



Enhancing our communities



209806 Highway 26, Craigleith

STORMWATER MANAGEMENT REPORT

Pinnacle Building Group Corp.

Document Control

File:

121258

Date:

September
13, 2022

Prepared by:

Tatham Engineering Limited
115 Sandford Fleming Drive, Suite 200
Collingwood, Ontario L9Y 5A6
T 705-444-2565
tathameng.com

Prepared for:

Pinnacle Building Group Corp.
1001 Durst Road
Waterloo, Ontario N2J 4G8

Authored by:	Reviewed by:
	
John Birchard, B.Eng., EIT Engineering Intern	Randy Simpson, B.A.Sc., P.Eng. Director, Manager - Land Development Engineering

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Issue	Date	Description
1	September 13, 2022	Stormwater Management Report

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1 Introduction

Pinnacle Building Group Corp. has retained Tatham Engineering to complete a stormwater report in support of site plan approval for the construction of a residential condominium development at 209806 and 209808, Highway 26, Town of The Blue Mountains.

1.1 OBJECTIVE

The primary objective of this report is to investigate the existing and proposed drainage conditions of the subject property to develop a stormwater management plan that does not adversely affect local surface water quantity or water quality conditions. This will be accomplished by evaluating the effect of the development on local drainage conditions and, where necessary, providing solutions to mitigate any adverse impacts.

1.2 GUIDELINES & BACKGROUND REPORTS

This report was prepared recognizing provincial guidelines on water resources and the environment, including the following publications:

- The Ministry of the Environment, Conservation and Parks (MECP) Stormwater Management Practices Planning and Design Manual (2003); and
- Town of The Blue Mountains Engineering Standards (2018).



2 Development Site

2.1 SITE LOCATION & DESCRIPTION

The site is legally described as Part Lots 150 & 151 Plan 14 The Blue Mountains. The site is located on Ontario Highway 26 and is bound by single detached residential dwellings to the west and south, an Esso gas station to the east and Highway 26 to the north. The subject property is zoned as R2 *Residential*.

2.2 SURFACE CONDITIONS.

A topographic survey of the subject property was completed in December 2021. The high spot of the subject site (180.53) is located at the southeast corner of the site. The subject property is fairly flat and generally slopes from the south to the north at an average gradient of less than 1% to existing ditches along Highway 26, ultimately outletting to Georgian Bay.

The 0.68 ha site is currently occupied by a 480 m² motel building and 950 m² of driveway with the remainder of the site being treed or unmaintained lawn.

2.3 SUBSURFACE CONDITIONS

A geotechnical investigation, submitted under separate cover, was completed by CMT Engineering Inc. Inc. dated February 15, 2022. Fieldwork was conducted on December 16 & 17, 2021, consisting of six exploratory sampled boreholes. The boreholes extended to a maximum depth of 6.5 meters below existing ground surface. Subsurface conditions are as follows:

- 50 to 100 mm of surficial topsoil;
- Loose sand fill with some to no gravel, trace silt and clay was found in Boreholes 1, 2, 5 and 6 ranging in depth from 0.97 to 1.57 m;
- a layer of sand was encountered under the topsoil or fill in all boreholes;
- sandy silt with some clay and trace gravel was found under the sand in boreholes 1, 2 and 6.
- Refusal was encountered at presumed bedrock in boreholes 1, 2 and 6 at depths ranging from 6.13 to 6.48 m.

Groundwater was encountered at four borehole locations at depths ranging from 0.41 to 1.05 m.

The soils have been classified as Granby Sand (Type B) as per the *Soil Survey of Grey County - Report No. 17 of the Ontario Soil Survey*, completed by the Ontario Department of Agriculture. This soil group has low runoff potential and high infiltration rates even when thoroughly wetted.



3 Existing Drainage Conditions

Information regarding the existing topography, ground cover and drainage patterns were obtained through collection of detailed topographic survey data, aerial photos and the review of relevant background.

3.1 SURFACE DRAINAGE & RUNOFF

The existing site slopes towards Highway 26 from south to north at an average gradient of 0.8% and is labelled as Catchment 101. The runoff enters the existing ditch on the south side of Highway 26 and eventually outlets to Georgian Bay. Refer to the *Pre-Development Drainage Plan (DP01)* for details on the existing drainage area.

3.2 PRE-DEVELOPMENT PEAK FLOWS

The existing conditions, considering the site's surface and subsurface conditions, have been modelled in Visual OTTHYMO to establish the pre-development peak flows. 2-year through to the 100-year return frequency design storms were generated utilizing the MTO IDF data. The pre-development flow results are summarized in Table 1 and supporting calculations are provided in Appendix A.

Table 1: Pre-Development Peak Flow Rate Summary

STORM EVENT	CATCHMENT 101	
	Chicago (m ³ /s)	SCS 24-Hour (m ³ /s)
2-year	0.020	0.022
5-year	0.028	0.033
10-year	0.033	0.043
25-year	0.040	0.059
50-year	0.046	0.068
100-year	0.051	0.087
Timmins	0.055	-



4 Proposed Stormwater Management Plan

4.1 DESIGN CRITERIA

The proposed stormwater management plan is subject to the review and approval of the Town of The Blue Mountains. Criteria to be met regarding the development of the site are summarized below.

4.1.1 Stormwater Quality Control

Water quality controls must be provided to satisfy the MECP SWM Practices Planning and Design Manual. Georgian Bay is the ultimate receiving waterbodies for site drainage. Enhanced Level water quality protection is required in the form of 80% total suspended solids (TSS) removal and treatment of 90% of the surface runoff generated from the contributing drainage area that occurs on a long-term average basis.

4.1.2 Stormwater Quantity Control

Proposed condition peak flows discharging into the Highway 26 ditch must be controlled to the existing peak flow rate for all storms up to and including the 100-year event to ensure no adverse impacts further downstream. Safe conveyance to a sufficient outlet must be provided for the Regulatory Storm event.

4.1.3 Siltation & Erosion Control

Recommendations for a siltation and erosion control strategy that will be implemented during construction are to be provided.

4.2 PROPOSED DRAINAGE CONDITIONS

The proposed development will remove the existing motel building and driveway and feature 4 townhouse blocks two comprised of 5 units, one comprised of 4 units and one comprised of 3 units for a total of 17 units as well as associated driveways and additional parking. The proposed development is shown on the Site Grading Plan (SG01), attached.

The existing drainage conditions will be generally maintained. Most of the site will drain via storm sewers to an underground storage system located beneath the proposed internal site road and parking. Flows from the 2-year through to the 100-year storm events will be collected by the underground storage system which will outlet to the Highway 26 ditch. Emergency overland flows for storms greater than the 100-year storm event will be conveyed via the proposed internal



site road to the Highway 26 roadside ditch, which ultimately outlets to Georgian Bay. A storm sewer design sheet is included in Appendix B.

Open space areas at the north and south of the site will remain uncontrolled in addition to a small portion of the internal site road immediately south of Highway 26.

The proposed drainage patterns are shown on the *Post-Development Drainage Plan (DP02)*.

4.3 WATER QUANTITY

The post-development stormwater flow from the proposed development will be maintained to the pre-development peak outflow for storms with return periods ranging up to 100 years. The proposed stormwater management system will outlet to the existing Highway 26 south ditch.

A Visual OTTHYMO model was developed to determine peak flow rates from the subject site under existing and proposed conditions for the 2 year through 100-year storm events. The model was then used to determine the required water quantity storage volume to attenuate the proposed condition peak flow rates to existing condition levels. A summary of proposed condition peak flow rates is provided in Table 2. The proposed condition supporting calculations and Visual OTTHYMO output is provided in Appendix B.

The proposed site has been modelled as two catchments. Catchment 201 consists of all uncontrolled area onsite, it is primarily pervious and consists of a grassed area along the south border of the site, grassed area at the northern portion of the site and approximately 60 m² of driveway at the northern extent of the site amounting to a total area of 0.32 ha. Catchment 202 consists of all the controlled area onsite and will include drainage from all townhouses, driveways, parking and the majority of the onsite roadway and has a total area of 0.36 ha. Post-development peak flows for the 2-year through to the 100-year return frequency design storms were generated utilizing the MTO IDF data.

The grading has been designed to convey runoff from Catchment 202 to an underground storage unit located beneath the site roadway and parking. The underground storage will be composed of 90 CULTEC Recharger 280HD units and provide a total storage volume of 171 m³. The underground storage system has been sized to attenuate post-development peak flow rates to pre-development levels. An oil grit separator (OGS) will provide the requisite quality control for Catchment 202 and will be placed at the outlet of the CLUTEC storage system immediately upstream of the Highway 26 ditch. The underground storage system will outlet to the Highway 26 ditch.

The results shown in Table 2 confirm that the proposed condition peak flow rates at the site outlet are maintained at or below pre-development quantities up to and including the 100-year



storm event. The water quantity storage volume required to control the 100-year storm is 154 m³ and the system provides 171 m³.

Table 2: Post-Development Peak Flow Rate Summary

STORM EVENT	DISCHARGE TO HWY 26		STORAGE USED		PRE-DEVELOPMENT FLOWS	
	Chicago (m ³ /s)	SCS 24-Hour (m ³ /s)	Chicago (m ³)	SCS 24-Hour (m ³)	Chicago (m ³ /s)	SCS 24-Hour (m ³ /s)
2-year	0.008	0.020	29	71	0.020	0.022
5-year	0.012	0.033	61	91	0.028	0.033
10-year	0.019	0.040	70	105	0.033	0.043
25-year	0.027	0.051	82	123	0.040	0.059
50-year	0.032	0.058	92	137	0.046	0.068
100-year	0.037	0.067	102	154	0.051	0.087
Timmins	0.053	-	133	-	0.055	-

The stage-storage-discharge table for the underground storage facility is included in Appendix B. Further design details are provided on Site Servicing Plan (SS01), attached.

The design of the outlet configuration for the surface and underground storage facility consists of the following:

- a 300 mm dia. PVC pipe outletting from the OGS discharging to the Highway 26 ditch and
- two 100 mm orifices at the outlet of the underground storage system one set at the underground storage system invert of 180.30 m and one 150 mm higher at an elevation of 180.45 m.

Emergency overland flows for storms greater than the 100-year storm event will be conveyed as sheet flow towards Highway 26. The Timmins regional storm event was modeled and can be safely conveyed through the CULTEC storage system without needing to use the overland flow path, however, should the underground system become blocked, stormwater will pond to a maximum depth of 0.10 m within the right of way, before spilling to the Highway. Refer to the Post-Development Drainage Plan (DP02) and the Site Grading Plan (SG01) drawings for proposed drainage patterns.



4.4 WATER QUALITY

An oil and grit separator designed to provide at least 80% total solids removal and treatment of 90% of the surface runoff generated from its contributing drainage area will be installed downstream of the underground storage system. Further, the underground storage system has been designed with separator rows to provide additional quality control by isolating debris and some contaminants which will be pumped out of the isolator rows.

A Stormceptor EFO4 treatment unit or approved equal is proposed to provide primary quality control for the site. The Stormceptor unit is to be placed at the outlet of the Cultec storage system and will therefore provide treatment for the entirety of Catchment 202. The Stormceptor EFO4 treatment unit has been sized by using the ETV verified sizing tool available from the manufacturer. This treatment unit will provide 83% total suspended solids removal for the site. The Stormceptor provides the treatment required to satisfy Provincial standards for enhanced quality control. The Stormceptor EFO sizing calculations are attached in Appendix C for reference. The location of the oil and grit separator is illustrated on the Site Servicing Drawing (SS01).

Note that specific water quality controls are not required for Catchment 202, as this area is only 3% impervious and primarily consists of grassed areas, which is considered clean runoff.



5 Siltation and Erosion Control

Siltation and erosion control will be implemented for all construction activities for the proposed development, including vegetation clearing, topsoil stripping, parking lot and building construction and stockpiling of materials. The basic principles considered to minimize erosion and sedimentation and resultant negative environmental impacts include:

- minimize disturbance activities where possible;
- expose the smallest possible land area to erosion for the shortest possible time;
- A silt fence will be erected around the site to control sediment movement;
- implement sediment and erosion control measures before the outset of construction activities; and
- carry out regular inspections of erosion/sediment control measures and repair or maintain as necessary.



6 Summary

The proposed residential development will consist of 17 condominium units.

Existing drainage patterns will generally be maintained, with stormwater runoff directed to the existing ditches on the south side of Highway 26 which ultimately outlet to Georgian Bay. Onsite runoff will drain to a proposed underground storage facility to provide quantity control for the site. Stormwater runoff will be controlled to pre-development quantities for storms with return periods ranging up to 100 years. Water quality control will be provided by an OGS system downstream of the underground storage facility.

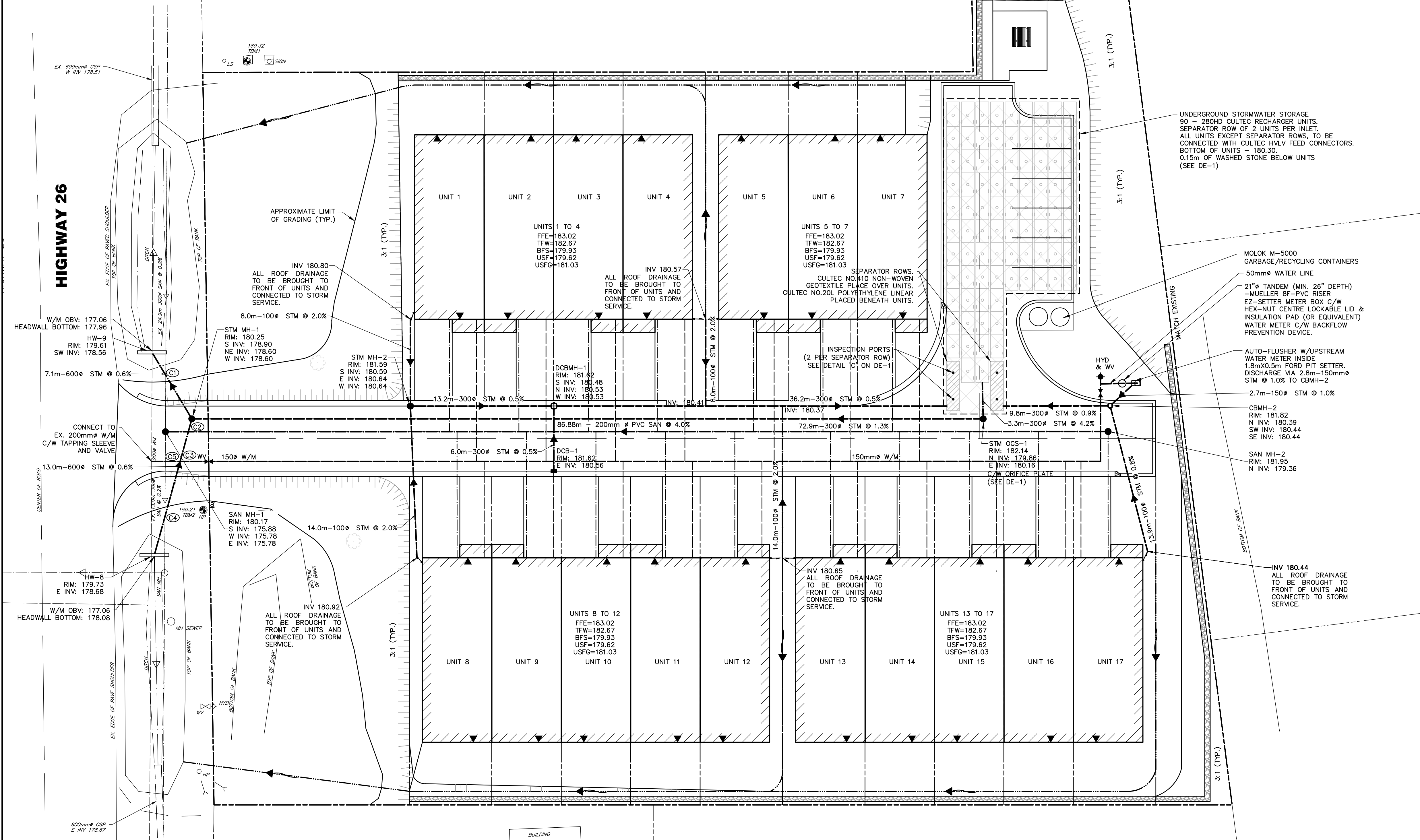
Siltation and erosion control will be provided with the proper construction mitigation efforts. Long-term erosion control will be enhanced with an effective revegetation strategy.



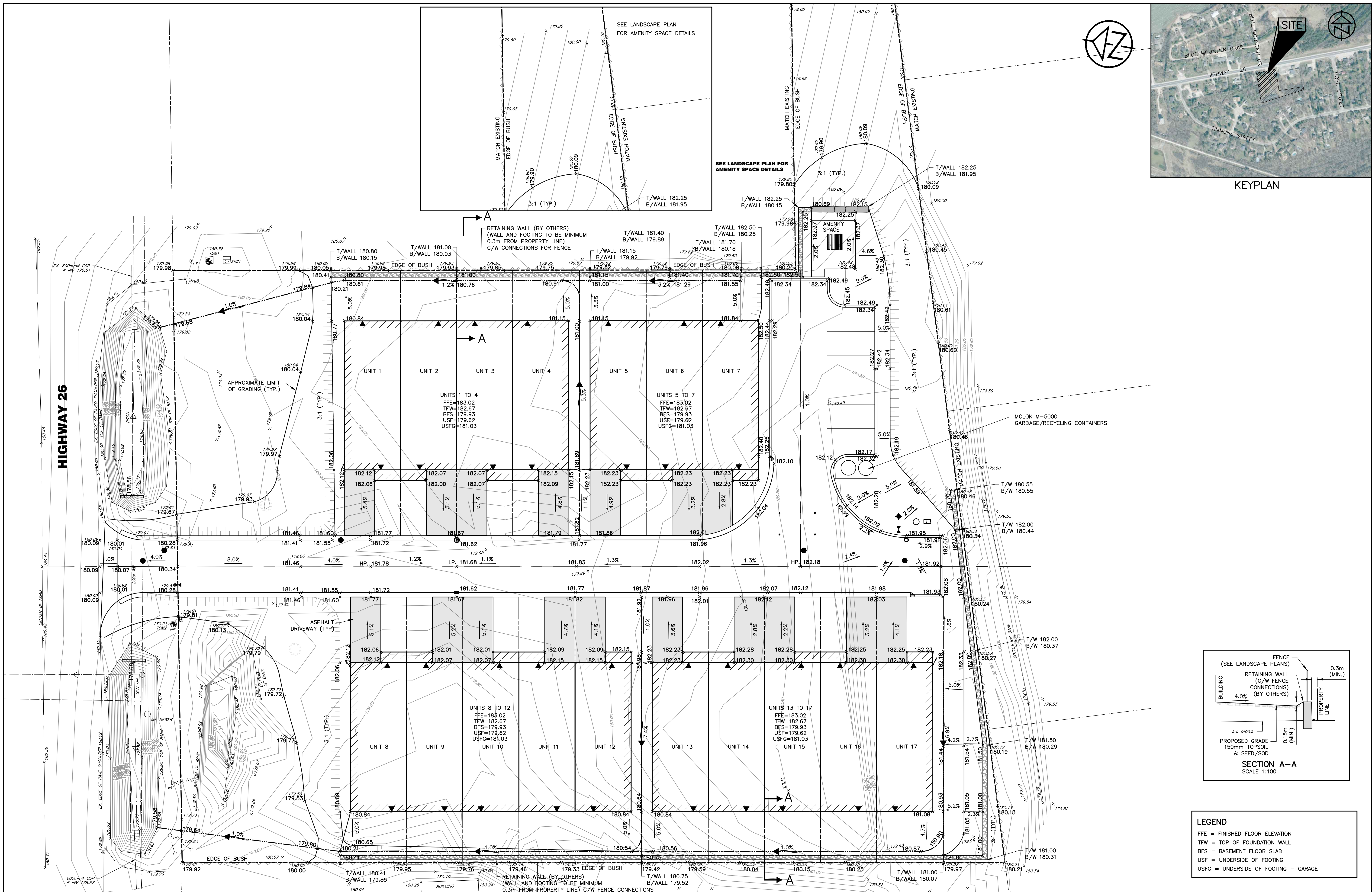
CROSSING TABLE				
	SANITARY SEWER	STORM SEWER	WATER MAIN	CLEARANCE
C1	OBV: 176.09	INV: 178.57		2.48m
C2	OBV: 176.17	INV: 178.61		2.44m
C3		INV: 178.62	OBV: 177.80	0.82m
C4	OBV: 176.06	INV: 178.66		2.60m
C5	OBV: 176.07		INV: 176.86	0.79m



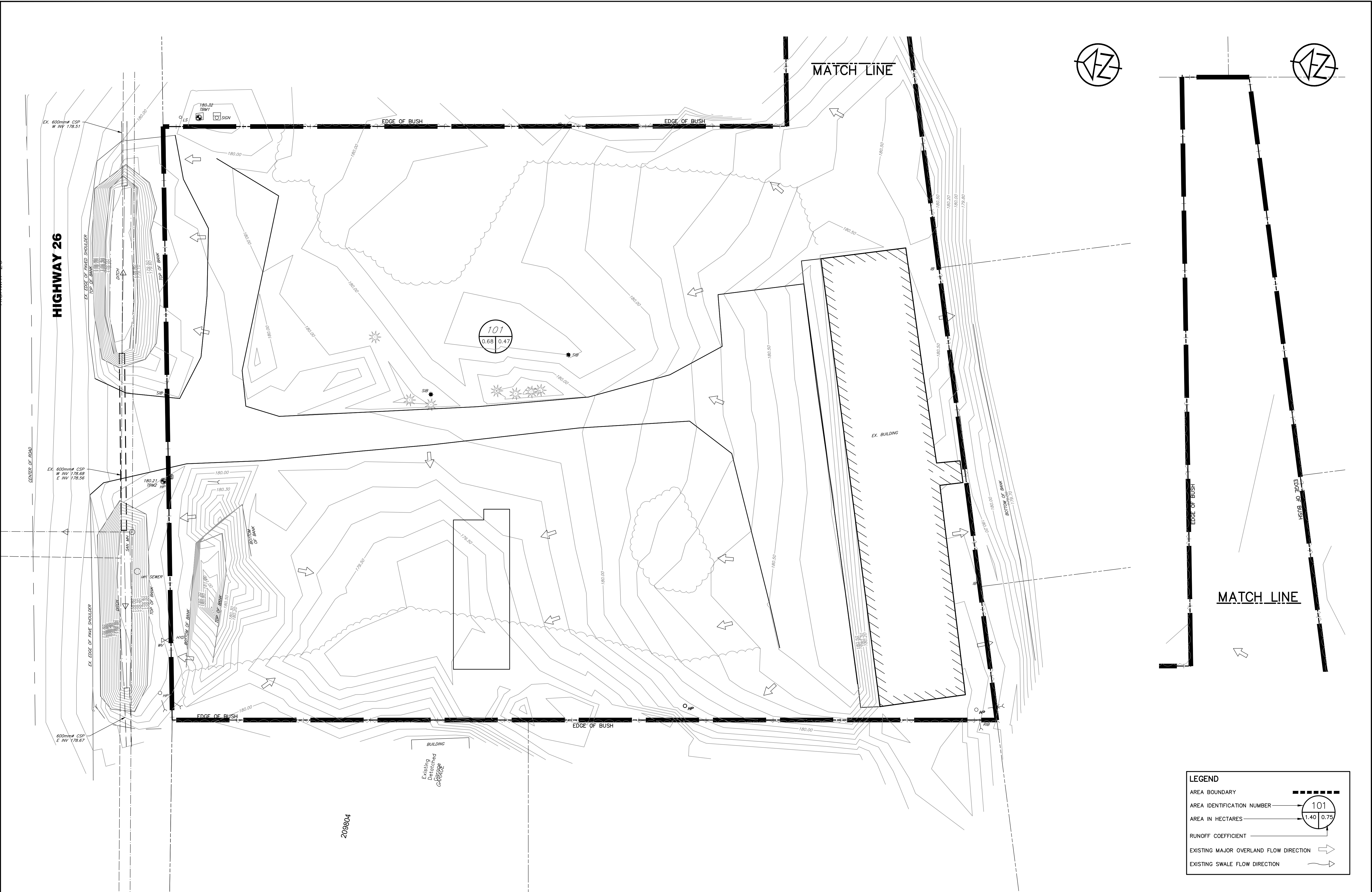
KEYPLAN



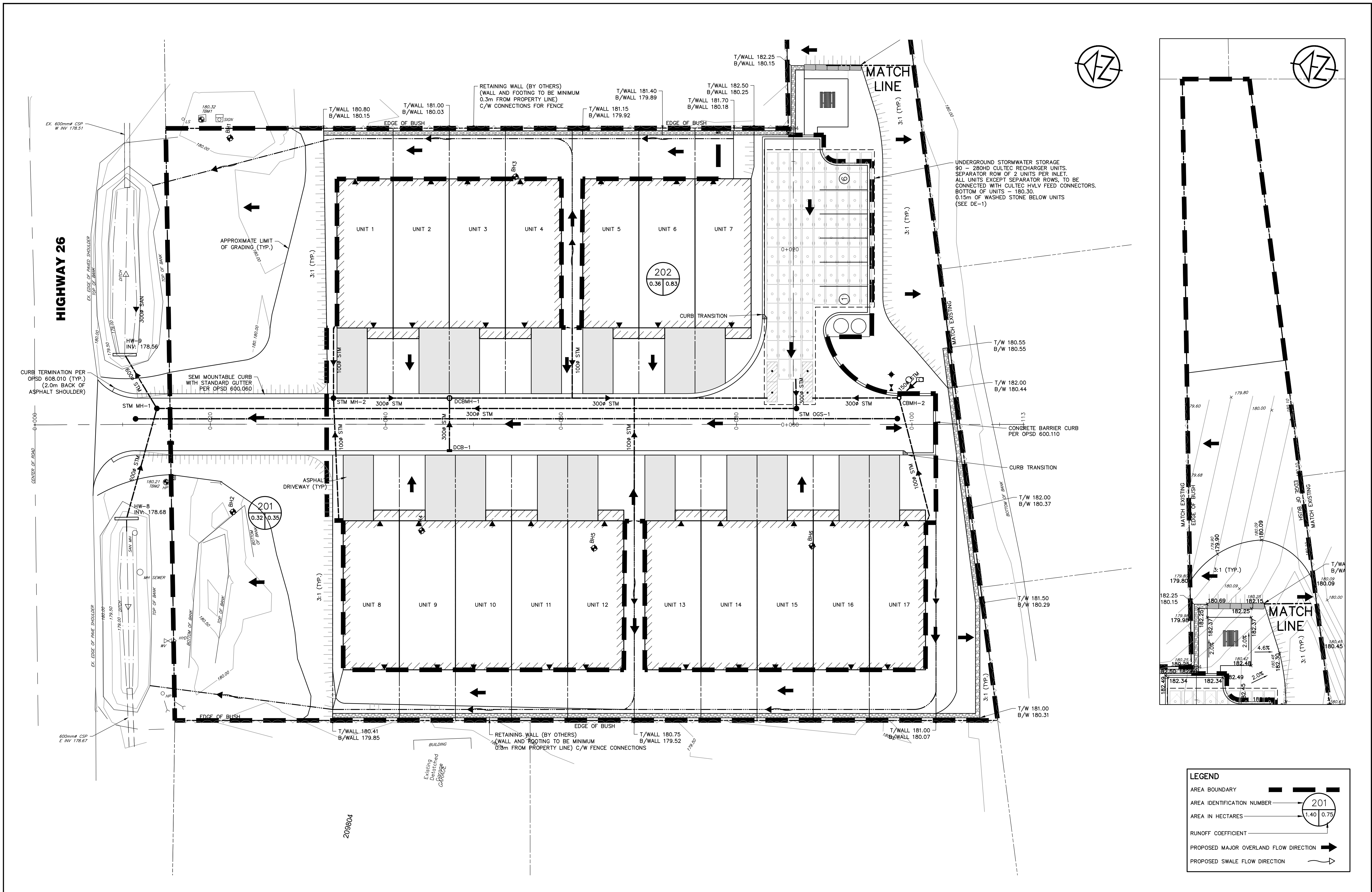
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			DRAWN: MM	DATE: FEB 2022	DP-2													
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Appendix A: Pre-Development SWM Calculations

Active coordinate

44° 31' 15" N, 80° 18' 14" W (44.520833,-80.304167)

Retrieved: Mon, 21 Feb 2022 22:05:29 GMT



Location summary

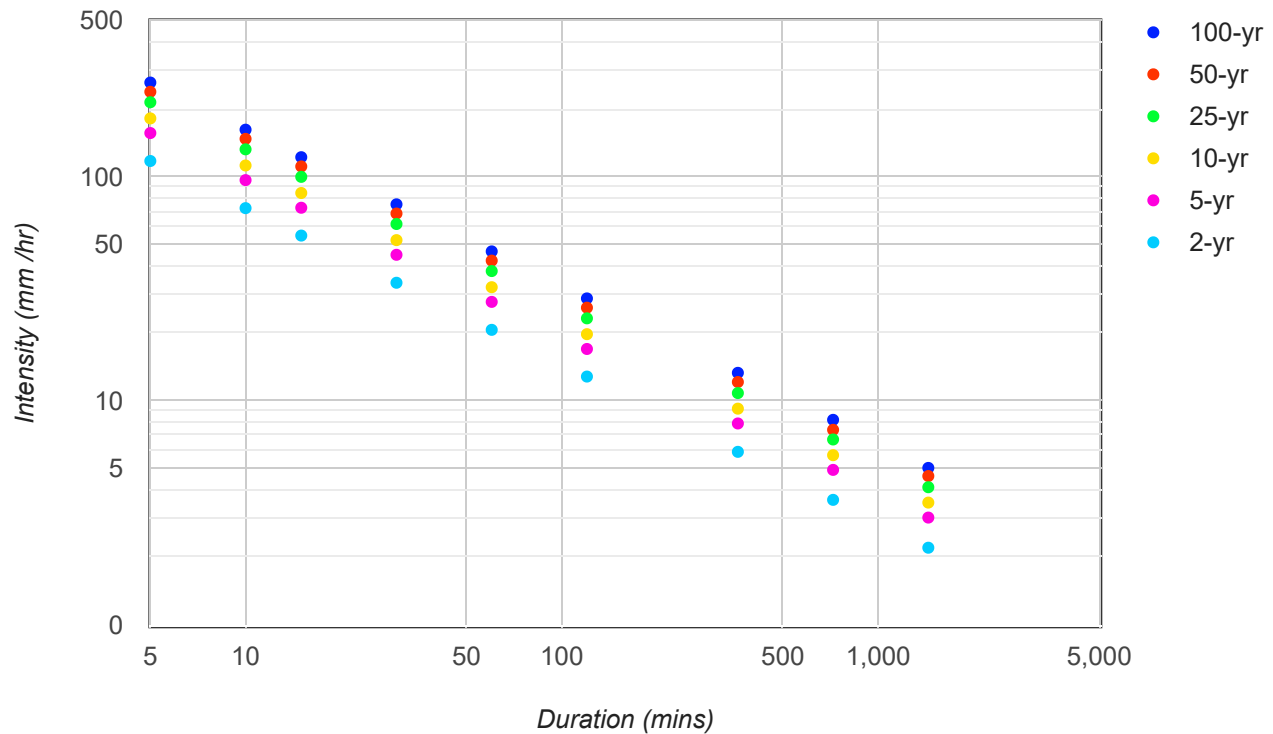
These are the locations in the selection.

IDF Curve: 44° 31' 15" N, 80° 18' 14" W (44.520833,-80.304167)

Results

An IDF curve was found.

Coordinate: 44.520833, -80.304167
IDF curve year: 2010



Coefficient summary

IDF Curve: 44° 31' 15" N, 80° 18' 14" W (44.520833,-80.304167)

Retrieved: Mon, 21 Feb 2022 22:05:29 GMT

Data year: 2010

IDF curve year: 2010

Return period	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
A	20.7	27.6	32.1	37.9	42.2	46.4
B	-0.699	-0.699	-0.699	-0.699	-0.699	-0.699

Statistics

Rainfall intensity (mm hr⁻¹)

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	117.6	72.4	54.6	33.6	20.7	12.8	5.9	3.6	2.2
5-yr	156.8	96.6	72.7	44.8	27.6	17.0	7.9	4.9	3.0
10-yr	182.3	112.3	84.6	52.1	32.1	19.8	9.2	5.7	3.5
25-yr	215.3	132.6	99.9	61.5	37.9	23.3	10.8	6.7	4.1
50-yr	239.7	147.7	111.2	68.5	42.2	26.0	12.1	7.4	4.6
100-yr	263.6	162.3	122.3	75.3	46.4	28.6	13.3	8.2	5.0

Rainfall depth (mm)

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	9.8	12.1	13.6	16.8	20.7	25.5	35.5	43.7	53.9
5-yr	13.1	16.1	18.2	22.4	27.6	34.0	47.3	58.3	71.8
10-yr	15.2	18.7	21.1	26.1	32.1	39.5	55.0	67.8	83.6
25-yr	17.9	22.1	25.0	30.8	37.9	46.7	65.0	80.1	98.6
50-yr	20.0	24.6	27.8	34.3	42.2	52.0	72.4	89.2	109.8
100-yr	22.0	27.1	30.6	37.7	46.4	57.2	79.6	98.0	120.8

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Last Modified: September 2016

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Project Name	121258
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Data Sources

Detailed Soil Survey Reports for Ontario, GSCA Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation (2010), MTO Drainage Management Manual (1997)

Prepared By

John Birchard	March 4, 2022
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Pre-Development Condition

Watershed:	GSCA
Catchment ID:	101
Catchment Area (ha):	0.68
Impervious %:	21%
Pervious Area (ha):	0.54

Average Curve Number (CN) and Initial Abstraction (IA) for Pervious Area

Soil Symbol	Gsl-b								
Soil Series	Granby								
Hydrologic Soils Group	B								
Soil Texture	Sand Loam								
Runoff Coefficient Type	2								
Area (ha)	0.54								
Percentage of Catchment	100%								
Land Cover Category	IA	A (ha)	CN	A (ha)	CN	A (ha)	CN	A (ha)	CN
Impervious	2		100						
Gravel	3		89						
Woodland	10		60						
Pasture/Lawns	5	0.54	69						
Meadows	8		65						
Cultivated	7		74						
Waterbody	12		50						
Average CN	69.00								
Average IA	5.00								

Notes

CN and IA values have been calculated for the pervious area of the catchment only.
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Summary

Catchment CN:	69.0
Catchment IA (mm):	5.00

PROJECT	209806 Highway 26	FILE	121258
		DATE	3/4/2022
SUBJECT	Visual OTTHYMO	NAME	JB
	Pre-Development Schematic	PAGE	1 OF 1

EXISTING CONDITIONS



101



NASHYD



ROUTE PIPE



DUHYD



STANDHYD



ROUTE
CHANNEL



DIVERT HYD



ADDHYD



ROUTE
RESERVOIR



SHIFTHYD

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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
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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 6.1\V02\voin.dat

Output filename:

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31b689-9aba-4804-a988-5fe0ce3fbee9\sc

Summary filename:

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31b689-9aba-4804-a988-5fe0ce3fbee9\sc

DATE: 03/04/2022

TIME: 10:21:00

USER:

COMMENTS: _____

** SIMULATION : A: 2 yr 4 hr chc **

| CHICAGO STORM |
Ptotal= 31.41 mm

IDF curve parameters: A= 362.158
B= 0.000
C= 0.699

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

Duration of storm = 4.00 hrs

Storm time step = 10.00 min

Time to peak ratio = 0.33

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.17	2.64	1.17	12.50	2.17	5.22	3.17	3.04
0.33	2.95	1.33	72.43	2.33	4.61	3.33	2.87
0.50	3.37	1.50	15.34	2.50	4.15	3.50	2.71
0.67	3.96	1.67	9.67	2.67	3.79	3.67	2.58
0.83	4.91	1.83	7.37	2.83	3.49	3.83	2.46
1.00	6.72	2.00	6.07	3.00	3.25	4.00	2.35

 | CALIB
 | STANDHYD (0101)
 | ID= 1 DT= 5.0 min |

Area (ha)= 0.68
 Total Imp(%)= 21.00 Dir. Conn.(%)= 15.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.14	0.54
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	0.80	0.80
Length	(m)=	90.00	90.00
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	2.64	1.083	12.50	2.083	5.22	3.08	3.04
0.167	2.64	1.167	12.50	2.167	5.22	3.17	3.04
0.250	2.95	1.250	72.43	2.250	4.61	3.25	2.87
0.333	2.95	1.333	72.43	2.333	4.61	3.33	2.87
0.417	3.37	1.417	15.34	2.417	4.15	3.42	2.71
0.500	3.37	1.500	15.34	2.500	4.15	3.50	2.71
0.583	3.96	1.583	9.67	2.583	3.79	3.58	2.58
0.667	3.96	1.667	9.67	2.667	3.79	3.67	2.58
0.750	4.91	1.750	7.37	2.750	3.49	3.75	2.46
0.833	4.91	1.833	7.37	2.833	3.49	3.83	2.46
0.917	6.72	1.917	6.07	2.917	3.25	3.92	2.35
1.000	6.72	2.000	6.07	3.000	3.25	4.00	2.35

Max.Eff.Inten.(mm/hr)=	72.43	3.67
over (min)	5.00	60.00

Storage Coeff. (min)=	2.92 (ii)	59.60 (ii)	
Unit Hyd. Tpeak (min)=	5.00	60.00	
Unit Hyd. peak (cms)=	0.28	0.02	
			TOTALS
PEAK FLOW (cms)=	0.02	0.00	0.020 (iii)
TIME TO PEAK (hrs)=	1.33	2.42	1.33
RUNOFF VOLUME (mm)=	30.41	5.39	9.09
TOTAL RAINFALL (mm)=	31.41	31.41	31.41
RUNOFF COEFFICIENT =	0.97	0.17	0.29

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

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 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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V	V	I	SSSSS	U	U	A	L		(v 6.1.2001)
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DATE: 03/04/2022

TIME: 10:21:00

USER:

COMMENTS: _____

** SIMULATION : B: 5 yr 4 hr chc **

| CHICAGO STORM |
Ptotal= 41.88 mm

IDF curve parameters: A= 482.877
B= 0.000
C= 0.699

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

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

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.17	3.52	1.17	16.66	2.17	6.96	3.17	4.06
0.33	3.93	1.33	96.57	2.33	6.15	3.33	3.82
0.50	4.49	1.50	20.45	2.50	5.53	3.50	3.61
0.67	5.29	1.67	12.89	2.67	5.05	3.67	3.43
0.83	6.55	1.83	9.83	2.83	4.66	3.83	3.27
1.00	8.96	2.00	8.10	3.00	4.33	4.00	3.13

| CALIB |
| STANDHYD (0101) |
ID= 1 DT= 5.0 min

Area (ha)= 0.68
Total Imp(%)= 21.00 Dir. Conn.(%)= 15.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.14	0.54
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	0.80	0.80
Length (m)=	90.00	90.00
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	3.52	1.083	16.66	2.083	6.96	3.08	4.06
0.167	3.52	1.167	16.66	2.167	6.96	3.17	4.06
0.250	3.93	1.250	96.57	2.250	6.15	3.25	3.82
0.333	3.93	1.333	96.57	2.333	6.15	3.33	3.82
0.417	4.49	1.417	20.45	2.417	5.53	3.42	3.61
0.500	4.49	1.500	20.45	2.500	5.53	3.50	3.61
0.583	5.29	1.583	12.89	2.583	5.05	3.58	3.43
0.667	5.29	1.667	12.89	2.667	5.05	3.67	3.43
0.750	6.55	1.750	9.83	2.750	4.66	3.75	3.27
0.833	6.55	1.833	9.83	2.833	4.66	3.83	3.27
0.917	8.96	1.917	8.10	2.917	4.33	3.92	3.13
1.000	8.96	2.000	8.10	3.000	4.33	4.00	3.13

Max.Eff.Inten.(mm/hr)= 96.57 7.98
over (min) 5.00 45.00
Storage Coeff. (min)= 2.60 (ii) 44.14 (ii)
Unit Hyd. Tpeak (min)= 5.00 45.00
Unit Hyd. peak (cms)= 0.29 0.03

TOTALS

PEAK FLOW (cms)= 0.03 0.01 0.028 (iii)
TIME TO PEAK (hrs)= 1.33 2.08 1.33
RUNOFF VOLUME (mm)= 40.88 9.67 14.32
TOTAL RAINFALL (mm)= 41.88 41.88 41.88
RUNOFF COEFFICIENT = 0.98 0.23 0.34

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 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.

V V I SSSSS U U A L (v 6.1.2001)
V V I SS U U A A L
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V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

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      0   0   T     T   H   H   Y   Y   MM  MM   0   0
      0   0   T     T   H   H   Y     M   M   0   0
      000     T     T   H   H   Y     M   M   000

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Summary filename:

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DATE: 03/04/2022

TIME: 10:21:00

USER:

COMMENTS: _____

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*****
** SIMULATION : C: 10 yr 4 hr chc          **
*****

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-----
| CHICAGO STORM |
| Ptotal= 48.70 mm |
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IDF curve parameters: A= 561.607
 B= 0.000
 C= 0.699

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

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

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr

0.17	4.10	1.17	19.38	2.17	8.10	3.17	4.72
0.33	4.58	1.33	112.31	2.33	7.15	3.33	4.44
0.50	5.22	1.50	23.78	2.50	6.44	3.50	4.20
0.67	6.15	1.67	15.00	2.67	5.87	3.67	3.99
0.83	7.62	1.83	11.44	2.83	5.42	3.83	3.81
1.00	10.42	2.00	9.42	3.00	5.04	4.00	3.64

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-----
| CALIB |
| STANDHYD ( 0101) |
| ID= 1 DT= 5.0 min |
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```

Area      (ha)= 0.68
Total Imp(%)= 21.00  Dir. Conn.(%)= 15.00

IMPERVIOUS      PERVIOUS (i)
Surface Area    (ha)= 0.14      0.54
Dep. Storage    (mm)= 1.00      5.00
Average Slope   (%)= 0.80      0.80
Length          (m)= 90.00     90.00
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	4.10	1.083	19.38	2.083	8.10	3.08	4.72
0.167	4.10	1.167	19.38	2.167	8.10	3.17	4.72
0.250	4.58	1.250	112.31	2.250	7.15	3.25	4.44
0.333	4.58	1.333	112.31	2.333	7.15	3.33	4.44
0.417	5.22	1.417	23.78	2.417	6.44	3.42	4.20
0.500	5.22	1.500	23.78	2.500	6.44	3.50	4.20
0.583	6.15	1.583	15.00	2.583	5.87	3.58	3.99
0.667	6.15	1.667	15.00	2.667	5.87	3.67	3.99
0.750	7.62	1.750	11.44	2.750	5.42	3.75	3.81
0.833	7.62	1.833	11.44	2.833	5.42	3.83	3.81
0.917	10.42	1.917	9.42	2.917	5.04	3.92	3.64
1.000	10.42	2.000	9.42	3.000	5.04	4.00	3.64

```

Max.Eff.Inten.(mm/hr)= 112.31      12.58
over (min)           5.00      40.00
Storage Coeff. (min)= 2.45 (ii) 37.08 (ii)
Unit Hyd. Tpeak (min)= 5.00      40.00
Unit Hyd. peak (cms)= 0.30      0.03

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```

*TOTALS*
PEAK FLOW      (cms)= 0.03      0.01      0.033 (iii)
TIME TO PEAK   (hrs)= 1.33      1.92      1.33
RUNOFF VOLUME  (mm)= 47.70      12.93      18.11
TOTAL RAINFALL (mm)= 48.70      48.70      48.70

```

RUNOFF COEFFICIENT = 0.98 0.27 0.37

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

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 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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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
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290d58-e2af-46ae-89fe-ea002d1603dc\sc

DATE: 03/04/2022

TIME: 10:21:00

USER:

COMMENTS: _____

** SIMULATION : D: 25 yr 4 hr chc **

CHICAGO STORM
Ptotal= 57.50 mm

IDF curve parameters: A= 663.082

B= 0.000

C= 0.699

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

Duration of storm = 4.00 hrs

Storm time step = 10.00 min

Time to peak ratio = 0.33

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.17	4.83	1.17	22.88	2.17	9.56	3.17	5.57
0.33	5.40	1.33	132.61	2.33	8.44	3.33	5.25
0.50	6.17	1.50	28.08	2.50	7.60	3.50	4.96
0.67	7.26	1.67	17.71	2.67	6.93	3.67	4.72
0.83	8.99	1.83	13.50	2.83	6.40	3.83	4.50
1.00	12.30	2.00	11.12	3.00	5.95	4.00	4.30

CALIB
STANDHYD (0101)
ID= 1 DT= 5.0 min

Area (ha)= 0.68

Total Imp(%)= 21.00 Dir. Conn.(%)= 15.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.14	0.54
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	0.80	0.80
Length	(m)=	90.00	90.00
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	4.83	1.083	22.88	2.083	9.56	3.08	5.57
0.167	4.83	1.167	22.88	2.167	9.56	3.17	5.57

0.250	5.40	1.250	132.61	2.250	8.44	3.25	5.25
0.333	5.40	1.333	132.61	2.333	8.44	3.33	5.25
0.417	6.17	1.417	28.08	2.417	7.60	3.42	4.96
0.500	6.17	1.500	28.08	2.500	7.60	3.50	4.96
0.583	7.26	1.583	17.71	2.583	6.93	3.58	4.72
0.667	7.26	1.667	17.71	2.667	6.93	3.67	4.72
0.750	8.99	1.750	13.50	2.750	6.40	3.75	4.50
0.833	8.99	1.833	13.50	2.833	6.40	3.83	4.50
0.917	12.30	1.917	11.12	2.917	5.95	3.92	4.30
1.000	12.30	2.000	11.12	3.000	5.95	4.00	4.30

Max.Eff.Inten.(mm/hr)= 132.61 19.16
over (min) 5.00 35.00
Storage Coeff. (min)= 2.29 (ii) 31.56 (ii)
Unit Hyd. Tpeak (min)= 5.00 35.00
Unit Hyd. peak (cms)= 0.30 0.03

TOTALS

PEAK FLOW (cms)= 0.04 0.02 0.040 (iii)
TIME TO PEAK (hrs)= 1.33 1.83 1.33
RUNOFF VOLUME (mm)= 56.50 17.58 23.39
TOTAL RAINFALL (mm)= 57.50 57.50 57.50
RUNOFF COEFFICIENT = 0.98 0.31 0.41

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 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.

=====

V V I SSSSS U U A L (v 6.1.2001)
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 UUUU A A LLLLL

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

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Summary filename:

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DATE: 03/04/2022

TIME: 10:21:00

USER:

COMMENTS: _____

 ** SIMULATION : E: 50 yr 4 hr chc **

 | CHICAGO STORM |
Ptotal= 64.03 mm

IDF curve parameters: A= 738.312

B= 0.000

C= 0.699

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

Duration of storm = 4.00 hrs

Storm time step = 10.00 min

Time to peak ratio = 0.33

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.17	5.38	1.17	25.48	2.17	10.64	3.17	6.20
0.33	6.02	1.33	147.65	2.33	9.40	3.33	5.84
0.50	6.87	1.50	31.27	2.50	8.46	3.50	5.53
0.67	8.08	1.67	19.71	2.67	7.72	3.67	5.25
0.83	10.01	1.83	15.03	2.83	7.12	3.83	5.01
1.00	13.70	2.00	12.38	3.00	6.62	4.00	4.79

```

-----
| CALIB |
| STANDHYD ( 0101) | Area (ha)= 0.68
| ID= 1 DT= 5.0 min | Total Imp(%)= 21.00 Dir. Conn.(%)= 15.00
-----

```

```

                IMPERVIOUS    PERVIOUS (i)
Surface Area    (ha)=        0.14        0.54
Dep. Storage    (mm)=        1.00        5.00
Average Slope    (%)=        0.80        0.80
Length          (m)=       90.00       90.00
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    5.38 | 1.083   25.48 | 2.083   10.64 | 3.08    6.20
0.167    5.38 | 1.167   25.48 | 2.167   10.64 | 3.17    6.20
0.250    6.02 | 1.250  147.65 | 2.250    9.40 | 3.25    5.84
0.333    6.02 | 1.333  147.65 | 2.333    9.40 | 3.33    5.84
0.417    6.87 | 1.417   31.27 | 2.417    8.46 | 3.42    5.53
0.500    6.87 | 1.500   31.27 | 2.500    8.46 | 3.50    5.53
0.583    8.08 | 1.583   19.71 | 2.583    7.72 | 3.58    5.25
0.667    8.08 | 1.667   19.71 | 2.667    7.72 | 3.67    5.25
0.750   10.01 | 1.750   15.03 | 2.750    7.12 | 3.75    5.01
0.833   10.01 | 1.833   15.03 | 2.833    7.12 | 3.83    5.01
0.917   13.70 | 1.917   12.38 | 2.917    6.62 | 3.92    4.79
1.000   13.70 | 2.000   12.38 | 3.000    6.62 | 4.00    4.79

```

```

Max.Eff.Inten.(mm/hr)=    147.65    23.46
      over (min)         5.00    30.00
Storage Coeff. (min)=    2.19 (ii) 29.19 (ii)
Unit Hyd. Tpeak (min)=    5.00    30.00
Unit Hyd. peak (cms)=    0.31    0.04

```

```

                *TOTALS*
PEAK FLOW      (cms)=    0.04    0.02    0.046 (iii)
TIME TO PEAK   (hrs)=    1.33    1.75    1.33
RUNOFF VOLUME   (mm)=    63.03    21.31    27.55
TOTAL RAINFALL  (mm)=    64.03    64.03    64.03
RUNOFF COEFFICIENT =    0.98    0.33    0.43

```

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 69.0 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.

=====

```

V   V   I   SSSSS U   U   A   L           (v 6.1.2001)
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

```

```

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

```

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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 6.1\V02\voin.dat

Output filename:

C:\Users\JBirchard\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\bb
9fa022-183d-4130-bc42-1455daedf7c1\sc

Summary filename:

C:\Users\JBirchard\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\bb
9fa022-183d-4130-bc42-1455daedf7c1\sc

DATE: 03/04/2022

TIME: 10:21:00

USER:

COMMENTS: _____


```

*****
** SIMULATION : F: 100 yr 4 hr chc          **
*****

```

```

-----
| CHICAGO STORM |
| Ptotal= 70.40 mm |
-----

```

IDF curve parameters: A= 811.794
 B= 0.000
 C= 0.699
 used in: INTENSITY = A / (t + B)^C

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

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.17	5.92	1.17	28.01	2.17	11.70	3.17	6.82
0.33	6.61	1.33	162.35	2.33	10.34	3.33	6.42
0.50	7.55	1.50	34.38	2.50	9.30	3.50	6.08
0.67	8.89	1.67	21.68	2.67	8.49	3.67	5.77
0.83	11.01	1.83	16.53	2.83	7.83	3.83	5.50
1.00	15.06	2.00	13.62	3.00	7.28	4.00	5.26

```

-----
| CALIB |
| STANDHYD ( 0101) |
| ID= 1 DT= 5.0 min |
-----

```

Area (ha)= 0.68
 Total Imp(%)= 21.00 Dir. Conn.(%)= 15.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.14	0.54
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	0.80	0.80
Length	(m)=	90.00	90.00
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	5.92	1.083	28.01	2.083	11.70	3.08	6.82
0.167	5.92	1.167	28.01	2.167	11.70	3.17	6.82
0.250	6.61	1.250	162.35	2.250	10.34	3.25	6.42
0.333	6.61	1.333	162.35	2.333	10.34	3.33	6.42
0.417	7.55	1.417	34.38	2.417	9.30	3.42	6.08
0.500	7.55	1.500	34.38	2.500	9.30	3.50	6.08
0.583	8.89	1.583	21.68	2.583	8.49	3.58	5.77
0.667	8.89	1.667	21.68	2.667	8.49	3.67	5.77
0.750	11.01	1.750	16.53	2.750	7.83	3.75	5.50
0.833	11.01	1.833	16.53	2.833	7.83	3.83	5.50

0.917	15.06		1.917	13.62		2.917	7.28		3.92	5.26
1.000	15.06		2.000	13.62		3.000	7.28		4.00	5.26

Max.Eff.Inten.(mm/hr)=	162.35	31.15	
over (min)	5.00	30.00	
Storage Coeff. (min)=	2.11 (ii)	26.21 (ii)	
Unit Hyd. Tpeak (min)=	5.00	30.00	
Unit Hyd. peak (cms)=	0.31	0.04	
			TOTALS
PEAK FLOW (cms)=	0.05	0.03	0.051 (iii)
TIME TO PEAK (hrs)=	1.33	1.75	1.33
RUNOFF VOLUME (mm)=	69.40	25.16	31.78
TOTAL RAINFALL (mm)=	70.40	70.40	70.40
RUNOFF COEFFICIENT =	0.99	0.36	0.45

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 69.0 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.

 =====
 =====

V	V	I	SSSSS	U	U	A	L		(v 6.1.2001)
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		

000	TTTTT	TTTTT	H	H	Y	Y	M	M	000	TM
0	0	T	T	H	H	Y Y	MM	MM	0	0
0	0	T	T	H	H	Y	M	M	0	0
000	T	T	H	H	Y	M	M	000		

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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 6.1\V02\voin.dat

Output filename:

C:\Users\JBirchard\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\86839c3-21f8-4a68-a507-c1923fcd0e6c\sc

Summary filename:

C:\Users\JBirchard\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\86839c3-21f8-4a68-a507-c1923fcd0e6c\sc

DATE: 03/04/2022

TIME: 10:21:00

USER:

COMMENTS: _____

** SIMULATION : G: 2 yr 24 hr scs **

MASS STORM

Ptotal= 53.90 mm

Filename: C:\Users\JBirchard\AppData\Local\Temp\9d43116c-ee6a-4156-9ab2-ed968cc38161\89f94fed
Comments: SCS Type II 24 HR MASS CURVE

Duration of storm = 23.75 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
0.25	0.65	6.25	1.08	12.25	7.76	18.25	0.86
0.50	0.43	6.50	0.86	12.50	4.10	18.50	1.08
0.75	0.65	6.75	1.08	12.75	3.88	18.75	0.86
1.00	0.65	7.00	1.08	13.00	3.02	19.00	1.08
1.25	0.65	7.25	1.29	13.25	2.80	19.25	0.86
1.50	0.43	7.50	1.08	13.50	2.37	19.50	1.08
1.75	0.65	7.75	1.29	13.75	2.16	19.75	0.86
2.00	0.65	8.00	1.29	14.00	1.72	20.00	0.65
2.25	0.86	8.25	1.51	14.25	1.51	20.25	0.65
2.50	0.65	8.50	1.51	14.50	1.72	20.50	0.65
2.75	0.65	8.75	1.51	14.75	1.51	20.75	0.65
3.00	0.65	9.00	1.72	15.00	1.72	21.00	0.65
3.25	0.86	9.25	1.72	15.25	1.51	21.25	0.65
3.50	0.65	9.50	1.94	15.50	1.72	21.50	0.65
3.75	0.65	9.75	1.94	15.75	1.51	21.75	0.65
4.00	0.86	10.00	2.37	16.00	1.08	22.00	0.65
4.25	0.86	10.25	2.59	16.25	0.86	22.25	0.65

4.50	0.86	10.50	3.23	16.50	1.08	22.50	0.65
4.75	0.86	10.75	3.45	16.75	0.86	22.75	0.65
5.00	0.86	11.00	5.17	17.00	1.08	23.00	0.65
5.25	0.86	11.25	5.17	17.25	0.86	23.25	0.65
5.50	0.86	11.50	15.95	17.50	1.08	23.50	0.65
5.75	0.86	11.75	65.97	17.75	0.86	23.75	0.65
6.00	0.86	12.00	7.76	18.00	1.08		

| CALIB
| STANDHYD (0101)
ID= 1 DT= 5.0 min

Area (ha)= 0.68
Total Imp(%)= 21.00 Dir. Conn.(%)= 15.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.14	0.54
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	0.80	0.80
Length	(m)=	90.00	90.00
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	0.65	6.083	1.08	12.083	7.76	18.08	0.86
0.167	0.65	6.167	1.08	12.167	7.76	18.17	0.86
0.250	0.65	6.250	1.08	12.250	7.76	18.25	0.86
0.333	0.43	6.333	0.86	12.333	4.10	18.33	1.08
0.417	0.43	6.417	0.86	12.417	4.10	18.42	1.08
0.500	0.43	6.500	0.86	12.500	4.10	18.50	1.08
0.583	0.65	6.583	1.08	12.583	3.88	18.58	0.86
0.667	0.65	6.667	1.08	12.667	3.88	18.67	0.86
0.750	0.65	6.750	1.08	12.750	3.88	18.75	0.86
0.833	0.65	6.833	1.08	12.833	3.02	18.83	1.08
0.917	0.65	6.917	1.08	12.917	3.02	18.92	1.08
1.000	0.65	7.000	1.08	13.000	3.02	19.00	1.08
1.083	0.65	7.083	1.29	13.083	2.80	19.08	0.86
1.167	0.65	7.167	1.29	13.167	2.80	19.17	0.86
1.250	0.65	7.250	1.29	13.250	2.80	19.25	0.86
1.333	0.43	7.333	1.08	13.333	2.37	19.33	1.08
1.417	0.43	7.417	1.08	13.417	2.37	19.42	1.08
1.500	0.43	7.500	1.08	13.500	2.37	19.50	1.08
1.583	0.65	7.583	1.29	13.583	2.16	19.58	0.86
1.667	0.65	7.667	1.29	13.667	2.16	19.67	0.86
1.750	0.65	7.750	1.29	13.750	2.16	19.75	0.86
1.833	0.65	7.833	1.29	13.833	1.72	19.83	0.65
1.917	0.65	7.917	1.29	13.917	1.72	19.92	0.65

2.000	0.65	8.000	1.29	14.000	1.72	20.00	0.65
2.083	0.86	8.083	1.51	14.083	1.51	20.08	0.65
2.167	0.86	8.167	1.51	14.167	1.51	20.17	0.65
2.250	0.86	8.250	1.51	14.250	1.51	20.25	0.65
2.333	0.65	8.333	1.51	14.333	1.72	20.33	0.65
2.417	0.65	8.417	1.51	14.417	1.72	20.42	0.65
2.500	0.65	8.500	1.51	14.500	1.72	20.50	0.65
2.583	0.65	8.583	1.51	14.583	1.51	20.58	0.65
2.667	0.65	8.667	1.51	14.667	1.51	20.67	0.65
2.750	0.65	8.750	1.51	14.750	1.51	20.75	0.65
2.833	0.65	8.833	1.72	14.833	1.72	20.83	0.65
2.917	0.65	8.917	1.72	14.917	1.72	20.92	0.65
3.000	0.65	9.000	1.72	15.000	1.72	21.00	0.65
3.083	0.86	9.083	1.72	15.083	1.51	21.08	0.65
3.167	0.86	9.167	1.72	15.167	1.51	21.17	0.65
3.250	0.86	9.250	1.72	15.250	1.51	21.25	0.65
3.333	0.65	9.333	1.94	15.333	1.72	21.33	0.65
3.417	0.65	9.417	1.94	15.417	1.72	21.42	0.65
3.500	0.65	9.500	1.94	15.500	1.72	21.50	0.65
3.583	0.65	9.583	1.94	15.583	1.51	21.58	0.65
3.667	0.65	9.667	1.94	15.667	1.51	21.67	0.65
3.750	0.65	9.750	1.94	15.750	1.51	21.75	0.65
3.833	0.86	9.833	2.37	15.833	1.08	21.83	0.65
3.917	0.86	9.917	2.37	15.917	1.08	21.92	0.65
4.000	0.86	10.000	2.37	16.000	1.08	22.00	0.65
4.083	0.86	10.083	2.59	16.083	0.86	22.08	0.65
4.167	0.86	10.167	2.59	16.167	0.86	22.17	0.65
4.250	0.86	10.250	2.59	16.250	0.86	22.25	0.65
4.333	0.86	10.333	3.23	16.333	1.08	22.33	0.65
4.417	0.86	10.417	3.23	16.417	1.08	22.42	0.65
4.500	0.86	10.500	3.23	16.500	1.08	22.50	0.65
4.583	0.86	10.583	3.45	16.583	0.86	22.58	0.65
4.667	0.86	10.667	3.45	16.667	0.86	22.67	0.65
4.750	0.86	10.750	3.45	16.750	0.86	22.75	0.65
4.833	0.86	10.833	5.17	16.833	1.08	22.83	0.65
4.917	0.86	10.917	5.17	16.917	1.08	22.92	0.65
5.000	0.86	11.000	5.17	17.000	1.08	23.00	0.65
5.083	0.86	11.083	5.17	17.083	0.86	23.08	0.65
5.167	0.86	11.167	5.17	17.167	0.86	23.17	0.65
5.250	0.86	11.250	5.17	17.250	0.86	23.25	0.65
5.333	0.86	11.333	15.95	17.333	1.08	23.33	0.65
5.417	0.86	11.417	15.95	17.417	1.08	23.42	0.65
5.500	0.86	11.500	15.95	17.500	1.08	23.50	0.65
5.583	0.86	11.583	65.97	17.583	0.86	23.58	0.65
5.667	0.86	11.667	65.97	17.667	0.86	23.67	0.65
5.750	0.86	11.750	65.97	17.750	0.86	23.75	0.65
5.833	0.86	11.833	7.77	17.833	1.08		
5.917	0.86	11.917	7.76	17.917	1.08		
6.000	0.86	12.000	7.76	18.000	1.08		

Max.Eff.Inten.(mm/hr)=	65.97	10.66	
over (min)	5.00	45.00	
Storage Coeff. (min)=	3.03 (ii)	40.03 (ii)	
Unit Hyd. Tpeak (min)=	5.00	45.00	
Unit Hyd. peak (cms)=	0.27	0.03	
			TOTALS
PEAK FLOW (cms)=	0.02	0.01	0.022 (iii)
TIME TO PEAK (hrs)=	11.75	12.33	11.75
RUNOFF VOLUME (mm)=	52.74	15.53	21.08
TOTAL RAINFALL (mm)=	53.74	53.74	53.74
RUNOFF COEFFICIENT =	0.98	0.29	0.39

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 69.0 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.

 =====
 =====

V	V	I	SSSSS	U	U	A	L		(v 6.1.2001)
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		

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

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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 6.1\V02\voin.dat

Output filename:

C:\Users\JBirchard\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\e6
 f7a3b6-bc28-41f0-b4a9-41710a49e1c5\sc

Summary filename:

C:\Users\JBirchard\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\6f7a3b6-bc28-41f0-b4a9-41710a49e1c5\sc

DATE: 03/04/2022

TIME: 10:21:00

USER:

COMMENTS: _____

** SIMULATION : H: 5 yr 24 hr scs **

MASS STORM	Filename: C:\Users\JBirchard\AppData\Local\Temp\9d43116c-ee6a-4156-9ab2-ed968cc38161\6c92c6cd
Ptotal= 71.80 mm	Comments: SCS Type II 24 HR MASS CURVE

Duration of storm = 23.75 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
0.25	0.86	6.25	1.44	12.25	10.34	18.25	1.15
0.50	0.57	6.50	1.15	12.50	5.46	18.50	1.44
0.75	0.86	6.75	1.44	12.75	5.17	18.75	1.15
1.00	0.86	7.00	1.44	13.00	4.02	19.00	1.44
1.25	0.86	7.25	1.72	13.25	3.73	19.25	1.15
1.50	0.57	7.50	1.44	13.50	3.16	19.50	1.44
1.75	0.86	7.75	1.72	13.75	2.87	19.75	1.15
2.00	0.86	8.00	1.72	14.00	2.30	20.00	0.86
2.25	1.15	8.25	2.01	14.25	2.01	20.25	0.86
2.50	0.86	8.50	2.01	14.50	2.30	20.50	0.86
2.75	0.86	8.75	2.01	14.75	2.01	20.75	0.86
3.00	0.86	9.00	2.30	15.00	2.30	21.00	0.86
3.25	1.15	9.25	2.30	15.25	2.01	21.25	0.86
3.50	0.86	9.50	2.58	15.50	2.30	21.50	0.86
3.75	0.86	9.75	2.58	15.75	2.01	21.75	0.86
4.00	1.15	10.00	3.16	16.00	1.44	22.00	0.86
4.25	1.15	10.25	3.45	16.25	1.15	22.25	0.86
4.50	1.15	10.50	4.31	16.50	1.44	22.50	0.86
4.75	1.15	10.75	4.60	16.75	1.15	22.75	0.86
5.00	1.15	11.00	6.89	17.00	1.44	23.00	0.86

5.25	1.15	11.25	6.89	17.25	1.15	23.25	0.86
5.50	1.15	11.50	21.25	17.50	1.44	23.50	0.86
5.75	1.15	11.75	87.88	17.75	1.15	23.75	0.86
6.00	1.15	12.00	10.34	18.00	1.44		

 | CALIB |
 | STANDHYD (0101) | Area (ha)= 0.68
 | ID= 1 DT= 5.0 min | Total Imp(%)= 21.00 Dir. Conn.(%)= 15.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.14	0.54
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	0.80	0.80
Length	(m)=	90.00	90.00
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	1.44	12.083	10.34	18.08	1.15	
0.167	0.86	6.167	1.44	12.167	10.34	18.17	1.15	
0.250	0.86	6.250	1.44	12.250	10.34	18.25	1.15	
0.333	0.57	6.333	1.15	12.333	5.46	18.33	1.44	
0.417	0.57	6.417	1.15	12.417	5.46	18.42	1.44	
0.500	0.57	6.500	1.15	12.500	5.46	18.50	1.44	
0.583	0.86	6.583	1.44	12.583	5.17	18.58	1.15	
0.667	0.86	6.667	1.44	12.667	5.17	18.67	1.15	
0.750	0.86	6.750	1.44	12.750	5.17	18.75	1.15	
0.833	0.86	6.833	1.44	12.833	4.02	18.83	1.44	
0.917	0.86	6.917	1.44	12.917	4.02	18.92	1.44	
1.000	0.86	7.000	1.44	13.000	4.02	19.00	1.44	
1.083	0.86	7.083	1.72	13.083	3.73	19.08	1.15	
1.167	0.86	7.167	1.72	13.167	3.73	19.17	1.15	
1.250	0.86	7.250	1.72	13.250	3.73	19.25	1.15	
1.333	0.57	7.333	1.44	13.333	3.16	19.33	1.44	
1.417	0.57	7.417	1.44	13.417	3.16	19.42	1.44	
1.500	0.57	7.500	1.44	13.500	3.16	19.50	1.44	
1.583	0.86	7.583	1.72	13.583	2.87	19.58	1.15	
1.667	0.86	7.667	1.72	13.667	2.87	19.67	1.15	
1.750	0.86	7.750	1.72	13.750	2.87	19.75	1.15	
1.833	0.86	7.833	1.72	13.833	2.30	19.83	0.86	
1.917	0.86	7.917	1.72	13.917	2.30	19.92	0.86	
2.000	0.86	8.000	1.72	14.000	2.30	20.00	0.86	
2.083	1.15	8.083	2.01	14.083	2.01	20.08	0.86	
2.167	1.15	8.167	2.01	14.167	2.01	20.17	0.86	

2.250	1.15	8.250	2.01	14.250	2.01	20.25	0.86
2.333	0.86	8.333	2.01	14.333	2.30	20.33	0.86
2.417	0.86	8.417	2.01	14.417	2.30	20.42	0.86
2.500	0.86	8.500	2.01	14.500	2.30	20.50	0.86
2.583	0.86	8.583	2.01	14.583	2.01	20.58	0.86
2.667	0.86	8.667	2.01	14.667	2.01	20.67	0.86
2.750	0.86	8.750	2.01	14.750	2.01	20.75	0.86
2.833	0.86	8.833	2.30	14.833	2.30	20.83	0.86
2.917	0.86	8.917	2.30	14.917	2.30	20.92	0.86
3.000	0.86	9.000	2.30	15.000	2.30	21.00	0.86
3.083	1.15	9.083	2.30	15.083	2.01	21.08	0.86
3.167	1.15	9.167	2.30	15.167	2.01	21.17	0.86
3.250	1.15	9.250	2.30	15.250	2.01	21.25	0.86
3.333	0.86	9.333	2.58	15.333	2.30	21.33	0.86
3.417	0.86	9.417	2.58	15.417	2.30	21.42	0.86
3.500	0.86	9.500	2.58	15.500	2.30	21.50	0.86
3.583	0.86	9.583	2.58	15.583	2.01	21.58	0.86
3.667	0.86	9.667	2.58	15.667	2.01	21.67	0.86
3.750	0.86	9.750	2.58	15.750	2.01	21.75	0.86
3.833	1.15	9.833	3.16	15.833	1.44	21.83	0.86
3.917	1.15	9.917	3.16	15.917	1.44	21.92	0.86
4.000	1.15	10.000	3.16	16.000	1.44	22.00	0.86
4.083	1.15	10.083	3.45	16.083	1.15	22.08	0.86
4.167	1.15	10.167	3.45	16.167	1.15	22.17	0.86
4.250	1.15	10.250	3.45	16.250	1.15	22.25	0.86
4.333	1.15	10.333	4.31	16.333	1.44	22.33	0.86
4.417	1.15	10.417	4.31	16.417	1.44	22.42	0.86
4.500	1.15	10.500	4.31	16.500	1.44	22.50	0.86
4.583	1.15	10.583	4.60	16.583	1.15	22.58	0.86
4.667	1.15	10.667	4.60	16.667	1.15	22.67	0.86
4.750	1.15	10.750	4.60	16.750	1.15	22.75	0.86
4.833	1.15	10.833	6.89	16.833	1.44	22.83	0.86
4.917	1.15	10.917	6.89	16.917	1.44	22.92	0.86
5.000	1.15	11.000	6.89	17.000	1.44	23.00	0.86
5.083	1.15	11.083	6.89	17.083	1.15	23.08	0.86
5.167	1.15	11.167	6.89	17.167	1.15	23.17	0.86
5.250	1.15	11.250	6.89	17.250	1.15	23.25	0.86
5.333	1.15	11.333	21.25	17.333	1.44	23.33	0.86
5.417	1.15	11.417	21.25	17.417	1.44	23.42	0.86
5.500	1.15	11.500	21.25	17.500	1.44	23.50	0.86
5.583	1.15	11.583	87.88	17.583	1.15	23.58	0.86
5.667	1.15	11.667	87.88	17.667	1.15	23.67	0.86
5.750	1.15	11.750	87.88	17.750	1.15	23.75	0.86
5.833	1.15	11.833	10.35	17.833	1.44		
5.917	1.15	11.917	10.34	17.917	1.44		
6.000	1.15	12.000	10.34	18.000	1.44		

Max.Eff.Inten.(mm/hr)= 87.88 22.19
 over (min) 5.00 35.00
 Storage Coeff. (min)= 2.70 (ii) 30.30 (ii)

Unit Hyd. Tpeak (min)=	5.00	35.00	
Unit Hyd. peak (cms)=	0.29	0.04	
			TOTALS
PEAK FLOW (cms)=	0.02	0.02	0.033 (iii)
TIME TO PEAK (hrs)=	11.75	12.17	11.75
RUNOFF VOLUME (mm)=	70.58	25.90	32.57
TOTAL RAINFALL (mm)=	71.58	71.58	71.58
RUNOFF COEFFICIENT =	0.99	0.36	0.46

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 69.0 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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 =====

V	V	I	SSSSS	U	U	A	L		(v 6.1.2001)
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	

000	TTTTT	TTTTT	H	H	Y	Y	M	M	000	TM	
0	0	T	T	H	H	Y	Y	MM	MM	0	0
0	0	T	T	H	H	Y		M	M	0	0
000	T	T	H	H	Y		M	M	000		

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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 6.1\V02\voin.dat

Output filename:

C:\Users\JBirchard\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\02
 a66ccd-ed06-4b0b-90d9-9519fd902f6e\sc

Summary filename:

C:\Users\JBirchard\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\02
 a66ccd-ed06-4b0b-90d9-9519fd902f6e\sc

DATE: 03/04/2022

TIME: 10:21:00

USER:

COMMENTS: _____

** SIMULATION : I: 10 yr 24 hr scs **

MASS STORM

Ptotal= 83.60 mm

Filename: C:\Users\JBirchard\AppData
ata\Local\Temp\
9d43116c-eeef-4156-9ab2-ed968cc38161\6ebf6965
Comments: SCS Type II 24 HR MASS CURVE

Duration of storm = 23.75 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
0.25	1.00	6.25	1.67	12.25	12.04	18.25	1.34
0.50	0.67	6.50	1.34	12.50	6.35	18.50	1.67
0.75	1.00	6.75	1.67	12.75	6.02	18.75	1.34
1.00	1.00	7.00	1.67	13.00	4.68	19.00	1.67
1.25	1.00	7.25	2.01	13.25	4.35	19.25	1.34
1.50	0.67	7.50	1.67	13.50	3.68	19.50	1.67
1.75	1.00	7.75	2.01	13.75	3.34	19.75	1.34
2.00	1.00	8.00	2.01	14.00	2.68	20.00	1.00
2.25	1.34	8.25	2.34	14.25	2.34	20.25	1.00
2.50	1.00	8.50	2.34	14.50	2.68	20.50	1.00
2.75	1.00	8.75	2.34	14.75	2.34	20.75	1.00
3.00	1.00	9.00	2.68	15.00	2.68	21.00	1.00
3.25	1.34	9.25	2.68	15.25	2.34	21.25	1.00
3.50	1.00	9.50	3.01	15.50	2.68	21.50	1.00
3.75	1.00	9.75	3.01	15.75	2.34	21.75	1.00
4.00	1.34	10.00	3.68	16.00	1.67	22.00	1.00
4.25	1.34	10.25	4.01	16.25	1.34	22.25	1.00
4.50	1.34	10.50	5.02	16.50	1.67	22.50	1.00
4.75	1.34	10.75	5.35	16.75	1.34	22.75	1.00
5.00	1.34	11.00	8.03	17.00	1.67	23.00	1.00
5.25	1.34	11.25	8.03	17.25	1.34	23.25	1.00
5.50	1.34	11.50	24.75	17.50	1.67	23.50	1.00
5.75	1.34	11.75	102.33	17.75	1.34	23.75	1.00

6.00 1.34 | 12.00 12.04 | 18.00 1.67 |

 | CALIB
 | STANDHYD (0101)
 | ID= 1 DT= 5.0 min |

Area (ha)= 0.68
 Total Imp(%)= 21.00 Dir. Conn.(%)= 15.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.14	0.54
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	0.80	0.80
Length	(m)=	90.00	90.00
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	1.00	6.083	1.67	12.083	12.04	18.08	1.34	
0.167	1.00	6.167	1.67	12.167	12.04	18.17	1.34	
0.250	1.00	6.250	1.67	12.250	12.04	18.25	1.34	
0.333	0.67	6.333	1.34	12.333	6.35	18.33	1.67	
0.417	0.67	6.417	1.34	12.417	6.35	18.42	1.67	
0.500	0.67	6.500	1.34	12.500	6.35	18.50	1.67	
0.583	1.00	6.583	1.67	12.583	6.02	18.58	1.34	
0.667	1.00	6.667	1.67	12.667	6.02	18.67	1.34	
0.750	1.00	6.750	1.67	12.750	6.02	18.75	1.34	
0.833	1.00	6.833	1.67	12.833	4.68	18.83	1.67	
0.917	1.00	6.917	1.67	12.917	4.68	18.92	1.67	
1.000	1.00	7.000	1.67	13.000	4.68	19.00	1.67	
1.083	1.00	7.083	2.01	13.083	4.35	19.08	1.34	
1.167	1.00	7.167	2.01	13.167	4.35	19.17	1.34	
1.250	1.00	7.250	2.01	13.250	4.35	19.25	1.34	
1.333	0.67	7.333	1.67	13.333	3.68	19.33	1.67	
1.417	0.67	7.417	1.67	13.417	3.68	19.42	1.67	
1.500	0.67	7.500	1.67	13.500	3.68	19.50	1.67	
1.583	1.00	7.583	2.01	13.583	3.34	19.58	1.34	
1.667	1.00	7.667	2.01	13.667	3.34	19.67	1.34	
1.750	1.00	7.750	2.01	13.750	3.34	19.75	1.34	
1.833	1.00	7.833	2.01	13.833	2.68	19.83	1.00	
1.917	1.00	7.917	2.01	13.917	2.68	19.92	1.00	
2.000	1.00	8.000	2.01	14.000	2.68	20.00	1.00	
2.083	1.34	8.083	2.34	14.083	2.34	20.08	1.00	
2.167	1.34	8.167	2.34	14.167	2.34	20.17	1.00	
2.250	1.34	8.250	2.34	14.250	2.34	20.25	1.00	
2.333	1.00	8.333	2.34	14.333	2.68	20.33	1.00	
2.417	1.00	8.417	2.34	14.417	2.68	20.42	1.00	

2.500	1.00	8.500	2.34	14.500	2.68	20.50	1.00
2.583	1.00	8.583	2.34	14.583	2.34	20.58	1.00
2.667	1.00	8.667	2.34	14.667	2.34	20.67	1.00
2.750	1.00	8.750	2.34	14.750	2.34	20.75	1.00
2.833	1.00	8.833	2.68	14.833	2.68	20.83	1.00
2.917	1.00	8.917	2.68	14.917	2.68	20.92	1.00
3.000	1.00	9.000	2.68	15.000	2.68	21.00	1.00
3.083	1.34	9.083	2.68	15.083	2.34	21.08	1.00
3.167	1.34	9.167	2.68	15.167	2.34	21.17	1.00
3.250	1.34	9.250	2.68	15.250	2.34	21.25	1.00
3.333	1.00	9.333	3.01	15.333	2.68	21.33	1.00
3.417	1.00	9.417	3.01	15.417	2.68	21.42	1.00
3.500	1.00	9.500	3.01	15.500	2.68	21.50	1.00
3.583	1.00	9.583	3.01	15.583	2.34	21.58	1.00
3.667	1.00	9.667	3.01	15.667	2.34	21.67	1.00
3.750	1.00	9.750	3.01	15.750	2.34	21.75	1.00
3.833	1.34	9.833	3.68	15.833	1.67	21.83	1.00
3.917	1.34	9.917	3.68	15.917	1.67	21.92	1.00
4.000	1.34	10.000	3.68	16.000	1.67	22.00	1.00
4.083	1.34	10.083	4.01	16.083	1.34	22.08	1.00
4.167	1.34	10.167	4.01	16.167	1.34	22.17	1.00
4.250	1.34	10.250	4.01	16.250	1.34	22.25	1.00
4.333	1.34	10.333	5.02	16.333	1.67	22.33	1.00
4.417	1.34	10.417	5.02	16.417	1.67	22.42	1.00
4.500	1.34	10.500	5.02	16.500	1.67	22.50	1.00
4.583	1.34	10.583	5.35	16.583	1.34	22.58	1.00
4.667	1.34	10.667	5.35	16.667	1.34	22.67	1.00
4.750	1.34	10.750	5.35	16.750	1.34	22.75	1.00
4.833	1.34	10.833	8.03	16.833	1.67	22.83	1.00
4.917	1.34	10.917	8.03	16.917	1.67	22.92	1.00
5.000	1.34	11.000	8.03	17.000	1.67	23.00	1.00
5.083	1.34	11.083	8.03	17.083	1.34	23.08	1.00
5.167	1.34	11.167	8.03	17.167	1.34	23.17	1.00
5.250	1.34	11.250	8.03	17.250	1.34	23.25	1.00
5.333	1.34	11.333	24.74	17.333	1.67	23.33	1.00
5.417	1.34	11.417	24.75	17.417	1.67	23.42	1.00
5.500	1.34	11.500	24.75	17.500	1.67	23.50	1.00
5.583	1.34	11.583	102.32	17.583	1.34	23.58	1.00
5.667	1.34	11.667	102.33	17.667	1.34	23.67	1.00
5.750	1.34	11.750	102.33	17.750	1.34	23.75	1.00
5.833	1.34	11.833	12.05	17.833	1.67		
5.917	1.34	11.917	12.04	17.917	1.67		
6.000	1.34	12.000	12.04	18.000	1.67		

Max.Eff.Inten.(mm/hr)=	102.33	33.28
over (min)	5.00	30.00
Storage Coeff. (min)=	2.54 (ii)	26.01 (ii)
Unit Hyd. Tpeak (min)=	5.00	30.00
Unit Hyd. peak (cms)=	0.29	0.04

TOTALS

TIME: 10:21:00

USER:

COMMENTS: _____

** SIMULATION : J: 25 yr 24 hr scs **

MASS STORM

Filename: C:\Users\JBirchard\AppData
Local\Temp\
9d43116c-eeef-4156-9ab2-ed968cc38161\05819587
Comments: SCS Type II 24 HR MASS CURVE

Ptotal= 98.60 mm

Duration of storm = 23.75 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
0.25	1.18	6.25	1.97	12.25	14.20	18.25	1.58
0.50	0.79	6.50	1.58	12.50	7.49	18.50	1.97
0.75	1.18	6.75	1.97	12.75	7.10	18.75	1.58
1.00	1.18	7.00	1.97	13.00	5.52	19.00	1.97
1.25	1.18	7.25	2.37	13.25	5.13	19.25	1.58
1.50	0.79	7.50	1.97	13.50	4.34	19.50	1.97
1.75	1.18	7.75	2.37	13.75	3.94	19.75	1.58
2.00	1.18	8.00	2.37	14.00	3.16	20.00	1.18
2.25	1.58	8.25	2.76	14.25	2.76	20.25	1.18
2.50	1.18	8.50	2.76	14.50	3.16	20.50	1.18
2.75	1.18	8.75	2.76	14.75	2.76	20.75	1.18
3.00	1.18	9.00	3.16	15.00	3.16	21.00	1.18
3.25	1.58	9.25	3.16	15.25	2.76	21.25	1.18
3.50	1.18	9.50	3.55	15.50	3.16	21.50	1.18
3.75	1.18	9.75	3.55	15.75	2.76	21.75	1.18
4.00	1.58	10.00	4.34	16.00	1.97	22.00	1.18
4.25	1.58	10.25	4.73	16.25	1.58	22.25	1.18
4.50	1.58	10.50	5.92	16.50	1.97	22.50	1.18
4.75	1.58	10.75	6.31	16.75	1.58	22.75	1.18
5.00	1.58	11.00	9.47	17.00	1.97	23.00	1.18
5.25	1.58	11.25	9.47	17.25	1.58	23.25	1.18
5.50	1.58	11.50	29.19	17.50	1.97	23.50	1.18
5.75	1.58	11.75	120.69	17.75	1.58	23.75	1.18
6.00	1.58	12.00	14.20	18.00	1.97		

CALIB	
STANDHYD (0101)	Area (ha)= 0.68
ID= 1 DT= 5.0 min	Total Imp(%)= 21.00 Dir. Conn.(%)= 15.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.14	0.54
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	0.80	0.80
Length (m)=	90.00	90.00
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	1.18	6.083	1.97	12.083	14.20	18.08	1.58
0.167	1.18	6.167	1.97	12.167	14.20	18.17	1.58
0.250	1.18	6.250	1.97	12.250	14.20	18.25	1.58
0.333	0.79	6.333	1.58	12.333	7.49	18.33	1.97
0.417	0.79	6.417	1.58	12.417	7.49	18.42	1.97
0.500	0.79	6.500	1.58	12.500	7.49	18.50	1.97
0.583	1.18	6.583	1.97	12.583	7.10	18.58	1.58
0.667	1.18	6.667	1.97	12.667	7.10	18.67	1.58
0.750	1.18	6.750	1.97	12.750	7.10	18.75	1.58
0.833	1.18	6.833	1.97	12.833	5.52	18.83	1.97
0.917	1.18	6.917	1.97	12.917	5.52	18.92	1.97
1.000	1.18	7.000	1.97	13.000	5.52	19.00	1.97
1.083	1.18	7.083	2.37	13.083	5.13	19.08	1.58
1.167	1.18	7.167	2.37	13.167	5.13	19.17	1.58
1.250	1.18	7.250	2.37	13.250	5.13	19.25	1.58
1.333	0.79	7.333	1.97	13.333	4.34	19.33	1.97
1.417	0.79	7.417	1.97	13.417	4.34	19.42	1.97
1.500	0.79	7.500	1.97	13.500	4.34	19.50	1.97
1.583	1.18	7.583	2.37	13.583	3.94	19.58	1.58
1.667	1.18	7.667	2.37	13.667	3.94	19.67	1.58
1.750	1.18	7.750	2.37	13.750	3.94	19.75	1.58
1.833	1.18	7.833	2.37	13.833	3.16	19.83	1.18
1.917	1.18	7.917	2.37	13.917	3.16	19.92	1.18
2.000	1.18	8.000	2.37	14.000	3.16	20.00	1.18
2.083	1.58	8.083	2.76	14.083	2.76	20.08	1.18
2.167	1.58	8.167	2.76	14.167	2.76	20.17	1.18
2.250	1.58	8.250	2.76	14.250	2.76	20.25	1.18
2.333	1.18	8.333	2.76	14.333	3.16	20.33	1.18
2.417	1.18	8.417	2.76	14.417	3.16	20.42	1.18
2.500	1.18	8.500	2.76	14.500	3.16	20.50	1.18
2.583	1.18	8.583	2.76	14.583	2.76	20.58	1.18
2.667	1.18	8.667	2.76	14.667	2.76	20.67	1.18

2.750	1.18	8.750	2.76	14.750	2.76	20.75	1.18
2.833	1.18	8.833	3.16	14.833	3.16	20.83	1.18
2.917	1.18	8.917	3.16	14.917	3.16	20.92	1.18
3.000	1.18	9.000	3.16	15.000	3.16	21.00	1.18
3.083	1.58	9.083	3.16	15.083	2.76	21.08	1.18
3.167	1.58	9.167	3.16	15.167	2.76	21.17	1.18
3.250	1.58	9.250	3.16	15.250	2.76	21.25	1.18
3.333	1.18	9.333	3.55	15.333	3.16	21.33	1.18
3.417	1.18	9.417	3.55	15.417	3.16	21.42	1.18
3.500	1.18	9.500	3.55	15.500	3.16	21.50	1.18
3.583	1.18	9.583	3.55	15.583	2.76	21.58	1.18
3.667	1.18	9.667	3.55	15.667	2.76	21.67	1.18
3.750	1.18	9.750	3.55	15.750	2.76	21.75	1.18
3.833	1.58	9.833	4.34	15.833	1.97	21.83	1.18
3.917	1.58	9.917	4.34	15.917	1.97	21.92	1.18
4.000	1.58	10.000	4.34	16.000	1.97	22.00	1.18
4.083	1.58	10.083	4.73	16.083	1.58	22.08	1.18
4.167	1.58	10.167	4.73	16.167	1.58	22.17	1.18
4.250	1.58	10.250	4.73	16.250	1.58	22.25	1.18
4.333	1.58	10.333	5.92	16.333	1.97	22.33	1.18
4.417	1.58	10.417	5.92	16.417	1.97	22.42	1.18
4.500	1.58	10.500	5.92	16.500	1.97	22.50	1.18
4.583	1.58	10.583	6.31	16.583	1.58	22.58	1.18
4.667	1.58	10.667	6.31	16.667	1.58	22.67	1.18
4.750	1.58	10.750	6.31	16.750	1.58	22.75	1.18
4.833	1.58	10.833	9.47	16.833	1.97	22.83	1.18
4.917	1.58	10.917	9.47	16.917	1.97	22.92	1.18
5.000	1.58	11.000	9.47	17.000	1.97	23.00	1.18
5.083	1.58	11.083	9.47	17.083	1.58	23.08	1.18
5.167	1.58	11.167	9.47	17.167	1.58	23.17	1.18
5.250	1.58	11.250	9.47	17.250	1.58	23.25	1.18
5.333	1.58	11.333	29.18	17.333	1.97	23.33	1.18
5.417	1.58	11.417	29.19	17.417	1.97	23.42	1.18
5.500	1.58	11.500	29.19	17.500	1.97	23.50	1.18
5.583	1.58	11.583	120.68	17.583	1.58	23.58	1.18
5.667	1.58	11.667	120.69	17.667	1.58	23.67	1.18
5.750	1.58	11.750	120.69	17.750	1.58	23.75	1.18
5.833	1.58	11.833	14.21	17.833	1.97		
5.917	1.58	11.917	14.20	17.917	1.97		
6.000	1.58	12.000	14.20	18.000	1.97		

Max.Eff.Inten.(mm/hr)=	120.69	52.13
over (min)	5.00	25.00
Storage Coeff. (min)=	2.38 (ii)	21.99 (ii)
Unit Hyd. Tpeak (min)=	5.00	25.00
Unit Hyd. peak (cms)=	0.30	0.05

TOTALS

PEAK FLOW (cms)=	0.03	0.04	0.059 (iii)
TIME TO PEAK (hrs)=	11.75	12.00	11.75
RUNOFF VOLUME (mm)=	97.30	43.92	51.91

TOTAL RAINFALL (mm)=	98.30	98.30	98.30
RUNOFF COEFFICIENT =	0.99	0.45	0.53

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 69.0 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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V	V	I	SSSSS	U	U	A	L					(v 6.1.2001)
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				

000	TTTTT	TTTTT	H	H	Y	Y	M	M	000	TM	
0	0	T	T	H	H	Y	Y	MM	MM	0	0
0	0	T	T	H	H	Y		M	M	0	0
000	T	T	H	H	Y		M	M	000		

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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 6.1\V02\voin.dat

Output filename:

C:\Users\JBirchard\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\7d3c92a0-64df-48a8-bc11-de7e7029ce66\sc

Summary filename:

C:\Users\JBirchard\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\7d3c92a0-64df-48a8-bc11-de7e7029ce66\sc

DATE: 03/04/2022

TIME: 10:21:00

USER:

COMMENTS: _____

** SIMULATION : K: 50 yr 24 hr scs **

MASS STORM

Ptotal=109.80 mm

Filename: C:\Users\JBirchard\AppData

ata\Local\Temp\

9d43116c-eefa-4156-9ab2-ed968cc38161\b4302855

Comments: SCS Type II 24 HR MASS CURVE

Duration of storm = 23.75 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
0.25	1.32	6.25	2.20	12.25	15.81	18.25	1.76
0.50	0.88	6.50	1.76	12.50	8.34	18.50	2.20
0.75	1.32	6.75	2.20	12.75	7.91	18.75	1.76
1.00	1.32	7.00	2.20	13.00	6.15	19.00	2.20
1.25	1.32	7.25	2.64	13.25	5.71	19.25	1.76
1.50	0.88	7.50	2.20	13.50	4.83	19.50	2.20
1.75	1.32	7.75	2.64	13.75	4.39	19.75	1.76
2.00	1.32	8.00	2.64	14.00	3.51	20.00	1.32
2.25	1.76	8.25	3.07	14.25	3.07	20.25	1.32
2.50	1.32	8.50	3.07	14.50	3.51	20.50	1.32
2.75	1.32	8.75	3.07	14.75	3.07	20.75	1.32
3.00	1.32	9.00	3.51	15.00	3.51	21.00	1.32
3.25	1.76	9.25	3.51	15.25	3.07	21.25	1.32
3.50	1.32	9.50	3.95	15.50	3.51	21.50	1.32
3.75	1.32	9.75	3.95	15.75	3.07	21.75	1.32
4.00	1.76	10.00	4.83	16.00	2.20	22.00	1.32
4.25	1.76	10.25	5.27	16.25	1.76	22.25	1.32
4.50	1.76	10.50	6.59	16.50	2.20	22.50	1.32
4.75	1.76	10.75	7.03	16.75	1.76	22.75	1.32
5.00	1.76	11.00	10.54	17.00	2.20	23.00	1.32
5.25	1.76	11.25	10.54	17.25	1.76	23.25	1.32
5.50	1.76	11.50	32.50	17.50	2.20	23.50	1.32
5.75	1.76	11.75	134.40	17.75	1.76	23.75	1.32
6.00	1.76	12.00	15.81	18.00	2.20		

CALIB

STANDHYD (0101)

Area (ha)= 0.68

|ID= 1 DT= 5.0 min | Total Imp(%)= 21.00 Dir. Conn.(%)= 15.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.14	0.54
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	0.80	0.80
Length	(m)=	90.00	90.00
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	6.083	2.20	12.083	15.81	18.08	1.76
0.167	1.32	6.167	2.20	12.167	15.81	18.17	1.76
0.250	1.32	6.250	2.20	12.250	15.81	18.25	1.76
0.333	0.88	6.333	1.76	12.333	8.35	18.33	2.20
0.417	0.88	6.417	1.76	12.417	8.34	18.42	2.20
0.500	0.88	6.500	1.76	12.500	8.34	18.50	2.20
0.583	1.32	6.583	2.20	12.583	7.91	18.58	1.76
0.667	1.32	6.667	2.20	12.667	7.91	18.67	1.76
0.750	1.32	6.750	2.20	12.750	7.91	18.75	1.76
0.833	1.32	6.833	2.20	12.833	6.15	18.83	2.20
0.917	1.32	6.917	2.20	12.917	6.15	18.92	2.20
1.000	1.32	7.000	2.20	13.000	6.15	19.00	2.20
1.083	1.32	7.083	2.64	13.083	5.71	19.08	1.76
1.167	1.32	7.167	2.64	13.167	5.71	19.17	1.76
1.250	1.32	7.250	2.64	13.250	5.71	19.25	1.76
1.333	0.88	7.333	2.20	13.333	4.83	19.33	2.20
1.417	0.88	7.417	2.20	13.417	4.83	19.42	2.20
1.500	0.88	7.500	2.20	13.500	4.83	19.50	2.20
1.583	1.32	7.583	2.64	13.583	4.39	19.58	1.76
1.667	1.32	7.667	2.64	13.667	4.39	19.67	1.76
1.750	1.32	7.750	2.64	13.750	4.39	19.75	1.76
1.833	1.32	7.833	2.64	13.833	3.51	19.83	1.32
1.917	1.32	7.917	2.64	13.917	3.51	19.92	1.32
2.000	1.32	8.000	2.64	14.000	3.51	20.00	1.32
2.083	1.76	8.083	3.07	14.083	3.07	20.08	1.32
2.167	1.76	8.167	3.07	14.167	3.07	20.17	1.32
2.250	1.76	8.250	3.07	14.250	3.07	20.25	1.32
2.333	1.32	8.333	3.07	14.333	3.51	20.33	1.32
2.417	1.32	8.417	3.07	14.417	3.51	20.42	1.32
2.500	1.32	8.500	3.07	14.500	3.51	20.50	1.32
2.583	1.32	8.583	3.07	14.583	3.07	20.58	1.32
2.667	1.32	8.667	3.07	14.667	3.07	20.67	1.32
2.750	1.32	8.750	3.07	14.750	3.07	20.75	1.32
2.833	1.32	8.833	3.51	14.833	3.51	20.83	1.32
2.917	1.32	8.917	3.51	14.917	3.51	20.92	1.32

3.000	1.32	9.000	3.51	15.000	3.51	21.00	1.32
3.083	1.76	9.083	3.51	15.083	3.07	21.08	1.32
3.167	1.76	9.167	3.51	15.167	3.07	21.17	1.32
3.250	1.76	9.250	3.51	15.250	3.07	21.25	1.32
3.333	1.32	9.333	3.95	15.333	3.51	21.33	1.32
3.417	1.32	9.417	3.95	15.417	3.51	21.42	1.32
3.500	1.32	9.500	3.95	15.500	3.51	21.50	1.32
3.583	1.32	9.583	3.95	15.583	3.07	21.58	1.32
3.667	1.32	9.667	3.95	15.667	3.07	21.67	1.32
3.750	1.32	9.750	3.95	15.750	3.07	21.75	1.32
3.833	1.76	9.833	4.83	15.833	2.20	21.83	1.32
3.917	1.76	9.917	4.83	15.917	2.20	21.92	1.32
4.000	1.76	10.000	4.83	16.000	2.20	22.00	1.32
4.083	1.76	10.083	5.27	16.083	1.76	22.08	1.32
4.167	1.76	10.167	5.27	16.167	1.76	22.17	1.32
4.250	1.76	10.250	5.27	16.250	1.76	22.25	1.32
4.333	1.76	10.333	6.59	16.333	2.20	22.33	1.32
4.417	1.76	10.417	6.59	16.417	2.20	22.42	1.32
4.500	1.76	10.500	6.59	16.500	2.20	22.50	1.32
4.583	1.76	10.583	7.03	16.583	1.76	22.58	1.32
4.667	1.76	10.667	7.03	16.667	1.76	22.67	1.32
4.750	1.76	10.750	7.03	16.750	1.76	22.75	1.32
4.833	1.76	10.833	10.54	16.833	2.20	22.83	1.32
4.917	1.76	10.917	10.54	16.917	2.20	22.92	1.32
5.000	1.76	11.000	10.54	17.000	2.20	23.00	1.32
5.083	1.76	11.083	10.54	17.083	1.76	23.08	1.32
5.167	1.76	11.167	10.54	17.167	1.76	23.17	1.32
5.250	1.76	11.250	10.54	17.250	1.76	23.25	1.32
5.333	1.76	11.333	32.50	17.333	2.20	23.33	1.32
5.417	1.76	11.417	32.50	17.417	2.20	23.42	1.32
5.500	1.76	11.500	32.50	17.500	2.20	23.50	1.32
5.583	1.76	11.583	134.39	17.583	1.76	23.58	1.32
5.667	1.76	11.667	134.40	17.667	1.76	23.67	1.32
5.750	1.76	11.750	134.40	17.750	1.76	23.75	1.32
5.833	1.76	11.833	15.82	17.833	2.20		
5.917	1.76	11.917	15.81	17.917	2.20		
6.000	1.76	12.000	15.81	18.000	2.20		

Max.Eff.Inten.(mm/hr)=	134.40	62.08
over (min)	5.00	25.00
Storage Coeff. (min)=	2.28 (ii)	20.57 (ii)
Unit Hyd. Tpeak (min)=	5.00	25.00
Unit Hyd. peak (cms)=	0.30	0.05

TOTALS

PEAK FLOW (cms)=	0.04	0.05	0.068 (iii)
TIME TO PEAK (hrs)=	11.75	12.00	11.75
RUNOFF VOLUME (mm)=	108.47	52.10	60.54
TOTAL RAINFALL (mm)=	109.47	109.47	109.47
RUNOFF COEFFICIENT =	0.99	0.48	0.55

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 69.0 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.

 =====
 =====

V	V	I	SSSSS	U	U	A	L					(v 6.1.2001)
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				

000	TTTTT	TTTTT	H	H	Y	Y	M	M	000	TM	
0	0	T	T	H	H	Y	Y	MM	MM	0	0
0	0	T	T	H	H	Y	M	M	0	0	
000	T	T	H	H	Y	M	M	000			

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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 6.1\V02\voin.dat

Output filename:

C:\Users\JBirchard\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\55
 1ba912-d441-4893-9362-4e6db0dc33aa\sc

Summary filename:

C:\Users\JBirchard\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\55
 1ba912-d441-4893-9362-4e6db0dc33aa\sc

DATE: 03/04/2022

TIME: 10:21:00

USER:

COMMENTS: _____

 ** SIMULATION : L: 100 yr 24 hr scs **

MASS STORM	Filename: C:\Users\JBirchard\AppData ata\Local\Temp\ 9d43116c-eeef-4156-9ab2-ed968cc38161\253c2c6e
Ptotal=120.80 mm	Comments: SCS Type II 24 HR MASS CURVE

Duration of storm = 23.75 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
0.25	1.45	6.25	2.42	12.25	17.40	18.25	1.93
0.50	0.97	6.50	1.93	12.50	9.18	18.50	2.42
0.75	1.45	6.75	2.42	12.75	8.70	18.75	1.93
1.00	1.45	7.00	2.42	13.00	6.76	19.00	2.42
1.25	1.45	7.25	2.90	13.25	6.28	19.25	1.93
1.50	0.97	7.50	2.42	13.50	5.32	19.50	2.42
1.75	1.45	7.75	2.90	13.75	4.83	19.75	1.93
2.00	1.45	8.00	2.90	14.00	3.87	20.00	1.45
2.25	1.93	8.25	3.38	14.25	3.38	20.25	1.45
2.50	1.45	8.50	3.38	14.50	3.87	20.50	1.45
2.75	1.45	8.75	3.38	14.75	3.38	20.75	1.45
3.00	1.45	9.00	3.87	15.00	3.87	21.00	1.45
3.25	1.93	9.25	3.87	15.25	3.38	21.25	1.45
3.50	1.45	9.50	4.35	15.50	3.87	21.50	1.45
3.75	1.45	9.75	4.35	15.75	3.38	21.75	1.45
4.00	1.93	10.00	5.32	16.00	2.42	22.00	1.45
4.25	1.93	10.25	5.80	16.25	1.93	22.25	1.45
4.50	1.93	10.50	7.25	16.50	2.42	22.50	1.45
4.75	1.93	10.75	7.73	16.75	1.93	22.75	1.45
5.00	1.93	11.00	11.60	17.00	2.42	23.00	1.45
5.25	1.93	11.25	11.60	17.25	1.93	23.25	1.45
5.50	1.93	11.50	35.76	17.50	2.42	23.50	1.45
5.75	1.93	11.75	147.86	17.75	1.93	23.75	1.45
6.00	1.93	12.00	17.40	18.00	2.42		

CALIB	Area (ha)= 0.68
STANDHYD (0101)	Total Imp(%)= 21.00 Dir. Conn.(%)= 15.00
ID= 1 DT= 5.0 min	

IMPERVIOUS PERVIOUS (i)

Surface Area	(ha)=	0.14	0.54
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	0.80	0.80
Length	(m)=	90.00	90.00
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	1.45	6.083	2.42	12.083	17.40	18.08	1.93
0.167	1.45	6.167	2.42	12.167	17.40	18.17	1.93
0.250	1.45	6.250	2.42	12.250	17.40	18.25	1.93
0.333	0.97	6.333	1.93	12.333	9.18	18.33	2.42
0.417	0.97	6.417	1.93	12.417	9.18	18.42	2.42
0.500	0.97	6.500	1.93	12.500	9.18	18.50	2.42
0.583	1.45	6.583	2.42	12.583	8.70	18.58	1.93
0.667	1.45	6.667	2.42	12.667	8.70	18.67	1.93
0.750	1.45	6.750	2.42	12.750	8.70	18.75	1.93
0.833	1.45	6.833	2.42	12.833	6.77	18.83	2.42
0.917	1.45	6.917	2.42	12.917	6.76	18.92	2.42
1.000	1.45	7.000	2.42	13.000	6.76	19.00	2.42
1.083	1.45	7.083	2.90	13.083	6.28	19.08	1.93
1.167	1.45	7.167	2.90	13.167	6.28	19.17	1.93
1.250	1.45	7.250	2.90	13.250	6.28	19.25	1.93
1.333	0.97	7.333	2.42	13.333	5.32	19.33	2.42
1.417	0.97	7.417	2.42	13.417	5.32	19.42	2.42
1.500	0.97	7.500	2.42	13.500	5.32	19.50	2.42
1.583	1.45	7.583	2.90	13.583	4.83	19.58	1.93
1.667	1.45	7.667	2.90	13.667	4.83	19.67	1.93
1.750	1.45	7.750	2.90	13.750	4.83	19.75	1.93
1.833	1.45	7.833	2.90	13.833	3.87	19.83	1.45
1.917	1.45	7.917	2.90	13.917	3.87	19.92	1.45
2.000	1.45	8.000	2.90	14.000	3.87	20.00	1.45
2.083	1.93	8.083	3.38	14.083	3.38	20.08	1.45
2.167	1.93	8.167	3.38	14.167	3.38	20.17	1.45
2.250	1.93	8.250	3.38	14.250	3.38	20.25	1.45
2.333	1.45	8.333	3.38	14.333	3.87	20.33	1.45
2.417	1.45	8.417	3.38	14.417	3.87	20.42	1.45
2.500	1.45	8.500	3.38	14.500	3.87	20.50	1.45
2.583	1.45	8.583	3.38	14.583	3.38	20.58	1.45
2.667	1.45	8.667	3.38	14.667	3.38	20.67	1.45
2.750	1.45	8.750	3.38	14.750	3.38	20.75	1.45
2.833	1.45	8.833	3.87	14.833	3.87	20.83	1.45
2.917	1.45	8.917	3.87	14.917	3.87	20.92	1.45
3.000	1.45	9.000	3.87	15.000	3.87	21.00	1.45
3.083	1.93	9.083	3.87	15.083	3.38	21.08	1.45
3.167	1.93	9.167	3.87	15.167	3.38	21.17	1.45

3.250	1.93	9.250	3.87	15.250	3.38	21.25	1.45
3.333	1.45	9.333	4.35	15.333	3.87	21.33	1.45
3.417	1.45	9.417	4.35	15.417	3.87	21.42	1.45
3.500	1.45	9.500	4.35	15.500	3.87	21.50	1.45
3.583	1.45	9.583	4.35	15.583	3.38	21.58	1.45
3.667	1.45	9.667	4.35	15.667	3.38	21.67	1.45
3.750	1.45	9.750	4.35	15.750	3.38	21.75	1.45
3.833	1.93	9.833	5.32	15.833	2.42	21.83	1.45
3.917	1.93	9.917	5.32	15.917	2.42	21.92	1.45
4.000	1.93	10.000	5.32	16.000	2.42	22.00	1.45
4.083	1.93	10.083	5.80	16.083	1.93	22.08	1.45
4.167	1.93	10.167	5.80	16.167	1.93	22.17	1.45
4.250	1.93	10.250	5.80	16.250	1.93	22.25	1.45
4.333	1.93	10.333	7.25	16.333	2.42	22.33	1.45
4.417	1.93	10.417	7.25	16.417	2.42	22.42	1.45
4.500	1.93	10.500	7.25	16.500	2.42	22.50	1.45
4.583	1.93	10.583	7.73	16.583	1.93	22.58	1.45
4.667	1.93	10.667	7.73	16.667	1.93	22.67	1.45
4.750	1.93	10.750	7.73	16.750	1.93	22.75	1.45
4.833	1.93	10.833	11.60	16.833	2.42	22.83	1.45
4.917	1.93	10.917	11.60	16.917	2.42	22.92	1.45
5.000	1.93	11.000	11.60	17.000	2.42	23.00	1.45
5.083	1.93	11.083	11.60	17.083	1.93	23.08	1.45
5.167	1.93	11.167	11.60	17.167	1.93	23.17	1.45
5.250	1.93	11.250	11.60	17.250	1.93	23.25	1.45
5.333	1.93	11.333	35.75	17.333	2.42	23.33	1.45
5.417	1.93	11.417	35.76	17.417	2.42	23.42	1.45
5.500	1.93	11.500	35.76	17.500	2.42	23.50	1.45
5.583	1.93	11.583	147.85	17.583	1.93	23.58	1.45
5.667	1.93	11.667	147.86	17.667	1.93	23.67	1.45
5.750	1.93	11.750	147.86	17.750	1.93	23.75	1.45
5.833	1.93	11.833	17.41	17.833	2.42		
5.917	1.93	11.917	17.40	17.917	2.42		
6.000	1.93	12.000	17.40	18.000	2.42		

Max.Eff.Inten.(mm/hr)=	147.86	72.23
over (min)	5.00	20.00
Storage Coeff. (min)=	2.19 (ii)	19.41 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.31	0.06

TOTALS

PEAK FLOW (cms)=	0.04	0.07	0.087 (iii)
TIME TO PEAK (hrs)=	11.75	11.92	11.75
RUNOFF VOLUME (mm)=	119.44	60.43	69.27
TOTAL RAINFALL (mm)=	120.44	120.44	120.44
RUNOFF COEFFICIENT =	0.99	0.50	0.58

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

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 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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V   V   I   SSSSS   U   U   A   L           (v 6.1.2001)
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

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

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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 6.1\V02\voin.dat

Output filename:

C:\Users\JBirchard\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\63
 a0aa2b-41f4-489e-b247-bf23ad4bdfdf4\sc

Summary filename:

C:\Users\JBirchard\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\63
 a0aa2b-41f4-489e-b247-bf23ad4bdfdf4\sc

DATE: 03/04/2022

TIME: 10:21:00

USER:

COMMENTS: _____

 ** SIMULATION : TIMMINS **

READ STORM	Filename: C:\Users\JBirchard\AppData Local\Temp\ 9d43116c-ee6a-4156-9ab2-ed968cc38161\6e58836e
Ptotal=193.00 mm	Comments: TIMMINS

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	15.00	3.25	3.00	6.25	43.00	9.25	13.00
0.50	15.00	3.50	3.00	6.50	43.00	9.50	13.00
0.75	15.00	3.75	3.00	6.75	43.00	9.75	13.00
1.00	15.00	4.00	3.00	7.00	43.00	10.00	13.00
1.25	20.00	4.25	5.00	7.25	20.00	10.25	13.00
1.50	20.00	4.50	5.00	7.50	20.00	10.50	13.00
1.75	20.00	4.75	5.00	7.75	20.00	10.75	13.00
2.00	20.00	5.00	5.00	8.00	20.00	11.00	13.00
2.25	10.00	5.25	20.00	8.25	23.00	11.25	8.00
2.50	10.00	5.50	20.00	8.50	23.00	11.50	8.00
2.75	10.00	5.75	20.00	8.75	23.00	11.75	8.00
3.00	10.00	6.00	20.00	9.00	23.00	12.00	8.00

CALIB	Area (ha)= 0.68
STANDHYD (0101)	Total Imp(%)= 21.00 Dir. Conn.(%)= 15.00
ID= 1 DT= 5.0 min	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.14	0.54
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	0.80	0.80
Length (m)=	90.00	90.00
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	15.00	3.083	3.00	6.083	43.00	9.08	13.00
0.167	15.00	3.167	3.00	6.167	43.00	9.17	13.00
0.250	15.00	3.250	3.00	6.250	43.00	9.25	13.00
0.333	15.00	3.333	3.00	6.333	43.00	9.33	13.00

0.417	15.00	3.417	3.00	6.417	43.00	9.42	13.00
0.500	15.00	3.500	3.00	6.500	43.00	9.50	13.00
0.583	15.00	3.583	3.00	6.583	43.00	9.58	13.00
0.667	15.00	3.667	3.00	6.667	43.00	9.67	13.00
0.750	15.00	3.750	3.00	6.750	43.00	9.75	13.00
0.833	15.00	3.833	3.00	6.833	43.00	9.83	13.00
0.917	15.00	3.917	3.00	6.917	43.00	9.92	13.00
1.000	15.00	4.000	3.00	7.000	43.00	10.00	13.00
1.083	20.00	4.083	5.00	7.083	20.00	10.08	13.00
1.167	20.00	4.167	5.00	7.167	20.00	10.17	13.00
1.250	20.00	4.250	5.00	7.250	20.00	10.25	13.00
1.333	20.00	4.333	5.00	7.333	20.00	10.33	13.00
1.417	20.00	4.417	5.00	7.417	20.00	10.42	13.00
1.500	20.00	4.500	5.00	7.500	20.00	10.50	13.00
1.583	20.00	4.583	5.00	7.583	20.00	10.58	13.00
1.667	20.00	4.667	5.00	7.667	20.00	10.67	13.00
1.750	20.00	4.750	5.00	7.750	20.00	10.75	13.00
1.833	20.00	4.833	5.00	7.833	20.00	10.83	13.00
1.917	20.00	4.917	5.00	7.917	20.00	10.92	13.00
2.000	20.00	5.000	5.00	8.000	20.00	11.00	13.00
2.083	10.00	5.083	20.00	8.083	23.00	11.08	8.00
2.167	10.00	5.167	20.00	8.167	23.00	11.17	8.00
2.250	10.00	5.250	20.00	8.250	23.00	11.25	8.00
2.333	10.00	5.333	20.00	8.333	23.00	11.33	8.00
2.417	10.00	5.417	20.00	8.417	23.00	11.42	8.00
2.500	10.00	5.500	20.00	8.500	23.00	11.50	8.00
2.583	10.00	5.583	20.00	8.583	23.00	11.58	8.00
2.667	10.00	5.667	20.00	8.667	23.00	11.67	8.00
2.750	10.00	5.750	20.00	8.750	23.00	11.75	8.00
2.833	10.00	5.833	20.00	8.833	23.00	11.83	8.00
2.917	10.00	5.917	20.00	8.917	23.00	11.92	8.00
3.000	10.00	6.000	20.00	9.000	23.00	12.00	8.00

Max.Eff.Inten.(mm/hr)=	43.00	34.27
over (min)	5.00	30.00
Storage Coeff. (min)=	3.59 (ii)	26.79 (ii)
Unit Hyd. Tpeak (min)=	5.00	30.00
Unit Hyd. peak (cms)=	0.26	0.04

TOTALS

PEAK FLOW (cms)=	0.01	0.04	0.055 (iii)
TIME TO PEAK (hrs)=	6.75	7.17	7.00
RUNOFF VOLUME (mm)=	192.00	120.50	131.20
TOTAL RAINFALL (mm)=	193.00	193.00	193.00
RUNOFF COEFFICIENT =	0.99	0.62	0.68

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

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

- CN* = 69.0 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.

FINISH

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Appendix B: Post Development SWM Calculations

Visual OTTHYMO Model Parameter Calculations (NasHYD)

Project Details

Project Name	121258
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Data Sources

Detailed Soil Survey Reports for Ontario, GSCA Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation (2010), MTO Drainage Management Manual (1997)

Prepared By

John Birchard	March 4, 2022
---------------	---------------

Post Development Condition

Watershed:	GSCA
Catchment ID:	201
Catchment Area (ha):	0.32
Impervious %:	3%

Average Curve Number (CN), Runoff Coefficient (C) and Initial Abstraction (IA)

Soil Symbol	Gsl												
Soil Series	Granby												
Hydrologic Soils Group	B												
Soil Texture	Sand Loam												
Runoff Coefficient Type	2												
Area (ha)	0.32												
Percentage of Catchment	100%												
Land Cover Category	IA	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C
Impervious	2	0.01	100	0.95									
Gravel	3		89	0.27									
Woodland	10		60	0.25									
Pasture/Lawns	5	0.31	69	0.28									
Meadows	8		65	0.27									
Cultivated	7		74	0.35									
Waterbody	12		50	0.05									
Average CN	68.72												
Average C	0.29												
Average IA	4.88												

Time to Peak Calculations

Max. Catchment Elev. (m):	180.53
Min. Catchment Elev. (m):	179.81
Catchment Length (m):	90
Catchment Slope (%):	0.80%
Method:	Airport Method
Time of Concentration (mins):	27.00

Summary

Catchment CN:	68.7
Catchment C:	0.29
Catchment IA (mm):	4.88
Time of Concentration (hrs):	0.45
Catchment Time to Peak (hrs):	0.30
Catchment Time Step (mins):	3.60

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Project Name	121258
--------------	--------

Data Sources

Detailed Soil Survey Reports for Ontario, GSCA Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation (2010), MTO Drainage Management Manual (1997)

Prepared By

John Birchard	March 4, 2022
---------------	---------------

Post Development Condition

Watershed:	GSCA
Catchment ID:	202
Catchment Area (ha):	0.36
Impervious %:	62%
Pervious Area (ha):	0.05

Average Curve Number (CN) and Initial Abstraction (IA) for Pervious Area

Soil Symbol	Gsl								
Soil Series	Granby								
Hydrologic Soils Group	B								
Soil Texture	Sand Loam								
Runoff Coefficient Type	2								
Area (ha)	0.05								
Percentage of Catchment	100%								
Land Cover Category	IA	A (ha)	CN	A (ha)	CN	A (ha)	CN	A (ha)	CN
Impervious	2		100						
Gravel	3		89						
Woodland	10		60						
Pasture/Lawns	5	0.05	69						
Meadows	8		65						
Cultivated	7		74						
Waterbody	12		50						
Average CN	69.00								
Average IA	5.00								

Notes

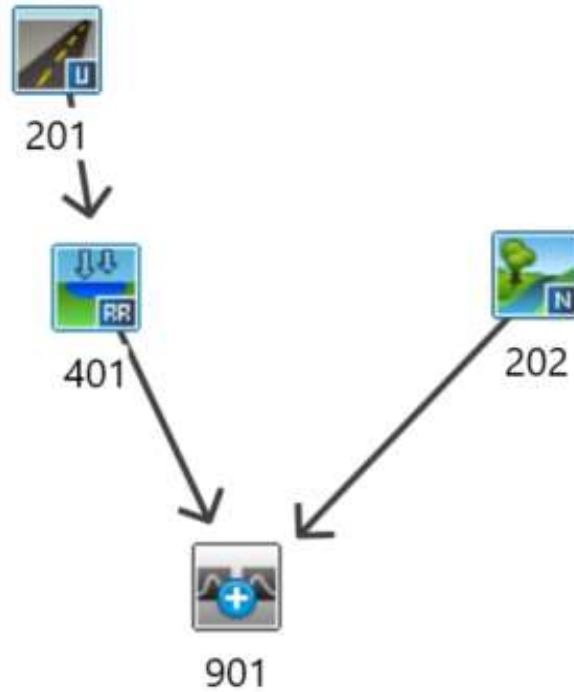
CN and IA values have been calculated for the pervious area of the catchment only.
--

Summary

Catchment CN:	69.0
Catchment IA (mm):	5.00

PROJECT	209806 Highway 26	FILE	121258
		DATE	3/4/2022
SUBJECT	Visual OTTHYMO	NAME	JB
	Post-Development Schematic	PAGE	1 OF 1

EXISTING CONDITIONS



NASHYD



ROUTE PIPE



DUHYD



STANDHYD



ROUTE
CHANNEL



DIVERT HYD



ADDHYD



ROUTE
RESERVOIR



SHIFTHYD

	Project :	209806 Highway 26
	File No.	121258
	Date:	August 2022
	Designed By:	JB
	Checked By:	AS
	Subject:	Underground Storage SSD Relationship

STAGE-STORAGE TABLE			
Elevation	Incremental Storage Depth	Volume	
		Incremental	Accumulated
		Storage	Storage
(m)	(m)	(cu.m)	(cu.m)
0.000	0.00	0.000	0.000
0.025	0.025	2.781	2.781
0.051	0.025	2.781	5.563
0.076	0.025	2.781	8.344
0.102	0.025	2.781	11.125
0.127	0.025	2.781	13.907
0.152	0.025	2.781	16.688
0.178	0.025	6.240	22.928
0.203	0.025	6.092	29.020
0.229	0.025	6.076	35.096
0.254	0.025	6.057	41.153
0.279	0.025	6.037	47.190
0.305	0.025	6.027	53.217
0.330	0.025	5.911	59.129
0.356	0.025	5.891	65.020
0.381	0.025	5.838	70.858
0.406	0.025	5.754	76.611
0.432	0.025	5.712	82.323
0.457	0.025	5.673	87.996
0.483	0.025	5.612	93.608
0.508	0.025	5.570	99.178
0.533	0.025	5.421	104.599
0.559	0.025	5.336	109.935
0.584	0.025	5.241	115.176
0.610	0.025	5.124	120.300
0.635	0.025	4.997	125.298
0.660	0.025	4.849	130.146
0.686	0.025	4.679	134.825
0.711	0.025	4.467	139.292
0.737	0.025	4.202	143.494
0.762	0.025	3.842	147.336
0.787	0.025	3.280	150.615
0.813	0.025	2.972	153.588
0.826	0.013	1.392	154.979
0.851	0.025	2.781	157.761
0.876	0.025	2.781	160.542
0.902	0.025	2.781	163.323
0.927	0.025	2.781	166.105
0.953	0.025	2.781	168.886
0.978	0.025	2.781	171.667

Bottom of Chambers

Top of Chambers

	Project :	209806 Highway 26
	File No.	121258
	Date:	August 2022
	Designed By:	JB
	Checked By:	AS
	Subject:	SWMF SSD Relationship

STAGE-DISCHARGE TABLE

Outlets

Type	Orifice #1	Orifice #2
Diameter (mm)	100	100
Area (sq.m)	0.0079	0.0079
Coefficient	0.63	0.63
Invert (m)	0.15	0.3

STAGE-DISCHARGE TABLE - STAGE 1					
Water Level	Outlets				Total Discharge
	Orifice #1		Orifice #2		
	Head	Discharge	Head	Discharge	
(m)	(m)	(cms)	(m)	(cms)	(cms)
0.00	0.000	0.0000	0.000	0.0000	0.0000
0.03	0.000	0.0000	0.000	0.0000	0.0000
0.05	0.000	0.0000	0.000	0.0000	0.0000
0.08	0.000	0.0000	0.000	0.0000	0.0000
0.10	0.000	0.0000	0.000	0.0000	0.0000
0.13	0.000	0.0000	0.000	0.0000	0.0000
0.15	0.000	0.0000	0.000	0.0000	0.0000
0.18	0.000	0.0000	0.000	0.0000	0.0000
0.20	0.003	0.0012	0.000	0.0000	0.0012
0.23	0.029	0.0037	0.000	0.0000	0.0037
0.25	0.054	0.0051	0.000	0.0000	0.0051
0.28	0.079	0.0062	0.000	0.0000	0.0062
0.30	0.105	0.0071	0.000	0.0000	0.0071
0.33	0.130	0.0079	0.000	0.0000	0.0079
0.36	0.156	0.0086	0.006	0.0016	0.0103
0.38	0.181	0.0093	0.031	0.0039	0.0132
0.41	0.206	0.0100	0.056	0.0052	0.0152
0.43	0.232	0.0106	0.082	0.0063	0.0168
0.46	0.257	0.0111	0.107	0.0072	0.0183
0.48	0.283	0.0117	0.133	0.0080	0.0196
0.51	0.308	0.0122	0.158	0.0087	0.0209
0.53	0.333	0.0127	0.183	0.0094	0.0220
0.56	0.359	0.0131	0.209	0.0100	0.0231
0.58	0.384	0.0136	0.234	0.0106	0.0242
0.61	0.410	0.0140	0.260	0.0112	0.0252
0.64	0.435	0.0145	0.285	0.0117	0.0262
0.66	0.460	0.0149	0.310	0.0122	0.0271
0.69	0.486	0.0153	0.336	0.0127	0.0280
0.71	0.511	0.0157	0.361	0.0132	0.0288
0.74	0.537	0.0161	0.387	0.0136	0.0297
0.76	0.562	0.0164	0.412	0.0141	0.0305
0.79	0.587	0.0168	0.437	0.0145	0.0313
0.81	0.613	0.0172	0.463	0.0149	0.0321
0.83	0.626	0.0173	0.476	0.0151	0.0324
0.85	0.651	0.0177	0.501	0.0155	0.0332
0.88	0.676	0.0180	0.526	0.0159	0.0339
0.90	0.702	0.0184	0.552	0.0163	0.0346
0.93	0.727	0.0187	0.577	0.0166	0.0353
0.95	0.753	0.0190	0.603	0.0170	0.0360
0.98	0.778	0.0193	0.628	0.0174	0.0367

	Project:	209806 Highway 26
	File No:	121258
	Date:	August 2022
	Designed By:	JB
	Checked By:	AS
	Subject:	SWMF SSD Relationship

STAGE-STORAGE-DISCHARGE TABLE

Outlets

Type	Orifice #1	Orifice #2
Diameter (mm)	100.00	100.00
Invert(m)	0.15	0.30

STAGE-STORAGE-DISCHARGE TABLE - STAGE 1					
Water Level	Outlets		Total Discharge	Storage Volume	
	Orifice #1 Discharge	Orifice #2 Discharge		Active Storage	Total Storage
(m)	(cms)	(cms)	(cms)	(cu.m)	(cu.m)
0.00	0.0000	0.0000	0.0000	0.00	0.00
0.03	0.0000	0.0000	0.0000	2.78	2.78
0.05	0.0000	0.0000	0.0000	2.78	5.56
0.08	0.0000	0.0000	0.0000	2.78	8.34
0.10	0.0000	0.0000	0.0000	2.78	11.13
0.13	0.0000	0.0000	0.0000	2.78	13.91
0.15	0.0000	0.0000	0.0000	2.78	16.69
0.18	0.0000	0.0000	0.0000	6.24	22.93
0.20	0.0012	0.0000	0.0012	6.09	29.02
0.23	0.0037	0.0000	0.0037	6.08	35.10
0.25	0.0051	0.0000	0.0051	6.06	41.15
0.28	0.0062	0.0000	0.0062	6.04	47.19
0.30	0.0071	0.0000	0.0071	6.03	53.22
0.33	0.0079	0.0000	0.0079	5.91	59.13
0.36	0.0086	0.0016	0.0103	5.89	65.02
0.38	0.0093	0.0039	0.0132	5.84	70.86
0.41	0.0100	0.0052	0.0152	5.75	76.61
0.43	0.0106	0.0063	0.0168	5.71	82.32
0.46	0.0111	0.0072	0.0183	5.67	88.00
0.48	0.0117	0.0080	0.0196	5.61	93.61
0.51	0.0122	0.0087	0.0209	5.57	99.18
0.53	0.0127	0.0094	0.0220	5.42	104.60
0.56	0.0131	0.0100	0.0231	5.34	109.94
0.58	0.0136	0.0106	0.0242	5.24	115.18
0.61	0.0140	0.0112	0.0252	5.12	120.30
0.64	0.0145	0.0117	0.0262	5.00	125.30
0.66	0.0149	0.0122	0.0271	4.85	130.15
0.69	0.0153	0.0127	0.0280	4.68	134.83
0.71	0.0157	0.0132	0.0288	4.47	139.29
0.74	0.0161	0.0136	0.0297	4.20	143.49
0.76	0.0164	0.0141	0.0305	3.84	147.34
0.79	0.0168	0.0145	0.0313	3.28	150.62
0.81	0.0172	0.0149	0.0321	2.97	153.59
0.83	0.0173	0.0151	0.0324	1.39	154.98
0.85	0.0177	0.0155	0.0332	2.78	157.76
0.88	0.0180	0.0159	0.0339	2.78	160.54
0.90	0.0184	0.0163	0.0346	2.78	163.32
0.93	0.0187	0.0166	0.0353	2.78	166.10
0.95	0.0190	0.0170	0.0360	2.78	168.89
0.98	0.0193	0.0174	0.0367	2.78	171.67

=====

```

V   V   I   SSSSS   U   U   A   L           (v 6.0.2006)
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

```

```

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

```

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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 6.0\V02\voin.dat

Output filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\6b7e
 e212-e87e-4ad8-a94b-f16d2aae895f\scen

Summary filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\6b7e
 e212-e87e-4ad8-a94b-f16d2aae895f\scen

DATE: 08-05-2022

TIME: 08:45:19

USER:

COMMENTS: _____

```

*****
** SIMULATION : A: 2 yr 4 hr chc           **
*****

```

```

-----
| CHICAGO STORM | IDF curve parameters: A= 362.158
| Ptotal= 31.41 mm | B= 0.000
|                  | C= 0.699
-----

```

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

Duration of storm = 4.00 hrs

Storm time step = 10.00 min

Time to peak ratio = 0.33

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.17	2.64	1.17	12.50	2.17	5.22	3.17	3.04
0.33	2.95	1.33	72.43	2.33	4.61	3.33	2.87
0.50	3.37	1.50	15.34	2.50	4.15	3.50	2.71
0.67	3.96	1.67	9.67	2.67	3.79	3.67	2.58
0.83	4.91	1.83	7.37	2.83	3.49	3.83	2.46
1.00	6.72	2.00	6.07	3.00	3.25	4.00	2.35

```
-----
| CALIB |
| NASHYD ( 0201) | Area (ha)= 0.32 Curve Number (CN)= 68.7
| ID= 1 DT= 5.0 min | Ia (mm)= 4.88 # of Linear Res.(N)= 3.00
|-----|
| U.H. Tp(hrs)= 0.30
```

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

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

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.64	1.083	12.50	2.083	5.22	3.08	3.04
0.167	2.64	1.167	12.50	2.167	5.22	3.17	3.04
0.250	2.95	1.250	72.43	2.250	4.61	3.25	2.87
0.333	2.95	1.333	72.43	2.333	4.61	3.33	2.87
0.417	3.37	1.417	15.34	2.417	4.15	3.42	2.71
0.500	3.37	1.500	15.34	2.500	4.15	3.50	2.71
0.583	3.96	1.583	9.67	2.583	3.79	3.58	2.58
0.667	3.96	1.667	9.67	2.667	3.79	3.67	2.58
0.750	4.91	1.750	7.37	2.750	3.49	3.75	2.46
0.833	4.91	1.833	7.37	2.833	3.49	3.83	2.46
0.917	6.72	1.917	6.07	2.917	3.25	3.92	2.35
1.000	6.72	2.000	6.07	3.000	3.25	4.00	2.35

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.003 (i)

TIME TO PEAK (hrs)= 1.667

RUNOFF VOLUME (mm)= 4.942

TOTAL RAINFALL (mm)= 31.407

RUNOFF COEFFICIENT = 0.157

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

```

-----
| CALIB |
| STANDHYD ( 0202) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 0.36
Total Imp(%)= 86.00 Dir. Conn.(%)= 40.00

```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.31	0.05
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	0.80	0.80
Length	(m)=	90.00	90.00
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	2.64	1.083	12.50	2.083	5.22	3.08	3.04
0.167	2.64	1.167	12.50	2.167	5.22	3.17	3.04
0.250	2.95	1.250	72.43	2.250	4.61	3.25	2.87
0.333	2.95	1.333	72.43	2.333	4.61	3.33	2.87
0.417	3.37	1.417	15.34	2.417	4.15	3.42	2.71
0.500	3.37	1.500	15.34	2.500	4.15	3.50	2.71
0.583	3.96	1.583	9.67	2.583	3.79	3.58	2.58
0.667	3.96	1.667	9.67	2.667	3.79	3.67	2.58
0.750	4.91	1.750	7.37	2.750	3.49	3.75	2.46
0.833	4.91	1.833	7.37	2.833	3.49	3.83	2.46
0.917	6.72	1.917	6.07	2.917	3.25	3.92	2.35
1.000	6.72	2.000	6.07	3.000	3.25	4.00	2.35

Max.Eff.Inten.(mm/hr)=	72.43	114.83
over (min)	5.00	20.00
Storage Coeff. (min)=	2.92 (ii)	17.22 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.28	0.06

			TOTALS
PEAK FLOW	(cms)=	0.03	0.01
TIME TO PEAK	(hrs)=	1.33	1.58
RUNOFF VOLUME	(mm)=	30.41	16.08
TOTAL RAINFALL	(mm)=	31.41	31.41
RUNOFF COEFFICIENT	=	0.97	0.51
			0.032 (iii)
			1.33
			21.79
			31.41
			0.69

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 69.0 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( 0401) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----

```

	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0029	0.0231	0.0110
	0.0037	0.0035	0.0242	0.0115
	0.0051	0.0041	0.0262	0.0125
	0.0071	0.0059	0.0288	0.0139
	0.0152	0.0077	0.0313	0.0151
	0.0168	0.0082	0.0332	0.0159
	0.0183	0.0088	0.0360	0.0169
	0.0196	0.0094	0.0367	0.0172
	0.0220	0.0105	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0202)	0.360	0.032	1.33	21.79
OUTFLOW: ID= 1 (0401)	0.360	0.005	2.25	13.63

PEAK FLOW REDUCTION [Qout/Qin](%)= 16.96
TIME SHIFT OF PEAK FLOW (min)= 55.00
MAXIMUM STORAGE USED (ha.m.)= 0.0029

```

-----
| ADD HYD ( 0901) |
| 1 + 2 = 3       |
-----

```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0201):	0.32	0.003	1.67	4.94
+ ID2= 2 (0401):	0.36	0.005	2.25	13.63
=====				
ID = 3 (0901):	0.68	0.008	1.83	9.54

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

=====
=====
V   V   I   SSSSS U   U   A   L           (v 6.0.2006)
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

```

```

      000   TTTT   TTTT   H   H   Y   Y   M   M   000   TM
      0   0   T     T   H   H   Y   Y   MM  MM   0   0
      0   0   T     T   H   H   Y     M   M   0   0
      000     T     T   H   H   Y     M   M   000

```

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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 6.0\V02\voin.dat

Output filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\52f34ca4-e427-46a1-82a2-e26229f5881e\scen

Summary filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\52f34ca4-e427-46a1-82a2-e26229f5881e\scen

DATE: 08-05-2022

TIME: 08:45:20

USER:

COMMENTS: _____

```

*****
** SIMULATION : B: 5 yr 4 hr chc          **
*****

```

```

-----
| CHICAGO STORM |
| Ptotal= 41.88 mm |
-----

```

IDF curve parameters: A= 482.877
 B= 0.000
 C= 0.699

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

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

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr

0.17	3.52	1.17	16.66	2.17	6.96	3.17	4.06
0.33	3.93	1.33	96.57	2.33	6.15	3.33	3.82
0.50	4.49	1.50	20.45	2.50	5.53	3.50	3.61
0.67	5.29	1.67	12.89	2.67	5.05	3.67	3.43
0.83	6.55	1.83	9.83	2.83	4.66	3.83	3.27
1.00	8.96	2.00	8.10	3.00	4.33	4.00	3.13

```

-----
| CALIB                                     |
| NASHYD ( 0201) | Area (ha)= 0.32 Curve Number (CN)= 68.7
| ID= 1 DT= 5.0 min | Ia (mm)= 4.88 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.30

```

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

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	3.52	1.083	16.66	2.083	6.96	3.08	4.06
0.167	3.52	1.167	16.66	2.167	6.96	3.17	4.06
0.250	3.93	1.250	96.57	2.250	6.15	3.25	3.82
0.333	3.93	1.333	96.57	2.333	6.15	3.33	3.82
0.417	4.49	1.417	20.45	2.417	5.53	3.42	3.61
0.500	4.49	1.500	20.45	2.500	5.53	3.50	3.61
0.583	5.29	1.583	12.89	2.583	5.05	3.58	3.43
0.667	5.29	1.667	12.89	2.667	5.05	3.67	3.43
0.750	6.55	1.750	9.83	2.750	4.66	3.75	3.27
0.833	6.55	1.833	9.83	2.833	4.66	3.83	3.27
0.917	8.96	1.917	8.10	2.917	4.33	3.92	3.13
1.000	8.96	2.000	8.10	3.000	4.33	4.00	3.13

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.006 (i)

TIME TO PEAK (hrs)= 1.667

RUNOFF VOLUME (mm)= 8.957

TOTAL RAINFALL (mm)= 41.876

RUNOFF COEFFICIENT = 0.214

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

```

-----
| CALIB                                     |
| STANDHYD ( 0202) | Area (ha)= 0.36
| ID= 1 DT= 5.0 min | Total Imp(%)= 86.00 Dir. Conn.(%)= 40.00
-----

```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.31	0.05
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	0.80	0.80
Length	(m)=	90.00	90.00
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	3.52	1.083	16.66	2.083	6.96	3.08	4.06
0.167	3.52	1.167	16.66	2.167	6.96	3.17	4.06
0.250	3.93	1.250	96.57	2.250	6.15	3.25	3.82
0.333	3.93	1.333	96.57	2.333	6.15	3.33	3.82
0.417	4.49	1.417	20.45	2.417	5.53	3.42	3.61
0.500	4.49	1.500	20.45	2.500	5.53	3.50	3.61
0.583	5.29	1.583	12.89	2.583	5.05	3.58	3.43
0.667	5.29	1.667	12.89	2.667	5.05	3.67	3.43
0.750	6.55	1.750	9.83	2.750	4.66	3.75	3.27
0.833	6.55	1.833	9.83	2.833	4.66	3.83	3.27
0.917	8.96	1.917	8.10	2.917	4.33	3.92	3.13
1.000	8.96	2.000	8.10	3.000	4.33	4.00	3.13

Max.Eff.Inten.(mm/hr)=	96.57	180.44
over (min)	5.00	15.00
Storage Coeff. (min)=	2.60 (ii)	14.54 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.29	0.08

TOTALS

PEAK FLOW (cms)=	0.04	0.02	0.047 (iii)
TIME TO PEAK (hrs)=	1.33	1.50	1.33
RUNOFF VOLUME (mm)=	40.88	24.61	31.10
TOTAL RAINFALL (mm)=	41.88	41.88	41.88
RUNOFF COEFFICIENT =	0.98	0.59	0.74

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 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(0401) | OVERFLOW IS OFF
 | IN= 2---> OUT= 1 |

DT= 5.0 min	OUTFLOW	STORAGE	OUTFLOW	STORAGE
-----	(cms)	(ha.m.)	(cms)	(ha.m.)
	0.0000	0.0029	0.0231	0.0110
	0.0037	0.0035	0.0242	0.0115
	0.0051	0.0041	0.0262	0.0125
	0.0071	0.0059	0.0288	0.0139
	0.0152	0.0077	0.0313	0.0151
	0.0168	0.0082	0.0332	0.0159
	0.0183	0.0088	0.0360	0.0169
	0.0196	0.0094	0.0367	0.0172
	0.0220	0.0105	0.0000	0.0000

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0202)	0.360	0.047	1.33	31.10
OUTFLOW: ID= 1 (0401)	0.360	0.008	2.17	22.94

PEAK FLOW REDUCTION [Qout/Qin](%)= 17.30
 TIME SHIFT OF PEAK FLOW (min)= 50.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0061

ADD HYD (0901)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0201):	0.32	0.006	1.67	8.96
+ ID2= 2 (0401):	0.36	0.008	2.17	22.94
=====				
ID = 3 (0901):	0.68	0.012	1.75	16.36

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

=====

=====

V	V	I	SSSSS	U	U	A	L					(v 6.0.2006)
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					

000	TTTTT	TTTTT	H	H	Y	Y	M	M	000	TM	
0	0	T	T	H	H	Y	Y	MM	MM	0	0
0	0	T	T	H	H	Y		M	M	0	0
000	T	T	H	H	Y		M	M	000		

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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 6.0\V02\voin.dat

Output filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\d6d65e14-1fb4-4706-8b8f-4a6b18cbdb32\scen

Summary filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\d6d65e14-1fb4-4706-8b8f-4a6b18cbdb32\scen

DATE: 08-05-2022

TIME: 08:45:20

USER:

COMMENTS: _____

 ** SIMULATION : C: 10 yr 4 hr chc **

 | CHICAGO STORM |
Ptotal= 48.70 mm

IDF curve parameters: A= 561.607

B= 0.000

C= 0.699

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

Duration of storm = 4.00 hrs

Storm time step = 10.00 min

Time to peak ratio = 0.33

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.17	4.10	1.17	19.38	2.17	8.10	3.17	4.72
0.33	4.58	1.33	112.31	2.33	7.15	3.33	4.44
0.50	5.22	1.50	23.78	2.50	6.44	3.50	4.20
0.67	6.15	1.67	15.00	2.67	5.87	3.67	3.99
0.83	7.62	1.83	11.44	2.83	5.42	3.83	3.81
1.00	10.42	2.00	9.42	3.00	5.04	4.00	3.64

```

-----
| CALIB                                     |
| NASHYD ( 0201) | Area (ha)= 0.32 Curve Number (CN)= 68.7
| ID= 1 DT= 5.0 min | Ia (mm)= 4.88 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.30

```

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

```

----- TRANSFORMED HYETOGRAPH -----
      TIME    RAIN | TIME    RAIN | TIME    RAIN | TIME    RAIN
      hrs  mm/hr | hrs  mm/hr | hrs  mm/hr | hrs  mm/hr
0.083   4.10 | 1.083  19.38 | 2.083   8.10 | 3.08   4.72
0.167   4.10 | 1.167  19.38 | 2.167   8.10 | 3.17   4.72
0.250   4.58 | 1.250 112.31 | 2.250   7.15 | 3.25   4.44
0.333   4.58 | 1.333 112.31 | 2.333   7.15 | 3.33   4.44
0.417   5.22 | 1.417  23.78 | 2.417   6.44 | 3.42   4.20
0.500   5.22 | 1.500  23.78 | 2.500   6.44 | 3.50   4.20
0.583   6.15 | 1.583  15.00 | 2.583   5.87 | 3.58   3.99
0.667   6.15 | 1.667  15.00 | 2.667   5.87 | 3.67   3.99
0.750   7.62 | 1.750  11.44 | 2.750   5.42 | 3.75   3.81
0.833   7.62 | 1.833  11.44 | 2.833   5.42 | 3.83   3.81
0.917  10.42 | 1.917   9.42 | 2.917   5.04 | 3.92   3.64
1.000  10.42 | 2.000   9.42 | 3.000   5.04 | 4.00   3.64

```

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.008 (i)
 TIME TO PEAK (hrs)= 1.667
 RUNOFF VOLUME (mm)= 12.031
 TOTAL RAINFALL (mm)= 48.704
 RUNOFF COEFFICIENT = 0.247

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

```

-----
| CALIB                                     |
| STANDHYD ( 0202) | Area (ha)= 0.36
| ID= 1 DT= 5.0 min | Total Imp(%)= 86.00 Dir. Conn.(%)= 40.00
|-----|

```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.31	0.05
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	0.80	0.80
Length	(m)=	90.00	90.00
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	4.10	1.083	19.38	2.083	8.10	3.08	4.72
0.167	4.10	1.167	19.38	2.167	8.10	3.17	4.72
0.250	4.58	1.250	112.31	2.250	7.15	3.25	4.44
0.333	4.58	1.333	112.31	2.333	7.15	3.33	4.44
0.417	5.22	1.417	23.78	2.417	6.44	3.42	4.20
0.500	5.22	1.500	23.78	2.500	6.44	3.50	4.20
0.583	6.15	1.583	15.00	2.583	5.87	3.58	3.99
0.667	6.15	1.667	15.00	2.667	5.87	3.67	3.99
0.750	7.62	1.750	11.44	2.750	5.42	3.75	3.81
0.833	7.62	1.833	11.44	2.833	5.42	3.83	3.81
0.917	10.42	1.917	9.42	2.917	5.04	3.92	3.64
1.000	10.42	2.000	9.42	3.000	5.04	4.00	3.64

Max.Eff.Inten.(mm/hr)= 112.31 300.14
over (min) 5.00 15.00
Storage Coeff. (min)= 2.45 (ii) 12.18 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.30 0.09

TOTALS

PEAK FLOW (cms)= 0.04 0.02 0.057 (iii)
TIME TO PEAK (hrs)= 1.33 1.50 1.33
RUNOFF VOLUME (mm)= 47.70 30.47 37.34
TOTAL RAINFALL (mm)= 48.70 48.70 48.70
RUNOFF COEFFICIENT = 0.98 0.63 0.77

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 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(0401) |
| IN= 2---> OUT= 1 |
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW	STORAGE	OUTFLOW	STORAGE
(cms)	(ha.m.)	(cms)	(ha.m.)
0.0000	0.0029	0.0231	0.0110
0.0037	0.0035	0.0242	0.0115
0.0051	0.0041	0.0262	0.0125
0.0071	0.0059	0.0288	0.0139
0.0152	0.0077	0.0313	0.0151
0.0168	0.0082	0.0332	0.0159

0.0183	0.0088		0.0360	0.0169
0.0196	0.0094		0.0367	0.0172
0.0220	0.0105		0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0202)	0.360	0.057	1.33	37.34
OUTFLOW: ID= 1 (0401)	0.360	0.012	1.92	29.19

PEAK FLOW REDUCTION [Qout/Qin](%)= 21.16
 TIME SHIFT OF PEAK FLOW (min)= 35.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0070

ADD HYD (0901)				
1 + 2 = 3				
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0201):	0.32	0.008	1.67	12.03
+ ID2= 2 (0401):	0.36	0.012	1.92	29.19
=====				
ID = 3 (0901):	0.68	0.019	1.75	21.11

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

=====

V	V	I	SSSSS	U	U	A	L			
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			

(v 6.0.2006)

000	TTTTT	TTTTT	H	H	Y	Y	M	M	000	TM
0	0	T	T	H	H	Y Y	MM	MM	0	0
0	0	T	T	H	H	Y	M	M	0	0
000	T	T	H	H	Y	M	M	000		

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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 6.0\V02\voin.dat

Output filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\66e993a0-38ee-4c3f-a49d-df584a8b0613\scen

Summary filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\66e993a0-38ee-4c3f-a49d-df584a8b0613\scen

DATE: 08-05-2022

TIME: 08:45:20

USER:

COMMENTS: _____

** SIMULATION : D: 25 yr 4 hr chc **

| CHICAGO STORM |
Ptotal= 57.50 mm

IDF curve parameters: A= 663.082

B= 0.000

C= 0.699

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

Duration of storm = 4.00 hrs

Storm time step = 10.00 min

Time to peak ratio = 0.33

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.17	4.83	1.17	22.88	2.17	9.56	3.17	5.57
0.33	5.40	1.33	132.61	2.33	8.44	3.33	5.25
0.50	6.17	1.50	28.08	2.50	7.60	3.50	4.96
0.67	7.26	1.67	17.71	2.67	6.93	3.67	4.72
0.83	8.99	1.83	13.50	2.83	6.40	3.83	4.50
1.00	12.30	2.00	11.12	3.00	5.95	4.00	4.30

| CALIB |
| NASHYD (0201) |
ID= 1 DT= 5.0 min

Area (ha)= 0.32 Curve Number (CN)= 68.7

Ia (mm)= 4.88 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.30

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

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	4.83	1.083	22.88	2.083	9.56	3.08	5.57
0.167	4.83	1.167	22.88	2.167	9.56	3.17	5.57
0.250	5.40	1.250	132.61	2.250	8.44	3.25	5.25
0.333	5.40	1.333	132.61	2.333	8.44	3.33	5.25
0.417	6.17	1.417	28.08	2.417	7.60	3.42	4.96
0.500	6.17	1.500	28.08	2.500	7.60	3.50	4.96
0.583	7.26	1.583	17.71	2.583	6.93	3.58	4.72
0.667	7.26	1.667	17.71	2.667	6.93	3.67	4.72
0.750	8.99	1.750	13.50	2.750	6.40	3.75	4.50
0.833	8.99	1.833	13.50	2.833	6.40	3.83	4.50
0.917	12.30	1.917	11.12	2.917	5.95	3.92	4.30
1.000	12.30	2.000	11.12	3.000	5.95	4.00	4.30

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.011 (i)
 TIME TO PEAK (hrs)= 1.583
 RUNOFF VOLUME (mm)= 16.442
 TOTAL RAINFALL (mm)= 57.504
 RUNOFF COEFFICIENT = 0.286

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

CALIB	
STANDHYD (0202)	Area (ha)= 0.36
ID= 1 DT= 5.0 min	Total Imp(%)= 86.00 Dir. Conn.(%)= 40.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.31	0.05
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	0.80	0.80
Length	(m)=	90.00	90.00
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	4.83	1.083	22.88	2.083	9.56	3.08	5.57
0.167	4.83	1.167	22.88	2.167	9.56	3.17	5.57
0.250	5.40	1.250	132.61	2.250	8.44	3.25	5.25

0.333	5.40	1.333	132.61	2.333	8.44	3.33	5.25
0.417	6.17	1.417	28.08	2.417	7.60	3.42	4.96
0.500	6.17	1.500	28.08	2.500	7.60	3.50	4.96
0.583	7.26	1.583	17.71	2.583	6.93	3.58	4.72
0.667	7.26	1.667	17.71	2.667	6.93	3.67	4.72
0.750	8.99	1.750	13.50	2.750	6.40	3.75	4.50
0.833	8.99	1.833	13.50	2.833	6.40	3.83	4.50
0.917	12.30	1.917	11.12	2.917	5.95	3.92	4.30
1.000	12.30	2.000	11.12	3.000	5.95	4.00	4.30

Max.Eff.Inten.(mm/hr)= 132.61 382.15
over (min) 5.00 15.00
Storage Coeff. (min)= 2.29 (ii) 11.13 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.30 0.09

TOTALS

PEAK FLOW (cms)= 0.05 0.03 0.069 (iii)
TIME TO PEAK (hrs)= 1.33 1.50 1.33
RUNOFF VOLUME (mm)= 56.50 38.26 45.54
TOTAL RAINFALL (mm)= 57.50 57.50 57.50
RUNOFF COEFFICIENT = 0.98 0.67 0.79

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 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(0401) |
| IN= 2---> OUT= 1 |
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0029	0.0231	0.0110
0.0037	0.0035	0.0242	0.0115
0.0051	0.0041	0.0262	0.0125
0.0071	0.0059	0.0288	0.0139
0.0152	0.0077	0.0313	0.0151
0.0168	0.0082	0.0332	0.0159
0.0183	0.0088	0.0360	0.0169
0.0196	0.0094	0.0367	0.0172
0.0220	0.0105	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0202)	0.360	0.069	1.33	45.54
OUTFLOW: ID= 1 (0401)	0.360	0.017	1.83	37.39

PEAK FLOW REDUCTION [Qout/Qin](%)= 24.04
 TIME SHIFT OF PEAK FLOW (min)= 30.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0082

```

-----
| ADD HYD ( 0901) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
ID1= 1 ( 0201):    0.32    0.011    1.58    16.44
+ ID2= 2 ( 0401):    0.36    0.017    1.83    37.39
=====
ID = 3 ( 0901):    0.68    0.027    1.75    27.53
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

V   V   I   SSSSS  U   U   A   L           (v 6.0.2006)
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

000   TTTTT  TTTTT  H   H   Y   Y   M   M   000   TM
O   O   T     T   H   H   Y   Y   MM  MM  O   O
O   O   T     T   H   H   Y     M   M   O   O
000     T     T   H   H   Y     M   M   000
  
```

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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 6.0\V02\voin.dat

Output filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\707a
 23a9-3138-4182-a840-f81571bab057\scen

Summary filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\707a
 23a9-3138-4182-a840-f81571bab057\scen

DATE: 08-05-2022

TIME: 08:45:20

USER:

COMMENTS: _____

** SIMULATION : E: 50 yr 4 hr chc **

| CHICAGO STORM |
Ptotal= 64.03 mm

IDF curve parameters: A= 738.312
B= 0.000
C= 0.699
used in: INTENSITY = A / (t + B)^C

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

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr
0.17	5.38	1.17	25.48		2.17	10.64	3.17	6.20
0.33	6.02	1.33	147.65		2.33	9.40	3.33	5.84
0.50	6.87	1.50	31.27		2.50	8.46	3.50	5.53
0.67	8.08	1.67	19.71		2.67	7.72	3.67	5.25
0.83	10.01	1.83	15.03		2.83	7.12	3.83	5.01
1.00	13.70	2.00	12.38		3.00	6.62	4.00	4.79

| CALIB |
| NASHYD (0201) |
ID= 1 DT= 5.0 min

Area (ha)= 0.32 Curve Number (CN)= 68.7
Ia (mm)= 4.88 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.30

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

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

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr
0.083	5.38	1.083	25.48		2.083	10.64	3.08	6.20
0.167	5.38	1.167	25.48		2.167	10.64	3.17	6.20
0.250	6.02	1.250	147.65		2.250	9.40	3.25	5.84

0.333	6.02	1.333	147.65	2.333	9.40	3.33	5.84
0.417	6.87	1.417	31.27	2.417	8.46	3.42	5.53
0.500	6.87	1.500	31.27	2.500	8.46	3.50	5.53
0.583	8.08	1.583	19.71	2.583	7.72	3.58	5.25
0.667	8.08	1.667	19.71	2.667	7.72	3.67	5.25
0.750	10.01	1.750	15.03	2.750	7.12	3.75	5.01
0.833	10.01	1.833	15.03	2.833	7.12	3.83	5.01
0.917	13.70	1.917	12.38	2.917	6.62	3.92	4.79
1.000	13.70	2.000	12.38	3.000	6.62	4.00	4.79

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.014 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 19.996
TOTAL RAINFALL (mm)= 64.028
RUNOFF COEFFICIENT = 0.312

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

```

-----
| CALIB |
| STANDHYD ( 0202) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 0.36
Total Imp(%)= 86.00 Dir. Conn.(%)= 40.00

```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.31	0.05
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	0.80	0.80
Length	(m)=	90.00	90.00
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	5.38	1.083	25.48	2.083	10.64	3.08	6.20
0.167	5.38	1.167	25.48	2.167	10.64	3.17	6.20
0.250	6.02	1.250	147.65	2.250	9.40	3.25	5.84
0.333	6.02	1.333	147.65	2.333	9.40	3.33	5.84
0.417	6.87	1.417	31.27	2.417	8.46	3.42	5.53
0.500	6.87	1.500	31.27	2.500	8.46	3.50	5.53
0.583	8.08	1.583	19.71	2.583	7.72	3.58	5.25
0.667	8.08	1.667	19.71	2.667	7.72	3.67	5.25
0.750	10.01	1.750	15.03	2.750	7.12	3.75	5.01
0.833	10.01	1.833	15.03	2.833	7.12	3.83	5.01
0.917	13.70	1.917	12.38	2.917	6.62	3.92	4.79

1.000 13.70 | 2.000 12.38 | 3.000 6.62 | 4.00 4.79

Max.Eff.Inten.(mm/hr)=	147.65	444.61	
over (min)	5.00	15.00	
Storage Coeff. (min)=	2.19 (ii)	10.51 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.31	0.09	
			TOTALS
PEAK FLOW (cms)=	0.06	0.03	0.079 (iii)
TIME TO PEAK (hrs)=	1.33	1.50	1.33
RUNOFF VOLUME (mm)=	63.03	44.16	51.69
TOTAL RAINFALL (mm)=	64.03	64.03	64.03
RUNOFF COEFFICIENT =	0.98	0.69	0.81

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 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(0401) |
 | IN= 2---> OUT= 1 |
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0029	0.0231	0.0110
0.0037	0.0035	0.0242	0.0115
0.0051	0.0041	0.0262	0.0125
0.0071	0.0059	0.0288	0.0139
0.0152	0.0077	0.0313	0.0151
0.0168	0.0082	0.0332	0.0159
0.0183	0.0088	0.0360	0.0169
0.0196	0.0094	0.0367	0.0172
0.0220	0.0105	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0202)	0.360	0.079	1.33	51.69
OUTFLOW: ID= 1 (0401)	0.360	0.019	1.83	43.54

PEAK FLOW REDUCTION [Qout/Qin](%)= 24.18
 TIME SHIFT OF PEAK FLOW (min)= 30.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0092

ADD HYD (0901)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				
ID1= 1 (0201):	0.32	0.014	1.58	20.00
+ ID2= 2 (0401):	0.36	0.019	1.83	43.54
=====				
ID = 3 (0901):	0.68	0.032	1.67	32.46

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

V   V   I   SSSSS   U   U   A   L           (v 6.0.2006)
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

```

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000   TTTTT   TTTTT   H   H   Y   Y   M   M   000   TM
0   0   T       T   H   H   Y   Y   MM MM   0   0
0   0   T       T   H   H   Y       M   M   0   0
000       T       T   H   H   Y       M   M   000

```

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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 OTTHYM0 6.0\V02\voin.dat

Output filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\5a1f0a08-877f-4743-8a90-95a332e84fae\scen

Summary filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\5a1f0a08-877f-4743-8a90-95a332e84fae\scen

DATE: 08-05-2022

TIME: 08:45:20

USER:

COMMENTS: _____

 ** SIMULATION : F: 100 yr 4 hr chc **

CHICAGO STORM
 Ptotal= 70.40 mm

IDF curve parameters: A= 811.794
 B= 0.000
 C= 0.699

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

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.17	5.92	1.17	28.01	2.17	11.70	3.17	6.82
0.33	6.61	1.33	162.35	2.33	10.34	3.33	6.42
0.50	7.55	1.50	34.38	2.50	9.30	3.50	6.08
0.67	8.89	1.67	21.68	2.67	8.49	3.67	5.77
0.83	11.01	1.83	16.53	2.83	7.83	3.83	5.50
1.00	15.06	2.00	13.62	3.00	7.28	4.00	5.26

CALIB
 NASHYD (0201)
 ID= 1 DT= 5.0 min

Area (ha)= 0.32 Curve Number (CN)= 68.7
 Ia (mm)= 4.88 # of Linear Res.(N)= 3.00
 U.H. Tp(hrs)= 0.30

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	5.92	1.083	28.01	2.083	11.70	3.08	6.82
0.167	5.92	1.167	28.01	2.167	11.70	3.17	6.82
0.250	6.61	1.250	162.35	2.250	10.34	3.25	6.42
0.333	6.61	1.333	162.35	2.333	10.34	3.33	6.42
0.417	7.55	1.417	34.38	2.417	9.30	3.42	6.08
0.500	7.55	1.500	34.38	2.500	9.30	3.50	6.08
0.583	8.89	1.583	21.68	2.583	8.49	3.58	5.77
0.667	8.89	1.667	21.68	2.667	8.49	3.67	5.77
0.750	11.01	1.750	16.53	2.750	7.83	3.75	5.50
0.833	11.01	1.833	16.53	2.833	7.83	3.83	5.50
0.917	15.06	1.917	13.62	2.917	7.28	3.92	5.26

1.000 15.06 | 2.000 13.62 | 3.000 7.28 | 4.00 5.26

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.017 (i)
 TIME TO PEAK (hrs)= 1.583
 RUNOFF VOLUME (mm)= 23.674
 TOTAL RAINFALL (mm)= 70.401
 RUNOFF COEFFICIENT = 0.336

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

 | CALIB |
 | STANDHYD (0202) | Area (ha)= 0.36
 | ID= 1 DT= 5.0 min | Total Imp(%)= 86.00 Dir. Conn.(%)= 40.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.31	0.05
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	0.80	0.80
Length	(m)=	90.00	90.00
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	5.92	1.083	28.01	2.083	11.70	3.08	6.82
0.167	5.92	1.167	28.01	2.167	11.70	3.17	6.82
0.250	6.61	1.250	162.35	2.250	10.34	3.25	6.42
0.333	6.61	1.333	162.35	2.333	10.34	3.33	6.42
0.417	7.55	1.417	34.38	2.417	9.30	3.42	6.08
0.500	7.55	1.500	34.38	2.500	9.30	3.50	6.08
0.583	8.89	1.583	21.68	2.583	8.49	3.58	5.77
0.667	8.89	1.667	21.68	2.667	8.49	3.67	5.77
0.750	11.01	1.750	16.53	2.750	7.83	3.75	5.50
0.833	11.01	1.833	16.53	2.833	7.83	3.83	5.50
0.917	15.06	1.917	13.62	2.917	7.28	3.92	5.26
1.000	15.06	2.000	13.62	3.000	7.28	4.00	5.26

Max.Eff.Inten.(mm/hr)= 162.35 506.63
 over (min) 5.00 15.00
 Storage Coeff. (min)= 2.11 (ii) 10.01 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.31 0.10

TOTALS

PEAK FLOW	(cms)=	0.06	0.04	0.088 (iii)
TIME TO PEAK	(hrs)=	1.33	1.50	1.33
RUNOFF VOLUME	(mm)=	69.40	50.00	57.75
TOTAL RAINFALL	(mm)=	70.40	70.40	70.40
RUNOFF COEFFICIENT	=	0.99	0.71	0.82

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 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( 0401) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----

```

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0029	0.0231	0.0110
0.0037	0.0035	0.0242	0.0115
0.0051	0.0041	0.0262	0.0125
0.0071	0.0059	0.0288	0.0139
0.0152	0.0077	0.0313	0.0151
0.0168	0.0082	0.0332	0.0159
0.0183	0.0088	0.0360	0.0169
0.0196	0.0094	0.0367	0.0172
0.0220	0.0105	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0202)	0.360	0.088	1.33	57.75
OUTFLOW: ID= 1 (0401)	0.360	0.021	1.83	49.59

PEAK FLOW REDUCTION [Qout/Qin](%)= 24.10
TIME SHIFT OF PEAK FLOW (min)= 30.00
MAXIMUM STORAGE USED (ha.m.)= 0.0102

```

-----
| ADD HYD ( 0901) |
| 1 + 2 = 3       |
-----

```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0201):	0.32	0.017	1.58	23.67
+ ID2= 2 (0401):	0.36	0.021	1.83	49.59
=====				
ID = 3 (0901):	0.68	0.037	1.67	37.40

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
=====
=====
V   V   I   SSSSS U   U   A   L           (v 6.0.2006)
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
```

```
000   TTTTT TTTTT H   H   Y   Y   M   M   000   TM
O   O   T       T   H   H   Y   Y   MM MM   O   O
O   O   T       T   H   H   Y       M   M   O   O
000       T       T   H   H   Y       M   M   000
```

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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 6.0\V02\voin.dat

Output filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\9d08
d295-56b8-484f-8b63-09a49645a3ed\scen

Summary filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\9d08
d295-56b8-484f-8b63-09a49645a3ed\scen

DATE: 08-05-2022

TIME: 08:45:20

USER:

COMMENTS: _____

```
-----
*****
** SIMULATION : G: 2 yr 24 hr scs           **
*****
```

```
-----
| MASS STORM           |      Filename: C:\Users\ASchoof\AppData
```

Ptotal= 53.90 mm	ata\Local\Temp\ fcd6b4ec-6229-4dc0-9c96-9778ea89173f\89f94fed Comments: SCS Type II 24 HR MASS CURVE
------------------	--

Duration of storm = 23.75 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
0.25	0.65	6.25	1.08	12.25	7.76	18.25	0.86
0.50	0.43	6.50	0.86	12.50	4.10	18.50	1.08
0.75	0.65	6.75	1.08	12.75	3.88	18.75	0.86
1.00	0.65	7.00	1.08	13.00	3.02	19.00	1.08
1.25	0.65	7.25	1.29	13.25	2.80	19.25	0.86
1.50	0.43	7.50	1.08	13.50	2.37	19.50	1.08
1.75	0.65	7.75	1.29	13.75	2.16	19.75	0.86
2.00	0.65	8.00	1.29	14.00	1.72	20.00	0.65
2.25	0.86	8.25	1.51	14.25	1.51	20.25	0.65
2.50	0.65	8.50	1.51	14.50	1.72	20.50	0.65
2.75	0.65	8.75	1.51	14.75	1.51	20.75	0.65
3.00	0.65	9.00	1.72	15.00	1.72	21.00	0.65
3.25	0.86	9.25	1.72	15.25	1.51	21.25	0.65
3.50	0.65	9.50	1.94	15.50	1.72	21.50	0.65
3.75	0.65	9.75	1.94	15.75	1.51	21.75	0.65
4.00	0.86	10.00	2.37	16.00	1.08	22.00	0.65
4.25	0.86	10.25	2.59	16.25	0.86	22.25	0.65
4.50	0.86	10.50	3.23	16.50	1.08	22.50	0.65
4.75	0.86	10.75	3.45	16.75	0.86	22.75	0.65
5.00	0.86	11.00	5.17	17.00	1.08	23.00	0.65
5.25	0.86	11.25	5.17	17.25	0.86	23.25	0.65
5.50	0.86	11.50	15.95	17.50	1.08	23.50	0.65
5.75	0.86	11.75	65.97	17.75	0.86	23.75	0.65
6.00	0.86	12.00	7.76	18.00	1.08		

CALIB NASHYD (0201) ID= 1 DT= 5.0 min	Area (ha)= 0.32 Ia (mm)= 4.88 U.H. Tp(hrs)= 0.30	Curve Number (CN)= 68.7 # of Linear Res.(N)= 3.00
--	--	--

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	1.08	12.083	7.76	18.08	0.86
0.167	0.65	6.167	1.08	12.167	7.76	18.17	0.86
0.250	0.65	6.250	1.08	12.250	7.76	18.25	0.86

0.333	0.43	6.333	0.86	12.333	4.10	18.33	1.08
0.417	0.43	6.417	0.86	12.417	4.10	18.42	1.08
0.500	0.43	6.500	0.86	12.500	4.10	18.50	1.08
0.583	0.65	6.583	1.08	12.583	3.88	18.58	0.86
0.667	0.65	6.667	1.08	12.667	3.88	18.67	0.86
0.750	0.65	6.750	1.08	12.750	3.88	18.75	0.86
0.833	0.65	6.833	1.08	12.833	3.02	18.83	1.08
0.917	0.65	6.917	1.08	12.917	3.02	18.92	1.08
1.000	0.65	7.000	1.08	13.000	3.02	19.00	1.08
1.083	0.65	7.083	1.29	13.083	2.80	19.08	0.86
1.167	0.65	7.167	1.29	13.167	2.80	19.17	0.86
1.250	0.65	7.250	1.29	13.250	2.80	19.25	0.86
1.333	0.43	7.333	1.08	13.333	2.37	19.33	1.08
1.417	0.43	7.417	1.08	13.417	2.37	19.42	1.08
1.500	0.43	7.500	1.08	13.500	2.37	19.50	1.08
1.583	0.65	7.583	1.29	13.583	2.16	19.58	0.86
1.667	0.65	7.667	1.29	13.667	2.16	19.67	0.86
1.750	0.65	7.750	1.29	13.750	2.16	19.75	0.86
1.833	0.65	7.833	1.29	13.833	1.72	19.83	0.65
1.917	0.65	7.917	1.29	13.917	1.72	19.92	0.65
2.000	0.65	8.000	1.29	14.000	1.72	20.00	0.65
2.083	0.86	8.083	1.51	14.083	1.51	20.08	0.65
2.167	0.86	8.167	1.51	14.167	1.51	20.17	0.65
2.250	0.86	8.250	1.51	14.250	1.51	20.25	0.65
2.333	0.65	8.333	1.51	14.333	1.72	20.33	0.65
2.417	0.65	8.417	1.51	14.417	1.72	20.42	0.65
2.500	0.65	8.500	1.51	14.500	1.72	20.50	0.65
2.583	0.65	8.583	1.51	14.583	1.51	20.58	0.65
2.667	0.65	8.667	1.51	14.667	1.51	20.67	0.65
2.750	0.65	8.750	1.51	14.750	1.51	20.75	0.65
2.833	0.65	8.833	1.72	14.833	1.72	20.83	0.65
2.917	0.65	8.917	1.72	14.917	1.72	20.92	0.65
3.000	0.65	9.000	1.72	15.000	1.72	21.00	0.65
3.083	0.86	9.083	1.72	15.083	1.51	21.08	0.65
3.167	0.86	9.167	1.72	15.167	1.51	21.17	0.65
3.250	0.86	9.250	1.72	15.250	1.51	21.25	0.65
3.333	0.65	9.333	1.94	15.333	1.72	21.33	0.65
3.417	0.65	9.417	1.94	15.417	1.72	21.42	0.65
3.500	0.65	9.500	1.94	15.500	1.72	21.50	0.65
3.583	0.65	9.583	1.94	15.583	1.51	21.58	0.65
3.667	0.65	9.667	1.94	15.667	1.51	21.67	0.65
3.750	0.65	9.750	1.94	15.750	1.51	21.75	0.65
3.833	0.86	9.833	2.37	15.833	1.08	21.83	0.65
3.917	0.86	9.917	2.37	15.917	1.08	21.92	0.65
4.000	0.86	10.000	2.37	16.000	1.08	22.00	0.65
4.083	0.86	10.083	2.59	16.083	0.86	22.08	0.65
4.167	0.86	10.167	2.59	16.167	0.86	22.17	0.65
4.250	0.86	10.250	2.59	16.250	0.86	22.25	0.65
4.333	0.86	10.333	3.23	16.333	1.08	22.33	0.65
4.417	0.86	10.417	3.23	16.417	1.08	22.42	0.65

4.500	0.86	10.500	3.23	16.500	1.08	22.50	0.65
4.583	0.86	10.583	3.45	16.583	0.86	22.58	0.65
4.667	0.86	10.667	3.45	16.667	0.86	22.67	0.65
4.750	0.86	10.750	3.45	16.750	0.86	22.75	0.65
4.833	0.86	10.833	5.17	16.833	1.08	22.83	0.65
4.917	0.86	10.917	5.17	16.917	1.08	22.92	0.65
5.000	0.86	11.000	5.17	17.000	1.08	23.00	0.65
5.083	0.86	11.083	5.17	17.083	0.86	23.08	0.65
5.167	0.86	11.167	5.17	17.167	0.86	23.17	0.65
5.250	0.86	11.250	5.17	17.250	0.86	23.25	0.65
5.333	0.86	11.333	15.95	17.333	1.08	23.33	0.65
5.417	0.86	11.417	15.95	17.417	1.08	23.42	0.65
5.500	0.86	11.500	15.95	17.500	1.08	23.50	0.65
5.583	0.86	11.583	65.97	17.583	0.86	23.58	0.65
5.667	0.86	11.667	65.97	17.667	0.86	23.67	0.65
5.750	0.86	11.750	65.97	17.750	0.86	23.75	0.65
5.833	0.86	11.833	7.77	17.833	1.08		
5.917	0.86	11.917	7.76	17.917	1.08		
6.000	0.86	12.000	7.76	18.000	1.08		

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.009 (i)

TIME TO PEAK (hrs)= 11.917

RUNOFF VOLUME (mm)= 14.496

TOTAL RAINFALL (mm)= 53.738

RUNOFF COEFFICIENT = 0.270

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

 | CALIB
 | STANDHYD (0202)
 | ID= 1 DT= 5.0 min |

Area (ha)= 0.36
 Total Imp(%)= 86.00 Dir. Conn.(%)= 40.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.31	0.05
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	0.80	0.80
Length	(m)=	90.00	90.00
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	0.65	6.083	1.08	12.083	7.76	18.08	0.86

0.167	0.65	6.167	1.08	12.167	7.76	18.17	0.86
0.250	0.65	6.250	1.08	12.250	7.76	18.25	0.86
0.333	0.43	6.333	0.86	12.333	4.10	18.33	1.08
0.417	0.43	6.417	0.86	12.417	4.10	18.42	1.08
0.500	0.43	6.500	0.86	12.500	4.10	18.50	1.08
0.583	0.65	6.583	1.08	12.583	3.88	18.58	0.86
0.667	0.65	6.667	1.08	12.667	3.88	18.67	0.86
0.750	0.65	6.750	1.08	12.750	3.88	18.75	0.86
0.833	0.65	6.833	1.08	12.833	3.02	18.83	1.08
0.917	0.65	6.917	1.08	12.917	3.02	18.92	1.08
1.000	0.65	7.000	1.08	13.000	3.02	19.00	1.08
1.083	0.65	7.083	1.29	13.083	2.80	19.08	0.86
1.167	0.65	7.167	1.29	13.167	2.80	19.17	0.86
1.250	0.65	7.250	1.29	13.250	2.80	19.25	0.86
1.333	0.43	7.333	1.08	13.333	2.37	19.33	1.08
1.417	0.43	7.417	1.08	13.417	2.37	19.42	1.08
1.500	0.43	7.500	1.08	13.500	2.37	19.50	1.08
1.583	0.65	7.583	1.29	13.583	2.16	19.58	0.86
1.667	0.65	7.667	1.29	13.667	2.16	19.67	0.86
1.750	0.65	7.750	1.29	13.750	2.16	19.75	0.86
1.833	0.65	7.833	1.29	13.833	1.72	19.83	0.65
1.917	0.65	7.917	1.29	13.917	1.72	19.92	0.65
2.000	0.65	8.000	1.29	14.000	1.72	20.00	0.65
2.083	0.86	8.083	1.51	14.083	1.51	20.08	0.65
2.167	0.86	8.167	1.51	14.167	1.51	20.17	0.65
2.250	0.86	8.250	1.51	14.250	1.51	20.25	0.65
2.333	0.65	8.333	1.51	14.333	1.72	20.33	0.65
2.417	0.65	8.417	1.51	14.417	1.72	20.42	0.65
2.500	0.65	8.500	1.51	14.500	1.72	20.50	0.65
2.583	0.65	8.583	1.51	14.583	1.51	20.58	0.65
2.667	0.65	8.667	1.51	14.667	1.51	20.67	0.65
2.750	0.65	8.750	1.51	14.750	1.51	20.75	0.65
2.833	0.65	8.833	1.72	14.833	1.72	20.83	0.65
2.917	0.65	8.917	1.72	14.917	1.72	20.92	0.65
3.000	0.65	9.000	1.72	15.000	1.72	21.00	0.65
3.083	0.86	9.083	1.72	15.083	1.51	21.08	0.65
3.167	0.86	9.167	1.72	15.167	1.51	21.17	0.65
3.250	0.86	9.250	1.72	15.250	1.51	21.25	0.65
3.333	0.65	9.333	1.94	15.333	1.72	21.33	0.65
3.417	0.65	9.417	1.94	15.417	1.72	21.42	0.65
3.500	0.65	9.500	1.94	15.500	1.72	21.50	0.65
3.583	0.65	9.583	1.94	15.583	1.51	21.58	0.65
3.667	0.65	9.667	1.94	15.667	1.51	21.67	0.65
3.750	0.65	9.750	1.94	15.750	1.51	21.75	0.65
3.833	0.86	9.833	2.37	15.833	1.08	21.83	0.65
3.917	0.86	9.917	2.37	15.917	1.08	21.92	0.65
4.000	0.86	10.000	2.37	16.000	1.08	22.00	0.65
4.083	0.86	10.083	2.59	16.083	0.86	22.08	0.65
4.167	0.86	10.167	2.59	16.167	0.86	22.17	0.65
4.250	0.86	10.250	2.59	16.250	0.86	22.25	0.65

4.333	0.86	10.333	3.23	16.333	1.08	22.33	0.65
4.417	0.86	10.417	3.23	16.417	1.08	22.42	0.65
4.500	0.86	10.500	3.23	16.500	1.08	22.50	0.65
4.583	0.86	10.583	3.45	16.583	0.86	22.58	0.65
4.667	0.86	10.667	3.45	16.667	0.86	22.67	0.65
4.750	0.86	10.750	3.45	16.750	0.86	22.75	0.65
4.833	0.86	10.833	5.17	16.833	1.08	22.83	0.65
4.917	0.86	10.917	5.17	16.917	1.08	22.92	0.65
5.000	0.86	11.000	5.17	17.000	1.08	23.00	0.65
5.083	0.86	11.083	5.17	17.083	0.86	23.08	0.65
5.167	0.86	11.167	5.17	17.167	0.86	23.17	0.65
5.250	0.86	11.250	5.17	17.250	0.86	23.25	0.65
5.333	0.86	11.333	15.95	17.333	1.08	23.33	0.65
5.417	0.86	11.417	15.95	17.417	1.08	23.42	0.65
5.500	0.86	11.500	15.95	17.500	1.08	23.50	0.65
5.583	0.86	11.583	65.97	17.583	0.86	23.58	0.65
5.667	0.86	11.667	65.97	17.667	0.86	23.67	0.65
5.750	0.86	11.750	65.97	17.750	0.86	23.75	0.65
5.833	0.86	11.833	7.77	17.833	1.08		
5.917	0.86	11.917	7.76	17.917	1.08		
6.000	0.86	12.000	7.76	18.000	1.08		

Max.Eff.Inten.(mm/hr)=	65.97	209.00
over (min)	5.00	15.00
Storage Coeff. (min)=	3.03 (ii)	14.28 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.27	0.08

TOTALS

PEAK FLOW (cms)=	0.03	0.02	0.042 (iii)
TIME TO PEAK (hrs)=	11.75	11.83	11.75
RUNOFF VOLUME (mm)=	52.74	34.90	42.01
TOTAL RAINFALL (mm)=	53.74	53.74	53.74
RUNOFF COEFFICIENT =	0.98	0.65	0.78

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 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(0401)			
IN= 2---> OUT= 1			
DT= 5.0 min			

OVERFLOW IS OFF			
OUTFLOW	STORAGE	OUTFLOW	STORAGE
(cms)	(ha.m.)	(cms)	(ha.m.)
0.0000	0.0029	0.0231	0.0110
0.0037	0.0035	0.0242	0.0115

0.0051	0.0041		0.0262	0.0125
0.0071	0.0059		0.0288	0.0139
0.0152	0.0077		0.0313	0.0151
0.0168	0.0082		0.0332	0.0159
0.0183	0.0088		0.0360	0.0169
0.0196	0.0094		0.0367	0.0172
0.0220	0.0105		0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0202)	0.360	0.042	11.75	42.01
OUTFLOW: ID= 1 (0401)	0.360	0.012	12.17	33.87

PEAK FLOW REDUCTION [Qout/Qin](%)= 29.76
 TIME SHIFT OF PEAK FLOW (min)= 25.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0071

```

-----
| ADD HYD ( 0901)|
| 1 + 2 = 3 |
-----
      AREA    QPEAK    TPEAK    R.V.
      (ha)    (cms)    (hrs)    (mm)
ID1= 1 ( 0201):  0.32  0.009  11.92  14.50
+ ID2= 2 ( 0401):  0.36  0.012  12.17  33.87
=====
ID = 3 ( 0901):  0.68  0.020  12.00  24.75
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

V   V   I   SSSSS U   U   A   L           (v 6.0.2006)
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

000  TTTTT TTTTT H   H   Y   Y   M   M   000  TM
O   O   T    T   H   H   Y   Y   MM  MM  O   O
O   O   T    T   H   H   Y    M   M   O   O
000    T    T   H   H   Y    M   M   000
  
```

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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 6.0\V02\voin.dat

Output filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\63106569-853c-4338-8772-e806afc65e88\scen

Summary filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\63106569-853c-4338-8772-e806afc65e88\scen

DATE: 08-05-2022

TIME: 08:45:20

USER:

COMMENTS: _____

** SIMULATION : H: 5 yr 24 hr scs **

MASS STORM

Ptotal= 71.80 mm

Filename: C:\Users\ASchoof\AppData

ata\Local\Temp\

fcd6b4ec-6229-4dc0-9c96-9778ea89173f\6c92c6cd

Comments: SCS Type II 24 HR MASS CURVE

Duration of storm = 23.75 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
0.25	0.86	6.25	1.44	12.25	10.34	18.25	1.15
0.50	0.57	6.50	1.15	12.50	5.46	18.50	1.44
0.75	0.86	6.75	1.44	12.75	5.17	18.75	1.15
1.00	0.86	7.00	1.44	13.00	4.02	19.00	1.44
1.25	0.86	7.25	1.72	13.25	3.73	19.25	1.15
1.50	0.57	7.50	1.44	13.50	3.16	19.50	1.44
1.75	0.86	7.75	1.72	13.75	2.87	19.75	1.15
2.00	0.86	8.00	1.72	14.00	2.30	20.00	0.86
2.25	1.15	8.25	2.01	14.25	2.01	20.25	0.86
2.50	0.86	8.50	2.01	14.50	2.30	20.50	0.86
2.75	0.86	8.75	2.01	14.75	2.01	20.75	0.86
3.00	0.86	9.00	2.30	15.00	2.30	21.00	0.86
3.25	1.15	9.25	2.30	15.25	2.01	21.25	0.86

3.50	0.86	9.50	2.58	15.50	2.30	21.50	0.86
3.75	0.86	9.75	2.58	15.75	2.01	21.75	0.86
4.00	1.15	10.00	3.16	16.00	1.44	22.00	0.86
4.25	1.15	10.25	3.45	16.25	1.15	22.25	0.86
4.50	1.15	10.50	4.31	16.50	1.44	22.50	0.86
4.75	1.15	10.75	4.60	16.75	1.15	22.75	0.86
5.00	1.15	11.00	6.89	17.00	1.44	23.00	0.86
5.25	1.15	11.25	6.89	17.25	1.15	23.25	0.86
5.50	1.15	11.50	21.25	17.50	1.44	23.50	0.86
5.75	1.15	11.75	87.88	17.75	1.15	23.75	0.86
6.00	1.15	12.00	10.34	18.00	1.44		

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| CALIB |
| NASHYD ( 0201) | Area (ha)= 0.32 Curve Number (CN)= 68.7
| ID= 1 DT= 5.0 min | Ia (mm)= 4.88 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.30

```

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

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.86	6.083	1.44	12.083	10.34	18.08	1.15
0.167	0.86	6.167	1.44	12.167	10.34	18.17	1.15
0.250	0.86	6.250	1.44	12.250	10.34	18.25	1.15
0.333	0.57	6.333	1.15	12.333	5.46	18.33	1.44
0.417	0.57	6.417	1.15	12.417	5.46	18.42	1.44
0.500	0.57	6.500	1.15	12.500	5.46	18.50	1.44
0.583	0.86	6.583	1.44	12.583	5.17	18.58	1.15
0.667	0.86	6.667	1.44	12.667	5.17	18.67	1.15
0.750	0.86	6.750	1.44	12.750	5.17	18.75	1.15
0.833	0.86	6.833	1.44	12.833	4.02	18.83	1.44
0.917	0.86	6.917	1.44	12.917	4.02	18.92	1.44
1.000	0.86	7.000	1.44	13.000	4.02	19.00	1.44
1.083	0.86	7.083	1.72	13.083	3.73	19.08	1.15
1.167	0.86	7.167	1.72	13.167	3.73	19.17	1.15
1.250	0.86	7.250	1.72	13.250	3.73	19.25	1.15
1.333	0.57	7.333	1.44	13.333	3.16	19.33	1.44
1.417	0.57	7.417	1.44	13.417	3.16	19.42	1.44
1.500	0.57	7.500	1.44	13.500	3.16	19.50	1.44
1.583	0.86	7.583	1.72	13.583	2.87	19.58	1.15
1.667	0.86	7.667	1.72	13.667	2.87	19.67	1.15
1.750	0.86	7.750	1.72	13.750	2.87	19.75	1.15
1.833	0.86	7.833	1.72	13.833	2.30	19.83	0.86
1.917	0.86	7.917	1.72	13.917	2.30	19.92	0.86
2.000	0.86	8.000	1.72	14.000	2.30	20.00	0.86
2.083	1.15	8.083	2.01	14.083	2.01	20.08	0.86

2.167	1.15	8.167	2.01	14.167	2.01	20.17	0.86
2.250	1.15	8.250	2.01	14.250	2.01	20.25	0.86
2.333	0.86	8.333	2.01	14.333	2.30	20.33	0.86
2.417	0.86	8.417	2.01	14.417	2.30	20.42	0.86
2.500	0.86	8.500	2.01	14.500	2.30	20.50	0.86
2.583	0.86	8.583	2.01	14.583	2.01	20.58	0.86
2.667	0.86	8.667	2.01	14.667	2.01	20.67	0.86
2.750	0.86	8.750	2.01	14.750	2.01	20.75	0.86
2.833	0.86	8.833	2.30	14.833	2.30	20.83	0.86
2.917	0.86	8.917	2.30	14.917	2.30	20.92	0.86
3.000	0.86	9.000	2.30	15.000	2.30	21.00	0.86
3.083	1.15	9.083	2.30	15.083	2.01	21.08	0.86
3.167	1.15	9.167	2.30	15.167	2.01	21.17	0.86
3.250	1.15	9.250	2.30	15.250	2.01	21.25	0.86
3.333	0.86	9.333	2.58	15.333	2.30	21.33	0.86
3.417	0.86	9.417	2.58	15.417	2.30	21.42	0.86
3.500	0.86	9.500	2.58	15.500	2.30	21.50	0.86
3.583	0.86	9.583	2.58	15.583	2.01	21.58	0.86
3.667	0.86	9.667	2.58	15.667	2.01	21.67	0.86
3.750	0.86	9.750	2.58	15.750	2.01	21.75	0.86
3.833	1.15	9.833	3.16	15.833	1.44	21.83	0.86
3.917	1.15	9.917	3.16	15.917	1.44	21.92	0.86
4.000	1.15	10.000	3.16	16.000	1.44	22.00	0.86
4.083	1.15	10.083	3.45	16.083	1.15	22.08	0.86
4.167	1.15	10.167	3.45	16.167	1.15	22.17	0.86
4.250	1.15	10.250	3.45	16.250	1.15	22.25	0.86
4.333	1.15	10.333	4.31	16.333	1.44	22.33	0.86
4.417	1.15	10.417	4.31	16.417	1.44	22.42	0.86
4.500	1.15	10.500	4.31	16.500	1.44	22.50	0.86
4.583	1.15	10.583	4.60	16.583	1.15	22.58	0.86
4.667	1.15	10.667	4.60	16.667	1.15	22.67	0.86
4.750	1.15	10.750	4.60	16.750	1.15	22.75	0.86
4.833	1.15	10.833	6.89	16.833	1.44	22.83	0.86
4.917	1.15	10.917	6.89	16.917	1.44	22.92	0.86
5.000	1.15	11.000	6.89	17.000	1.44	23.00	0.86
5.083	1.15	11.083	6.89	17.083	1.15	23.08	0.86
5.167	1.15	11.167	6.89	17.167	1.15	23.17	0.86
5.250	1.15	11.250	6.89	17.250	1.15	23.25	0.86
5.333	1.15	11.333	21.25	17.333	1.44	23.33	0.86
5.417	1.15	11.417	21.25	17.417	1.44	23.42	0.86
5.500	1.15	11.500	21.25	17.500	1.44	23.50	0.86
5.583	1.15	11.583	87.88	17.583	1.15	23.58	0.86
5.667	1.15	11.667	87.88	17.667	1.15	23.67	0.86
5.750	1.15	11.750	87.88	17.750	1.15	23.75	0.86
5.833	1.15	11.833	10.35	17.833	1.44		
5.917	1.15	11.917	10.34	17.917	1.44		
6.000	1.15	12.000	10.34	18.000	1.44		

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.015 (i)
 TIME TO PEAK (hrs)= 11.917
 RUNOFF VOLUME (mm)= 24.379
 TOTAL RAINFALL (mm)= 71.585
 RUNOFF COEFFICIENT = 0.341

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

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-----
| CALIB |
| STANDHYD ( 0202) |
| ID= 1 DT= 5.0 min |
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Area (ha)= 0.36
 Total Imp(%)= 86.00 Dir. Conn.(%)= 40.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.31	0.05
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	0.80	0.80
Length	(m)=	90.00	90.00
Mannings n	=	0.013	0.250

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

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

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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	1.44	12.083	10.34	18.08	1.15
0.167	0.86	6.167	1.44	12.167	10.34	18.17	1.15
0.250	0.86	6.250	1.44	12.250	10.34	18.25	1.15
0.333	0.57	6.333	1.15	12.333	5.46	18.33	1.44
0.417	0.57	6.417	1.15	12.417	5.46	18.42	1.44
0.500	0.57	6.500	1.15	12.500	5.46	18.50	1.44
0.583	0.86	6.583	1.44	12.583	5.17	18.58	1.15
0.667	0.86	6.667	1.44	12.667	5.17	18.67	1.15
0.750	0.86	6.750	1.44	12.750	5.17	18.75	1.15
0.833	0.86	6.833	1.44	12.833	4.02	18.83	1.44
0.917	0.86	6.917	1.44	12.917	4.02	18.92	1.44
1.000	0.86	7.000	1.44	13.000	4.02	19.00	1.44
1.083	0.86	7.083	1.72	13.083	3.73	19.08	1.15
1.167	0.86	7.167	1.72	13.167	3.73	19.17	1.15
1.250	0.86	7.250	1.72	13.250	3.73	19.25	1.15
1.333	0.57	7.333	1.44	13.333	3.16	19.33	1.44
1.417	0.57	7.417	1.44	13.417	3.16	19.42	1.44
1.500	0.57	7.500	1.44	13.500	3.16	19.50	1.44
1.583	0.86	7.583	1.72	13.583	2.87	19.58	1.15
1.667	0.86	7.667	1.72	13.667	2.87	19.67	1.15
1.750	0.86	7.750	1.72	13.750	2.87	19.75	1.15
1.833	0.86	7.833	1.72	13.833	2.30	19.83	0.86
1.917	0.86	7.917	1.72	13.917	2.30	19.92	0.86

2.000	0.86	8.000	1.72	14.000	2.30	20.00	0.86
2.083	1.15	8.083	2.01	14.083	2.01	20.08	0.86
2.167	1.15	8.167	2.01	14.167	2.01	20.17	0.86
2.250	1.15	8.250	2.01	14.250	2.01	20.25	0.86
2.333	0.86	8.333	2.01	14.333	2.30	20.33	0.86
2.417	0.86	8.417	2.01	14.417	2.30	20.42	0.86
2.500	0.86	8.500	2.01	14.500	2.30	20.50	0.86
2.583	0.86	8.583	2.01	14.583	2.01	20.58	0.86
2.667	0.86	8.667	2.01	14.667	2.01	20.67	0.86
2.750	0.86	8.750	2.01	14.750	2.01	20.75	0.86
2.833	0.86	8.833	2.30	14.833	2.30	20.83	0.86
2.917	0.86	8.917	2.30	14.917	2.30	20.92	0.86
3.000	0.86	9.000	2.30	15.000	2.30	21.00	0.86
3.083	1.15	9.083	2.30	15.083	2.01	21.08	0.86
3.167	1.15	9.167	2.30	15.167	2.01	21.17	0.86
3.250	1.15	9.250	2.30	15.250	2.01	21.25	0.86
3.333	0.86	9.333	2.58	15.333	2.30	21.33	0.86
3.417	0.86	9.417	2.58	15.417	2.30	21.42	0.86
3.500	0.86	9.500	2.58	15.500	2.30	21.50	0.86
3.583	0.86	9.583	2.58	15.583	2.01	21.58	0.86
3.667	0.86	9.667	2.58	15.667	2.01	21.67	0.86
3.750	0.86	9.750	2.58	15.750	2.01	21.75	0.86
3.833	1.15	9.833	3.16	15.833	1.44	21.83	0.86
3.917	1.15	9.917	3.16	15.917	1.44	21.92	0.86
4.000	1.15	10.000	3.16	16.000	1.44	22.00	0.86
4.083	1.15	10.083	3.45	16.083	1.15	22.08	0.86
4.167	1.15	10.167	3.45	16.167	1.15	22.17	0.86
4.250	1.15	10.250	3.45	16.250	1.15	22.25	0.86
4.333	1.15	10.333	4.31	16.333	1.44	22.33	0.86
4.417	1.15	10.417	4.31	16.417	1.44	22.42	0.86
4.500	1.15	10.500	4.31	16.500	1.44	22.50	0.86
4.583	1.15	10.583	4.60	16.583	1.15	22.58	0.86
4.667	1.15	10.667	4.60	16.667	1.15	22.67	0.86
4.750	1.15	10.750	4.60	16.750	1.15	22.75	0.86
4.833	1.15	10.833	6.89	16.833	1.44	22.83	0.86
4.917	1.15	10.917	6.89	16.917	1.44	22.92	0.86
5.000	1.15	11.000	6.89	17.000	1.44	23.00	0.86
5.083	1.15	11.083	6.89	17.083	1.15	23.08	0.86
5.167	1.15	11.167	6.89	17.167	1.15	23.17	0.86
5.250	1.15	11.250	6.89	17.250	1.15	23.25	0.86
5.333	1.15	11.333	21.25	17.333	1.44	23.33	0.86
5.417	1.15	11.417	21.25	17.417	1.44	23.42	0.86
5.500	1.15	11.500	21.25	17.500	1.44	23.50	0.86
5.583	1.15	11.583	87.88	17.583	1.15	23.58	0.86
5.667	1.15	11.667	87.88	17.667	1.15	23.67	0.86
5.750	1.15	11.750	87.88	17.750	1.15	23.75	0.86
5.833	1.15	11.833	10.35	17.833	1.44		
5.917	1.15	11.917	10.34	17.917	1.44		
6.000	1.15	12.000	10.34	18.000	1.44		

Max.Eff.Inten.(mm/hr)=	87.88	313.66	
over (min)	5.00	15.00	
Storage Coeff. (min)=	2.70 (ii)	12.27 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.29	0.09	
			TOTALS
PEAK FLOW (cms)=	0.04	0.03	0.060 (iii)
TIME TO PEAK (hrs)=	11.75	11.83	11.75
RUNOFF VOLUME (mm)=	70.58	51.10	58.87
TOTAL RAINFALL (mm)=	71.58	71.58	71.58
RUNOFF COEFFICIENT =	0.99	0.71	0.82

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 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( 0401) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
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	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0029	0.0231	0.0110
	0.0037	0.0035	0.0242	0.0115
	0.0051	0.0041	0.0262	0.0125
	0.0071	0.0059	0.0288	0.0139
	0.0152	0.0077	0.0313	0.0151
	0.0168	0.0082	0.0332	0.0159
	0.0183	0.0088	0.0360	0.0169
	0.0196	0.0094	0.0367	0.0172
	0.0220	0.0105	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0202)	0.360	0.060	11.75	58.87
OUTFLOW: ID= 1 (0401)	0.360	0.019	12.08	50.72

PEAK FLOW REDUCTION [Qout/Qin](%)= 31.65
TIME SHIFT OF PEAK FLOW (min)= 20.00
MAXIMUM STORAGE USED (ha.m.)= 0.0091

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| ADD HYD ( 0901) |
| 1 + 2 = 3       |
| AREA   QPEAK   TPEAK   R.V.

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		(ha)	(cms)	(hrs)	(mm)
-----	ID1= 1 (0201):	0.32	0.015	11.92	24.38
	+ ID2= 2 (0401):	0.36	0.019	12.08	50.72
	=====				
	ID = 3 (0901):	0.68	0.033	11.92	38.32

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

=====

V	V	I	SSSSS	U	U	A	L		(v 6.0.2006)
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		

000	TTTTT	TTTTT	H	H	Y	Y	M	M	000	TM
0	0	T	T	H	H	Y Y	MM	MM	0	0
0	0	T	T	H	H	Y	M	M	0	0
000	T	T	H	H	Y		M	M	000	

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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 6.0\V02\voin.dat

Output filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\dc2b8536-0ed0-4b02-b13c-35d91af323b1\scen

Summary filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\dc2b8536-0ed0-4b02-b13c-35d91af323b1\scen

DATE: 08-05-2022

TIME: 08:45:20

USER:

COMMENTS: _____

 ** SIMULATION : I: 10 yr 24 hr scs **

MASS STORM	Filename: C:\Users\ASchoof\AppData\Local\Temp\ fcd6b4ec-6229-4dc0-9c96-9778ea89173f\6ebf6965
Ptotal= 83.60 mm	Comments: SCS Type II 24 HR MASS CURVE

Duration of storm = 23.75 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
0.25	1.00	6.25	1.67	12.25	12.04	18.25	1.34
0.50	0.67	6.50	1.34	12.50	6.35	18.50	1.67
0.75	1.00	6.75	1.67	12.75	6.02	18.75	1.34
1.00	1.00	7.00	1.67	13.00	4.68	19.00	1.67
1.25	1.00	7.25	2.01	13.25	4.35	19.25	1.34
1.50	0.67	7.50	1.67	13.50	3.68	19.50	1.67
1.75	1.00	7.75	2.01	13.75	3.34	19.75	1.34
2.00	1.00	8.00	2.01	14.00	2.68	20.00	1.00
2.25	1.34	8.25	2.34	14.25	2.34	20.25	1.00
2.50	1.00	8.50	2.34	14.50	2.68	20.50	1.00
2.75	1.00	8.75	2.34	14.75	2.34	20.75	1.00
3.00	1.00	9.00	2.68	15.00	2.68	21.00	1.00
3.25	1.34	9.25	2.68	15.25	2.34	21.25	1.00
3.50	1.00	9.50	3.01	15.50	2.68	21.50	1.00
3.75	1.00	9.75	3.01	15.75	2.34	21.75	1.00
4.00	1.34	10.00	3.68	16.00	1.67	22.00	1.00
4.25	1.34	10.25	4.01	16.25	1.34	22.25	1.00
4.50	1.34	10.50	5.02	16.50	1.67	22.50	1.00
4.75	1.34	10.75	5.35	16.75	1.34	22.75	1.00
5.00	1.34	11.00	8.03	17.00	1.67	23.00	1.00
5.25	1.34	11.25	8.03	17.25	1.34	23.25	1.00
5.50	1.34	11.50	24.75	17.50	1.67	23.50	1.00
5.75	1.34	11.75	102.33	17.75	1.34	23.75	1.00
6.00	1.34	12.00	12.04	18.00	1.67		

CALIB	Area (ha)= 0.32	Curve Number (CN)= 68.7
NASHYD (0201)	Ia (mm)= 4.88	# of Linear Res.(N)= 3.00
ID= 1 DT= 5.0 min	U.H. Tp(hrs)= 0.30	

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

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.00	6.083	1.67	12.083	12.04	18.08	1.34
0.167	1.00	6.167	1.67	12.167	12.04	18.17	1.34
0.250	1.00	6.250	1.67	12.250	12.04	18.25	1.34
0.333	0.67	6.333	1.34	12.333	6.35	18.33	1.67
0.417	0.67	6.417	1.34	12.417	6.35	18.42	1.67
0.500	0.67	6.500	1.34	12.500	6.35	18.50	1.67
0.583	1.00	6.583	1.67	12.583	6.02	18.58	1.34
0.667	1.00	6.667	1.67	12.667	6.02	18.67	1.34
0.750	1.00	6.750	1.67	12.750	6.02	18.75	1.34
0.833	1.00	6.833	1.67	12.833	4.68	18.83	1.67
0.917	1.00	6.917	1.67	12.917	4.68	18.92	1.67
1.000	1.00	7.000	1.67	13.000	4.68	19.00	1.67
1.083	1.00	7.083	2.01	13.083	4.35	19.08	1.34
1.167	1.00	7.167	2.01	13.167	4.35	19.17	1.34
1.250	1.00	7.250	2.01	13.250	4.35	19.25	1.34
1.333	0.67	7.333	1.67	13.333	3.68	19.33	1.67
1.417	0.67	7.417	1.67	13.417	3.68	19.42	1.67
1.500	0.67	7.500	1.67	13.500	3.68	19.50	1.67
1.583	1.00	7.583	2.01	13.583	3.34	19.58	1.34
1.667	1.00	7.667	2.01	13.667	3.34	19.67	1.34
1.750	1.00	7.750	2.01	13.750	3.34	19.75	1.34
1.833	1.00	7.833	2.01	13.833	2.68	19.83	1.00
1.917	1.00	7.917	2.01	13.917	2.68	19.92	1.00
2.000	1.00	8.000	2.01	14.000	2.68	20.00	1.00
2.083	1.34	8.083	2.34	14.083	2.34	20.08	1.00
2.167	1.34	8.167	2.34	14.167	2.34	20.17	1.00
2.250	1.34	8.250	2.34	14.250	2.34	20.25	1.00
2.333	1.00	8.333	2.34	14.333	2.68	20.33	1.00
2.417	1.00	8.417	2.34	14.417	2.68	20.42	1.00
2.500	1.00	8.500	2.34	14.500	2.68	20.50	1.00
2.583	1.00	8.583	2.34	14.583	2.34	20.58	1.00
2.667	1.00	8.667	2.34	14.667	2.34	20.67	1.00
2.750	1.00	8.750	2.34	14.750	2.34	20.75	1.00
2.833	1.00	8.833	2.68	14.833	2.68	20.83	1.00
2.917	1.00	8.917	2.68	14.917	2.68	20.92	1.00
3.000	1.00	9.000	2.68	15.000	2.68	21.00	1.00
3.083	1.34	9.083	2.68	15.083	2.34	21.08	1.00
3.167	1.34	9.167	2.68	15.167	2.34	21.17	1.00
3.250	1.34	9.250	2.68	15.250	2.34	21.25	1.00
3.333	1.00	9.333	3.01	15.333	2.68	21.33	1.00
3.417	1.00	9.417	3.01	15.417	2.68	21.42	1.00
3.500	1.00	9.500	3.01	15.500	2.68	21.50	1.00
3.583	1.00	9.583	3.01	15.583	2.34	21.58	1.00
3.667	1.00	9.667	3.01	15.667	2.34	21.67	1.00
3.750	1.00	9.750	3.01	15.750	2.34	21.75	1.00
3.833	1.34	9.833	3.68	15.833	1.67	21.83	1.00
3.917	1.34	9.917	3.68	15.917	1.67	21.92	1.00

4.000	1.34	10.000	3.68	16.000	1.67	22.00	1.00
4.083	1.34	10.083	4.01	16.083	1.34	22.08	1.00
4.167	1.34	10.167	4.01	16.167	1.34	22.17	1.00
4.250	1.34	10.250	4.01	16.250	1.34	22.25	1.00
4.333	1.34	10.333	5.02	16.333	1.67	22.33	1.00
4.417	1.34	10.417	5.02	16.417	1.67	22.42	1.00
4.500	1.34	10.500	5.02	16.500	1.67	22.50	1.00
4.583	1.34	10.583	5.35	16.583	1.34	22.58	1.00
4.667	1.34	10.667	5.35	16.667	1.34	22.67	1.00
4.750	1.34	10.750	5.35	16.750	1.34	22.75	1.00
4.833	1.34	10.833	8.03	16.833	1.67	22.83	1.00
4.917	1.34	10.917	8.03	16.917	1.67	22.92	1.00
5.000	1.34	11.000	8.03	17.000	1.67	23.00	1.00
5.083	1.34	11.083	8.03	17.083	1.34	23.08	1.00
5.167	1.34	11.167	8.03	17.167	1.34	23.17	1.00
5.250	1.34	11.250	8.03	17.250	1.34	23.25	1.00
5.333	1.34	11.333	24.74	17.333	1.67	23.33	1.00
5.417	1.34	11.417	24.75	17.417	1.67	23.42	1.00
5.500	1.34	11.500	24.75	17.500	1.67	23.50	1.00
5.583	1.34	11.583	102.32	17.583	1.34	23.58	1.00
5.667	1.34	11.667	102.33	17.667	1.34	23.67	1.00
5.750	1.34	11.750	102.33	17.750	1.34	23.75	1.00
5.833	1.34	11.833	12.05	17.833	1.67		
5.917	1.34	11.917	12.04	17.917	1.67		
6.000	1.34	12.000	12.04	18.000	1.67		

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.019 (i)

TIME TO PEAK (hrs)= 11.917

RUNOFF VOLUME (mm)= 31.694

TOTAL RAINFALL (mm)= 83.349

RUNOFF COEFFICIENT = 0.380

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

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| CALIB                                     |
| STANDHYD ( 0202) | Area (ha)= 0.36      |
| ID= 1 DT= 5.0 min | Total Imp(%)= 86.00   Dir. Conn.(%)= 40.00
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		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.31	0.05
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	0.80	0.80
Length	(m)=	90.00	90.00
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	1.00	6.083	1.67	12.083	12.04	18.08	1.34
0.167	1.00	6.167	1.67	12.167	12.04	18.17	1.34
0.250	1.00	6.250	1.67	12.250	12.04	18.25	1.34
0.333	0.67	6.333	1.34	12.333	6.35	18.33	1.67
0.417	0.67	6.417	1.34	12.417	6.35	18.42	1.67
0.500	0.67	6.500	1.34	12.500	6.35	18.50	1.67
0.583	1.00	6.583	1.67	12.583	6.02	18.58	1.34
0.667	1.00	6.667	1.67	12.667	6.02	18.67	1.34
0.750	1.00	6.750	1.67	12.750	6.02	18.75	1.34
0.833	1.00	6.833	1.67	12.833	4.68	18.83	1.67
0.917	1.00	6.917	1.67	12.917	4.68	18.92	1.67
1.000	1.00	7.000	1.67	13.000	4.68	19.00	1.67
1.083	1.00	7.083	2.01	13.083	4.35	19.08	1.34
1.167	1.00	7.167	2.01	13.167	4.35	19.17	1.34
1.250	1.00	7.250	2.01	13.250	4.35	19.25	1.34
1.333	0.67	7.333	1.67	13.333	3.68	19.33	1.67
1.417	0.67	7.417	1.67	13.417	3.68	19.42	1.67
1.500	0.67	7.500	1.67	13.500	3.68	19.50	1.67
1.583	1.00	7.583	2.01	13.583	3.34	19.58	1.34
1.667	1.00	7.667	2.01	13.667	3.34	19.67	1.34
1.750	1.00	7.750	2.01	13.750	3.34	19.75	1.34
1.833	1.00	7.833	2.01	13.833	2.68	19.83	1.00
1.917	1.00	7.917	2.01	13.917	2.68	19.92	1.00
2.000	1.00	8.000	2.01	14.000	2.68	20.00	1.00
2.083	1.34	8.083	2.34	14.083	2.34	20.08	1.00
2.167	1.34	8.167	2.34	14.167	2.34	20.17	1.00
2.250	1.34	8.250	2.34	14.250	2.34	20.25	1.00
2.333	1.00	8.333	2.34	14.333	2.68	20.33	1.00
2.417	1.00	8.417	2.34	14.417	2.68	20.42	1.00
2.500	1.00	8.500	2.34	14.500	2.68	20.50	1.00
2.583	1.00	8.583	2.34	14.583	2.34	20.58	1.00
2.667	1.00	8.667	2.34	14.667	2.34	20.67	1.00
2.750	1.00	8.750	2.34	14.750	2.34	20.75	1.00
2.833	1.00	8.833	2.68	14.833	2.68	20.83	1.00
2.917	1.00	8.917	2.68	14.917	2.68	20.92	1.00
3.000	1.00	9.000	2.68	15.000	2.68	21.00	1.00
3.083	1.34	9.083	2.68	15.083	2.34	21.08	1.00
3.167	1.34	9.167	2.68	15.167	2.34	21.17	1.00
3.250	1.34	9.250	2.68	15.250	2.34	21.25	1.00
3.333	1.00	9.333	3.01	15.333	2.68	21.33	1.00
3.417	1.00	9.417	3.01	15.417	2.68	21.42	1.00
3.500	1.00	9.500	3.01	15.500	2.68	21.50	1.00
3.583	1.00	9.583	3.01	15.583	2.34	21.58	1.00
3.667	1.00	9.667	3.01	15.667	2.34	21.67	1.00
3.750	1.00	9.750	3.01	15.750	2.34	21.75	1.00

3.833	1.34	9.833	3.68	15.833	1.67	21.83	1.00
3.917	1.34	9.917	3.68	15.917	1.67	21.92	1.00
4.000	1.34	10.000	3.68	16.000	1.67	22.00	1.00
4.083	1.34	10.083	4.01	16.083	1.34	22.08	1.00
4.167	1.34	10.167	4.01	16.167	1.34	22.17	1.00
4.250	1.34	10.250	4.01	16.250	1.34	22.25	1.00
4.333	1.34	10.333	5.02	16.333	1.67	22.33	1.00
4.417	1.34	10.417	5.02	16.417	1.67	22.42	1.00
4.500	1.34	10.500	5.02	16.500	1.67	22.50	1.00
4.583	1.34	10.583	5.35	16.583	1.34	22.58	1.00
4.667	1.34	10.667	5.35	16.667	1.34	22.67	1.00
4.750	1.34	10.750	5.35	16.750	1.34	22.75	1.00
4.833	1.34	10.833	8.03	16.833	1.67	22.83	1.00
4.917	1.34	10.917	8.03	16.917	1.67	22.92	1.00
5.000	1.34	11.000	8.03	17.000	1.67	23.00	1.00
5.083	1.34	11.083	8.03	17.083	1.34	23.08	1.00
5.167	1.34	11.167	8.03	17.167	1.34	23.17	1.00
5.250	1.34	11.250	8.03	17.250	1.34	23.25	1.00
5.333	1.34	11.333	24.74	17.333	1.67	23.33	1.00
5.417	1.34	11.417	24.75	17.417	1.67	23.42	1.00
5.500	1.34	11.500	24.75	17.500	1.67	23.50	1.00
5.583	1.34	11.583	102.32	17.583	1.34	23.58	1.00
5.667	1.34	11.667	102.33	17.667	1.34	23.67	1.00
5.750	1.34	11.750	102.33	17.750	1.34	23.75	1.00
5.833	1.34	11.833	12.05	17.833	1.67		
5.917	1.34	11.917	12.04	17.917	1.67		
6.000	1.34	12.000	12.04	18.000	1.67		

Max.Eff.Inten.(mm/hr)= 102.33 377.90
over (min) 5.00 15.00
Storage Coeff. (min)= 2.54 (ii) 11.42 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.29 0.09

TOTALS

PEAK FLOW (cms)= 0.04 0.03 0.072 (iii)
TIME TO PEAK (hrs)= 11.75 11.83 11.75
RUNOFF VOLUME (mm)= 82.35 62.07 70.17
TOTAL RAINFALL (mm)= 83.35 83.35 83.35
RUNOFF COEFFICIENT = 0.99 0.74 0.84

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 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( 0401)|
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
|-----|
```

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0029	0.0231	0.0110
0.0037	0.0035	0.0242	0.0115
0.0051	0.0041	0.0262	0.0125
0.0071	0.0059	0.0288	0.0139
0.0152	0.0077	0.0313	0.0151
0.0168	0.0082	0.0332	0.0159
0.0183	0.0088	0.0360	0.0169
0.0196	0.0094	0.0367	0.0172
0.0220	0.0105	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0202)	0.360	0.072	11.75	70.17
OUTFLOW: ID= 1 (0401)	0.360	0.022	12.08	62.01

PEAK FLOW REDUCTION [Qout/Qin](%)= 30.54
 TIME SHIFT OF PEAK FLOW (min)= 20.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0105

```
| ADD HYD ( 0901)|
| 1 + 2 = 3      |
|-----|
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0201):	0.32	0.019	11.92	31.69
+ ID2= 2 (0401):	0.36	0.022	12.08	62.01
=====				
ID = 3 (0901):	0.68	0.040	11.92	47.75

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
V  V  I  SSSSS  U  U  A  L  (v 6.0.2006)
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

000  TTTTT  TTTTT  H  H  Y  Y  M  M  000  TM
O  O  T  T  H  H  Y  Y  MM MM  O  O
O  O  T  T  H  H  Y  M  M  O  O
000  T  T  H  H  Y  M  M  000
```

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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 6.0\V02\voin.dat

Output filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\0c61da86-d247-402e-a49e-02a8b094dd98\scen

Summary filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\0c61da86-d247-402e-a49e-02a8b094dd98\scen

DATE: 08-05-2022

TIME: 08:45:20

USER:

COMMENTS: _____

** SIMULATION : J: 25 yr 24 hr scs **

MASS STORM	Filename: C:\Users\ASchoof\AppData\Local\Temp\
	fcd6b4ec-6229-4dc0-9c96-9778ea89173f\05819587
Ptotal= 98.60 mm	Comments: SCS Type II 24 HR MASS CURVE

Duration of storm = 23.75 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
0.25	1.18	6.25	1.97	12.25	14.20	18.25	1.58
0.50	0.79	6.50	1.58	12.50	7.49	18.50	1.97
0.75	1.18	6.75	1.97	12.75	7.10	18.75	1.58
1.00	1.18	7.00	1.97	13.00	5.52	19.00	1.97
1.25	1.18	7.25	2.37	13.25	5.13	19.25	1.58
1.50	0.79	7.50	1.97	13.50	4.34	19.50	1.97
1.75	1.18	7.75	2.37	13.75	3.94	19.75	1.58

2.00	1.18	8.00	2.37	14.00	3.16	20.00	1.18
2.25	1.58	8.25	2.76	14.25	2.76	20.25	1.18
2.50	1.18	8.50	2.76	14.50	3.16	20.50	1.18
2.75	1.18	8.75	2.76	14.75	2.76	20.75	1.18
3.00	1.18	9.00	3.16	15.00	3.16	21.00	1.18
3.25	1.58	9.25	3.16	15.25	2.76	21.25	1.18
3.50	1.18	9.50	3.55	15.50	3.16	21.50	1.18
3.75	1.18	9.75	3.55	15.75	2.76	21.75	1.18
4.00	1.58	10.00	4.34	16.00	1.97	22.00	1.18
4.25	1.58	10.25	4.73	16.25	1.58	22.25	1.18
4.50	1.58	10.50	5.92	16.50	1.97	22.50	1.18
4.75	1.58	10.75	6.31	16.75	1.58	22.75	1.18
5.00	1.58	11.00	9.47	17.00	1.97	23.00	1.18
5.25	1.58	11.25	9.47	17.25	1.58	23.25	1.18
5.50	1.58	11.50	29.19	17.50	1.97	23.50	1.18
5.75	1.58	11.75	120.69	17.75	1.58	23.75	1.18
6.00	1.58	12.00	14.20	18.00	1.97		

CALIB							
NASHYD (0201)	Area (ha)=	0.32	Curve Number (CN)=	68.7			
ID= 1 DT= 5.0 min	Ia (mm)=	4.88	# of Linear Res.(N)=	3.00			
	U.H. Tp(hrs)=	0.30					

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

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.18	6.083	1.97	12.083	14.20	18.08	1.58
0.167	1.18	6.167	1.97	12.167	14.20	18.17	1.58
0.250	1.18	6.250	1.97	12.250	14.20	18.25	1.58
0.333	0.79	6.333	1.58	12.333	7.49	18.33	1.97
0.417	0.79	6.417	1.58	12.417	7.49	18.42	1.97
0.500	0.79	6.500	1.58	12.500	7.49	18.50	1.97
0.583	1.18	6.583	1.97	12.583	7.10	18.58	1.58
0.667	1.18	6.667	1.97	12.667	7.10	18.67	1.58
0.750	1.18	6.750	1.97	12.750	7.10	18.75	1.58
0.833	1.18	6.833	1.97	12.833	5.52	18.83	1.97
0.917	1.18	6.917	1.97	12.917	5.52	18.92	1.97
1.000	1.18	7.000	1.97	13.000	5.52	19.00	1.97
1.083	1.18	7.083	2.37	13.083	5.13	19.08	1.58
1.167	1.18	7.167	2.37	13.167	5.13	19.17	1.58
1.250	1.18	7.250	2.37	13.250	5.13	19.25	1.58
1.333	0.79	7.333	1.97	13.333	4.34	19.33	1.97
1.417	0.79	7.417	1.97	13.417	4.34	19.42	1.97
1.500	0.79	7.500	1.97	13.500	4.34	19.50	1.97
1.583	1.18	7.583	2.37	13.583	3.94	19.58	1.58

1.667	1.18	7.667	2.37	13.667	3.94	19.67	1.58
1.750	1.18	7.750	2.37	13.750	3.94	19.75	1.58
1.833	1.18	7.833	2.37	13.833	3.16	19.83	1.18
1.917	1.18	7.917	2.37	13.917	3.16	19.92	1.18
2.000	1.18	8.000	2.37	14.000	3.16	20.00	1.18
2.083	1.58	8.083	2.76	14.083	2.76	20.08	1.18
2.167	1.58	8.167	2.76	14.167	2.76	20.17	1.18
2.250	1.58	8.250	2.76	14.250	2.76	20.25	1.18
2.333	1.18	8.333	2.76	14.333	3.16	20.33	1.18
2.417	1.18	8.417	2.76	14.417	3.16	20.42	1.18
2.500	1.18	8.500	2.76	14.500	3.16	20.50	1.18
2.583	1.18	8.583	2.76	14.583	2.76	20.58	1.18
2.667	1.18	8.667	2.76	14.667	2.76	20.67	1.18
2.750	1.18	8.750	2.76	14.750	2.76	20.75	1.18
2.833	1.18	8.833	3.16	14.833	3.16	20.83	1.18
2.917	1.18	8.917	3.16	14.917	3.16	20.92	1.18
3.000	1.18	9.000	3.16	15.000	3.16	21.00	1.18
3.083	1.58	9.083	3.16	15.083	2.76	21.08	1.18
3.167	1.58	9.167	3.16	15.167	2.76	21.17	1.18
3.250	1.58	9.250	3.16	15.250	2.76	21.25	1.18
3.333	1.18	9.333	3.55	15.333	3.16	21.33	1.18
3.417	1.18	9.417	3.55	15.417	3.16	21.42	1.18
3.500	1.18	9.500	3.55	15.500	3.16	21.50	1.18
3.583	1.18	9.583	3.55	15.583	2.76	21.58	1.18
3.667	1.18	9.667	3.55	15.667	2.76	21.67	1.18
3.750	1.18	9.750	3.55	15.750	2.76	21.75	1.18
3.833	1.58	9.833	4.34	15.833	1.97	21.83	1.18
3.917	1.58	9.917	4.34	15.917	1.97	21.92	1.18
4.000	1.58	10.000	4.34	16.000	1.97	22.00	1.18
4.083	1.58	10.083	4.73	16.083	1.58	22.08	1.18
4.167	1.58	10.167	4.73	16.167	1.58	22.17	1.18
4.250	1.58	10.250	4.73	16.250	1.58	22.25	1.18
4.333	1.58	10.333	5.92	16.333	1.97	22.33	1.18
4.417	1.58	10.417	5.92	16.417	1.97	22.42	1.18
4.500	1.58	10.500	5.92	16.500	1.97	22.50	1.18
4.583	1.58	10.583	6.31	16.583	1.58	22.58	1.18
4.667	1.58	10.667	6.31	16.667	1.58	22.67	1.18
4.750	1.58	10.750	6.31	16.750	1.58	22.75	1.18
4.833	1.58	10.833	9.47	16.833	1.97	22.83	1.18
4.917	1.58	10.917	9.47	16.917	1.97	22.92	1.18
5.000	1.58	11.000	9.47	17.000	1.97	23.00	1.18
5.083	1.58	11.083	9.47	17.083	1.58	23.08	1.18
5.167	1.58	11.167	9.47	17.167	1.58	23.17	1.18
5.250	1.58	11.250	9.47	17.250	1.58	23.25	1.18
5.333	1.58	11.333	29.18	17.333	1.97	23.33	1.18
5.417	1.58	11.417	29.19	17.417	1.97	23.42	1.18
5.500	1.58	11.500	29.19	17.500	1.97	23.50	1.18
5.583	1.58	11.583	120.68	17.583	1.58	23.58	1.18
5.667	1.58	11.667	120.69	17.667	1.58	23.67	1.18
5.750	1.58	11.750	120.69	17.750	1.58	23.75	1.18

5.833	1.58	11.833	14.21	17.833	1.97
5.917	1.58	11.917	14.20	17.917	1.97
6.000	1.58	12.000	14.20	18.000	1.97

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.026 (i)
 TIME TO PEAK (hrs)= 11.917
 RUNOFF VOLUME (mm)= 41.713
 TOTAL RAINFALL (mm)= 98.304
 RUNOFF COEFFICIENT = 0.424

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

CALIB	
STANDHYD (0202)	Area (ha)= 0.36
ID= 1 DT= 5.0 min	Total Imp(%)= 86.00 Dir. Conn.(%)= 40.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.31	0.05
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	0.80	0.80
Length	(m)=	90.00	90.00
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	1.18	6.083	1.97	12.083	14.20	18.08	1.58
0.167	1.18	6.167	1.97	12.167	14.20	18.17	1.58
0.250	1.18	6.250	1.97	12.250	14.20	18.25	1.58
0.333	0.79	6.333	1.58	12.333	7.49	18.33	1.97
0.417	0.79	6.417	1.58	12.417	7.49	18.42	1.97
0.500	0.79	6.500	1.58	12.500	7.49	18.50	1.97
0.583	1.18	6.583	1.97	12.583	7.10	18.58	1.58
0.667	1.18	6.667	1.97	12.667	7.10	18.67	1.58
0.750	1.18	6.750	1.97	12.750	7.10	18.75	1.58
0.833	1.18	6.833	1.97	12.833	5.52	18.83	1.97
0.917	1.18	6.917	1.97	12.917	5.52	18.92	1.97
1.000	1.18	7.000	1.97	13.000	5.52	19.00	1.97
1.083	1.18	7.083	2.37	13.083	5.13	19.08	1.58
1.167	1.18	7.167	2.37	13.167	5.13	19.17	1.58
1.250	1.18	7.250	2.37	13.250	5.13	19.25	1.58
1.333	0.79	7.333	1.97	13.333	4.34	19.33	1.97
1.417	0.79	7.417	1.97	13.417	4.34	19.42	1.97

1.500	0.79	7.500	1.97	13.500	4.34	19.50	1.97
1.583	1.18	7.583	2.37	13.583	3.94	19.58	1.58
1.667	1.18	7.667	2.37	13.667	3.94	19.67	1.58
1.750	1.18	7.750	2.37	13.750	3.94	19.75	1.58
1.833	1.18	7.833	2.37	13.833	3.16	19.83	1.18
1.917	1.18	7.917	2.37	13.917	3.16	19.92	1.18
2.000	1.18	8.000	2.37	14.000	3.16	20.00	1.18
2.083	1.58	8.083	2.76	14.083	2.76	20.08	1.18
2.167	1.58	8.167	2.76	14.167	2.76	20.17	1.18
2.250	1.58	8.250	2.76	14.250	2.76	20.25	1.18
2.333	1.18	8.333	2.76	14.333	3.16	20.33	1.18
2.417	1.18	8.417	2.76	14.417	3.16	20.42	1.18
2.500	1.18	8.500	2.76	14.500	3.16	20.50	1.18
2.583	1.18	8.583	2.76	14.583	2.76	20.58	1.18
2.667	1.18	8.667	2.76	14.667	2.76	20.67	1.18
2.750	1.18	8.750	2.76	14.750	2.76	20.75	1.18
2.833	1.18	8.833	3.16	14.833	3.16	20.83	1.18
2.917	1.18	8.917	3.16	14.917	3.16	20.92	1.18
3.000	1.18	9.000	3.16	15.000	3.16	21.00	1.18
3.083	1.58	9.083	3.16	15.083	2.76	21.08	1.18
3.167	1.58	9.167	3.16	15.167	2.76	21.17	1.18
3.250	1.58	9.250	3.16	15.250	2.76	21.25	1.18
3.333	1.18	9.333	3.55	15.333	3.16	21.33	1.18
3.417	1.18	9.417	3.55	15.417	3.16	21.42	1.18
3.500	1.18	9.500	3.55	15.500	3.16	21.50	1.18
3.583	1.18	9.583	3.55	15.583	2.76	21.58	1.18
3.667	1.18	9.667	3.55	15.667	2.76	21.67	1.18
3.750	1.18	9.750	3.55	15.750	2.76	21.75	1.18
3.833	1.58	9.833	4.34	15.833	1.97	21.83	1.18
3.917	1.58	9.917	4.34	15.917	1.97	21.92	1.18
4.000	1.58	10.000	4.34	16.000	1.97	22.00	1.18
4.083	1.58	10.083	4.73	16.083	1.58	22.08	1.18
4.167	1.58	10.167	4.73	16.167	1.58	22.17	1.18
4.250	1.58	10.250	4.73	16.250	1.58	22.25	1.18
4.333	1.58	10.333	5.92	16.333	1.97	22.33	1.18
4.417	1.58	10.417	5.92	16.417	1.97	22.42	1.18
4.500	1.58	10.500	5.92	16.500	1.97	22.50	1.18
4.583	1.58	10.583	6.31	16.583	1.58	22.58	1.18
4.667	1.58	10.667	6.31	16.667	1.58	22.67	1.18
4.750	1.58	10.750	6.31	16.750	1.58	22.75	1.18
4.833	1.58	10.833	9.47	16.833	1.97	22.83	1.18
4.917	1.58	10.917	9.47	16.917	1.97	22.92	1.18
5.000	1.58	11.000	9.47	17.000	1.97	23.00	1.18
5.083	1.58	11.083	9.47	17.083	1.58	23.08	1.18
5.167	1.58	11.167	9.47	17.167	1.58	23.17	1.18
5.250	1.58	11.250	9.47	17.250	1.58	23.25	1.18
5.333	1.58	11.333	29.18	17.333	1.97	23.33	1.18
5.417	1.58	11.417	29.19	17.417	1.97	23.42	1.18
5.500	1.58	11.500	29.19	17.500	1.97	23.50	1.18
5.583	1.58	11.583	120.68	17.583	1.58	23.58	1.18

5.667	1.58	11.667	120.69	17.667	1.58	23.67	1.18
5.750	1.58	11.750	120.69	17.750	1.58	23.75	1.18
5.833	1.58	11.833	14.21	17.833	1.97		
5.917	1.58	11.917	14.20	17.917	1.97		
6.000	1.58	12.000	14.20	18.000	1.97		

Max.Eff.Inten.(mm/hr)= 120.69 459.71
over (min) 5.00 15.00
Storage Coeff. (min)= 2.38 (ii) 10.59 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.30 0.09

TOTALS

PEAK FLOW (cms)= 0.05 0.04 0.087 (iii)
TIME TO PEAK (hrs)= 11.75 11.83 11.75
RUNOFF VOLUME (mm)= 97.30 76.24 84.65
TOTAL RAINFALL (mm)= 98.30 98.30 98.30
RUNOFF COEFFICIENT = 0.99 0.78 0.86

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 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(0401) |
| IN= 2---> OUT= 1 |
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0029	0.0231	0.0110
0.0037	0.0035	0.0242	0.0115
0.0051	0.0041	0.0262	0.0125
0.0071	0.0059	0.0288	0.0139
0.0152	0.0077	0.0313	0.0151
0.0168	0.0082	0.0332	0.0159
0.0183	0.0088	0.0360	0.0169
0.0196	0.0094	0.0367	0.0172
0.0220	0.0105	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0202)	0.360	0.087	11.75	84.65
OUTFLOW: ID= 1 (0401)	0.360	0.026	12.08	76.50

PEAK FLOW REDUCTION [Qout/Qin](%)= 29.52
TIME SHIFT OF PEAK FLOW (min)= 20.00
MAXIMUM STORAGE USED (ha.m.)= 0.0123

```

-----
| ADD HYD ( 0901)|
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
ID1= 1 ( 0201):    0.32    0.026    11.92    41.71
+ ID2= 2 ( 0401):    0.36    0.026    12.08    76.50
=====
ID = 3 ( 0901):    0.68    0.051    11.92    60.13

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

V   V   I   SSSSS  U   U   A   L           (v 6.0.2006)
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

000  TTTTT  TTTTT  H   H   Y   Y   M   M   000  TM
0   0   T     T   H   H   Y   Y   MM  MM  0   0
0   0   T     T   H   H   Y     M   M   0   0
000    T     T   H   H   Y     M   M   000

```

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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 6.0\V02\voin.dat

Output filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\1a904bfd-3cf6-4fe8-ae6b-fc228a7e34c9\scen

Summary filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\1a904bfd-3cf6-4fe8-ae6b-fc228a7e34c9\scen

DATE: 08-05-2022

TIME: 08:45:20

USER:

COMMENTS: _____

** SIMULATION : K: 50 yr 24 hr scs **

MASS STORM

Ptotal=109.80 mm

Filename: C:\Users\ASchoof\AppData
Local\Temp\
fcd6b4ec-6229-4dc0-9c96-9778ea89173f\b4302855
Comments: SCS Type II 24 HR MASS CURVE

Duration of storm = 23.75 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
0.25	1.32	6.25	2.20	12.25	15.81	18.25	1.76
0.50	0.88	6.50	1.76	12.50	8.34	18.50	2.20
0.75	1.32	6.75	2.20	12.75	7.91	18.75	1.76
1.00	1.32	7.00	2.20	13.00	6.15	19.00	2.20
1.25	1.32	7.25	2.64	13.25	5.71	19.25	1.76
1.50	0.88	7.50	2.20	13.50	4.83	19.50	2.20
1.75	1.32	7.75	2.64	13.75	4.39	19.75	1.76
2.00	1.32	8.00	2.64	14.00	3.51	20.00	1.32
2.25	1.76	8.25	3.07	14.25	3.07	20.25	1.32
2.50	1.32	8.50	3.07	14.50	3.51	20.50	1.32
2.75	1.32	8.75	3.07	14.75	3.07	20.75	1.32
3.00	1.32	9.00	3.51	15.00	3.51	21.00	1.32
3.25	1.76	9.25	3.51	15.25	3.07	21.25	1.32
3.50	1.32	9.50	3.95	15.50	3.51	21.50	1.32
3.75	1.32	9.75	3.95	15.75	3.07	21.75	1.32
4.00	1.76	10.00	4.83	16.00	2.20	22.00	1.32
4.25	1.76	10.25	5.27	16.25	1.76	22.25	1.32
4.50	1.76	10.50	6.59	16.50	2.20	22.50	1.32
4.75	1.76	10.75	7.03	16.75	1.76	22.75	1.32
5.00	1.76	11.00	10.54	17.00	2.20	23.00	1.32
5.25	1.76	11.25	10.54	17.25	1.76	23.25	1.32
5.50	1.76	11.50	32.50	17.50	2.20	23.50	1.32
5.75	1.76	11.75	134.40	17.75	1.76	23.75	1.32
6.00	1.76	12.00	15.81	18.00	2.20		

CALIB

NASHYD (0201)

Area (ha)= 0.32 Curve Number (CN)= 68.7

|ID= 1 DT= 5.0 min | Ia (mm)= 4.88 # of Linear Res.(N)= 3.00
 ----- U.H. Tp(hrs)= 0.30

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

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.32	6.083	2.20	12.083	15.81	18.08	1.76
0.167	1.32	6.167	2.20	12.167	15.81	18.17	1.76
0.250	1.32	6.250	2.20	12.250	15.81	18.25	1.76
0.333	0.88	6.333	1.76	12.333	8.35	18.33	2.20
0.417	0.88	6.417	1.76	12.417	8.34	18.42	2.20
0.500	0.88	6.500	1.76	12.500	8.34	18.50	2.20
0.583	1.32	6.583	2.20	12.583	7.91	18.58	1.76
0.667	1.32	6.667	2.20	12.667	7.91	18.67	1.76
0.750	1.32	6.750	2.20	12.750	7.91	18.75	1.76
0.833	1.32	6.833	2.20	12.833	6.15	18.83	2.20
0.917	1.32	6.917	2.20	12.917	6.15	18.92	2.20
1.000	1.32	7.000	2.20	13.000	6.15	19.00	2.20
1.083	1.32	7.083	2.64	13.083	5.71	19.08	1.76
1.167	1.32	7.167	2.64	13.167	5.71	19.17	1.76
1.250	1.32	7.250	2.64	13.250	5.71	19.25	1.76
1.333	0.88	7.333	2.20	13.333	4.83	19.33	2.20
1.417	0.88	7.417	2.20	13.417	4.83	19.42	2.20
1.500	0.88	7.500	2.20	13.500	4.83	19.50	2.20
1.583	1.32	7.583	2.64	13.583	4.39	19.58	1.76
1.667	1.32	7.667	2.64	13.667	4.39	19.67	1.76
1.750	1.32	7.750	2.64	13.750	4.39	19.75	1.76
1.833	1.32	7.833	2.64	13.833	3.51	19.83	1.32
1.917	1.32	7.917	2.64	13.917	3.51	19.92	1.32
2.000	1.32	8.000	2.64	14.000	3.51	20.00	1.32
2.083	1.76	8.083	3.07	14.083	3.07	20.08	1.32
2.167	1.76	8.167	3.07	14.167	3.07	20.17	1.32
2.250	1.76	8.250	3.07	14.250	3.07	20.25	1.32
2.333	1.32	8.333	3.07	14.333	3.51	20.33	1.32
2.417	1.32	8.417	3.07	14.417	3.51	20.42	1.32
2.500	1.32	8.500	3.07	14.500	3.51	20.50	1.32
2.583	1.32	8.583	3.07	14.583	3.07	20.58	1.32
2.667	1.32	8.667	3.07	14.667	3.07	20.67	1.32
2.750	1.32	8.750	3.07	14.750	3.07	20.75	1.32
2.833	1.32	8.833	3.51	14.833	3.51	20.83	1.32
2.917	1.32	8.917	3.51	14.917	3.51	20.92	1.32
3.000	1.32	9.000	3.51	15.000	3.51	21.00	1.32
3.083	1.76	9.083	3.51	15.083	3.07	21.08	1.32
3.167	1.76	9.167	3.51	15.167	3.07	21.17	1.32
3.250	1.76	9.250	3.51	15.250	3.07	21.25	1.32
3.333	1.32	9.333	3.95	15.333	3.51	21.33	1.32
3.417	1.32	9.417	3.95	15.417	3.51	21.42	1.32

3.500	1.32	9.500	3.95	15.500	3.51	21.50	1.32
3.583	1.32	9.583	3.95	15.583	3.07	21.58	1.32
3.667	1.32	9.667	3.95	15.667	3.07	21.67	1.32
3.750	1.32	9.750	3.95	15.750	3.07	21.75	1.32
3.833	1.76	9.833	4.83	15.833	2.20	21.83	1.32
3.917	1.76	9.917	4.83	15.917	2.20	21.92	1.32
4.000	1.76	10.000	4.83	16.000	2.20	22.00	1.32
4.083	1.76	10.083	5.27	16.083	1.76	22.08	1.32
4.167	1.76	10.167	5.27	16.167	1.76	22.17	1.32
4.250	1.76	10.250	5.27	16.250	1.76	22.25	1.32
4.333	1.76	10.333	6.59	16.333	2.20	22.33	1.32
4.417	1.76	10.417	6.59	16.417	2.20	22.42	1.32
4.500	1.76	10.500	6.59	16.500	2.20	22.50	1.32
4.583	1.76	10.583	7.03	16.583	1.76	22.58	1.32
4.667	1.76	10.667	7.03	16.667	1.76	22.67	1.32
4.750	1.76	10.750	7.03	16.750	1.76	22.75	1.32
4.833	1.76	10.833	10.54	16.833	2.20	22.83	1.32
4.917	1.76	10.917	10.54	16.917	2.20	22.92	1.32
5.000	1.76	11.000	10.54	17.000	2.20	23.00	1.32
5.083	1.76	11.083	10.54	17.083	1.76	23.08	1.32
5.167	1.76	11.167	10.54	17.167	1.76	23.17	1.32
5.250	1.76	11.250	10.54	17.250	1.76	23.25	1.32
5.333	1.76	11.333	32.50	17.333	2.20	23.33	1.32
5.417	1.76	11.417	32.50	17.417	2.20	23.42	1.32
5.500	1.76	11.500	32.50	17.500	2.20	23.50	1.32
5.583	1.76	11.583	134.39	17.583	1.76	23.58	1.32
5.667	1.76	11.667	134.40	17.667	1.76	23.67	1.32
5.750	1.76	11.750	134.40	17.750	1.76	23.75	1.32
5.833	1.76	11.833	15.82	17.833	2.20		
5.917	1.76	11.917	15.81	17.917	2.20		
6.000	1.76	12.000	15.81	18.000	2.20		

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.031 (i)

TIME TO PEAK (hrs)= 11.917

RUNOFF VOLUME (mm)= 49.632

TOTAL RAINFALL (mm)= 109.471

RUNOFF COEFFICIENT = 0.453

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

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-----
| CALIB |
| STANDHYD ( 0202) |
| ID= 1 DT= 5.0 min |
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```

Area (ha)= 0.36

Total Imp(%)= 86.00 Dir. Conn.(%)= 40.00

Surface Area (ha)= IMPERVIOUS 0.31 PERVIOUS (i) 0.05

Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	0.80	0.80
Length	(m)=	90.00	90.00
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	6.083	2.20	12.083	15.81	18.08	1.76
0.167	1.32	6.167	2.20	12.167	15.81	18.17	1.76
0.250	1.32	6.250	2.20	12.250	15.81	18.25	1.76
0.333	0.88	6.333	1.76	12.333	8.35	18.33	2.20
0.417	0.88	6.417	1.76	12.417	8.34	18.42	2.20
0.500	0.88	6.500	1.76	12.500	8.34	18.50	2.20
0.583	1.32	6.583	2.20	12.583	7.91	18.58	1.76
0.667	1.32	6.667	2.20	12.667	7.91	18.67	1.76
0.750	1.32	6.750	2.20	12.750	7.91	18.75	1.76
0.833	1.32	6.833	2.20	12.833	6.15	18.83	2.20
0.917	1.32	6.917	2.20	12.917	6.15	18.92	2.20
1.000	1.32	7.000	2.20	13.000	6.15	19.00	2.20
1.083	1.32	7.083	2.64	13.083	5.71	19.08	1.76
1.167	1.32	7.167	2.64	13.167	5.71	19.17	1.76
1.250	1.32	7.250	2.64	13.250	5.71	19.25	1.76
1.333	0.88	7.333	2.20	13.333	4.83	19.33	2.20
1.417	0.88	7.417	2.20	13.417	4.83	19.42	2.20
1.500	0.88	7.500	2.20	13.500	4.83	19.50	2.20
1.583	1.32	7.583	2.64	13.583	4.39	19.58	1.76
1.667	1.32	7.667	2.64	13.667	4.39	19.67	1.76
1.750	1.32	7.750	2.64	13.750	4.39	19.75	1.76
1.833	1.32	7.833	2.64	13.833	3.51	19.83	1.32
1.917	1.32	7.917	2.64	13.917	3.51	19.92	1.32
2.000	1.32	8.000	2.64	14.000	3.51	20.00	1.32
2.083	1.76	8.083	3.07	14.083	3.07	20.08	1.32
2.167	1.76	8.167	3.07	14.167	3.07	20.17	1.32
2.250	1.76	8.250	3.07	14.250	3.07	20.25	1.32
2.333	1.32	8.333	3.07	14.333	3.51	20.33	1.32
2.417	1.32	8.417	3.07	14.417	3.51	20.42	1.32
2.500	1.32	8.500	3.07	14.500	3.51	20.50	1.32
2.583	1.32	8.583	3.07	14.583	3.07	20.58	1.32
2.667	1.32	8.667	3.07	14.667	3.07	20.67	1.32
2.750	1.32	8.750	3.07	14.750	3.07	20.75	1.32
2.833	1.32	8.833	3.51	14.833	3.51	20.83	1.32
2.917	1.32	8.917	3.51	14.917	3.51	20.92	1.32
3.000	1.32	9.000	3.51	15.000	3.51	21.00	1.32
3.083	1.76	9.083	3.51	15.083	3.07	21.08	1.32
3.167	1.76	9.167	3.51	15.167	3.07	21.17	1.32
3.250	1.76	9.250	3.51	15.250	3.07	21.25	1.32

3.333	1.32	9.333	3.95	15.333	3.51	21.33	1.32
3.417	1.32	9.417	3.95	15.417	3.51	21.42	1.32
3.500	1.32	9.500	3.95	15.500	3.51	21.50	1.32
3.583	1.32	9.583	3.95	15.583	3.07	21.58	1.32
3.667	1.32	9.667	3.95	15.667	3.07	21.67	1.32
3.750	1.32	9.750	3.95	15.750	3.07	21.75	1.32
3.833	1.76	9.833	4.83	15.833	2.20	21.83	1.32
3.917	1.76	9.917	4.83	15.917	2.20	21.92	1.32
4.000	1.76	10.000	4.83	16.000	2.20	22.00	1.32
4.083	1.76	10.083	5.27	16.083	1.76	22.08	1.32
4.167	1.76	10.167	5.27	16.167	1.76	22.17	1.32
4.250	1.76	10.250	5.27	16.250	1.76	22.25	1.32
4.333	1.76	10.333	6.59	16.333	2.20	22.33	1.32
4.417	1.76	10.417	6.59	16.417	2.20	22.42	1.32
4.500	1.76	10.500	6.59	16.500	2.20	22.50	1.32
4.583	1.76	10.583	7.03	16.583	1.76	22.58	1.32
4.667	1.76	10.667	7.03	16.667	1.76	22.67	1.32
4.750	1.76	10.750	7.03	16.750	1.76	22.75	1.32
4.833	1.76	10.833	10.54	16.833	2.20	22.83	1.32
4.917	1.76	10.917	10.54	16.917	2.20	22.92	1.32
5.000	1.76	11.000	10.54	17.000	2.20	23.00	1.32
5.083	1.76	11.083	10.54	17.083	1.76	23.08	1.32
5.167	1.76	11.167	10.54	17.167	1.76	23.17	1.32
5.250	1.76	11.250	10.54	17.250	1.76	23.25	1.32
5.333	1.76	11.333	32.50	17.333	2.20	23.33	1.32
5.417	1.76	11.417	32.50	17.417	2.20	23.42	1.32
5.500	1.76	11.500	32.50	17.500	2.20	23.50	1.32
5.583	1.76	11.583	134.39	17.583	1.76	23.58	1.32
5.667	1.76	11.667	134.40	17.667	1.76	23.67	1.32
5.750	1.76	11.750	134.40	17.750	1.76	23.75	1.32
5.833	1.76	11.833	15.82	17.833	2.20		
5.917	1.76	11.917	15.81	17.917	2.20		
6.000	1.76	12.000	15.81	18.000	2.20		

Max.Eff.Inten.(mm/hr)=	134.40	520.77
over (min)	5.00	15.00
Storage Coeff. (min)=	2.28 (ii)	10.09 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.30	0.10

TOTALS

PEAK FLOW (cms)=	0.05	0.05	0.099 (iii)
TIME TO PEAK (hrs)=	11.75	11.83	11.75
RUNOFF VOLUME (mm)=	108.47	86.93	95.53
TOTAL RAINFALL (mm)=	109.47	109.47	109.47
RUNOFF COEFFICIENT =	0.99	0.79	0.87

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 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( 0401) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
|-----|
```

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0029	0.0231	0.0110
0.0037	0.0035	0.0242	0.0115
0.0051	0.0041	0.0262	0.0125
0.0071	0.0059	0.0288	0.0139
0.0152	0.0077	0.0313	0.0151
0.0168	0.0082	0.0332	0.0159
0.0183	0.0088	0.0360	0.0169
0.0196	0.0094	0.0367	0.0172
0.0220	0.0105	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0202)	0.360	0.099	11.75	95.53
OUTFLOW: ID= 1 (0401)	0.360	0.028	12.08	87.39

PEAK FLOW REDUCTION [Qout/Qin](%)= 28.67
TIME SHIFT OF PEAK FLOW (min)= 20.00
MAXIMUM STORAGE USED (ha.m.)= 0.0137

```
-----
| ADD HYD ( 0901) |
| 1 + 2 = 3       |
|-----|
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0201):	0.32	0.031	11.92	49.63
+ ID2= 2 (0401):	0.36	0.028	12.08	87.39
=====				
ID = 3 (0901):	0.68	0.058	11.92	69.62

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
=====
=====
V  V  I  SSSSS  U  U  A  L
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
```

(v 6.0.2006)

```

      000   TTTT   TTTT   H   H   Y   Y   M   M   000   TM
      0   0   T     T   H   H   Y   Y   MM  MM   0   0
      0   0   T     T   H   H   Y     M   M   0   0
      000     T     T   H   H   Y     M   M   000

```

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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 6.0\V02\voin.dat

Output filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\fd9f9889-5fc9-4327-a8e9-dffa80490467\scen

Summary filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\fd9f9889-5fc9-4327-a8e9-dffa80490467\scen

DATE: 08-05-2022

TIME: 08:45:20

USER:

COMMENTS: _____

```

*****
** SIMULATION : L: 100 yr 24 hr scs          **
*****

```

MASS STORM	Filename: C:\Users\ASchoof\AppData\Local\Temp\
Ptotal=120.80 mm	fcd6b4ec-6229-4dc0-9c96-9778ea89173f\253c2c6e
	Comments: SCS Type II 24 HR MASS CURVE

Duration of storm = 23.75 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
0.25	1.45	6.25	2.42	12.25	17.40	18.25	1.93

0.50	0.97	6.50	1.93	12.50	9.18	18.50	2.42
0.75	1.45	6.75	2.42	12.75	8.70	18.75	1.93
1.00	1.45	7.00	2.42	13.00	6.76	19.00	2.42
1.25	1.45	7.25	2.90	13.25	6.28	19.25	1.93
1.50	0.97	7.50	2.42	13.50	5.32	19.50	2.42
1.75	1.45	7.75	2.90	13.75	4.83	19.75	1.93
2.00	1.45	8.00	2.90	14.00	3.87	20.00	1.45
2.25	1.93	8.25	3.38	14.25	3.38	20.25	1.45
2.50	1.45	8.50	3.38	14.50	3.87	20.50	1.45
2.75	1.45	8.75	3.38	14.75	3.38	20.75	1.45
3.00	1.45	9.00	3.87	15.00	3.87	21.00	1.45
3.25	1.93	9.25	3.87	15.25	3.38	21.25	1.45
3.50	1.45	9.50	4.35	15.50	3.87	21.50	1.45
3.75	1.45	9.75	4.35	15.75	3.38	21.75	1.45
4.00	1.93	10.00	5.32	16.00	2.42	22.00	1.45
4.25	1.93	10.25	5.80	16.25	1.93	22.25	1.45
4.50	1.93	10.50	7.25	16.50	2.42	22.50	1.45
4.75	1.93	10.75	7.73	16.75	1.93	22.75	1.45
5.00	1.93	11.00	11.60	17.00	2.42	23.00	1.45
5.25	1.93	11.25	11.60	17.25	1.93	23.25	1.45
5.50	1.93	11.50	35.76	17.50	2.42	23.50	1.45
5.75	1.93	11.75	147.86	17.75	1.93	23.75	1.45
6.00	1.93	12.00	17.40	18.00	2.42		

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| CALIB                                     |
| NASHYD ( 0201) | Area (ha)= 0.32 Curve Number (CN)= 68.7
| ID= 1 DT= 5.0 min | Ia (mm)= 4.88 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.30

```

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

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.45	6.083	2.42	12.083	17.40	18.08	1.93
0.167	1.45	6.167	2.42	12.167	17.40	18.17	1.93
0.250	1.45	6.250	2.42	12.250	17.40	18.25	1.93
0.333	0.97	6.333	1.93	12.333	9.18	18.33	2.42
0.417	0.97	6.417	1.93	12.417	9.18	18.42	2.42
0.500	0.97	6.500	1.93	12.500	9.18	18.50	2.42
0.583	1.45	6.583	2.42	12.583	8.70	18.58	1.93
0.667	1.45	6.667	2.42	12.667	8.70	18.67	1.93
0.750	1.45	6.750	2.42	12.750	8.70	18.75	1.93
0.833	1.45	6.833	2.42	12.833	6.77	18.83	2.42
0.917	1.45	6.917	2.42	12.917	6.76	18.92	2.42
1.000	1.45	7.000	2.42	13.000	6.76	19.00	2.42
1.083	1.45	7.083	2.90	13.083	6.28	19.08	1.93

1.167	1.45	7.167	2.90	13.167	6.28	19.17	1.93
1.250	1.45	7.250	2.90	13.250	6.28	19.25	1.93
1.333	0.97	7.333	2.42	13.333	5.32	19.33	2.42
1.417	0.97	7.417	2.42	13.417	5.32	19.42	2.42
1.500	0.97	7.500	2.42	13.500	5.32	19.50	2.42
1.583	1.45	7.583	2.90	13.583	4.83	19.58	1.93
1.667	1.45	7.667	2.90	13.667	4.83	19.67	1.93
1.750	1.45	7.750	2.90	13.750	4.83	19.75	1.93
1.833	1.45	7.833	2.90	13.833	3.87	19.83	1.45
1.917	1.45	7.917	2.90	13.917	3.87	19.92	1.45
2.000	1.45	8.000	2.90	14.000	3.87	20.00	1.45
2.083	1.93	8.083	3.38	14.083	3.38	20.08	1.45
2.167	1.93	8.167	3.38	14.167	3.38	20.17	1.45
2.250	1.93	8.250	3.38	14.250	3.38	20.25	1.45
2.333	1.45	8.333	3.38	14.333	3.87	20.33	1.45
2.417	1.45	8.417	3.38	14.417	3.87	20.42	1.45
2.500	1.45	8.500	3.38	14.500	3.87	20.50	1.45
2.583	1.45	8.583	3.38	14.583	3.38	20.58	1.45
2.667	1.45	8.667	3.38	14.667	3.38	20.67	1.45
2.750	1.45	8.750	3.38	14.750	3.38	20.75	1.45
2.833	1.45	8.833	3.87	14.833	3.87	20.83	1.45
2.917	1.45	8.917	3.87	14.917	3.87	20.92	1.45
3.000	1.45	9.000	3.87	15.000	3.87	21.00	1.45
3.083	1.93	9.083	3.87	15.083	3.38	21.08	1.45
3.167	1.93	9.167	3.87	15.167	3.38	21.17	1.45
3.250	1.93	9.250	3.87	15.250	3.38	21.25	1.45
3.333	1.45	9.333	4.35	15.333	3.87	21.33	1.45
3.417	1.45	9.417	4.35	15.417	3.87	21.42	1.45
3.500	1.45	9.500	4.35	15.500	3.87	21.50	1.45
3.583	1.45	9.583	4.35	15.583	3.38	21.58	1.45
3.667	1.45	9.667	4.35	15.667	3.38	21.67	1.45
3.750	1.45	9.750	4.35	15.750	3.38	21.75	1.45
3.833	1.93	9.833	5.32	15.833	2.42	21.83	1.45
3.917	1.93	9.917	5.32	15.917	2.42	21.92	1.45
4.000	1.93	10.000	5.32	16.000	2.42	22.00	1.45
4.083	1.93	10.083	5.80	16.083	1.93	22.08	1.45
4.167	1.93	10.167	5.80	16.167	1.93	22.17	1.45
4.250	1.93	10.250	5.80	16.250	1.93	22.25	1.45
4.333	1.93	10.333	7.25	16.333	2.42	22.33	1.45
4.417	1.93	10.417	7.25	16.417	2.42	22.42	1.45
4.500	1.93	10.500	7.25	16.500	2.42	22.50	1.45
4.583	1.93	10.583	7.73	16.583	1.93	22.58	1.45
4.667	1.93	10.667	7.73	16.667	1.93	22.67	1.45
4.750	1.93	10.750	7.73	16.750	1.93	22.75	1.45
4.833	1.93	10.833	11.60	16.833	2.42	22.83	1.45
4.917	1.93	10.917	11.60	16.917	2.42	22.92	1.45
5.000	1.93	11.000	11.60	17.000	2.42	23.00	1.45
5.083	1.93	11.083	11.60	17.083	1.93	23.08	1.45
5.167	1.93	11.167	11.60	17.167	1.93	23.17	1.45
5.250	1.93	11.250	11.60	17.250	1.93	23.25	1.45

5.333	1.93	11.333	35.75	17.333	2.42	23.33	1.45
5.417	1.93	11.417	35.76	17.417	2.42	23.42	1.45
5.500	1.93	11.500	35.76	17.500	2.42	23.50	1.45
5.583	1.93	11.583	147.85	17.583	1.93	23.58	1.45
5.667	1.93	11.667	147.86	17.667	1.93	23.67	1.45
5.750	1.93	11.750	147.86	17.750	1.93	23.75	1.45
5.833	1.93	11.833	17.41	17.833	2.42		
5.917	1.93	11.917	17.40	17.917	2.42		
6.000	1.93	12.000	17.40	18.000	2.42		

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.036 (i)
TIME TO PEAK (hrs)= 11.917
RUNOFF VOLUME (mm)= 57.713
TOTAL RAINFALL (mm)= 120.438
RUNOFF COEFFICIENT = 0.479

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

CALIB	
STANDHYD (0202)	Area (ha)= 0.36
ID= 1 DT= 5.0 min	Total Imp(%)= 86.00 Dir. Conn.(%)= 40.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.31	0.05
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	0.80	0.80
Length	(m)=	90.00	90.00
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	1.45	6.083	2.42	12.083	17.40	18.08	1.93
0.167	1.45	6.167	2.42	12.167	17.40	18.17	1.93
0.250	1.45	6.250	2.42	12.250	17.40	18.25	1.93
0.333	0.97	6.333	1.93	12.333	9.18	18.33	2.42
0.417	0.97	6.417	1.93	12.417	9.18	18.42	2.42
0.500	0.97	6.500	1.93	12.500	9.18	18.50	2.42
0.583	1.45	6.583	2.42	12.583	8.70	18.58	1.93
0.667	1.45	6.667	2.42	12.667	8.70	18.67	1.93
0.750	1.45	6.750	2.42	12.750	8.70	18.75	1.93
0.833	1.45	6.833	2.42	12.833	6.77	18.83	2.42
0.917	1.45	6.917	2.42	12.917	6.76	18.92	2.42

1.000	1.45	7.000	2.42	13.000	6.76	19.00	2.42
1.083	1.45	7.083	2.90	13.083	6.28	19.08	1.93
1.167	1.45	7.167	2.90	13.167	6.28	19.17	1.93
1.250	1.45	7.250	2.90	13.250	6.28	19.25	1.93
1.333	0.97	7.333	2.42	13.333	5.32	19.33	2.42
1.417	0.97	7.417	2.42	13.417	5.32	19.42	2.42
1.500	0.97	7.500	2.42	13.500	5.32	19.50	2.42
1.583	1.45	7.583	2.90	13.583	4.83	19.58	1.93
1.667	1.45	7.667	2.90	13.667	4.83	19.67	1.93
1.750	1.45	7.750	2.90	13.750	4.83	19.75	1.93
1.833	1.45	7.833	2.90	13.833	3.87	19.83	1.45
1.917	1.45	7.917	2.90	13.917	3.87	19.92	1.45
2.000	1.45	8.000	2.90	14.000	3.87	20.00	1.45
2.083	1.93	8.083	3.38	14.083	3.38	20.08	1.45
2.167	1.93	8.167	3.38	14.167	3.38	20.17	1.45
2.250	1.93	8.250	3.38	14.250	3.38	20.25	1.45
2.333	1.45	8.333	3.38	14.333	3.87	20.33	1.45
2.417	1.45	8.417	3.38	14.417	3.87	20.42	1.45
2.500	1.45	8.500	3.38	14.500	3.87	20.50	1.45
2.583	1.45	8.583	3.38	14.583	3.38	20.58	1.45
2.667	1.45	8.667	3.38	14.667	3.38	20.67	1.45
2.750	1.45	8.750	3.38	14.750	3.38	20.75	1.45
2.833	1.45	8.833	3.87	14.833	3.87	20.83	1.45
2.917	1.45	8.917	3.87	14.917	3.87	20.92	1.45
3.000	1.45	9.000	3.87	15.000	3.87	21.00	1.45
3.083	1.93	9.083	3.87	15.083	3.38	21.08	1.45
3.167	1.93	9.167	3.87	15.167	3.38	21.17	1.45
3.250	1.93	9.250	3.87	15.250	3.38	21.25	1.45
3.333	1.45	9.333	4.35	15.333	3.87	21.33	1.45
3.417	1.45	9.417	4.35	15.417	3.87	21.42	1.45
3.500	1.45	9.500	4.35	15.500	3.87	21.50	1.45
3.583	1.45	9.583	4.35	15.583	3.38	21.58	1.45
3.667	1.45	9.667	4.35	15.667	3.38	21.67	1.45
3.750	1.45	9.750	4.35	15.750	3.38	21.75	1.45
3.833	1.93	9.833	5.32	15.833	2.42	21.83	1.45
3.917	1.93	9.917	5.32	15.917	2.42	21.92	1.45
4.000	1.93	10.000	5.32	16.000	2.42	22.00	1.45
4.083	1.93	10.083	5.80	16.083	1.93	22.08	1.45
4.167	1.93	10.167	5.80	16.167	1.93	22.17	1.45
4.250	1.93	10.250	5.80	16.250	1.93	22.25	1.45
4.333	1.93	10.333	7.25	16.333	2.42	22.33	1.45
4.417	1.93	10.417	7.25	16.417	2.42	22.42	1.45
4.500	1.93	10.500	7.25	16.500	2.42	22.50	1.45
4.583	1.93	10.583	7.73	16.583	1.93	22.58	1.45
4.667	1.93	10.667	7.73	16.667	1.93	22.67	1.45
4.750	1.93	10.750	7.73	16.750	1.93	22.75	1.45
4.833	1.93	10.833	11.60	16.833	2.42	22.83	1.45
4.917	1.93	10.917	11.60	16.917	2.42	22.92	1.45
5.000	1.93	11.000	11.60	17.000	2.42	23.00	1.45
5.083	1.93	11.083	11.60	17.083	1.93	23.08	1.45

5.167	1.93	11.167	11.60	17.167	1.93	23.17	1.45
5.250	1.93	11.250	11.60	17.250	1.93	23.25	1.45
5.333	1.93	11.333	35.75	17.333	2.42	23.33	1.45
5.417	1.93	11.417	35.76	17.417	2.42	23.42	1.45
5.500	1.93	11.500	35.76	17.500	2.42	23.50	1.45
5.583	1.93	11.583	147.85	17.583	1.93	23.58	1.45
5.667	1.93	11.667	147.86	17.667	1.93	23.67	1.45
5.750	1.93	11.750	147.86	17.750	1.93	23.75	1.45
5.833	1.93	11.833	17.41	17.833	2.42		
5.917	1.93	11.917	17.40	17.917	2.42		
6.000	1.93	12.000	17.40	18.000	2.42		

Max.Eff.Inten.(mm/hr)= 147.86 580.65
over (min) 5.00 10.00
Storage Coeff. (min)= 2.19 (ii) 9.67 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.31 0.11

TOTALS

PEAK FLOW (cms)= 0.06 0.06 0.120 (iii)
TIME TO PEAK (hrs)= 11.75 11.75 11.75
RUNOFF VOLUME (mm)= 119.44 97.50 106.26
TOTAL RAINFALL (mm)= 120.44 120.44 120.44
RUNOFF COEFFICIENT = 0.99 0.81 0.88

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 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(0401) |
| IN= 2---> OUT= 1 |
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0029	0.0231	0.0110
0.0037	0.0035	0.0242	0.0115
0.0051	0.0041	0.0262	0.0125
0.0071	0.0059	0.0288	0.0139
0.0152	0.0077	0.0313	0.0151
0.0168	0.0082	0.0332	0.0159
0.0183	0.0088	0.0360	0.0169
0.0196	0.0094	0.0367	0.0172
0.0220	0.0105	0.0000	0.0000

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

INFLOW : ID= 2 (0202) 0.360 0.120 11.75 106.26
 OUTFLOW: ID= 1 (0401) 0.360 0.032 12.00 98.12

PEAK FLOW REDUCTION [Qout/Qin](%)= 26.56
 TIME SHIFT OF PEAK FLOW (min)= 15.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0154

```
-----
| ADD HYD ( 0901) |
| 1 + 2 = 3 |
-----
                AREA      QPEAK      TPEAK      R.V.
                (ha)      (cms)      (hrs)      (mm)
ID1= 1 ( 0201):  0.32    0.036    11.92    57.71
+ ID2= 2 ( 0401):  0.36    0.032    12.00    98.12
=====
ID = 3 ( 0901):  0.68    0.067    11.92    79.10
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
=====
=====
V   V   I   SSSSS  U   U   A   L           (v 6.0.2006)
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

000   TTTTT  TTTTT  H   H   Y   Y  M   M   000   TM
0   0   T     T   H   H   Y   Y  MM  MM  0   0
0   0   T     T   H   H   Y     M   M  0   0
000   T     T   H   H   Y     M   M  000
```

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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 6.0\V02\voin.dat

Output filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\f11f
 ce97-d19a-4b1a-a515-d166d62474c6\scen

Summary filename:

C:\Users\ASchoof\AppData\Local\Civica\XH5\083bc3bd-f268-40e8-a24a-6bb70a06f7ae\f11f
 ce97-d19a-4b1a-a515-d166d62474c6\scen

DATE: 08-05-2022

TIME: 08:45:20

USER:

COMMENTS: _____

** SIMULATION : TIMMINS **

READ STORM	Filename: C:\Users\ASchoof\AppData
	ata\Local\Temp\
	fcd6b4ec-6229-4dc0-9c96-9778ea89173f\6e58836e
Ptotal=193.00 mm	Comments: TIMMINS

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.25	15.00	3.25	3.00	6.25	43.00	9.25	13.00
0.50	15.00	3.50	3.00	6.50	43.00	9.50	13.00
0.75	15.00	3.75	3.00	6.75	43.00	9.75	13.00
1.00	15.00	4.00	3.00	7.00	43.00	10.00	13.00
1.25	20.00	4.25	5.00	7.25	20.00	10.25	13.00
1.50	20.00	4.50	5.00	7.50	20.00	10.50	13.00
1.75	20.00	4.75	5.00	7.75	20.00	10.75	13.00
2.00	20.00	5.00	5.00	8.00	20.00	11.00	13.00
2.25	10.00	5.25	20.00	8.25	23.00	11.25	8.00
2.50	10.00	5.50	20.00	8.50	23.00	11.50	8.00
2.75	10.00	5.75	20.00	8.75	23.00	11.75	8.00
3.00	10.00	6.00	20.00	9.00	23.00	12.00	8.00

CALIB	Area (ha)= 0.32	Curve Number (CN)= 68.7
NASHYD (0201)	Ia (mm)= 4.88	# of Linear Res.(N)= 3.00
ID= 1 DT= 5.0 min	U.H. Tp(hrs)= 0.30	

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

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	15.00	3.083	3.00	6.083	43.00	9.08	13.00
0.167	15.00	3.167	3.00	6.167	43.00	9.17	13.00
0.250	15.00	3.250	3.00	6.250	43.00	9.25	13.00
0.333	15.00	3.333	3.00	6.333	43.00	9.33	13.00
0.417	15.00	3.417	3.00	6.417	43.00	9.42	13.00
0.500	15.00	3.500	3.00	6.500	43.00	9.50	13.00
0.583	15.00	3.583	3.00	6.583	43.00	9.58	13.00
0.667	15.00	3.667	3.00	6.667	43.00	9.67	13.00
0.750	15.00	3.750	3.00	6.750	43.00	9.75	13.00
0.833	15.00	3.833	3.00	6.833	43.00	9.83	13.00
0.917	15.00	3.917	3.00	6.917	43.00	9.92	13.00
1.000	15.00	4.000	3.00	7.000	43.00	10.00	13.00
1.083	20.00	4.083	5.00	7.083	20.00	10.08	13.00
1.167	20.00	4.167	5.00	7.167	20.00	10.17	13.00
1.250	20.00	4.250	5.00	7.250	20.00	10.25	13.00
1.333	20.00	4.333	5.00	7.333	20.00	10.33	13.00
1.417	20.00	4.417	5.00	7.417	20.00	10.42	13.00
1.500	20.00	4.500	5.00	7.500	20.00	10.50	13.00
1.583	20.00	4.583	5.00	7.583	20.00	10.58	13.00
1.667	20.00	4.667	5.00	7.667	20.00	10.67	13.00
1.750	20.00	4.750	5.00	7.750	20.00	10.75	13.00
1.833	20.00	4.833	5.00	7.833	20.00	10.83	13.00
1.917	20.00	4.917	5.00	7.917	20.00	10.92	13.00
2.000	20.00	5.000	5.00	8.000	20.00	11.00	13.00
2.083	10.00	5.083	20.00	8.083	23.00	11.08	8.00
2.167	10.00	5.167	20.00	8.167	23.00	11.17	8.00
2.250	10.00	5.250	20.00	8.250	23.00	11.25	8.00
2.333	10.00	5.333	20.00	8.333	23.00	11.33	8.00
2.417	10.00	5.417	20.00	8.417	23.00	11.42	8.00
2.500	10.00	5.500	20.00	8.500	23.00	11.50	8.00
2.583	10.00	5.583	20.00	8.583	23.00	11.58	8.00
2.667	10.00	5.667	20.00	8.667	23.00	11.67	8.00
2.750	10.00	5.750	20.00	8.750	23.00	11.75	8.00
2.833	10.00	5.833	20.00	8.833	23.00	11.83	8.00
2.917	10.00	5.917	20.00	8.917	23.00	11.92	8.00
3.000	10.00	6.000	20.00	9.000	23.00	12.00	8.00

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.026 (i)

TIME TO PEAK (hrs)= 7.000

RUNOFF VOLUME (mm)= 116.424

TOTAL RAINFALL (mm)= 193.000

RUNOFF COEFFICIENT = 0.603

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

CALIB	
STANDHYD (0202)	Area (ha)= 0.36
ID= 1 DT= 5.0 min	Total Imp(%)= 86.00 Dir. Conn.(%)= 40.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.31	0.05
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	0.80	0.80
Length (m)=	90.00	90.00
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	15.00	3.083	3.00	6.083	43.00	9.08	13.00
0.167	15.00	3.167	3.00	6.167	43.00	9.17	13.00
0.250	15.00	3.250	3.00	6.250	43.00	9.25	13.00
0.333	15.00	3.333	3.00	6.333	43.00	9.33	13.00
0.417	15.00	3.417	3.00	6.417	43.00	9.42	13.00
0.500	15.00	3.500	3.00	6.500	43.00	9.50	13.00
0.583	15.00	3.583	3.00	6.583	43.00	9.58	13.00
0.667	15.00	3.667	3.00	6.667	43.00	9.67	13.00
0.750	15.00	3.750	3.00	6.750	43.00	9.75	13.00
0.833	15.00	3.833	3.00	6.833	43.00	9.83	13.00
0.917	15.00	3.917	3.00	6.917	43.00	9.92	13.00
1.000	15.00	4.000	3.00	7.000	43.00	10.00	13.00
1.083	20.00	4.083	5.00	7.083	20.00	10.08	13.00
1.167	20.00	4.167	5.00	7.167	20.00	10.17	13.00
1.250	20.00	4.250	5.00	7.250	20.00	10.25	13.00
1.333	20.00	4.333	5.00	7.333	20.00	10.33	13.00
1.417	20.00	4.417	5.00	7.417	20.00	10.42	13.00
1.500	20.00	4.500	5.00	7.500	20.00	10.50	13.00
1.583	20.00	4.583	5.00	7.583	20.00	10.58	13.00
1.667	20.00	4.667	5.00	7.667	20.00	10.67	13.00
1.750	20.00	4.750	5.00	7.750	20.00	10.75	13.00
1.833	20.00	4.833	5.00	7.833	20.00	10.83	13.00
1.917	20.00	4.917	5.00	7.917	20.00	10.92	13.00
2.000	20.00	5.000	5.00	8.000	20.00	11.00	13.00
2.083	10.00	5.083	20.00	8.083	23.00	11.08	8.00
2.167	10.00	5.167	20.00	8.167	23.00	11.17	8.00
2.250	10.00	5.250	20.00	8.250	23.00	11.25	8.00
2.333	10.00	5.333	20.00	8.333	23.00	11.33	8.00
2.417	10.00	5.417	20.00	8.417	23.00	11.42	8.00
2.500	10.00	5.500	20.00	8.500	23.00	11.50	8.00
2.583	10.00	5.583	20.00	8.583	23.00	11.58	8.00
2.667	10.00	5.667	20.00	8.667	23.00	11.67	8.00

2.750	10.00	5.750	20.00	8.750	23.00	11.75	8.00
2.833	10.00	5.833	20.00	8.833	23.00	11.83	8.00
2.917	10.00	5.917	20.00	8.917	23.00	11.92	8.00
3.000	10.00	6.000	20.00	9.000	23.00	12.00	8.00

Max.Eff.Inten.(mm/hr)= 43.00 177.22
over (min) 5.00 20.00
Storage Coeff. (min)= 3.59 (ii) 15.62 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.26 0.07

TOTALS

PEAK FLOW (cms)= 0.02 0.02 0.041 (iii)
TIME TO PEAK (hrs)= 6.83 7.00 7.00
RUNOFF VOLUME (mm)= 192.00 168.45 177.84
TOTAL RAINFALL (mm)= 193.00 193.00 193.00
RUNOFF COEFFICIENT = 0.99 0.87 0.92

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 69.0 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(0401) |
| IN= 2---> OUT= 1 |
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0029	0.0231	0.0110
0.0037	0.0035	0.0242	0.0115
0.0051	0.0041	0.0262	0.0125
0.0071	0.0059	0.0288	0.0139
0.0152	0.0077	0.0313	0.0151
0.0168	0.0082	0.0332	0.0159
0.0183	0.0088	0.0360	0.0169
0.0196	0.0094	0.0367	0.0172
0.0220	0.0105	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0202)	0.360	0.041	7.00	177.84
OUTFLOW: ID= 1 (0401)	0.360	0.028	7.25	169.69

PEAK FLOW REDUCTION [Qout/Qin](%)= 66.84
TIME SHIFT OF PEAK FLOW (min)= 15.00
MAXIMUM STORAGE USED (ha.m.)= 0.0133

| ADD HYD (0901) |
1 + 2 = 3

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0201):	0.32	0.026	7.00	116.42
+ ID2= 2 (0401):	0.36	0.028	7.25	169.69
=====				
ID = 3 (0901):	0.68	0.053	7.08	144.62

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

FINISH

=====

=====

Project Information

Municipality

Manning's Coefficient

IDF Curve Coefficients

Engineer Stamp



Drawing Reference

Runoff Coefficient Adjustment

Time of Concentration

15 mins

Prepared By

Reviewed By

Randy Simpson	Sept 2022
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1. Insert Note
2. Insert Note
3. Insert Note
4. Insert Note
5. Insert Note

Appendix C: Underground Storage & OGS Details



CULTEC Stormwater Design Calculator

Date: August 05, 2022

Project Information:

209806 Highway 26 - Roadway

Calculations Performed By:

Andrew Schoof
Tatham Engineering

RECHARGER 280HD



Recharger 280HD Chamber Specifications

Height	673	mm
Width	1194	mm
Length	2.44	meters
Installed Length	2.13	meters
Bare Chamber Volume	1.20	cu. meters
Installed Chamber Volume	1.85	cu. meters

Breakdown of Storage Provided by Recharger 280HD Stormwater System

Within Chambers	107.41	cu. meters
Within Feed Connectors	0.18	cu. meters
Within Stone	64.04	cu. meters
Total Storage Provided	171.6	cu. meters
Total Storage Required	160.00	cu. meters

Materials List

Recharger 280HD

Total Number of Chambers Required	88	pieces
Separator Row Chambers	11	pieces
Starter Chambers	8	pieces
Intermediate Chambers	72	pieces
End Chambers	8	pieces
HVLV FC-24 Feed Connectors	14	pieces
CULTEC No. 410 Non-Woven Geotextile	771	sq. meters
CULTEC No. 4800 Woven Geotextile	47	meters
Stone	160	cu. meters

Separator Row Qty Included in Total

Based on 2 Internal Manifolds

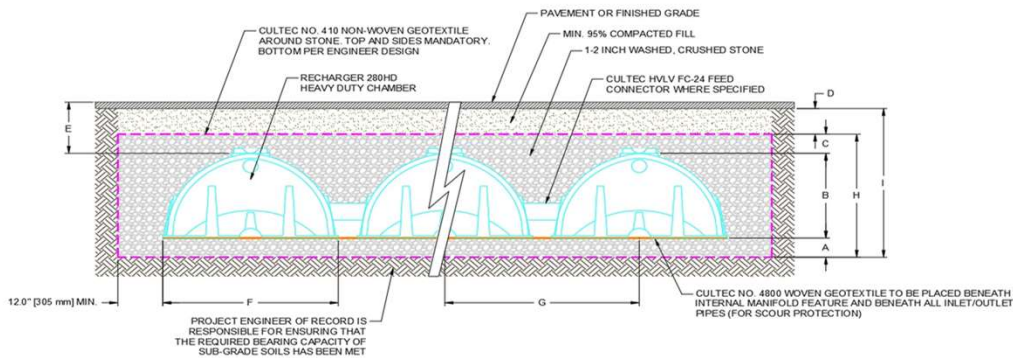
Bed Detail



Bed detail for reference only. Not project specific. Not to scale.

Bed Layout Information

Number of Rows Wide	8	pieces
Number of Chambers Long	11	pieces
Chamber Row Width	10.62	meters
Chamber Row Length	23.77	meters
Bed Width	11.23	meters
Bed Length	24.38	meters
Bed Area Required	273.75	sq. meters
Length of Separator Row	23.77	meters



Conceptual graphic only. Not job specific.

Cross Section Table Reference

A	Depth of Stone Base	152	mm
B	Chamber Height	673	mm
C	Depth of Stone Above Units	152	mm
D	Depth of 95% Compacted Fill	600	mm
E	Max. Depth Allowed Above the Chamber	3.66	meters
F	Chamber Width	1194	mm
G	Center to Center Spacing	1.35	meters
H	Effective Depth	0.98	meters
I	Bed Depth	1.23	meters

Stormceptor®EF Sizing Report

STORMCEPTOR®

ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

03/10/2022

Province:	Ontario	Project Name:	209806 Highway 26
City:	Collingwood	Project Number:	121258
Nearest Rainfall Station:	OWEN SOUND MOE	Designer Name:	John Birchard
Climate Station Id:	6116132	Designer Company:	Tatham Engineering
Years of Rainfall Data:	40	Designer Email:	jbirchard@tathameng.com
		Designer Phone:	705-444-2565
Site Name:	209806 Highway 26	EOR Name:	
		EOR Company:	
Drainage Area (ha):	0.44	EOR Email:	
% Imperviousness:	62.00	EOR Phone:	

Runoff Coefficient 'c': 0.67

Particle Size Distribution:	Fine
Target TSS Removal (%):	80.0

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	12.43
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	Yes
Upstream Orifice Control Flow Rate to Stormceptor (L/s):	73.00
Peak Conveyance (maximum) Flow Rate (L/s):	73.00
Site Sediment Transport Rate (kg/ha/yr):	

**Net Annual Sediment
(TSS) Load Reduction
Sizing Summary**

Stormceptor Model	TSS Removal Provided (%)
EFO4	83
EFO6	91
EFO8	95
EFO10	97
EFO12	99

Recommended Stormceptor EFO Model: **EFO4**
Estimated Net Annual Sediment (TSS) Load Reduction (%): **83**
Water Quality Runoff Volume Capture (%): **> 90**

Stormceptor® EF Sizing Report

THIRD-PARTY TESTING AND VERIFICATION

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

PERFORMANCE

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

PARTICLE SIZE DISTRIBUTION (PSD)

► The **Canadian ETV PSD** shown in the table below was used, 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

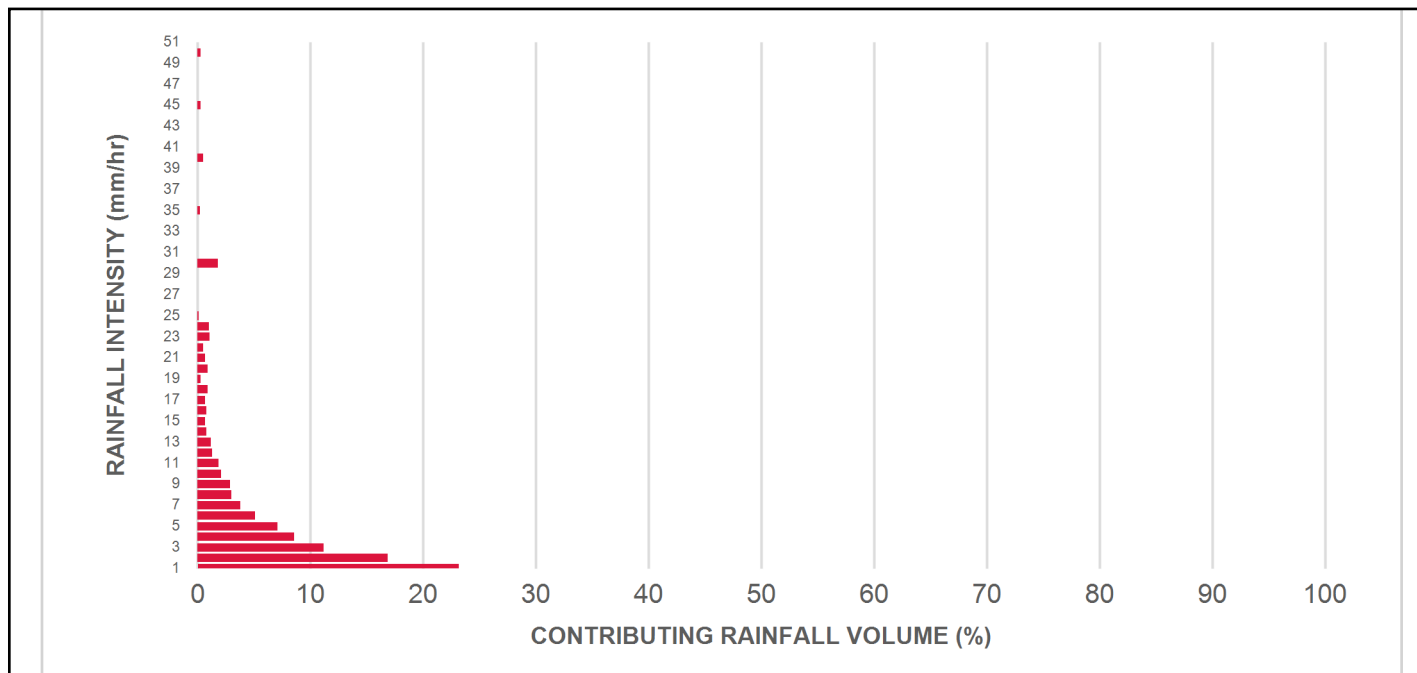
Upstream Flow Controlled Results

Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
1	23.2	23.2	0.82	49.0	41.0	100	23.2	23.2
2	16.9	40.0	1.64	99.0	82.0	91	15.4	38.6
3	11.2	51.3	2.47	148.0	123.0	87	9.7	48.3
4	8.6	59.9	3.29	197.0	164.0	82	7.1	55.4
5	7.1	67.0	4.11	247.0	205.0	77	5.5	60.9
6	5.1	72.2	4.93	296.0	247.0	75	3.9	64.8
7	3.8	76.0	5.75	345.0	288.0	74	2.8	67.6
8	3.0	79.0	6.58	395.0	329.0	72	2.2	69.7
9	2.9	81.9	7.40	444.0	370.0	70	2.0	71.8
10	2.1	83.9	8.22	493.0	411.0	68	1.4	73.2
11	1.9	85.8	9.04	543.0	452.0	66	1.3	74.4
12	1.3	87.1	9.86	592.0	493.0	65	0.8	75.3
13	1.2	88.4	10.69	641.0	534.0	63	0.8	76.0
14	0.8	89.2	11.51	690.0	575.0	61	0.5	76.6
15	0.7	89.9	12.33	740.0	616.0	60	0.4	77.0
16	0.8	90.7	13.15	789.0	658.0	60	0.5	77.4
17	0.7	91.4	13.97	838.0	699.0	59	0.4	77.9
18	0.9	92.2	14.80	888.0	740.0	59	0.5	78.4
19	0.3	92.6	15.62	937.0	781.0	59	0.2	78.6
20	0.9	93.5	16.44	986.0	822.0	58	0.6	79.1
21	0.7	94.3	17.26	1036.0	863.0	58	0.4	79.6
22	0.5	94.8	18.08	1085.0	904.0	58	0.3	79.9
23	1.1	95.9	18.91	1134.0	945.0	58	0.6	80.5
24	1.0	96.9	19.73	1184.0	986.0	57	0.6	81.0
25	0.1	97.0	20.55	1233.0	1027.0	57	0.1	81.1
30	1.8	98.8	24.66	1480.0	1233.0	52	0.9	82.0
35	0.2	99.0	28.77	1726.0	1438.0	48	0.1	82.1
40	0.5	99.5	32.88	1973.0	1644.0	41	0.2	82.3
45	0.3	99.7	36.99	2219.0	1849.0	37	0.1	82.4
50	0.3	100.0	41.10	2466.0	2055.0	33	0.1	82.5
Estimated Net Annual Sediment (TSS) Load Reduction =								83 %

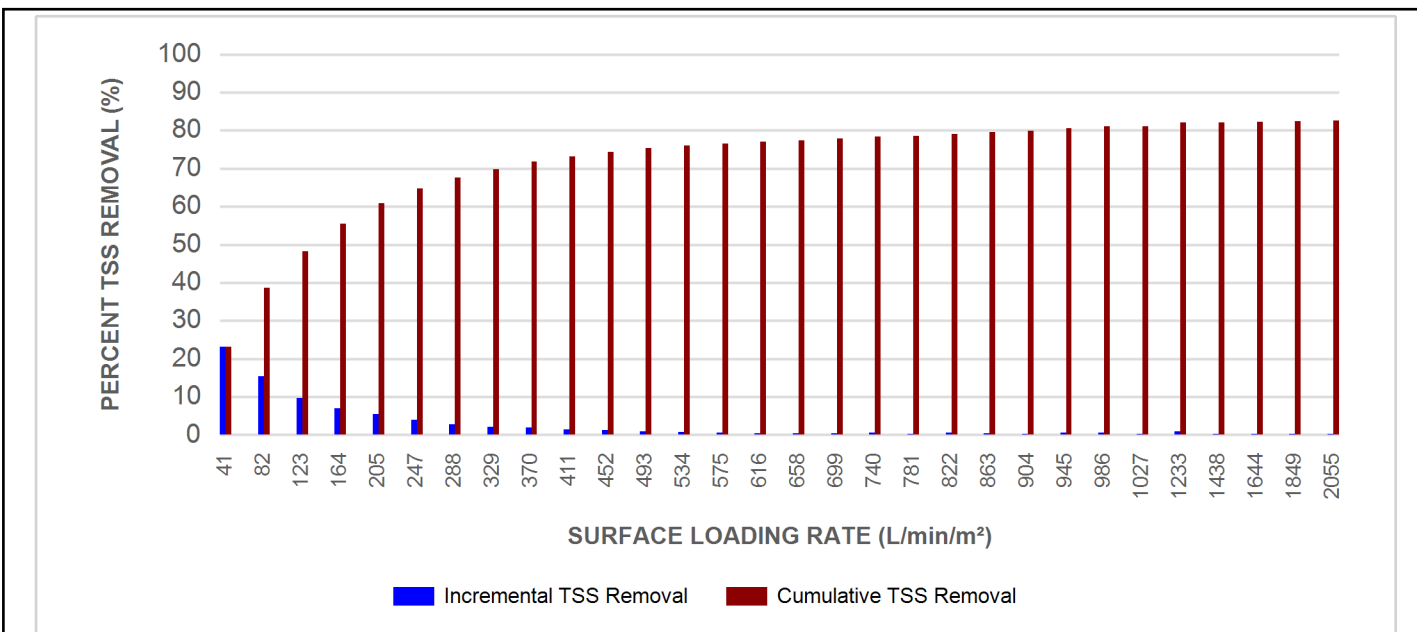
Climate Station ID: 6116132 Years of Rainfall Data: 40

Stormceptor®EF Sizing Report

RAINFALL DATA FROM OWEN SOUND MOE RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Stormceptor® EF Sizing Report

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

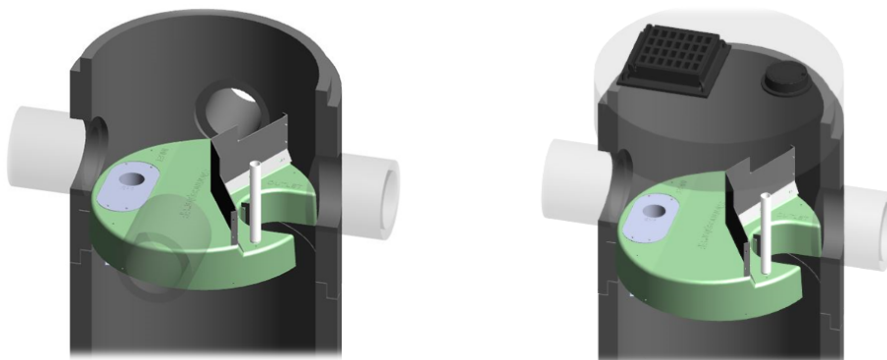
► **Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test 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

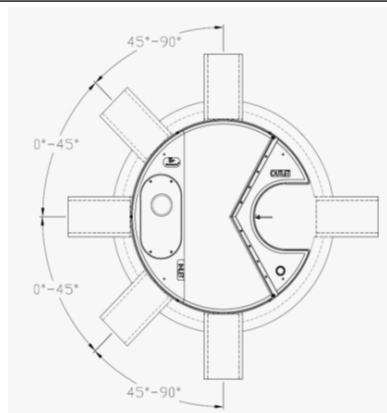
► **Stormceptor® EF and EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend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



Stormceptor® EF Sizing Report



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)	(ft³)	(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/ft³)

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>

Stormceptor®EF Sizing Report

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

Stormceptor®EF Sizing Report

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, and only rainfall intensities greater than 0.5 mm/hr shall be included in sizing calculations. 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/m² to 1400 L/min/m², 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/m² and 1400 L/min/m² 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/m² shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m². No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m².

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m² shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m², and shall be calculated using a simple proportioning formula, with 1400 L/min/m² 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/m².

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/m².

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

Stormceptor®EF Sizing Report

surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to assess whether light liquids captured after a spill are effectively retained at high flow rates.

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