82.74	17.917	1.22	23.92	0.81
6.000	1.08	12.000	82.74	18.000	1.22	24.00	0.81

Unit Hyd Qpeak (cms)= 0.026

PEAK FLOW (cms)= 0.009 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 30.502
TOTAL RAINFALL (mm)= 67.600
RUNOFF COEFFICIENT = 0.451

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

CALIB	
STANDHYD (0043)	Area (ha)= 2.03
ID= 1 DT= 5.0 min	Total Imp(%)= 63.00 Dir. Conn.(%)= 63.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.28	0.75
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.30	2.00
Length	(m)=	116.33	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	0.74	6.083	1.22	12.083	9.74	18.08	1.22
0.167	0.74	6.167	1.22	12.167	9.73	18.17	1.22
0.250	0.74	6.250	1.22	12.250	9.73	18.25	1.22
0.333	0.74	6.333	1.22	12.333	9.73	18.33	1.22
0.417	0.74	6.417	1.22	12.417	9.73	18.42	1.22
0.500	0.74	6.500	1.22	12.500	9.73	18.50	1.22
0.583	0.74	6.583	1.22	12.583	5.00	18.58	1.22
0.667	0.74	6.667	1.22	12.667	5.00	18.67	1.22
0.750	0.74	6.750	1.22	12.750	5.00	18.75	1.22
0.833	0.74	6.833	1.22	12.833	5.00	18.83	1.22
0.917	0.74	6.917	1.22	12.917	5.00	18.92	1.22
1.000	0.74	7.000	1.22	13.000	5.00	19.00	1.22
1.083	0.74	7.083	1.49	13.083	3.65	19.08	1.22
1.167	0.74	7.167	1.49	13.167	3.65	19.17	1.22
1.250	0.74	7.250	1.49	13.250	3.65	19.25	1.22
1.333	0.74	7.333	1.49	13.333	3.65	19.33	1.22
1.417	0.74	7.417	1.49	13.417	3.65	19.42	1.22
1.500	0.74	7.500	1.49	13.500	3.65	19.50	1.22
1.583	0.74	7.583	1.49	13.583	2.84	19.58	1.22
1.667	0.74	7.667	1.49	13.667	2.84	19.67	1.22
1.750	0.74	7.750	1.49	13.750	2.84	19.75	1.22
1.833	0.74	7.833	1.49	13.833	2.84	19.83	1.22
1.917	0.74	7.917	1.49	13.917	2.84	19.92	1.22
2.000	0.74	8.000	1.49	14.000	2.84	20.00	1.22
2.083	0.88	8.083	1.76	14.083	2.03	20.08	0.81
2.167	0.88	8.167	1.76	14.167	2.03	20.17	0.81
2.250	0.88	8.250	1.76	14.250	2.03	20.25	0.81
2.333	0.88	8.333	1.76	14.333	2.03	20.33	0.81
2.417	0.88	8.417	1.76	14.417	2.03	20.42	0.81
2.500	0.88	8.500	1.76	14.500	2.03	20.50	0.81
2.583	0.88	8.583	1.89	14.583	2.03	20.58	0.81
2.667	0.88	8.667	1.89	14.667	2.03	20.67	0.81
2.750	0.88	8.750	1.89	14.750	2.03	20.75	0.81
2.833	0.88	8.833	1.89	14.833	2.03	20.83	0.81
2.917	0.88	8.917	1.89	14.917	2.03	20.92	0.81
3.000	0.88	9.000	1.89	15.000	2.03	21.00	0.81
3.083	0.88	9.083	2.16	15.083	2.03	21.08	0.81
3.167	0.88	9.167	2.16	15.167	2.03	21.17	0.81
3.250	0.88	9.250	2.16	15.250	2.03	21.25	0.81
3.333	0.88	9.333	2.16	15.333	2.03	21.33	0.81
3.417	0.88	9.417	2.16	15.417	2.03	21.42	0.81
3.500	0.88	9.500	2.16	15.500	2.03	21.50	0.81
3.583	0.88	9.583	2.43	15.583	2.03	21.58	0.81
3.667	0.88	9.667	2.43	15.667	2.03	21.67	0.81
3.750	0.88	9.750	2.43	15.750	2.03	21.75	0.81
3.833	0.88	9.833	2.43	15.833	2.03	21.83	0.81
3.917	0.88	9.917	2.43	15.917	2.03	21.92	0.81
4.000	0.88	10.000	2.43	16.000	2.03	22.00	0.81
4.083	1.08	10.083	3.11	16.083	1.22	22.08	0.81
4.167	1.08	10.167	3.11	16.167	1.22	22.17	0.81
4.250	1.08	10.250	3.11	16.250	1.22	22.25	0.81
4.333	1.08	10.333	3.11	16.333	1.22	22.33	0.81
4.417	1.08	10.417	3.11	16.417	1.22	22.42	0.81
4.500	1.08	10.500	3.11	16.500	1.22	22.50	0.81
4.583	1.08	10.583	4.19	16.583	1.22	22.58	0.81
4.667	1.08	10.667	4.19	16.667	1.22	22.67	0.81
4.750	1.08	10.750	4.19	16.750	1.22	22.75	0.81
4.833	1.08	10.833	4.19	16.833	1.22	22.83	0.81
4.917	1.08	10.917	4.19	16.917	1.22	22.92	0.81
5.000	1.08	11.000	4.19	17.000	1.22	23.00	0.81
5.083	1.08	11.083	6.49	17.083	1.22	23.08	0.81
5.167	1.08	11.167	6.49	17.167	1.22	23.17	0.81
5.250	1.08	11.250	6.49	17.250	1.22	23.25	0.81
5.333	1.08	11.333	6.49	17.333	1.22	23.33	0.81
5.417	1.08	11.417	6.49	17.417	1.22	23.42	0.81
5.500	1.08	11.500	6.49	17.500	1.22	23.50	0.81
5.583	1.08	11.583	20.01	17.583	1.22	23.58	0.81
5.667	1.08	11.667	20.01	17.667	1.22	23.67	0.81
5.750	1.08	11.750	20.01	17.750	1.22	23.75	0.81

5.833	1.08	11.833	82.74	17.833	1.22	23.83	0.81
5.917	1.08	11.917	82.74	17.917	1.22	23.92	0.81
6.000	1.08	12.000	82.74	18.000	1.22	24.00	0.81

Max.Eff.Inten.(mm/hr)=	82.74	46.67		
over (min)	5.00	15.00		
Storage Coeff. (min)=	2.79 (ii)	12.36 (ii)		
Unit Hyd. Tpeak (min)=	5.00	15.00		
Unit Hyd. peak (cms)=	0.28	0.08		
			TOTALS	
PEAK FLOW (cms)=	0.29	0.06	0.343 (iii)	
TIME TO PEAK (hrs)=	12.00	12.08	12.00	
RUNOFF VOLUME (mm)=	66.60	31.08	53.45	
TOTAL RAINFALL (mm)=	67.60	67.60	67.60	
RUNOFF COEFFICIENT =	0.99	0.46	0.79	

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0048)	Area (ha)=	0.24	
ID= 1 DT= 5.0 min	Total Imp(%)=	99.00	Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.24	0.00
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	40.00	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	0.74	6.083	1.22	12.083	9.74	18.08	1.22
0.167	0.74	6.167	1.22	12.167	9.73	18.17	1.22
0.250	0.74	6.250	1.22	12.250	9.73	18.25	1.22
0.333	0.74	6.333	1.22	12.333	9.73	18.33	1.22
0.417	0.74	6.417	1.22	12.417	9.73	18.42	1.22
0.500	0.74	6.500	1.22	12.500	9.73	18.50	1.22
0.583	0.74	6.583	1.22	12.583	5.00	18.58	1.22
0.667	0.74	6.667	1.22	12.667	5.00	18.67	1.22
0.750	0.74	6.750	1.22	12.750	5.00	18.75	1.22
0.833	0.74	6.833	1.22	12.833	5.00	18.83	1.22
0.917	0.74	6.917	1.22	12.917	5.00	18.92	1.22
1.000	0.74	7.000	1.22	13.000	5.00	19.00	1.22
1.083	0.74	7.083	1.49	13.083	3.65	19.08	1.22
1.167	0.74	7.167	1.49	13.167	3.65	19.17	1.22
1.250	0.74	7.250	1.49	13.250	3.65	19.25	1.22
1.333	0.74	7.333	1.49	13.333	3.65	19.33	1.22
1.417	0.74	7.417	1.49	13.417	3.65	19.42	1.22
1.500	0.74	7.500	1.49	13.500	3.65	19.50	1.22
1.583	0.74	7.583	1.49	13.583	2.84	19.58	1.22
1.667	0.74	7.667	1.49	13.667	2.84	19.67	1.22
1.750	0.74	7.750	1.49	13.750	2.84	19.75	1.22
1.833	0.74	7.833	1.49	13.833	2.84	19.83	1.22
1.917	0.74	7.917	1.49	13.917	2.84	19.92	1.22
2.000	0.74	8.000	1.49	14.000	2.84	20.00	1.22
2.083	0.88	8.083	1.76	14.083	2.03	20.08	0.81
2.167	0.88	8.167	1.76	14.167	2.03	20.17	0.81
2.250	0.88	8.250	1.76	14.250	2.03	20.25	0.81
2.333	0.88	8.333	1.76	14.333	2.03	20.33	0.81
2.417	0.88	8.417	1.76	14.417	2.03	20.42	0.81
2.500	0.88	8.500	1.76	14.500	2.03	20.50	0.81
2.583	0.88	8.583	1.89	14.583	2.03	20.58	0.81
2.667	0.88	8.667	1.89	14.667	2.03	20.67	0.81
2.750	0.88	8.750	1.89	14.750	2.03	20.75	0.81
2.833	0.88	8.833	1.89	14.833	2.03	20.83	0.81
2.917	0.88	8.917	1.89	14.917	2.03	20.92	0.81
3.000	0.88	9.000	1.89	15.000	2.03	21.00	0.81
3.083	0.88	9.083	2.16	15.083	2.03	21.08	0.81
3.167	0.88	9.167	2.16	15.167	2.03	21.17	0.81
3.250	0.88	9.250	2.16	15.250	2.03	21.25	0.81
3.333	0.88	9.333	2.16	15.333	2.03	21.33	0.81
3.417	0.88	9.417	2.16	15.417	2.03	21.42	0.81
3.500	0.88	9.500	2.16	15.500	2.03	21.50	0.81
3.583	0.88	9.583	2.43	15.583	2.03	21.58	0.81
3.667	0.88	9.667	2.43	15.667	2.03	21.67	0.81
3.750	0.88	9.750	2.43	15.750	2.03	21.75	0.81
3.833	0.88	9.833	2.43	15.833	2.03	21.83	0.81
3.917	0.88	9.917	2.43	15.917	2.03	21.92	0.81
4.000	0.88	10.000	2.43	16.000	2.03	22.00	0.81
4.083	1.08	10.083	3.11	16.083	1.22	22.08	0.81
4.167	1.08	10.167	3.11	16.167	1.22	22.17	0.81
4.250	1.08	10.250	3.11	16.250	1.22	22.25	0.81
4.333	1.08	10.333	3.11	16.333	1.22	22.33	0.81
4.417	1.08	10.417	3.11	16.417	1.22	22.42	0.81
4.500	1.08	10.500	3.11	16.500	1.22	22.50	0.81
4.583	1.08	10.583	4.19	16.583	1.22	22.58	0.81
4.667	1.08	10.667	4.19	16.667	1.22	22.67	0.81
4.750	1.08	10.750	4.19	16.750	1.22	22.75	0.81
4.833	1.08	10.833	4.19	16.833	1.22	22.83	0.81
4.917	1.08	10.917	4.19	16.917	1.22	22.92	0.81
5.000	1.08	11.000	4.19	17.000	1.22	23.00	0.81
5.083	1.08	11.083	6.49	17.083	1.22	23.08	0.81
5.167	1.08	11.167	6.49	17.167	1.22	23.17	0.81
5.250	1.08	11.250	6.49	17.250	1.22	23.25	0.81
5.333	1.08	11.333	6.49	17.333	1.22	23.33	0.81
5.417	1.08	11.417	6.49	17.417	1.22	23.42	0.81
5.500	1.08	11.500	6.49	17.500	1.22	23.50	0.81
5.583	1.08	11.583	20.01	17.583	1.22	23.58	0.81
5.667	1.08	11.667	20.01	17.667	1.22	23.67	0.81
5.750	1.08	11.750	20.01	17.750	1.22	23.75	0.81
5.833	1.08	11.833	82.74	17.833	1.22	23.83	0.81
5.917	1.08	11.917	82.74	17.917	1.22	23.92	0.81
6.000	1.08	12.000	82.74	18.000	1.22	24.00	0.81

Max.Eff.Inten.(mm/hr)=	82.74	46.67		
over (min)	5.00	5.00		
Storage Coeff. (min)=	1.59 (ii)	2.80 (ii)		
Unit Hyd. Tpeak (min)=	5.00	5.00		
Unit Hyd. peak (cms)=	0.33	0.28		
			TOTALS	
PEAK FLOW (cms)=	0.05	0.00	0.055 (iii)	
TIME TO PEAK (hrs)=	12.00	12.00	12.00	
RUNOFF VOLUME (mm)=	66.60	31.08	66.24	
TOTAL RAINFALL (mm)=	67.60	67.60	67.60	
RUNOFF COEFFICIENT =	0.99	0.46	0.98	

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  80.0     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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--------------------
| RESERVOIR(  0050)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0128      0.0103

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0048)     0.240     0.055     12.00      66.24
   OUTFLOW: ID= 1 (  0050)     0.240     0.009     12.08      65.42

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 15.87
                  TIME SHIFT OF PEAK FLOW          (min)=  5.00
                  MAXIMUM  STORAGE   USED        (ha.m.)=  0.0070

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--------------------
| ADD HYD  (  0049)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
       ID1= 1 (  0043):     2.03   0.343    12.00    53.45
     + ID2= 2 (  0050):     0.24   0.009    12.08    65.42
       ================================================
       ID = 3 (  0049):     2.27   0.350    12.00    54.72

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| CALIB            |
| STANDHYD (  0051)|   Area     (ha)=   1.68
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.66         0.02
     Dep. Storage     (mm)=       5.00         1.50
     Average Slope     (%)=       1.20         2.00
     Length            (m)=     105.83        40.00
     Mannings n           =      0.013        0.250

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


                          ---- TRANSFORMED HYETOGRAPH ----
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
              0.083    0.74 | 6.083    1.22 |12.083    9.74 | 18.08    1.22
              0.167    0.74 | 6.167    1.22 |12.167    9.73 | 18.17    1.22
              0.250    0.74 | 6.250    1.22 |12.250    9.73 | 18.25    1.22
              0.333    0.74 | 6.333    1.22 |12.333    9.73 | 18.33    1.22
              0.417    0.74 | 6.417    1.22 |12.417    9.73 | 18.42    1.22
              0.500    0.74 | 6.500    1.22 |12.500    9.73 | 18.50    1.22
              0.583    0.74 | 6.583    1.22 |12.583    5.00 | 18.58    1.22
              0.667    0.74 | 6.667    1.22 |12.667    5.00 | 18.67    1.22
              0.750    0.74 | 6.750    1.22 |12.750    5.00 | 18.75    1.22
              0.833    0.74 | 6.833    1.22 |12.833    5.00 | 18.83    1.22
              0.917    0.74 | 6.917    1.22 |12.917    5.00 | 18.92    1.22
              1.000    0.74 | 7.000    1.22 |13.000    5.00 | 19.00    1.22
              1.083    0.74 | 7.083    1.49 |13.083    3.65 | 19.08    1.22
              1.167    0.74 | 7.167    1.49 |13.167    3.65 | 19.17    1.22
              1.250    0.74 | 7.250    1.49 |13.250    3.65 | 19.25    1.22
              1.333    0.74 | 7.333    1.49 |13.333    3.65 | 19.33    1.22
              1.417    0.74 | 7.417    1.49 |13.417    3.65 | 19.42    1.22
              1.500    0.74 | 7.500    1.49 |13.500    3.65 | 19.50    1.22
              1.583    0.74 | 7.583    1.49 |13.583    2.84 | 19.58    1.22
              1.667    0.74 | 7.667    1.49 |13.667    2.84 | 19.67    1.22
              1.750    0.74 | 7.750    1.49 |13.750    2.84 | 19.75    1.22
              1.833    0.74 | 7.833    1.49 |13.833    2.84 | 19.83    1.22
              1.917    0.74 | 7.917    1.49 |13.917    2.84 | 19.92    1.22
              2.000    0.74 | 8.000    1.49 |14.000    2.84 | 20.00    1.22
              2.083    0.88 | 8.083    1.76 |14.083    2.03 | 20.08    0.81
              2.167    0.88 | 8.167    1.76 |14.167    2.03 | 20.17    0.81
              2.250    0.88 | 8.250    1.76 |14.250    2.03 | 20.25    0.81
              2.333    0.88 | 8.333    1.76 |14.333    2.03 | 20.33    0.81
              2.417    0.88 | 8.417    1.76 |14.417    2.03 | 20.42    0.81
              2.500    0.88 | 8.500    1.76 |14.500    2.03 | 20.50    0.81
              2.583    0.88 | 8.583    1.89 |14.583    2.03 | 20.58    0.81
              2.667    0.88 | 8.667    1.89 |14.667    2.03 | 20.67    0.81
              2.750    0.88 | 8.750    1.89 |14.750    2.03 | 20.75    0.81
              2.833    0.88 | 8.833    1.89 |14.833    2.03 | 20.83    0.81
              2.917    0.88 | 8.917    1.89 |14.917    2.03 | 20.92    0.81
              3.000    0.88 | 9.000    1.89 |15.000    2.03 | 21.00    0.81
              3.083    0.88 | 9.083    2.16 |15.083    2.03 | 21.08    0.81
              3.167    0.88 | 9.167    2.16 |15.167    2.03 | 21.17    0.81
              3.250    0.88 | 9.250    2.16 |15.250    2.03 | 21.25    0.81
              3.333    0.88 | 9.333    2.16 |15.333    2.03 | 21.33    0.81
              3.417    0.88 | 9.417    2.16 |15.417    2.03 | 21.42    0.81
              3.500    0.88 | 9.500    2.16 |15.500    2.03 | 21.50    0.81
              3.583    0.88 | 9.583    2.43 |15.583    2.03 | 21.58    0.81
              3.667    0.88 | 9.667    2.43 |15.667    2.03 | 21.67    0.81
              3.750    0.88 | 9.750    2.43 |15.750    2.03 | 21.75    0.81
              3.833    0.88 | 9.833    2.43 |15.833    2.03 | 21.83    0.81
              3.917    0.88 | 9.917    2.43 |15.917    2.03 | 21.92    0.81
              4.000    0.88 |10.000    2.43 |16.000    2.03 | 22.00    0.81
              4.083    1.08 |10.083    3.11 |16.083    1.22 | 22.08    0.81
              4.167    1.08 |10.167    3.11 |16.167    1.22 | 22.17    0.81
              4.250    1.08 |10.250    3.11 |16.250    1.22 | 22.25    0.81
              4.333    1.08 |10.333    3.11 |16.333    1.22 | 22.33    0.81
              4.417    1.08 |10.417    3.11 |16.417    1.22 | 22.42    0.81
              4.500    1.08 |10.500    3.11 |16.500    1.22 | 22.50    0.81
              4.583    1.08 |10.583    4.19 |16.583    1.22 | 22.58    0.81
              4.667    1.08 |10.667    4.19 |16.667    1.22 | 22.67    0.81
              4.750    1.08 |10.750    4.19 |16.750    1.22 | 22.75    0.81
              4.833    1.08 |10.833    4.19 |16.833    1.22 | 22.83    0.81
              4.917    1.08 |10.917    4.19 |16.917    1.22 | 22.92    0.81
              5.000    1.08 |11.000    4.19 |17.000    1.22 | 23.00    0.81
              5.083    1.08 |11.083    6.49 |17.083    1.22 | 23.08    0.81
              5.167    1.08 |11.167    6.49 |17.167    1.22 | 23.17    0.81
              5.250    1.08 |11.250    6.49 |17.250    1.22 | 23.25    0.81
              5.333    1.08 |11.333    6.49 |17.333    1.22 | 23.33    0.81
              5.417    1.08 |11.417    6.49 |17.417    1.22 | 23.42    0.81
              5.500    1.08 |11.500    6.49 |17.500    1.22 | 23.50    0.81
              5.583    1.08 |11.583   20.01 |17.583    1.22 | 23.58    0.81
              5.667    1.08 |11.667   20.01 |17.667    1.22 | 23.67    0.81
              5.750    1.08 |11.750   20.01 |17.750    1.22 | 23.75    0.81
              5.833    1.08 |11.833   82.74 |17.833    1.22 | 23.83    0.81
              5.917    1.08 |11.917   82.74 |17.917    1.22 | 23.92    0.81
              6.000    1.08 |12.000   82.74 |18.000    1.22 | 24.00    0.81
```

```
     Max.Eff.Inten.(mm/hr)=      82.74        49.17
                over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.70 (ii)    3.91 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.29         0.25
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.38         0.00          0.383 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00         12.00
     RUNOFF VOLUME    (mm)=      62.60        33.71         62.31
     TOTAL RAINFALL   (mm)=      67.60        67.60         67.60
     RUNOFF COEFFICIENT   =       0.93         0.50          0.92

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  80.0    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  (  0046)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)      (mm)
       ID1= 1 (  0049):     2.27   0.350    12.00    54.72
     + ID2= 2 (  0051):     1.68   0.383    12.00    62.31
       ================================================
       ID = 3 (  0046):     3.95   0.734    12.00    57.95

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0047)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.1630      0.2697
                         0.0080     0.0487   |   0.1700      0.2885
                         0.0100     0.0674   |   0.1720      0.2960
                         0.0880     0.1049   |   0.1760      0.3072
                         0.1040     0.1311   |   0.1770      0.3109
                         0.1170     0.1573   |   0.1800      0.3184
                         0.1260     0.1761   |   0.1870      0.3409
                         0.1300     0.1836   |   0.1880      0.3447
                         0.1570     0.2510   |   0.1910      0.3559

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0046)     3.950     0.734     12.00      57.95
   OUTFLOW: ID= 1 (  0047)     3.950     0.099     12.50      57.56

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 13.55
                  TIME SHIFT OF PEAK FLOW         (min)= 30.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1238

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

--------------------
| ADD HYD  (  0039)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)      (mm)
       ID1= 1 (  0040):     6.56   0.645    12.08    30.56
     + ID2= 2 (  0047):     3.95   0.099    12.50    57.56
       ================================================
       ID = 3 (  0039):    10.51   0.740    12.08    40.71

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

--------------------
| ADD HYD  (  0039)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)      (mm)
       ID1= 3 (  0039):    10.51   0.740    12.08    40.71
     + ID2= 2 (  0052):     0.08   0.009    12.00    30.50
       ================================================
       ID = 1 (  0039):    10.59   0.747    12.08    40.63

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

      V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
      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\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\fbc28258-05ae-4d71-b3fd-f0038c768908\
  Summary filename: C:\Users\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\fbc28258-05ae-4d71-b3fd-f0038c768908\


DATE: 03-08-2023                          TIME: 01:45:27

USER:



COMMENTS: _____________________________________________________


--------------------------------------------------------------------------------
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  ******************************************
  ** SIMULATION : 14 - 25-YR - SCS TYPE II 24HR **
  ******************************************

--------------------
| MASS STORM       |    Filename: C:\Users\sramsoomair\AppD
```

	ata\Local\Temp\
	72e98174-9551-451b-b568-e4dbecda99d3\dd1cb23b
Ptotal= 78.50 mm	Comments: SCS TYPE II MASS CURVE

Duration of storm = 24.00 hrs
Mass curve time step = 15.00 min

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.86	6.00	1.41	12.00	11.30	18.00	1.41
0.25	0.86	6.25	1.41	12.25	11.30	18.25	1.41
0.50	0.86	6.50	1.41	12.50	5.81	18.50	1.41
0.75	0.86	6.75	1.41	12.75	5.81	18.75	1.41
1.00	0.86	7.00	1.73	13.00	4.24	19.00	1.41
1.25	0.86	7.25	1.73	13.25	4.24	19.25	1.41
1.50	0.86	7.50	1.73	13.50	3.30	19.50	1.41
1.75	0.86	7.75	1.73	13.75	3.30	19.75	1.41
2.00	1.02	8.00	2.04	14.00	2.35	20.00	0.94
2.25	1.02	8.25	2.04	14.25	2.35	20.25	0.94
2.50	1.02	8.50	2.20	14.50	2.35	20.50	0.94
2.75	1.02	8.75	2.20	14.75	2.36	20.75	0.94
3.00	1.02	9.00	2.51	15.00	2.35	21.00	0.94
3.25	1.02	9.25	2.51	15.25	2.35	21.25	0.94
3.50	1.02	9.50	2.83	15.50	2.35	21.50	0.94
3.75	1.02	9.75	2.83	15.75	2.35	21.75	0.94
4.00	1.26	10.00	3.61	16.00	1.41	22.00	0.94
4.25	1.26	10.25	3.61	16.25	1.41	22.25	0.94
4.50	1.26	10.50	4.87	16.50	1.41	22.50	0.94
4.75	1.26	10.75	4.87	16.75	1.41	22.75	0.94
5.00	1.26	11.00	7.54	17.00	1.41	23.00	0.94
5.25	1.26	11.25	7.54	17.25	1.41	23.25	0.94
5.50	1.26	11.50	23.24	17.50	1.41	23.50	0.94
5.75	1.26	11.75	96.08	17.75	1.41	23.75	0.94

CALIB			
NASHYD (0041)	Area (ha)= 6.56	Curve Number (CN)= 82.0	
ID= 1 DT= 5.0 min	Ia (mm)= 8.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.14		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.86	6.083	1.41	12.083	11.31	18.08	1.41
0.167	0.86	6.167	1.41	12.167	11.30	18.17	1.41
0.250	0.86	6.250	1.41	12.250	11.30	18.25	1.41
0.333	0.86	6.333	1.41	12.333	11.30	18.33	1.41
0.417	0.86	6.417	1.41	12.417	11.30	18.42	1.41
0.500	0.86	6.500	1.41	12.500	11.30	18.50	1.41
0.583	0.86	6.583	1.41	12.583	5.81	18.58	1.41
0.667	0.86	6.667	1.41	12.667	5.81	18.67	1.41
0.750	0.86	6.750	1.41	12.750	5.81	18.75	1.41
0.833	0.86	6.833	1.41	12.833	5.81	18.83	1.41
0.917	0.86	6.917	1.41	12.917	5.81	18.92	1.41
1.000	0.86	7.000	1.41	13.000	5.81	19.00	1.41
1.083	0.86	7.083	1.73	13.083	4.24	19.08	1.41
1.167	0.86	7.167	1.73	13.167	4.24	19.17	1.41
1.250	0.86	7.250	1.73	13.250	4.24	19.25	1.41
1.333	0.86	7.333	1.73	13.333	4.24	19.33	1.41
1.417	0.86	7.417	1.73	13.417	4.24	19.42	1.41
1.500	0.86	7.500	1.73	13.500	4.24	19.50	1.41
1.583	0.86	7.583	1.73	13.583	3.30	19.58	1.41
1.667	0.86	7.667	1.73	13.667	3.30	19.67	1.41
1.750	0.86	7.750	1.73	13.750	3.30	19.75	1.41
1.833	0.86	7.833	1.73	13.833	3.30	19.83	1.41
1.917	0.86	7.917	1.73	13.917	3.30	19.92	1.41
2.000	0.86	8.000	1.73	14.000	3.30	20.00	1.41
2.083	1.02	8.083	2.04	14.083	2.36	20.08	0.94
2.167	1.02	8.167	2.04	14.167	2.35	20.17	0.94
2.250	1.02	8.250	2.04	14.250	2.35	20.25	0.94
2.333	1.02	8.333	2.04	14.333	2.35	20.33	0.94
2.417	1.02	8.417	2.04	14.417	2.35	20.42	0.94
2.500	1.02	8.500	2.04	14.500	2.35	20.50	0.94
2.583	1.02	8.583	2.20	14.583	2.35	20.58	0.94
2.667	1.02	8.667	2.20	14.667	2.35	20.67	0.94
2.750	1.02	8.750	2.20	14.750	2.35	20.75	0.94
2.833	1.02	8.833	2.20	14.833	2.36	20.83	0.94
2.917	1.02	8.917	2.20	14.917	2.36	20.92	0.94
3.000	1.02	9.000	2.20	15.000	2.36	21.00	0.94
3.083	1.02	9.083	2.51	15.083	2.35	21.08	0.94
3.167	1.02	9.167	2.51	15.167	2.35	21.17	0.94
3.250	1.02	9.250	2.51	15.250	2.35	21.25	0.94
3.333	1.02	9.333	2.51	15.333	2.35	21.33	0.94
3.417	1.02	9.417	2.51	15.417	2.35	21.42	0.94
3.500	1.02	9.500	2.51	15.500	2.35	21.50	0.94
3.583	1.02	9.583	2.83	15.583	2.35	21.58	0.94
3.667	1.02	9.667	2.83	15.667	2.35	21.67	0.94
3.750	1.02	9.750	2.83	15.750	2.35	21.75	0.94
3.833	1.02	9.833	2.83	15.833	2.35	21.83	0.94
3.917	1.02	9.917	2.83	15.917	2.35	21.92	0.94
4.000	1.02	10.000	2.83	16.000	2.35	22.00	0.94
4.083	1.26	10.083	3.61	16.083	1.41	22.08	0.94
4.167	1.26	10.167	3.61	16.167	1.41	22.17	0.94
4.250	1.26	10.250	3.61	16.250	1.41	22.25	0.94
4.333	1.26	10.333	3.61	16.333	1.41	22.33	0.94
4.417	1.26	10.417	3.61	16.417	1.41	22.42	0.94
4.500	1.26	10.500	3.61	16.500	1.41	22.50	0.94
4.583	1.26	10.583	4.87	16.583	1.41	22.58	0.94
4.667	1.26	10.667	4.87	16.667	1.41	22.67	0.94
4.750	1.26	10.750	4.87	16.750	1.41	22.75	0.94
4.833	1.26	10.833	4.87	16.833	1.41	22.83	0.94
4.917	1.26	10.917	4.87	16.917	1.41	22.92	0.94
5.000	1.26	11.000	4.87	17.000	1.41	23.00	0.94
5.083	1.26	11.083	7.54	17.083	1.41	23.08	0.94
5.167	1.26	11.167	7.54	17.167	1.41	23.17	0.94
5.250	1.26	11.250	7.54	17.250	1.41	23.25	0.94
5.333	1.26	11.333	7.54	17.333	1.41	23.33	0.94
5.417	1.26	11.417	7.54	17.417	1.41	23.42	0.94
5.500	1.26	11.500	7.54	17.500	1.41	23.50	0.94
5.583	1.26	11.583	23.23	17.583	1.41	23.58	0.94
5.667	1.26	11.667	23.24	17.667	1.41	23.67	0.94
5.750	1.26	11.750	23.24	17.750	1.41	23.75	0.94
5.833	1.26	11.833	96.08	17.833	1.41	23.83	0.94
5.917	1.26	11.917	96.08	17.917	1.41	23.92	0.94
6.000	1.26	12.000	96.08	18.000	1.41	24.00	0.94

Unit Hyd Qpeak (cms)= 1.790

PEAK FLOW (cms)= 0.849 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 39.072
TOTAL RAINFALL (mm)= 78.500
RUNOFF COEFFICIENT = 0.498

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

| ROUTE CHN(0040)|
| IN= 2---> OUT= 1 | Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	101.50	0.0500	
1.00	100.70	0.0500	
1.50	100.55	0.0500 /0.0300	Main Channel
2.00	99.50	0.0300	Main Channel
3.50	99.60	0.0300	Main Channel
4.50	100.65	0.0300 /0.0500	Main Channel
6.00	101.45	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	99.60	.185E+02	0.0	0.54	8.09
0.19	99.69	.587E+02	0.2	1.04	4.22
0.29	99.79	.102E+03	0.5	1.38	3.16
0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	0.85	12.00	39.07	0.36	1.58
OUTFLOW: ID= 1 (0040)	6.56	0.82	12.08	39.07	0.35	1.56

CALIB					
NASHYD (0052)	Area (ha)=	0.08	Curve Number (CN)=	80.0	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.11			

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.86	6.083	1.41	12.083	11.31	18.08	1.41
0.167	0.86	6.167	1.41	12.167	11.30	18.17	1.41
0.250	0.86	6.250	1.41	12.250	11.30	18.25	1.41
0.333	0.86	6.333	1.41	12.333	11.30	18.33	1.41
0.417	0.86	6.417	1.41	12.417	11.30	18.42	1.41
0.500	0.86	6.500	1.41	12.500	11.30	18.50	1.41
0.583	0.86	6.583	1.41	12.583	5.81	18.58	1.41
0.667	0.86	6.667	1.41	12.667	5.81	18.67	1.41
0.750	0.86	6.750	1.41	12.750	5.81	18.75	1.41
0.833	0.86	6.833	1.41	12.833	5.81	18.83	1.41
0.917	0.86	6.917	1.41	12.917	5.81	18.92	1.41
1.000	0.86	7.000	1.41	13.000	5.81	19.00	1.41
1.083	0.86	7.083	1.73	13.083	4.24	19.08	1.41
1.167	0.86	7.167	1.73	13.167	4.24	19.17	1.41
1.250	0.86	7.250	1.73	13.250	4.24	19.25	1.41
1.333	0.86	7.333	1.73	13.333	4.24	19.33	1.41
1.417	0.86	7.417	1.73	13.417	4.24	19.42	1.41
1.500	0.86	7.500	1.73	13.500	4.24	19.50	1.41
1.583	0.86	7.583	1.73	13.583	3.30	19.58	1.41
1.667	0.86	7.667	1.73	13.667	3.30	19.67	1.41
1.750	0.86	7.750	1.73	13.750	3.30	19.75	1.41
1.833	0.86	7.833	1.73	13.833	3.30	19.83	1.41
1.917	0.86	7.917	1.73	13.917	3.30	19.92	1.41
2.000	0.86	8.000	1.73	14.000	3.30	20.00	1.41
2.083	1.02	8.083	2.04	14.083	2.36	20.08	0.94
2.167	1.02	8.167	2.04	14.167	2.35	20.17	0.94
2.250	1.02	8.250	2.04	14.250	2.35	20.25	0.94
2.333	1.02	8.333	2.04	14.333	2.35	20.33	0.94
2.417	1.02	8.417	2.04	14.417	2.35	20.42	0.94
2.500	1.02	8.500	2.04	14.500	2.35	20.50	0.94
2.583	1.02	8.583	2.20	14.583	2.35	20.58	0.94
2.667	1.02	8.667	2.20	14.667	2.35	20.67	0.94
2.750	1.02	8.750	2.20	14.750	2.35	20.75	0.94
2.833	1.02	8.833	2.20	14.833	2.36	20.83	0.94
2.917	1.02	8.917	2.20	14.917	2.36	20.92	0.94
3.000	1.02	9.000	2.20	15.000	2.36	21.00	0.94
3.083	1.02	9.083	2.51	15.083	2.35	21.08	0.94
3.167	1.02	9.167	2.51	15.167	2.35	21.17	0.94
3.250	1.02	9.250	2.51	15.250	2.35	21.25	0.94
3.333	1.02	9.333	2.51	15.333	2.35	21.33	0.94
3.417	1.02	9.417	2.51	15.417	2.35	21.42	0.94
3.500	1.02	9.500	2.51	15.500	2.35	21.50	0.94
3.583	1.02	9.583	2.83	15.583	2.35	21.58	0.94
3.667	1.02	9.667	2.83	15.667	2.35	21.67	0.94
3.750	1.02	9.750	2.83	15.750	2.35	21.75	0.94
3.833	1.02	9.833	2.83	15.833	2.35	21.83	0.94
3.917	1.02	9.917	2.83	15.917	2.35	21.92	0.94
4.000	1.02	10.000	2.83	16.000	2.35	22.00	0.94
4.083	1.26	10.083	3.61	16.083	1.41	22.08	0.94
4.167	1.26	10.167	3.61	16.167	1.41	22.17	0.94
4.250	1.26	10.250	3.61	16.250	1.41	22.25	0.94
4.333	1.26	10.333	3.61	16.333	1.41	22.33	0.94
4.417	1.26	10.417	3.61	16.417	1.41	22.42	0.94
4.500	1.26	10.500	3.61	16.500	1.41	22.50	0.94
4.583	1.26	10.583	4.87	16.583	1.41	22.58	0.94
4.667	1.26	10.667	4.87	16.667	1.41	22.67	0.94
4.750	1.26	10.750	4.87	16.750	1.41	22.75	0.94
4.833	1.26	10.833	4.87	16.833	1.41	22.83	0.94
4.917	1.26	10.917	4.87	16.917	1.41	22.92	0.94
5.000	1.26	11.000	4.87	17.000	1.41	23.00	0.94
5.083	1.26	11.083	7.54	17.083	1.41	23.08	0.94
5.167	1.26	11.167	7.54	17.167	1.41	23.17	0.94
5.250	1.26	11.250	7.54	17.250	1.41	23.25	0.94
5.333	1.26	11.333	7.54	17.333	1.41	23.33	0.94
5.417	1.26	11.417	7.54	17.417	1.41	23.42	0.94
5.500	1.26	11.500	7.54	17.500	1.41	23.50	0.94
5.583	1.26	11.583	23.23	17.583	1.41	23.58	0.94

5.667	1.26	11.667	23.24	17.667	1.41	23.67	0.94
5.750	1.26	11.750	23.24	17.750	1.41	23.75	0.94
5.833	1.26	11.833	96.08	17.833	1.41	23.83	0.94
5.917	1.26	11.917	96.08	17.917	1.41	23.92	0.94
6.000	1.26	12.000	96.08	18.000	1.41	24.00	0.94

Unit Hyd Qpeak (cms)= 0.026

PEAK FLOW (cms)= 0.011 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 38.704
TOTAL RAINFALL (mm)= 78.500
RUNOFF COEFFICIENT = 0.493

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

CALIB	
STANDHYD (0043)	Area (ha)= 2.03
ID= 1 DT= 5.0 min	Total Imp(%)= 63.00 Dir. Conn.(%)= 63.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.28	0.75
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.30	2.00
Length	(m)=	116.33	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	0.86	6.083	1.41	12.083	11.31	18.08	1.41
0.167	0.86	6.167	1.41	12.167	11.30	18.17	1.41
0.250	0.86	6.250	1.41	12.250	11.30	18.25	1.41
0.333	0.86	6.333	1.41	12.333	11.30	18.33	1.41
0.417	0.86	6.417	1.41	12.417	11.30	18.42	1.41
0.500	0.86	6.500	1.41	12.500	11.30	18.50	1.41
0.583	0.86	6.583	1.41	12.583	5.81	18.58	1.41
0.667	0.86	6.667	1.41	12.667	5.81	18.67	1.41
0.750	0.86	6.750	1.41	12.750	5.81	18.75	1.41
0.833	0.86	6.833	1.41	12.833	5.81	18.83	1.41
0.917	0.86	6.917	1.41	12.917	5.81	18.92	1.41
1.000	0.86	7.000	1.41	13.000	5.81	19.00	1.41
1.083	0.86	7.083	1.73	13.083	4.24	19.08	1.41
1.167	0.86	7.167	1.73	13.167	4.24	19.17	1.41
1.250	0.86	7.250	1.73	13.250	4.24	19.25	1.41
1.333	0.86	7.333	1.73	13.333	4.24	19.33	1.41
1.417	0.86	7.417	1.73	13.417	4.24	19.42	1.41
1.500	0.86	7.500	1.73	13.500	4.24	19.50	1.41
1.583	0.86	7.583	1.73	13.583	3.30	19.58	1.41
1.667	0.86	7.667	1.73	13.667	3.30	19.67	1.41
1.750	0.86	7.750	1.73	13.750	3.30	19.75	1.41
1.833	0.86	7.833	1.73	13.833	3.30	19.83	1.41
1.917	0.86	7.917	1.73	13.917	3.30	19.92	1.41
2.000	0.86	8.000	1.73	14.000	3.30	20.00	1.41
2.083	1.02	8.083	2.04	14.083	2.36	20.08	0.94
2.167	1.02	8.167	2.04	14.167	2.35	20.17	0.94
2.250	1.02	8.250	2.04	14.250	2.35	20.25	0.94
2.333	1.02	8.333	2.04	14.333	2.35	20.33	0.94
2.417	1.02	8.417	2.04	14.417	2.35	20.42	0.94
2.500	1.02	8.500	2.04	14.500	2.35	20.50	0.94
2.583	1.02	8.583	2.20	14.583	2.35	20.58	0.94
2.667	1.02	8.667	2.20	14.667	2.35	20.67	0.94
2.750	1.02	8.750	2.20	14.750	2.35	20.75	0.94
2.833	1.02	8.833	2.20	14.833	2.36	20.83	0.94
2.917	1.02	8.917	2.20	14.917	2.36	20.92	0.94
3.000	1.02	9.000	2.20	15.000	2.36	21.00	0.94
3.083	1.02	9.083	2.51	15.083	2.35	21.08	0.94
3.167	1.02	9.167	2.51	15.167	2.35	21.17	0.94
3.250	1.02	9.250	2.51	15.250	2.35	21.25	0.94
3.333	1.02	9.333	2.51	15.333	2.35	21.33	0.94
3.417	1.02	9.417	2.51	15.417	2.35	21.42	0.94
3.500	1.02	9.500	2.51	15.500	2.35	21.50	0.94
3.583	1.02	9.583	2.83	15.583	2.35	21.58	0.94
3.667	1.02	9.667	2.83	15.667	2.35	21.67	0.94
3.750	1.02	9.750	2.83	15.750	2.35	21.75	0.94
3.833	1.02	9.833	2.83	15.833	2.35	21.83	0.94
3.917	1.02	9.917	2.83	15.917	2.35	21.92	0.94
4.000	1.02	10.000	2.83	16.000	2.35	22.00	0.94
4.083	1.26	10.083	3.61	16.083	1.41	22.08	0.94
4.167	1.26	10.167	3.61	16.167	1.41	22.17	0.94
4.250	1.26	10.250	3.61	16.250	1.41	22.25	0.94
4.333	1.26	10.333	3.61	16.333	1.41	22.33	0.94
4.417	1.26	10.417	3.61	16.417	1.41	22.42	0.94
4.500	1.26	10.500	3.61	16.500	1.41	22.50	0.94
4.583	1.26	10.583	4.87	16.583	1.41	22.58	0.94
4.667	1.26	10.667	4.87	16.667	1.41	22.67	0.94
4.750	1.26	10.750	4.87	16.750	1.41	22.75	0.94
4.833	1.26	10.833	4.87	16.833	1.41	22.83	0.94
4.917	1.26	10.917	4.87	16.917	1.41	22.92	0.94
5.000	1.26	11.000	4.87	17.000	1.41	23.00	0.94
5.083	1.26	11.083	7.54	17.083	1.41	23.08	0.94
5.167	1.26	11.167	7.54	17.167	1.41	23.17	0.94
5.250	1.26	11.250	7.54	17.250	1.41	23.25	0.94
5.333	1.26	11.333	7.54	17.333	1.41	23.33	0.94
5.417	1.26	11.417	7.54	17.417	1.41	23.42	0.94
5.500	1.26	11.500	7.54	17.500	1.41	23.50	0.94
5.583	1.26	11.583	23.23	17.583	1.41	23.58	0.94
5.667	1.26	11.667	23.24	17.667	1.41	23.67	0.94
5.750	1.26	11.750	23.24	17.750	1.41	23.75	0.94
5.833	1.26	11.833	96.08	17.833	1.41	23.83	0.94
5.917	1.26	11.917	96.08	17.917	1.41	23.92	0.94
6.000	1.26	12.000	96.08	18.000	1.41	24.00	0.94

Max.Eff.Inten.(mm/hr)=	96.08	59.01		
over (min)	5.00	15.00		
Storage Coeff. (min)=	2.63 (ii)	11.34 (ii)		
Unit Hyd. Tpeak (min)=	5.00	15.00		
Unit Hyd. peak (cms)=	0.29	0.09		
			TOTALS	
PEAK FLOW (cms)=	0.34	0.08	0.407 (iii)	
TIME TO PEAK (hrs)=	12.00	12.08	12.00	
RUNOFF VOLUME (mm)=	77.50	39.43	63.41	
TOTAL RAINFALL (mm)=	78.50	78.50	78.50	
RUNOFF COEFFICIENT =	0.99	0.50	0.81	

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 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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| CALIB            |
| STANDHYD (  0048)|   Area     (ha)=   0.24
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
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                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24          0.00
     Dep. Storage     (mm)=       1.00          5.00
     Average Slope     (%)=       1.00          2.00
     Length            (m)=      40.00         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     0.86 | 6.083     1.41 |12.083    11.31 | 18.08     1.41
    0.167     0.86 | 6.167     1.41 |12.167    11.30 | 18.17     1.41
    0.250     0.86 | 6.250     1.41 |12.250    11.30 | 18.25     1.41
    0.333     0.86 | 6.333     1.41 |12.333    11.30 | 18.33     1.41
    0.417     0.86 | 6.417     1.41 |12.417    11.30 | 18.42     1.41
    0.500     0.86 | 6.500     1.41 |12.500    11.30 | 18.50     1.41
    0.583     0.86 | 6.583     1.41 |12.583     5.81 | 18.58     1.41
    0.667     0.86 | 6.667     1.41 |12.667     5.81 | 18.67     1.41
    0.750     0.86 | 6.750     1.41 |12.750     5.81 | 18.75     1.41
    0.833     0.86 | 6.833     1.41 |12.833     5.81 | 18.83     1.41
    0.917     0.86 | 6.917     1.41 |12.917     5.81 | 18.92     1.41
    1.000     0.86 | 7.000     1.41 |13.000     5.81 | 19.00     1.41
    1.083     0.86 | 7.083     1.73 |13.083     4.24 | 19.08     1.41
    1.167     0.86 | 7.167     1.73 |13.167     4.24 | 19.17     1.41
    1.250     0.86 | 7.250     1.73 |13.250     4.24 | 19.25     1.41
    1.333     0.86 | 7.333     1.73 |13.333     4.24 | 19.33     1.41
    1.417     0.86 | 7.417     1.73 |13.417     4.24 | 19.42     1.41
    1.500     0.86 | 7.500     1.73 |13.500     4.24 | 19.50     1.41
    1.583     0.86 | 7.583     1.73 |13.583     3.30 | 19.58     1.41
    1.667     0.86 | 7.667     1.73 |13.667     3.30 | 19.67     1.41
    1.750     0.86 | 7.750     1.73 |13.750     3.30 | 19.75     1.41
    1.833     0.86 | 7.833     1.73 |13.833     3.30 | 19.83     1.41
    1.917     0.86 | 7.917     1.73 |13.917     3.30 | 19.92     1.41
    2.000     0.86 | 8.000     1.73 |14.000     3.30 | 20.00     1.41
    2.083     1.02 | 8.083     2.04 |14.083     2.36 | 20.08     0.94
    2.167     1.02 | 8.167     2.04 |14.167     2.35 | 20.17     0.94
    2.250     1.02 | 8.250     2.04 |14.250     2.35 | 20.25     0.94
    2.333     1.02 | 8.333     2.04 |14.333     2.35 | 20.33     0.94
    2.417     1.02 | 8.417     2.04 |14.417     2.35 | 20.42     0.94
    2.500     1.02 | 8.500     2.04 |14.500     2.35 | 20.50     0.94
    2.583     1.02 | 8.583     2.20 |14.583     2.35 | 20.58     0.94
    2.667     1.02 | 8.667     2.20 |14.667     2.35 | 20.67     0.94
    2.750     1.02 | 8.750     2.20 |14.750     2.35 | 20.75     0.94
    2.833     1.02 | 8.833     2.20 |14.833     2.36 | 20.83     0.94
    2.917     1.02 | 8.917     2.20 |14.917     2.36 | 20.92     0.94
    3.000     1.02 | 9.000     2.20 |15.000     2.36 | 21.00     0.94
    3.083     1.02 | 9.083     2.51 |15.083     2.35 | 21.08     0.94
    3.167     1.02 | 9.167     2.51 |15.167     2.35 | 21.17     0.94
    3.250     1.02 | 9.250     2.51 |15.250     2.35 | 21.25     0.94
    3.333     1.02 | 9.333     2.51 |15.333     2.35 | 21.33     0.94
    3.417     1.02 | 9.417     2.51 |15.417     2.35 | 21.42     0.94
    3.500     1.02 | 9.500     2.51 |15.500     2.35 | 21.50     0.94
    3.583     1.02 | 9.583     2.83 |15.583     2.35 | 21.58     0.94
    3.667     1.02 | 9.667     2.83 |15.667     2.35 | 21.67     0.94
    3.750     1.02 | 9.750     2.83 |15.750     2.35 | 21.75     0.94
    3.833     1.02 | 9.833     2.83 |15.833     2.35 | 21.83     0.94
    3.917     1.02 | 9.917     2.83 |15.917     2.35 | 21.92     0.94
    4.000     1.02 |10.000     2.83 |16.000     2.35 | 22.00     0.94
    4.083     1.26 |10.083     3.61 |16.083     1.41 | 22.08     0.94
    4.167     1.26 |10.167     3.61 |16.167     1.41 | 22.17     0.94
    4.250     1.26 |10.250     3.61 |16.250     1.41 | 22.25     0.94
    4.333     1.26 |10.333     3.61 |16.333     1.41 | 22.33     0.94
    4.417     1.26 |10.417     3.61 |16.417     1.41 | 22.42     0.94
    4.500     1.26 |10.500     3.61 |16.500     1.41 | 22.50     0.94
    4.583     1.26 |10.583     4.87 |16.583     1.41 | 22.58     0.94
    4.667     1.26 |10.667     4.87 |16.667     1.41 | 22.67     0.94
    4.750     1.26 |10.750     4.87 |16.750     1.41 | 22.75     0.94
    4.833     1.26 |10.833     4.87 |16.833     1.41 | 22.83     0.94
    4.917     1.26 |10.917     4.87 |16.917     1.41 | 22.92     0.94
    5.000     1.26 |11.000     4.87 |17.000     1.41 | 23.00     0.94
    5.083     1.26 |11.083     7.54 |17.083     1.41 | 23.08     0.94
    5.167     1.26 |11.167     7.54 |17.167     1.41 | 23.17     0.94
    5.250     1.26 |11.250     7.54 |17.250     1.41 | 23.25     0.94
    5.333     1.26 |11.333     7.54 |17.333     1.41 | 23.33     0.94
    5.417     1.26 |11.417     7.54 |17.417     1.41 | 23.42     0.94
    5.500     1.26 |11.500     7.54 |17.500     1.41 | 23.50     0.94
    5.583     1.26 |11.583    23.23 |17.583     1.41 | 23.58     0.94
    5.667     1.26 |11.667    23.24 |17.667     1.41 | 23.67     0.94
    5.750     1.26 |11.750    23.24 |17.750     1.41 | 23.75     0.94
    5.833     1.26 |11.833    96.08 |17.833     1.41 | 23.83     0.94
    5.917     1.26 |11.917    96.08 |17.917     1.41 | 23.92     0.94
    6.000     1.26 |12.000    96.08 |18.000     1.41 | 24.00     0.94

     Max.Eff.Inten.(mm/hr)=      96.08         59.01
               over (min)         5.00          5.00
     Storage Coeff.  (min)=       1.50 (ii)     2.64 (ii)
     Unit Hyd. Tpeak (min)=       5.00          5.00
     Unit Hyd. peak  (cms)=       0.33          0.29
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.06          0.00          0.064 (iii)
     TIME TO PEAK    (hrs)=      12.00         12.00          12.00
     RUNOFF VOLUME    (mm)=      77.50         39.43          77.12
     TOTAL RAINFALL   (mm)=      78.50         78.50          78.50
     RUNOFF COEFFICIENT   =       0.99          0.50           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  80.0    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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--------------------
| RESERVOIR(  0050)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000     0.0000   |   0.0128     0.0103

                                    AREA     QPEAK     TPEAK       R.V.
                                    (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0048)         0.240     0.064     12.00      77.12
   OUTFLOW: ID= 1 (  0050)         0.240     0.010     12.08      76.30

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 15.88
                  TIME SHIFT OF PEAK FLOW          (min)=  5.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0082
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--------------------
| ADD HYD  (  0049)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
       ID1= 1 (  0043):      2.03    0.407    12.00    63.41
     + ID2= 2 (  0050):      0.24    0.010    12.08    76.30
       ================================================
       ID = 3 (  0049):      2.27    0.416    12.00    64.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0051)|   Area     (ha)=   1.68
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.66         0.02
     Dep. Storage     (mm)=       5.00         1.50
     Average Slope     (%)=       1.20         2.00
     Length            (m)=     105.83        40.00
     Mannings n           =      0.013        0.250

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

                          ---- TRANSFORMED HYETOGRAPH ----
                TIME     RAIN |  TIME     RAIN |'  TIME     RAIN |  TIME     RAIN
                 hrs    mm/hr |   hrs    mm/hr |'   hrs    mm/hr |   hrs    mm/hr
               0.083     0.86 | 6.083     1.41 |12.083    11.31 | 18.08     1.41
               0.167     0.86 | 6.167     1.41 |12.167    11.30 | 18.17     1.41
               0.250     0.86 | 6.250     1.41 |12.250    11.30 | 18.25     1.41
               0.333     0.86 | 6.333     1.41 |12.333    11.30 | 18.33     1.41
               0.417     0.86 | 6.417     1.41 |12.417    11.30 | 18.42     1.41
               0.500     0.86 | 6.500     1.41 |12.500    11.30 | 18.50     1.41
               0.583     0.86 | 6.583     1.41 |12.583     5.81 | 18.58     1.41
               0.667     0.86 | 6.667     1.41 |12.667     5.81 | 18.67     1.41
               0.750     0.86 | 6.750     1.41 |12.750     5.81 | 18.75     1.41
               0.833     0.86 | 6.833     1.41 |12.833     5.81 | 18.83     1.41
               0.917     0.86 | 6.917     1.41 |12.917     5.81 | 18.92     1.41
               1.000     0.86 | 7.000     1.41 |13.000     5.81 | 19.00     1.41
               1.083     0.86 | 7.083     1.73 |13.083     4.24 | 19.08     1.41
               1.167     0.86 | 7.167     1.73 |13.167     4.24 | 19.17     1.41
               1.250     0.86 | 7.250     1.73 |13.250     4.24 | 19.25     1.41
               1.333     0.86 | 7.333     1.73 |13.333     4.24 | 19.33     1.41
               1.417     0.86 | 7.417     1.73 |13.417     4.24 | 19.42     1.41
               1.500     0.86 | 7.500     1.73 |13.500     4.24 | 19.50     1.41
               1.583     0.86 | 7.583     1.73 |13.583     3.30 | 19.58     1.41
               1.667     0.86 | 7.667     1.73 |13.667     3.30 | 19.67     1.41
               1.750     0.86 | 7.750     1.73 |13.750     3.30 | 19.75     1.41
               1.833     0.86 | 7.833     1.73 |13.833     3.30 | 19.83     1.41
               1.917     0.86 | 7.917     1.73 |13.917     3.30 | 19.92     1.41
               2.000     0.86 | 8.000     1.73 |14.000     3.30 | 20.00     1.41
               2.083     1.02 | 8.083     2.04 |14.083     2.36 | 20.08     0.94
               2.167     1.02 | 8.167     2.04 |14.167     2.35 | 20.17     0.94
               2.250     1.02 | 8.250     2.04 |14.250     2.35 | 20.25     0.94
               2.333     1.02 | 8.333     2.04 |14.333     2.35 | 20.33     0.94
               2.417     1.02 | 8.417     2.04 |14.417     2.35 | 20.42     0.94
               2.500     1.02 | 8.500     2.04 |14.500     2.35 | 20.50     0.94
               2.583     1.02 | 8.583     2.20 |14.583     2.35 | 20.58     0.94
               2.667     1.02 | 8.667     2.20 |14.667     2.35 | 20.67     0.94
               2.750     1.02 | 8.750     2.20 |14.750     2.35 | 20.75     0.94
               2.833     1.02 | 8.833     2.20 |14.833     2.36 | 20.83     0.94
               2.917     1.02 | 8.917     2.20 |14.917     2.36 | 20.92     0.94
               3.000     1.02 | 9.000     2.20 |15.000     2.36 | 21.00     0.94
               3.083     1.02 | 9.083     2.51 |15.083     2.35 | 21.08     0.94
               3.167     1.02 | 9.167     2.51 |15.167     2.35 | 21.17     0.94
               3.250     1.02 | 9.250     2.51 |15.250     2.35 | 21.25     0.94
               3.333     1.02 | 9.333     2.51 |15.333     2.35 | 21.33     0.94
               3.417     1.02 | 9.417     2.51 |15.417     2.35 | 21.42     0.94
               3.500     1.02 | 9.500     2.51 |15.500     2.35 | 21.50     0.94
               3.583     1.02 | 9.583     2.83 |15.583     2.35 | 21.58     0.94
               3.667     1.02 | 9.667     2.83 |15.667     2.35 | 21.67     0.94
               3.750     1.02 | 9.750     2.83 |15.750     2.35 | 21.75     0.94
               3.833     1.02 | 9.833     2.83 |15.833     2.35 | 21.83     0.94
               3.917     1.02 | 9.917     2.83 |15.917     2.35 | 21.92     0.94
               4.000     1.02 |10.000     2.83 |16.000     2.35 | 22.00     0.94
               4.083     1.26 |10.083     3.61 |16.083     1.41 | 22.08     0.94
               4.167     1.26 |10.167     3.61 |16.167     1.41 | 22.17     0.94
               4.250     1.26 |10.250     3.61 |16.250     1.41 | 22.25     0.94
               4.333     1.26 |10.333     3.61 |16.333     1.41 | 22.33     0.94
               4.417     1.26 |10.417     3.61 |16.417     1.41 | 22.42     0.94
               4.500     1.26 |10.500     3.61 |16.500     1.41 | 22.50     0.94
               4.583     1.26 |10.583     4.87 |16.583     1.41 | 22.58     0.94
               4.667     1.26 |10.667     4.87 |16.667     1.41 | 22.67     0.94
               4.750     1.26 |10.750     4.87 |16.750     1.41 | 22.75     0.94
               4.833     1.26 |10.833     4.87 |16.833     1.41 | 22.83     0.94
               4.917     1.26 |10.917     4.87 |16.917     1.41 | 22.92     0.94
               5.000     1.26 |11.000     4.87 |17.000     1.41 | 23.00     0.94
               5.083     1.26 |11.083     7.54 |17.083     1.41 | 23.08     0.94
               5.167     1.26 |11.167     7.54 |17.167     1.41 | 23.17     0.94
               5.250     1.26 |11.250     7.54 |17.250     1.41 | 23.25     0.94
               5.333     1.26 |11.333     7.54 |17.333     1.41 | 23.33     0.94
               5.417     1.26 |11.417     7.54 |17.417     1.41 | 23.42     0.94
               5.500     1.26 |11.500     7.54 |17.500     1.41 | 23.50     0.94
               5.583     1.26 |11.583    23.23 |17.583     1.41 | 23.58     0.94
               5.667     1.26 |11.667    23.24 |17.667     1.41 | 23.67     0.94
               5.750     1.26 |11.750    23.24 |17.750     1.41 | 23.75     0.94
               5.833     1.26 |11.833    96.08 |17.833     1.41 | 23.83     0.94
               5.917     1.26 |11.917    96.08 |17.917     1.41 | 23.92     0.94
               6.000     1.26 |12.000    96.08 |18.000     1.41 | 24.00     0.94

     Max.Eff.Inten.(mm/hr)=      96.08        61.43
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.54 (ii)    3.68 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.29         0.25
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.44         0.00          0.446 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      73.50        42.20          73.19
     TOTAL RAINFALL   (mm)=      78.50        78.50          78.50
     RUNOFF COEFFICIENT   =       0.94         0.54           0.93

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  80.0    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  (  0046)|
|   1 +  2 =  3    |          AREA     QPEAK     TPEAK      R.V.
-------------------          (ha)      (cms)     (hrs)      (mm)
       ID1= 1 (  0049):      2.27    0.416     12.00     64.77
     + ID2= 2 (  0051):      1.68    0.446     12.00     73.19
       ================================================
       ID = 3 (  0046):      3.95    0.862     12.00     68.35

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0047)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                        0.0000     0.0000    |   0.1630     0.2697
                        0.0080     0.0487    |   0.1700     0.2885
                        0.0100     0.0674    |   0.1720     0.2960
                        0.0880     0.1049    |   0.1760     0.3072
                        0.1040     0.1311    |   0.1770     0.3109
                        0.1170     0.1573    |   0.1800     0.3184
                        0.1260     0.1761    |   0.1870     0.3409
                        0.1300     0.1836    |   0.1880     0.3447
                        0.1570     0.2510    |   0.1910     0.3559

                             AREA      QPEAK      TPEAK       R.V.
                             (ha)      (cms)      (hrs)       (mm)
   INFLOW : ID= 2 (  0046)     3.950      0.862      12.00      68.35
   OUTFLOW: ID= 1 (  0047)     3.950      0.111      12.50      67.96

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 12.92
                  TIME SHIFT OF PEAK FLOW          (min)= 30.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1462

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--------------------
| ADD HYD  (  0039)|
|   1 +  2 =  3    |          AREA     QPEAK     TPEAK      R.V.
-------------------          (ha)      (cms)     (hrs)      (mm)
       ID1= 1 (  0040):      6.56    0.816     12.08     39.07
     + ID2= 2 (  0047):      3.95    0.111     12.50     67.96
       ================================================
       ID = 3 (  0039):     10.51    0.924     12.08     49.93

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0039)|
|   3 +  2 =  1    |          AREA     QPEAK     TPEAK      R.V.
-------------------          (ha)      (cms)     (hrs)      (mm)
       ID1= 3 (  0039):     10.51    0.924     12.08     49.93
     + ID2= 2 (  0052):      0.08    0.011     12.00     38.70
       ================================================
       ID = 1 (  0039):     10.59    0.931     12.08     49.85

    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 6.2.2010)
       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 *****


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DATE: 03-08-2023                          TIME: 01:45:26

USER:


COMMENTS: _____

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  ********************************************
  ** SIMULATION : 15 - 50-YR - SCS TYPE II 24HR **
  ********************************************

--------------------
| MASS STORM       |    Filename: C:\Users\sramsoomair\AppD
|                  |              ata\Local\Temp\
|                  |              72e98174-9551-451b-b568-e4dbecda99d3\8343046c
| Ptotal= 86.70 mm |    Comments: SCS TYPE II MASS CURVE
--------------------
                       Duration of storm    = 24.00 hrs
                       Mass curve time step = 15.00 min

      TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
       hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
      0.00    0.95 |  6.00    1.56 | 12.00   12.48 | 18.00    1.56
      0.25    0.95 |  6.25    1.56 | 12.25   12.48 | 18.25    1.56
      0.50    0.95 |  6.50    1.56 | 12.50    6.42 | 18.50    1.56
      0.75    0.95 |  6.75    1.56 | 12.75    6.42 | 18.75    1.56
      1.00    0.95 |  7.00    1.91 | 13.00    4.68 | 19.00    1.56
      1.25    0.95 |  7.25    1.91 | 13.25    4.68 | 19.25    1.56
      1.50    0.95 |  7.50    1.91 | 13.50    3.64 | 19.50    1.56
      1.75    0.95 |  7.75    1.91 | 13.75    3.64 | 19.75    1.56
      2.00    1.13 |  8.00    2.25 | 14.00    2.60 | 20.00    1.04
      2.25    1.13 |  8.25    2.25 | 14.25    2.60 | 20.25    1.04
```

2.50	1.13	8.50	2.43	14.50	2.60	20.50	1.04
2.75	1.13	8.75	2.43	14.75	2.60	20.75	1.04
3.00	1.13	9.00	2.77	15.00	2.60	21.00	1.04
3.25	1.13	9.25	2.77	15.25	2.60	21.25	1.04
3.50	1.13	9.50	3.12	15.50	2.60	21.50	1.04
3.75	1.13	9.75	3.12	15.75	2.60	21.75	1.04
4.00	1.39	10.00	3.99	16.00	1.56	22.00	1.04
4.25	1.39	10.25	3.99	16.25	1.56	22.25	1.04
4.50	1.39	10.50	5.38	16.50	1.56	22.50	1.04
4.75	1.39	10.75	5.38	16.75	1.56	22.75	1.04
5.00	1.39	11.00	8.32	17.00	1.56	23.00	1.04
5.25	1.39	11.25	8.32	17.25	1.56	23.25	1.04
5.50	1.39	11.50	25.66	17.50	1.56	23.50	1.04
5.75	1.39	11.75	106.12	17.75	1.56	23.75	1.04

CALIB			
NASHYD (0041)	Area (ha)=	6.56	Curve Number (CN)= 82.0
ID= 1 DT= 5.0 min	Ia (mm)=	8.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.14	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.95	6.083	1.56	12.083	12.50	18.08	1.56
0.167	0.95	6.167	1.56	12.167	12.48	18.17	1.56
0.250	0.95	6.250	1.56	12.250	12.48	18.25	1.56
0.333	0.95	6.333	1.56	12.333	12.48	18.33	1.56
0.417	0.95	6.417	1.56	12.417	12.48	18.42	1.56
0.500	0.95	6.500	1.56	12.500	12.48	18.50	1.56
0.583	0.95	6.583	1.56	12.583	6.42	18.58	1.56
0.667	0.95	6.667	1.56	12.667	6.42	18.67	1.56
0.750	0.95	6.750	1.56	12.750	6.42	18.75	1.56
0.833	0.95	6.833	1.56	12.833	6.42	18.83	1.56
0.917	0.95	6.917	1.56	12.917	6.42	18.92	1.56
1.000	0.95	7.000	1.56	13.000	6.42	19.00	1.56
1.083	0.95	7.083	1.91	13.083	4.68	19.08	1.56
1.167	0.95	7.167	1.91	13.167	4.68	19.17	1.56
1.250	0.95	7.250	1.91	13.250	4.68	19.25	1.56
1.333	0.95	7.333	1.91	13.333	4.68	19.33	1.56
1.417	0.95	7.417	1.91	13.417	4.68	19.42	1.56
1.500	0.95	7.500	1.91	13.500	4.68	19.50	1.56
1.583	0.95	7.583	1.91	13.583	3.64	19.58	1.56
1.667	0.95	7.667	1.91	13.667	3.64	19.67	1.56
1.750	0.95	7.750	1.91	13.750	3.64	19.75	1.56
1.833	0.95	7.833	1.91	13.833	3.64	19.83	1.56
1.917	0.95	7.917	1.91	13.917	3.64	19.92	1.56
2.000	0.95	8.000	1.91	14.000	3.64	20.00	1.56
2.083	1.13	8.083	2.25	14.083	2.60	20.08	1.04
2.167	1.13	8.167	2.25	14.167	2.60	20.17	1.04
2.250	1.13	8.250	2.25	14.250	2.60	20.25	1.04
2.333	1.13	8.333	2.25	14.333	2.60	20.33	1.04
2.417	1.13	8.417	2.25	14.417	2.60	20.42	1.04
2.500	1.13	8.500	2.25	14.500	2.60	20.50	1.04
2.583	1.13	8.583	2.43	14.583	2.60	20.58	1.04
2.667	1.13	8.667	2.43	14.667	2.60	20.67	1.04
2.750	1.13	8.750	2.43	14.750	2.60	20.75	1.04
2.833	1.13	8.833	2.43	14.833	2.60	20.83	1.04
2.917	1.13	8.917	2.43	14.917	2.60	20.92	1.04
3.000	1.13	9.000	2.43	15.000	2.60	21.00	1.04
3.083	1.13	9.083	2.77	15.083	2.60	21.08	1.04
3.167	1.13	9.167	2.77	15.167	2.60	21.17	1.04
3.250	1.13	9.250	2.77	15.250	2.60	21.25	1.04
3.333	1.13	9.333	2.77	15.333	2.60	21.33	1.04
3.417	1.13	9.417	2.77	15.417	2.60	21.42	1.04
3.500	1.13	9.500	2.77	15.500	2.60	21.50	1.04
3.583	1.13	9.583	3.12	15.583	2.60	21.58	1.04
3.667	1.13	9.667	3.12	15.667	2.60	21.67	1.04
3.750	1.13	9.750	3.12	15.750	2.60	21.75	1.04
3.833	1.13	9.833	3.12	15.833	2.60	21.83	1.04
3.917	1.13	9.917	3.12	15.917	2.60	21.92	1.04
4.000	1.13	10.000	3.12	16.000	2.60	22.00	1.04
4.083	1.39	10.083	3.99	16.083	1.56	22.08	1.04
4.167	1.39	10.167	3.99	16.167	1.56	22.17	1.04
4.250	1.39	10.250	3.99	16.250	1.56	22.25	1.04
4.333	1.39	10.333	3.99	16.333	1.56	22.33	1.04
4.417	1.39	10.417	3.99	16.417	1.56	22.42	1.04
4.500	1.39	10.500	3.99	16.500	1.56	22.50	1.04
4.583	1.39	10.583	5.38	16.583	1.56	22.58	1.04
4.667	1.39	10.667	5.38	16.667	1.56	22.67	1.04
4.750	1.39	10.750	5.38	16.750	1.56	22.75	1.04
4.833	1.39	10.833	5.38	16.833	1.56	22.83	1.04
4.917	1.39	10.917	5.38	16.917	1.56	22.92	1.04
5.000	1.39	11.000	5.38	17.000	1.56	23.00	1.04
5.083	1.39	11.083	8.32	17.083	1.56	23.08	1.04
5.167	1.39	11.167	8.32	17.167	1.56	23.17	1.04
5.250	1.39	11.250	8.32	17.250	1.56	23.25	1.04
5.333	1.39	11.333	8.32	17.333	1.56	23.33	1.04
5.417	1.39	11.417	8.32	17.417	1.56	23.42	1.04
5.500	1.39	11.500	8.32	17.500	1.56	23.50	1.04
5.583	1.39	11.583	25.66	17.583	1.56	23.58	1.04
5.667	1.39	11.667	25.66	17.667	1.56	23.67	1.04
5.750	1.39	11.750	25.66	17.750	1.56	23.75	1.04
5.833	1.39	11.833	106.11	17.833	1.56	23.83	1.04
5.917	1.39	11.917	106.12	17.917	1.56	23.92	1.04
6.000	1.39	12.000	106.12	18.000	1.56	24.00	1.04

Unit Hyd Qpeak (cms)= 1.790

PEAK FLOW (cms)= 0.995 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 45.720
TOTAL RAINFALL (mm)= 86.700
RUNOFF COEFFICIENT = 0.527

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

ROUTE CHN(0040)		
IN= 2---> OUT= 1	Routing time step (min)'=	5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	101.50	0.0500	
1.00	100.70	0.0500	
1.50	100.55	0.0500 /0.0300	Main Channel
2.00	99.50	0.0300	Main Channel
3.50	99.60	0.0300	Main Channel
4.50	100.65	0.0300 /0.0500	Main Channel
6.00	101.45	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH	ELEV	VOLUME	FLOW RATE	VELOCITY	TRAV.TIME

(m)	(m)	(cu.m.)	(cms)	(m/s)	(min)
0.10	99.60	.185E+02	0.0	0.54	8.09
0.19	99.69	.587E+02	0.2	1.04	4.22
0.29	99.79	.102E+03	0.5	1.38	3.16
0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0041)	6.56	1.00	12.00	45.72	0.39	1.68
OUTFLOW: ID= 1 (0040)	6.56	0.96	12.08	45.72	0.38	1.66

CALIB					
NASHYD (0052)	Area (ha)=	0.08	Curve Number (CN)=	80.0	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.11			

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.95	6.083	1.56	12.083	12.50	18.08	1.56
0.167	0.95	6.167	1.56	12.167	12.48	18.17	1.56
0.250	0.95	6.250	1.56	12.250	12.48	18.25	1.56
0.333	0.95	6.333	1.56	12.333	12.48	18.33	1.56
0.417	0.95	6.417	1.56	12.417	12.48	18.42	1.56
0.500	0.95	6.500	1.56	12.500	12.48	18.50	1.56
0.583	0.95	6.583	1.56	12.583	6.42	18.58	1.56
0.667	0.95	6.667	1.56	12.667	6.42	18.67	1.56
0.750	0.95	6.750	1.56	12.750	6.42	18.75	1.56
0.833	0.95	6.833	1.56	12.833	6.42	18.83	1.56
0.917	0.95	6.917	1.56	12.917	6.42	18.92	1.56
1.000	0.95	7.000	1.56	13.000	6.42	19.00	1.56
1.083	0.95	7.083	1.91	13.083	4.68	19.08	1.56
1.167	0.95	7.167	1.91	13.167	4.68	19.17	1.56
1.250	0.95	7.250	1.91	13.250	4.68	19.25	1.56
1.333	0.95	7.333	1.91	13.333	4.68	19.33	1.56
1.417	0.95	7.417	1.91	13.417	4.68	19.42	1.56
1.500	0.95	7.500	1.91	13.500	4.68	19.50	1.56
1.583	0.95	7.583	1.91	13.583	3.64	19.58	1.56
1.667	0.95	7.667	1.91	13.667	3.64	19.67	1.56
1.750	0.95	7.750	1.91	13.750	3.64	19.75	1.56
1.833	0.95	7.833	1.91	13.833	3.64	19.83	1.56
1.917	0.95	7.917	1.91	13.917	3.64	19.92	1.56
2.000	0.95	8.000	1.91	14.000	3.64	20.00	1.56
2.083	1.13	8.083	2.25	14.083	2.60	20.08	1.04
2.167	1.13	8.167	2.25	14.167	2.60	20.17	1.04
2.250	1.13	8.250	2.25	14.250	2.60	20.25	1.04
2.333	1.13	8.333	2.25	14.333	2.60	20.33	1.04
2.417	1.13	8.417	2.25	14.417	2.60	20.42	1.04
2.500	1.13	8.500	2.25	14.500	2.60	20.50	1.04
2.583	1.13	8.583	2.43	14.583	2.60	20.58	1.04
2.667	1.13	8.667	2.43	14.667	2.60	20.67	1.04
2.750	1.13	8.750	2.43	14.750	2.60	20.75	1.04
2.833	1.13	8.833	2.43	14.833	2.60	20.83	1.04
2.917	1.13	8.917	2.43	14.917	2.60	20.92	1.04
3.000	1.13	9.000	2.43	15.000	2.60	21.00	1.04
3.083	1.13	9.083	2.77	15.083	2.60	21.08	1.04
3.167	1.13	9.167	2.77	15.167	2.60	21.17	1.04
3.250	1.13	9.250	2.77	15.250	2.60	21.25	1.04
3.333	1.13	9.333	2.77	15.333	2.60	21.33	1.04
3.417	1.13	9.417	2.77	15.417	2.60	21.42	1.04
3.500	1.13	9.500	2.77	15.500	2.60	21.50	1.04
3.583	1.13	9.583	3.12	15.583	2.60	21.58	1.04
3.667	1.13	9.667	3.12	15.667	2.60	21.67	1.04
3.750	1.13	9.750	3.12	15.750	2.60	21.75	1.04
3.833	1.13	9.833	3.12	15.833	2.60	21.83	1.04
3.917	1.13	9.917	3.12	15.917	2.60	21.92	1.04
4.000	1.13	10.000	3.12	16.000	2.60	22.00	1.04
4.083	1.39	10.083	3.99	16.083	1.56	22.08	1.04
4.167	1.39	10.167	3.99	16.167	1.56	22.17	1.04
4.250	1.39	10.250	3.99	16.250	1.56	22.25	1.04
4.333	1.39	10.333	3.99	16.333	1.56	22.33	1.04
4.417	1.39	10.417	3.99	16.417	1.56	22.42	1.04
4.500	1.39	10.500	3.99	16.500	1.56	22.50	1.04
4.583	1.39	10.583	5.38	16.583	1.56	22.58	1.04
4.667	1.39	10.667	5.38	16.667	1.56	22.67	1.04
4.750	1.39	10.750	5.38	16.750	1.56	22.75	1.04
4.833	1.39	10.833	5.38	16.833	1.56	22.83	1.04
4.917	1.39	10.917	5.38	16.917	1.56	22.92	1.04
5.000	1.39	11.000	5.38	17.000	1.56	23.00	1.04
5.083	1.39	11.083	8.32	17.083	1.56	23.08	1.04
5.167	1.39	11.167	8.32	17.167	1.56	23.17	1.04
5.250	1.39	11.250	8.32	17.250	1.56	23.25	1.04
5.333	1.39	11.333	8.32	17.333	1.56	23.33	1.04
5.417	1.39	11.417	8.32	17.417	1.56	23.42	1.04
5.500	1.39	11.500	8.32	17.500	1.56	23.50	1.04
5.583	1.39	11.583	25.66	17.583	1.56	23.58	1.04
5.667	1.39	11.667	25.66	17.667	1.56	23.67	1.04
5.750	1.39	11.750	25.66	17.750	1.56	23.75	1.04
5.833	1.39	11.833	106.11	17.833	1.56	23.83	1.04
5.917	1.39	11.917	106.12	17.917	1.56	23.92	1.04
6.000	1.39	12.000	106.12	18.000	1.56	24.00	1.04

Unit Hyd Qpeak (cms)= 0.026

PEAK FLOW (cms)= 0.013 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 45.121
TOTAL RAINFALL (mm)= 86.700
RUNOFF COEFFICIENT = 0.520

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

CALIB

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| STANDHYD (  0043)|   Area     (ha)=   2.03
|ID= 1 DT= 5.0 min |   Total Imp(%)=  63.00   Dir. Conn.(%)=  63.00
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                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.28         0.75
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.30         2.00
     Length            (m)=     116.33        40.00
     Mannings n             =     0.013        0.250

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.95	6.083	1.56	12.083	12.50	18.08	1.56
0.167	0.95	6.167	1.56	12.167	12.48	18.17	1.56
0.250	0.95	6.250	1.56	12.250	12.48	18.25	1.56
0.333	0.95	6.333	1.56	12.333	12.48	18.33	1.56
0.417	0.95	6.417	1.56	12.417	12.48	18.42	1.56
0.500	0.95	6.500	1.56	12.500	12.48	18.50	1.56
0.583	0.95	6.583	1.56	12.583	6.42	18.58	1.56
0.667	0.95	6.667	1.56	12.667	6.42	18.67	1.56
0.750	0.95	6.750	1.56	12.750	6.42	18.75	1.56
0.833	0.95	6.833	1.56	12.833	6.42	18.83	1.56
0.917	0.95	6.917	1.56	12.917	6.42	18.92	1.56
1.000	0.95	7.000	1.56	13.000	6.42	19.00	1.56
1.083	0.95	7.083	1.91	13.083	4.68	19.08	1.56
1.167	0.95	7.167	1.91	13.167	4.68	19.17	1.56
1.250	0.95	7.250	1.91	13.250	4.68	19.25	1.56
1.333	0.95	7.333	1.91	13.333	4.68	19.33	1.56
1.417	0.95	7.417	1.91	13.417	4.68	19.42	1.56
1.500	0.95	7.500	1.91	13.500	4.68	19.50	1.56
1.583	0.95	7.583	1.91	13.583	3.64	19.58	1.56
1.667	0.95	7.667	1.91	13.667	3.64	19.67	1.56
1.750	0.95	7.750	1.91	13.750	3.64	19.75	1.56
1.833	0.95	7.833	1.91	13.833	3.64	19.83	1.56
1.917	0.95	7.917	1.91	13.917	3.64	19.92	1.56
2.000	0.95	8.000	1.91	14.000	3.64	20.00	1.56
2.083	1.13	8.083	2.25	14.083	2.60	20.08	1.04
2.167	1.13	8.167	2.25	14.167	2.60	20.17	1.04
2.250	1.13	8.250	2.25	14.250	2.60	20.25	1.04
2.333	1.13	8.333	2.25	14.333	2.60	20.33	1.04
2.417	1.13	8.417	2.25	14.417	2.60	20.42	1.04
2.500	1.13	8.500	2.25	14.500	2.60	20.50	1.04
2.583	1.13	8.583	2.43	14.583	2.60	20.58	1.04
2.667	1.13	8.667	2.43	14.667	2.60	20.67	1.04
2.750	1.13	8.750	2.43	14.750	2.60	20.75	1.04
2.833	1.13	8.833	2.43	14.833	2.60	20.83	1.04
2.917	1.13	8.917	2.43	14.917	2.60	20.92	1.04
3.000	1.13	9.000	2.43	15.000	2.60	21.00	1.04
3.083	1.13	9.083	2.77	15.083	2.60	21.08	1.04
3.167	1.13	9.167	2.77	15.167	2.60	21.17	1.04
3.250	1.13	9.250	2.77	15.250	2.60	21.25	1.04
3.333	1.13	9.333	2.77	15.333	2.60	21.33	1.04
3.417	1.13	9.417	2.77	15.417	2.60	21.42	1.04
3.500	1.13	9.500	2.77	15.500	2.60	21.50	1.04
3.583	1.13	9.583	3.12	15.583	2.60	21.58	1.04
3.667	1.13	9.667	3.12	15.667	2.60	21.67	1.04
3.750	1.13	9.750	3.12	15.750	2.60	21.75	1.04
3.833	1.13	9.833	3.12	15.833	2.60	21.83	1.04
3.917	1.13	9.917	3.12	15.917	2.60	21.92	1.04
4.000	1.13	10.000	3.12	16.000	2.60	22.00	1.04
4.083	1.39	10.083	3.99	16.083	1.56	22.08	1.04
4.167	1.39	10.167	3.99	16.167	1.56	22.17	1.04
4.250	1.39	10.250	3.99	16.250	1.56	22.25	1.04
4.333	1.39	10.333	3.99	16.333	1.56	22.33	1.04
4.417	1.39	10.417	3.99	16.417	1.56	22.42	1.04
4.500	1.39	10.500	3.99	16.500	1.56	22.50	1.04
4.583	1.39	10.583	5.38	16.583	1.56	22.58	1.04
4.667	1.39	10.667	5.38	16.667	1.56	22.67	1.04
4.750	1.39	10.750	5.38	16.750	1.56	22.75	1.04
4.833	1.39	10.833	5.38	16.833	1.56	22.83	1.04
4.917	1.39	10.917	5.38	16.917	1.56	22.92	1.04
5.000	1.39	11.000	5.38	17.000	1.56	23.00	1.04
5.083	1.39	11.083	8.32	17.083	1.56	23.08	1.04
5.167	1.39	11.167	8.32	17.167	1.56	23.17	1.04
5.250	1.39	11.250	8.32	17.250	1.56	23.25	1.04
5.333	1.39	11.333	8.32	17.333	1.56	23.33	1.04
5.417	1.39	11.417	8.32	17.417	1.56	23.42	1.04
5.500	1.39	11.500	8.32	17.500	1.56	23.50	1.04
5.583	1.39	11.583	25.66	17.583	1.56	23.58	1.04
5.667	1.39	11.667	25.66	17.667	1.56	23.67	1.04
5.750	1.39	11.750	25.66	17.750	1.56	23.75	1.04
5.833	1.39	11.833	106.11	17.833	1.56	23.83	1.04
5.917	1.39	11.917	106.12	17.917	1.56	23.92	1.04
6.000	1.39	12.000	106.12	18.000	1.56	24.00	1.04

```
     Max.Eff.Inten.(mm/hr)=     106.12        68.59
               over (min)          5.00        15.00
     Storage Coeff.  (min)=        2.52 (ii)   10.73 (ii)
     Unit Hyd. Tpeak (min)=        5.00        15.00
     Unit Hyd. peak  (cms)=        0.29         0.09
                                                          *TOTALS*
     PEAK FLOW       (cms)=        0.38         0.09          0.456 (iii)
     TIME TO PEAK    (hrs)=       12.00        12.08          12.00
     RUNOFF VOLUME    (mm)=       85.70        45.97          71.00
     TOTAL RAINFALL   (mm)=       86.70        86.70          86.70
     RUNOFF COEFFICIENT   =        0.99         0.53           0.82

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  80.0     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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--------------------
| CALIB            |
| STANDHYD (  0048)|   Area     (ha)=   0.24
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.00
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      40.00        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    0.95 | 6.083    1.56 |12.083   12.50 | 18.08    1.56
0.167    0.95 | 6.167    1.56 |12.167   12.48 | 18.17    1.56
0.250    0.95 | 6.250    1.56 |12.250   12.48 | 18.25    1.56
0.333    0.95 | 6.333    1.56 |12.333   12.48 | 18.33    1.56
0.417    0.95 | 6.417    1.56 |12.417   12.48 | 18.42    1.56
0.500    0.95 | 6.500    1.56 |12.500   12.48 | 18.50    1.56
0.583    0.95 | 6.583    1.56 |12.583    6.42 | 18.58    1.56
0.667    0.95 | 6.667    1.56 |12.667    6.42 | 18.67    1.56
0.750    0.95 | 6.750    1.56 |12.750    6.42 | 18.75    1.56
0.833    0.95 | 6.833    1.56 |12.833    6.42 | 18.83    1.56
0.917    0.95 | 6.917    1.56 |12.917    6.42 | 18.92    1.56
1.000    0.95 | 7.000    1.56 |13.000    6.42 | 19.00    1.56
1.083    0.95 | 7.083    1.91 |13.083    4.68 | 19.08    1.56
1.167    0.95 | 7.167    1.91 |13.167    4.68 | 19.17    1.56
1.250    0.95 | 7.250    1.91 |13.250    4.68 | 19.25    1.56
1.333    0.95 | 7.333    1.91 |13.333    4.68 | 19.33    1.56
1.417    0.95 | 7.417    1.91 |13.417    4.68 | 19.42    1.56
1.500    0.95 | 7.500    1.91 |13.500    4.68 | 19.50    1.56
1.583    0.95 | 7.583    1.91 |13.583    3.64 | 19.58    1.56
1.667    0.95 | 7.667    1.91 |13.667    3.64 | 19.67    1.56
1.750    0.95 | 7.750    1.91 |13.750    3.64 | 19.75    1.56
1.833    0.95 | 7.833    1.91 |13.833    3.64 | 19.83    1.56
1.917    0.95 | 7.917    1.91 |13.917    3.64 | 19.92    1.56
2.000    0.95 | 8.000    1.91 |14.000    3.64 | 20.00    1.56
2.083    1.13 | 8.083    2.25 |14.083    2.60 | 20.08    1.04
2.167    1.13 | 8.167    2.25 |14.167    2.60 | 20.17    1.04
2.250    1.13 | 8.250    2.25 |14.250    2.60 | 20.25    1.04
2.333    1.13 | 8.333    2.25 |14.333    2.60 | 20.33    1.04
2.417    1.13 | 8.417    2.25 |14.417    2.60 | 20.42    1.04
2.500    1.13 | 8.500    2.25 |14.500    2.60 | 20.50    1.04
2.583    1.13 | 8.583    2.43 |14.583    2.60 | 20.58    1.04
2.667    1.13 | 8.667    2.43 |14.667    2.60 | 20.67    1.04
2.750    1.13 | 8.750    2.43 |14.750    2.60 | 20.75    1.04
2.833    1.13 | 8.833    2.43 |14.833    2.60 | 20.83    1.04
2.917    1.13 | 8.917    2.43 |14.917    2.60 | 20.92    1.04
3.000    1.13 | 9.000    2.43 |15.000    2.60 | 21.00    1.04
3.083    1.13 | 9.083    2.77 |15.083    2.60 | 21.08    1.04
3.167    1.13 | 9.167    2.77 |15.167    2.60 | 21.17    1.04
3.250    1.13 | 9.250    2.77 |15.250    2.60 | 21.25    1.04
3.333    1.13 | 9.333    2.77 |15.333    2.60 | 21.33    1.04
3.417    1.13 | 9.417    2.77 |15.417    2.60 | 21.42    1.04
3.500    1.13 | 9.500    2.77 |15.500    2.60 | 21.50    1.04
3.583    1.13 | 9.583    3.12 |15.583    2.60 | 21.58    1.04
3.667    1.13 | 9.667    3.12 |15.667    2.60 | 21.67    1.04
3.750    1.13 | 9.750    3.12 |15.750    2.60 | 21.75    1.04
3.833    1.13 | 9.833    3.12 |15.833    2.60 | 21.83    1.04
3.917    1.13 | 9.917    3.12 |15.917    2.60 | 21.92    1.04
4.000    1.13 |10.000    3.12 |16.000    2.60 | 22.00    1.04
4.083    1.39 |10.083    3.99 |16.083    1.56 | 22.08    1.04
4.167    1.39 |10.167    3.99 |16.167    1.56 | 22.17    1.04
4.250    1.39 |10.250    3.99 |16.250    1.56 | 22.25    1.04
4.333    1.39 |10.333    3.99 |16.333    1.56 | 22.33    1.04
4.417    1.39 |10.417    3.99 |16.417    1.56 | 22.42    1.04
4.500    1.39 |10.500    3.99 |16.500    1.56 | 22.50    1.04
4.583    1.39 |10.583    5.38 |16.583    1.56 | 22.58    1.04
4.667    1.39 |10.667    5.38 |16.667    1.56 | 22.67    1.04
4.750    1.39 |10.750    5.38 |16.750    1.56 | 22.75    1.04
4.833    1.39 |10.833    5.38 |16.833    1.56 | 22.83    1.04
4.917    1.39 |10.917    5.38 |16.917    1.56 | 22.92    1.04
5.000    1.39 |11.000    5.38 |17.000    1.56 | 23.00    1.04
5.083    1.39 |11.083    8.32 |17.083    1.56 | 23.08    1.04
5.167    1.39 |11.167    8.32 |17.167    1.56 | 23.17    1.04
5.250    1.39 |11.250    8.32 |17.250    1.56 | 23.25    1.04
5.333    1.39 |11.333    8.32 |17.333    1.56 | 23.33    1.04
5.417    1.39 |11.417    8.32 |17.417    1.56 | 23.42    1.04
5.500    1.39 |11.500    8.32 |17.500    1.56 | 23.50    1.04
5.583    1.39 |11.583   25.66 |17.583    1.56 | 23.58    1.04
5.667    1.39 |11.667   25.66 |17.667    1.56 | 23.67    1.04
5.750    1.39 |11.750   25.66 |17.750    1.56 | 23.75    1.04
5.833    1.39 |11.833  106.11 |17.833    1.56 | 23.83    1.04
5.917    1.39 |11.917  106.12 |17.917    1.56 | 23.92    1.04
6.000    1.39 |12.000  106.12 |18.000    1.56 | 24.00    1.04

     Max.Eff.Inten.(mm/hr)=     106.12        68.59
               over (min)         5.00         5.00
     Storage Coeff.  (min)=       1.44 (ii)    2.54 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.33         0.29
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.07         0.00          0.071 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      85.70        45.97          85.30
     TOTAL RAINFALL   (mm)=      86.70        86.70          86.70
     RUNOFF COEFFICIENT   =       0.99         0.53           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  80.0    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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--------------------
| RESERVOIR(  0050)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)   |    (cms)     (ha.m.)
                           0.0000     0.0000   |   0.0128      0.0103

                                    AREA     QPEAK     TPEAK       R.V.
                                    (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0048)      0.240      0.071     12.00      85.30
   OUTFLOW: ID= 1 (  0050)      0.240      0.011     12.08      84.49

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 15.89
                  TIME SHIFT OF PEAK FLOW          (min)=  5.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0090

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--------------------
| ADD HYD  (  0049)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0043):     2.03   0.456    12.00    71.00
     + ID2= 2 (  0050):     0.24   0.011    12.08    84.49
       ================================================
       ID = 3 (  0049):     2.27   0.466    12.00    72.42

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| CALIB            |
| STANDHYD (  0051)|   Area     (ha)=   1.68
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
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		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.66	0.02
Dep. Storage	(mm)=	5.00	1.50
Average Slope	(%)=	1.20	2.00
Length	(m)=	105.83	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.95	6.083	1.56	12.083	12.50	18.08	1.56
0.167	0.95	6.167	1.56	12.167	12.48	18.17	1.56
0.250	0.95	6.250	1.56	12.250	12.48	18.25	1.56
0.333	0.95	6.333	1.56	12.333	12.48	18.33	1.56
0.417	0.95	6.417	1.56	12.417	12.48	18.42	1.56
0.500	0.95	6.500	1.56	12.500	12.48	18.50	1.56
0.583	0.95	6.583	1.56	12.583	6.42	18.58	1.56
0.667	0.95	6.667	1.56	12.667	6.42	18.67	1.56
0.750	0.95	6.750	1.56	12.750	6.42	18.75	1.56
0.833	0.95	6.833	1.56	12.833	6.42	18.83	1.56
0.917	0.95	6.917	1.56	12.917	6.42	18.92	1.56
1.000	0.95	7.000	1.56	13.000	6.42	19.00	1.56
1.083	0.95	7.083	1.91	13.083	4.68	19.08	1.56
1.167	0.95	7.167	1.91	13.167	4.68	19.17	1.56
1.250	0.95	7.250	1.91	13.250	4.68	19.25	1.56
1.333	0.95	7.333	1.91	13.333	4.68	19.33	1.56
1.417	0.95	7.417	1.91	13.417	4.68	19.42	1.56
1.500	0.95	7.500	1.91	13.500	4.68	19.50	1.56
1.583	0.95	7.583	1.91	13.583	3.64	19.58	1.56
1.667	0.95	7.667	1.91	13.667	3.64	19.67	1.56
1.750	0.95	7.750	1.91	13.750	3.64	19.75	1.56
1.833	0.95	7.833	1.91	13.833	3.64	19.83	1.56
1.917	0.95	7.917	1.91	13.917	3.64	19.92	1.56
2.000	0.95	8.000	1.91	14.000	3.64	20.00	1.56
2.083	1.13	8.083	2.25	14.083	2.60	20.08	1.04
2.167	1.13	8.167	2.25	14.167	2.60	20.17	1.04
2.250	1.13	8.250	2.25	14.250	2.60	20.25	1.04
2.333	1.13	8.333	2.25	14.333	2.60	20.33	1.04
2.417	1.13	8.417	2.25	14.417	2.60	20.42	1.04
2.500	1.13	8.500	2.25	14.500	2.60	20.50	1.04
2.583	1.13	8.583	2.43	14.583	2.60	20.58	1.04
2.667	1.13	8.667	2.43	14.667	2.60	20.67	1.04
2.750	1.13	8.750	2.43	14.750	2.60	20.75	1.04
2.833	1.13	8.833	2.43	14.833	2.60	20.83	1.04
2.917	1.13	8.917	2.43	14.917	2.60	20.92	1.04
3.000	1.13	9.000	2.43	15.000	2.60	21.00	1.04
3.083	1.13	9.083	2.77	15.083	2.60	21.08	1.04
3.167	1.13	9.167	2.77	15.167	2.60	21.17	1.04
3.250	1.13	9.250	2.77	15.250	2.60	21.25	1.04
3.333	1.13	9.333	2.77	15.333	2.60	21.33	1.04
3.417	1.13	9.417	2.77	15.417	2.60	21.42	1.04
3.500	1.13	9.500	2.77	15.500	2.60	21.50	1.04
3.583	1.13	9.583	3.12	15.583	2.60	21.58	1.04
3.667	1.13	9.667	3.12	15.667	2.60	21.67	1.04
3.750	1.13	9.750	3.12	15.750	2.60	21.75	1.04
3.833	1.13	9.833	3.12	15.833	2.60	21.83	1.04
3.917	1.13	9.917	3.12	15.917	2.60	21.92	1.04
4.000	1.13	10.000	3.12	16.000	2.60	22.00	1.04
4.083	1.39	10.083	3.99	16.083	1.56	22.08	1.04
4.167	1.39	10.167	3.99	16.167	1.56	22.17	1.04
4.250	1.39	10.250	3.99	16.250	1.56	22.25	1.04
4.333	1.39	10.333	3.99	16.333	1.56	22.33	1.04
4.417	1.39	10.417	3.99	16.417	1.56	22.42	1.04
4.500	1.39	10.500	3.99	16.500	1.56	22.50	1.04
4.583	1.39	10.583	5.38	16.583	1.56	22.58	1.04
4.667	1.39	10.667	5.38	16.667	1.56	22.67	1.04
4.750	1.39	10.750	5.38	16.750	1.56	22.75	1.04
4.833	1.39	10.833	5.38	16.833	1.56	22.83	1.04
4.917	1.39	10.917	5.38	16.917	1.56	22.92	1.04
5.000	1.39	11.000	5.38	17.000	1.56	23.00	1.04
5.083	1.39	11.083	8.32	17.083	1.56	23.08	1.04
5.167	1.39	11.167	8.32	17.167	1.56	23.17	1.04
5.250	1.39	11.250	8.32	17.250	1.56	23.25	1.04
5.333	1.39	11.333	8.32	17.333	1.56	23.33	1.04
5.417	1.39	11.417	8.32	17.417	1.56	23.42	1.04
5.500	1.39	11.500	8.32	17.500	1.56	23.50	1.04
5.583	1.39	11.583	25.66	17.583	1.56	23.58	1.04
5.667	1.39	11.667	25.66	17.667	1.56	23.67	1.04
5.750	1.39	11.750	25.66	17.750	1.56	23.75	1.04
5.833	1.39	11.833	106.11	17.833	1.56	23.83	1.04
5.917	1.39	11.917	106.12	17.917	1.56	23.92	1.04
6.000	1.39	12.000	106.12	18.000	1.56	24.00	1.04

Max.Eff.Inten.	(mm/hr)=	106.12	70.94	
over	(min)	5.00	5.00	
Storage Coeff.	(min)=	2.44 (ii)	3.54 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	5.00	
Unit Hyd. peak	(cms)=	0.30	0.26	
				TOTALS
PEAK FLOW	(cms)=	0.49	0.00	0.493 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	81.70	48.82	81.37
TOTAL RAINFALL	(mm)=	86.70	86.70	86.70
RUNOFF COEFFICIENT	=	0.94	0.56	0.94

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 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 (0046)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0049):		2.27	0.466	12.00	72.42
+ ID2= 2 (0051):		1.68	0.493	12.00	81.37
ID = 3 (0046):		3.95	0.959	12.00	76.23

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0047)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.1630	0.2697
	0.0080	0.0487	0.1700	0.2885
	0.0100	0.0674	0.1720	0.2960
	0.0880	0.1049	0.1760	0.3072

```
                        0.1040     0.1311   |   0.1770      0.3109
                        0.1170     0.1573   |   0.1800      0.3184
                        0.1260     0.1761   |   0.1870      0.3409
                        0.1300     0.1836   |   0.1880      0.3447
                        0.1570     0.2510   |   0.1910      0.3559

                              AREA      QPEAK      TPEAK       R.V.
                              (ha)      (cms)      (hrs)       (mm)
   INFLOW : ID= 2 (  0046)    3.950      0.959      12.00      76.23
   OUTFLOW: ID= 1 (  0047)    3.950      0.120      12.50      75.84

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 12.48
                  TIME SHIFT OF PEAK FLOW         (min)= 30.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1633

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--------------------
| ADD HYD  (  0039)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0040):     6.56   0.955    12.08    45.72
     + ID2= 2 (  0047):     3.95   0.120    12.50    75.84
       ==========================================================
       ID = 3 (  0039):    10.51   1.070    12.08    57.04

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0039)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0039):    10.51   1.070    12.08    57.04
     + ID2= 2 (  0052):     0.08   0.013    12.00    45.12
       ==========================================================
       ID = 1 (  0039):    10.59   1.079    12.08    56.95

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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      V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
      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\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\a3fb225f-3006-43b7-b02e-5da0ffa75d98\

  Summary filename: C:\Users\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\a3fb225f-3006-43b7-b02e-5da0ffa75d98\


DATE: 03-08-2023                          TIME: 01:45:26

USER:


COMMENTS: _____________________________________________________________

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  ********************************************
  ** SIMULATION : 16 - 100-YR - SCS TYPE II 24H **
  ********************************************

--------------------
| MASS STORM       |    Filename: C:\Users\sramsoomair\AppD
|                  |              ata\Local\Temp\
|                  |              72e98174-9551-451b-b568-e4dbecda99d3\aed835c3
| Ptotal= 94.70 mm |    Comments: SCS TYPE II MASS CURVE
--------------------
                       Duration of storm    = 24.00 hrs
                       Mass curve time step = 15.00 min

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    1.04 |  6.00    1.70 | 12.00   13.64 | 18.00    1.70
                0.25    1.04 |  6.25    1.70 | 12.25   13.64 | 18.25    1.70
                0.50    1.04 |  6.50    1.70 | 12.50    7.01 | 18.50    1.70
                0.75    1.04 |  6.75    1.70 | 12.75    7.01 | 18.75    1.70
                1.00    1.04 |  7.00    2.08 | 13.00    5.11 | 19.00    1.70
                1.25    1.04 |  7.25    2.08 | 13.25    5.11 | 19.25    1.70
                1.50    1.04 |  7.50    2.08 | 13.50    3.98 | 19.50    1.70
                1.75    1.04 |  7.75    2.08 | 13.75    3.98 | 19.75    1.70
                2.00    1.23 |  8.00    2.46 | 14.00    2.84 | 20.00    1.14
                2.25    1.23 |  8.25    2.46 | 14.25    2.84 | 20.25    1.14
                2.50    1.23 |  8.50    2.65 | 14.50    2.84 | 20.50    1.14
                2.75    1.23 |  8.75    2.65 | 14.75    2.84 | 20.75    1.14
                3.00    1.23 |  9.00    3.03 | 15.00    2.84 | 21.00    1.14
                3.25    1.23 |  9.25    3.03 | 15.25    2.84 | 21.25    1.14
                3.50    1.23 |  9.50    3.41 | 15.50    2.84 | 21.50    1.14
                3.75    1.23 |  9.75    3.41 | 15.75    2.84 | 21.75    1.14
                4.00    1.52 | 10.00    4.36 | 16.00    1.70 | 22.00    1.14
                4.25    1.52 | 10.25    4.36 | 16.25    1.70 | 22.25    1.14
                4.50    1.52 | 10.50    5.87 | 16.50    1.70 | 22.50    1.14
                4.75    1.52 | 10.75    5.87 | 16.75    1.70 | 22.75    1.14
                5.00    1.52 | 11.00    9.09 | 17.00    1.70 | 23.00    1.14
                5.25    1.52 | 11.25    9.09 | 17.25    1.70 | 23.25    1.14
                5.50    1.52 | 11.50   28.03 | 17.50    1.70 | 23.50    1.14
                5.75    1.52 | 11.75  115.91 | 17.75    1.70 | 23.75    1.14

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--------------------
| CALIB            |
| NASHYD   (  0041)|   Area     (ha)=   6.56   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.04	6.083	1.70	12.083	13.65	18.08	1.70
0.167	1.04	6.167	1.70	12.167	13.64	18.17	1.70
0.250	1.04	6.250	1.70	12.250	13.64	18.25	1.70
0.333	1.04	6.333	1.70	12.333	13.64	18.33	1.70
0.417	1.04	6.417	1.70	12.417	13.64	18.42	1.70
0.500	1.04	6.500	1.70	12.500	13.64	18.50	1.70
0.583	1.04	6.583	1.70	12.583	7.01	18.58	1.70
0.667	1.04	6.667	1.70	12.667	7.01	18.67	1.70
0.750	1.04	6.750	1.70	12.750	7.01	18.75	1.70
0.833	1.04	6.833	1.70	12.833	7.01	18.83	1.70
0.917	1.04	6.917	1.70	12.917	7.01	18.92	1.70
1.000	1.04	7.000	1.70	13.000	7.01	19.00	1.70
1.083	1.04	7.083	2.08	13.083	5.11	19.08	1.70
1.167	1.04	7.167	2.08	13.167	5.11	19.17	1.70
1.250	1.04	7.250	2.08	13.250	5.11	19.25	1.70
1.333	1.04	7.333	2.08	13.333	5.11	19.33	1.70
1.417	1.04	7.417	2.08	13.417	5.11	19.42	1.70
1.500	1.04	7.500	2.08	13.500	5.11	19.50	1.70
1.583	1.04	7.583	2.08	13.583	3.98	19.58	1.70
1.667	1.04	7.667	2.08	13.667	3.98	19.67	1.70
1.750	1.04	7.750	2.08	13.750	3.98	19.75	1.70
1.833	1.04	7.833	2.08	13.833	3.98	19.83	1.70
1.917	1.04	7.917	2.08	13.917	3.98	19.92	1.70
2.000	1.04	8.000	2.08	14.000	3.98	20.00	1.70
2.083	1.23	8.083	2.46	14.083	2.84	20.08	1.14
2.167	1.23	8.167	2.46	14.167	2.84	20.17	1.14
2.250	1.23	8.250	2.46	14.250	2.84	20.25	1.14
2.333	1.23	8.333	2.46	14.333	2.84	20.33	1.14
2.417	1.23	8.417	2.46	14.417	2.84	20.42	1.14
2.500	1.23	8.500	2.46	14.500	2.84	20.50	1.14
2.583	1.23	8.583	2.65	14.583	2.84	20.58	1.14
2.667	1.23	8.667	2.65	14.667	2.84	20.67	1.14
2.750	1.23	8.750	2.65	14.750	2.84	20.75	1.14
2.833	1.23	8.833	2.65	14.833	2.84	20.83	1.14
2.917	1.23	8.917	2.65	14.917	2.84	20.92	1.14
3.000	1.23	9.000	2.65	15.000	2.84	21.00	1.14
3.083	1.23	9.083	3.03	15.083	2.84	21.08	1.14
3.167	1.23	9.167	3.03	15.167	2.84	21.17	1.14
3.250	1.23	9.250	3.03	15.250	2.84	21.25	1.14
3.333	1.23	9.333	3.03	15.333	2.84	21.33	1.14
3.417	1.23	9.417	3.03	15.417	2.84	21.42	1.14
3.500	1.23	9.500	3.03	15.500	2.84	21.50	1.14
3.583	1.23	9.583	3.41	15.583	2.84	21.58	1.14
3.667	1.23	9.667	3.41	15.667	2.84	21.67	1.14
3.750	1.23	9.750	3.41	15.750	2.84	21.75	1.14
3.833	1.23	9.833	3.41	15.833	2.84	21.83	1.14
3.917	1.23	9.917	3.41	15.917	2.84	21.92	1.14
4.000	1.23	10.000	3.41	16.000	2.84	22.00	1.14
4.083	1.52	10.083	4.36	16.083	1.70	22.08	1.14
4.167	1.52	10.167	4.36	16.167	1.70	22.17	1.14
4.250	1.52	10.250	4.36	16.250	1.70	22.25	1.14
4.333	1.52	10.333	4.36	16.333	1.70	22.33	1.14
4.417	1.52	10.417	4.36	16.417	1.70	22.42	1.14
4.500	1.52	10.500	4.36	16.500	1.70	22.50	1.14
4.583	1.52	10.583	5.87	16.583	1.70	22.58	1.14
4.667	1.52	10.667	5.87	16.667	1.70	22.67	1.14
4.750	1.52	10.750	5.87	16.750	1.70	22.75	1.14
4.833	1.52	10.833	5.87	16.833	1.70	22.83	1.14
4.917	1.52	10.917	5.87	16.917	1.70	22.92	1.14
5.000	1.52	11.000	5.87	17.000	1.70	23.00	1.14
5.083	1.52	11.083	9.09	17.083	1.70	23.08	1.14
5.167	1.52	11.167	9.09	17.167	1.70	23.17	1.14
5.250	1.52	11.250	9.09	17.250	1.70	23.25	1.14
5.333	1.52	11.333	9.09	17.333	1.70	23.33	1.14
5.417	1.52	11.417	9.09	17.417	1.70	23.42	1.14
5.500	1.52	11.500	9.09	17.500	1.70	23.50	1.14
5.583	1.52	11.583	28.03	17.583	1.70	23.58	1.14
5.667	1.52	11.667	28.03	17.667	1.70	23.67	1.14
5.750	1.52	11.750	28.03	17.750	1.70	23.75	1.14
5.833	1.52	11.833	115.90	17.833	1.70	23.83	1.14
5.917	1.52	11.917	115.91	17.917	1.70	23.92	1.14
6.000	1.52	12.000	115.91	18.000	1.70	24.00	1.14

Unit Hyd Qpeak (cms)= 1.790

PEAK FLOW (cms)= 1.141 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 52.371
TOTAL RAINFALL (mm)= 94.700
RUNOFF COEFFICIENT = 0.553

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

ROUTE CHN(0040)	
IN= 2---> OUT= 1	Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	101.50	0.0500	
1.00	100.70	0.0500	
1.50	100.55	0.0500 /0.0300	Main Channel
2.00	99.50	0.0300	Main Channel
3.50	99.60	0.0300	Main Channel
4.50	100.65	0.0300 /0.0500	Main Channel
6.00	101.45	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	99.60	.185E+02	0.0	0.54	8.09
0.19	99.69	.587E+02	0.2	1.04	4.22
0.29	99.79	.102E+03	0.5	1.38	3.16
0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

<---- hydrograph ----> <-pipe / channel->

AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)

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   INFLOW : ID= 2 (  0041)    6.56     1.14   12.00  52.37      0.42      1.74
   OUTFLOW: ID= 1 (  0040)    6.56     1.09   12.08  52.37      0.41      1.72


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| CALIB            |
| NASHYD   (  0052)|   Area     (ha)=   0.08   Curve Number    (CN)= 80.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    1.04 | 6.083    1.70 |12.083   13.65 | 18.08    1.70
 0.167    1.04 | 6.167    1.70 |12.167   13.64 | 18.17    1.70
 0.250    1.04 | 6.250    1.70 |12.250   13.64 | 18.25    1.70
 0.333    1.04 | 6.333    1.70 |12.333   13.64 | 18.33    1.70
 0.417    1.04 | 6.417    1.70 |12.417   13.64 | 18.42    1.70
 0.500    1.04 | 6.500    1.70 |12.500   13.64 | 18.50    1.70
 0.583    1.04 | 6.583    1.70 |12.583    7.01 | 18.58    1.70
 0.667    1.04 | 6.667    1.70 |12.667    7.01 | 18.67    1.70
 0.750    1.04 | 6.750    1.70 |12.750    7.01 | 18.75    1.70
 0.833    1.04 | 6.833    1.70 |12.833    7.01 | 18.83    1.70
 0.917    1.04 | 6.917    1.70 |12.917    7.01 | 18.92    1.70
 1.000    1.04 | 7.000    1.70 |13.000    7.01 | 19.00    1.70
 1.083    1.04 | 7.083    2.08 |13.083    5.11 | 19.08    1.70
 1.167    1.04 | 7.167    2.08 |13.167    5.11 | 19.17    1.70
 1.250    1.04 | 7.250    2.08 |13.250    5.11 | 19.25    1.70
 1.333    1.04 | 7.333    2.08 |13.333    5.11 | 19.33    1.70
 1.417    1.04 | 7.417    2.08 |13.417    5.11 | 19.42    1.70
 1.500    1.04 | 7.500    2.08 |13.500    5.11 | 19.50    1.70
 1.583    1.04 | 7.583    2.08 |13.583    3.98 | 19.58    1.70
 1.667    1.04 | 7.667    2.08 |13.667    3.98 | 19.67    1.70
 1.750    1.04 | 7.750    2.08 |13.750    3.98 | 19.75    1.70
 1.833    1.04 | 7.833    2.08 |13.833    3.98 | 19.83    1.70
 1.917    1.04 | 7.917    2.08 |13.917    3.98 | 19.92    1.70
 2.000    1.04 | 8.000    2.08 |14.000    3.98 | 20.00    1.70
 2.083    1.23 | 8.083    2.46 |14.083    2.84 | 20.08    1.14
 2.167    1.23 | 8.167    2.46 |14.167    2.84 | 20.17    1.14
 2.250    1.23 | 8.250    2.46 |14.250    2.84 | 20.25    1.14
 2.333    1.23 | 8.333    2.46 |14.333    2.84 | 20.33    1.14
 2.417    1.23 | 8.417    2.46 |14.417    2.84 | 20.42    1.14
 2.500    1.23 | 8.500    2.46 |14.500    2.84 | 20.50    1.14
 2.583    1.23 | 8.583    2.65 |14.583    2.84 | 20.58    1.14
 2.667    1.23 | 8.667    2.65 |14.667    2.84 | 20.67    1.14
 2.750    1.23 | 8.750    2.65 |14.750    2.84 | 20.75    1.14
 2.833    1.23 | 8.833    2.65 |14.833    2.84 | 20.83    1.14
 2.917    1.23 | 8.917    2.65 |14.917    2.84 | 20.92    1.14
 3.000    1.23 | 9.000    2.65 |15.000    2.84 | 21.00    1.14
 3.083    1.23 | 9.083    3.03 |15.083    2.84 | 21.08    1.14
 3.167    1.23 | 9.167    3.03 |15.167    2.84 | 21.17    1.14
 3.250    1.23 | 9.250    3.03 |15.250    2.84 | 21.25    1.14
 3.333    1.23 | 9.333    3.03 |15.333    2.84 | 21.33    1.14
 3.417    1.23 | 9.417    3.03 |15.417    2.84 | 21.42    1.14
 3.500    1.23 | 9.500    3.03 |15.500    2.84 | 21.50    1.14
 3.583    1.23 | 9.583    3.41 |15.583    2.84 | 21.58    1.14
 3.667    1.23 | 9.667    3.41 |15.667    2.84 | 21.67    1.14
 3.750    1.23 | 9.750    3.41 |15.750    2.84 | 21.75    1.14
 3.833    1.23 | 9.833    3.41 |15.833    2.84 | 21.83    1.14
 3.917    1.23 | 9.917    3.41 |15.917    2.84 | 21.92    1.14
 4.000    1.23 |10.000    3.41 |16.000    2.84 | 22.00    1.14
 4.083    1.52 |10.083    4.36 |16.083    1.70 | 22.08    1.14
 4.167    1.52 |10.167    4.36 |16.167    1.70 | 22.17    1.14
 4.250    1.52 |10.250    4.36 |16.250    1.70 | 22.25    1.14
 4.333    1.52 |10.333    4.36 |16.333    1.70 | 22.33    1.14
 4.417    1.52 |10.417    4.36 |16.417    1.70 | 22.42    1.14
 4.500    1.52 |10.500    4.36 |16.500    1.70 | 22.50    1.14
 4.583    1.52 |10.583    5.87 |16.583    1.70 | 22.58    1.14
 4.667    1.52 |10.667    5.87 |16.667    1.70 | 22.67    1.14
 4.750    1.52 |10.750    5.87 |16.750    1.70 | 22.75    1.14
 4.833    1.52 |10.833    5.87 |16.833    1.70 | 22.83    1.14
 4.917    1.52 |10.917    5.87 |16.917    1.70 | 22.92    1.14
 5.000    1.52 |11.000    5.87 |17.000    1.70 | 23.00    1.14
 5.083    1.52 |11.083    9.09 |17.083    1.70 | 23.08    1.14
 5.167    1.52 |11.167    9.09 |17.167    1.70 | 23.17    1.14
 5.250    1.52 |11.250    9.09 |17.250    1.70 | 23.25    1.14
 5.333    1.52 |11.333    9.09 |17.333    1.70 | 23.33    1.14
 5.417    1.52 |11.417    9.09 |17.417    1.70 | 23.42    1.14
 5.500    1.52 |11.500    9.09 |17.500    1.70 | 23.50    1.14
 5.583    1.52 |11.583   28.03 |17.583    1.70 | 23.58    1.14
 5.667    1.52 |11.667   28.03 |17.667    1.70 | 23.67    1.14
 5.750    1.52 |11.750   28.03 |17.750    1.70 | 23.75    1.14
 5.833    1.52 |11.833  115.90 |17.833    1.70 | 23.83    1.14
 5.917    1.52 |11.917  115.91 |17.917    1.70 | 23.92    1.14
 6.000    1.52 |12.000  115.91 |18.000    1.70 | 24.00    1.14

     Unit Hyd Qpeak  (cms)=   0.026

     PEAK FLOW       (cms)=   0.014 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  51.550
     TOTAL RAINFALL   (mm)=  94.700
     RUNOFF COEFFICIENT   =   0.544

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

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--------------------
| CALIB            |
| STANDHYD (  0043)|   Area     (ha)=   2.03
|ID= 1 DT= 5.0 min |   Total Imp(%)=  63.00   Dir. Conn.(%)=  63.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.28          0.75
     Dep. Storage     (mm)=       1.00          5.00
     Average Slope     (%)=       1.30          2.00
     Length            (m)=     116.33         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    1.04 | 6.083    1.70 |12.083   13.65 | 18.08    1.70
 0.167    1.04 | 6.167    1.70 |12.167   13.64 | 18.17    1.70
 0.250    1.04 | 6.250    1.70 |12.250   13.64 | 18.25    1.70
 0.333    1.04 | 6.333    1.70 |12.333   13.64 | 18.33    1.70
 0.417    1.04 | 6.417    1.70 |12.417   13.64 | 18.42    1.70
 0.500    1.04 | 6.500    1.70 |12.500   13.64 | 18.50    1.70
 0.583    1.04 | 6.583    1.70 |12.583    7.01 | 18.58    1.70
 0.667    1.04 | 6.667    1.70 |12.667    7.01 | 18.67    1.70
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0.750	1.04	6.750	1.70	12.750	7.01	18.75	1.70
0.833	1.04	6.833	1.70	12.833	7.01	18.83	1.70
0.917	1.04	6.917	1.70	12.917	7.01	18.92	1.70
1.000	1.04	7.000	1.70	13.000	7.01	19.00	1.70
1.083	1.04	7.083	2.08	13.083	5.11	19.08	1.70
1.167	1.04	7.167	2.08	13.167	5.11	19.17	1.70
1.250	1.04	7.250	2.08	13.250	5.11	19.25	1.70
1.333	1.04	7.333	2.08	13.333	5.11	19.33	1.70
1.417	1.04	7.417	2.08	13.417	5.11	19.42	1.70
1.500	1.04	7.500	2.08	13.500	5.11	19.50	1.70
1.583	1.04	7.583	2.08	13.583	3.98	19.58	1.70
1.667	1.04	7.667	2.08	13.667	3.98	19.67	1.70
1.750	1.04	7.750	2.08	13.750	3.98	19.75	1.70
1.833	1.04	7.833	2.08	13.833	3.98	19.83	1.70
1.917	1.04	7.917	2.08	13.917	3.98	19.92	1.70
2.000	1.04	8.000	2.08	14.000	3.98	20.00	1.70
2.083	1.23	8.083	2.46	14.083	2.84	20.08	1.14
2.167	1.23	8.167	2.46	14.167	2.84	20.17	1.14
2.250	1.23	8.250	2.46	14.250	2.84	20.25	1.14
2.333	1.23	8.333	2.46	14.333	2.84	20.33	1.14
2.417	1.23	8.417	2.46	14.417	2.84	20.42	1.14
2.500	1.23	8.500	2.46	14.500	2.84	20.50	1.14
2.583	1.23	8.583	2.65	14.583	2.84	20.58	1.14
2.667	1.23	8.667	2.65	14.667	2.84	20.67	1.14
2.750	1.23	8.750	2.65	14.750	2.84	20.75	1.14
2.833	1.23	8.833	2.65	14.833	2.84	20.83	1.14
2.917	1.23	8.917	2.65	14.917	2.84	20.92	1.14
3.000	1.23	9.000	2.65	15.000	2.84	21.00	1.14
3.083	1.23	9.083	3.03	15.083	2.84	21.08	1.14
3.167	1.23	9.167	3.03	15.167	2.84	21.17	1.14
3.250	1.23	9.250	3.03	15.250	2.84	21.25	1.14
3.333	1.23	9.333	3.03	15.333	2.84	21.33	1.14
3.417	1.23	9.417	3.03	15.417	2.84	21.42	1.14
3.500	1.23	9.500	3.03	15.500	2.84	21.50	1.14
3.583	1.23	9.583	3.41	15.583	2.84	21.58	1.14
3.667	1.23	9.667	3.41	15.667	2.84	21.67	1.14
3.750	1.23	9.750	3.41	15.750	2.84	21.75	1.14
3.833	1.23	9.833	3.41	15.833	2.84	21.83	1.14
3.917	1.23	9.917	3.41	15.917	2.84	21.92	1.14
4.000	1.23	10.000	3.41	16.000	2.84	22.00	1.14
4.083	1.52	10.083	4.36	16.083	1.70	22.08	1.14
4.167	1.52	10.167	4.36	16.167	1.70	22.17	1.14
4.250	1.52	10.250	4.36	16.250	1.70	22.25	1.14
4.333	1.52	10.333	4.36	16.333	1.70	22.33	1.14
4.417	1.52	10.417	4.36	16.417	1.70	22.42	1.14
4.500	1.52	10.500	4.36	16.500	1.70	22.50	1.14
4.583	1.52	10.583	5.87	16.583	1.70	22.58	1.14
4.667	1.52	10.667	5.87	16.667	1.70	22.67	1.14
4.750	1.52	10.750	5.87	16.750	1.70	22.75	1.14
4.833	1.52	10.833	5.87	16.833	1.70	22.83	1.14
4.917	1.52	10.917	5.87	16.917	1.70	22.92	1.14
5.000	1.52	11.000	5.87	17.000	1.70	23.00	1.14
5.083	1.52	11.083	9.09	17.083	1.70	23.08	1.14
5.167	1.52	11.167	9.09	17.167	1.70	23.17	1.14
5.250	1.52	11.250	9.09	17.250	1.70	23.25	1.14
5.333	1.52	11.333	9.09	17.333	1.70	23.33	1.14
5.417	1.52	11.417	9.09	17.417	1.70	23.42	1.14
5.500	1.52	11.500	9.09	17.500	1.70	23.50	1.14
5.583	1.52	11.583	28.03	17.583	1.70	23.58	1.14
5.667	1.52	11.667	28.03	17.667	1.70	23.67	1.14
5.750	1.52	11.750	28.03	17.750	1.70	23.75	1.14
5.833	1.52	11.833	115.90	17.833	1.70	23.83	1.14
5.917	1.52	11.917	115.91	17.917	1.70	23.92	1.14
6.000	1.52	12.000	115.91	18.000	1.70	24.00	1.14

Max.Eff.Inten.(mm/hr)=	115.91	78.12	
over (min)	5.00	15.00	
Storage Coeff. (min)=	2.44 (ii)	10.23 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.30	0.09	
			TOTALS
PEAK FLOW (cms)=	0.41	0.11	0.505 (iii)
TIME TO PEAK (hrs)=	12.00	12.08	12.00
RUNOFF VOLUME (mm)=	93.70	52.52	78.46
TOTAL RAINFALL (mm)=	94.70	94.70	94.70
RUNOFF COEFFICIENT =	0.99	0.55	0.83

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0048) | Area (ha)= 0.24
ID= 1 DT= 5.0 min | Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.24	0.00
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	40.00	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	1.04	6.083	1.70	12.083	13.65	18.08	1.70
0.167	1.04	6.167	1.70	12.167	13.64	18.17	1.70
0.250	1.04	6.250	1.70	12.250	13.64	18.25	1.70
0.333	1.04	6.333	1.70	12.333	13.64	18.33	1.70
0.417	1.04	6.417	1.70	12.417	13.64	18.42	1.70
0.500	1.04	6.500	1.70	12.500	13.64	18.50	1.70
0.583	1.04	6.583	1.70	12.583	7.01	18.58	1.70
0.667	1.04	6.667	1.70	12.667	7.01	18.67	1.70
0.750	1.04	6.750	1.70	12.750	7.01	18.75	1.70
0.833	1.04	6.833	1.70	12.833	7.01	18.83	1.70
0.917	1.04	6.917	1.70	12.917	7.01	18.92	1.70
1.000	1.04	7.000	1.70	13.000	7.01	19.00	1.70
1.083	1.04	7.083	2.08	13.083	5.11	19.08	1.70
1.167	1.04	7.167	2.08	13.167	5.11	19.17	1.70
1.250	1.04	7.250	2.08	13.250	5.11	19.25	1.70
1.333	1.04	7.333	2.08	13.333	5.11	19.33	1.70
1.417	1.04	7.417	2.08	13.417	5.11	19.42	1.70
1.500	1.04	7.500	2.08	13.500	5.11	19.50	1.70
1.583	1.04	7.583	2.08	13.583	3.98	19.58	1.70
1.667	1.04	7.667	2.08	13.667	3.98	19.67	1.70
1.750	1.04	7.750	2.08	13.750	3.98	19.75	1.70
1.833	1.04	7.833	2.08	13.833	3.98	19.83	1.70
1.917	1.04	7.917	2.08	13.917	3.98	19.92	1.70
2.000	1.04	8.000	2.08	14.000	3.98	20.00	1.70

2.083	1.23	8.083	2.46	14.083	2.84	20.08	1.14
2.167	1.23	8.167	2.46	14.167	2.84	20.17	1.14
2.250	1.23	8.250	2.46	14.250	2.84	20.25	1.14
2.333	1.23	8.333	2.46	14.333	2.84	20.33	1.14
2.417	1.23	8.417	2.46	14.417	2.84	20.42	1.14
2.500	1.23	8.500	2.46	14.500	2.84	20.50	1.14
2.583	1.23	8.583	2.65	14.583	2.84	20.58	1.14
2.667	1.23	8.667	2.65	14.667	2.84	20.67	1.14
2.750	1.23	8.750	2.65	14.750	2.84	20.75	1.14
2.833	1.23	8.833	2.65	14.833	2.84	20.83	1.14
2.917	1.23	8.917	2.65	14.917	2.84	20.92	1.14
3.000	1.23	9.000	2.65	15.000	2.84	21.00	1.14
3.083	1.23	9.083	3.03	15.083	2.84	21.08	1.14
3.167	1.23	9.167	3.03	15.167	2.84	21.17	1.14
3.250	1.23	9.250	3.03	15.250	2.84	21.25	1.14
3.333	1.23	9.333	3.03	15.333	2.84	21.33	1.14
3.417	1.23	9.417	3.03	15.417	2.84	21.42	1.14
3.500	1.23	9.500	3.03	15.500	2.84	21.50	1.14
3.583	1.23	9.583	3.41	15.583	2.84	21.58	1.14
3.667	1.23	9.667	3.41	15.667	2.84	21.67	1.14
3.750	1.23	9.750	3.41	15.750	2.84	21.75	1.14
3.833	1.23	9.833	3.41	15.833	2.84	21.83	1.14
3.917	1.23	9.917	3.41	15.917	2.84	21.92	1.14
4.000	1.23	10.000	3.41	16.000	2.84	22.00	1.14
4.083	1.52	10.083	4.36	16.083	1.70	22.08	1.14
4.167	1.52	10.167	4.36	16.167	1.70	22.17	1.14
4.250	1.52	10.250	4.36	16.250	1.70	22.25	1.14
4.333	1.52	10.333	4.36	16.333	1.70	22.33	1.14
4.417	1.52	10.417	4.36	16.417	1.70	22.42	1.14
4.500	1.52	10.500	4.36	16.500	1.70	22.50	1.14
4.583	1.52	10.583	5.87	16.583	1.70	22.58	1.14
4.667	1.52	10.667	5.87	16.667	1.70	22.67	1.14
4.750	1.52	10.750	5.87	16.750	1.70	22.75	1.14
4.833	1.52	10.833	5.87	16.833	1.70	22.83	1.14
4.917	1.52	10.917	5.87	16.917	1.70	22.92	1.14
5.000	1.52	11.000	5.87	17.000	1.70	23.00	1.14
5.083	1.52	11.083	9.09	17.083	1.70	23.08	1.14
5.167	1.52	11.167	9.09	17.167	1.70	23.17	1.14
5.250	1.52	11.250	9.09	17.250	1.70	23.25	1.14
5.333	1.52	11.333	9.09	17.333	1.70	23.33	1.14
5.417	1.52	11.417	9.09	17.417	1.70	23.42	1.14
5.500	1.52	11.500	9.09	17.500	1.70	23.50	1.14
5.583	1.52	11.583	28.03	17.583	1.70	23.58	1.14
5.667	1.52	11.667	28.03	17.667	1.70	23.67	1.14
5.750	1.52	11.750	28.03	17.750	1.70	23.75	1.14
5.833	1.52	11.833	115.90	17.833	1.70	23.83	1.14
5.917	1.52	11.917	115.91	17.917	1.70	23.92	1.14
6.000	1.52	12.000	115.91	18.000	1.70	24.00	1.14

Max.Eff.Inten.(mm/hr)=	115.91	78.12		
over (min)	5.00	5.00		
Storage Coeff. (min)=	1.39 (ii)	2.45 (ii)		
Unit Hyd. Tpeak (min)=	5.00	5.00		
Unit Hyd. peak (cms)=	0.33	0.30		
			TOTALS	
PEAK FLOW (cms)=	0.08	0.00	0.077 (iii)	
TIME TO PEAK (hrs)=	12.00	12.00	12.00	
RUNOFF VOLUME (mm)=	93.70	52.52	93.29	
TOTAL RAINFALL (mm)=	94.70	94.70	94.70	
RUNOFF COEFFICIENT =	0.99	0.55	0.99	

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0050)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0128	0.0103

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0048)	0.240	0.077	12.00	93.29
OUTFLOW: ID= 1 (0050)	0.240	0.012	12.08	92.47

PEAK FLOW REDUCTION [Qout/Qin](%)= 15.90
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0099

ADD HYD (0049)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				
ID1= 1 (0043):	2.03	0.505	12.00	78.46
+ ID2= 2 (0050):	0.24	0.012	12.08	92.47
ID = 3 (0049):	2.27	0.516	12.00	79.94

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0051)	Area (ha)= 1.68		
ID= 1 DT= 5.0 min	Total Imp(%)= 99.00	Dir. Conn.(%)= 99.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.66	0.02
Dep. Storage	(mm)=	5.00	1.50
Average Slope	(%)=	1.20	2.00
Length	(m)=	105.83	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.04	6.083	1.70	12.083	13.65	18.08	1.70
0.167	1.04	6.167	1.70	12.167	13.64	18.17	1.70
0.250	1.04	6.250	1.70	12.250	13.64	18.25	1.70
0.333	1.04	6.333	1.70	12.333	13.64	18.33	1.70
0.417	1.04	6.417	1.70	12.417	13.64	18.42	1.70
0.500	1.04	6.500	1.70	12.500	13.64	18.50	1.70
0.583	1.04	6.583	1.70	12.583	7.01	18.58	1.70
0.667	1.04	6.667	1.70	12.667	7.01	18.67	1.70
0.750	1.04	6.750	1.70	12.750	7.01	18.75	1.70
0.833	1.04	6.833	1.70	12.833	7.01	18.83	1.70
0.917	1.04	6.917	1.70	12.917	7.01	18.92	1.70

1.000	1.04	7.000	1.70	13.000	7.01	19.00	1.70
1.083	1.04	7.083	2.08	13.083	5.11	19.08	1.70
1.167	1.04	7.167	2.08	13.167	5.11	19.17	1.70
1.250	1.04	7.250	2.08	13.250	5.11	19.25	1.70
1.333	1.04	7.333	2.08	13.333	5.11	19.33	1.70
1.417	1.04	7.417	2.08	13.417	5.11	19.42	1.70
1.500	1.04	7.500	2.08	13.500	5.11	19.50	1.70
1.583	1.04	7.583	2.08	13.583	3.98	19.58	1.70
1.667	1.04	7.667	2.08	13.667	3.98	19.67	1.70
1.750	1.04	7.750	2.08	13.750	3.98	19.75	1.70
1.833	1.04	7.833	2.08	13.833	3.98	19.83	1.70
1.917	1.04	7.917	2.08	13.917	3.98	19.92	1.70
2.000	1.04	8.000	2.08	14.000	3.98	20.00	1.70
2.083	1.23	8.083	2.46	14.083	2.84	20.08	1.14
2.167	1.23	8.167	2.46	14.167	2.84	20.17	1.14
2.250	1.23	8.250	2.46	14.250	2.84	20.25	1.14
2.333	1.23	8.333	2.46	14.333	2.84	20.33	1.14
2.417	1.23	8.417	2.46	14.417	2.84	20.42	1.14
2.500	1.23	8.500	2.46	14.500	2.84	20.50	1.14
2.583	1.23	8.583	2.65	14.583	2.84	20.58	1.14
2.667	1.23	8.667	2.65	14.667	2.84	20.67	1.14
2.750	1.23	8.750	2.65	14.750	2.84	20.75	1.14
2.833	1.23	8.833	2.65	14.833	2.84	20.83	1.14
2.917	1.23	8.917	2.65	14.917	2.84	20.92	1.14
3.000	1.23	9.000	2.65	15.000	2.84	21.00	1.14
3.083	1.23	9.083	3.03	15.083	2.84	21.08	1.14
3.167	1.23	9.167	3.03	15.167	2.84	21.17	1.14
3.250	1.23	9.250	3.03	15.250	2.84	21.25	1.14
3.333	1.23	9.333	3.03	15.333	2.84	21.33	1.14
3.417	1.23	9.417	3.03	15.417	2.84	21.42	1.14
3.500	1.23	9.500	3.03	15.500	2.84	21.50	1.14
3.583	1.23	9.583	3.41	15.583	2.84	21.58	1.14
3.667	1.23	9.667	3.41	15.667	2.84	21.67	1.14
3.750	1.23	9.750	3.41	15.750	2.84	21.75	1.14
3.833	1.23	9.833	3.41	15.833	2.84	21.83	1.14
3.917	1.23	9.917	3.41	15.917	2.84	21.92	1.14
4.000	1.23	10.000	3.41	16.000	2.84	22.00	1.14
4.083	1.52	10.083	4.36	16.083	1.70	22.08	1.14
4.167	1.52	10.167	4.36	16.167	1.70	22.17	1.14
4.250	1.52	10.250	4.36	16.250	1.70	22.25	1.14
4.333	1.52	10.333	4.36	16.333	1.70	22.33	1.14
4.417	1.52	10.417	4.36	16.417	1.70	22.42	1.14
4.500	1.52	10.500	4.36	16.500	1.70	22.50	1.14
4.583	1.52	10.583	5.87	16.583	1.70	22.58	1.14
4.667	1.52	10.667	5.87	16.667	1.70	22.67	1.14
4.750	1.52	10.750	5.87	16.750	1.70	22.75	1.14
4.833	1.52	10.833	5.87	16.833	1.70	22.83	1.14
4.917	1.52	10.917	5.87	16.917	1.70	22.92	1.14
5.000	1.52	11.000	5.87	17.000	1.70	23.00	1.14
5.083	1.52	11.083	9.09	17.083	1.70	23.08	1.14
5.167	1.52	11.167	9.09	17.167	1.70	23.17	1.14
5.250	1.52	11.250	9.09	17.250	1.70	23.25	1.14
5.333	1.52	11.333	9.09	17.333	1.70	23.33	1.14
5.417	1.52	11.417	9.09	17.417	1.70	23.42	1.14
5.500	1.52	11.500	9.09	17.500	1.70	23.50	1.14
5.583	1.52	11.583	28.03	17.583	1.70	23.58	1.14
5.667	1.52	11.667	28.03	17.667	1.70	23.67	1.14
5.750	1.52	11.750	28.03	17.750	1.70	23.75	1.14
5.833	1.52	11.833	115.90	17.833	1.70	23.83	1.14
5.917	1.52	11.917	115.91	17.917	1.70	23.92	1.14
6.000	1.52	12.000	115.91	18.000	1.70	24.00	1.14

Max.Eff.Inten.(mm/hr)=	115.91	80.40
over (min)	5.00	5.00

			TOTALS
Storage Coeff. (min)=	2.36 (ii)	3.42 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.30	0.26	
PEAK FLOW (cms)=	0.53	0.00	0.539 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	89.70	55.43	89.36
TOTAL RAINFALL (mm)=	94.70	94.70	94.70
RUNOFF COEFFICIENT =	0.95	0.59	0.94

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 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 (0046)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0049):	2.27	0.516	12.00	79.94
+ ID2= 2 (0051):	1.68	0.539	12.00	89.36
ID = 3 (0046):	3.95	1.055	12.00	83.95

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0047)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.1630	0.2697
	0.0080	0.0487	0.1700	0.2885
	0.0100	0.0674	0.1720	0.2960
	0.0880	0.1049	0.1760	0.3072
	0.1040	0.1311	0.1770	0.3109
	0.1170	0.1573	0.1800	0.3184
	0.1260	0.1761	0.1870	0.3409
	0.1300	0.1836	0.1880	0.3447
	0.1570	0.2510	0.1910	0.3559

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0046)	3.950	1.055	12.00	83.95
OUTFLOW: ID= 1 (0047)	3.950	0.128	12.58	83.55

PEAK FLOW REDUCTION [Qout/Qin](%)= 12.12
TIME SHIFT OF PEAK FLOW (min)= 35.00
MAXIMUM STORAGE USED (ha.m.)= 0.1799

ADD HYD (0039)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0040):	6.56	1.092	12.08	52.37
+ ID2= 2 (0047):	3.95	0.128	12.58	83.55

```
        ID = 3 (  0039):    10.51   1.214    12.08    64.09

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

--------------------
| ADD HYD  (  0039)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK      R.V.
--------------------         (ha)    (cms)    (hrs)      (mm)
        ID1= 3 (  0039):    10.51   1.214    12.08    64.09
      + ID2= 2 (  0052):     0.08   0.014    12.00    51.55
        ==================================================
        ID = 1 (  0039):    10.59   1.224    12.08    64.00

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

       V    V   I    SSSSS  U   U    A    L             (v 6.2.2010)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
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DATE: 03-08-2023                          TIME: 01:45:27

USER:


COMMENTS: _____________________________________________________


--------------------------------------------------------------------------------
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  ***********************************************
  ** SIMULATION : 21 - 2-YR Chicago W-S         **
  ***********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 696.679
| Ptotal= 32.17 mm |                          B=   4.957
--------------------                          C=   0.811
                       used in:   INTENSITY =  A / (t + B)^C

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

    TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
     hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
    0.00    1.90 |  1.00   16.52 |'  2.00    4.64 |  3.00    2.27
    0.17    2.19 |  1.17   77.67 |'  2.17    3.92 |  3.17    2.10
    0.33    2.59 |  1.33   21.92 |'  2.33    3.41 |  3.33    1.96
    0.50    3.21 |  1.50   11.14 |'  2.50    3.02 |  3.50    1.84
    0.67    4.28 |  1.67    7.52 |'  2.67    2.72 |  3.67    1.73
    0.83    6.61 |  1.83    5.72 |'  2.83    2.47 |  3.83    1.64

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0041)|   Area     (ha)=   6.56   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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

                          ---- TRANSFORMED HYETOGRAPH ----
    TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
     hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
   0.083    1.90 | 1.083   16.52 | 2.083    4.64 |  3.08    2.27
   0.167    1.90 | 1.167   16.52 | 2.167    4.64 |  3.17    2.27
   0.250    2.19 | 1.250   77.67 | 2.250    3.92 |  3.25    2.10
   0.333    2.19 | 1.333   77.67 | 2.333    3.92 |  3.33    2.10
   0.417    2.59 | 1.417   21.92 | 2.417    3.41 |  3.42    1.96
   0.500    2.59 | 1.500   21.92 | 2.500    3.41 |  3.50    1.96
   0.583    3.21 | 1.583   11.14 | 2.583    3.02 |  3.58    1.84
   0.667    3.21 | 1.667   11.14 | 2.667    3.02 |  3.67    1.84
   0.750    4.28 | 1.750    7.52 | 2.750    2.72 |  3.75    1.73
   0.833    4.28 | 1.833    7.52 | 2.833    2.72 |  3.83    1.73
   0.917    6.61 | 1.917    5.72 | 2.917    2.47 |  3.92    1.64
   1.000    6.61 | 2.000    5.72 | 3.000    2.47 |  4.00    1.64

    Unit Hyd Qpeak  (cms)=   1.790

    PEAK FLOW       (cms)=   0.156 (i)
    TIME TO PEAK    (hrs)=   1.500
    RUNOFF VOLUME    (mm)=   7.253
    TOTAL RAINFALL   (mm)=  32.167
    RUNOFF COEFFICIENT   =   0.225

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

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0040)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
             <------ DATA FOR SECTION (   1.1) ------>
             Distance      Elevation       Manning
                 0.00         101.50        0.0500
                 1.00         100.70        0.0500
                 1.50         100.55    0.0500 /0.0300  Main Channel
                 2.00          99.50        0.0300      Main Channel
                 3.50          99.60        0.0300      Main Channel
                 4.50         100.65    0.0300 /0.0500  Main Channel
```

6.00 101.45 0.0500

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	99.60	.185E+02	0.0	0.54	8.09
0.19	99.69	.587E+02	0.2	1.04	4.22
0.29	99.79	.102E+03	0.5	1.38	3.16
0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	0.16	1.50	7.25	0.15	0.76
OUTFLOW: ID= 1 (0040)	6.56	0.14	1.58	7.25	0.15	0.73

CALIB					
NASHYD (0052)	Area (ha)=	0.08	Curve Number (CN)=	80.0	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.11			

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.90	1.083	16.52	2.083	4.64	3.08	2.27
0.167	1.90	1.167	16.52	2.167	4.64	3.17	2.27
0.250	2.19	1.250	77.67	2.250	3.92	3.25	2.10
0.333	2.19	1.333	77.67	2.333	3.92	3.33	2.10
0.417	2.59	1.417	21.92	2.417	3.41	3.42	1.96
0.500	2.59	1.500	21.92	2.500	3.41	3.50	1.96
0.583	3.21	1.583	11.14	2.583	3.02	3.58	1.84
0.667	3.21	1.667	11.14	2.667	3.02	3.67	1.84
0.750	4.28	1.750	7.52	2.750	2.72	3.75	1.73
0.833	4.28	1.833	7.52	2.833	2.72	3.83	1.73
0.917	6.61	1.917	5.72	2.917	2.47	3.92	1.64
1.000	6.61	2.000	5.72	3.000	2.47	4.00	1.64

Unit Hyd Qpeak (cms)= 0.026

PEAK FLOW (cms)= 0.002 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 7.987
TOTAL RAINFALL (mm)= 32.167
RUNOFF COEFFICIENT = 0.248

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

CALIB					
STANDHYD (0043)	Area (ha)=	2.03			
ID= 1 DT= 5.0 min	Total Imp(%)=	63.00	Dir. Conn.(%)=	63.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.28	0.75
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.30	2.00
Length	(m)=	116.33	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	1.90	1.083	16.52	2.083	4.64	3.08	2.27
0.167	1.90	1.167	16.52	2.167	4.64	3.17	2.27
0.250	2.19	1.250	77.67	2.250	3.92	3.25	2.10
0.333	2.19	1.333	77.67	2.333	3.92	3.33	2.10
0.417	2.59	1.417	21.92	2.417	3.41	3.42	1.96
0.500	2.59	1.500	21.92	2.500	3.41	3.50	1.96
0.583	3.21	1.583	11.14	2.583	3.02	3.58	1.84
0.667	3.21	1.667	11.14	2.667	3.02	3.67	1.84
0.750	4.28	1.750	7.52	2.750	2.72	3.75	1.73
0.833	4.28	1.833	7.52	2.833	2.72	3.83	1.73
0.917	6.61	1.917	5.72	2.917	2.47	3.92	1.64
1.000	6.61	2.000	5.72	3.000	2.47	4.00	1.64

				TOTALS
Max.Eff.Inten.(mm/hr)=	77.67	11.64		
over (min)	5.00	20.00		
Storage Coeff. (min)=	2.86 (ii)	19.54 (ii)		
Unit Hyd. Tpeak (min)=	5.00	20.00		
Unit Hyd. peak (cms)=	0.28	0.06		
PEAK FLOW (cms)=	0.27	0.01	0.273 (iii)	
TIME TO PEAK (hrs)=	1.33	1.58	1.33	
RUNOFF VOLUME (mm)=	31.17	8.14	22.64	
TOTAL RAINFALL (mm)=	32.17	32.17	32.17	
RUNOFF COEFFICIENT =	0.97	0.25	0.70	

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
STANDHYD (0048)	Area (ha)=	0.24			
ID= 1 DT= 5.0 min	Total Imp(%)=	99.00	Dir. Conn.(%)=	99.00	

	IMPERVIOUS	PERVIOUS (i)

Surface Area	(ha)=	0.24	0.00
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	40.00	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	1.90	1.083	16.52	2.083	4.64	3.08	2.27
0.167	1.90	1.167	16.52	2.167	4.64	3.17	2.27
0.250	2.19	1.250	77.67	2.250	3.92	3.25	2.10
0.333	2.19	1.333	77.67	2.333	3.92	3.33	2.10
0.417	2.59	1.417	21.92	2.417	3.41	3.42	1.96
0.500	2.59	1.500	21.92	2.500	3.41	3.50	1.96
0.583	3.21	1.583	11.14	2.583	3.02	3.58	1.84
0.667	3.21	1.667	11.14	2.667	3.02	3.67	1.84
0.750	4.28	1.750	7.52	2.750	2.72	3.75	1.73
0.833	4.28	1.833	7.52	2.833	2.72	3.83	1.73
0.917	6.61	1.917	5.72	2.917	2.47	3.92	1.64
1.000	6.61	2.000	5.72	3.000	2.47	4.00	1.64

Max.Eff.Inten.	(mm/hr)=	77.67	15.35	
over	(min)	5.00	5.00	
Storage Coeff.	(min)=	1.63 (ii)	2.87 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	5.00	
Unit Hyd. peak	(cms)=	0.32	0.28	
				TOTALS
PEAK FLOW	(cms)=	0.05	0.00	0.051 (iii)
TIME TO PEAK	(hrs)=	1.33	1.33	1.33
RUNOFF VOLUME	(mm)=	31.17	8.14	30.93
TOTAL RAINFALL	(mm)=	32.17	32.17	32.17
RUNOFF COEFFICIENT	=	0.97	0.25	0.96

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0050)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0128	0.0103

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0048)	0.240	0.051	1.33	30.93
OUTFLOW: ID= 1 (0050)	0.240	0.006	1.75	30.10

PEAK FLOW REDUCTION [Qout/Qin](%)= 11.28
TIME SHIFT OF PEAK FLOW (min)= 25.00
MAXIMUM STORAGE USED (ha.m.)= 0.0047

ADD HYD (0049)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0043):	2.03	0.273	1.33	22.64
	+ ID2= 2 (0050):	0.24	0.006	1.75	30.10
	ID = 3 (0049):	2.27	0.277	1.33	23.43

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0051)	Area (ha)= 1.68		
ID= 1 DT= 5.0 min	Total Imp(%)= 99.00	Dir. Conn.(%)= 99.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.66	0.02
Dep. Storage	(mm)=	5.00	1.50
Average Slope	(%)=	1.20	2.00
Length	(m)=	105.83	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.90	1.083	16.52	2.083	4.64	3.08	2.27
0.167	1.90	1.167	16.52	2.167	4.64	3.17	2.27
0.250	2.19	1.250	77.67	2.250	3.92	3.25	2.10
0.333	2.19	1.333	77.67	2.333	3.92	3.33	2.10
0.417	2.59	1.417	21.92	2.417	3.41	3.42	1.96
0.500	2.59	1.500	21.92	2.500	3.41	3.50	1.96
0.583	3.21	1.583	11.14	2.583	3.02	3.58	1.84
0.667	3.21	1.667	11.14	2.667	3.02	3.67	1.84
0.750	4.28	1.750	7.52	2.750	2.72	3.75	1.73
0.833	4.28	1.833	7.52	2.833	2.72	3.83	1.73
0.917	6.61	1.917	5.72	2.917	2.47	3.92	1.64
1.000	6.61	2.000	5.72	3.000	2.47	4.00	1.64

Max.Eff.Inten.	(mm/hr)=	77.67	21.10	
over	(min)	5.00	5.00	
Storage Coeff.	(min)=	2.77 (ii)	4.01 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	5.00	
Unit Hyd. peak	(cms)=	0.28	0.24	
				TOTALS
PEAK FLOW	(cms)=	0.35	0.00	0.352 (iii)
TIME TO PEAK	(hrs)=	1.33	1.33	1.33
RUNOFF VOLUME	(mm)=	27.17	9.99	26.99
TOTAL RAINFALL	(mm)=	32.17	32.17	32.17
RUNOFF COEFFICIENT	=	0.84	0.31	0.84

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 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  (  0046)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0049):     2.27   0.277     1.33    23.43
     + ID2= 2 (  0051):     1.68   0.352     1.33    26.99
       ================================================
       ID = 3 (  0046):     3.95   0.629     1.33    24.95

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0047)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.1630      0.2697
                         0.0080     0.0487   |   0.1700      0.2885
                         0.0100     0.0674   |   0.1720      0.2960
                         0.0880     0.1049   |   0.1760      0.3072
                         0.1040     0.1311   |   0.1770      0.3109
                         0.1170     0.1573   |   0.1800      0.3184
                         0.1260     0.1761   |   0.1870      0.3409
                         0.1300     0.1836   |   0.1880      0.3447
                         0.1570     0.2510   |   0.1910      0.3559

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0046)     3.950     0.629     1.33      24.95
   OUTFLOW: ID= 1 (  0047)     3.950     0.028     3.00      24.56

                 PEAK   FLOW   REDUCTION [Qout/Qin](%)=  4.41
                 TIME SHIFT OF PEAK FLOW         (min)=100.00
                 MAXIMUM  STORAGE   USED       (ha.m.)=  0.0759

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

--------------------
| ADD HYD  (  0039)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0040):     6.56   0.143     1.58     7.25
     + ID2= 2 (  0047):     3.95   0.028     3.00    24.56
       ================================================
       ID = 3 (  0039):    10.51   0.152     1.58    13.75

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

--------------------
| ADD HYD  (  0039)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0039):    10.51   0.152     1.58    13.75
     + ID2= 2 (  0052):     0.08   0.002     1.42     7.99
       ================================================
       ID = 1 (  0039):    10.59   0.154     1.58    13.71

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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================================================================================
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      V    V   I    SSSSS  U   U    A    L             (v 6.2.2010)
```

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

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
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DATE: 03-08-2023                          TIME: 01:45:26

USER:



COMMENTS: _____________________________________________________

--------------------------------------------------------------------------------
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  ********************************************
  ** SIMULATION : 22 - 5-YR Chicago W-S       **
  ********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1015.963
| Ptotal= 43.15 mm |                          B=   5.255
--------------------                          C=   0.826
                         used in:   INTENSITY =  A / (t + B)^C

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

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    2.39 |  1.00   22.43 |  2.00    6.02 |  3.00    2.87
                0.17    2.76 |  1.17  107.00 |  2.17    5.05 |  3.17    2.65
                0.33    3.29 |  1.33   29.97 |  2.33    4.37 |  3.33    2.47
                0.50    4.10 |  1.50   14.93 |  2.50    3.85 |  3.50    2.31
                0.67    5.53 |  1.67    9.93 |  2.67    3.45 |  3.67    2.17
                0.83    8.69 |  1.83    7.48 |  2.83    3.13 |  3.83    2.05

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0041)|   Area    (ha)=   6.56   Curve Number   (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
```

---------- U.H. Tp(hrs)= 0.14

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.39	1.083	22.43	2.083	6.02	3.08	2.87
0.167	2.39	1.167	22.43	2.167	6.02	3.17	2.87
0.250	2.76	1.250	107.00	2.250	5.05	3.25	2.65
0.333	2.76	1.333	107.00	2.333	5.05	3.33	2.65
0.417	3.29	1.417	29.97	2.417	4.37	3.42	2.47
0.500	3.29	1.500	29.97	2.500	4.37	3.50	2.47
0.583	4.10	1.583	14.93	2.583	3.85	3.58	2.31
0.667	4.10	1.667	14.93	2.667	3.85	3.67	2.31
0.750	5.53	1.750	9.93	2.750	3.45	3.75	2.17
0.833	5.53	1.833	9.93	2.833	3.45	3.83	2.17
0.917	8.69	1.917	7.48	2.917	3.13	3.92	2.05
1.000	8.69	2.000	7.48	3.000	3.13	4.00	2.05

Unit Hyd Qpeak (cms)= 1.790

PEAK FLOW (cms)= 0.336 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 13.489
TOTAL RAINFALL (mm)= 43.150
RUNOFF COEFFICIENT = 0.313

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

ROUTE CHN(0040)
IN= 2---> OUT= 1	Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	101.50	0.0500	
1.00	100.70	0.0500	
1.50	100.55	0.0500 /0.0300	Main Channel
2.00	99.50	0.0300	Main Channel
3.50	99.60	0.0300	Main Channel
4.50	100.65	0.0300 /0.0500	Main Channel
6.00	101.45	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	99.60	.185E+02	0.0	0.54	8.09
0.19	99.69	.587E+02	0.2	1.04	4.22
0.29	99.79	.102E+03	0.5	1.38	3.16
0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	0.34	1.42	13.49	0.22	1.13
OUTFLOW: ID= 1 (0040)	6.56	0.35	1.50	13.49	0.23	1.14

CALIB					
NASHYD (0052)	Area (ha)= 0.08		Curve Number (CN)= 80.0		
ID= 1 DT= 5.0 min	Ia (mm)= 5.00		# of Linear Res.(N)= 3.00		
	U.H. Tp(hrs)= 0.11				

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.39	1.083	22.43	2.083	6.02	3.08	2.87
0.167	2.39	1.167	22.43	2.167	6.02	3.17	2.87
0.250	2.76	1.250	107.00	2.250	5.05	3.25	2.65
0.333	2.76	1.333	107.00	2.333	5.05	3.33	2.65
0.417	3.29	1.417	29.97	2.417	4.37	3.42	2.47
0.500	3.29	1.500	29.97	2.500	4.37	3.50	2.47
0.583	4.10	1.583	14.93	2.583	3.85	3.58	2.31
0.667	4.10	1.667	14.93	2.667	3.85	3.67	2.31
0.750	5.53	1.750	9.93	2.750	3.45	3.75	2.17
0.833	5.53	1.833	9.93	2.833	3.45	3.83	2.17
0.917	8.69	1.917	7.48	2.917	3.13	3.92	2.05
1.000	8.69	2.000	7.48	3.000	3.13	4.00	2.05

Unit Hyd Qpeak (cms)= 0.026

PEAK FLOW (cms)= 0.005 (i)
TIME TO PEAK (hrs)= 1.333
RUNOFF VOLUME (mm)= 14.050
TOTAL RAINFALL (mm)= 43.150
RUNOFF COEFFICIENT = 0.326

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

CALIB			
STANDHYD (0043)	Area (ha)= 2.03		
ID= 1 DT= 5.0 min	Total Imp(%)= 63.00	Dir. Conn.(%)= 63.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.28	0.75
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.30	2.00
Length (m)=	116.33	40.00
Mannings n =	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.39	1.083	22.43	2.083	6.02	3.08	2.87
0.167	2.39	1.167	22.43	2.167	6.02	3.17	2.87
0.250	2.76	1.250	107.00	2.250	5.05	3.25	2.65
0.333	2.76	1.333	107.00	2.333	5.05	3.33	2.65
0.417	3.29	1.417	29.97	2.417	4.37	3.42	2.47
0.500	3.29	1.500	29.97	2.500	4.37	3.50	2.47
0.583	4.10	1.583	14.93	2.583	3.85	3.58	2.31
0.667	4.10	1.667	14.93	2.667	3.85	3.67	2.31
0.750	5.53	1.750	9.93	2.750	3.45	3.75	2.17
0.833	5.53	1.833	9.93	2.833	3.45	3.83	2.17
0.917	8.69	1.917	7.48	2.917	3.13	3.92	2.05
1.000	8.69	2.000	7.48	3.000	3.13	4.00	2.05

Max.Eff.Inten.(mm/hr)=	107.00	24.83		
over (min)	5.00	15.00		
Storage Coeff. (min)=	2.52 (ii)	14.84 (ii)		
Unit Hyd. Tpeak (min)=	5.00	15.00		
Unit Hyd. peak (cms)=	0.29	0.08		
			TOTALS	
PEAK FLOW (cms)=	0.37	0.03	0.388 (iii)	
TIME TO PEAK (hrs)=	1.33	1.50	1.33	
RUNOFF VOLUME (mm)=	42.15	14.32	31.85	
TOTAL RAINFALL (mm)=	43.15	43.15	43.15	
RUNOFF COEFFICIENT =	0.98	0.33	0.74	

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0048)	Area (ha)= 0.24
ID= 1 DT= 5.0 min	Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.24	0.00
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	40.00	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.39	1.083	22.43	2.083	6.02	3.08	2.87
0.167	2.39	1.167	22.43	2.167	6.02	3.17	2.87
0.250	2.76	1.250	107.00	2.250	5.05	3.25	2.65
0.333	2.76	1.333	107.00	2.333	5.05	3.33	2.65
0.417	3.29	1.417	29.97	2.417	4.37	3.42	2.47
0.500	3.29	1.500	29.97	2.500	4.37	3.50	2.47
0.583	4.10	1.583	14.93	2.583	3.85	3.58	2.31
0.667	4.10	1.667	14.93	2.667	3.85	3.67	2.31
0.750	5.53	1.750	9.93	2.750	3.45	3.75	2.17
0.833	5.53	1.833	9.93	2.833	3.45	3.83	2.17
0.917	8.69	1.917	7.48	2.917	3.13	3.92	2.05
1.000	8.69	2.000	7.48	3.000	3.13	4.00	2.05

Max.Eff.Inten.(mm/hr)=	107.00	30.48		
over (min)	5.00	5.00		
Storage Coeff. (min)=	1.43 (ii)	2.53 (ii)		
Unit Hyd. Tpeak (min)=	5.00	5.00		
Unit Hyd. peak (cms)=	0.33	0.29		
			TOTALS	
PEAK FLOW (cms)=	0.07	0.00	0.071 (iii)	
TIME TO PEAK (hrs)=	1.33	1.33	1.33	
RUNOFF VOLUME (mm)=	42.15	14.32	41.87	
TOTAL RAINFALL (mm)=	43.15	43.15	43.15	
RUNOFF COEFFICIENT =	0.98	0.33	0.97	

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0050)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0128	0.0103

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0048)	0.240	0.071	1.33	41.87
OUTFLOW: ID= 1 (0050)	0.240	0.008	1.75	41.05

PEAK FLOW REDUCTION [Qout/Qin](%)= 11.21
TIME SHIFT OF PEAK FLOW (min)= 25.00
MAXIMUM STORAGE USED (ha.m.)= 0.0064

ADD HYD (0049)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0043):	2.03	0.388	1.33	31.85
+ ID2= 2 (0050):	0.24	0.008	1.75	41.05
ID = 3 (0049):	2.27	0.394	1.33	32.82

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	
STANDHYD (0051)	Area (ha)= 1.68
ID= 1 DT= 5.0 min	Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.66	0.02
Dep. Storage	(mm)=	5.00	1.50
Average Slope	(%)=	1.20	2.00

```
     Length            (m)=     105.83        40.00
     Mannings n            =      0.013        0.250

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


                          ---- TRANSFORMED HYETOGRAPH ----
               TIME     RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs    mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
              0.083     2.39 | 1.083   22.43 | 2.083    6.02 |  3.08    2.87
              0.167     2.39 | 1.167   22.43 | 2.167    6.02 |  3.17    2.87
              0.250     2.76 | 1.250  107.00 | 2.250    5.05 |  3.25    2.65
              0.333     2.76 | 1.333  107.00 | 2.333    5.05 |  3.33    2.65
              0.417     3.29 | 1.417   29.97 | 2.417    4.37 |  3.42    2.47
              0.500     3.29 | 1.500   29.97 | 2.500    4.37 |  3.50    2.47
              0.583     4.10 | 1.583   14.93 | 2.583    3.85 |  3.58    2.31
              0.667     4.10 | 1.667   14.93 | 2.667    3.85 |  3.67    2.31
              0.750     5.53 | 1.750    9.93 | 2.750    3.45 |  3.75    2.17
              0.833     5.53 | 1.833    9.93 | 2.833    3.45 |  3.83    2.17
              0.917     8.69 | 1.917    7.48 | 2.917    3.13 |  3.92    2.05
              1.000     8.69 | 2.000    7.48 | 3.000    3.13 |  4.00    2.05

     Max.Eff.Inten.(mm/hr)=     107.00        37.18
               over (min)          5.00         5.00
     Storage Coeff.  (min)=       2.44 (ii)    3.53 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.30         0.26
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.49         0.00      0.490 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33       1.33
     RUNOFF VOLUME    (mm)=      38.15        16.50      37.93
     TOTAL RAINFALL   (mm)=      43.15        43.15      43.15
     RUNOFF COEFFICIENT   =       0.88         0.38       0.88

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  80.0    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  (  0046)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
       ID1= 1 (  0049):      2.27   0.394     1.33    32.82
     + ID2= 2 (  0051):      1.68   0.490     1.33    37.93
       ================================================
       ID = 3 (  0046):      3.95   0.883     1.33    35.00

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0047)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)  |    (cms)     (ha.m.)
                         0.0000     0.0000   |   0.1630      0.2697
                         0.0080     0.0487   |   0.1700      0.2885
                         0.0100     0.0674   |   0.1720      0.2960
                         0.0880     0.1049   |   0.1760      0.3072
                         0.1040     0.1311   |   0.1770      0.3109
                         0.1170     0.1573   |   0.1800      0.3184
                         0.1260     0.1761   |   0.1870      0.3409
                         0.1300     0.1836   |   0.1880      0.3447
                         0.1570     0.2510   |   0.1910      0.3559

                                   AREA     QPEAK     TPEAK       R.V.
                                   (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0046)        3.950     0.883      1.33       35.00
   OUTFLOW: ID= 1 (  0047)        3.950     0.066      2.17       34.60

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.45
                  TIME SHIFT OF PEAK FLOW          (min)= 50.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0943

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

--------------------
| ADD HYD  (  0039)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
       ID1= 1 (  0040):      6.56   0.347     1.50    13.49
     + ID2= 2 (  0047):      3.95   0.066     2.17    34.60
       ================================================
       ID = 3 (  0039):     10.51   0.379     1.50    21.42

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

--------------------
| ADD HYD  (  0039)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
       ID1= 3 (  0039):     10.51   0.379     1.50    21.42
     + ID2= 2 (  0052):      0.08   0.005     1.33    14.05
       ================================================
       ID = 1 (  0039):     10.59   0.383     1.50    21.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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       V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
       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\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\5d514a60-7abd-4110-9975-c51f4582cf8e\
```

```
  Summary filename: C:\Users\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\5d514a60-7abd-4110-9975-c51f4582cf8e\


DATE: 03-08-2023                          TIME: 01:45:26

USER:


COMMENTS: _____________________________________________________
```

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--------------------------------------------------------------------------------
--------------------
  ***********************************************
  ** SIMULATION : 23 - 10-YR Chicago W-S        **
  ***********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1279.709
| Ptotal= 49.97 mm |                          B=   5.715
--------------------                          C=   0.841
                       used in:   INTENSITY =  A / (t + B)^C

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	2.59	1.00	26.46	2.00	6.76	3.00	3.13
0.17	3.01	1.17	126.19	2.17	5.63	3.17	2.89
0.33	3.61	1.33	35.58	2.33	4.84	3.33	2.68
0.50	4.54	1.50	17.38	2.50	4.25	3.50	2.50
0.67	6.19	1.67	11.39	2.67	3.79	3.67	2.35
0.83	9.92	1.83	8.47	2.83	3.43	3.83	2.21

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0041)|   Area     (ha)=   6.56   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.59	1.083	26.46	2.083	6.76	3.08	3.13
0.167	2.59	1.167	26.46	2.167	6.76	3.17	3.13
0.250	3.01	1.250	126.19	2.250	5.63	3.25	2.89
0.333	3.01	1.333	126.19	2.333	5.63	3.33	2.89
0.417	3.61	1.417	35.58	2.417	4.84	3.42	2.68
0.500	3.61	1.500	35.58	2.500	4.84	3.50	2.68
0.583	4.54	1.583	17.38	2.583	4.25	3.58	2.50
0.667	4.54	1.667	17.38	2.667	4.25	3.67	2.50
0.750	6.19	1.750	11.39	2.750	3.79	3.75	2.35
0.833	6.19	1.833	11.39	2.833	3.79	3.83	2.35
0.917	9.92	1.917	8.47	2.917	3.43	3.92	2.21
1.000	9.92	2.000	8.47	3.000	3.43	4.00	2.21

```
     Unit Hyd Qpeak  (cms)=   1.790

     PEAK FLOW       (cms)=   0.478 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=  17.888
     TOTAL RAINFALL   (mm)=  49.968
     RUNOFF COEFFICIENT   =   0.358

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

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0040)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         101.50        0.0500
                   1.00         100.70        0.0500
                   1.50         100.55    0.0500 /0.0300  Main Channel
                   2.00          99.50        0.0300      Main Channel
                   3.50          99.60        0.0300      Main Channel
                   4.50         100.65    0.0300 /0.0500  Main Channel
                   6.00         101.45        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY    TRAV.TIME
        (m)       (m)     (cu.m.)      (cms)        (m/s)       (min)
       0.10     99.60    .185E+02        0.0         0.54        8.09
       0.19     99.69    .587E+02        0.2         1.04        4.22
       0.29     99.79    .102E+03        0.5         1.38        3.16
       0.38     99.88    .149E+03        0.9         1.66        2.64
       0.48     99.98    .200E+03        1.4         1.88        2.32
       0.57    100.07    .254E+03        2.0         2.08        2.10
       0.67    100.17    .311E+03        2.7         2.26        1.93
       0.76    100.26    .372E+03        3.4         2.42        1.81
       0.86    100.36    .436E+03        4.3         2.57        1.70
       0.95    100.45    .503E+03        5.2         2.70        1.61
       1.05    100.55    .574E+03        6.2         2.83        1.54
       1.16    100.66    .667E+03        7.7         3.02        1.45
       1.28    100.78    .774E+03        9.5         3.22        1.35
       1.39    100.89    .892E+03       11.6         3.40        1.29
       1.50    101.00    .102E+04       13.8         3.54        1.23
       1.61    101.11    .116E+04       16.3         3.67        1.19
       1.72    101.22    .131E+04       18.9         3.79        1.15
       1.84    101.34    .147E+04       21.8         3.90        1.12
       1.95    101.45    .164E+04       25.0         4.00        1.09
```

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	0.48	1.42	17.89	0.27	1.29
OUTFLOW: ID= 1 (0040)	6.56	0.50	1.50	17.88	0.27	1.31

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0052)|   Area     (ha)=   0.08   Curve Number    (CN)= 80.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11
```

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.59	1.083	26.46	2.083	6.76	3.08	3.13
0.167	2.59	1.167	26.46	2.167	6.76	3.17	3.13
0.250	3.01	1.250	126.19	2.250	5.63	3.25	2.89
0.333	3.01	1.333	126.19	2.333	5.63	3.33	2.89
0.417	3.61	1.417	35.58	2.417	4.84	3.42	2.68
0.500	3.61	1.500	35.58	2.500	4.84	3.50	2.68
0.583	4.54	1.583	17.38	2.583	4.25	3.58	2.50
0.667	4.54	1.667	17.38	2.667	4.25	3.67	2.50
0.750	6.19	1.750	11.39	2.750	3.79	3.75	2.35
0.833	6.19	1.833	11.39	2.833	3.79	3.83	2.35
0.917	9.92	1.917	8.47	2.917	3.43	3.92	2.21
1.000	9.92	2.000	8.47	3.000	3.43	4.00	2.21

Unit Hyd Qpeak	(cms)=	0.026	
PEAK FLOW	(cms)=	0.007	(i)
TIME TO PEAK	(hrs)=	1.333	
RUNOFF VOLUME	(mm)=	18.294	
TOTAL RAINFALL	(mm)=	49.968	
RUNOFF COEFFICIENT	=	0.366	

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

CALIB	
STANDHYD (0043)	Area (ha)= 2.03
ID= 1 DT= 5.0 min	Total Imp(%)= 63.00 Dir. Conn.(%)= 63.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.28	0.75
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.30	2.00
Length	(m)=	116.33	40.00
Mannings n	=	0.013	0.250

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.59	1.083	26.46	2.083	6.76	3.08	3.13
0.167	2.59	1.167	26.46	2.167	6.76	3.17	3.13
0.250	3.01	1.250	126.19	2.250	5.63	3.25	2.89
0.333	3.01	1.333	126.19	2.333	5.63	3.33	2.89
0.417	3.61	1.417	35.58	2.417	4.84	3.42	2.68
0.500	3.61	1.500	35.58	2.500	4.84	3.50	2.68
0.583	4.54	1.583	17.38	2.583	4.25	3.58	2.50
0.667	4.54	1.667	17.38	2.667	4.25	3.67	2.50
0.750	6.19	1.750	11.39	2.750	3.79	3.75	2.35
0.833	6.19	1.833	11.39	2.833	3.79	3.83	2.35
0.917	9.92	1.917	8.47	2.917	3.43	3.92	2.21
1.000	9.92	2.000	8.47	3.000	3.43	4.00	2.21

Max.Eff.Inten.	(mm/hr)=	126.19	41.89	
	over (min)	5.00	15.00	
Storage Coeff.	(min)=	2.36 (ii)	12.35 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	15.00	
Unit Hyd. peak	(cms)=	0.30	0.08	
				TOTALS
PEAK FLOW	(cms)=	0.44	0.05	0.465 (iii)
TIME TO PEAK	(hrs)=	1.33	1.50	1.33
RUNOFF VOLUME	(mm)=	48.97	18.64	37.74
TOTAL RAINFALL	(mm)=	49.97	49.97	49.97
RUNOFF COEFFICIENT	=	0.98	0.37	0.76

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0048)	Area (ha)= 0.24
ID= 1 DT= 5.0 min	Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.24	0.00
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	40.00	40.00
Mannings n	=	0.013	0.250

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.59	1.083	26.46	2.083	6.76	3.08	3.13
0.167	2.59	1.167	26.46	2.167	6.76	3.17	3.13
0.250	3.01	1.250	126.19	2.250	5.63	3.25	2.89
0.333	3.01	1.333	126.19	2.333	5.63	3.33	2.89
0.417	3.61	1.417	35.58	2.417	4.84	3.42	2.68
0.500	3.61	1.500	35.58	2.500	4.84	3.50	2.68
0.583	4.54	1.583	17.38	2.583	4.25	3.58	2.50
0.667	4.54	1.667	17.38	2.667	4.25	3.67	2.50
0.750	6.19	1.750	11.39	2.750	3.79	3.75	2.35
0.833	6.19	1.833	11.39	2.833	3.79	3.83	2.35
0.917	9.92	1.917	8.47	2.917	3.43	3.92	2.21
1.000	9.92	2.000	8.47	3.000	3.43	4.00	2.21

Max.Eff.Inten.	(mm/hr)=	126.19	41.89	
	over (min)	5.00	5.00	
Storage Coeff.	(min)=	1.34 (ii)	2.37 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	5.00	
Unit Hyd. peak	(cms)=	0.33	0.30	
				TOTALS
PEAK FLOW	(cms)=	0.08	0.00	0.084 (iii)
TIME TO PEAK	(hrs)=	1.33	1.33	1.33
RUNOFF VOLUME	(mm)=	48.97	18.64	48.66
TOTAL RAINFALL	(mm)=	49.97	49.97	49.97
RUNOFF COEFFICIENT	=	0.98	0.37	0.97

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

```
           CN*  =  80.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0050)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.0128      0.0103

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0048)      0.240     0.084      1.33      48.66
   OUTFLOW: ID= 1 (  0050)      0.240     0.009      1.75      47.85

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 11.17
                  TIME SHIFT OF PEAK FLOW         (min)= 25.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0075

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

--------------------
| ADD HYD  (  0049)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0043):     2.03   0.465     1.33    37.74
     + ID2= 2 (  0050):     0.24   0.009     1.75    47.85
       ================================================
       ID = 3 (  0049):     2.27   0.471     1.33    38.81

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0051)|   Area     (ha)=   1.68
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       1.66         0.02
    Dep. Storage     (mm)=       5.00         1.50
    Average Slope     (%)=       1.20         2.00
    Length            (m)=     105.83        40.00
    Mannings n           =      0.013        0.250

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

                        ---- TRANSFORMED HYETOGRAPH ----
  TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
 0.083    2.59 | 1.083   26.46 | 2.083    6.76 |  3.08    3.13
 0.167    2.59 | 1.167   26.46 | 2.167    6.76 |  3.17    3.13
 0.250    3.01 | 1.250  126.19 | 2.250    5.63 |  3.25    2.89
 0.333    3.01 | 1.333  126.19 | 2.333    5.63 |  3.33    2.89
 0.417    3.61 | 1.417   35.58 | 2.417    4.84 |  3.42    2.68
 0.500    3.61 | 1.500   35.58 | 2.500    4.84 |  3.50    2.68
 0.583    4.54 | 1.583   17.38 | 2.583    4.25 |  3.58    2.50
 0.667    4.54 | 1.667   17.38 | 2.667    4.25 |  3.67    2.50
 0.750    6.19 | 1.750   11.39 | 2.750    3.79 |  3.75    2.35
 0.833    6.19 | 1.833   11.39 | 2.833    3.79 |  3.83    2.35
 0.917    9.92 | 1.917    8.47 | 2.917    3.43 |  3.92    2.21
 1.000    9.92 | 2.000    8.47 | 3.000    3.43 |  4.00    2.21

    Max.Eff.Inten.(mm/hr)=     126.19        49.06
              over (min)          5.00         5.00
    Storage Coeff.  (min)=       2.28 (ii)    3.30 (ii)
    Unit Hyd. Tpeak (min)=       5.00         5.00
    Unit Hyd. peak  (cms)=       0.30         0.27
                                                          *TOTALS*
    PEAK FLOW       (cms)=       0.58         0.00          0.580 (iii)
    TIME TO PEAK    (hrs)=       1.33         1.33           1.33
    RUNOFF VOLUME    (mm)=      44.97        20.98          44.73
    TOTAL RAINFALL   (mm)=      49.97        49.97          49.97
    RUNOFF COEFFICIENT   =       0.90         0.42           0.90

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  80.0    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  (  0046)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0049):     2.27   0.471     1.33    38.81
     + ID2= 2 (  0051):     1.68   0.580     1.33    44.73
       ================================================
       ID = 3 (  0046):     3.95   1.051     1.33    41.33

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0047)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.1630      0.2697
                         0.0080     0.0487   |   0.1700      0.2885
                         0.0100     0.0674   |   0.1720      0.2960
                         0.0880     0.1049   |   0.1760      0.3072
                         0.1040     0.1311   |   0.1770      0.3109
                         0.1170     0.1573   |   0.1800      0.3184
                         0.1260     0.1761   |   0.1870      0.3409
                         0.1300     0.1836   |   0.1880      0.3447
                         0.1570     0.2510   |   0.1910      0.3559

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0046)      3.950     1.051      1.33      41.33
   OUTFLOW: ID= 1 (  0047)      3.950     0.090      2.08      40.94

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  8.55
                  TIME SHIFT OF PEAK FLOW         (min)= 45.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1080

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

--------------------
| ADD HYD  (  0039)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
```

```
--------------------          (ha)     (cms)     (hrs)      (mm)
        ID1= 1 (  0040):     6.56    0.497     1.50     17.88
      + ID2= 2 (  0047):     3.95    0.090     2.08     40.94
        ================================================
        ID = 3 (  0039):    10.51    0.559     1.50     26.55

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

--------------------
| ADD HYD  (  0039)|
|   3 +  2 =  1    |          AREA     QPEAK     TPEAK      R.V.
--------------------          (ha)     (cms)     (hrs)      (mm)
        ID1= 3 (  0039):    10.51    0.559     1.50     26.55
      + ID2= 2 (  0052):     0.08    0.007     1.33     18.29
        ================================================
        ID = 1 (  0039):    10.59    0.565     1.50     26.49

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

       V    V   I    SSSSS  U   U    A    L             (v 6.2.2010)
       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\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\d0baaebc-e7bb-46c3-a35d-fa636dc090d9\
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DATE: 03-08-2023                          TIME: 01:45:27

USER:


COMMENTS: _____

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  ***********************************************
  ** SIMULATION : 24 - 25-YR Chicago W-S        **
  ***********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1546.810
| Ptotal= 59.08 mm |                          B=   5.746
--------------------                          C=   0.845
                         used in:   INTENSITY =  A / (t + B)^C

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

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    3.00 |  1.00   31.33 |  2.00    7.90 |  3.00    3.64
                0.17    3.49 |  1.17  150.60 |  2.17    6.57 |  3.17    3.35
                0.33    4.19 |  1.33   42.20 |  2.33    5.64 |  3.33    3.11
                0.50    5.28 |  1.50   20.50 |  2.50    4.94 |  3.50    2.90
                0.67    7.22 |  1.67   13.38 |  2.67    4.41 |  3.67    2.72
                0.83   11.64 |  1.83    9.92 |  2.83    3.98 |  3.83    2.56

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0041)|   Area     (ha)=   6.56   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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

                                ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    3.00 | 1.083   31.33 | 2.083    7.90 |  3.08    3.64
               0.167    3.00 | 1.167   31.33 | 2.167    7.90 |  3.17    3.64
               0.250    3.49 | 1.250  150.60 | 2.250    6.57 |  3.25    3.35
               0.333    3.49 | 1.333  150.60 | 2.333    6.57 |  3.33    3.35
               0.417    4.19 | 1.417   42.20 | 2.417    5.64 |  3.42    3.11
               0.500    4.19 | 1.500   42.20 | 2.500    5.64 |  3.50    3.11
               0.583    5.28 | 1.583   20.50 | 2.583    4.94 |  3.58    2.90
               0.667    5.28 | 1.667   20.50 | 2.667    4.94 |  3.67    2.90
               0.750    7.22 | 1.750   13.38 | 2.750    4.41 |  3.75    2.72
               0.833    7.22 | 1.833   13.38 | 2.833    4.41 |  3.83    2.72
               0.917   11.64 | 1.917    9.92 | 2.917    3.98 |  3.92    2.56
               1.000   11.64 | 2.000    9.92 | 3.000    3.98 |  4.00    2.56

    Unit Hyd Qpeak  (cms)=   1.790

    PEAK FLOW       (cms)=   0.680 (i)
    TIME TO PEAK    (hrs)=   1.417
    RUNOFF VOLUME    (mm)=  24.236
    TOTAL RAINFALL   (mm)=  59.076
    RUNOFF COEFFICIENT   =   0.410

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

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0040)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
             <------ DATA FOR SECTION (   1.1) ------>
             Distance      Elevation       Manning
                 0.00         101.50        0.0500
                 1.00         100.70        0.0500
```

1.50	100.55	0.0500 /0.0300	Main Channel
2.00	99.50	0.0300	Main Channel
3.50	99.60	0.0300	Main Channel
4.50	100.65	0.0300 /0.0500	Main Channel
6.00	101.45	0.0500	

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	99.60	.185E+02	0.0	0.54	8.09
0.19	99.69	.587E+02	0.2	1.04	4.22
0.29	99.79	.102E+03	0.5	1.38	3.16
0.38	99.88	.149E+03	0.9	1.66	2.64
0.48	99.98	.200E+03	1.4	1.88	2.32
0.57	100.07	.254E+03	2.0	2.08	2.10
0.67	100.17	.311E+03	2.7	2.26	1.93
0.76	100.26	.372E+03	3.4	2.42	1.81
0.86	100.36	.436E+03	4.3	2.57	1.70
0.95	100.45	.503E+03	5.2	2.70	1.61
1.05	100.55	.574E+03	6.2	2.83	1.54
1.16	100.66	.667E+03	7.7	3.02	1.45
1.28	100.78	.774E+03	9.5	3.22	1.35
1.39	100.89	.892E+03	11.6	3.40	1.29
1.50	101.00	.102E+04	13.8	3.54	1.23
1.61	101.11	.116E+04	16.3	3.67	1.19
1.72	101.22	.131E+04	18.9	3.79	1.15
1.84	101.34	.147E+04	21.8	3.90	1.12
1.95	101.45	.164E+04	25.0	4.00	1.09

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	0.68	1.42	24.24	0.32	1.47
OUTFLOW: ID= 1 (0040)	6.56	0.68	1.50	24.23	0.32	1.47

CALIB					
NASHYD (0052)	Area (ha)=	0.08	Curve Number (CN)=	80.0	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.11			

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	3.00	1.083	31.33	2.083	7.90	3.08	3.64
0.167	3.00	1.167	31.33	2.167	7.90	3.17	3.64
0.250	3.49	1.250	150.60	2.250	6.57	3.25	3.35
0.333	3.49	1.333	150.60	2.333	6.57	3.33	3.35
0.417	4.19	1.417	42.20	2.417	5.64	3.42	3.11
0.500	4.19	1.500	42.20	2.500	5.64	3.50	3.11
0.583	5.28	1.583	20.50	2.583	4.94	3.58	2.90
0.667	5.28	1.667	20.50	2.667	4.94	3.67	2.90
0.750	7.22	1.750	13.38	2.750	4.41	3.75	2.72
0.833	7.22	1.833	13.38	2.833	4.41	3.83	2.72
0.917	11.64	1.917	9.92	2.917	3.98	3.92	2.56
1.000	11.64	2.000	9.92	3.000	3.98	4.00	2.56

Unit Hyd Qpeak (cms)= 0.026

PEAK FLOW (cms)= 0.009 (i)
TIME TO PEAK (hrs)= 1.333
RUNOFF VOLUME (mm)= 24.411
TOTAL RAINFALL (mm)= 59.076
RUNOFF COEFFICIENT = 0.413

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

CALIB			
STANDHYD (0043)	Area (ha)=	2.03	
ID= 1 DT= 5.0 min	Total Imp(%)=	63.00	Dir. Conn.(%)= 63.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.28	0.75
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.30	2.00
Length	(m)=	116.33	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	3.00	1.083	31.33	2.083	7.90	3.08	3.64
0.167	3.00	1.167	31.33	2.167	7.90	3.17	3.64
0.250	3.49	1.250	150.60	2.250	6.57	3.25	3.35
0.333	3.49	1.333	150.60	2.333	6.57	3.33	3.35
0.417	4.19	1.417	42.20	2.417	5.64	3.42	3.11
0.500	4.19	1.500	42.20	2.500	5.64	3.50	3.11
0.583	5.28	1.583	20.50	2.583	4.94	3.58	2.90
0.667	5.28	1.667	20.50	2.667	4.94	3.67	2.90
0.750	7.22	1.750	13.38	2.750	4.41	3.75	2.72
0.833	7.22	1.833	13.38	2.833	4.41	3.83	2.72
0.917	11.64	1.917	9.92	2.917	3.98	3.92	2.56
1.000	11.64	2.000	9.92	3.000	3.98	4.00	2.56

Max.Eff.Inten.(mm/hr)=	150.60	58.29		
over (min)	5.00	10.00		
Storage Coeff. (min)=	2.20 (ii)	7.04 (ii)		
Unit Hyd. Tpeak (min)=	5.00	10.00		
Unit Hyd. peak (cms)=	0.30	0.14		
			TOTALS	
PEAK FLOW (cms)=	0.53	0.09	0.601 (iii)	
TIME TO PEAK (hrs)=	1.33	1.42	1.33	
RUNOFF VOLUME (mm)=	58.08	24.87	45.79	
TOTAL RAINFALL (mm)=	59.08	59.08	59.08	
RUNOFF COEFFICIENT =	0.98	0.42	0.78	

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	

```
| STANDHYD (  0048)|   Area     (ha)=   0.24
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.00
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      40.00        40.00
     Mannings n            =      0.013        0.250

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


                          ---- TRANSFORMED HYETOGRAPH ----
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
              0.083    3.00 | 1.083   31.33 | 2.083    7.90 |  3.08    3.64
              0.167    3.00 | 1.167   31.33 | 2.167    7.90 |  3.17    3.64
              0.250    3.49 | 1.250  150.60 | 2.250    6.57 |  3.25    3.35
              0.333    3.49 | 1.333  150.60 | 2.333    6.57 |  3.33    3.35
              0.417    4.19 | 1.417   42.20 | 2.417    5.64 |  3.42    3.11
              0.500    4.19 | 1.500   42.20 | 2.500    5.64 |  3.50    3.11
              0.583    5.28 | 1.583   20.50 | 2.583    4.94 |  3.58    2.90
              0.667    5.28 | 1.667   20.50 | 2.667    4.94 |  3.67    2.90
              0.750    7.22 | 1.750   13.38 | 2.750    4.41 |  3.75    2.72
              0.833    7.22 | 1.833   13.38 | 2.833    4.41 |  3.83    2.72
              0.917   11.64 | 1.917    9.92 | 2.917    3.98 |  3.92    2.56
              1.000   11.64 | 2.000    9.92 | 3.000    3.98 |  4.00    2.56

     Max.Eff.Inten.(mm/hr)=     150.60        58.29
               over (min)         5.00         5.00
     Storage Coeff.  (min)=       1.25 (ii)    2.20 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.33         0.30
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.10         0.00       0.100 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33        1.33
     RUNOFF VOLUME    (mm)=      58.08        24.87       57.74
     TOTAL RAINFALL   (mm)=      59.08        59.08       59.08
     RUNOFF COEFFICIENT   =       0.98         0.42        0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  80.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0050)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.0128      0.0103

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0048)    0.240     0.100      1.33      57.74
   OUTFLOW: ID= 1 (  0050)    0.240     0.011      1.75      56.91

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 11.14
                  TIME SHIFT OF PEAK FLOW         (min)= 25.00

                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0090

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

--------------------
| ADD HYD  (  0049)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
       ID1= 1 (  0043):      2.03   0.601     1.33    45.79
     + ID2= 2 (  0050):      0.24   0.011     1.75    56.91
       ==========================================================
       ID = 3 (  0049):      2.27   0.609     1.33    46.96

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0051)|   Area     (ha)=   1.68
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.66         0.02
     Dep. Storage     (mm)=       5.00         1.50
     Average Slope     (%)=       1.20         2.00
     Length            (m)=     105.83        40.00
     Mannings n            =      0.013        0.250

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


                          ---- TRANSFORMED HYETOGRAPH ----
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
              0.083    3.00 | 1.083   31.33 | 2.083    7.90 |  3.08    3.64
              0.167    3.00 | 1.167   31.33 | 2.167    7.90 |  3.17    3.64
              0.250    3.49 | 1.250  150.60 | 2.250    6.57 |  3.25    3.35
              0.333    3.49 | 1.333  150.60 | 2.333    6.57 |  3.33    3.35
              0.417    4.19 | 1.417   42.20 | 2.417    5.64 |  3.42    3.11
              0.500    4.19 | 1.500   42.20 | 2.500    5.64 |  3.50    3.11
              0.583    5.28 | 1.583   20.50 | 2.583    4.94 |  3.58    2.90
              0.667    5.28 | 1.667   20.50 | 2.667    4.94 |  3.67    2.90
              0.750    7.22 | 1.750   13.38 | 2.750    4.41 |  3.75    2.72
              0.833    7.22 | 1.833   13.38 | 2.833    4.41 |  3.83    2.72
              0.917   11.64 | 1.917    9.92 | 2.917    3.98 |  3.92    2.56
              1.000   11.64 | 2.000    9.92 | 3.000    3.98 |  4.00    2.56

     Max.Eff.Inten.(mm/hr)=     150.60        65.85
               over (min)         5.00         5.00
     Storage Coeff.  (min)=       2.12 (ii)    3.08 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.31         0.27
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.69         0.00       0.694 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33        1.33
     RUNOFF VOLUME    (mm)=      54.08        27.38       53.81
     TOTAL RAINFALL   (mm)=      59.08        59.08       59.08
     RUNOFF COEFFICIENT   =       0.92         0.46        0.91

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  80.0    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 (0046)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0049):		2.27	0.609	1.33	46.96
+ ID2= 2 (0051):		1.68	0.694	1.33	53.81
ID = 3 (0046):		3.95	1.303	1.33	49.88

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0047)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.1630	0.2697
	0.0080	0.0487	0.1700	0.2885
	0.0100	0.0674	0.1720	0.2960
	0.0880	0.1049	0.1760	0.3072
	0.1040	0.1311	0.1770	0.3109
	0.1170	0.1573	0.1800	0.3184
	0.1260	0.1761	0.1870	0.3409
	0.1300	0.1836	0.1880	0.3447
	0.1570	0.2510	0.1910	0.3559

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0046)	3.950	1.303	1.33	49.88
OUTFLOW: ID= 1 (0047)	3.950	0.104	2.00	49.48

PEAK FLOW REDUCTION [Qout/Qin](%)= 7.97
TIME SHIFT OF PEAK FLOW (min)= 40.00
MAXIMUM STORAGE USED (ha.m.)= 0.1308

ADD HYD (0039)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0040):		6.56	0.684	1.50	24.23
+ ID2= 2 (0047):		3.95	0.104	2.00	49.48
ID = 3 (0039):		10.51	0.778	1.50	33.72

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0039)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0039):		10.51	0.778	1.50	33.72
+ ID2= 2 (0052):		0.08	0.009	1.33	24.41
ID = 1 (0039):		10.59	0.785	1.50	33.66

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2010)
       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 *****

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DATE: 03-08-2023                          TIME: 01:45:27

USER:


COMMENTS: _____
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  ********************************************
  ** SIMULATION : 25 - 50-YR Chicago W-S     **
  ********************************************
```

CHICAGO STORM	Ptotal= 65.82 mm

IDF curve parameters: A=1802.604
B= 6.029
C= 0.853
used in: INTENSITY = A / (t + B)^C

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	3.22	1.00	35.30	2.00	8.66	3.00	3.92
0.17	3.76	1.17	169.09	2.17	7.18	3.17	3.60
0.33	4.53	1.33	47.71	2.33	6.14	3.33	3.34
0.50	5.74	1.50	22.94	2.50	5.37	3.50	3.11
0.67	7.91	1.67	14.85	2.67	4.77	3.67	2.91
0.83	12.88	1.83	10.94	2.83	4.30	3.83	2.74

```
--------------------
| CALIB            |
| NASHYD   (  0041)|   Area     (ha)=   6.56   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	3.22	1.083	35.30	2.083	8.66	3.08	3.92
0.167	3.22	1.167	35.30	2.167	8.66	3.17	3.92
0.250	3.76	1.250	169.09	2.250	7.18	3.25	3.60
0.333	3.76	1.333	169.09	2.333	7.18	3.33	3.60
0.417	4.53	1.417	47.71	2.417	6.14	3.42	3.34
0.500	4.53	1.500	47.71	2.500	6.14	3.50	3.34
0.583	5.74	1.583	22.94	2.583	5.37	3.58	3.11
0.667	5.74	1.667	22.94	2.667	5.37	3.67	3.11
0.750	7.91	1.750	14.85	2.750	4.77	3.75	2.91
0.833	7.91	1.833	14.85	2.833	4.77	3.83	2.91
0.917	12.88	1.917	10.94	2.917	4.30	3.92	2.74
1.000	12.88	2.000	10.94	3.000	4.30	4.00	2.74

```
     Unit Hyd Qpeak  (cms)=   1.790

     PEAK FLOW       (cms)=   0.846 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=  29.211
     TOTAL RAINFALL   (mm)=  65.815
     RUNOFF COEFFICIENT   =   0.444

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

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0040)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00         101.50        0.0500
                  1.00         100.70        0.0500
                  1.50         100.55    0.0500 /0.0300  Main Channel
                  2.00          99.50        0.0300      Main Channel
                  3.50          99.60        0.0300      Main Channel
                  4.50         100.65    0.0300 /0.0500  Main Channel
                  6.00         101.45        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.10    99.60    .185E+02       0.0         0.54       8.09
        0.19    99.69    .587E+02       0.2         1.04       4.22
        0.29    99.79    .102E+03       0.5         1.38       3.16
        0.38    99.88    .149E+03       0.9         1.66       2.64
        0.48    99.98    .200E+03       1.4         1.88       2.32
        0.57   100.07    .254E+03       2.0         2.08       2.10
        0.67   100.17    .311E+03       2.7         2.26       1.93
        0.76   100.26    .372E+03       3.4         2.42       1.81
        0.86   100.36    .436E+03       4.3         2.57       1.70
        0.95   100.45    .503E+03       5.2         2.70       1.61
        1.05   100.55    .574E+03       6.2         2.83       1.54
        1.16   100.66    .667E+03       7.7         3.02       1.45
        1.28   100.78    .774E+03       9.5         3.22       1.35
        1.39   100.89    .892E+03      11.6         3.40       1.29
        1.50   101.00    .102E+04      13.8         3.54       1.23
        1.61   101.11    .116E+04      16.3         3.67       1.19
        1.72   101.22    .131E+04      18.9         3.79       1.15
        1.84   101.34    .147E+04      21.8         3.90       1.12
        1.95   101.45    .164E+04      25.0         4.00       1.09
```

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0041)	6.56	0.85	1.42	29.21	0.36	1.58
OUTFLOW: ID= 1 (0040)	6.56	0.85	1.42	29.21	0.36	1.58

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0052)|   Area     (ha)=   0.08   Curve Number    (CN)= 80.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	3.22	1.083	35.30	2.083	8.66	3.08	3.92
0.167	3.22	1.167	35.30	2.167	8.66	3.17	3.92
0.250	3.76	1.250	169.09	2.250	7.18	3.25	3.60
0.333	3.76	1.333	169.09	2.333	7.18	3.33	3.60
0.417	4.53	1.417	47.71	2.417	6.14	3.42	3.34
0.500	4.53	1.500	47.71	2.500	6.14	3.50	3.34
0.583	5.74	1.583	22.94	2.583	5.37	3.58	3.11
0.667	5.74	1.667	22.94	2.667	5.37	3.67	3.11
0.750	7.91	1.750	14.85	2.750	4.77	3.75	2.91
0.833	7.91	1.833	14.85	2.833	4.77	3.83	2.91
0.917	12.88	1.917	10.94	2.917	4.30	3.92	2.74
1.000	12.88	2.000	10.94	3.000	4.30	4.00	2.74

```
     Unit Hyd Qpeak  (cms)=   0.026

     PEAK FLOW       (cms)=   0.011 (i)
     TIME TO PEAK    (hrs)=   1.333
     RUNOFF VOLUME    (mm)=  29.201
     TOTAL RAINFALL   (mm)=  65.815
     RUNOFF COEFFICIENT   =   0.444

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0043)|   Area     (ha)=   2.03
|ID= 1 DT= 5.0 min |   Total Imp(%)=  63.00   Dir. Conn.(%)=  63.00
--------------------

                                  IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=           1.28          0.75
     Dep. Storage     (mm)=           1.00          5.00
     Average Slope     (%)=           1.30          2.00
     Length            (m)=         116.33         40.00
```

```
     Mannings n           =      0.013        0.250

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


                          ---- TRANSFORMED HYETOGRAPH ----
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
              0.083    3.22 | 1.083   35.30 | 2.083    8.66 |  3.08    3.92
              0.167    3.22 | 1.167   35.30 | 2.167    8.66 |  3.17    3.92
              0.250    3.76 | 1.250  169.09 | 2.250    7.18 |  3.25    3.60
              0.333    3.76 | 1.333  169.09 | 2.333    7.18 |  3.33    3.60
              0.417    4.53 | 1.417   47.71 | 2.417    6.14 |  3.42    3.34
              0.500    4.53 | 1.500   47.71 | 2.500    6.14 |  3.50    3.34
              0.583    5.74 | 1.583   22.94 | 2.583    5.37 |  3.58    3.11
              0.667    5.74 | 1.667   22.94 | 2.667    5.37 |  3.67    3.11
              0.750    7.91 | 1.750   14.85 | 2.750    4.77 |  3.75    2.91
              0.833    7.91 | 1.833   14.85 | 2.833    4.77 |  3.83    2.91
              0.917   12.88 | 1.917   10.94 | 2.917    4.30 |  3.92    2.74
              1.000   12.88 | 2.000   10.94 | 3.000    4.30 |  4.00    2.74

     Max.Eff.Inten.(mm/hr)=     169.09        71.61
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       2.10 (ii)    6.72 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.31         0.14
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.60         0.11          0.686 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42          1.33
     RUNOFF VOLUME    (mm)=      64.82        29.75         51.84
     TOTAL RAINFALL   (mm)=      65.82        65.82         65.82
     RUNOFF COEFFICIENT   =       0.98         0.45          0.79

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  80.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0048)|   Area    (ha)=   0.24
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.24         0.00
     Dep. Storage     (mm)=      1.00         5.00
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     40.00        40.00
     Mannings n           =      0.013        0.250

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


                          ---- TRANSFORMED HYETOGRAPH ----
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
              0.083    3.22 | 1.083   35.30 | 2.083    8.66 |  3.08    3.92
              0.167    3.22 | 1.167   35.30 | 2.167    8.66 |  3.17    3.92
              0.250    3.76 | 1.250  169.09 | 2.250    7.18 |  3.25    3.60
              0.333    3.76 | 1.333  169.09 | 2.333    7.18 |  3.33    3.60
              0.417    4.53 | 1.417   47.71 | 2.417    6.14 |  3.42    3.34
              0.500    4.53 | 1.500   47.71 | 2.500    6.14 |  3.50    3.34
              0.583    5.74 | 1.583   22.94 | 2.583    5.37 |  3.58    3.11
              0.667    5.74 | 1.667   22.94 | 2.667    5.37 |  3.67    3.11
              0.750    7.91 | 1.750   14.85 | 2.750    4.77 |  3.75    2.91
              0.833    7.91 | 1.833   14.85 | 2.833    4.77 |  3.83    2.91
              0.917   12.88 | 1.917   10.94 | 2.917    4.30 |  3.92    2.74
              1.000   12.88 | 2.000   10.94 | 3.000    4.30 |  4.00    2.74

     Max.Eff.Inten.(mm/hr)=     169.09        71.61
               over (min)         5.00         5.00
     Storage Coeff.  (min)=       1.19 (ii)    2.11 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.33         0.31
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.11         0.00          0.112 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33          1.33
     RUNOFF VOLUME    (mm)=      64.82        29.75         64.46
     TOTAL RAINFALL   (mm)=      65.82        65.82         65.82
     RUNOFF COEFFICIENT   =       0.98         0.45          0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  80.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0050)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0128     0.0103

                                    AREA     QPEAK     TPEAK       R.V.
                                    (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0048)         0.240     0.112      1.33      64.46
   OUTFLOW: ID= 1 (  0050)         0.240     0.012      1.75      63.64

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 11.14
                  TIME SHIFT OF PEAK FLOW          (min)= 25.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0101

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

--------------------
| ADD HYD  (  0049)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0043):      2.03    0.686     1.33    51.84
      + ID2= 2 (  0050):      0.24    0.012     1.75    63.64
        ================================================
        ID = 3 (  0049):      2.27    0.695     1.33    53.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0051)|   Area    (ha)=   1.68
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
```

```
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area      (ha)=       1.66         0.02
     Dep. Storage      (mm)=       5.00         1.50
     Average Slope      (%)=       1.20         2.00
     Length             (m)=     105.83        40.00
     Mannings n            =      0.013        0.250

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


                          ---- TRANSFORMED HYETOGRAPH ----
               TIME     RAIN |  TIME     RAIN |'  TIME     RAIN |  TIME     RAIN
                hrs    mm/hr |   hrs    mm/hr |'   hrs    mm/hr |   hrs    mm/hr
              0.083     3.22 | 1.083    35.30 | 2.083     8.66 |  3.08     3.92
              0.167     3.22 | 1.167    35.30 | 2.167     8.66 |  3.17     3.92
              0.250     3.76 | 1.250   169.09 | 2.250     7.18 |  3.25     3.60
              0.333     3.76 | 1.333   169.09 | 2.333     7.18 |  3.33     3.60
              0.417     4.53 | 1.417    47.71 | 2.417     6.14 |  3.42     3.34
              0.500     4.53 | 1.500    47.71 | 2.500     6.14 |  3.50     3.34
              0.583     5.74 | 1.583    22.94 | 2.583     5.37 |  3.58     3.11
              0.667     5.74 | 1.667    22.94 | 2.667     5.37 |  3.67     3.11
              0.750     7.91 | 1.750    14.85 | 2.750     4.77 |  3.75     2.91
              0.833     7.91 | 1.833    14.85 | 2.833     4.77 |  3.83     2.91
              0.917    12.88 | 1.917    10.94 | 2.917     4.30 |  3.92     2.74
              1.000    12.88 | 2.000    10.94 | 3.000     4.30 |  4.00     2.74

     Max.Eff.Inten.(mm/hr)=     169.09        79.38
               over (min)          5.00         5.00
     Storage Coeff.  (min)=       2.03 (ii)    2.94 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.31         0.28
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.78         0.00      0.781 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33       1.33
     RUNOFF VOLUME    (mm)=      60.82        32.36      60.53
     TOTAL RAINFALL   (mm)=      65.82        65.82      65.82
     RUNOFF COEFFICIENT   =       0.92         0.49       0.92

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  80.0    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  (  0046)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0049):     2.27   0.695     1.33    53.09
     + ID2= 2 (  0051):     1.68   0.781     1.33    60.53
       ================================================
       ID = 3 (  0046):     3.95   1.475     1.33    56.25

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0047)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.1630     0.2697
                          0.0080     0.0487   |   0.1700     0.2885
                          0.0100     0.0674   |   0.1720     0.2960
                          0.0880     0.1049   |   0.1760     0.3072
                          0.1040     0.1311   |   0.1770     0.3109
                          0.1170     0.1573   |   0.1800     0.3184
                          0.1260     0.1761   |   0.1870     0.3409
                          0.1300     0.1836   |   0.1880     0.3447
                          0.1570     0.2510   |   0.1910     0.3559

                                    AREA     QPEAK     TPEAK       R.V.
                                    (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0046)         3.950     1.475      1.33       56.25
   OUTFLOW: ID= 1 (  0047)         3.950     0.113      2.00       55.86

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.64
                  TIME SHIFT OF PEAK FLOW          (min)= 40.00
                  MAXIMUM  STORAGE   USED        (ha.m.)=  0.1489

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

--------------------
| ADD HYD  (  0039)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0040):     6.56   0.850     1.42    29.21
     + ID2= 2 (  0047):     3.95   0.113     2.00    55.86
       ================================================
       ID = 3 (  0039):    10.51   0.947     1.50    39.23

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

--------------------
| ADD HYD  (  0039)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0039):    10.51   0.947     1.50    39.23
     + ID2= 2 (  0052):     0.08   0.011     1.33    29.20
       ================================================
       ID = 1 (  0039):    10.59   0.955     1.50    39.15

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

      V    V   I    SSSSS  U   U    A    L                (v 6.2.2010)
      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\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\7f8b8eca-2182-41f6-a7fd-dddac6946d5e\
  Summary filename: C:\Users\sramsoomair\AppData\Local\Civica\VH5\04f67f97-4cd9-
42e5-99bc-6f706f925a0e\7f8b8eca-2182-41f6-a7fd-dddac6946d5e\


DATE: 03-08-2023                          TIME: 01:45:26

USER:


COMMENTS: _____________________________________________________

--------------------------------------------------------------------------------
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  ***********************************************
  ** SIMULATION : 26 - 100-YR Chicago W-S       **
  ***********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A=2051.707
| Ptotal= 72.03 mm |                          B=   6.230
--------------------                          C=   0.860
                       used in:   INTENSITY =  A / (t + B)^C

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

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    3.40 |  1.00   38.94 |  2.00    9.33 |  3.00    4.16
                0.17    3.98 |  1.17  186.74 |  2.17    7.70 |  3.17    3.82
                0.33    4.82 |  1.33   52.78 |  2.33    6.56 |  3.33    3.53
                0.50    6.14 |  1.50   25.16 |  2.50    5.72 |  3.50    3.28
                0.67    8.50 |  1.67   16.16 |  2.67    5.08 |  3.67    3.07
                0.83   13.98 |  1.83   11.84 |  2.83    4.57 |  3.83    2.89


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0041)|   Area     (ha)=   6.56   Curve Number    (CN)= 82.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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


                      ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    3.40 | 1.083   38.94 | 2.083    9.33 |  3.08    4.16
               0.167    3.40 | 1.167   38.94 | 2.167    9.33 |  3.17    4.16
               0.250    3.98 | 1.250  186.74 | 2.250    7.70 |  3.25    3.82
               0.333    3.98 | 1.333  186.74 | 2.333    7.70 |  3.33    3.82
               0.417    4.82 | 1.417   52.78 | 2.417    6.56 |  3.42    3.53
               0.500    4.82 | 1.500   52.78 | 2.500    6.56 |  3.50    3.53
               0.583    6.14 | 1.583   25.16 | 2.583    5.72 |  3.58    3.28
               0.667    6.14 | 1.667   25.16 | 2.667    5.72 |  3.67    3.28
               0.750    8.50 | 1.750   16.16 | 2.750    5.08 |  3.75    3.07
               0.833    8.50 | 1.833   16.16 | 2.833    5.08 |  3.83    3.07
               0.917   13.98 | 1.917   11.84 | 2.917    4.57 |  3.92    2.89
               1.000   13.98 | 2.000   11.84 | 3.000    4.57 |  4.00    2.89

    Unit Hyd Qpeak  (cms)=   1.790

    PEAK FLOW       (cms)=   1.009 (i)
    TIME TO PEAK    (hrs)=   1.417
    RUNOFF VOLUME    (mm)=  33.968
    TOTAL RAINFALL   (mm)=  72.028
    RUNOFF COEFFICIENT   =   0.472

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

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0040)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00         101.50        0.0500
                  1.00         100.70        0.0500
                  1.50         100.55    0.0500 /0.0300  Main Channel
                  2.00          99.50        0.0300      Main Channel
                  3.50          99.60        0.0300      Main Channel
                  4.50         100.65    0.0300 /0.0500  Main Channel
                  6.00         101.45        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)      (m)      (cu.m.)      (cms)        (m/s)      (min)
      0.10    99.60    .185E+02       0.0          0.54       8.09
      0.19    99.69    .587E+02       0.2          1.04       4.22
      0.29    99.79    .102E+03       0.5          1.38       3.16
      0.38    99.88    .149E+03       0.9          1.66       2.64
      0.48    99.98    .200E+03       1.4          1.88       2.32
      0.57   100.07    .254E+03       2.0          2.08       2.10
      0.67   100.17    .311E+03       2.7          2.26       1.93
      0.76   100.26    .372E+03       3.4          2.42       1.81
      0.86   100.36    .436E+03       4.3          2.57       1.70
      0.95   100.45    .503E+03       5.2          2.70       1.61
      1.05   100.55    .574E+03       6.2          2.83       1.54
      1.16   100.66    .667E+03       7.7          3.02       1.45
      1.28   100.78    .774E+03       9.5          3.22       1.35
      1.39   100.89    .892E+03      11.6          3.40       1.29
      1.50   101.00    .102E+04      13.8          3.54       1.23
      1.61   101.11    .116E+04      16.3          3.67       1.19
      1.72   101.22    .131E+04      18.9          3.79       1.15
      1.84   101.34    .147E+04      21.8          3.90       1.12
      1.95   101.45    .164E+04      25.0          4.00       1.09

                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)       (m)      (m/s)
    INFLOW : ID= 2 (  0041)    6.56     1.01    1.42  33.97       0.39      1.68
    OUTFLOW: ID= 1 (  0040)    6.56     1.05    1.42  33.97       0.40      1.70


--------------------------------------------------------------------------------
--------------------
| CALIB            |
```

```
| NASHYD   (  0052)|   Area     (ha)=   0.08   Curve Number    (CN)= 80.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	3.40	1.083	38.94	2.083	9.33	3.08	4.16
0.167	3.40	1.167	38.94	2.167	9.33	3.17	4.16
0.250	3.98	1.250	186.74	2.250	7.70	3.25	3.82
0.333	3.98	1.333	186.74	2.333	7.70	3.33	3.82
0.417	4.82	1.417	52.78	2.417	6.56	3.42	3.53
0.500	4.82	1.500	52.78	2.500	6.56	3.50	3.53
0.583	6.14	1.583	25.16	2.583	5.72	3.58	3.28
0.667	6.14	1.667	25.16	2.667	5.72	3.67	3.28
0.750	8.50	1.750	16.16	2.750	5.08	3.75	3.07
0.833	8.50	1.833	16.16	2.833	5.08	3.83	3.07
0.917	13.98	1.917	11.84	2.917	4.57	3.92	2.89
1.000	13.98	2.000	11.84	3.000	4.57	4.00	2.89

```
     Unit Hyd Qpeak  (cms)=   0.026

     PEAK FLOW       (cms)=   0.013 (i)
     TIME TO PEAK    (hrs)=   1.333
     RUNOFF VOLUME    (mm)=  33.784
     TOTAL RAINFALL   (mm)=  72.028
     RUNOFF COEFFICIENT   =   0.469

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0043)|   Area     (ha)=   2.03
|ID= 1 DT= 5.0 min |   Total Imp(%)=  63.00   Dir. Conn.(%)=  63.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.28         0.75
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.30         2.00
     Length            (m)=     116.33        40.00
     Mannings n             =      0.013        0.250

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	3.40	1.083	38.94	2.083	9.33	3.08	4.16
0.167	3.40	1.167	38.94	2.167	9.33	3.17	4.16
0.250	3.98	1.250	186.74	2.250	7.70	3.25	3.82
0.333	3.98	1.333	186.74	2.333	7.70	3.33	3.82
0.417	4.82	1.417	52.78	2.417	6.56	3.42	3.53
0.500	4.82	1.500	52.78	2.500	6.56	3.50	3.53
0.583	6.14	1.583	25.16	2.583	5.72	3.58	3.28
0.667	6.14	1.667	25.16	2.667	5.72	3.67	3.28
0.750	8.50	1.750	16.16	2.750	5.08	3.75	3.07
0.833	8.50	1.833	16.16	2.833	5.08	3.83	3.07
0.917	13.98	1.917	11.84	2.917	4.57	3.92	2.89
1.000	13.98	2.000	11.84	3.000	4.57	4.00	2.89

```
     Max.Eff.Inten.(mm/hr)=     186.74         84.83
               over (min)          5.00         10.00
     Storage Coeff.  (min)=       2.01 (ii)     6.46 (ii)
     Unit Hyd. Tpeak (min)=       5.00         10.00
     Unit Hyd. peak  (cms)=       0.31          0.14
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.66          0.13          0.768 (iii)
     TIME TO PEAK    (hrs)=       1.33          1.42           1.33
     RUNOFF VOLUME    (mm)=      71.03         34.42          57.48
     TOTAL RAINFALL   (mm)=      72.03         72.03          72.03
     RUNOFF COEFFICIENT   =       0.99          0.48           0.80

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  80.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0048)|   Area     (ha)=   0.24
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.00
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      40.00        40.00
     Mannings n             =      0.013        0.250

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	3.40	1.083	38.94	2.083	9.33	3.08	4.16
0.167	3.40	1.167	38.94	2.167	9.33	3.17	4.16
0.250	3.98	1.250	186.74	2.250	7.70	3.25	3.82
0.333	3.98	1.333	186.74	2.333	7.70	3.33	3.82
0.417	4.82	1.417	52.78	2.417	6.56	3.42	3.53
0.500	4.82	1.500	52.78	2.500	6.56	3.50	3.53
0.583	6.14	1.583	25.16	2.583	5.72	3.58	3.28
0.667	6.14	1.667	25.16	2.667	5.72	3.67	3.28
0.750	8.50	1.750	16.16	2.750	5.08	3.75	3.07
0.833	8.50	1.833	16.16	2.833	5.08	3.83	3.07
0.917	13.98	1.917	11.84	2.917	4.57	3.92	2.89
1.000	13.98	2.000	11.84	3.000	4.57	4.00	2.89

```
     Max.Eff.Inten.(mm/hr)=     186.74         84.83
               over (min)          5.00          5.00
     Storage Coeff.  (min)=       1.15 (ii)     2.02 (ii)
     Unit Hyd. Tpeak (min)=       5.00          5.00
     Unit Hyd. peak  (cms)=       0.34          0.31
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.12          0.00          0.124 (iii)
     TIME TO PEAK    (hrs)=       1.33          1.33           1.33
     RUNOFF VOLUME    (mm)=      71.03         34.42          70.66
     TOTAL RAINFALL   (mm)=      72.03         72.03          72.03
     RUNOFF COEFFICIENT   =       0.99          0.48           0.98
```

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  80.0     Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0050)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.0128     0.0103

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0048)      0.240     0.124      1.33      70.66
   OUTFLOW: ID= 1 (  0050)      0.240     0.014      1.75      69.83

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 11.12
                   TIME SHIFT OF PEAK FLOW         (min)= 25.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0111

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

--------------------
| ADD HYD  (  0049)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0043):     2.03   0.768     1.33    57.48
     + ID2= 2 (  0050):     0.24   0.014     1.75    69.83
       ================================================
       ID = 3 (  0049):     2.27   0.778     1.33    58.79

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0051)|   Area     (ha)=   1.68
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.66         0.02
     Dep. Storage     (mm)=       5.00         1.50
     Average Slope     (%)=       1.20         2.00
     Length            (m)=     105.83        40.00
     Mannings n           =      0.013        0.250

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

                        ---- TRANSFORMED HYETOGRAPH ----
      TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
       hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
     0.083    3.40 | 1.083   38.94 | 2.083    9.33 |  3.08    4.16
     0.167    3.40 | 1.167   38.94 | 2.167    9.33 |  3.17    4.16
     0.250    3.98 | 1.250  186.74 | 2.250    7.70 |  3.25    3.82
     0.333    3.98 | 1.333  186.74 | 2.333    7.70 |  3.33    3.82
     0.417    4.82 | 1.417   52.78 | 2.417    6.56 |  3.42    3.53
     0.500    4.82 | 1.500   52.78 | 2.500    6.56 |  3.50    3.53
     0.583    6.14 | 1.583   25.16 | 2.583    5.72 |  3.58    3.28
     0.667    6.14 | 1.667   25.16 | 2.667    5.72 |  3.67    3.28
     0.750    8.50 | 1.750   16.16 | 2.750    5.08 |  3.75    3.07
     0.833    8.50 | 1.833   16.16 | 2.833    5.08 |  3.83    3.07
     0.917   13.98 | 1.917   11.84 | 2.917    4.57 |  3.92    2.89
     1.000   13.98 | 2.000   11.84 | 3.000    4.57 |  4.00    2.89

     Max.Eff.Inten.(mm/hr)=     186.74         92.77
               over (min)          5.00          5.00
     Storage Coeff.  (min)=       1.95 (ii)     2.82 (ii)
     Unit Hyd. Tpeak (min)=       5.00          5.00
     Unit Hyd. peak  (cms)=       0.31          0.28
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.86          0.00        0.863 (iii)
     TIME TO PEAK    (hrs)=       1.33          1.33         1.33
     RUNOFF VOLUME    (mm)=      67.03         37.11        66.73
     TOTAL RAINFALL   (mm)=      72.03         72.03        72.03
     RUNOFF COEFFICIENT   =       0.93          0.52         0.93

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  80.0     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  (  0046)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0049):     2.27   0.778     1.33    58.79
     + ID2= 2 (  0051):     1.68   0.863     1.33    66.73
       ================================================
       ID = 3 (  0046):     3.95   1.641     1.33    62.16

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0047)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.1630     0.2697
                         0.0080     0.0487   |   0.1700     0.2885
                         0.0100     0.0674   |   0.1720     0.2960
                         0.0880     0.1049   |   0.1760     0.3072
                         0.1040     0.1311   |   0.1770     0.3109
                         0.1170     0.1573   |   0.1800     0.3184
                         0.1260     0.1761   |   0.1870     0.3409
                         0.1300     0.1836   |   0.1880     0.3447
                         0.1570     0.2510   |   0.1910     0.3559

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0046)      3.950     1.641      1.33      62.16
   OUTFLOW: ID= 1 (  0047)      3.950     0.121      2.08      61.77

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.38
                   TIME SHIFT OF PEAK FLOW         (min)= 45.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.1661

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

```
--------------------
| ADD HYD  (  0039)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)      (mm)
        ID1= 1 (  0040):      6.56   1.046     1.42     33.97
      + ID2= 2 (  0047):      3.95   0.121     2.08     61.77
        ================================================
        ID = 3 (  0039):     10.51   1.149     1.42     44.42

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

--------------------
| ADD HYD  (  0039)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)      (mm)
        ID1= 3 (  0039):     10.51   1.149     1.42     44.42
      + ID2= 2 (  0052):      0.08   0.013     1.33     33.78
        ================================================
        ID = 1 (  0039):     10.59   1.161     1.42     44.34

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

Appendix B.5 – Water Balance

Table 7: LSRCA Recharge Compensation Fee Schedule

LSRCA Recharge Compensation Cost Table			
Water Balance Deficit (m^3/yr)	Storage Volume Required [1] (m^3)	Cost per m^3 of storage volume	Total Cost
500	22	$ 1,200.00	$ 26,400.00
1000	44	$ 1,200.00	$ 52,800.00
1500	66	$ 1,200.00	$ 79,200.00
2000	88	$ 1,200.00	$ 105,600.00
2500	110	$ 1,200.00	$ 132,000.00
3000	132	$ 1,200.00	$ 158,400.00
3500	154	$ 1,200.00	$ 184,800.00
4000	176	$ 1,200.00	$ 211,200.00
4500	198	$ 1,200.00	$ 237,600.00
5000	220	$ 1,200.00	$ 264,000.00
5500	242	$ 1,200.00	$ 290,400.00
6000	264	$ 1,200.00	$ 316,800.00
6500	286	$ 1,200.00	$ 343,200.00
7000	308	$ 1,200.00	$ 369,600.00
7500	330	$ 1,200.00	$ 396,000.00
8000	352	$ 1,200.00	$ 422,400.00
8500	374	$ 1,200.00	$ 448,800.00
9000	396	$ 1,200.00	$ 475,200.00
9500	418	$ 1,200.00	$ 501,600.00
10000	440	$ 1,200.00	$ 528,000.00
Notes: [1] LID sizing based on capturing 95% of annual rainfall (25mm)			

GAMAN CONSULTANTS INC.

WATER BALANCE EVALUATION
PHASE 2 LIMEN HEAD OFFICE
15123 WOODBINE AVENUE
TOWN OF WHITCHURCH-STOUFFVILLE
YORK REGION

Prepared for:
SCAL Properties Ltd.

February 2023

File 21013.02

Distribution:
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1 c File

GAMAN CONSULTANTS INC.
Barrie, Ont.
705-279-9156
ghendy.gaman@outlook.com

February 28, 2023

SCAL Properties Ltd.
46 Lepage Court
Toronto, Ontario
M3J 1Z9

Attention: Mr. Amir Soleimani, Executive VP and COO

Re: Water Balance Evaluation
Phase 2 Limen Head Office 15123 Woodbine Avenue
Town of Whitchurch-Stouffville, York Region
File 21013.02

GAMAN Consultants Inc. is pleased to submit this updated hydrogeological report to address the Conservation Authority Hydrogeological Requirements for Water Balances. The evaluation documents the recharge rate needed to match pre-development recharge rates at the site. The Schaeffers's stormwater management plan will address the implementation of low impact development measures to enhance recharge at the site. If you have any questions or require further information, please contact us.

Yours truly,
GAMAN Consultants Inc.

Gary R. Hendy, P.Eng.
Consulting Engineer

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1.0 INTRODUCTION

1.1 BACKGROUND

GAMAN Consultants Inc. was retained by the SCAL Properties Ltd. to complete a water balance evaluation of the subject site to address the Lake Simcoe Region Conservation Authority Guidelines.

The proposed development is located east of Aurora between Woodbine Avenue and Fortecon Drive on a 4.02 ha parcel of land as shown on Figures 1 and 2. The site will be developed to support the Limen Head Office in Phase 2A and a future building in Phase 2B. It is proposed to service the sites with individual drilled wells for water supply, individual on-site subsurface sewage disposal systems and a stormwater pond. A stormwater management report and sewage system report will be prepared as part of separate investigations for the site by other consultants. This report was prepared to assess changes to the water budget and determine the need to mitigate groundwater recharge at the site in support of Site Plan Approval, a Zoning By-Law Amendment and an Official Plan Amendment to permit the contractor yard as shown on the Site Plan (Figure1). Two office buildings are proposed, each building on lot areas of 1.48ha and 2.54ha with a contractor yard use on the easterly portion of the 2.54ha 2B office building site. Proposed zoning is from "Development Reserve" to "Village Commercial" and "Employment Heavy", to permit the office buildings and a contractor yard use. Concurrent applications for severance of the proposed 1.48ha and 2.54ha lots within Phase 2 lands are being submitted to the Town Committee of Adjustment.

1.2 STUDY OBJECTIVES & SCOPE

The Conservation Authorities Geoscience Group developed guidelines for hydrogeological assessment submissions related to water balances. The document provides information for

consultants to consider and address in technical submissions for a development site. The purpose of this evaluation was to assess the changes in recharge to the site for input into appropriate mitigation methods to be implemented to maintain groundwater recharge.

The tasks required to complete the work program included:

- Background review of the physical setting of the site including physiography, surficial geology, and groundwater.
- A site inspection of the site and surrounding area.
- Test pit excavations were completed to assess shallow soil and groundwater for the suitability of on-site sewage disposal systems as provided by other project team members and to provide data for the water budget evaluation.
- A review of local water well records and existing services around the site.
- Sample shallow groundwater to assess water quality from past land use.
- Groundwater level monitoring.
- Preparation of a hydrogeological report to address LSRCA Guideline for a water balance.

This report documents the study findings of these investigations.

2.0 PHYSICAL SETTING

2.1 PHYSIOGRAPHY, SURFICIAL GEOLOGY AND DRAINAGE

The site is situated just north of the Oak Ridges Moraine within the Schomberg Clay Plains Physiographic Region as described by Chapman and Putnam (1984). The clay plain in the vicinity of Newmarket is described as drumlinized till plain. The surficial geology illustrated in Figure 3 shows the presence of drumlins in the vicinity of the site. The site is

also located near the northern boundary of the Oak Ridges Moraine. The figure illustrates sandy surficial deposits extend onto the site. Site investigations described later in this report confirm these permeable deposits do not exist at the site.

Drainage is north to northwest through a tributary of the East Branch Holland River. The Holland River eventually discharges into Lake Simcoe at Cook's Bay.

2.2 HYDROGEOLOGY

Aquifers are sources of groundwater yielding enough water to supply a well. Aquifers are commonly derived from saturated sand and/or gravel deposits within overburden and from fractured bedrock. Aquitards are barriers to groundwater movement and can provide protection to aquifers from sources of contamination. Aquitards are commonly comprised of silt, clay, till or bedrock. Figure 4 is a stratigraphic cross section from west to east through the site. The section was created from the Oak Ridges Moraine Groundwater Program (ORMGP) site and extends from just west of Woodbine Avenue to Warden Avenue.

There are three hydrostratigraphic units of interest to this investigation.

- The Newmarket Aquitard
- The Oak Ridges Aquifer Complex
- The Thorncliffe Aquifer Complex

The Newmarket (Till) Aquitard is the uppermost stratigraphic unit beneath the site. This unit is expected to behave as an aquitard that protects or buffers deeper sources of groundwater from contamination.

The Oak Ridges Moraine is a source of groundwater for municipal, communal, and individual wells and is referred to as the Oak Ridges Aquifer Complex (ORAC). It is a major recharge area for deeper aquifers and a source of recharge for the headwaters to

many streams originating on or down hill of the Moraine. The ORAC is exposed at surface east of the site as shown in Figure 4.

The Thorncliffe Formation is an aquifer where its composition is comprised of coarser deposits of saturated sand and/or gravel. Locally, the Thorncliffe Aquifer Complex (TAC) is a source of groundwater to municipal, communal, and individual wells in the vicinity of Aurora, Newmarket and the Town of Whitchurch-Stouffville. The TAC is a proposed source of groundwater for this site.

The west to east Cross-Section shows deeper stratigraphic units comprised of other aquitards or aquifers. These deeper deposits are below the hydrostratigraphic units relevant to this water budget evaluation.

2.3 SHALLOW GROUNDWATER MOVEMENT

Shallow groundwater movement reflects local topography and drainage. The ORMGP is an interactive web-site analytical tool used to evaluate hydrogeological data at a high scale. Figure 5 is an interpretation of shallow groundwater movement based on shallow groundwater monitors and wells in the database. The overall direction of shallow groundwater movement is northward through the site at a regional scale. This is reasonably consistent with local topography and drainage at the site that is generally northward too.

2.4 LOCAL WATER SUPPLIES

Figure 6 illustrates the location of water wells in the vicinity of the site. Most wells extend into the TAC. The reported test rates of wells terminating in the TAC ranges from 9 to 273 L/min in this area. Most wells yield more than the reported test rates because the wells

were not tested to evaluate maximum yield. The average test rate of wells terminating in the TAC and appearing in Figure 6 is 68 L/min.

There is evidence of a few dug wells or a sand point terminating within perhaps sandy fractions of the Newmarket Aquitard. Some wells extract groundwater from a productive zone less than 30 metres below grade and we expect that these wells may be hydraulically connected with the TAC given the history of water takings in the Vandorf Area.

The water well for this site will be constructed in the future. The well at 28 Fortecon Drive, abutting the site to the east, was drilled and constructed by Wilson Water Wells and it provides an example of expected yields from wells terminating in the TAC as illustrated in Well Record A199020 (attached). This well was drilled to a depth of 60.35 metres below grade and terminates within the TAC. The total volume of water removed from the well was 2,720 litres in one hour. The well is overlain with a thick sequence of Newmarket Aquitard that behaves as a protective layer to buffer this water from sources of contamination. The well test provides evidence of a long-term sustainable yield of 45.5 L/min.

3.0 SITE INVESTIGATIONS

3.1 SHALLOW SUBSURFACE SOILS

Gunnell Engineering is responsible for the design of the subsurface sewage disposal system at this site. The firm completed a test excavation program at the site to document shallow soil and groundwater conditions within the proposed sewage bed area and at other locations on-site. We understand the proposed sewage bed is to be constructed near test pits TP7 and TP8 as shown in Figures 7. The soils in the Phase 2 Limen Head Office are documented as silty clay. Soil Engineers completed a geotechnical evaluation in 2022. Borehole logs are included in Appendix A and boreholes are shown on Figures C-1 and C-2. The soils in the borehole logs are consistent with soils documented in the test pit program. Groundwater was encountered within two metres of ground surface.

3.2 BACKGROUND WATER QUALITY

The site has been used for agricultural purposes. Two existing shallow groundwater monitors designated BH-4 and BH-8 are illustrated in Figure C-1, Appendix C. These existing shallow groundwater monitors were drilled and constructed for other investigations at the site. There are no borehole logs available. The monitors are constructed with 50-mm diameter pvc casing and protective steel casing. The monitor depths are shallow and documented in Table A-1.

Nitrates are an indicator parameter used to assess the effects of fertilizers on agricultural farmland. Samples of groundwater were collected from BH4 and BH8 to document background nitrate and nitrite concentrations in the shallow groundwater. The results are included in Appendix B and show background nitrates ranging from 0.5 to 1.0 mg/L. Nitrites were not detected in groundwater. The results of these indicator parameters show agricultural land use has not affected shallow groundwater quality.

4.0 WATER BUDGET

4.1 CLIMATIC DATA

As precipitation falls to the ground in the form of rainfall or snow, it is subject to components of the hydrological cycle. Water will generally runoff, infiltrate, evaporate or be subject to transpiration from plant uptake. Evaporation and transpiration are commonly grouped together as evapotranspiration while runoff and infiltration are grouped together as water surplus. The water budget is represented in a simple form as follows:

Water In = water Out

$$P + EI = ET + IR + RO + EO$$

Where:

P = Precipitation

EI = External Inputs (Run-on, irrigation, and vertical/lateral transfers)

ET = Evapotranspiration from plant uptake and evaporation.

IR = Infiltration Recharge

RO = Run-off

EO = External Outputs (water taking and vertical/lateral transfers)

4.2 CLIMATIC STATION SELECTION

Precipitation data is available from the Environment Canada website for climatic stations across the country and is also compiled in the Oak Ridges Moraine Groundwater Program (ORMGP).

GAMAN examined the ORMGP interactive map for climatic stations to identify a station with suitable data for the water budget. Table C-1, Appendix C provides details about climatic stations surrounding this site as a screening tool to select an appropriate station. The table documents the station, years of data and total precipitation. Climatic stations located near a site with 30-years of continuous data and similar elevations are amongst the criteria used to evaluate a suitable station. Most of the stations shown in Table C-1 either have insufficient data or have ceased operation.

The King Smoke Tree Climatic Station provides climatic data, temperature and precipitation for the period 1981 to 2010. The station was chosen for the following reasons:

1. Located 10km west of the property, it is close to the site.
2. The climatic station has a recent 30-year dataset ending in 2010.
3. The annual precipitation is within the range of precipitation of other stations evaluated in Table C-1.

4. King Smoke Tree station is at an elevation of 352 masl compared with the site elevation of about 300 masl.
5. Buttonville A is another climatic station with 30 years of data, but it is further away and at a much lower elevation of 197 masl.

Thornthwaite (1948) developed a mathematical method for analyzing precipitation data and calculating evapotranspiration and water surplus. The method was modified by Thornthwaite-Mather in 1957 and was used to evaluate water surplus. Average monthly temperature and precipitation data were analyzed using this method and the results are presented in Table C-2. The 30-year normal annual precipitation is 857.7 mm/yr. with a resultant moisture surplus of 241.4 m/yr.

4.3 GROUNDWATER RECHARGE ESTIMATES

4.3.1 MECP Recharge Rates

The MOECC Hydrogeological Technical Information Requirements For Land Development Applications (1995) includes Table 2 derived from hydrologic analysis for assessing peak runoff for storm water management. The method considers topography, soil type and vegetation cover at a site. Table C-3(A) documents the infiltration factors for pre-development and post-development at the site.

Topography was evaluated from west to east and north to south and the resulting average slopes at the site ranged from 27 metres per kilometre. The site reflects steep slopes with a topographic factor of 0.1 for pre-development as shown in Table C-3(A). It is proposed to grade the site. Site grading usually makes the slopes gentler than the original topography. The gentler the slope, the higher the infiltration factor and higher the recharge rate.

The peer review comments from the LSRCA for the Phase 1 site to the east requested a rational for ignoring run-on from the lands to the south forming Catchment Area 301 shown

on Figure 9 prepared by Schaeffers Engineering. A site inspection of the Powell's property to the north shows an existing drainage course is oriented west to east across the north property boundary conveys runoff through the Powell site. Figure 9 Catchment Areas 302 and 103 drain into this drainage path and provide no additional infiltration from off-site sources.

Soils at the Phase 2 sites were confirmed to be comprised of silty clay as described in Section 3.1. The soils are associated with low permeability and reflect an infiltration factor of 0.2 as shown in Table C-3(A) for pre-development and post-development. It is assumed filled needed to raise the grades in Phase 2 will be similar in permeability.

Cover reflects the presence or absence of a canopy that can shade parts of the site and reduce evaporation. The site was open agricultural fields in its pre-development state and will remain open post-development, so the Cover Infiltration Factor was selected as 0.1 for both the pre-development and post-development scenarios.

The pre-development total infiltration factors presented in Table C-3(A) are 0.4 and 0.5 respectively. Pre-development recharge rate for the site is the product of the infiltration factor (0.4) times the moisture surplus (241.4 mm/year) and results in 97 mm/year of recharge (Table C-3(B)). This seems reasonable for a site comprised of silty/clayey deposits.

4.3.2 ORMGP Recharge Rates

The Oak Ridges Moraine Groundwater Program was used as a guide for evaluating recharge rates. We reviewed the recharge model for the area and presented the information in Figure 8. The recharge rates within various blocks (or cells) in the figure show wide ranging recharge rates. The high rates at the site and south of the site appear to be related to the surficial geological mapping of the area (Figure 3) showing sandy soils. These high recharge rates do not accurately reflect recharge in the area because the Gunnell Test Pit program revealed no coarse-grained sediments (sands and gravels) at the site. The test pits shown in Figure 8 were those excavated for the sewage system evaluation and all show soils at the site

to be comprised of silty-clayey deposits as documented in Figure 7. The recharge rates in Figure 8 commonly range from about 65 to 135 mm/yr. if we ignore the anomalies from the high recharge rates. We have also ignored the very low recharge rate of 14 mm/year. The site recharge rate presented in Section 4.3.1 was calculated at 97 mm/year and seems reasonable with the ORMGP if we ignore the high recharge rates that are not supported by the geology of the site.

In summary the pre-development recharge rate was calculated at 97 mm/year and this appears reasonable compared with the range of recharge rates documented in the ORMGP.

4.4 PRE-DEVELOPMENT & POST-DEVELOPMENT WATER BUDGETS

The existing lands were used for agricultural purposes. There are no impermeable surfaces at the site and the soils have been shown to be comprised of silty-clayey deposits. We have examined runoff and infiltration for the pre-development conditions of the site based on water budget information presented in previous sections. Table C-3(B) documents the runoff and recharge rates for the pre-development and post-development scenarios. The pre-development recharge rate for the undeveloped lands was calculated at 3,881 m^3/year based on a recharge rate of 97 mm/year. Runoff is higher at 5,821 m^3/year.

Sources of recharge for post-development include infiltration on the permeable areas of the site shown on Figure 2. The permeable areas of the site include:

a) Landscaped areas
b) The sewage bed areas excluding the volume of sewage.

The impermeable areas of the site include:

a) The two office buildings.
b) The lined stormwater pond.
c) The parking lots.

The permeable areas of the site post-development total 2.8905 ha of the 4.02 ha parcel of land. Infiltration rates post-development are documented in Table C-3(B). The site will be raised with 1-2 metres of fill and graded gently eastward with mild slopes. The infiltration factor on landscaped areas of the site was increased slightly for the gentle slopes. The permeability of the storage areas is expected to be higher than the native soils with a resultant infiltration factor of 0.5. The total infiltration post-development is estimated at 1,363 m^3/year.

Table C-3(B) documents a recharge deficit of 2,517 m^3/year for the site equivalent to an 65% reduction in recharge.

4.5 MITIGATION

Low impact development (LID) systems are used to capture runoff and promote infiltration as a means of restoring recharge. LID provides a wide range of practices that off-set the negative impacts of urban stormwater runoff including the reduction of groundwater recharge. Geology and water levels are two of the most important factors used to assess the suitability of a site for LID measures. The LSRCA published a document entitled ***"Shallow Subsurface Characterization to Support Placement for Infiltration Based Low Impact Development Practices"*** dated March 2000. The document aimed to provide guidance on areas low, medium and high suitability for LID systems within the East Holland River Sub-watershed.

The site is overlain with fine-textured silty clay (till-like) soils that correspond with Medium Suitability for LID systems based on geology.

The LSRCA document references the 2012 TRCA Guideline Stormwater Management Criteria that notes a preference for at least 1 metre of separation between the seasonal high groundwater table and the base of an infiltration facility. Locations with less than 1 metre

separation are considered low suitability, moderate suitability for 1-2 metres of separation and high suitability for more than 2 metres of separation to the water table.

Groundwater levels are presented in Table A-1 show varying depths to groundwater. The area around BH22-8 was flooded due to a drainage obstruction at the north property boundary. Groundwater levels from late 2021 to the summer of 2022 show high water levels at or near ground surface. Efforts to remove the water and improve drainage occurred during the summer and fall of 2022 and water levels at monitor BH22-8 showed groundwater levels in November and December were 1 -2 metres below grade. Additional groundwater level monitoring is needed to re-establish the seasonal variations for the water table on this site. Despite the uncertainty, these groundwater levels provide evidence of medium to high suitability for LID measures subject to confirmation from additional monitoring.

The geology and groundwater information available to date suggests the site has medium to moderate suitability for LID measures where there may be more than 1 metre of separation to the water table. The volume of water to be made up from the recharge deficit is calculated at 2,518 m^3/year.

The two office building areas are 4,924 m^2. From March to November, the total precipitation is 704 mm/year and provides up to 3,466 m^3/year of water for infiltration. If 90% of this precipitation is captured and infiltrated through infiltration trenches for example, roof runoff could provide about 3,119 m^3 of recharge to off-set the 2,518 m^3 of deficit. Capturing roof runoff between March and November could off-set all of the recharge deficit and provide suitable mitigation.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations presented below are based upon the data collected and reviewed as part of these investigations:

- The study area and site are located within the Schomberg Clay Plain Physiographic Region. This physiographic region has a clayey-silty (till-like) soil matrix at the site.

- Drainage is north to northwest through a tributary of the East Branch Holland River. The Holland River eventually discharges into Lake Simcoe at Cook's Bay.

- The two common sources of groundwater within the study area include the Oak Ridges Aquifer and the Thorncliffe Aquifer.

- Test pit excavations for the proposed on-site sewage disposal system confirm shallows soils are comprised of silty, clayey (till-like) sediments.

- The depth to groundwater was affected by poor drainage and recent monitoring suggests groundwater may be 1-2 metres below grade. Additional groundwater monitoring is needed to re-establish and confirm seasonal variations in the water table.

- The west area of the site has medium or moderate suitability for Low Impact Development (LID) systems based on geology and groundwater data, subject to confirmation with groundwater level monitoring.

- An existing drainage course, oriented west to east across the north property boundary, conveys runoff through the Powell site north of this development. Runoff from Catchment Areas 103 and 302 (Figure 9) is directed towards this drainage path, provides no additional infiltration from off-site sources.

- The recharge rate for this site was estimated at 97 mm/year. This is consistent and within the range of values obtained from the Oak Ridges Moraine Groundwater Program.

- The recharge deficit for this site is calculated at 2,517 m^3/year, equivalent to a 65% reduction in recharge. This volume of water requires the use of LID systems to be established during detailed design of the site to capture runoff from the two-storey office building. The volume of roof from the buildings alone could provide enough make-up water to off-set the recharge deficit.

Respectfully Submitted,
GAMAN CONSULTANTS INC.

Gary R. Hendy, P.Eng.
Consulting Engineer

6.0 LIMITATIONS AND USE

This report has been prepared for the exclusive use of SCAL Properties Ltd. for the exclusive use in the evaluation of the area for the proposed development. GAMAN Consultants Inc. accepts no responsibility for any damages incurred by any third party because of decisions made, or actions taken based upon the information contained within this report.

All background information used in the preparation of this report has been relied upon in good faith, and GAMAN does not accept any responsibility for any misstatements, inaccuracies, or deficiencies contained in those documents or records. The information contained in this report should be evaluated, interpreted and implemented only in the context of the assignment.

The findings and conclusions included in this report reflect our best judgement in light of the information available at the time of report preparation and site inspection and are valid only at the date of issuance. If additional information is provided in the future, such as the results of additional site-specific assessments or monitoring, GAMAN will be pleased to re-evaluate our conclusions contained within this report, and issue amendments, as required.

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Shallow Subsurface Characterization to Support Placement for Infiltration Based Low Impact Development Practices

Ministry of Environment Conservation & Parks

Water Well Records

Ministry of Environment Conservation & Parks

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Oak Ridges Moraine Groundwater Program

FIGURES

NOTES

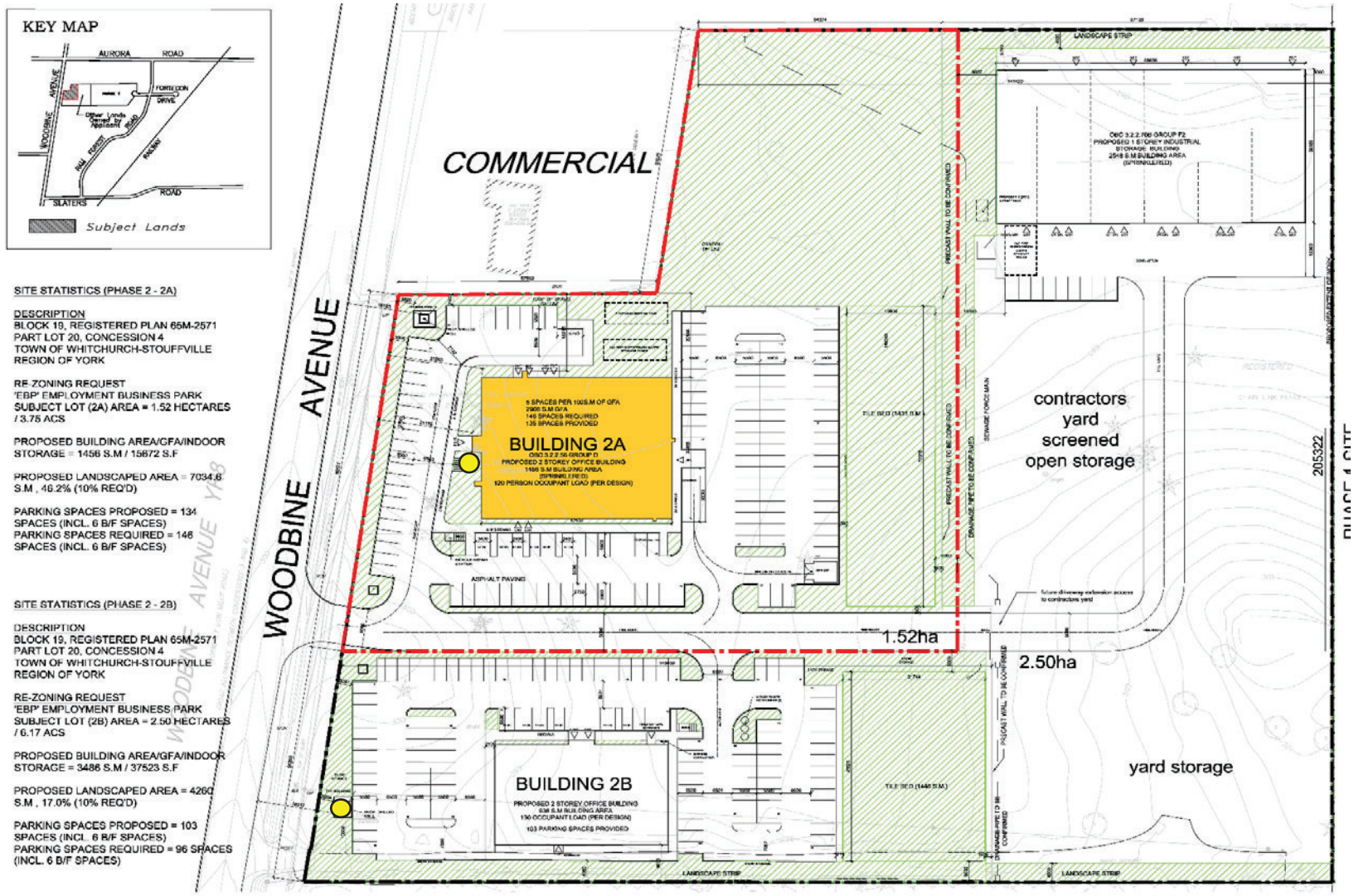
SITE LOCATION

Water Balance Evaluation, Phase 2 Limen Head Office,
15123 Woodbine Avenue
For SCAL Properties Ltd

Date:	Feb-23	Scale:	as shown
Project:	21013.02	Ref No:	

GAMAN Consultants Inc.

Figure 1



NOTES

Future Drilled Well Locations

Areas where infiltration can occur.

Site Plan

Water Balance Evaluation, Phase 2 Limen Head Office,
15123 Woodbine Avenue
For Scal Properties Ltd

Date:	Feb-23	Scale:	as shown
Project:	21013.02	Ref No:	

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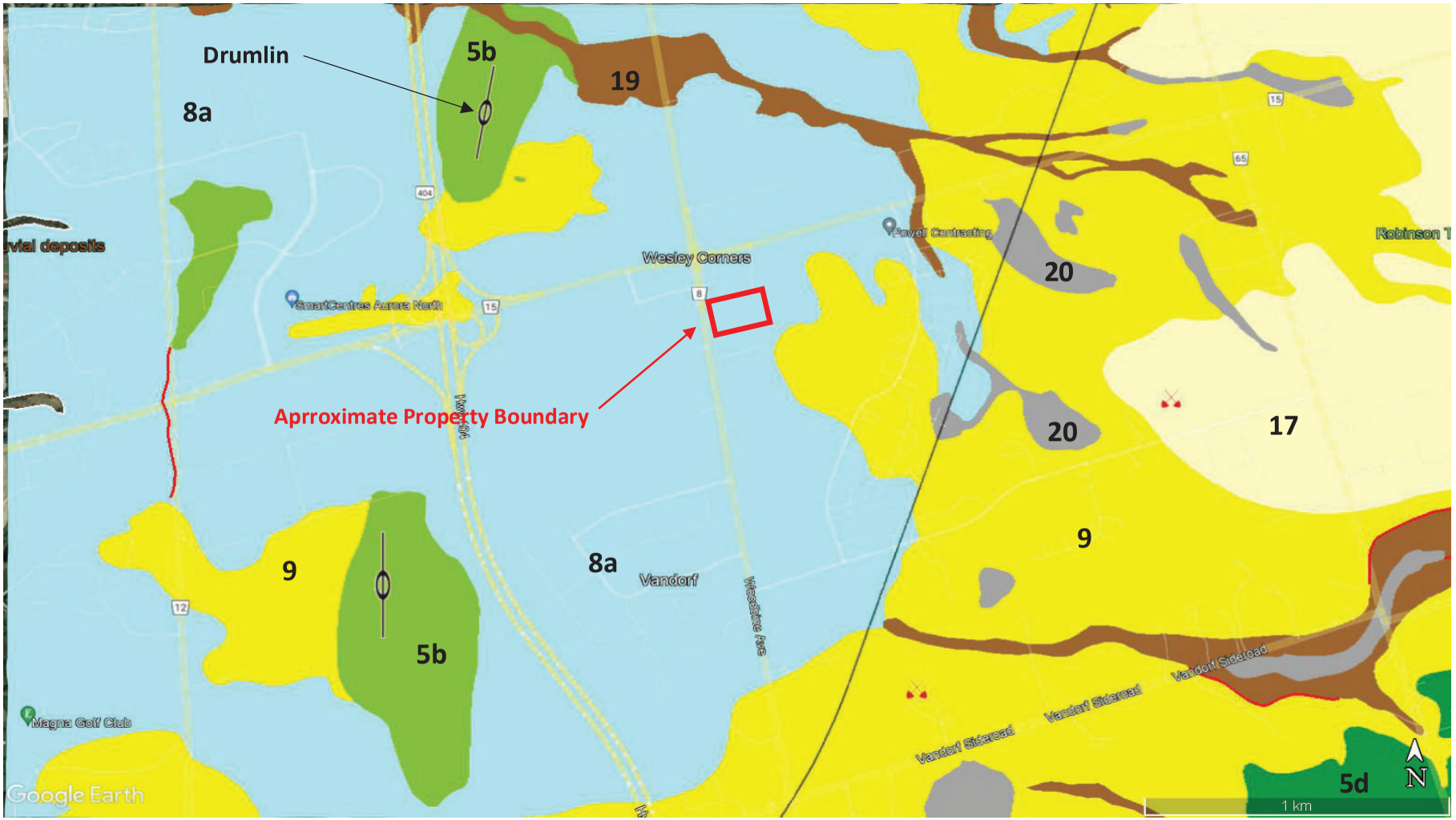
Figure 2



NOTES

5b	Sandy silt to silty sand till
5d	Clay to silt textured till
8a	Fine Textured Glaciolacustrine Deposits (silt & clay, trace sand/gravel
9	Coarse Textured Glaciolacustrine Deposits
17	Fine to very fine sand and silt
19	Modern Alluvial Deposits (gravel sand, silt, clay)
20	Organic Deposits (peat, muck marl)

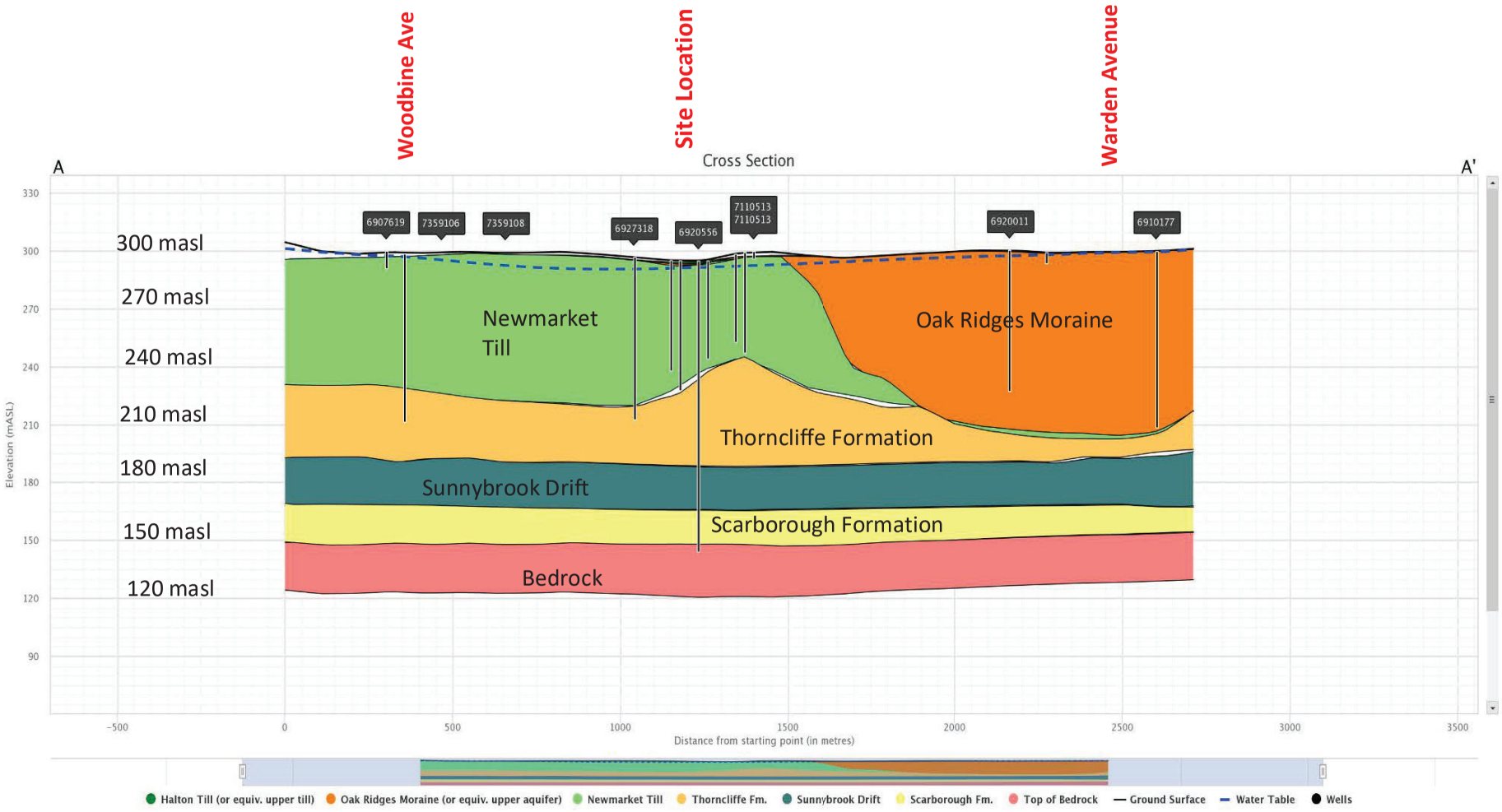
Surficial Geology

Water Balance Evaluation, Phase 2 Limen Head Office,
15123 Woodbine Avenue
For Scal Properties Ltd

Date:	Feb-23	Scale:	as shown
Project:	21013.02	Ref No:	

GAMAN Consultants Inc.

Figure 3



NOTES

Source of Information: -Oak Ridges Moraine Groundwater Program

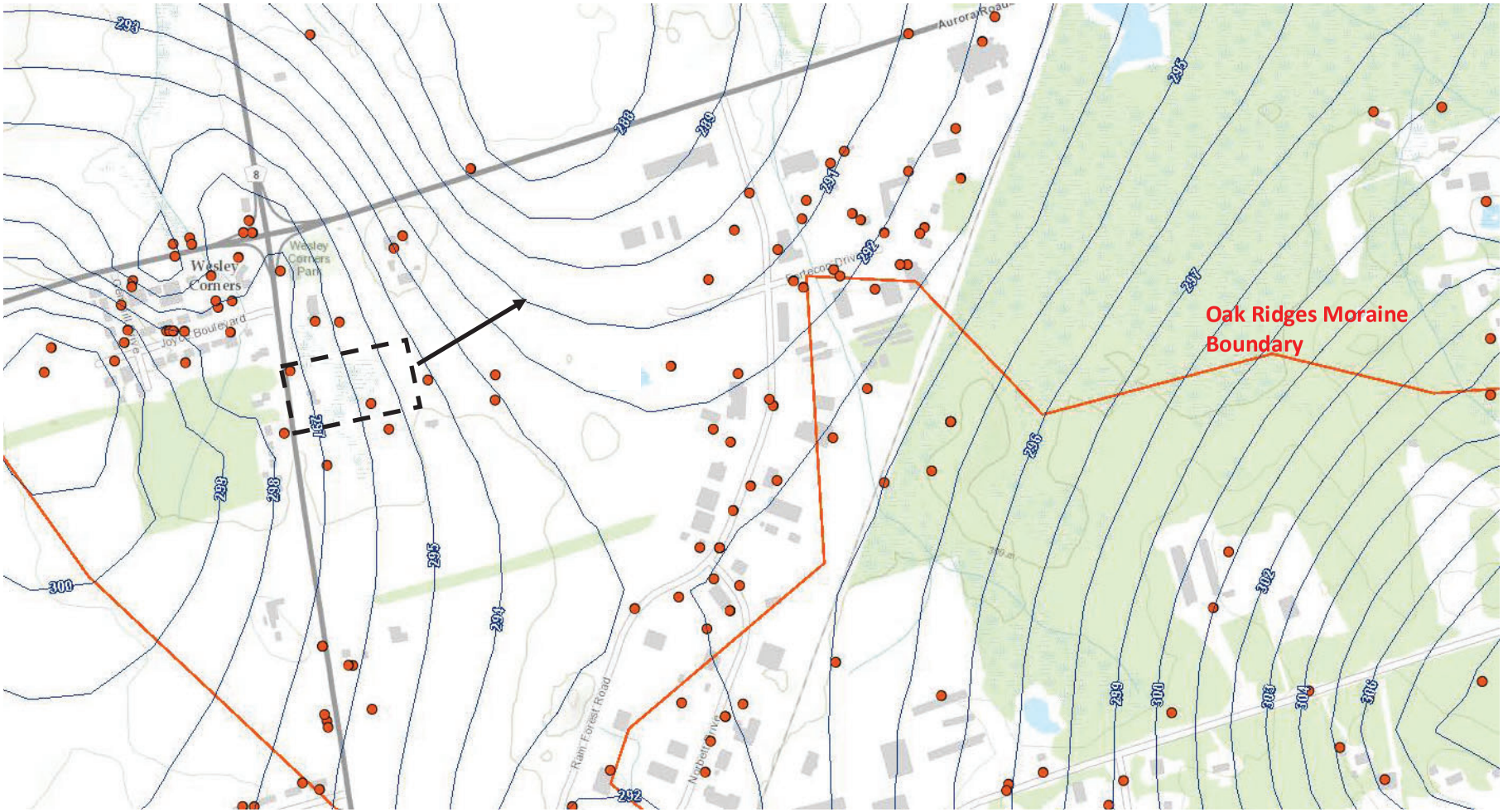
Stratigraphic Cross Section A-A'

Water Balance Evaluation, Phase 2 Limen Head Office,
15123 Woodbine Avenue
For Scal Properties Ltd

Date:	Feb-23	Scale:	as shown
Project:	21013.02	Ref No:	

GAMAN Consultants Inc.

Figure 4



NOTES

Groundwater Table Elevations -Oak Ridges Moraine Groundwater PGM

Approximate Site Boundary

Interpretion direction of shallow groundwater movement

Shallow Groundwater Movement

Water Balance Evaluation, Phase 2 Limen Head Office,
15123 Woodbine Avenue
For Scal Properties Ltd

Date:	Feb-23	Scale:	as shown
Project:	21013.02	Ref No:	

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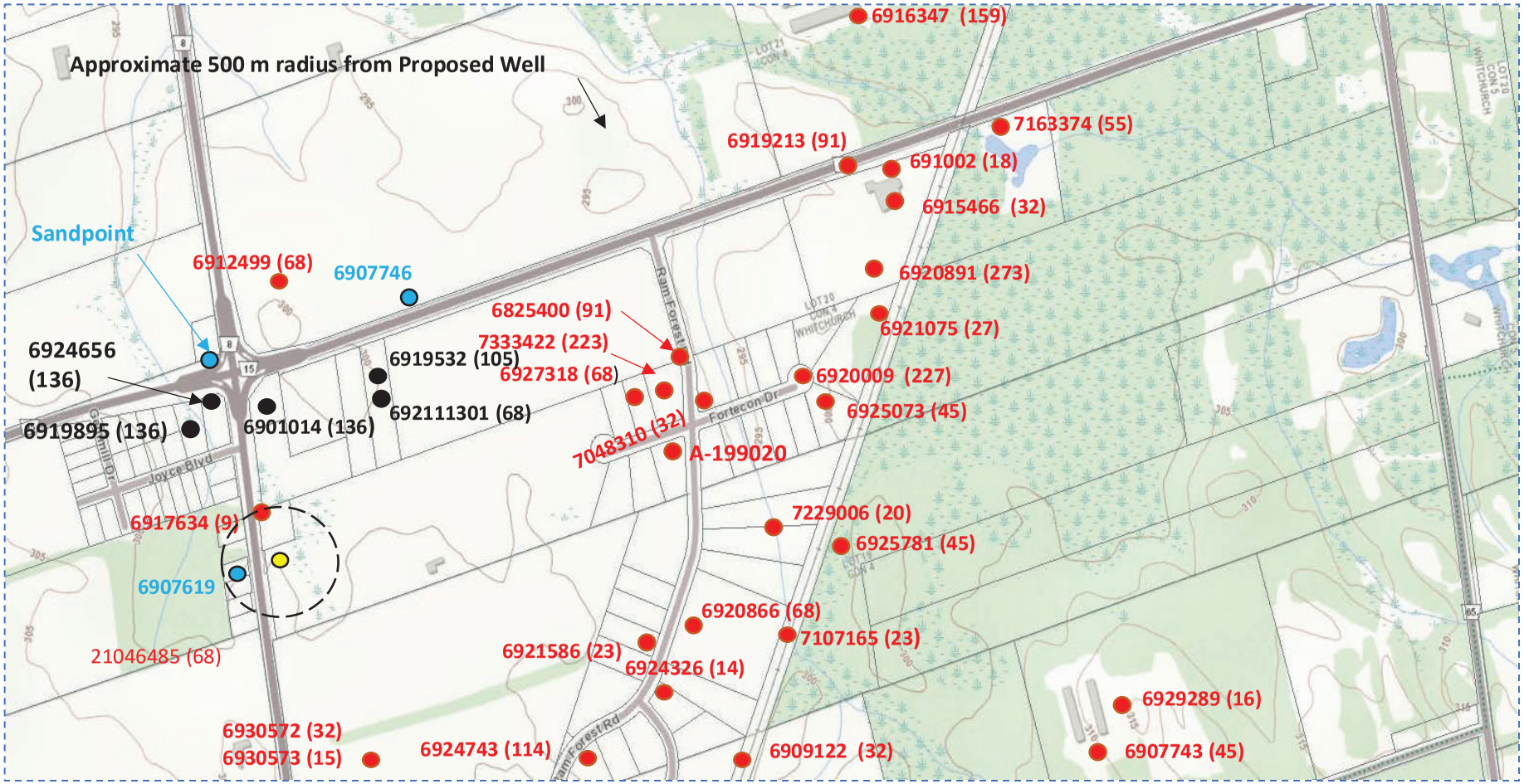
Figure 5



NOTES

- Proposed Well Location (approximate)
- Wells terminating Thorncliffe Aquifer Complex (test rate L/min)
- Dug Well
- Drilled Wells Less Than 30m Deep (tesr rate L/min)
- Predicted Zone of Influence to 0.3 metres of drawdown at 9,000 L/day Phase 2A

Water Well Location Map

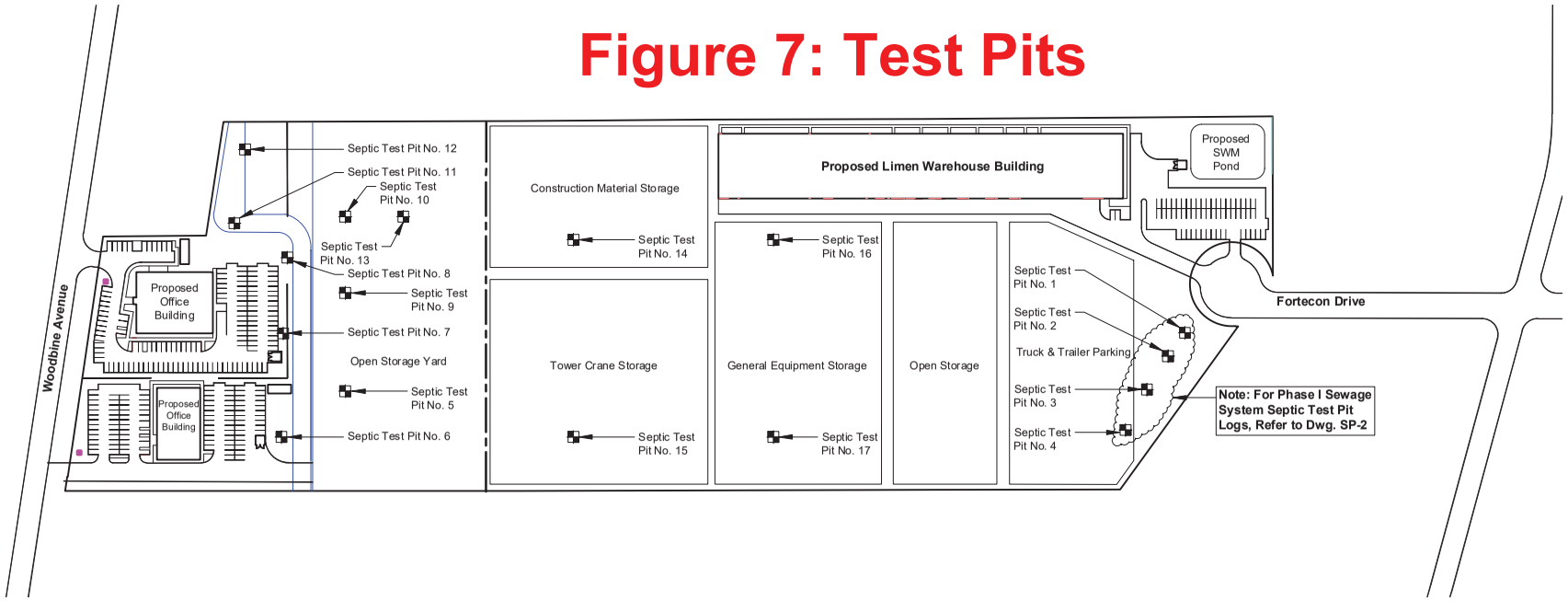
Water Balance Evaluation, Phase 2 Limen Head Office,
15123 Woodbine Avenue
For Scal Properties Ltd

Date:	Feb-23	Scale:	as shown
Project:	21013.02	Ref No:	

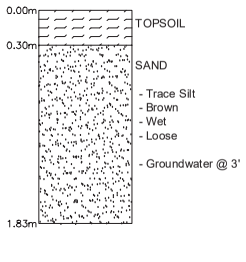
GAMAN Consultants Inc.

Figure 6

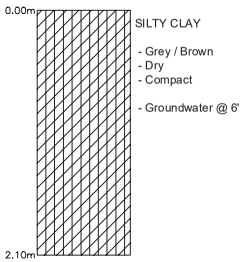
Figure 7: Test Pits



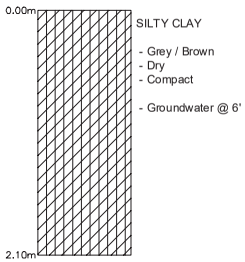
Gunnell Engineering Ltd.
1110 Stellar Drive, Unit 106
Newmarket, ON L3Y 7B7
bus: 905-868-9400
fax: 905-853-5734
www.septicdesign.ca



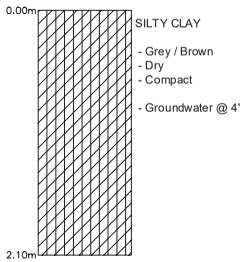
TP-21-05
Septic Test Pit No. 5



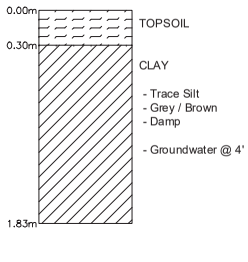
TP-21-06
Septic Test Pit No. 6



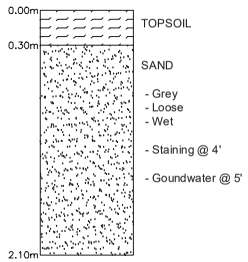
TP-21-07
Septic Test Pit No. 7



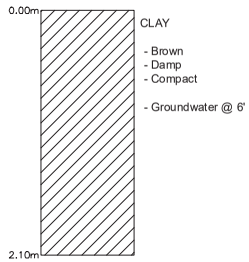
TP-21-08
Septic Test Pit No. 8



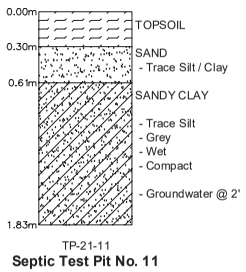
TP-21-09
Septic Test Pit No. 9



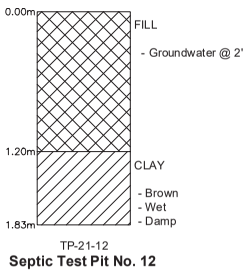
TP-21-10
Septic Test Pit No. 10



TP-21-17
Septic Test Pit No. 17



TP-21-11
Septic Test Pit No. 11



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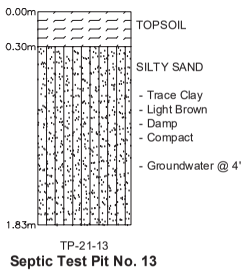
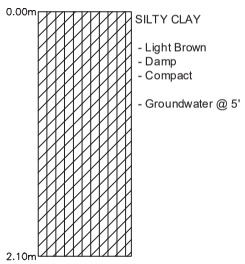
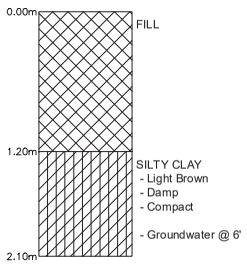
Septic Test Pit No. 12



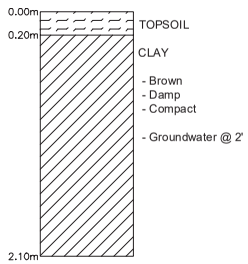
TP-21-13
Septic Test Pit No. 13



TP-21-14
Septic Test Pit No. 14



TP-21-15
Septic Test Pit No. 15



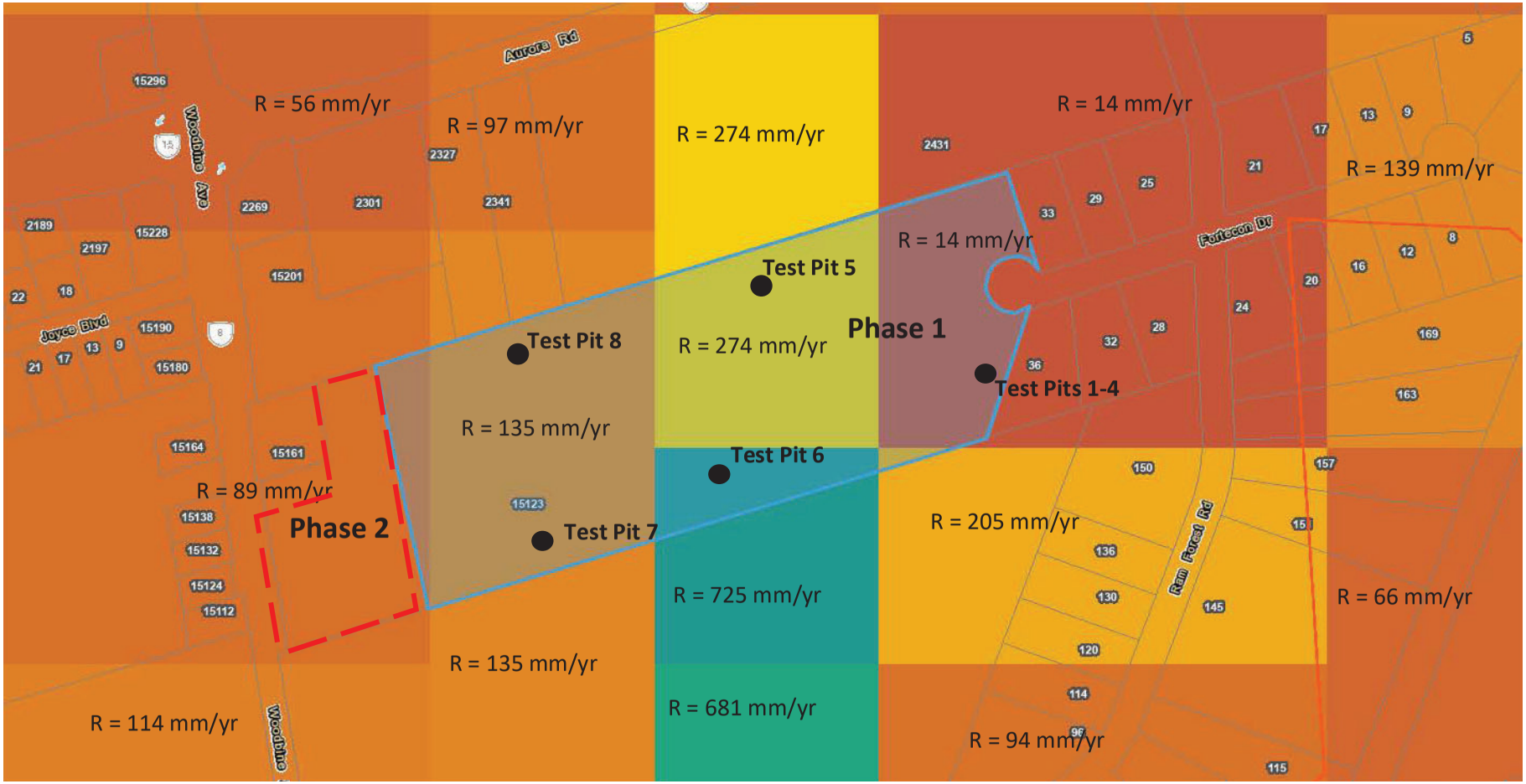
TP-21-16
Septic Test Pit No. 16

Limen Facility
15123 Fortecon Drive
Town of Stouffville

Overall Property
Septic Test Pit Locations
Soil Logs

Scale: 1:2,500	Designed By: --
Date: 22-NOV-2021	Drawn By: JK
Project No.: D3389	Checked By: --
	Drawing No.: SP-1

File: Z:\Gunnell Engineering Auto\CAD\D3300 - PROJECTS\D3389 - 15123 Fortecon Dr - Gormley\CAD\WRK\20211119 - TP LOC AND LOG (Phase II).dwg
Plotted On: Wed, 01 Dec 2021 - 9:43pm



NOTES

Source: Oak Ridges Moraine Groundwater Program (2021)

● Test Pit 8 Gunnell Engineering Test Pit Location and Number

Phase 2 Limen Head Office

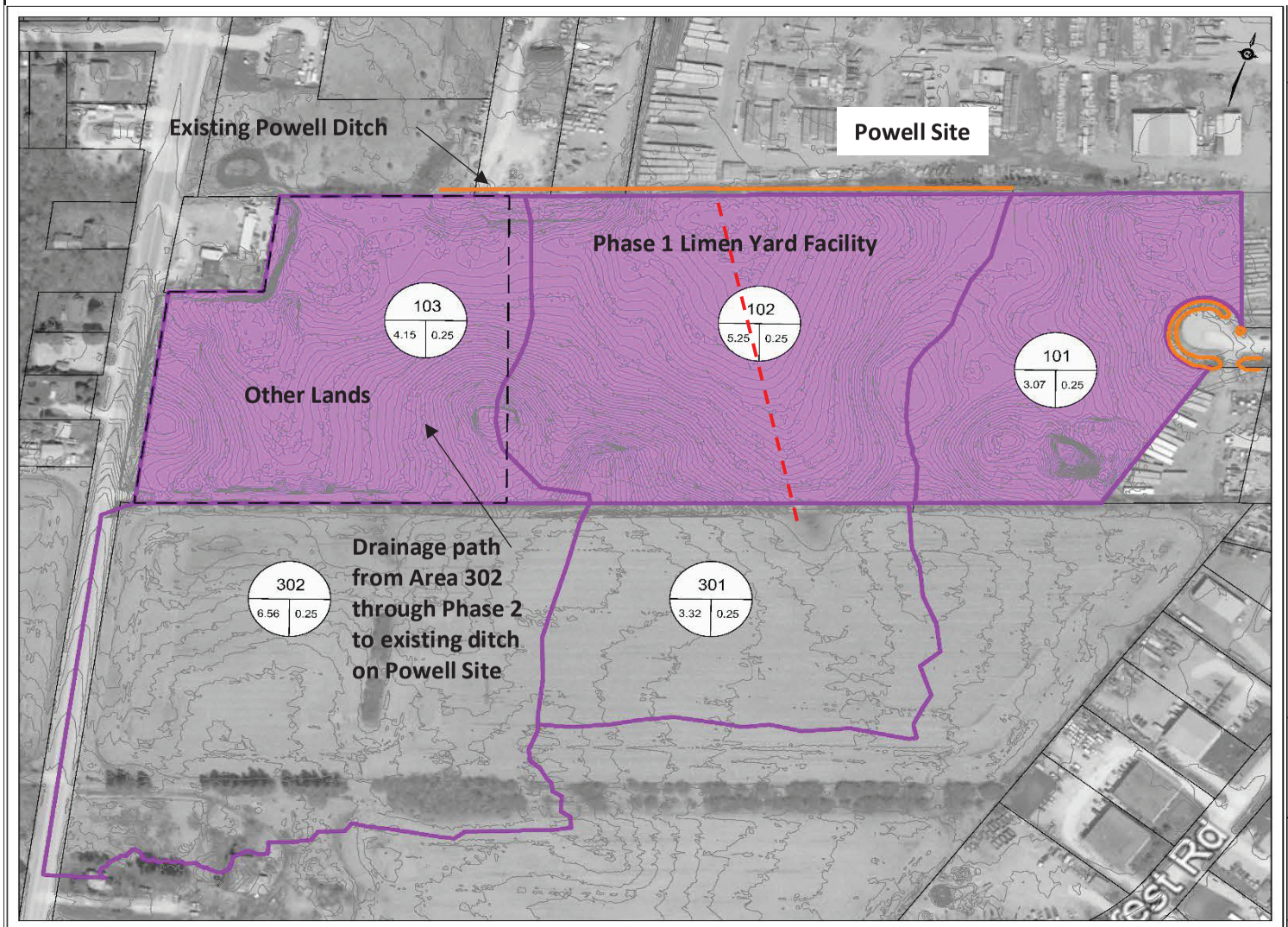
Recharge Evaluation

Water Balance Evaluation, Phase 2 Limen Head Office,
15123 Woodbine Avenue
For Scal Properties Ltd

Date:	Feb-23	Scale:	as shown
Project:	21013.02	Ref No:	

GAMAN Consultants Inc.

Figure 8



NOTES

Drainage Areas

Water Balance Evaluation, Phase 2 Limen Head Office,
15123 Woodbine Avenue
For SCAL Properties Ltd

Date:	Feb-23	Scale:	as shown
Project:	21013.02	Ref No:	

GAMAN Consultants Inc.

Figure 9

APPENDICES

APPENDIX A

WELL RECORDS & MONITOR DETAILS

TABLE A-1 MONITOR DETAILS & GROUNDWATER LEVELS

Project: Water Balance Evaluation Limen Head Office

Fortecon Drive (21013.02)

Monitor Details						15-Sep-21			21-Nov-21			12-Mar-22		
Monitor	Well Depth (mbtoc)	Casing Stickup (magl)	Casing Elev.	Ground Elev.	Depth (mbgl)	Water level (mbtoc)	Water level (mbgl)	Water level Elev. (masl)	Water level (mbtoc)	Water level (mbgl)	Water level Elev. (masl)	Water level (mbtoc)	Water level (mbgl)	Water level Elev. (masl)
BH1	4.52	0.67	299.34	298.67	3.85	3.28	2.61	296.07	destroyed			destroyed		
BH2	4.69	0.69	298.52	297.52	4.00	1.84	1.15	296.69	2.96	2.27	295.56	0.67	Frozen	
BH3	4.79	0.73	299.00	298.12	4.06	1.78	1.05	297.22	1.04	0.31	297.96	0.73	Frozen	
BH4	6.69	0.70	300.45	299.60	5.99	4.78	4.08	295.67	1.64	0.94	298.81	1.33	0.63	299.12
BH5	5.98	0.78	299.61	298.67	5.20	4.57	3.79	295.04	2.02	1.24	297.59	2.02	1.24	297.59
BH6	5.05	0.81	299.00	298.09	4.24	3.64	2.83	295.36	1.66	0.85	297.34	1.62	0.81	297.38
BH7	6.78	0.90	298.33	297.44	5.88	4.30	3.40	294.03	1.65	0.75	296.68	1.88	0.98	296.45
BH8	6.80	0.67	299.99	299.15	6.13	5.64	4.97	294.35	2.27	1.60	297.72	1.74	1.07	298.25
BH22-1	5.36	0.86	298.26	297.40	4.5							1.03	0.17	297.23
BH22-2	5.36	0.86	297.86	297.00	4.5							1.47	0.61	296.39
BH22-8	5.46	0.96	298.56	297.60	4.5							0.75	Frozen	297.81

Phase 2 Monitor Wells

mbtoc = metres below topp of casing

mbgl - metres below ground level

BH22-1, BH22-2, BH22-8 are Soil-Eng Borehole Monitors and construction data are from the Draft Borehole Logs

TABLE A-1 MONITOR DETAILS & GROUNDWATER LEVELS

Project: Water Balance Evaluation Limen Head Office

Fortecon Drive (21013.02)

Monitor Details						24-Apr-22			5-May-22			15-Jun-22		
Monitor	Well Depth (mbtoc)	Casing Stickup (magl)	Casing Elev.	Ground Elev.	Depth (mbgl)	Water level (mbtoc)	Water level (mbgl)	Water level Elev. (masl)	Water level (mbtoc)	Water level (mbgl)	Water level Elev. (masl)	Water level (mbtoc)	Water level (mbgl)	Water level Elev. (masl)
BH1	4.52	0.67	299.34	298.67	3.85	destroyed			destroyed			destroyed		
BH2	4.69	0.69	298.52	297.52	4.00	0.95	0.26	297.57	1.24	0.55	297.28	1.19	0.50	297.33
BH3	4.79	0.73	299.00	298.12	4.06	0.91	0.18	298.09	0.93	0.20	298.07	1.10	0.37	297.90
BH4	6.69	0.70	300.45	299.60	5.99	1.51	0.81	298.94	1.42	0.72	299.03	1.59	0.89	298.86
BH5	5.98	0.78	299.61	298.67	5.20	1.62	0.84	297.99	1.72	0.94	297.89	2.27	1.49	297.34
BH6	5.05	0.81	299.00	298.09	4.24	1.47	0.66	297.53	1.78	0.97	297.22	1.98	1.17	297.02
BH7	6.78	0.90	298.33	297.44	5.88	1.22	0.32	297.11	1.31	0.41	297.02	2.18	1.28	296.15
BH8	6.80	0.67	299.99	299.15	6.13	1.35	0.68	298.64	1.43	0.76	298.56	1.89	1.22	298.10
BH22-1	5.36	0.86	298.26	297.40	4.5	1.09	0.23	297.18	1.14	0.28	297.12	1.44	0.58	296.82
BH22-2	5.36	0.86	297.86	297.00	4.5	1.20	0.34	296.66	1.21	0.35	296.65	1.35	0.49	296.51
BH22-8	5.46	0.96	298.56	297.60	4.5	0.99	0.03	297.57	1.04	0.08	297.52	1.01	0.05	297.55

Phase 2 Monitor Wells

mbtoc = metres below topp of casing

mbgl - metres below ground level

BH22-1, BH22-2, BH22-8 are Soil-Eng Borehole Monitors and construction data are from the Draft Borehole Logs

TABLE A-1 MONITOR DETAILS & GROUNDWATER LEVELS

Project: Water Balance Evaluation Limen Head Office

Fortecon Drive (21013.02)

Monitor Details						24-Oct-22			10-Dec-22		
Monitor	Well Depth (mbtoc)	Casing Stickup (magl)	Casing Elev.	Ground Elev.	Depth (mbgl)	Water level (mbtoc)	Water level (mbgl)	Water level Elev. (masl)	Water level (mbtoc)	Water level (mbgl)	Water level Elev. (masl)
BH1	4.52	0.67	299.34	298.67	3.85	destroyed			destroyed		
BH2	4.69	0.69	298.52	297.52	4.00	3.09	2.40	295.43	2.36	1.67	296.16
BH3	4.79	0.73	299.00	298.12	4.06	3.33	2.60	295.67	2.47	1.74	296.53
BH4	6.69	0.70	300.45	299.60	5.99	dry	dry	dry	6.12	dry	dry
BH5	5.98	0.78	299.61	298.67	5.20	5.39	4.61	294.22	4.12	3.34	295.49
BH6	5.05	0.81	299.00	298.09	4.24	dry	dry	dry	na	na	na
BH7	6.78	0.90	298.33	297.44	5.88	dry	dry	dry	dry	dry	dry
BH8	6.80	0.67	299.99	299.15	6.13	dry	dry	dry	dry	dry	dry
BH22-1	5.36	0.86	298.26	297.40	4.5	3.72	2.86	294.54	4.12	3.26	294.14
BH22-2	5.36	0.86	297.86	297.00	4.5	5.11	4.25	292.75	2.96	2.10	294.90
BH22-8	5.46	0.96	298.56	297.60	4.5	2.95	1.99	295.61	2.02	1.06	296.54

Phase 2 Monitor Wells

mbtoc = metres below topp of casing

mbgl - metres below ground level

BH22-1, BH22-2, BH22-8 are Soil-Eng Borehole Monitors and construction data are from the Draft Borehole Logs

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 1

FIGURE NO.: 1

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 24, 2022

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
297.4	Ground Surface			
0.0	30 cm TOPSOIL	1	DO	8
	Brown, firm to very stiff			
		2	DO	5
	weathered			
	SILTY CLAY	3	DO	14
	occ. wet sand and silt seams and layers	4	DO	24
		5	DO	24
293.4				
4.0	Grey, compact			
	SILT	6	DO	27
292.4				
5.0	END OF BOREHOLE			
	Installed 50 mm Ø monitoring well to 4.5 m Provided with a protective steel cover.			

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

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

Moisture Content values: 40, 21, 19, 23, 25, 21

WATER LEVEL

W.L. @ El. 293.7 m on completion

Soil Engineers Ltd.

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 2

FIGURE NO.: 2

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: December 10, 2021

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
297.0	Ground Surface			
0.0	100 mm GRANULAR FILL	1	DO	9
	Brown, stiff to very stiff weathered	2	DO	14
		3	DO	20
	SILTY CLAY	4	DO	28
	occ. wet sand and silt seams and layers	5	DO	22
292.0		6	DO	18
5.0	END OF BOREHOLE			
	Installed 50 mm Ø monitoring well to 4.5 m Provided with a protective steel cover.			

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

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

Moisture Content values: 20, 21, 23, 19, 22, 21

WATER LEVEL

W.L. @ El. 293.3 m on completion

Soil Engineers Ltd.

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 3

FIGURE NO.: 3

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 24, 2022

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
297.2	Ground Surface			
0.0	30 cm TOPSOIL	1	DO	7
	Brown, loose, weathered			
	SILTY SAND	2	DO	4
295.8				
1.4	Brown, loose to compact	3	DO	8
	weathered			
		4	DO	21
	SILT	5	DO	24
		6	DO	17
292.2				
5.0	END OF BOREHOLE			

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10

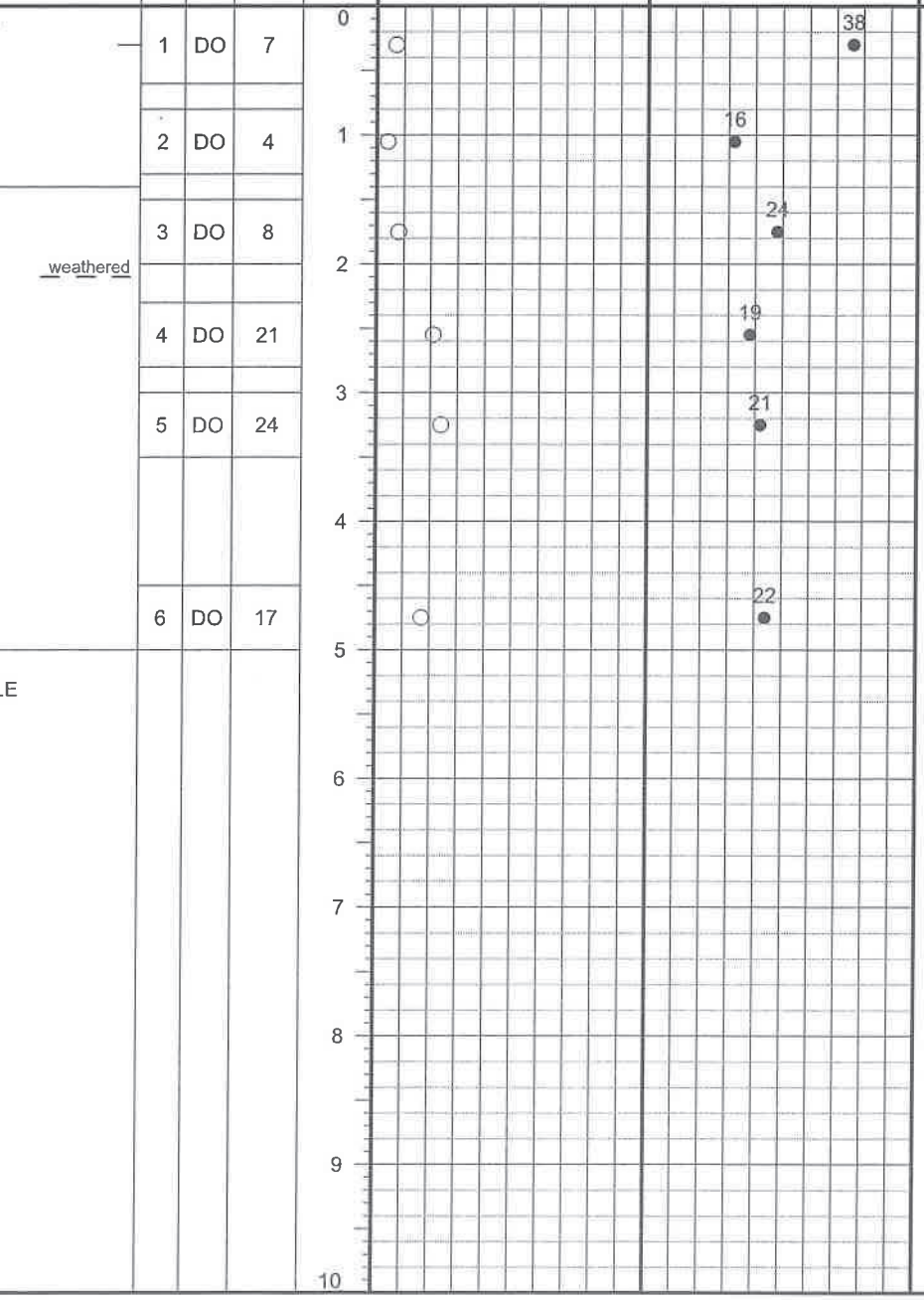
Dynamic Cone (blows/30 cm): 10 30 50 70 90

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: W.L. @ El. 293.2 m on completion

Soil Engineers Ltd.

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 4

FIGURE NO.: 4

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 24, 2022

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
298.8 / 0.0	Ground Surface 30 cm TOPSOIL	1	DO	4
	Loose to dense	2	DO	10
	weathered	3	DO	7
		4	DO	35
	SILT	5	DO	27
		6	DO	42
	brown grey	7	DO	33
292.2 / 6.6	END OF BOREHOLE			

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

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

Moisture Content values: 38, 21, 26, 22, 19, 22, 18

WATER LEVEL: Dry on completion

Soil Engineers Ltd.

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 5

FIGURE NO.: 5

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 24, 2022

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
297.2	Ground Surface			
0.0	30 cm TOPSOIL	1	DO	5
	Brown, very loose to loose, weathered SILTY SAND	2	DO	1
295.8				
1.4	Stiff to hard weathered	3	DO	13
		4	DO	22
	brown grey	5	DO	15
	SILTY CLAY occ. wet sand and silt seams and layers	6	DO	33
290.6				
6.6	END OF BOREHOLE	7	DO	9

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

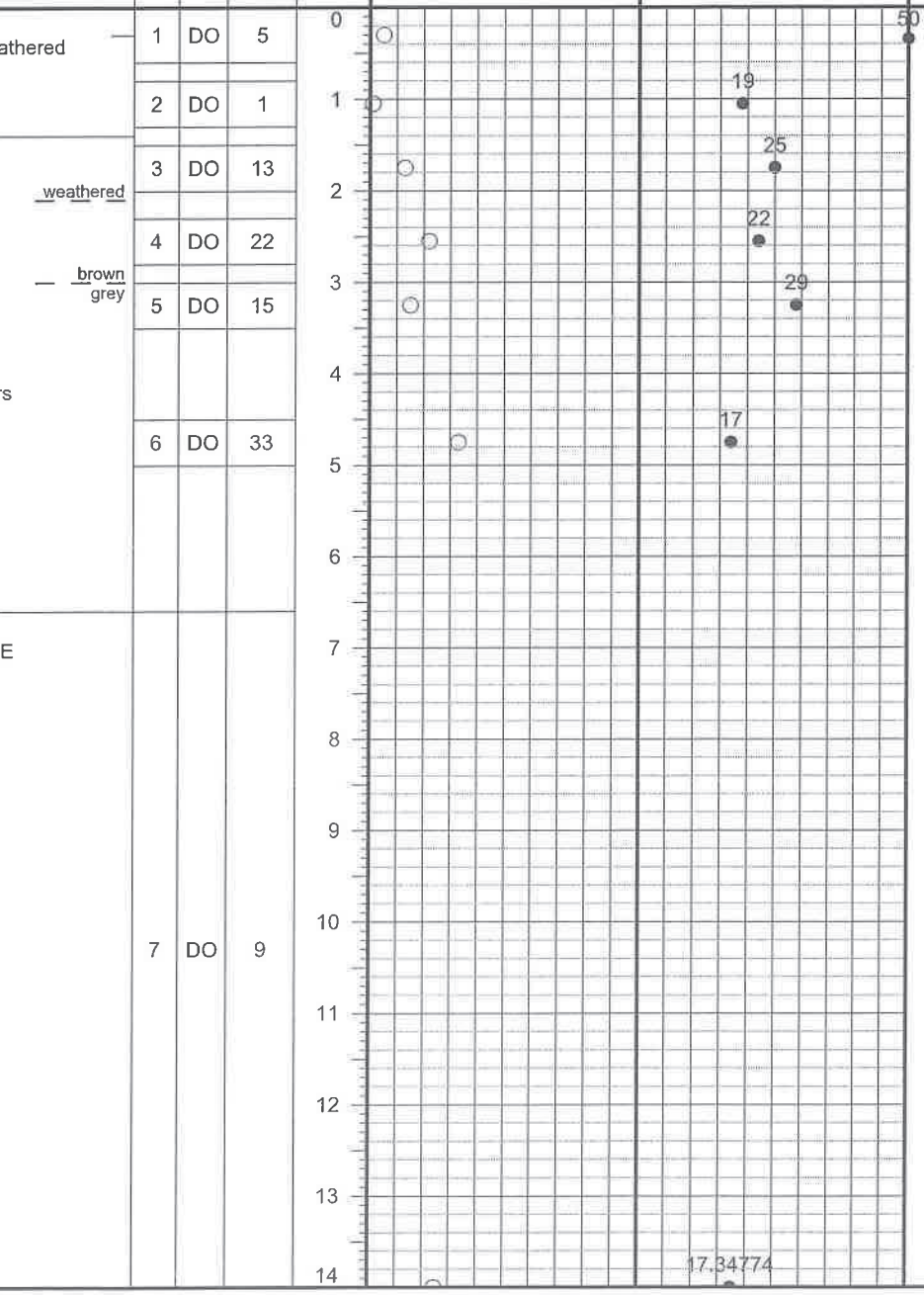
Dynamic Cone (blows/30 cm) 10 30 50 70 90

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

W.L. @ El. 294.2 m on completion

Soil Engineers Ltd.

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 6

FIGURE NO.: 6

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 24, 2022

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
296.4	Ground Surface			
0.0	15 cm TOPSOIL	1	DO	2
	Very soft to hard	2	DO	6
		3	DO	7
	SILTY CLAY — weathered			
	occ. wet sand and silt seams and layers	4	DO	24
		5	DO	43
	— brown grey	6	DO	38
291.4				
5.0	END OF BOREHOLE			

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

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

Moisture Content values: 37, 25, 28, 23, 18, 17

WATER LEVEL

W.L. @ El. 293.4 m on completion

Soil Engineers Ltd.

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 7

FIGURE NO.: 7

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 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
297.5	Ground Surface							
0.0	10 cm TOPSOIL	1	DO	1	0		46	
	Very soft to hard	2	DO	7	1		23	
		3	DO	8	2		21	
	weathered SILTY CLAY	4	DO	22	2		19	
	occ. wet sand and silt seams and layers	5	DO	28	3		19	▽ W.L. @ El. 294.5 m on completion
	brown grey	6	DO	38	4		16	
292.5					5			
5.0	END OF BOREHOLE				6			
					7			
					8			
					9			
					10			
					11			
					12			
					13			
					14			

Soil Engineers Ltd.

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 8

FIGURE NO.: 8

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 25, 2022

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
297.6	Ground Surface			
0.0	36 cm TOPSOIL	1	DO	2
	Very soft to very stiff			
		2	DO	12
	weathered			
		3	DO	23
	SILTY CLAY			
	brown grey			
	occ. wet sand and silt seams and layers	4	DO	28
		5	DO	28
		6	DO	26
292.6				
5.0	END OF BOREHOLE			
	Installed 50 mm Ø monitoring well to 4.5 m Provided with a protective steel cover.			

Depth Scale (m): 0 1 2 3 4 5 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

Moisture Content values: 36, 24, 24, 19, 20, 18

WATER LEVEL: W.L. @ El. 294.6 m on completion

Soil Engineers Ltd.

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 9

FIGURE NO.: 9

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 25, 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
298.2	Ground Surface							
0.0	25 cm TOPSOIL	1	DO	4	0		41	
	Soft to hard weathered	2	DO	15	1		21	
		3	DO	21	2		20	
		4	DO	20			20	
	SILTY CLAY				3			
	occ. wet sand and silt seams and layers	5	DO	36			21	
		6	DO	50/15	4		18	
					5			
		7	DO	50	6		17	
291.6								
6.6	END OF BOREHOLE				7			
					8			
					9			
					10			

W.L. @ El. 295.2 m on completion

Soil Engineers Ltd.

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 10

FIGURE NO.: 10

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 25, 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
297.8	Ground Surface							
0.0	25 cm TOPSOIL	1	DO	3	0		40	
	Very soft to hard — weathered	2	DO	20	1		21	
		3	DO	54	2		18	
	SILTY CLAY							
	occ. wet sand and silt seams and layers	4	DO	42			17	
		5	DO	32	3		18	
	— brown grey	6	DO	48	4		18	
292.8					5			
5.0	END OF BOREHOLE				6			
					7			
					8			
					9			
					10			

W.L. @ El. 293.5 m on completion

Soil Engineers Ltd.

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 11

FIGURE NO.: 11

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 25, 2022

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
299.5	Ground Surface			
0.0	25 cm TOPSOIL	1	DO	6
	Brown, firm to hard	2	DO	8
	SILTY CLAY occ. wet sand and silt seams and layers	3	DO	19
		4	DO	52
296.6				
2.9	Brown, very dense SILT	5	DO	86
295.5				
4.0	Grey, hard SILTY CLAY	6	DO	50/2
		7	DO	38
292.9				
6.6	END OF BOREHOLE			

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10

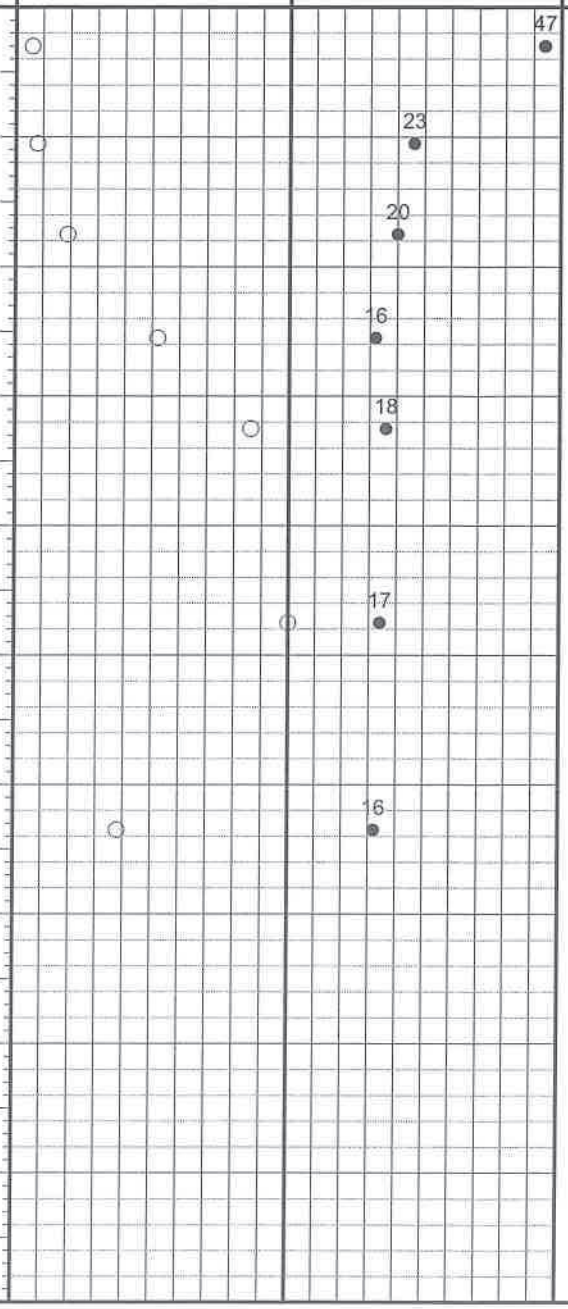
Dynamic Cone (blows/30 cm) 10 30 50 70 90

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

W.L. @ El. 294.0 m on completion

Soil Engineers Ltd.

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 12

FIGURE NO.: 12

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 25, 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
298.9	Ground Surface							
298.6	25 cm TOPSOIL	1	DO	4	0		50	Dry on completion
	Soft to hard weathered	2	DO	14	1		20	
		3	DO	36	2		18	
	SILTY CLAY occ. wet sand and silt seams and layers	4	DO	58	2		18	
		5	DO	54	3		18	
	brown grey	6	DO	56	4		18	
293.9 / 5.0	END OF BOREHOLE				5			
					6			
					7			
					8			
					9			
					10			

Soil Engineers Ltd.

JOB NO.: 2109-S177

LOG OF BOREHOLE NO.: 13

FIGURE NO.: 13

PROJECT DESCRIPTION: Proposed Industrial Buildings, SWM Ponds and Septics

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: Woodbine Avenue and Aurora Road
Town of Whitchurch-Stouffville

DRILLING DATE: January 25, 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
298.4 / 0.0	Ground Surface							
	30 cm TOPSOIL	1	DO	7	0		50	
	Firm to hard							
		2	DO	12	1		24	
	weathered							
		3	DO	26	2		21	
	SILTY CLAY							
	occ. wet sand and silt seams and layers	4	DO	36			20	
	brown grey				3			
		5	DO	31			18	
					4			
293.4 / 5.0		6	DO	50			16	
	END OF BOREHOLE				5			
					6			
					7			
					8			
					9			
					10			

W.L. @ El. 295.4 m on completion

Soil Engineers Ltd.

Ontario — Ministry of the Environment, Conservation and Parks

Well Tag#: A199020 (ow) A199020

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Measurements recorded in: ☐ Metric ☒ Imperial

Well Owner's Information

First Name	Last Name/Organization	E-mail Address	☐ Well Constructed by Well Owner
Powell	Foundations		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
28 Fortecon Dr.	Stouffville	ON	L4A 7G8	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
28 Fortecon Dr	Whitchurch	19	4

County/District/Municipality	City/Town/Village	Province	Postal Code
York	Vandorf	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	629379	4874748		

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
Grey	Fill		Packed	0	2
Brown	Clay	Stones	Hard	2	17
Grey	Clay	Silt	Soft, Layered	17	113
Grey	Clay	Stones	Hard, Packed	113	192
Grey	Medium Sand	Stones	Loose	192	198

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	20	Bentonite Slurry	7.86

Method of Construction

☐ Cable Tool ☐ Diamond ☐ Rotary (Conventional) ☐ Jetting ☐ Rotary (Reverse) ☐ Driving ☐ Boring ☐ Digging ☐ Air percussion ☒ Other, specify Air Dual Rotary

Well Use

☐ Public ☐ Commercial ☐ Not used ☒ Domestic ☐ Municipal ☐ Dewatering ☐ Livestock ☐ Test Hole ☐ Monitoring ☐ Irrigation ☐ Cooling & Air Conditioning ☐ Industrial ☐ Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
6	Steel	.188	0	192

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To
5	Stainless Steel	10	192	198

Status of Well

☒ Water Supply ☐ Replacement Well ☐ Test Hole ☐ Recharge Well ☐ Dewatering Well ☐ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality ☐ Abandoned, other, specify ☐ Other, specify

Water Details

Water found at Depth	Kind of Water	Hole Diameter Depth (m/ft) From	To	Diameter (cm/in)
192 (m/ft) ☐ Gas	☐ Fresh ☒ Untested ☐ Other, specify	0	198	6
(m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify	0	20	10
(m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify			

Results of Well Yield Testing

After test of well yield, water was: ☒ Clear and sand free ☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft): 180

Pumping rate (l/min / GPM): 10

Duration of pumping: 1 hrs + ___ min

Final water level end of pumping (m/ft): 130.6

If flowing give rate (l/min/GPM)

Recommended pump depth (m/ft): 185

Recommended pump rate (l/min/GPM): 10

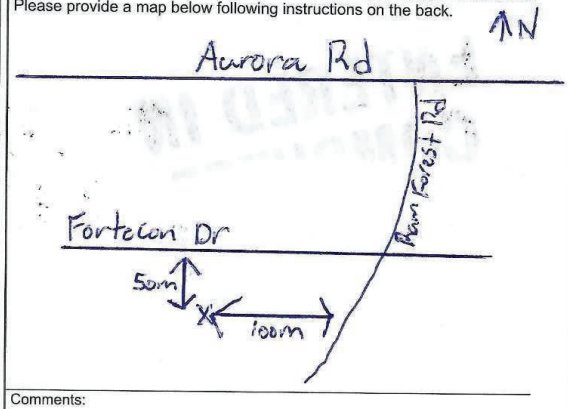
Well production (l/min/GPM): 14

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)	Water Level (m/ft)
Static Level	114.0		
1	117.7	1	129.5
2	119.6	2	128.2
3	120.8	3	127.8
4	121.6	4	126.1
5	122.2	5	124.9
10	124.2	10	117.6
15	125.5	15	114.0
20	126.5	20	114.0
25	127.3	25	114.0
30	127.9	30	114.0
40	129.0	40	"
50	129.9	50	"
60	130.6	60	"

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

200 PPm 75 PPm residule 19 ms

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Wilson's Water Wells LTD.	5459

Business Address (Street Number/Name)	Municipality	Province	Postal Code	Business E-mail Address
13787 Hwy 48	Stouffville	ON	L4A 3B3	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)	Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
9056404369	Hinves, Jesse	3662		2021 07 27

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☒ Yes ☐ No	2021 07 26	2021 07 26

Ministry Use Only

Audit No. Z353010

Received

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Ministry's Copy

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

YORK

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 6918798

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON. BLOCK, TRACT, SURVEY, ETC	LOT
YORK - WHITCHURCH	WHITCHURCH - STOUFFVILLE	CON 4. [redacted]	20

[redacted] 2565 Aurora Sd. Rd. — DATE COMPLETED: DAY 11 MO 5 YR 87

UTM: 17 14757 — RC — ELEVATION: 0310 — RC — BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown	sand			0	11
Grey	clay	silt		11	22
Grey	sand	stones		22	33
Brown	sand	stones		33	56
Grey	clay	sand & stones		56	148
Grey	clay	silt		148	158
Grey	clay	stony & sand		158	221
Grey	clay	silt		221	238
Grey	clay	Lots grey		238	249
Grey	sand	stoned		249	251
Grey	clay	silt		251	261
Grey	sand	stones		261	267

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
267	1 ☒ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6 1/4	1 ☒ STEEL; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE	.188	0	261
	1 ☐ STEEL; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE			
	1 ☐ STEEL; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
20	6 INCHES	6 FEET

MATERIAL AND TYPE: 55 — DEPTH TO TOP OF SCREEN: 261 FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☐ BAILER — AIR

PUMPING RATE: 25 GPM — DURATION OF PUMPING: 3 HOURS ___ MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☑ PUMPING 2 ☐ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
84 FEET	261 FEET	261 FEET	261 FEET	261 FEET	261 FEET

IF FLOWING, GIVE RATE: ___ GPM

PUMP INTAKE SET AT: 261 FEET

WATER AT END OF TEST: 1 ☑ CLEAR 2 ☐ CLOUDY

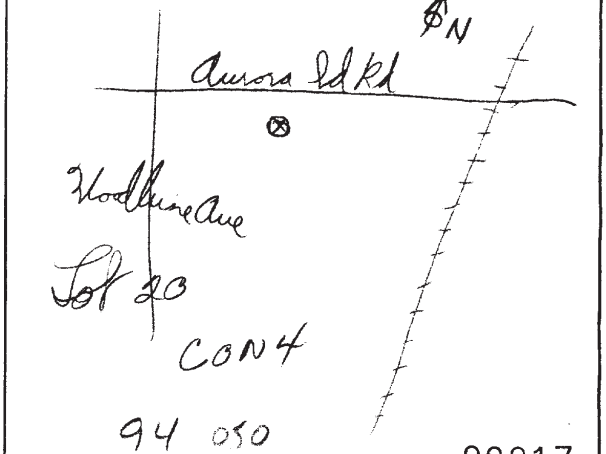
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☑ DEEP

RECOMMENDED PUMP SETTING: 250 FEET

RECOMMENDED PUMPING RATE: 20 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS: 09817

FINAL STATUS OF WELL

1 ☑ WATER SUPPLY; 2 ☐ OBSERVATION WELL; 3 ☐ TEST HOLE; 4 ☐ RECHARGE WELL; 5 ☐ ABANDONED, INSUFFICIENT SUPPLY; 6 ☐ ABANDONED, POOR QUALITY; 7 ☐ UNFINISHED

WATER USE

1 ☐ DOMESTIC; 2 ☐ STOCK; 3 ☐ IRRIGATION; 4 ☑ INDUSTRIAL; 5 ☐ COMMERCIAL; 6 ☐ MUNICIPAL; 7 ☐ PUBLIC SUPPLY; 8 ☐ COOLING OR AIR CONDITIONING; ☐ OTHER; 9 ☐ NOT USED

METHOD OF DRILLING

1 ☐ CABLE TOOL; 2 ☑ ROTARY (CONVENTIONAL); 3 ☐ ROTARY (REVERSE); 4 ☐ ROTARY (AIR); 5 ☐ AIR PERCUSSION; 6 ☐ BORING; 7 ☐ DIAMOND; 8 ☐ JETTING; 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Wilson Water Wells Ltd — LICENCE NUMBER: 5459

ADDRESS: RR4 Stouffville Ont

NAME OF DRILLER OR BORER: Jack Cook — LICENCE NUMBER: 0234

SIGNATURE OF CONTRACTOR: William Wilson — SUBMISSION DATE: DAY ___ MO ___ YR ___

OFFICE USE ONLY

DATE RECEIVED: JUL 21 1987

REMARKS:

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506—4—77 FORM 7

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 | 6920866 | MUNICIP 6900 9 | CON. CON 10A

COUNTY OR DISTRICT: York | TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Vandorf R | CON. BLOCK, TRACT, SURVEY, ETC.: CON 4 | LOT: 15

[redacted] 130 Ram Forest Dr | DATE COMPLETED: DAY 16 MO 02 YR 90

G 74299 | RC | ELEVATION 1030 | RC | BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
	Top Soil			0	2
Brown	Clay	Sandy		2	16
Grey	Clay	Silty	Soft	16	117
Grey	Clay	Stoney	Hard	117	178
Brown	Sand		Coarse	178	183

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
178	1 ☑ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6 1/4	1 ☑ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	0	180
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
14	6 INCHES	3 FEET

MATERIAL AND TYPE: S. S | DEPTH TO TOP OF SCREEN: 180 FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☑ BAILER | PUMPING RATE: 15 GPM | DURATION OF PUMPING: 1 HOURS ___ MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☑ PUMPING 2 ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
130 FEET	150 FEET		150 FEET	150 FEET	150 FEET	150 FEET

IF FLOWING, GIVE RATE: ___ GPM | PUMP INTAKE SET AT: ___ FEET | WATER AT END OF TEST: 1 ☑ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☑ DEEP | RECOMMENDED PUMP SETTING: 170 FEET | RECOMMENDED PUMPING RATE: 15 GPM

FINAL STATUS OF WELL

1 ☑ WATER SUPPLY | 2 ☐ OBSERVATION WELL | 3 ☐ TEST HOLE | 4 ☐ RECHARGE WELL | 5 ☐ ABANDONED, INSUFFICIENT SUPPLY | 6 ☐ ABANDONED, POOR QUALITY | 7 ☐ UNFINISHED | ☐ DEWATERING

WATER USE

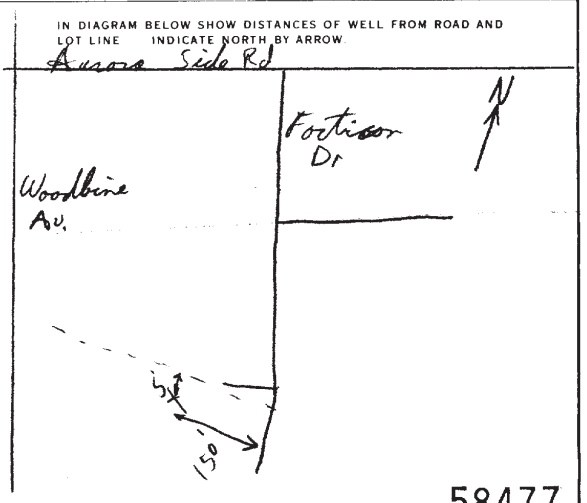
1 ☐ DOMESTIC | 2 ☐ STOCK | 3 ☐ IRRIGATION | 4 ☑ INDUSTRIAL | ☐ OTHER | 5 ☐ COMMERCIAL | 6 ☐ MUNICIPAL | 7 ☐ PUBLIC SUPPLY | 8 ☐ COOLING OR AIR CONDITIONING | 9 ☐ NOT USED

METHOD OF CONSTRUCTION

1 ☑ CABLE TOOL | 2 ☐ ROTARY (CONVENTIONAL) | 3 ☐ ROTARY (REVERSE) | 4 ☐ ROTARY (AIR) | 5 ☐ AIR PERCUSSION | 6 ☐ BORING | 7 ☐ DIAMOND | 8 ☐ JETTING | 9 ☐ DRIVING | ☐ DIGGING | ☐ OTHER

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



58477

DRILLERS REMARKS

CONTRACTOR

NAME OF WELL CONTRACTOR: Wilson Water Wells Ltd | WELL CONTRACTOR'S LICENCE NUMBER: 5459

ADDRESS: RR#4 Stouffville Ont

NAME OF WELL TECHNICIAN: [signature] | WELL TECHNICIAN'S LICENCE NUMBER: 6

SIGNATURE OF TECHNICIAN/CONTRACTOR: [signature] | SUBMISSION DATE: DAY ___ MO ___ YR ___

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR: 5459 | DATE RECEIVED: FEB 28 1990

DATE OF INSPECTION | INSPECTOR

REMARKS

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FORM NO. 0506 (11/86) FORM 9

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 — 6921653 — MUNICIP 69009 — CON. CON 104

COUNTY OR DISTRICT: York
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Whitchurch.
CON. BLOCK, TRACT, SURVEY, ETC: Con. 4
LOT: 19
[redacted]
RAM FOREST DR. VANDORF
DATE COMPLETED: DAY 25 MO 10 YR 91
NG: 744139 — RC — ELEVATION: 0300 — RC — BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
	FILL			0	10
BROWN	CLAY			10	17
BLUE	CLAY			17	64
	SAND			64	82
BLUE	CLAY	GRAVEL		82	94
BLUE	CLAY	SAND		94	114
BROWN	SAND			114	123
BLUE	CLAY			123	140
	SAND			140	150
BLUE	CLAY			150	162

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
140	1 ☑ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6	1 ☑ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	0	117
5	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☑ PLASTIC	.188	110	141
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.): 10, 12 — DIAMETER: 6 INCHES — LENGTH: 6 FEET
MATERIAL AND TYPE: STAINLESS STEEL — DEPTH TO TOP OF SCREEN: 141 FEET

61 PLUGGING & SEALING RECORD

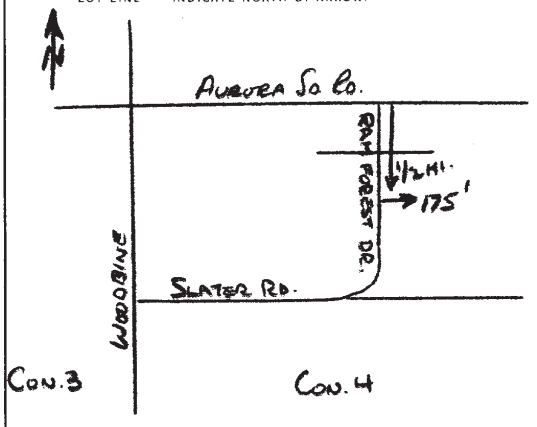
DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
0	117	CUTTINGS - BENSEAL

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP ☑ BAILER — AIR
PUMPING RATE: 3 GPM
DURATION OF PUMPING: 3 HOURS ___ MINS
STATIC LEVEL: 116 FEET
WATER LEVEL END OF PUMPING: ___ FEET
WATER LEVELS DURING: 1 ☐ PUMPING 2 ☐ RECOVERY
15 MINUTES ___ FEET — 30 MINUTES ___ FEET — 45 MINUTES ___ FEET — 60 MINUTES ___ FEET
IF FLOWING, GIVE RATE ___ GPM
PUMP INTAKE SET AT ___ FEET
WATER AT END OF TEST: 1 ☑ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☑ DEEP
RECOMMENDED PUMP SETTING: 146 FEET
RECOMMENDED PUMPING RATE: 3 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS: 095276

FINAL STATUS OF WELL (54)
1 ☑ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED ☐ DEWATERING

WATER USE (55-56)
1 ☐ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☑ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF CONSTRUCTION (57)
1 ☐ CABLE TOOL 2 ☑ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: KING CITY WELL DRILLING CO. LTD. — WELL CONTRACTOR'S LICENSE NUMBER: 3108
ADDRESS: Box 192 KING CITY
NAME OF WELL TECHNICIAN: BILL SANDERS JR. — WELL TECHNICIAN'S LICENCE NUMBER: T0323
SIGNATURE OF TECHNICIAN/CONTRACTOR: Bill O'Brien — SUBMISSION DATE: DAY 1 MO 11 YR 91

OFFICE USE ONLY

DATA SOURCE (58) — CONTRACTOR (59-62): 3108 — DATE RECEIVED (63-68): NOV 13 1991
DATE OF INSPECTION — INSPECTOR
REMARKS

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ministry of Environment and Energy
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 — 6924326 — Municipality 69009 — Con. CON 04

County or District [redacted] — Township/Borough/City/Town/Village STOUFFVILLE — Con block tract survey, etc. 4 — Lot 17

Address — Date completed 06 03 98 (day month year)

Northing — RC — Elevation — RC — Basin Code — ii — iii — iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	Depth – feet To
BLACK	TOPSOIL		SOFT	0	1
BROWN	CLAY		SOFT	1	15
GREY	CLAY	SILT, STONES	LAYERED	15	163
BROWN	GRAVEL	SILT	LOOSE	163	167
BROWN	SAND, SILT		DIRTY	167	180

41 WATER RECORD

Water found at – feet	Kind of water
167	1 ☑ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth – feet From	Depth – feet To
6 1/4	1 ☑ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188	+2	160
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Sizes of opening (Slot No.)	Diameter inches	Length feet
20	6	4

Material and type: STAINLESS — Depth at top of screen: 163 feet

61 PLUGGING & SEALING RECORD

☑ Annular space ☐ Abandonment

Depth set at – feet From	Depth set at – feet To	Material and type (Cement grout, bentonite, etc.)
3	150	HOLE PLUG CUTTINGS

71 PUMPING TEST

Pumping test method: AIR (1 ☐ Pump 2 ☐ Bailer) — Pumping rate: 3 GPM — Duration of pumping: .1.... Hours ..... Mins

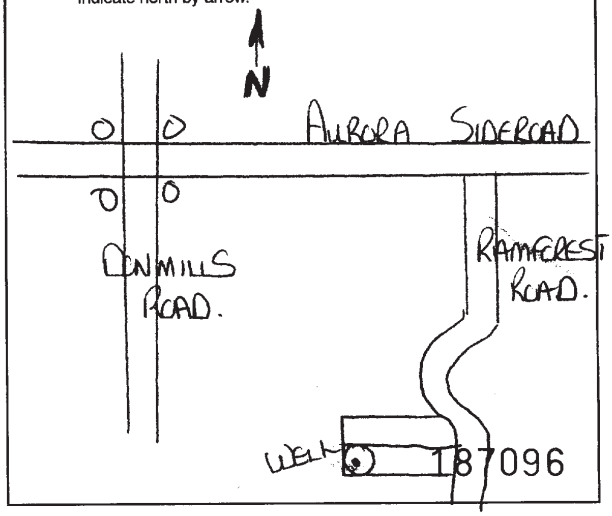
Static level	Water level end of pumping	Water levels during: 1 ☑ Pumping 2 ☐ Recovery	15 minutes	30 minutes	45 minutes	60 minutes
130 feet	160 feet		160 feet	160 feet	160 feet	160 feet

If flowing give rate: GPM — Pump intake set at: feet — Water at end of test: ☑ Clear ☐ Cloudy

Recommended pump type: ☐ Shallow ☑ Deep — Recommended pump setting: 160 feet — Recommended pump rate: 3 GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line.
Indicate north by arrow.



FINAL STATUS OF WELL

1 ☑ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

1 ☐ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not used 10 ☐ Other

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☑ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☐ Rotary (air) 5 ☐ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

Name of Well Contractor: R & B WELL DRILLING LTD — Well Contractor's Licence No.: 4645

Address: PO BOX 320 BEETON ONT L0G 1A0

Name of Well Technician: ROBERT W. KOWALSKI — Well Technician's Licence No.: T-2425

Signature of Technician/Contractor — Submission date: 09 03 98 (day mo yr)

MINISTRY USE ONLY

Data source — Contractor: 4645 — Date received: APR 14 1998

Date of inspection — Inspector

Remarks

0506 (07/94) Front Form 9

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Ontario Ministry of the Environment

The Ontario Water Resources Act
WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 — 6927318 — Municipality 69009 — Con. CON 04

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot
YORK	WHITECHURCH STOUFFVILLE	4	20
[redacted]	Address RICHMOND HILL	Date completed 27 day 02 month 03 year	

21 — UTM Zone 17 — Easting 629346 — Northing 4874845 — RC — Elevation — RC — Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
BROWN	CLAY	SILT	SAND	0	110
BROWN	SAND	GRAVEL & CLAY		110	121
BLUE	CLAY	SAND STONES		121	138
BROWN	SAND	GRAVEL	CEMENTED	138	158
GREY	MED SAND	GRAVEL		158	163
BLUE	CLAY	SAND GRAVEL	STREAKS	163	258
GREY	MED SAND	FINE SAND	DIRTY	258	264
BLUE	CLAY	GRAVEL		264	266
GREY	CRS SAND	GRAVEL		266	275
BLUE	CLAY			275	277

31

32

41 WATER RECORD

Water found at - feet	Kind of water
266	1 ☑ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas

AIR 60+

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
6¼	1 ☑ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188	0	267
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Sizes of opening (Slot No.)	Diameter	Length
30 35	6 inches	7 feet

Material and type: SS TELESCOPE — Depth at top of screen: 267 feet

61 PLUGGING & SEALING RECORD

☑ Annular space ☐ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
0	20	BENTONITE GROUT
		K PACKER

PUMPING TEST

71 — Pumping test method: 1 ☐ Pump 2 ☐ Bailer — Pumping rate: 15.5 GPM — Duration of pumping: 1 Hours 0 Mins

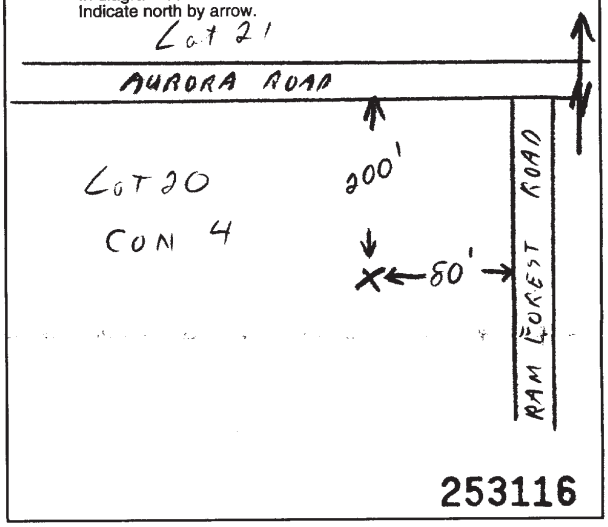
Static level	Water level end of pumping	Water levels during: 1 ☐ Pumping 2 ☐ Recovery			
		15 minutes	30 minutes	45 minutes	60 minutes
148.2 feet	149.2 feet	149.1 feet	149.2 feet	149.2 feet	149.2 feet

If flowing give rate: — GPM — Pump intake set at: feet — Water at end of test: ☑ Clear ☐ Cloudy

Recommended pump type: ☐ Shallow ☑ Deep — Recommended pump setting: 180 feet — Recommended pump rate: 30 GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



253116

FINAL STATUS OF WELL

1 ☑ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

1 ☐ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☑ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not use 10 ☐ Other

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☑ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☐ Rotary (air) 5 ☐ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

Name of Well Contractor	Well Contractor's Licence No.
FRED CONSTABLE & SON LTD	1663
Address: 3519 5TH LINE BRADFORD	
Name of Well Technician: STEVE THOMPSON	Well Technician's Licence No.: T 2120
Signature of Technician/Contractor: [signature]	Submission date: day 13 mo 5 yr 03

MINISTRY USE ONLY

Data source	Contractor	Date received
	1663	OCT 22 2003
Date of inspection	Inspector	
Remarks		

0506 (07/00) Front Form 9

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Ontario Ministry of the Environment

Imperial

Well Tag Number (I A 032845

A 032845

Well Record

Regulation 903 Ontario Water Resources Act

page ___ of ___

Instructions for Completing Form

- For use in the **Province of Ontario** only. This document is a permanent **legal** document. Please retain for future reference.
- All Sections **must** be completed in full to avoid delays in processing. Further instructions and explanations are available on the back of this form.
- Questions regarding completing this application can be directed to the Water Well Management Coordinator at 416-235-6203.
- **All metre measurements shall be reported to 1/10th of a metre.**
- Please print clearly in blue or black ink only.

Ministry Use Only

MUN | CON | LOT

Well Owner's Information and Location of Well Information

[redacted]

York | Whitchurch | 22 | 4

RR#/Street Number/Name: 15451 Woodbine | City/Town/Village: Vandorf | Site/Compartment/Block/Tract etc.

GPS Reading | NAD: 83 | Zone: 17 | Easting: 628733 | Northing: 4876365 | Unit Make/Model: TAGELIAN | Mode of Operation: ☐ Undifferentiated ☒ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

IN FEET

General Colour	Most common material	Other Materials	General Description	Depth From	Depth To
GREY	CLAY		SOFT	0	80
GREY	SILTY SANDS		SOFT	80	100
GREY	CLAY		SOFT	100	150
GREY	SILTY SANDS	"MED SAND "WATER"	SOFT	150	200
GREY	CLAY	SILT LAYERS	SOFT	200	245
GREY	GRAVEL	SANDS	LOOSE	245	251

Hole Diameter

Depth From	Depth To	Diameter Centimetres
0	251	6"

Water Record

Water found at ___ Metres	Kind of Water
250 ft	☒ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:
___ m	☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:
___ m	☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

After test of well yield, water was ☐ Clear and sediment free ☐ Other, specify CLOUDY

Chlorinated ☒ Yes ☐ No

Construction Record IN FEET

Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Depth To
Casing				
6"	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	.188	0	248
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
Screen				
Outside diam 6"	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No. #10	248	251
No Casing or Screen				
	☐ Open hole			

Test of Well Yield

Pumping test method	Draw Down Time min	Draw Down Water Level Metres	Recovery Time min	Recovery Water Level Metres
Pump intake set at - (metres) 240	Static Level	140.2		
Pumping rate - (litres/min) 15 ~~GPM~~	1	141.6	1	
Duration of pumping 1 hrs + 0 min	2	141.1	2	
Final water level end of pumping 141.1 metres	3	141.1	3	
Recommended pump type. ☐ Shallow ☐ Deep	4	141.1	4	
Recommended pump depth. ___ metres	5	141.1	5	
Recommended pump rate. (litres/min)	10	141.1	10	
	15		15	
If flowing give rate - (litres/min)	20		20	
	25		25	
If pumping discontinued, give reason.	30	141.1	30	
	40	141.1	40	
	50	141.1	50	
	60	141.1	60	

Plugging and Sealing Record ☒ Annular space ☐ Abandonment

Depth set at - Metres From	Depth set at - Metres To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
0	6M	BENTONITE BENSEAL	

Method of Construction

☐ Cable Tool ☒ Rotary (air) ☐ Diamond ☐ Digging
☐ Rotary (conventional) ☐ Air percussion ☐ Jetting ☐ Other
☐ Rotary (reverse) ☐ Boring ☐ Driving

Water Use

☒ Domestic ☐ Industrial ☐ Public Supply ☐ Other
☐ Stock ☐ Commercial ☐ Not used
☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning

Final Status of Well

☒ Water Supply ☐ Recharge well ☐ Unfinished ☐ Abandoned, (Other)
☐ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering
☐ Test Hole ☐ Abandoned, poor quality ☐ Replacement well

Well Contractor/Technician Information

Name of Well Contractor: WILSON'S WATER WELLS | Well Contractor's Licence No.: 5459

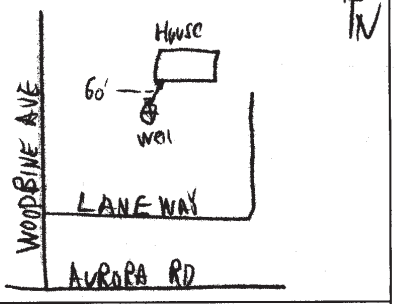
Business Address (street name, number, city etc.): 13797 HWY 48 STOUFFVILLE

Name of Well Technician (last name, first name): O'BRIEN MICHAEL | Well Technician's Licence No.: T-2516

Signature of Technician/Contractor: x M. C. O'Brien | Date Submitted: 2006 06 06

Location of Well

In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.



Audit No. Z 35896 | Date Well Completed: 2006 05 29

Was the well owner's information package delivered? ☐ Yes ☐ No | Date Delivered

Ministry Use Only

Data Source | Contractor: 5459

Date Received: JUN 15 2006 | Date of Inspection

Remarks | Well Record Number

0506E (09/03) Contractor's Copy ☐ Ministry's Copy ☐ Well Owner's Copy ☐

Cette formule est disponible en français

Ontario Ministry of the Environment

Well Tag No. (Plate Number) and/or Print Below: A 075482 (A075482)

Master Well Record for Cluster Well Construction

Regulation 903 Ontario Water Resources Act

Page 1 of

4425

[redacted]

Address of Well Location (Street Number/Name, RR): 1 Fortecon Dr | Township | Lot | Concession

County/District/Municipality | City/Town/Village: Gormley | Province: Ontario | Postal Code

UTM Coordinates: NAD 83 | Zone | Easting 17 629287 | Northing 4874714 | GPS Unit Make: Garmin | Model: Etrex | Mode of Operation: ☐ Undifferentiated ☐ Averaged ☐ Differentiated, specify

Overburden and Bedrock Materials *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (Metres) From	To
Brn	Gravel	Sand		0	.91
Brn	fine Sand	Silt	soft	.91	1.22
Brn	fine Sand	Silt	soft, wet	1.22	3.1
Gy	clay	Silt	soft, wet	3.1	3.66

Hole Details

Depth (Metres) From	To	Diameter (Centimetres)
0	3.66	10.92

Water Use

☐ Public ☐ Industrial ☐ Not used ☐ Other, specify
☐ Domestic ☐ Commercial ☐ Dewatering
☐ Livestock ☐ Municipal ☒ Monitoring
☐ Irrigation ☐ Test Hole ☐ Cooling & Air Conditioning

Method of Construction

☐ Cable Tool ☐ Air Percussion ☐ Digging
☐ Rotary (Conventional) ☐ Diamond ☐ Boring
☐ Rotary (Reverse) ☐ Jetting ☐ Other, specify
☐ Rotary (Air) ☐ Driving Direct Push

Status of Well

☒ Test Hole ☐ Abandoned, Insufficient Supply
☐ Replacement Well ☐ Abandoned, Poor Water Quality
☐ Dewatering Well ☒ Other, specify Monitoring
☐ Alteration (Construction) ☐ Abandoned, other, specify

Construction Details

Inside Diameter (Centimetres)	Material (steel, plastic, fibreglass, concrete, galvanized)	Wall Thickness	Depth (Metres) From	To
.052	PVC Riser	.0039	0	1.22
	PVC Screen		1.22	3.66

No Casing and Screen Used

Open Hole ☐ Yes ☐ No

Static Water Level Test

Metres

Screen

☐ Galvanized ☐ Steel ☐ Fibreglass ☐ Concrete ☒ Plastic

Outside Diameter (Centimetres): 6.03 | Slot No.: 10

Annular Space/Abandonment Sealing Record

Depth Set at (Metres) From	To	Type of Sealant Used (Material and Type)	Volume Used (Cubic Metres)
0	.3	Concrete / flushmount	
.3	.91	Bensea	
.91	3.66	Sand	

Water Details

Water found at Depth		Kind of Water
	Metres ☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
	Metres ☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
	Metres ☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals

Disinfected ☐ Yes ☐ No If no, provide reason:

Date Master Well Completed (yyyy/mm/dd): 2008/07/30

Cluster Information *(Please also fill out the additional Cluster Well Information for Well Construction for each parcel of land and cluster.)*

Total Wells in Cluster: 3

Please indicate Number of Cluster Well Information Log Sheets Submitted: 2

Total Wells on this Property: 3

Location of Well Cluster

Detailed Map must be provided as an attachment no larger than legal size (8.5" x 14"). Sketches are not allowed.

☐ Check box to confirm detailed map is provided as per Section 11.1 (3)

Consent to release additional information concerning the cluster to the Director upon request

[redacted]

Well Contractor and Well Technician Information

Business Name of Well Contractor: Strata Soil Sampling | Well Contractor's Licence No.: 7141

Business Address (Street No./Name, number, RR): #2-147 West Beaver Creek Rd. | Municipality: Richmond

Province: ON | Postal Code: L4B1C6 | Business E-mail Address

Bus. Telephone No. (inc. area code): (905) 764-9304 | Name of Well Technician (Last Name, First Name): Brown, Mike

Well Technician's Licence No.: 2977 | Signature of Technician: MB, 1786 | Date Submitted (yyyy/mm/dd): 2008/07/31

Ministry Use Only

Audit No.: M 01560 | Well Contractor No.

Date Received (yyyy/mm/dd): AUG 28 2008 | Date of Inspection (yyyy/mm/dd)

Remarks: C 00479

1992 (11/2006)

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Ontario

Ministry of the Environment

Well T A 075482 (Well Tag No.)

A 075482

Cluster Well Information for Cluster Well Construction

Regulation 903 Ontario Water Resources Act

4925

[redacted]

Address of Well Location (Street Number/Name, RR)	Lot	Concession	Township	County/District/Municipality
1 Fortecon Dr. RR#1				

City/Town/Village	Province	Postal Code	GPS Unit Make	Model	Unit Mode of Operation
Gormley	Ontario		Garmin	Etrex	☐ Undifferentiated ☑ Averaged ☐ Differentiated, specify:

upon request

Signature of Technician/Contractor	Date (yyyy/mm/dd)

Well # on Sketch	UTM Coordinates Zone	Easting	Northing	Full Depth of Hole (metres)	Hole Diameter (cm)	Method of Construction	Casing Material	Casing Length (metres)	Screen Interval (metres) From	To	Annular Space Sealant Used	Static Water Level (metres)	Abandonment Sealant Used	Comments	Date of Completion (yyyy/mm/dd)
2	17	629689	4874931	3.66	10.92	Direct Push	PVC	1.22	1.22	3.66	Bensen				2008/07/30
3	17	629697	4874940	3.66	10.92	"	"	1.22	1.22	3.66	Bensed				"

Well Contractor and Well Technician Information

Business Name of Well Contractor	Business Address (Street Number/Name, RR)	Municipality	Province
Shata Soil Sampling	2-147 West Beaver Creek	Richmond Hill	ON

Postal Code	Business Telephone No. (inc. area code)	Well Contractor's Licence No.	Business E-mail Address
L4B 1G6	(905) 764-9304		

Name of Well Technician (First Name, Last Name)	Well Technician's Licence No.	Date Submitted (yyyy/mm/dd)	Signature of Technician
[redacted] BB, 1796	T-2977	2008/07/31	[redacted]

Date 1st Well in Cluster Constructed (yyyy/mm/dd)	Date Last Well in Cluster Constructed (yyyy/mm/dd)
2008/07/30	2008/07/30

Ministry Use Only

Date Received (yyyy/mm/dd)	Date Inspected (yyyy/mm/dd)
AUG 28 2008	
Audit No. C 00479	Remarks M01560

1991 (11/2006)

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Ontario Ministry of the Environment

Measurements recorded in: ☑ Metric ☐ Imperial

Well Tag No. (Place Sticker and/or Print Below) **Tag#: A161432**

Well Record

Regulation 903 Ontario Water Resources Act

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
163 RAM FOREST RD.	WHITCHURCH-STOUFFVILLE	21	4
County/District/Municipality	**City/Town/Village**	**Province**	**Postal Code**
YORK	GORMLEY	Ontario	L0H 1G0
UTM Coordinates Zone / Easting / Northing	**Municipal Plan and Sublot Number**	**Other**	
NAD 83 17 629608 4874676			

Overburden and Bedrock Materials/Abandonment Sealing Record *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
BLACK	TOPSOIL		SOFT	0	.3
GREY	CLAY		SOFT	.3	32
GREY	CLAY	STONES	MED.	32	50.2
BROWN	SAND	GRAVEL	PACKED	50.2	58.5

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
0	6	BENTONITE SLURRY	.18

Method of Construction

☑ Cable Tool ☐ Diamond
☑ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion
☐ Other, specify

Well Use

☐ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☑ Industrial
☐ Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
15.4	STEEL	.477	+.7	37.7
12.7	PLASTIC	.544	36.2	55.4

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
14.75	STAINLESS	12	55.4	56.9
14.75	STAINLESS	14	56.9	58.5

Status of Well

☑ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, specify
☐ Other, specify

Water Details

Water found at Depth (m/ft)	Kind of Water	Other, specify
50 (m/ft) ☐ Gas	☑ Fresh ☐ Untested	
(m/ft) ☐ Gas	☐ Fresh ☐ Untested	
(m/ft) ☐ Gas	☐ Fresh ☐ Untested	

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0	6	25.4
6	37.7	17.1
37.7	58.5	15.36

Results of Well Yield Testing

After test of well yield, water was:
☑ Clear and sand free
☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft): 55

Pumping rate (l/min / GPM): 20

Duration of pumping: 1 hrs + 30 min

Final water level end of pumping (m/ft): 48.15

If flowing give rate (l/min / GPM):

Recommended pump depth (m/ft): 55

Recommended pump rate (l/min / GPM): 20

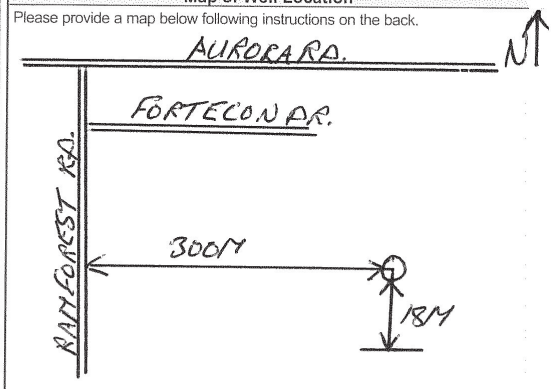
Well production (l/min / GPM): 20

Disinfected? ☑ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	34.75		
1	36.54	1	45.87
2	38.15	2	44.76
3	39.55	3	43.76
4	40.66	4	42.87
5	41.64	5	42.08
10	44.72	10	39.14
15	46.14	15	37.41
20	46.82	20	36.4
25	47.2	25	35.8
30	47.42	30	35.45
40	47.63	40	35.17
50	47.73	50	35.03
60	47.8	60	34.95

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
E.SWELL DRILLING	7108
Business Address (Street Number/Name)	**Municipality**
32 NORTHLINE RD. FENELON FALLS	KAWARTHA
Province	**Postal Code**
ONT	K0M1N0
Business E-mail Address	
Bus. Telephone No. (inc. area code)	**Name of Well Technician (Last Name, First Name)**
7054542323	HOUSTON EARL
Well Technician's Licence No.	**Signature of Technician and/or Contractor**
1554	

Date Submitted: 2014 10 07

Well owner's information package delivered: ☑ Yes ☐ No

Date Package Delivered: 2014 09 26

Date Work Completed: 2014 09 26

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Audit No. Z185065

Received OCT 08 2014

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APPENDIX B

GROUNDWATER QUALITY

CADUCEON™ ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: ---

REPORT No. B21-38777

Report To:

Gaman Consultants Inc
7 Pinsent Court,
Barrie ON L4N 6E3
Attention: Gary Hendy

Caduceon Environmental Laboratories
112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 25-Nov-21
DATE REPORTED: 02-Dec-21
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Limen Foretcon Drive
P.O. NUMBER: 21013.00
WATERWORKS NO.

			Client I.D.:		BH4	BH8	ODWS	
			Sample I.D.:		B21-38777-1	B21-38777-2	Objective	Type of Objective
			Date Collected:		24-Nov-21	24-Nov-21		
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Nitrite (N)	mg/L	0.1	SM4110C	01-Dec-21/O	< 0.1	< 0.1	1	MAC
Nitrate (N)	mg/L	0.1	SM4110C	01-Dec-21/O	0.5	1.0	10	MAC

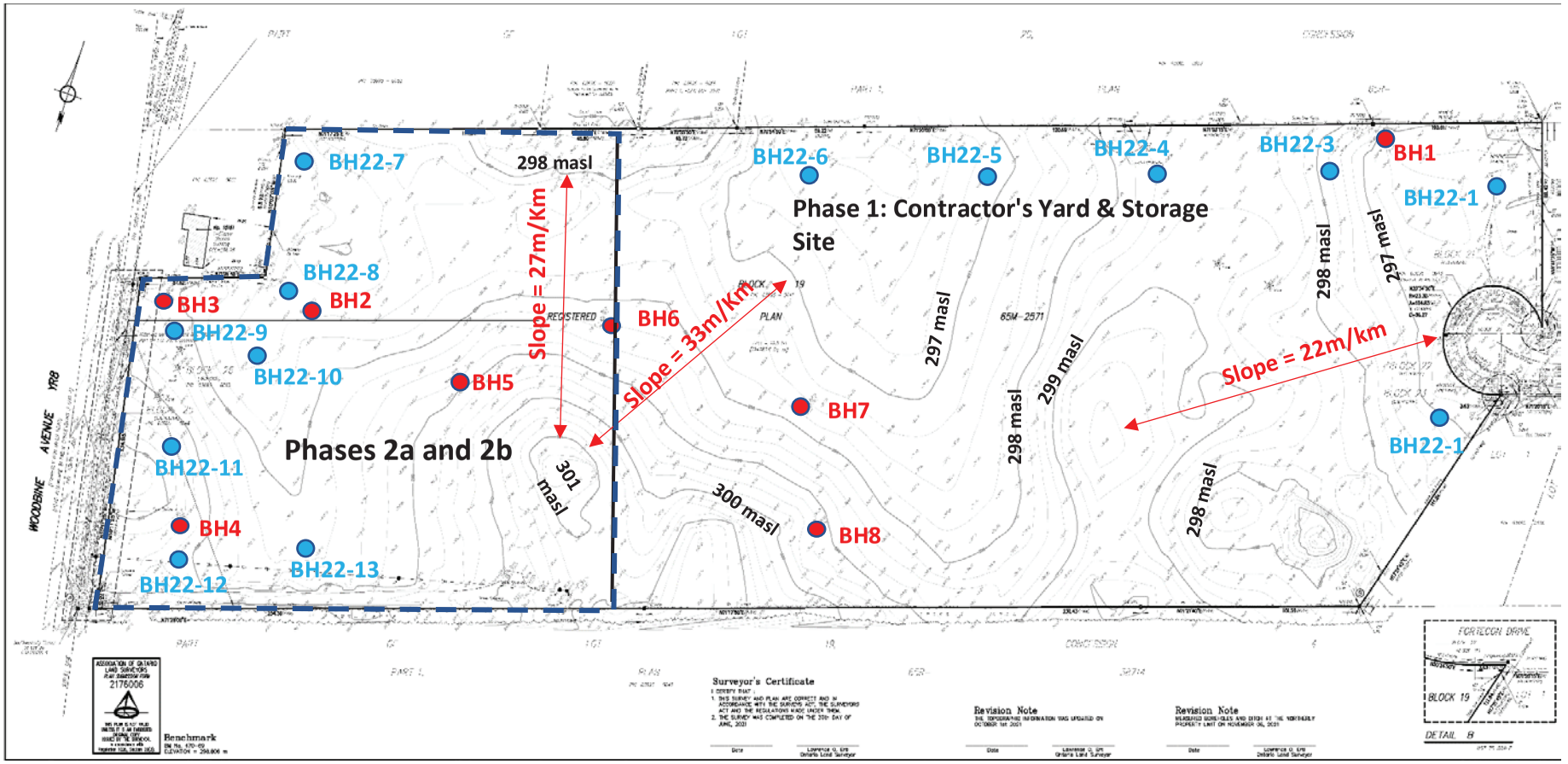
ODWS - Ontario Drinking Water Standards
AO - Aesthetic Objectives
IMAC - Interim Maximum Acceptable Concentration
MAC - Maximum Acceptable Concentration
ODWO - D-5-5 Objective
OG - Operational Guidelines
WL - Warning Level - Sodium Restricted Diets
R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Christine Burke
Lab Manager

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

APPENDIX C

WATER BUDGET



NOTES

BH8 ● Borehole location and designation (BH Logs not available)

BH22-1 ● Soil-Eng Borehole Location & Designation

Borehole locations are approximate

300 masl topographic contour metres above sea level

Phase 2 Boundary (Approximate)

Existing Boreholes and Topography

Water Balance Evaluation, Phase 2 Limen Head Office,
15123 Woodbine Avenue
For SCAL Properties Ltd

Date:	Feb-23	Scale:	as shown
Project:	21013.02	Ref No:	

GAMAN Consultants Inc.

Figure C-1

NOTES

- **BH22-8** Soil-Eng Groundwater Monitor
- BH10 Soil-Eng borehole Location

Soil-Eng Borehole Map

Water Balance Evaluation, Phase 2 Limen Head Office,
15123 Woodbine Avenue
For SCAL Properties Ltd

Date:	Feb-23	Scale:	as shown
Project:	21013.02	Ref No:	

GAMAN Consultants Inc.

Figure C-2

TABLE C-1 SUMMARY OF CLIMATIC STATIONS

Project: Water Balance Evaluation Phase 2 Limen Head Office 15123 Woodbine Ave (21013.02)

Station Name	Station ID	years Monitored	Years	Total Precipitation	Distance from Site (km)
Aurora NE	6150398	2003-2009	6	892	4km NW
Newmarket 3	615N002	1996-2002	16	817	4.6km NW
Ballantrea	6150460	1979-1992	13	902	8 Km East
Bruce Mills		2002-2021	19	885	13 KM South
Stouffville WPCP		1971-1993	22	851	13 Km Southwest
Goodwood Pumping Stat	6158040	2004-2021	17	964	16 Km East
Uxbridge	HY031	1983-1992	9	809	24 Km East
King Smoke Tree	6154142	1981-2010	30	853	10 Km West
Sharon	6157685	1961-1999	38	779	10 Km North
Buttonville A	615HMAK	1981-2010	30	853	18 Km South
			Average Precipitation	**861**	

TABLE C-2
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1981-2010 (King Smoke Tree ID6154142) #
Potential Evapotranspiration
Project: Water Balance Evaluation Phase 2 Limen Head Office 15123 Woodbine Ave (21013.02)

	Thornthwaite (1948)									Thornthwaite and Mather (1957)					
Month	Mean Temperature (°C)	Heat Index	Potential Evapo-transpiration (mm)	Daylight Correction Value	Adjusted Potential Evapo-transpiration (mm)	Total Precipitation (mm)	Surplus (mm)	Deficit (mm)	PPT - PET (mm)	Accumulated Potential Water Loss (mm)	Storage (mm) (ST)	Change in Soil Moisture (mm) (delta S)	Actual Evapo-transpiration (mm)	Moisture Deficit (mm)	Unadjusted Moisture Surplus (mm)
January	-7.4	0.0	0.0	0.81	0.0	51.7	51.7	0.0	51.7	0.0	250.0	0.0	0.0	0.0	51.7
February	-6.1	0.0	0.0	0.81	0.0	46.0	46.0	0.0	46.0	0.0	250.0	0.0	0.0	0.0	46.0
March	-1.5	0.0	0.0	1.02	0.0	51.2	51.2	0.0	51.2	0.0	250.0	0.0	0.0	0.0	51.2
April	6	1.3	27.6	1.12	30.9	64.9	34.0	0.0	34.0	0.0	250.0	0.0	30.9	0.0	34.0
May	12.5	4.0	60.5	1.27	76.8	87.1	10.3	0.0	10.3	0.0	250.0	0.0	76.8	0.0	10.3
June	17.7	6.8	87.7	1.29	113.1	84.8	0.0	28.3	-28.3	-28.3	197.0	-53.0	137.8	-24.7	0.0
July	20.5	8.5	102.6	1.30	133.4	86.4	0.0	47.0	-47.0	-75.3	170.0	-27.0	113.4	20.0	0.0
August	19.6	7.9	97.8	1.20	117.3	88.4	0.0	28.9	-28.9	-104.2	125.0	-45.0	133.4	-16.1	0.0
September	15.3	5.4	75.0	1.04	78.0	84.2	6.2	0.0	6.2	0.0	131.2	6.2	78.0	0.0	0.0
October	8.6	2.3	40.5	0.95	38.5	72.9	34.4	0.0	34.4	0.0	250.0	118.8	38.5	0.0	-84.4
November	2.2	0.3	9.4	0.80	7.5	84.6	77.1	0.0	77.1	0.0	250.0	0.0	7.5	0.0	77.1
December	-3.7	0.0	0.0	0.74	0.0	55.5	55.5	0.0	55.5	0.0	250.0	0.0	0.0	0.0	55.5
TOTALS		36.5			595.6	857.7	366.4	104.2	**262.1**	**-207.8**	**2623.2**	**0.0**	**616.3**	**-20.8**	**241.4**

TOTAL WATER SURPLUS 262.1 mm

TOTAL MOISTURE SURPLUS **241.4** **mm**

NOTES:
1) Water budget adjusted for latitude and daylight.
2) (°C) - Represents calculated mean of daily temperatures for the month.
3) Precipitation and Temperature data from the King Smoke Tree Latitude 44°01'00.00" N, Longitude 79°31'00.00" W, elevation 352 masl
4) Total Water Surplus (Thornthwaite, 1948) is calculated as total precipitation minus adjusted potential evapotranspiration.

557.1

TABLE C-3(A): PRE-DEVELOPMENT AND POST-DEVELOPMENT INFILTRATION FACTORS

Project: Water Balance Evaluation Phase 2 Limen Head Office (21013.02)

MOECC 1995 Hydrogeological Technical Information Requirements (page 4-62)

Desription of Area/Development Site		Pre-development		Post-development		
TOPOGRAPHY	**Factor**	Description	Factor	Description		Factor
Flat lying, average slope < 0.6m/km	0.3	Slopes = 27m/km	0.1	Between Flat and Rolling		0.2
Rolling land average slope of 2.8-3.8m	0.2					
Hilly land, average slopes of 28-47 metres	0.1					
SOILS						
Tight impervious Clay	0.1	Clay and loam	0.2	Clay and loam	0	0.2
Medium combinations of clay and loam	0.2					
open sandy loam	0.4					
COVER						
Cultivated land	0.1	Agricultural land	0.1	Open space		0.1
Woodland	0.2					
Total Infiltration factor for pervious areas with medium combinations of clay and loam pre-development and post-development.			**0.4**	Clay and Loam		**0.5**

TABLE C-3(B): PRE-DEVELOPMENT AND POST-DEVELOPMENT WATER BUDGETS

Project: Water Balance Evaluation Phase 2 Limen Head Office 15123 Woodbine Ave (21013.02)

	PRE-DEVELOPMENT WATER BUDGET	
	Water Surplus (mm/yr)	241.4
	Infiltration Areas (ha)	4.02
	Pre-Development Infiltration Factor	0.4
A	Total Recharge m3/yr	3,881
	Total Recharge mm/yr	97
	Runoff m3/year	5,821

	POST-DEVELOPMENT RECHARGE RATES	Landscape & sewage bed area	2-storey office bld	Parking Lot	Other impervious areas	Impervious Areas*	Totals
	90% Total Precipication (mm/yr)					772	
	Water Surplus (mm/yr)	241.4	241.4	241.4	241.4		
	Areas (ha)	1.130	0.4924	2.398	0.000		4.020
	Infiltration Factor	0.5	0	0	0	0	
B	Recharge from precipitation m3/yr	1,364	-	-	-	-	1,364
	Runoff m3/year	1,364	1,188	5,788	-	-	8,340
C	Recharge Deficit (A-B) m3/year						2,517

Assumptions: (1) stormwater pond is lined, (2) site grading changes topography to gentler slopes, fill soils similar in composition to native soils

***Impervious areas include: Building, parking areas, 90% total precipitation**

Appendix C – Sanitary Servicing – Refer to Submission Package

Appendix D – Water Supply – Refer to Submission Package

Appendix E – Engineering Drawings – Refer to Submission Package