May 26, 2025
Project No. 2402381

VIA EMAIL: chad.aitken@bgcdsb.org

Chad Aitken
Bruce Grey Catholic District Schoolboard
799 - 16th Avenue
Hanover, ON N4N 3A1

Re: Pre-Consultation Comments
New School Site
28th Avenue East, Owen Sound

Dear Chad:

To address the Pre-Consultation comments provided by the City in their previous response (dated December 7, 2023), we provide the following to address the items that you identified and provided to use. Please see the respective Items below:

1) Petroleum Well

A petroleum well, identified as the '*Ormiston Well*' is noted on the Ministry's Petroleum Well database and the associated mapping. The identified well is approximately 900 m east of the subject property and beyond Bothwell & Telfer Creeks. Based on a review of the mapping available, the historical Petroleum Well appears to be located on the property described as 203414 Highway 26; being Part Lot 18, Concession 10 East, in the Municipality of Meaford. We previously completed a detailed review and search of the available MECP Well Record Inventory and the Petroleum Well mapping and there are no registered "petroleum wells" identified onsite in the MECP databases. Additionally, we completed the previous Phase One ESA, including an onsite inspection, which did not identify any evidence of current or historical petroleum wells. Furthermore, in my experience the historical installation of exploration wells on a property (i.e., petroleum, oil, and gas wells) is accompanied by a formal lease or drilling exploration agreement that shows up in the historical Title Search documents for the subject property where the well was installed. No evidence of a drilling agreement or property lease by an exploration company is available in the Title Search that was completed as part of the Phase One ESA. Based on the onsite conditions, multiple site visits, and the historical document review, there is no evidence of a Petroleum Well located on the property.

2) Record of Site Condition Discussion

Based on the requirements of the *Record of Site Condition Regulation* (i.e., Ontario Regulation 153/04 as amended), I provide the following discussion for your reference. The following is provided based on our understanding of O.Reg. 153/04, direct project related experience, and on the previous application of the regulatory requirements.

The Regulation categorizes land uses in three separate classifications as follows (from least sensitive to most sensitive):

1. Industrial/Commercial/Community;
2. Residential/Parkland/Institutional;
3. Agricultural/Other

As noted in the previous Phase One ESA, the need/regulatory trigger for a Record of Site Condition (RSC) is based on a change of land use to a more sensitive use – e.g., changing from an Industrial or Commercial land use to a

Residential or Institutional use would trigger the need for an RSC. This change is dependent on the actual "use" of the property and is regardless of zoning.

Based on the information that has been provided to us and on a detailed review of the actual property use, it is our understanding that the subject property has most recently had an Agricultural or Other use. Additionally, where a property is vacant or unused (i.e., doesn't have a "current" use) the Regulation specifies that the actual use is determined by the following:

> ***Unused property, most recent use***
>
> ***2.*** *For the purposes of this Regulation, if a property is unused, the property is deemed to have the type of property use to which the property was most recently put. O. Reg. 153/04, s. 2.*

Further, the Regulation specifies that where there is a mixed use property (i.e., Commercial/Residential), the more sensitive of the 2 uses is considered to apply. Therefore, based on our interpretation of the regulatory requirements noted above, it appears relatively clear that the most recent use of the property would fall under the Agricultural/Other Use as per the land use categories established in the Regulation.

To clarify the regulatory requirements regarding zoning and the requirements of the Regulation pertaining to current zoning, I provide the following:

> ***PART IV***
> ***CHANGE OF PROPERTY USE***
>
> ***Definitions for the Act, industrial, commercial, residential and parkland use***
>
> ***11.*** *(1) For the purposes of section 168.3.1 of the Act, "industrial use", "commercial use", "residential use" and "parkland use", in relation to the use of property, have the meanings given by subsection 1 (3) of this Regulation. O. Reg. 153/04, s. 11 (1).*
>
> *(2) For the purposes of the Act and this Regulation, a reference to a change in the use of a property does not include a reference to a change in the zoning of the property under a municipal by-law. O. Reg. 153/04, s. 11 (2).*

In consideration of the above noted information and based on the intended use of the property as a school (i.e., Institutional property use), it is our interpretation that no Record of Site Condition would be required for the planned land use at the subject property. The proposed development does not represent a change in use to a more sensitive land use as defined by O.Reg. 153/04.

3) Hydrogeological Study

A Hydrogeologic Study is unnecessary since there will be no taking of groundwater, and no on-site sewage system. The geotechnical report identifies that groundwater elevations on-site will be well below the planned footing elevations.

4) Heliport Pad

A helipad approach pathway is a quadrilateral area that starts at the edge of the heliport safety area and extends outwards, ensuring a safe flight path for the helicopter. The width of the pathway increases by a factor of 0.15D,

where D is the distance from the helipad. The vertical pathway transitions to a 12% slope. The pathway must be clear of all obstacles that could endanger the helicopter's flight.

The site is about 1.5 km east and 1.5 km north of the helipad and, therefore, the school will be well beyond the 225 m horizontal and well below the 180 m vertical flight path. Further, the hospital itself is on a line between the helipad and the school site.

5) Drainage Report

A Phase 1 Drainage Report is attached, which addresses the proposed pre-grading drainage conditions, including management of flows within the existing westerly watercourse. The existing flood plane is intended to be slightly shifted to accommodate two planned playing fields, but the functionality will not change as there would be no impact to flood flow conveyance or backwater effects onto upstream landowners.

Should you require any further input, please do not hesitate to contact us.

Yours truly,

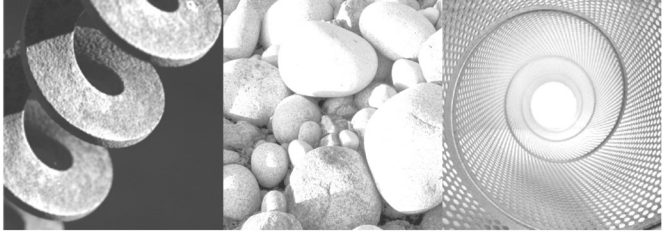
GEI Consultants Canada Ltd.

John Slocombe, P.Eng.
JS/AB:clw

Al Bringleson, P.Eng.

Encl. "2402381 - Proposed Diversion Channel Report - 28th Ave East, Owen Sound - May 26, 2025"

cc: File No. 2402381



New Owen Sound Catholic District Secondary School

Phase 1 Drainage Report

28th Ave East, Owen Sound, Ontario

Submitted to:
Chad Aitken
Manager of Facility Services - Construction
Bruce Grey Catholic District School Board
799 16th Avenue
Hanover, ON, N4N 3A1

Submitted by:
GEI Consultants Canada Ltd.
1260 2nd Ave East
Owen Sound, ON, N4K 2J3
519.376.1805

May 26, 2025
Project No. 2402381

Christopher Slocombe B.Eng.
Project Professional

John Slocombe, P.Eng.
Senior Project Manager

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Appendices

1. Introduction

The Bruce Grey Catholic District School Board (BGCDSB) is proposing to construct a new school on lands south of 16th Street East and west of 28th Avenue East, where shown in **Figure 1 – Appendix A**. As an initial phase 1 to the development, the BGCDSB intends to complete off-site servicing requirements and to pre-grade the site, including a construction road, to support building construction and site development as a second phase.

The existing on-site terrain is rolling, with two drainage features traversing the site. The easterly drainage feature is not regulated by GSCA but provides a spill route from a groundwater contact pond on lands to the north, southerly across the site. Flows continue southerly to the northerly ditch along Grey Road 5 (8th Street East), then confluence with other flows from south of 8th Street East flowing, then northerly within a GSCA regulated watercourse from south to north across the site, then bending westerly to the County Rail Trail drainage system. These existing drainage features are illustrated in **Figure 2 – Appendix A**.

The BGCDSB intends to manage appropriate flows within these drainage features to accommodate the planned school development. On behalf of the BGCDSB, GEI Consultants Canada Ltd. (GEI) has prepared a pre-grading plan and details to describe the planned phase 1 pre-grading and to evaluate the sizing for new infrastructure and planned modifications to existing drainage. The following sections discuss the phase 1 drainage design for the various drainage systems/catchment areas.

2. Drainage Philosophy

The Rational Method was used for each of the individual catchments as stated in the Owen Sound Site Development Engineering Standards. Calculations for each individual catchment can be found in **Appendix B**.

Under existing conditions, the site is primarily classified as a "Green Field" apart from catchment A1, as it includes a 880 m^2 impervious area along 28th Avenue East. Catchment A1 has an impervious area of 5.5% and, therefore, linear interpolation was used to obtain a "C" Value from the City's Site Development Engineering Standards - Runoff Coefficient Chart. A "C" Value of 0.24 was obtained based on this linear interpolation.

Due to the rolling topography of the Site, existing drainage patterns can be sub-divided into four on-site catchment areas, as follows:

Table 1: Existing Rational Method Calculations

Existing Catchment	Area (ha) % imp	Site Generated Runoff Existing Condition (m^3/s)						Outlet Location
		2yr	5yr	10yr	25yr	50yr	100yr	
A1	5.5	0.01	0.01	0.02	0.02	0.02	0.02	Easterly across Grey Road 5 via 600 Ø CSP
A2	Ø	0.01	0.02	0.02	0.02	0.02	0.02	Southerly in east drainage feature
A3	Ø	0.02	0.03	0.03	0.03	0.04	0.04	Northerly in west watercourse
A4	Ø	0.01	0.01	0.01	0.01	0.01	0.01	Rail Trail east ditch

Like existing conditions, phase 1 pre-grading catchments are primarily classified as a "Green Field" apart from catchment B1, as it includes a 1600 m^2 impervious area along the proposed 28th Avenue East. Catchment B1 has an impervious area of 21.6% and, therefore, linear interpolation was used to obtain a "C" Value from the City's Site Development Engineering Standards - Runoff Coefficient Chart. A "C" Value of 0.35 was obtained based on this linear interpolation.

The phase 1 pre-grading plan considers the following alterations to the pre-development catchment areas:

Table 2: Phase 1 Pre-Grading Rational Method Calculations

Phase 1 Pre-Graded Catchment	Area (ha) % imp	Site Generated Runoff Phase 1 Pre-Development Condition (m^3/s)						Outlet Location
		2yr	5yr	10yr	25yr	50yr	100yr	
B1	21.6	0.01	0.01	0.01	0.01	0.01	0.01	Easterly across Grey Road 5 via 600 Ø CSP
B2	Ø	0.01	0.01	0.01	0.01	0.01	0.01	Southerly in east drainage feature
B3	Ø	**0.03** (0.02)	**0.04** (0.03)	**0.05** (0.03)	**0.05** (0.03)	**0.05** (0.04)	**0.06** (0.04)	Northerly in west watercourse
B4	Ø	0.01	0.01	0.01	0.01	0.01	0.01	Rail Trail east ditch

Note:

* (0.03) = Pre-Development Conditions

* Bolded values represent an increase from the pre-development conditions

Figure 3 – Appendix A visually represents both the existing and phase 1 pre-grading catchments

With this plan:

i) Flows directed from the Site easterly to the west ditch of Grey Road 5 would be reduced,
ii) Flows directed southerly in the east drainage feature would be maintained,
iii) Site-generated flows directed to the westerly watercourse would increase slightly but would not affect the actual peak of flow that would arrive later from the larger off-site rural up-gradient catchment area (see Section 3.0),
iv) Flows to the east Rail Trail ditch would be maintained to the confluence point.

A Phase 2 - Stormwater Management (SWM) Report will be prepared to address development-related flows for the Phase 2 school building and site development planned for 2027.

3. South-North Westerly Watercourse

The contributing drainage area was mapped using the Ontario Watershed Information Tool (OWIT) combined with a site survey of the subject property. Under existing conditions there are five sub-catchments that contribute to the overall drainage area of approximately 64.49 ha. Existing catchments and calculations can be found in **Appendix B.**

Under phase 1 pre-grading conditions, the catchment area draining easterly off-site to 28th Avenue East (A1 to B1) will be reduced by 0.86 ha. Phase 1 pre-grading conditions will decrease the catchment area to the easterly watercourse (A2 to B2) by 1.46 ha and increase the catchment area to the westerly watercourse (A3 to B3) by 1.89 ha. Further, pre-grading conditions will slightly decrease the catchment

area to the rail-trail (A4 to B4) by 0.1 ha. When viewing the existing and pre-grading catchment areas, the drainage area from the site to the westerly watercourse will increase by 0.43 ha.

Visual Otthymo was used to calculate the peak rainfall flows generated by the pre- and post-development conditions. The following table summarizes the calculated flows for various rainfall return events, including the Timmins Regional storm, based on runoff modelling provided in **Appendix B**.

Based on areal imagery and site inspections, design flows are reduced by a factor of 64% to account for significant wetland area (4.7 ha) north of 8th Street East and south of the subject property along the east side of the rail trail. MTO Hydrotechnical Design Chart 1.06 (January 2023) can be found in **Appendix B**.

The Phase 1 post-development peak flow rates within the westerly watercourse also are noted to demonstrate no net increase to peak flows.

Table 3: Ex Overall Catchment Peak Flows

Rainfall Return Frequency (CA 100)	Pre-Development Flows (m^3/s)	Phase 1 Post-Development Flows (m^3/s)	Design Flow (m^3/s)
2-Year	0.40	0.40	0.26
5-Year	0.69	0.69	0.44
25-Year	1.28	1.28	0.82
100-Year	1.80	1.80	1.15
Timmins	3.7	3.7	2.40

The pre-grading work planned for the site will include levelling the existing rolling landscape into two tiers. The upper tier, near 28th Avenue East, will be graded flat to support the new school building. An intermediate slope will descend westerly to a lower level to accommodate two outdoor sports fields. The two sports fields will be oriented to maintain the main channel of the existing westerly watercourse; however, the banks of the watercourse will be modified to fit the playing fields while maintaining flood flow conveyance.

The existing watercourse has a longitudinal gradient of about 0.3% and a 2.0 m bottom width, with about 20:1 side slopes on each side. For a manning coefficient of n = 0.035, the existing channel will convey the Timmins design flood flow of 2.40 m^3/s at a depth of 0.42 m and a velocity of 0.54m/s, with a top flow width of about 19 m.

The proposed channel section will maintain the existing longitudinal gradient and slightly increase the bottom width from 2 m to 3 m. The easterly side slope will be increased to 5:1 and the westerly side slope will be flattened to 30:1 (3%). With a manning coefficient of n = 0.035, the proposed channel will convey the Timmins design flow of 2.40 m^3/s at a depth of 0.42 m, with a top flow width of about 18 m and a velocity of 0.55 m/s. As grassed waterways can withstand velocities up to 1.2 m/s, a grass-lined section would continue to be appropriate to prevent erosion.

Two 2.4 m x 1.2 m pre-cast concrete box culverts are proposed in series: one for a public trail connection along the new 15th Street East Right-of-Way from the Site to the Rail Trail, and the second to for school-use connection between playing fields. The 2.40 m^3/s Timmins design flood flow would rise to a flow depth of 0.46 m through the box culverts, which would locally raise the flood line by about 0.04 m for about 16 m upgradient. This local flood line increase would be maintained well within the limits of the School Board

property and not affect upstream landowners. 300 mm Ø riprap is planned to be installed at the inlet and outlet to each box culvert to dissipate the localized increased velocities.

Yours truly,

GEI Consultants Canada Ltd.

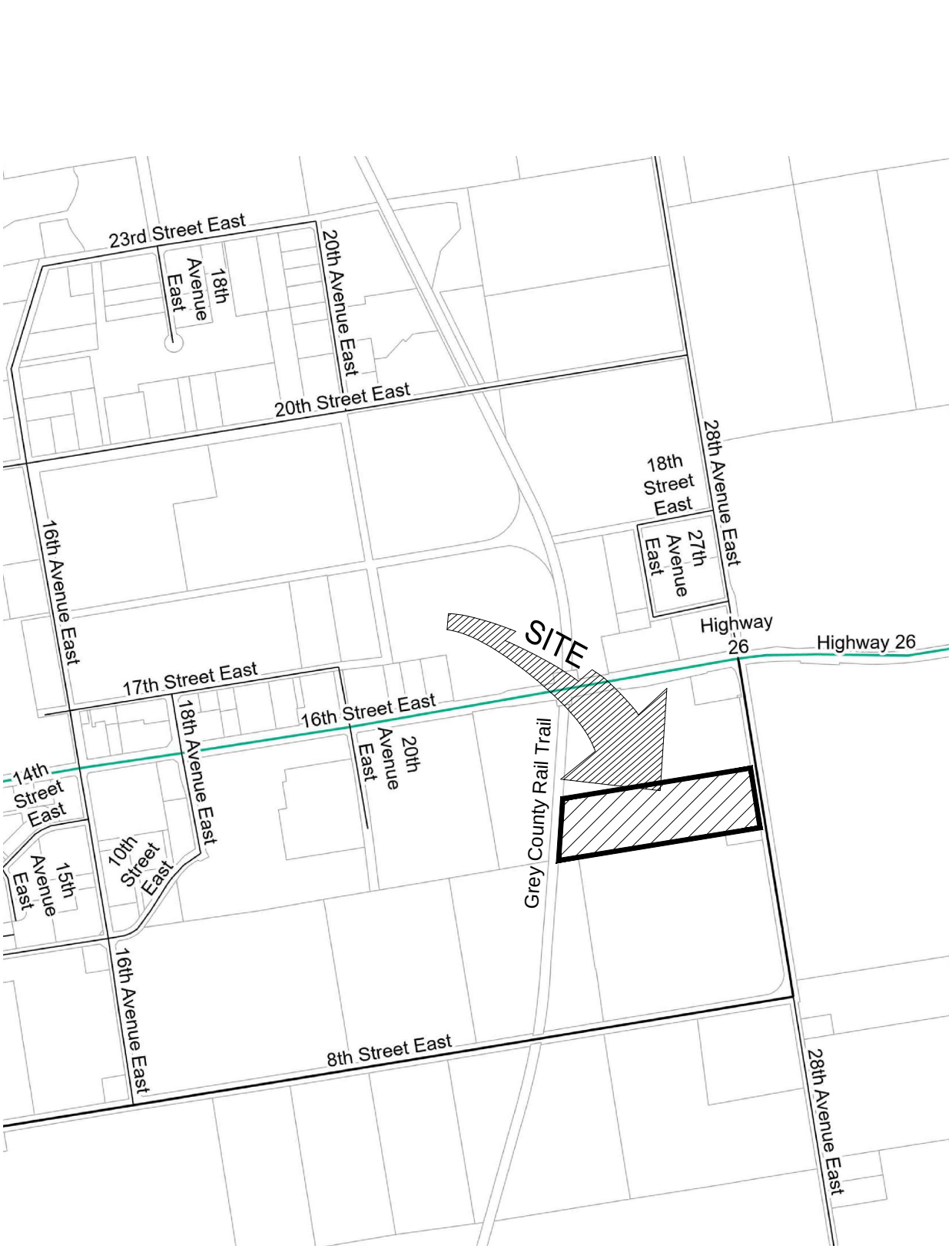
Christopher Slocombe, B.Eng.
Project Professional

John Slocombe, P.Eng.
Senior Project Manager

CS:js

Appendix A Figures

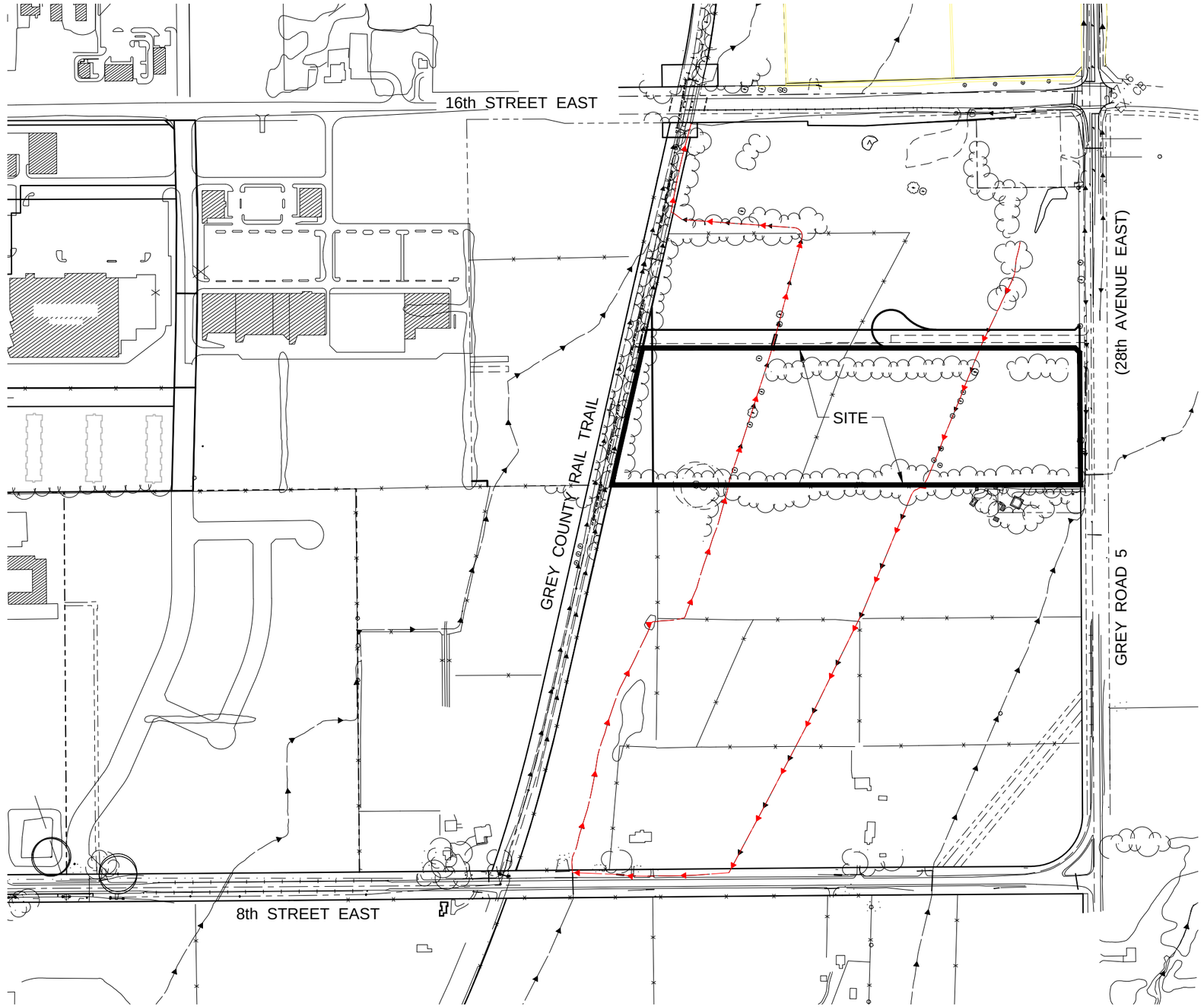
A.1. Site Location Map



Grey Road 5 Road Improvements Proposed High School Owen Sound, Ontario	GEI Consultants Canada	SITE LOCATION MAP
Bruce Grey Catholic District School Board Hanover, Ontario	Project 2402381	APRIL 2025 Fig. 1

BOERS, KEN C:\AutoCAD Drawings\2402381 GP3-K.dwg - 4/29/2025

A.2. Existing Watercourse



SCALE: 1:5000

Grey Road 5 Road Improvements
Proposed High School
Owen Sound, Ontario

Bruce Grey Catholic District School Board
Hanover, Ontario

GEI Consultants Canada

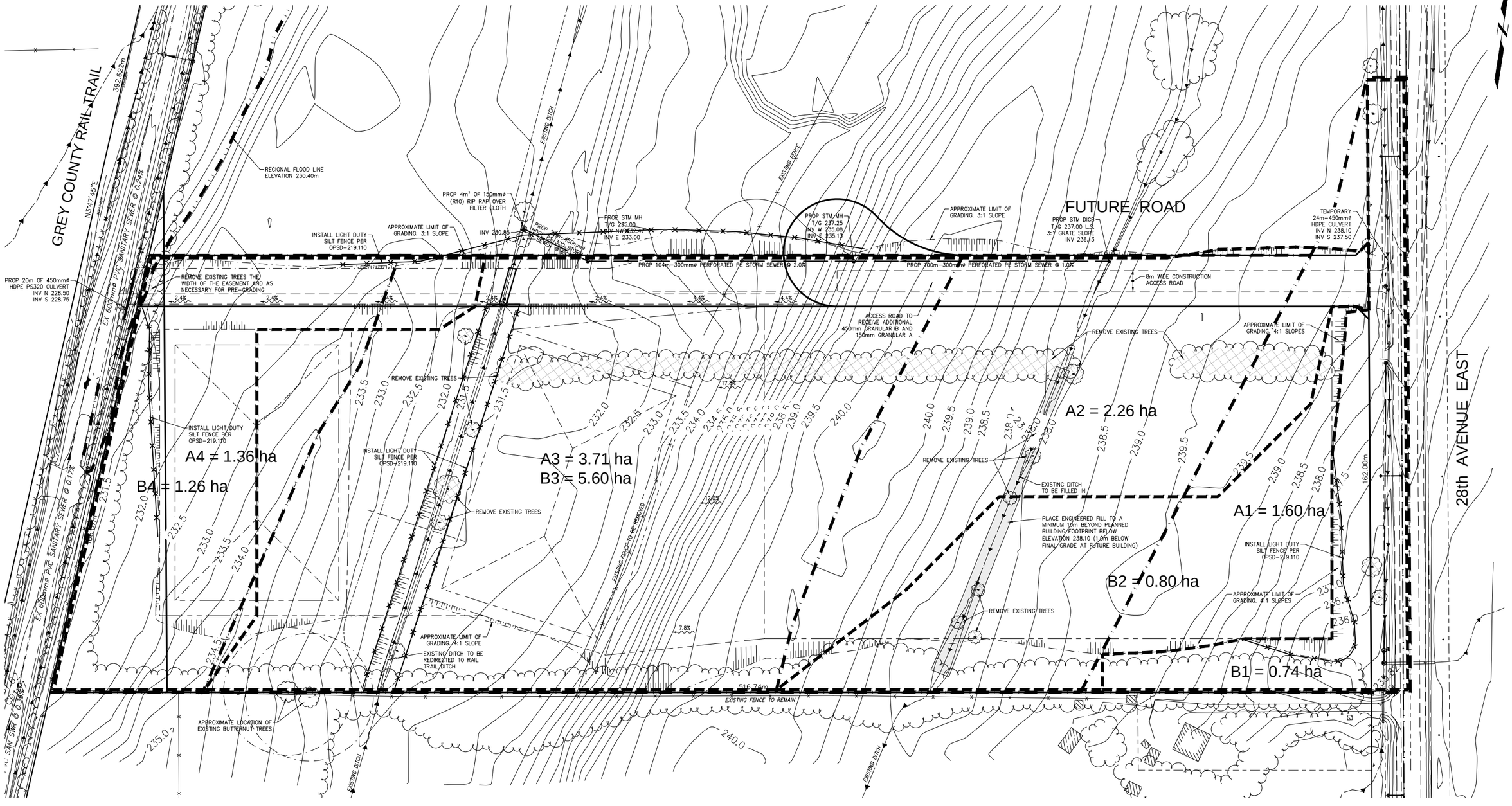
EXISTING WATERCOURSE

Project 2402381

APRIL 2025 Fig. 2

BOERS, KEN C:\AutoCAD Drawings\2402381 GP3-K.dwg - 4/29/2025

A.3. Pre & Post Development Catchment Areas



LEGEND

EXISTING CATCHMENT AREA

PRE-GRADING PROPOSED CATCHMENT AREA
B1 TO 28th AVENUE EAST
B2 TO SOUTH DITCH
B3 TO NORTH DITCH
B4 TO RAIL TRAIL

SCALE: 1:1500

Grey Road 5 Road Improvements
Proposed High School
Owen Sound, Ontario

Bruce Grey Catholic District School Board
Hanover, Ontario

GEI Consultants Canada

PRE & POST DEVELOPMENT CATCHMENT AREAS

Project 2402381 | APRIL 2025 | Fig. 3

Appendix B Runoff Modelling

B.1. Rational Method Calculations

Project Name: New School Site
Project No.: 2402381
Designed By: CS
Reviewed By: JS
Revison No.: 1
Date: May 1, 2025

GEI Consultants

Note: Rational Method is based on Owen Sound Engineering Design Standards (2021)

Runoff Coefficients:

LAND USE	"C" VALUE	% IMPERVIOUS	ENTRY TIME (min)
Green Field, Parks	0.2	0	10
Unimproved	0.30	14	10
Single Family	0.6	57	10
Semi-detached	0.7	71	10
Townhouses	0.75	79	10
Apartments, schools, churches	0.75	79	5
Industrial	0.9	85	5
Commercial	0.9	85	5

Intensity/ Durtion

Design Storm	A	B	hrs
2 yr	22.3	-0.714	3
5 yr	29.1	-0.724	3
10 yr	33.6	-0.729	3
25 yr	39.3	-0.734	3.5
50 yr	43.5	-0.736	3.5
100 yr	47.7	-0.738	3.5

Catchment A1

Area (ha) **1.60**
"C" Value **0.24**

Design Storm	Intensity (mm/hr)	Peak Flow (m3/hr)
2 yr	10.18	0.01
5 yr	13.14	0.01
10 yr	15.08	0.02
25 yr	15.67	0.02
50 yr	17.3	0.02
100 yr	18.92	0.02

Catchment A2

Area (ha) **2.26**
"C" Value **0.20**

Design Storm	Intensity (mm/hr)	Peak Flow (m3/hr)
2 yr	10.18	0.01
5 yr	13.14	0.02
10 yr	15.08	0.02
25 yr	15.67	0.02
50 yr	17.3	0.02
100 yr	18.92	0.02

Catchment A3

Area (ha) **3.71**

"C" Value **0.20**

Design Storm	Intensity (mm/hr)	Peak Flow (m3/hr)
2 yr	10.18	0.02
5 yr	13.14	0.03
10 yr	15.08	0.03
25 yr	15.67	0.03
50 yr	17.3	0.04
100 yr	18.92	0.04

Catchment A4

Area (ha) **1.36**

"C" Value **0.20**

Design Storm	Intensity (mm/hr)	Peak Flow (m3/hr)
2 yr	10.18	0.01
5 yr	13.14	0.01
10 yr	15.08	0.01
25 yr	15.67	0.01
50 yr	17.3	0.01
100 yr	18.92	0.01

Catchment B1

Area (ha) **0.74**

"C" Value **0.35**

Design Storm	Intensity (mm/hr)	Peak Flow (m3/hr)
2 yr	10.18	0.01
5 yr	13.14	0.01
10 yr	15.08	0.01
25 yr	15.67	0.01
50 yr	17.3	0.01
100 yr	18.92	0.01

Catchment B2

Area (ha) **0.80**

"C" Value **0.20**

Design Storm	Intensity (mm/hr)	Peak Flow (m3/hr)
2 yr	10.18	0.01
5 yr	13.14	0.01
10 yr	15.08	0.01
25 yr	15.67	0.01
50 yr	17.3	0.01
100 yr	18.92	0.01

Catchment B3

Area (ha) **5.60**

"C" Value **0.20**

Design Storm	Intensity (mm/hr)	Peak Flow (m3/hr)
2 yr	10.18	0.03
5 yr	13.14	0.04
10 yr	15.08	0.05
25 yr	15.67	0.05
50 yr	17.3	0.05
100 yr	18.92	0.06

Catchment B4

Area (ha) **1.26**

"C" Value **0.20**

Design Storm	Intensity (mm/hr)	Peak Flow (m3/hr)
2 yr	10.18	0.01
5 yr	13.14	0.01
10 yr	15.08	0.01
25 yr	15.67	0.01
50 yr	17.3	0.01
100 yr	18.92	0.01

B.2. CN Number Calculations

Catchment #	**100**
Total Area (Ha) =	**39.24**

Project Name	New School Site
Project Number	2402381
Date	2025-04-29
Designed	CS
Checked	JS

					Crop and Other Improved			Pasture and other Unimproved			Woodland/Forest			Wetlands			Impervious			Average CN
Soil Type	**Hydological Soil Group**	**Hydological Soil Group**	**Area (%)**	**Area (Ha)**	**Area (ha)**	**%age**	**CN**	**Area**	**%age**	**CN**	**Area**	**%age**	**CN**	**Area**	**%age**	**CN**	**Area**	**%age**	**CN**	
Harkaway 2	si l	BC	100.0%	39.24	18.5213	47.2%	78	18.482	47.1%	71	1.09872	2.8%	65	0	0%	50	1.13796	2.9%	98	74.92
			100%	39.24	**100%**															**74.92**

Tc Calculations					
Bransby - Williams Formula (For C > 0.4)			Airport Method (For C < 0.4)		
Maximum Catchment Elevation	250.89	m	Maximum Catchment Elevation	250.89	m
Minimum Catchment Elevation	232.00	m	Minimum Catchment Elevation	232.00	m
Catchment Length	1114.00	m	Catchment Length	1114.00	m
Catchment Slope	0.02		Catchment Slope	0.02	
Catchment Area	39.24	Ha	Catchment Area	39.24	Ha
Time of Concentration (Tc) (Minutes)	39.58	minutes	Time of Concentration (Tc) (Minutes)	71.30	minutes
Time of Concentration (Tc) (Hours)	0.66	Hours	Time of Concentration (Tc) (Hours)	1.19	Hours
Time to Peak (Tp)	0.44	hours	Time to Peak (Tp)	0.79	hours
Runoff coefficient used	**0.32**				

Catchment #	**101**
Total Area (Ha) =	**10.38**

Project Name	New School Site
Project Number	2402381
Date	2025-04-29
Designed	CS
Checked	JS

					Crop and Other Improved			Pasture and other Unimproved			Woodland/Forest			Wetlands			Impervious			Average CN
Soil Type	**Hydological Soil Group**	**Hydological Soil Group**	**Area (%)**	**Area (Ha)**	**Area (ha)**	**%age**	**CN**	**Area**	**%age**	**CN**	**Area**	**%age**	**CN**	**Area**	**%age**	**CN**	**Area**	**%age**	**CN**	
Harkaway 2	si l	BC	100.0%	10.38	5.0862	49.0%	78	5.0862	49.0%	71	0.1038	1.0%	65	0	0%	50	0.1038	1.0%	98	74.64
			100%	10.38	**100%**															**74.64**

Tc Calculations					
Bransby - Williams Formula (For C > 0.4)			Airport Method (For C < 0.4)		
Maximum Catchment Elevation	238.00	m	Maximum Catchment Elevation	238.00	m
Minimum Catchment Elevation	232.00	m	Minimum Catchment Elevation	232.00	m
Catchment Length	730.00	m	Catchment Length	730.00	m
Catchment Slope	0.01		Catchment Slope	0.01	
Catchment Area	10.38	Ha	Catchment Area	10.38	Ha
Time of Concentration (Tc) (Minutes)	34.25	minutes	Time of Concentration (Tc) (Minutes)	73.30	minutes
Time of Concentration (Tc) (Hours)	0.57	Hours	Time of Concentration (Tc) (Hours)	1.22	Hours
Time to Peak (Tp)	0.38	hours	Time to Peak (Tp)	0.81	hours
Runoff coefficient used	**0.32**				

Initial Abstraction (Ia)	**6.00 mm**

Catchment #	**102**
Total Area (Ha) =	**8.90**

Project Name	New School Site
Project Number	2402381
Date	2025-04-29
Designed	CS
Checked	JS

Soil Type	Hydological Soil Group	Hydological Soil Group	Area (%)	Area (Ha)	Crop and Other Improved			Pasture and other Unimproved			Woodland/Forest			Wetlands			Impervious			Average CN
					Area (ha)	%age	CN	Area	%age	CN	Area	%age	CN	Area	%age	CN	Area	%age	CN	
Harkaway 2	si l	BC	100.0%	8.90	2.9637	33.3%	78	2.9637	33.3%	71	2.8836	32.4%	65	0	0%	50	0.089	1.0%	98	71.66
			100%	8.90								**100%**								**71.66**

Initial Abstraction (Ia)	**7.26 mm**

Tc Calculations					
Bransby - Williams Formula (For C > 0.4)			Airport Method (For C < 0.4)		
Maximum Catchment Elevation	232.00	m	Maximum Catchment Elevation	232.00	m
Minimum Catchment Elevation	231.50	m	Minimum Catchment Elevation	231.50	m
Catchment Length	300.00	m	Catchment Length	300.00	m
Catchment Slope	0.00		Catchment Slope	0.002	
Catchment Area	8.90	Ha	Catchment Area	8.90	Ha
Time of Concentration (Tc) (Minutes)	19.66	minutes	Time of Concentration (Tc) (Minutes)	81.59	minutes
Time of Concentration (Tc) (Hours)	0.33	Hours	Time of Concentration (Tc) (Hours)	1.36	Hours
Time to Peak (Tp)	0.22	hours	Time to Peak (Tp)	0.91	hours
Runoff coefficient used	**0.30**				

Catchment #	**A2**
Total Area (Ha) =	**2.26**

Project Name	New School Site
Project Number	2402381
Date	2025-04-29
Designed	CS
Checked	JS

Soil Type	Hydological Soil Group	Hydological Soil Group	Area (%)	Area (Ha)	Crop and Other Improved			Pasture and other Unimproved			Woodland/Forest			Wetlands			Impervious			Average CN
					Area (ha)	%age	CN	Area	%age	CN	Area	%age	CN	Area	%age	CN	Area	%age	CN	
Harkaway 2	si l	BC	100.0%	2.26	0	0.0%	78	2.02044	89.4%	71	0.23956	10.6%	65	0	0.0%	50	0	0.0%	98	70.36
			100%	2.26								**100%**								**70.36**

Initial Abstraction (Ia)	**5.53 mm**

Tc Calculations					
Bransby - Williams Formula (For C > 0.4)			Airport Method (For C < 0.4)		
Maximum Catchment Elevation	245.00	m	Maximum Catchment Elevation	245.00	m
Minimum Catchment Elevation	238.00	m	Minimum Catchment Elevation	238.00	m
Catchment Length	100.00	m	Catchment Length	100.00	m
Catchment Slope	0.07		Catchment Slope	0.07	
Catchment Area	2.26	Ha	Catchment Area	2.26	Ha
Time of Concentration (Tc) (Minutes)	3.56	minutes	Time of Concentration (Tc) (Minutes)	14.07	minutes
Time of Concentration (Tc) (Hours)	0.06	Hours	Time of Concentration (Tc) (Hours)	0.23	Hours
Time to Peak (Tp)	0.04	hours	Time to Peak (Tp)	0.16	hours
Runoff coefficient used	**0.28**				

Catchment #	A3
Total Area (Ha) =	3.71

Project Name	New School Site
Project Number	2402381
Date	2025-04-29
Designed	CS
Checked	JS

					Crop and Other Improved			Pasture and other Unimproved			Woodland/Forest			Wetlands			Impervious			Average CN
Soil Type	Hydological Soil Group	Hydological Soil Group	Area (%)	Area (Ha)	Area (ha)	%age	CN	Area	%age	CN	Area	%age	CN	Area	%age	CN	Area	%age	CN	
Harkaway 2	si l	BC	100.0%	3.71	0	0.0%	78	3.35013	90.3%	71	0.35987	9.7%	65	0	0.0%	50	0	0.0%	98	70.42
			100%	3.71							**100%**									**70.42**

Initial Abstraction (Ia)	5.49 mm

Tc Calculations					
Bransby - Williams Formula (For C > 0.4)			Airport Method (For C < 0.4)		
Maximum Catchment Elevation	231.50	m	Maximum Catchment Elevation	231.50	m
Minimum Catchment Elevation	230.86	m	Minimum Catchment Elevation	230.86	m
Catchment Length	220.00	m	Catchment Length	220.00	m
Catchment Slope	0.00		Catchment Slope	0.003	
Catchment Area	3.71	Ha	Catchment Area	3.71	Ha
Time of Concentration (Tc) (Minutes)	14.08	minutes	Time of Concentration (Tc) (Minutes)	59.59	minutes
Time of Concentration (Tc) (Hours)	0.23	Hours	Time of Concentration (Tc) (Hours)	0.99	Hours
Time to Peak (Tp)	0.16	hours	Time to Peak (Tp)	0.66	hours
Runoff coefficient used	**0.28**				

Catchment #	B2
Total Area (Ha) =	0.80

Project Name	New School Site
Project Number	2402381
Date	2025-04-29
Designed	CS
Checked	JS

					Crop and Other Improved			Pasture and other Unimproved			Woodland/Forest			Wetlands			Impervious			Average CN
Soil Type	Hydological Soil Group	Hydological Soil Group	Area (%)	Area (Ha)	Area (ha)	%age	CN	Area	%age	CN	Area	%age	CN	Area	%age	CN	Area	%age	CN	
Harkaway 2	si l	BC	100.0%	0.80	0.68	85.0%	78	0	0.0%	71	0.12	15.0%	65	0	0.0%	50	0	0.0%	98	76.05
			100%	0.80							**100%**									**76.05**

Initial Abstraction (Ia)	7.45 mm

Tc Calculations					
Bransby - Williams Formula (For C > 0.4)			Airport Method (For C < 0.4)		
Maximum Catchment Elevation	245.00	m	Maximum Catchment Elevation	245.00	m
Minimum Catchment Elevation	238.00	m	Minimum Catchment Elevation	238.00	m
Catchment Length	100.00	m	Catchment Length	100.00	m
Catchment Slope	0.07		Catchment Slope	0.07	
Catchment Area	0.80	Ha	Catchment Area	0.80	Ha
Time of Concentration (Tc) (Minutes)	3.95	minutes	Time of Concentration (Tc) (Minutes)	13.04	minutes
Time of Concentration (Tc) (Hours)	0.07	Hours	Time of Concentration (Tc) (Hours)	0.22	Hours
Time to Peak (Tp)	0.04	hours	Time to Peak (Tp)	0.14	hours
Runoff coefficient used	**0.34**				

Catchment #	**B3**
Total Area (Ha) =	**5.60**

Project Name	New School Site
Project Number	2402381
Date	2025-04-29
Designed	CS
Checked	JS

					Crop and Other Improved			Pasture and other Unimproved			Woodland/Forest			Wetlands			Impervious			Average CN
Soil Type	**Hydological Soil Group**	**Hydological Soil Group**	**Area (%)**	**Area (Ha)**	**Area (ha)**	**%age**	**CN**	**Area**	**%age**	**CN**	**Area**	**%age**	**CN**	**Area**	**%age**	**CN**	**Area**	**%age**	**CN**	
Harkaway 2	si l	BC	100.0%	5.60	5.3928	96.3%	78	0	0.0%	71	0.2072	3.7%	65	0	0.0%	50	0	0.0%	98	77.52
			100%	5.60	**100%**															**77.52**

Initial Abstraction (Ia)	**7.11 mm**

Tc Calculations					
Bransby - Williams Formula (For C > 0.4)			Airport Method (For C < 0.4)		
Maximum Catchment Elevation	231.50	m	Maximum Catchment Elevation	236.00	m
Minimum Catchment Elevation	230.86	m	Minimum Catchment Elevation	230.86	m
Catchment Length	220.00	m	Catchment Length	300.00	m
Catchment Slope	0.00		Catchment Slope	0.017	
Catchment Area	5.60	Ha	Catchment Area	5.60	Ha
Time of Concentration (Tc) (Minutes)	13.51	minutes	Time of Concentration (Tc) (Minutes)	35.45	minutes
Time of Concentration (Tc) (Hours)	0.23	Hours	Time of Concentration (Tc) (Hours)	0.59	Hours
Time to Peak (Tp)	0.15	hours	Time to Peak (Tp)	0.39	hours
Runoff coefficient used	**0.35**				

B.3. Runoff Coefficient Calculations

Project Number: 2402381 **Location:** 28th Ave West, Owen Sound ON **Prepared By:** CS

Project Name: New School Site **Date:** April, 2025 **Checked By:** JS

Runoff Coefficient Calculations - CA 100

Crossing No. and Sta.	Soil Texture	Woodland						Pasture/Meadows						Cultivated/Improved						Urban or Bare Rock							Lake and Wetland		Composite C Value	Total Area
		Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		% Imperv.	Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		A (ha)	C		
		A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C		A (ha)	C	A (ha)	C	A (ha)	C				(ha)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	Open Sand Loam		0.08		0.12	0	0.18		0.1	0	0.15	0	0.22		0.22	0	0.3	0	0.4	50		0.4	0	0.5	0	0.55				
	Loam or Silt Loam	1.10	0.25		0.3		0.35	18.48	0.28		0.35		0.4	18.52	0.35		0.45		0.65	0.5	1.14	0.55		0.65		0.7	0	0.05	0.32	39.24
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.95				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	50		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	50		0.55		0.65		0.7		0.05	#DIV/0!	0.0
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	50		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	0.5		0.55		0.65		0.7		0.05	#DIV/0!	0.0
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	0.3		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	50		0.55		0.65		0.7		0.05	#DIV/0!	0.0
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	0.3		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	0.5		0.55		0.65		0.7		0.05		
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				

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Project Number: 2402381 **Location:** 28th Ave West, Owen Sound ON **Prepared By:** CS

Project Name: New School Site **Date:** April, 2025 **Checked By:** JS

Runoff Coefficient Calculations - CA 101

Crossing No. and Sta.	Soil Texture	Woodland						Pasture/Meadows						Cultivated/Improved						Urban or Bare Rock							Lake and Wetland		Composite C Value	Total Area
		Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		% Imperv.	Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		A (ha)	C		
		A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C		A (ha)	C	A (ha)	C	A (ha)	C				(ha)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	Open Sand Loam		0.08		0.12	0	0.18		0.1	0	0.15	0	0.22		0.22	0	0.3	0	0.4	50		0.4	0	0.5	0	0.55				
	Loam or Silt Loam	0.10	0.25		0.3		0.35	5.09	0.28		0.35		0.4	5.09	0.35		0.45		0.65	0.5	0.1	0.55		0.65		0.7	0	0.05	0.32	10.38
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.95				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	50		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	50		0.55		0.65		0.7		0.05	#DIV/0!	0.0
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	50		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	0.5		0.55		0.65		0.7		0.05	#DIV/0!	0.0
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	0.3		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	50		0.55		0.65		0.7		0.05	#DIV/0!	0.0
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	0.3		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	0.5		0.55		0.65		0.7		0.05		
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				

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Project Number: 2402381 **Location:** 28th Ave West, Owen Sound ON **Prepared By:** CS

Project Name: New School Site **Date:** April, 2025 **Checked By:** JS

Runoff Coefficient Calculations - CA 102

Crossing No. and Sta.	Soil Texture	Woodland						Pasture/Meadows						Cultivated/Improved						Urban or Bare Rock							Lake and Wetland		Composite C Value	Total Area
		Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		% Imperv.	Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		A (ha)	C		
		A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C		A (ha)	C	A (ha)	C	A (ha)	C				(ha)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	Open Sand Loam		0.08		0.12	0	0.18		0.1	0	0.15	0	0.22		0.22	0	0.3	0	0.4	50		0.4	0	0.5	0	0.55				
	Loam or Silt Loam	2.89	0.25		0.3		0.35	2.96	0.28		0.35		0.4	2.96	0.35		0.45		0.65	0.5	0.09	0.55		0.65		0.7	0	0.05	0.30	8.90
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.95				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	50		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	50		0.55		0.65		0.7		0.05	#DIV/0!	0.0
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	50		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	0.5		0.55		0.65		0.7		0.05	#DIV/0!	0.0
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	0.3		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	50		0.55		0.65		0.7		0.05	#DIV/0!	0.0
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	0.3		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	0.5		0.55		0.65		0.7		0.05		
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				

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Project Number: 2402381 **Location:** 28th Ave West, Owen Sound ON **Prepared By:** CS

Project Name: New School Site **Date:** April, 2025 **Checked By:** JS

Runoff Coefficient Calculations - CA A2

Crossing No. and Sta.	Soil Texture	Woodland						Pasture/Meadows						Cultivated/Improved						Urban or Bare Rock							Lake and Wetland		Composite C Value	Total Area
		Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		% Imperv.	Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		A (ha)	C		
		A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C		A (ha)	C	A (ha)	C	A (ha)	C				(ha)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	Open Sand Loam		0.08		0.12	0	0.18		0.1	0	0.15	0	0.22		0.22	0	0.3	0	0.4	50		0.4	0	0.5	0	0.55				
	Loam or Silt Loam	0.24	0.25		0.3		0.35	2.02	0.28		0.35		0.4	0	0.35		0.45		0.65	0.5	0	0.55		0.65		0.7	0	0.05	0.28	2.26
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.95				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	50		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	50		0.55		0.65		0.7		0.05	#DIV/0!	0.0
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	50		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	0.5		0.55		0.65		0.7		0.05	#DIV/0!	0.0
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	0.3		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	50		0.55		0.65		0.7		0.05	#DIV/0!	0.0
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	0.3		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	0.5		0.55		0.65		0.7		0.05		
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				

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Project Number: 2402381 **Location:** 28th Ave West, Owen Sound ON **Prepared By:** CS

Project Name: New School Site **Date:** April, 2025 **Checked By:** JS

Runoff Coefficient Calculations - CA A3

Crossing No. and Sta.	Soil Texture	Woodland						Pasture/Meadows						Cultivated/Improved						Urban or Bare Rock							Lake and Wetland		Composite C Value	Total Area
		Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		% Imperv.	Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		A (ha)	C		
		A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C		A (ha)	C	A (ha)	C	A (ha)	C				(ha)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	Open Sand Loam		0.08		0.12	0	0.18		0.1	0	0.15	0	0.22		0.22	0	0.3	0	0.4	50		0.4	0	0.5	0	0.55				
	Loam or Silt Loam	0.36	0.25		0.3		0.35	3.35	0.28		0.35		0.4	0	0.35		0.45		0.65	0.5	0	0.55		0.65		0.7	0	0.05	0.28	3.71
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.95				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	50		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	50		0.55		0.65		0.7		0.05	#DIV/0!	0.0
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	50		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	0.5		0.55		0.65		0.7		0.05	#DIV/0!	0.0
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	0.3		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	50		0.55		0.65		0.7		0.05	#DIV/0!	0.0
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	0.3		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	0.5		0.55		0.65		0.7		0.05		
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				

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Project Number: 2402381 **Location:** 28th Ave West, Owen Sound ON **Prepared By:** CS

Project Name: New School Site **Date:** April, 2025 **Checked By:** JS

Runoff Coefficient Calculations - CA B2

Crossing No. and Sta.	Soil Texture	Woodland						Pasture/Meadows						Cultivated/Improved						Urban or Bare Rock							Lake and Wetland		Composite C Value	Total Area
		Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		% Imperv.	Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		A (ha)	C		
		A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C		A (ha)	C	A (ha)	C	A (ha)	C				(ha)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	Open Sand Loam		0.08		0.12	0	0.18		0.1	0	0.15	0	0.22		0.22	0	0.3	0	0.4	50		0.4	0	0.5	0	0.55				
	Loam or Silt Loam	0.12	0.25		0.3		0.35	0	0.28		0.35		0.4	0.68	0.35		0.45		0.65	0.5	0	0.55		0.65		0.7	0	0.05	0.34	0.80
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.95				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	50		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	50		0.55		0.65		0.7		0.05	#DIV/0!	0.0
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	50		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	0.5		0.55		0.65		0.7		0.05	#DIV/0!	0.0
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	0.3		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	50		0.55		0.65		0.7		0.05	#DIV/0!	0.0
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	0.3		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	0.5		0.55		0.65		0.7		0.05		
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				

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Project Number: 2402381 **Location:** 28th Ave West, Owen Sound ON **Prepared By:** CS

Project Name: New School Site **Date:** April, 2025 **Checked By:** JS

Runoff Coefficient Calculations - CA B3

Crossing No. and Sta.	Soil Texture	Woodland						Pasture/Meadows						Cultivated/Improved						Urban or Bare Rock							Lake and Wetland		Composite C Value	Total Area
		Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		% Imperv.	Flat (0% to 5%)		Rolling (5% to 10%)		Hilly (10% to 30%)		A (ha)	C		
		A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C	A (ha)	C		A (ha)	C	A (ha)	C	A (ha)	C				(ha)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	Open Sand Loam		0.08		0.12	0	0.18		0.1	0	0.15	0	0.22		0.22	0	0.3	0	0.4	50		0.4	0	0.5	0	0.55				
	Loam or Silt Loam	0.21	0.25		0.3		0.35	0	0.28		0.35		0.4	5.39	0.35		0.45		0.65	0.5	0	0.55		0.65		0.7	0	0.05	0.35	5.60
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.95				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	50		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	50		0.55		0.65		0.7		0.05	#DIV/0!	0.0
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	50		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	0.5		0.55		0.65		0.7		0.05	#DIV/0!	0.0
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	0.3		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	50		0.55		0.65		0.7		0.05	#DIV/0!	0.0
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				
	Open Sand Loam		0.08		0.12		0.18		0.1		0.15		0.22		0.22		0.3		0.4	0.3		0.4		0.5		0.55				
	Loam or Silt Loam		0.25		0.3		0.35		0.28		0.35		0.4		0.35		0.45		0.65	0.5		0.55		0.65		0.7		0.05		
	Clay Loam or Clay		0.35		0.42		0.52		0.4		0.45		0.55		0.55		0.6		0.7	0.7		0.75		0.8		0.85				

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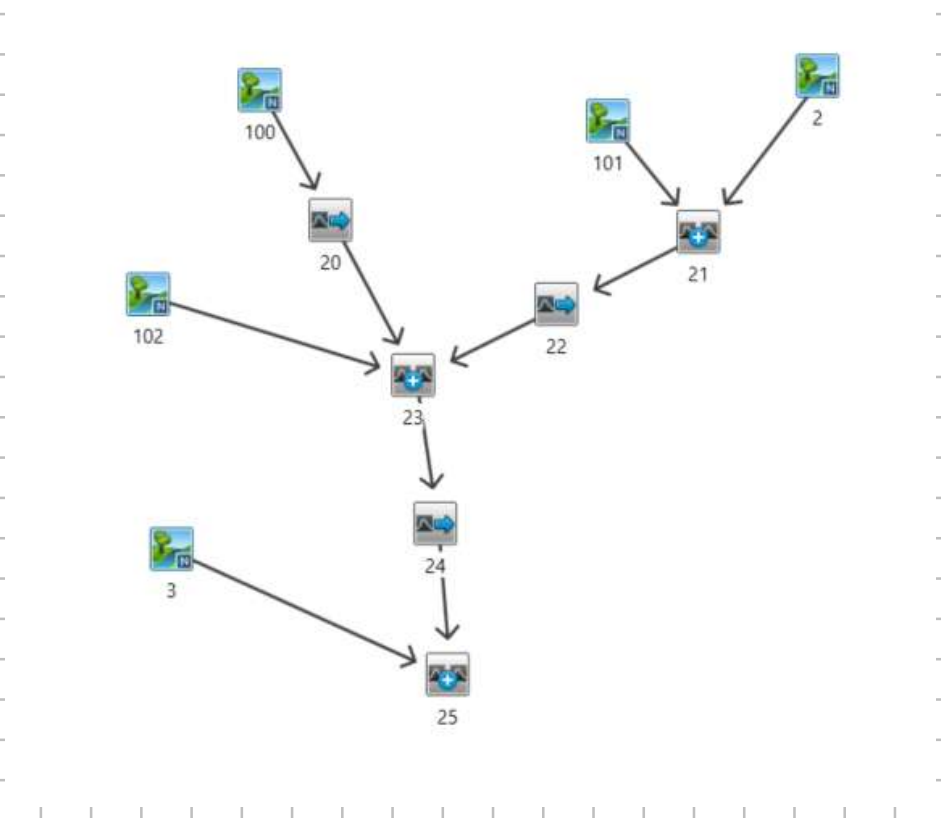
B.4. Pre-Development OTTHYMO Schematic

Project:	New School Site
File No.:	2402381
Date:	May, 2025
Designed	CS
Checked:	JS
Subject:	Pre-Development OTTHYMO Schematic



B.5. Pre-Development OTTHYMO Output

```
*****************************************
** SIMULATION:100 yr Chicago Design Storm **
*****************************************
--------------------
| CHICAGO STORM    |    IDF curve parameters: A=2171.754
| Ptotal= 72.84 mm |                          B=   8.303
--------------------                          C=   0.867
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    =  5.00 min
                       Time to peak ratio =  0.38

               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.00    3.15 |  1.00   12.18 |  2.00   14.13 |  3.00    4.70
               0.08    3.35 |  1.08   15.91 |  2.08   12.15 |  3.08    4.46
               0.17    3.59 |  1.17   22.59 |  2.17   10.64 |  3.17    4.23
               0.25    3.85 |  1.25   37.28 |  2.25    9.45 |  3.25    4.03
               0.33    4.17 |  1.33   87.10 |  2.33    8.50 |  3.33    3.85
               0.42    4.54 |  1.42  230.33 |  2.42    7.72 |  3.42    3.69
               0.50    4.98 |  1.50  104.88 |  2.50    7.07 |  3.50    3.54
               0.58    5.53 |  1.58   56.05 |  2.58    6.52 |  3.58    3.40
               0.67    6.21 |  1.67   36.64 |  2.67    6.05 |  3.67    3.27
               0.75    7.08 |  1.75   26.66 |  2.75    5.65 |  3.75    3.15
               0.83    8.23 |  1.83   20.72 |  2.83    5.29 |  3.83    3.04
               0.92    9.83 |  1.92   16.84 |  2.92    4.98 |  3.92    2.94


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   3.71   Curve Number   (CN)= 70.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.49   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.66

     Unit Hyd Qpeak  (cms)=   0.215

     PEAK FLOW       (cms)=   0.155 (i)
     TIME TO PEAK    (hrs)=   2.333
     RUNOFF VOLUME    (mm)=  26.064
     TOTAL RAINFALL   (mm)=  72.844
     RUNOFF COEFFICIENT   =   0.358

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   2.26   Curve Number   (CN)= 70.4
```

```
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.53   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.16

     Unit Hyd Qpeak  (cms)=   0.540

     PEAK FLOW       (cms)=   0.242 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  25.877
     TOTAL RAINFALL   (mm)=  72.844
     RUNOFF COEFFICIENT   =   0.355

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

------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0101)|   Area    (ha)=  10.38   Curve Number   (CN)= 74.6
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.81

     Unit Hyd Qpeak  (cms)=   0.489

     PEAK FLOW       (cms)=   0.419 (i)
     TIME TO PEAK    (hrs)=   2.500
     RUNOFF VOLUME    (mm)=  29.176
     TOTAL RAINFALL   (mm)=  72.844
     RUNOFF COEFFICIENT   =   0.401

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

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

--------------------
| ADD HYD  (  0021)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):    10.38   0.419     2.50    29.18
      + ID2= 2 (  0002):     2.26   0.242     1.67    25.88
        ================================================
        ID = 3 (  0021):    12.64   0.458     2.42    28.59

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0022)|
| IN= 2---> OUT= 1 |
| SHIFT=149.6 min  |      AREA     QPEAK     TPEAK      R.V.
-------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0021):   12.64     0.46      2.42     28.59
    SHIFT ID= 1 (  0022):   12.64     0.46      4.83     28.59
```

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0100)|   Area    (ha)=  39.24   Curve Number   (CN)= 74.9
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.79

     Unit Hyd Qpeak  (cms)=   1.897

     PEAK FLOW       (cms)=   1.628 (i)
     TIME TO PEAK    (hrs)=   2.417
     RUNOFF VOLUME    (mm)=  29.420
     TOTAL RAINFALL   (mm)=  72.844
     RUNOFF COEFFICIENT   =   0.404

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

--------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0020)|
| IN= 2---> OUT= 1 |
| SHIFT=244.7 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0100):   39.24     1.63      2.42     29.42
    SHIFT ID= 1 (  0020):   39.24     1.63      6.42     29.42

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0102)|   Area    (ha)=   8.90   Curve Number   (CN)= 71.7
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.26   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.91

     Unit Hyd Qpeak  (cms)=   0.374

     PEAK FLOW       (cms)=   0.289 (i)
     TIME TO PEAK    (hrs)=   2.583
     RUNOFF VOLUME    (mm)=  25.906
     TOTAL RAINFALL   (mm)=  72.844
     RUNOFF COEFFICIENT   =   0.356

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

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
```

```
        ID1= 1 (  0102):     8.90   0.289     2.58    25.91
      + ID2= 2 (  0020):    39.24   1.628     6.42    29.42
        ================================================
        ID = 3 (  0023):    48.14   1.635     6.42    28.77

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

--------------------
| ADD HYD  (  0023)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0023):    48.14   1.635     6.42    28.77
      + ID2= 2 (  0022):    12.64   0.458     4.83    28.59
        ================================================
        ID = 1 (  0023):    60.78   1.804     6.42    28.73

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0024)|
| IN= 2---> OUT= 1 |
| SHIFT= 50.6 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0023):   60.78     1.80      6.42     28.73
    SHIFT ID= 1 (  0024):   60.78     1.80      7.25     28.73

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

--------------------
| ADD HYD  (  0025)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0024):    60.78   1.804     7.25    28.73
      + ID2= 2 (  0003):     3.71   0.155     2.33    26.06
        ================================================
        ID = 3 (  0025):    64.49   1.804     7.25    28.58

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
****************************************
** SIMULATION:2 yr Chicago Design Storm **
****************************************
--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 854.100
| Ptotal= 33.23 mm |                          B=   7.781
--------------------                          C=   0.830
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  3.00 hrs
```

Storm time step = 5.00 min
Time to peak ratio = 0.38

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	2.37	0.75	8.07	1.50	10.29	2.25	3.57
0.08	2.56	0.83	11.14	1.58	8.50	2.33	3.34
0.17	2.79	0.92	17.74	1.67	7.24	2.42	3.13
0.25	3.07	1.00	39.66	1.75	6.30	2.50	2.95
0.33	3.41	1.08	103.05	1.83	5.58	2.58	2.79
0.42	3.85	1.17	47.46	1.92	5.01	2.67	2.65
0.50	4.42	1.25	26.04	2.00	4.55	2.75	2.52
0.58	5.20	1.33	17.46	2.08	4.17	2.83	2.41
0.67	6.32	1.42	12.99	2.17	3.85	2.92	2.30

CALIB NASHYD (0003) ID= 1 DT= 5.0 min	Area (ha)= 3.71	Curve Number (CN)= 70.4
	Ia (mm)= 5.49	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.66	

Unit Hyd Qpeak (cms)= 0.215

PEAK FLOW (cms)= 0.033 (i)
TIME TO PEAK (hrs)= 2.083
RUNOFF VOLUME (mm)= 5.723
TOTAL RAINFALL (mm)= 33.227
RUNOFF COEFFICIENT = 0.172

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

CALIB NASHYD (0002) ID= 1 DT= 5.0 min	Area (ha)= 2.26	Curve Number (CN)= 70.4
	Ia (mm)= 5.53	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.16	

Unit Hyd Qpeak (cms)= 0.540

PEAK FLOW (cms)= 0.047 (i)
TIME TO PEAK (hrs)= 1.333
RUNOFF VOLUME (mm)= 5.670
TOTAL RAINFALL (mm)= 33.227
RUNOFF COEFFICIENT = 0.171

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

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0101)|   Area    (ha)=  10.38   Curve Number   (CN)= 74.6
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.81

     Unit Hyd Qpeak  (cms)=   0.489

     PEAK FLOW       (cms)=   0.093 (i)
     TIME TO PEAK    (hrs)=   2.250
     RUNOFF VOLUME    (mm)=   6.530
     TOTAL RAINFALL   (mm)=  33.227
     RUNOFF COEFFICIENT   =   0.197

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

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

--------------------
| ADD HYD  (  0021)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):    10.38   0.093     2.25     6.53
      + ID2= 2 (  0002):     2.26   0.047     1.33     5.67
        ================================================
        ID = 3 (  0021):    12.64   0.103     2.17     6.38

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0022)|
| IN= 2---> OUT= 1 |
| SHIFT=149.6 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0021):   12.64     0.10      2.17      6.38
    SHIFT ID= 1 (  0022):   12.64     0.10      4.58      6.38

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0100)|   Area    (ha)=  39.24   Curve Number   (CN)= 74.9
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.79

     Unit Hyd Qpeak  (cms)=   1.897

     PEAK FLOW       (cms)=   0.360 (i)
     TIME TO PEAK    (hrs)=   2.250
     RUNOFF VOLUME    (mm)=   6.604
```

```
     TOTAL RAINFALL   (mm)=  33.227
     RUNOFF COEFFICIENT   =   0.199

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

--------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0020)|
| IN= 2---> OUT= 1 |
| SHIFT=244.7 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0100):   39.24     0.36      2.25      6.60
    SHIFT ID= 1 (  0020):   39.24     0.36      6.25      6.60

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0102)|   Area    (ha)=   8.90   Curve Number   (CN)= 71.7
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.26   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.91

     Unit Hyd Qpeak  (cms)=   0.374

     PEAK FLOW       (cms)=   0.059 (i)
     TIME TO PEAK    (hrs)=   2.417
     RUNOFF VOLUME    (mm)=   5.334
     TOTAL RAINFALL   (mm)=  33.227
     RUNOFF COEFFICIENT   =   0.161

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

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0102):     8.90   0.059     2.42     5.33
      + ID2= 2 (  0020):    39.24   0.360     6.25     6.60
        ================================================
        ID = 3 (  0023):    48.14   0.361     6.25     6.37

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

--------------------
| ADD HYD  (  0023)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0023):    48.14   0.361     6.25     6.37
```

```
      + ID2= 2 (  0022):    12.64   0.103     4.58     6.38
        ================================================
        ID = 1 (  0023):    60.78   0.396     6.17     6.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0024)|
| IN= 2---> OUT= 1 |
| SHIFT= 50.6 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0023):   60.78     0.40      6.17      6.37
    SHIFT ID= 1 (  0024):   60.78     0.40      7.00      6.37

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

--------------------
| ADD HYD  (  0025)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0024):    60.78   0.396     7.00     6.37
      + ID2= 2 (  0003):     3.71   0.033     2.08     5.72
        ================================================
        ID = 3 (  0025):    64.49   0.396     7.00     6.33

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
****************************************
** SIMULATION:25 yr Chicago Design Storm **
****************************************
--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1750.276
| Ptotal= 60.35 mm |                          B=   8.303
--------------------                          C=   0.862
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    =  5.00 min
                       Time to peak ratio =  0.38

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    2.69 |  1.00   10.22 |  2.00   11.84 |  3.00    3.99
                0.08    2.86 |  1.08   13.31 |  2.08   10.19 |  3.08    3.78
                0.17    3.05 |  1.17   18.82 |  2.17    8.94 |  3.17    3.60
                0.25    3.28 |  1.25   30.89 |  2.25    7.95 |  3.25    3.43
                0.33    3.54 |  1.33   71.60 |  2.33    7.16 |  3.33    3.28
                0.42    3.85 |  1.42  188.05 |  2.42    6.51 |  3.42    3.14
                0.50    4.23 |  1.50   86.10 |  2.50    5.97 |  3.50    3.01
                0.58    4.68 |  1.58   46.26 |  2.58    5.51 |  3.58    2.89
```

0.67	5.25	1.67	30.37	2.67	5.12	3.67	2.79
0.75	5.98	1.75	22.17	2.75	4.78	3.75	2.69
0.83	6.94	1.83	17.28	2.83	4.49	3.83	2.59
0.92	8.27	1.92	14.08	2.92	4.22	3.92	2.51

CALIB NASHYD (0003)	Area (ha)= 3.71	Curve Number (CN)= 70.4
ID= 1 DT= 5.0 min	Ia (mm)= 5.49	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.66	

Unit Hyd Qpeak (cms)= 0.215

PEAK FLOW (cms)= 0.109 (i)
TIME TO PEAK (hrs)= 2.333
RUNOFF VOLUME (mm)= 18.628
TOTAL RAINFALL (mm)= 60.348
RUNOFF COEFFICIENT = 0.309

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

CALIB NASHYD (0002)	Area (ha)= 2.26	Curve Number (CN)= 70.4
ID= 1 DT= 5.0 min	Ia (mm)= 5.53	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.16	

Unit Hyd Qpeak (cms)= 0.540

PEAK FLOW (cms)= 0.167 (i)
TIME TO PEAK (hrs)= 1.667
RUNOFF VOLUME (mm)= 18.487
TOTAL RAINFALL (mm)= 60.348
RUNOFF COEFFICIENT = 0.306

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

CALIB NASHYD (0101)	Area (ha)= 10.38	Curve Number (CN)= 74.6
ID= 1 DT= 5.0 min	Ia (mm)= 6.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.81	

Unit Hyd Qpeak (cms)= 0.489

PEAK FLOW (cms)= 0.297 (i)

```
     TIME TO PEAK    (hrs)=   2.500
     RUNOFF VOLUME    (mm)=  21.001
     TOTAL RAINFALL   (mm)=  60.348
     RUNOFF COEFFICIENT   =   0.348

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

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

--------------------
| ADD HYD  (  0021)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):    10.38   0.297     2.50    21.00
      + ID2= 2 (  0002):     2.26   0.167     1.67    18.49
        ================================================
        ID = 3 (  0021):    12.64   0.325     2.42    20.55

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0022)|
| IN= 2---> OUT= 1 |
| SHIFT=149.6 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0021):   12.64     0.33      2.42     20.55
    SHIFT ID= 1 (  0022):   12.64     0.33      4.83     20.55

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0100)|   Area    (ha)=  39.24   Curve Number   (CN)= 74.9
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.79

     Unit Hyd Qpeak  (cms)=   1.897

     PEAK FLOW       (cms)=   1.154 (i)
     TIME TO PEAK    (hrs)=   2.500
     RUNOFF VOLUME    (mm)=  21.192
     TOTAL RAINFALL   (mm)=  60.348
     RUNOFF COEFFICIENT   =   0.351

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

--------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0020)|
| IN= 2---> OUT= 1 |
| SHIFT=244.7 min  |      AREA     QPEAK     TPEAK      R.V.
```

```
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0100):   39.24     1.15      2.50     21.19
    SHIFT ID= 1 (  0020):   39.24     1.15      6.50     21.19

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0102)|   Area    (ha)=   8.90   Curve Number   (CN)= 71.7
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.26   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.91

     Unit Hyd Qpeak  (cms)=   0.374

     PEAK FLOW       (cms)=   0.202 (i)
     TIME TO PEAK    (hrs)=   2.667
     RUNOFF VOLUME    (mm)=  18.356
     TOTAL RAINFALL   (mm)=  60.348
     RUNOFF COEFFICIENT   =   0.304

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

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0102):     8.90   0.202     2.67    18.36
      + ID2= 2 (  0020):    39.24   1.154     6.50    21.19
        ================================================
        ID = 3 (  0023):    48.14   1.159     6.50    20.67

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

--------------------
| ADD HYD  (  0023)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0023):    48.14   1.159     6.50    20.67
      + ID2= 2 (  0022):    12.64   0.325     4.83    20.55
        ================================================
        ID = 1 (  0023):    60.78   1.284     6.42    20.64

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0024)|
| IN= 2---> OUT= 1 |
| SHIFT= 50.6 min  |      AREA     QPEAK     TPEAK      R.V.
```

```
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0023):   60.78     1.28      6.42     20.64
    SHIFT ID= 1 (  0024):   60.78     1.28      7.25     20.64

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

--------------------
| ADD HYD  (  0025)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0024):    60.78   1.284     7.25    20.64
      + ID2= 2 (  0003):     3.71   0.109     2.33    18.63
        ================================================
        ID = 3 (  0025):    64.49   1.284     7.25    20.53

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
****************************************
** SIMULATION:5 yr Chicago Design Storm **
****************************************
--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1234.576
| Ptotal= 42.93 mm |                          B=   8.297
--------------------                          C=   0.851
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  3.00 hrs
                       Storm time step    =  5.00 min
                       Time to peak ratio =  0.38

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    2.80 |  0.75   10.17 |  1.50   13.13 |  2.25    4.31
                0.08    3.04 |  0.83   14.27 |  1.58   10.75 |  2.33    4.01
                0.17    3.33 |  0.92   23.16 |  1.67    9.08 |  2.42    3.75
                0.25    3.68 |  1.00   52.75 |  1.75    7.85 |  2.50    3.53
                0.33    4.11 |  1.08  136.52 |  1.83    6.91 |  2.58    3.33
                0.42    4.67 |  1.17   63.26 |  1.92    6.16 |  2.67    3.15
                0.50    5.40 |  1.25   34.39 |  2.00    5.57 |  2.75    2.99
                0.58    6.40 |  1.33   22.78 |  2.08    5.07 |  2.83    2.84
                0.67    7.87 |  1.42   16.75 |  2.17    4.66 |  2.92    2.71


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   3.71   Curve Number   (CN)= 70.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.49   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.66
```

```
     Unit Hyd Qpeak  (cms)=   0.215

     PEAK FLOW       (cms)=   0.059 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=   9.724
     TOTAL RAINFALL   (mm)=  42.928
     RUNOFF COEFFICIENT   =   0.227

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   2.26   Curve Number   (CN)= 70.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.53   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.16

     Unit Hyd Qpeak  (cms)=   0.540

     PEAK FLOW       (cms)=   0.087 (i)
     TIME TO PEAK    (hrs)=   1.333
     RUNOFF VOLUME    (mm)=   9.642
     TOTAL RAINFALL   (mm)=  42.928
     RUNOFF COEFFICIENT   =   0.225

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0101)|   Area    (ha)=  10.38   Curve Number   (CN)= 74.6
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.81

     Unit Hyd Qpeak  (cms)=   0.489

     PEAK FLOW       (cms)=   0.161 (i)
     TIME TO PEAK    (hrs)=   2.250
     RUNOFF VOLUME    (mm)=  11.066
     TOTAL RAINFALL   (mm)=  42.928
     RUNOFF COEFFICIENT   =   0.258

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

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

--------------------
| ADD HYD  (  0021)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
```

```
        ID1= 1 (  0101):    10.38   0.161     2.25    11.07
      + ID2= 2 (  0002):     2.26   0.087     1.33     9.64
        ================================================
        ID = 3 (  0021):    12.64   0.178     2.17    10.81

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0022)|
| IN= 2---> OUT= 1 |
| SHIFT=149.6 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0021):   12.64     0.18      2.17     10.81
    SHIFT ID= 1 (  0022):   12.64     0.18      4.58     10.81

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0100)|   Area    (ha)=  39.24   Curve Number   (CN)= 74.9
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.79

     Unit Hyd Qpeak  (cms)=   1.897

     PEAK FLOW       (cms)=   0.629 (i)
     TIME TO PEAK    (hrs)=   2.167
     RUNOFF VOLUME    (mm)=  11.182
     TOTAL RAINFALL   (mm)=  42.928
     RUNOFF COEFFICIENT   =   0.260

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

--------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0020)|
| IN= 2---> OUT= 1 |
| SHIFT=244.7 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0100):   39.24     0.63      2.17     11.18
    SHIFT ID= 1 (  0020):   39.24     0.63      6.17     11.18

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0102)|   Area    (ha)=   8.90   Curve Number   (CN)= 71.7
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.26   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.91

     Unit Hyd Qpeak  (cms)=   0.374
```

```
     PEAK FLOW       (cms)=   0.107 (i)
     TIME TO PEAK    (hrs)=   2.333
     RUNOFF VOLUME    (mm)=   9.346
     TOTAL RAINFALL   (mm)=  42.928
     RUNOFF COEFFICIENT   =   0.218

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

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0102):     8.90   0.107     2.33     9.35
      + ID2= 2 (  0020):    39.24   0.629     6.17    11.18
        ================================================
        ID = 3 (  0023):    48.14   0.630     6.17    10.84

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

--------------------
| ADD HYD  (  0023)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0023):    48.14   0.630     6.17    10.84
      + ID2= 2 (  0022):    12.64   0.178     4.58    10.81
        ================================================
        ID = 1 (  0023):    60.78   0.687     6.08    10.84

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0024)|
| IN= 2---> OUT= 1 |
| SHIFT= 50.6 min  |      AREA     QPEAK     TPEAK      R.V.
-------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0023):   60.78     0.69      6.08     10.84
    SHIFT ID= 1 (  0024):   60.78     0.69      6.92     10.84

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| ADD HYD  (  0025)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0024):    60.78   0.687     6.92    10.84
      + ID2= 2 (  0003):     3.71   0.059     2.00     9.72
        ================================================
```

```
        ID = 3 (  0025):    64.49   0.687     6.92    10.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
******************************
** SIMULATION:Timmins Storm   **
******************************

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|    READ STORM    |    Filename: C:\Users\chrslo4129\AppD
|                  |              ata\Local\Temp\
|                  |              9f4aab99-9ab4-4355-8e3e-a41af8c38c06\9953f822
| Ptotal=193.00 mm |    Comments: Timmins Storm
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00   15.00 |  3.00    3.00 |  6.00   43.00 |  9.00   13.00
                1.00   20.00 |  4.00    5.00 |  7.00   20.00 | 10.00   13.00
                2.00   10.00 |  5.00   20.00 |  8.00   23.00 | 11.00    8.00

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| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   3.71   Curve Number   (CN)= 70.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.49   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.66

         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
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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)= 0.215

PEAK FLOW (cms)= 0.253 (i)
TIME TO PEAK (hrs)= 7.333
RUNOFF VOLUME (mm)= 119.507
TOTAL RAINFALL (mm)= 193.000
RUNOFF COEFFICIENT = 0.619

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

CALIB				
NASHYD (0002)	Area (ha)=	2.26	Curve Number (CN)=	70.4
ID= 1 DT= 5.0 min	Ia (mm)=	5.53	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.16		

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

Unit Hyd Qpeak (cms)= 0.540

PEAK FLOW (cms)= 0.198 (i)
TIME TO PEAK (hrs)= 7.000
RUNOFF VOLUME (mm)= 118.812
TOTAL RAINFALL (mm)= 193.000
RUNOFF COEFFICIENT = 0.616

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

CALIB					
NASHYD (0101)	Area (ha)=	10.38	Curve Number (CN)=	74.6	
ID= 1 DT= 5.0 min	Ia (mm)=	6.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.81			

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

Unit Hyd Qpeak (cms)= 0.489

PEAK FLOW (cms)= 0.701 (i)
TIME TO PEAK (hrs)= 7.500
RUNOFF VOLUME (mm)= 127.950
TOTAL RAINFALL (mm)= 193.000
RUNOFF COEFFICIENT = 0.663

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

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| ADD HYD  (  0021)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):    10.38   0.701     7.50   127.95
      + ID2= 2 (  0002):     2.26   0.198     7.00   118.81
        ================================================
        ID = 3 (  0021):    12.64   0.807     7.08   126.32

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| SHIFT HYD(  0022)|
| IN= 2---> OUT= 1 |
| SHIFT=149.6 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0021):   12.64     0.81      7.08    126.32
    SHIFT ID= 1 (  0022):   12.64     0.81      9.50    126.32

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--------------------
| CALIB            |
| NASHYD   (  0100)|   Area    (ha)=  39.24   Curve Number   (CN)= 74.9
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.79

         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)= 1.897

PEAK FLOW (cms)= 2.690 (i)
TIME TO PEAK (hrs)= 7.500
RUNOFF VOLUME (mm)= 128.548
TOTAL RAINFALL (mm)= 193.000
RUNOFF COEFFICIENT = 0.666

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

SHIFT HYD(0020)
IN= 2---> OUT= 1
SHIFT=244.7 min

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID= 2 (0100):	39.24	2.69	7.50	128.55
SHIFT ID= 1 (0020):	39.24	2.69	11.50	128.55

CALIB			
NASHYD (0102)	Area (ha)= 8.90	Curve Number (CN)= 71.7	
ID= 1 DT= 5.0 min	Ia (mm)= 7.26	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.91		

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

Unit Hyd Qpeak (cms)= 0.374

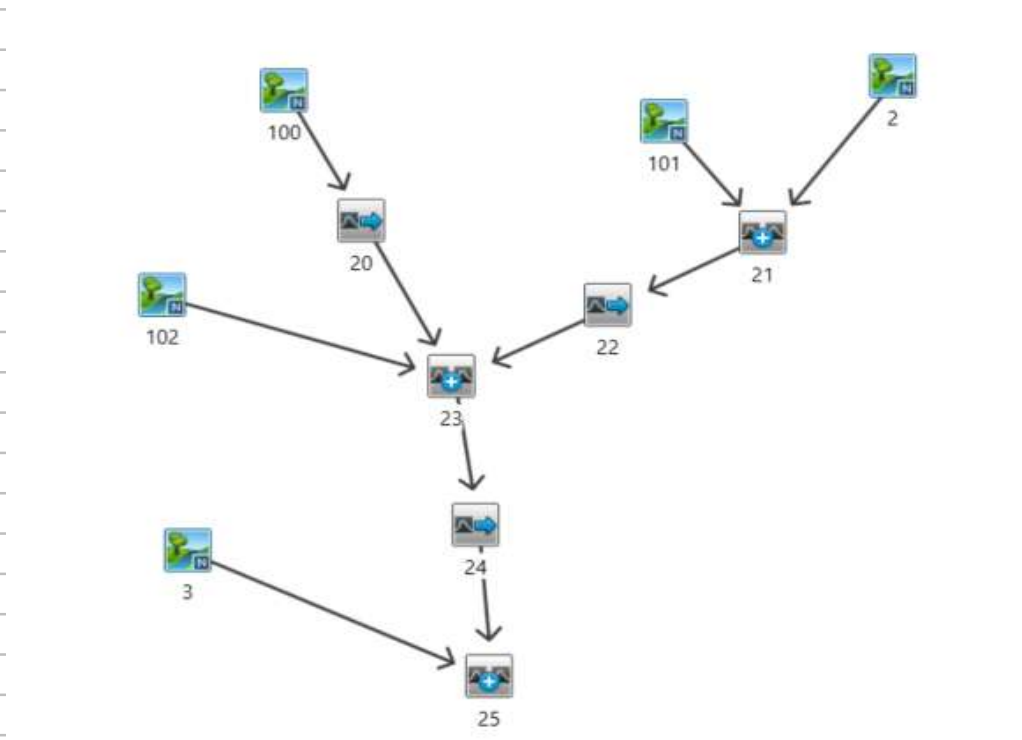
PEAK FLOW (cms)= 0.539 (i)
TIME TO PEAK (hrs)= 7.667
RUNOFF VOLUME (mm)= 120.545
TOTAL RAINFALL (mm)= 193.000
RUNOFF COEFFICIENT = 0.625

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

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0102):     8.90   0.539     7.67   120.55
      + ID2= 2 (  0020):    39.24   2.690    11.50   128.55
        ================================================
        ID = 3 (  0023):    48.14   2.974    11.42   127.07

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

--------------------
| ADD HYD  (  0023)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0023):    48.14   2.974    11.42   127.07
      + ID2= 2 (  0022):    12.64   0.807     9.50   126.32
        ================================================
        ID = 1 (  0023):    60.78   3.657    11.42   126.91

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0024)|
| IN= 2---> OUT= 1 |
| SHIFT= 50.6 min  |       AREA     QPEAK     TPEAK      R.V.
--------------------       (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0023):   60.78      3.66     11.42    126.91
    SHIFT ID= 1 (  0024):   60.78      3.66     12.25    126.91

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

--------------------
| ADD HYD  (  0025)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0024):    60.78   3.657    12.25   126.91
      + ID2= 2 (  0003):     3.71   0.253     7.33   119.51
        ================================================
        ID = 3 (  0025):    64.49   3.735    12.25   126.49

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

B.6. Post- Development OTTHYMO Schematic

Project:	New School Site
File No.:	2402381
Date:	May, 2025
Designed	CS
Checked:	JS
Subject:	Pre-Grading Phase 1 OTTHYMO Schematic



B.7. Post- Development OTTHYMO Output

```
*****************************************
** SIMULATION:100 yr Chicago Design Storm **
*****************************************
--------------------
| CHICAGO STORM    |    IDF curve parameters: A=2171.754
| Ptotal= 72.84 mm |                          B=   8.303
--------------------                          C=   0.867
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    =  5.00 min
                       Time to peak ratio =  0.38

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    3.15 |  1.00   12.18 |  2.00   14.13 |  3.00    4.70
                0.08    3.35 |  1.08   15.91 |  2.08   12.15 |  3.08    4.46
                0.17    3.59 |  1.17   22.59 |  2.17   10.64 |  3.17    4.23
                0.25    3.85 |  1.25   37.28 |  2.25    9.45 |  3.25    4.03
                0.33    4.17 |  1.33   87.10 |  2.33    8.50 |  3.33    3.85
                0.42    4.54 |  1.42  230.33 |  2.42    7.72 |  3.42    3.69
                0.50    4.98 |  1.50  104.88 |  2.50    7.07 |  3.50    3.54
                0.58    5.53 |  1.58   56.05 |  2.58    6.52 |  3.58    3.40
                0.67    6.21 |  1.67   36.64 |  2.67    6.05 |  3.67    3.27
                0.75    7.08 |  1.75   26.66 |  2.75    5.65 |  3.75    3.15
                0.83    8.23 |  1.83   20.72 |  2.83    5.29 |  3.83    3.04
                0.92    9.83 |  1.92   16.84 |  2.92    4.98 |  3.92    2.94


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   0.80   Curve Number   (CN)= 76.1
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.45   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.218

     PEAK FLOW       (cms)=   0.103 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  29.194
     TOTAL RAINFALL   (mm)=  72.844
     RUNOFF COEFFICIENT   =   0.401

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0101)|   Area    (ha)=  10.38   Curve Number   (CN)= 74.6
```

```
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.81

     Unit Hyd Qpeak  (cms)=   0.489

     PEAK FLOW       (cms)=   0.419 (i)
     TIME TO PEAK    (hrs)=   2.500
     RUNOFF VOLUME    (mm)=  29.176
     TOTAL RAINFALL   (mm)=  72.844
     RUNOFF COEFFICIENT   =   0.401

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

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

--------------------
| ADD HYD  (  0021)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):    10.38   0.419     2.50    29.18
      + ID2= 2 (  0002):     0.80   0.103     1.67    29.19
        ================================================
        ID = 3 (  0021):    11.18   0.433     2.42    29.18

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0022)|
| IN= 2---> OUT= 1 |
| SHIFT=149.6 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0021):   11.18     0.43      2.42     29.18
    SHIFT ID= 1 (  0022):   11.18     0.43      4.83     29.18

------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0100)|   Area    (ha)=  39.24   Curve Number   (CN)= 74.9
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.79

     Unit Hyd Qpeak  (cms)=   1.897

     PEAK FLOW       (cms)=   1.628 (i)
     TIME TO PEAK    (hrs)=   2.417
     RUNOFF VOLUME    (mm)=  29.420
     TOTAL RAINFALL   (mm)=  72.844
     RUNOFF COEFFICIENT   =   0.404

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

```
--------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0020)|
| IN= 2---> OUT= 1 |
| SHIFT=244.7 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0100):   39.24     1.63      2.42     29.42
    SHIFT ID= 1 (  0020):   39.24     1.63      6.42     29.42

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0102)|   Area    (ha)=   8.90   Curve Number   (CN)= 71.7
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.26   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.91

     Unit Hyd Qpeak  (cms)=   0.374

     PEAK FLOW       (cms)=   0.289 (i)
     TIME TO PEAK    (hrs)=   2.583
     RUNOFF VOLUME    (mm)=  25.906
     TOTAL RAINFALL   (mm)=  72.844
     RUNOFF COEFFICIENT   =   0.356

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

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0102):     8.90   0.289     2.58    25.91
      + ID2= 2 (  0020):    39.24   1.628     6.42    29.42
        ================================================
        ID = 3 (  0023):    48.14   1.635     6.42    28.77

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

--------------------
| ADD HYD  (  0023)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0023):    48.14   1.635     6.42    28.77
      + ID2= 2 (  0022):    11.18   0.433     4.83    29.18
        ================================================
        ID = 1 (  0023):    59.32   1.797     6.42    28.85
```

```
     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0024)|
| IN= 2---> OUT= 1 |
| SHIFT= 50.6 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0023):   59.32     1.80      6.42     28.85
    SHIFT ID= 1 (  0024):   59.32     1.80      7.25     28.85

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   5.60   Curve Number   (CN)= 77.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.11   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.39

     Unit Hyd Qpeak  (cms)=   0.548

     PEAK FLOW       (cms)=   0.411 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  30.995
     TOTAL RAINFALL   (mm)=  72.844
     RUNOFF COEFFICIENT   =   0.425

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

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

--------------------
| ADD HYD  (  0025)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0024):    59.32   1.797     7.25    28.85
      + ID2= 2 (  0003):     5.60   0.411     1.92    30.99
        ================================================
        ID = 3 (  0025):    64.92   1.797     7.25    29.03

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
****************************************
** SIMULATION:2 yr Chicago Design Storm **
****************************************
--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 854.100
| Ptotal= 33.23 mm |                          B=   7.781
--------------------                          C=   0.830
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  3.00 hrs
```

Storm time step = 5.00 min
Time to peak ratio = 0.38

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	2.37	0.75	8.07	1.50	10.29	2.25	3.57
0.08	2.56	0.83	11.14	1.58	8.50	2.33	3.34
0.17	2.79	0.92	17.74	1.67	7.24	2.42	3.13
0.25	3.07	1.00	39.66	1.75	6.30	2.50	2.95
0.33	3.41	1.08	103.05	1.83	5.58	2.58	2.79
0.42	3.85	1.17	47.46	1.92	5.01	2.67	2.65
0.50	4.42	1.25	26.04	2.00	4.55	2.75	2.52
0.58	5.20	1.33	17.46	2.08	4.17	2.83	2.41
0.67	6.32	1.42	12.99	2.17	3.85	2.92	2.30

CALIB NASHYD (0002) ID= 1 DT= 5.0 min	Area (ha)= 0.80	Curve Number (CN)= 76.1
	Ia (mm)= 7.45	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.14	

Unit Hyd Qpeak (cms)= 0.218

PEAK FLOW (cms)= 0.019 (i)
TIME TO PEAK (hrs)= 1.333
RUNOFF VOLUME (mm)= 6.235
TOTAL RAINFALL (mm)= 33.227
RUNOFF COEFFICIENT = 0.188

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

CALIB NASHYD (0101) ID= 1 DT= 5.0 min	Area (ha)= 10.38	Curve Number (CN)= 74.6
	Ia (mm)= 6.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.81	

Unit Hyd Qpeak (cms)= 0.489

PEAK FLOW (cms)= 0.093 (i)
TIME TO PEAK (hrs)= 2.250
RUNOFF VOLUME (mm)= 6.530
TOTAL RAINFALL (mm)= 33.227
RUNOFF COEFFICIENT = 0.197

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

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

--------------------
| ADD HYD  (  0021)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):    10.38   0.093     2.25     6.53
      + ID2= 2 (  0002):     0.80   0.019     1.33     6.23
        ================================================
        ID = 3 (  0021):    11.18   0.096     2.25     6.51

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0022)|
| IN= 2---> OUT= 1 |
| SHIFT=149.6 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0021):   11.18     0.10      2.25      6.51
    SHIFT ID= 1 (  0022):   11.18     0.10      4.67      6.51

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0100)|   Area    (ha)=  39.24   Curve Number   (CN)= 74.9
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.79

     Unit Hyd Qpeak  (cms)=   1.897

     PEAK FLOW       (cms)=   0.360 (i)
     TIME TO PEAK    (hrs)=   2.250
     RUNOFF VOLUME    (mm)=   6.604
     TOTAL RAINFALL   (mm)=  33.227
     RUNOFF COEFFICIENT   =   0.199

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

--------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0020)|
| IN= 2---> OUT= 1 |
| SHIFT=244.7 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0100):   39.24     0.36      2.25      6.60
    SHIFT ID= 1 (  0020):   39.24     0.36      6.25      6.60

--------------------------------------------------------------------------------
--------------------
| CALIB            |
```

```
| NASHYD   (  0102)|   Area    (ha)=   8.90   Curve Number   (CN)= 71.7
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.26   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.91

     Unit Hyd Qpeak  (cms)=   0.374

     PEAK FLOW       (cms)=   0.059 (i)
     TIME TO PEAK    (hrs)=   2.417
     RUNOFF VOLUME    (mm)=   5.334
     TOTAL RAINFALL   (mm)=  33.227
     RUNOFF COEFFICIENT   =   0.161

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

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0102):     8.90   0.059     2.42     5.33
      + ID2= 2 (  0020):    39.24   0.360     6.25     6.60
        ================================================
        ID = 3 (  0023):    48.14   0.361     6.25     6.37

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

--------------------
| ADD HYD  (  0023)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0023):    48.14   0.361     6.25     6.37
      + ID2= 2 (  0022):    11.18   0.096     4.67     6.51
        ================================================
        ID = 1 (  0023):    59.32   0.396     6.17     6.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0024)|
| IN= 2---> OUT= 1 |
| SHIFT= 50.6 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0023):   59.32     0.40      6.17      6.40
    SHIFT ID= 1 (  0024):   59.32     0.40      7.00      6.40

--------------------------------------------------------------------------------
--------------------
| CALIB            |
```

```
| NASHYD   (  0003)|   Area    (ha)=   5.60   Curve Number   (CN)= 77.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.11   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.39

     Unit Hyd Qpeak  (cms)=   0.548

     PEAK FLOW       (cms)=   0.084 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   6.836
     TOTAL RAINFALL   (mm)=  33.227
     RUNOFF COEFFICIENT   =   0.206

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

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

--------------------
| ADD HYD  (  0025)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0024):    59.32   0.396     7.00     6.40
      + ID2= 2 (  0003):     5.60   0.084     1.67     6.84
        ================================================
        ID = 3 (  0025):    64.92   0.396     7.00     6.43

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
****************************************
** SIMULATION:25 yr Chicago Design Storm **
****************************************
--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1750.276
| Ptotal= 60.35 mm |                          B=   8.303
--------------------                          C=   0.862
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    =  5.00 min
                       Time to peak ratio =  0.38

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    2.69 |  1.00   10.22 |  2.00   11.84 |  3.00    3.99
                0.08    2.86 |  1.08   13.31 |  2.08   10.19 |  3.08    3.78
                0.17    3.05 |  1.17   18.82 |  2.17    8.94 |  3.17    3.60
                0.25    3.28 |  1.25   30.89 |  2.25    7.95 |  3.25    3.43
                0.33    3.54 |  1.33   71.60 |  2.33    7.16 |  3.33    3.28
                0.42    3.85 |  1.42  188.05 |  2.42    6.51 |  3.42    3.14
                0.50    4.23 |  1.50   86.10 |  2.50    5.97 |  3.50    3.01
                0.58    4.68 |  1.58   46.26 |  2.58    5.51 |  3.58    2.89
```

```
                0.67    5.25 |  1.67   30.37 |  2.67    5.12 |  3.67    2.79
                0.75    5.98 |  1.75   22.17 |  2.75    4.78 |  3.75    2.69
                0.83    6.94 |  1.83   17.28 |  2.83    4.49 |  3.83    2.59
                0.92    8.27 |  1.92   14.08 |  2.92    4.22 |  3.92    2.51


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   0.80   Curve Number   (CN)= 76.1
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.45   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.218

     PEAK FLOW       (cms)=   0.071 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  20.899
     TOTAL RAINFALL   (mm)=  60.348
     RUNOFF COEFFICIENT   =   0.346

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0101)|   Area    (ha)=  10.38   Curve Number   (CN)= 74.6
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.81

     Unit Hyd Qpeak  (cms)=   0.489

     PEAK FLOW       (cms)=   0.297 (i)
     TIME TO PEAK    (hrs)=   2.500
     RUNOFF VOLUME    (mm)=  21.001
     TOTAL RAINFALL   (mm)=  60.348
     RUNOFF COEFFICIENT   =   0.348

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

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

--------------------
| ADD HYD  (  0021)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):    10.38   0.297     2.50    21.00
      + ID2= 2 (  0002):     0.80   0.071     1.67    20.90
        ================================================
        ID = 3 (  0021):    11.18   0.307     2.50    20.99
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

SHIFT HYD(0022)		AREA	QPEAK	TPEAK	R.V.
IN= 2---> OUT= 1		(ha)	(cms)	(hrs)	(mm)
SHIFT=149.6 min	ID= 2 (0021):	11.18	0.31	2.50	20.99
	SHIFT ID= 1 (0022):	11.18	0.31	4.92	20.99

CALIB					
NASHYD (0100)	Area (ha)=	39.24	Curve Number (CN)=	74.9	
ID= 1 DT= 5.0 min	Ia (mm)=	6.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.79			

Unit Hyd Qpeak (cms)= 1.897

PEAK FLOW (cms)= 1.154 (i)
TIME TO PEAK (hrs)= 2.500
RUNOFF VOLUME (mm)= 21.192
TOTAL RAINFALL (mm)= 60.348
RUNOFF COEFFICIENT = 0.351

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

SHIFT HYD(0020)		AREA	QPEAK	TPEAK	R.V.
IN= 2---> OUT= 1		(ha)	(cms)	(hrs)	(mm)
SHIFT=244.7 min	ID= 2 (0100):	39.24	1.15	2.50	21.19
	SHIFT ID= 1 (0020):	39.24	1.15	6.50	21.19

CALIB					
NASHYD (0102)	Area (ha)=	8.90	Curve Number (CN)=	71.7	
ID= 1 DT= 5.0 min	Ia (mm)=	7.26	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.91			

Unit Hyd Qpeak (cms)= 0.374

PEAK FLOW (cms)= 0.202 (i)
TIME TO PEAK (hrs)= 2.667
RUNOFF VOLUME (mm)= 18.356
TOTAL RAINFALL (mm)= 60.348

```
     RUNOFF COEFFICIENT   =   0.304

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

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0102):     8.90   0.202     2.67    18.36
      + ID2= 2 (  0020):    39.24   1.154     6.50    21.19
        ================================================
        ID = 3 (  0023):    48.14   1.159     6.50    20.67

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

--------------------
| ADD HYD  (  0023)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0023):    48.14   1.159     6.50    20.67
      + ID2= 2 (  0022):    11.18   0.307     4.92    20.99
        ================================================
        ID = 1 (  0023):    59.32   1.278     6.42    20.73

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0024)|
| IN= 2---> OUT= 1 |
| SHIFT= 50.6 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0023):   59.32     1.28      6.42     20.73
    SHIFT ID= 1 (  0024):   59.32     1.28      7.25     20.73

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   5.60   Curve Number   (CN)= 77.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.11   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.39

     Unit Hyd Qpeak  (cms)=   0.548

     PEAK FLOW       (cms)=   0.289 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  22.333
     TOTAL RAINFALL   (mm)=  60.348
```

RUNOFF COEFFICIENT = 0.370

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

ADD HYD (0025)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0024):	59.32	1.278	7.25	20.73
	+ ID2= 2 (0003):	5.60	0.289	2.00	22.33
	ID = 3 (0025):	64.92	1.278	7.25	20.87

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:5 yr Chicago Design Storm **
****

CHICAGO STORM	Ptotal= 42.93 mm

IDF curve parameters: A=1234.576
B= 8.297
C= 0.851
used in: INTENSITY = A / (t + B)^C

Duration of storm = 3.00 hrs
Storm time step = 5.00 min
Time to peak ratio = 0.38

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	2.80	0.75	10.17	1.50	13.13	2.25	4.31
0.08	3.04	0.83	14.27	1.58	10.75	2.33	4.01
0.17	3.33	0.92	23.16	1.67	9.08	2.42	3.75
0.25	3.68	1.00	52.75	1.75	7.85	2.50	3.53
0.33	4.11	1.08	136.52	1.83	6.91	2.58	3.33
0.42	4.67	1.17	63.26	1.92	6.16	2.67	3.15
0.50	5.40	1.25	34.39	2.00	5.57	2.75	2.99
0.58	6.40	1.33	22.78	2.08	5.07	2.83	2.84
0.67	7.87	1.42	16.75	2.17	4.66	2.92	2.71

CALIB NASHYD (0002)	ID= 1 DT= 5.0 min	Area (ha)= 0.80	Curve Number (CN)= 76.1	# of Linear Res.(N)= 3.00	U.H. Tp(hrs)= 0.14

```
     Unit Hyd Qpeak  (cms)=   0.218

     PEAK FLOW       (cms)=   0.037 (i)
     TIME TO PEAK    (hrs)=   1.333
     RUNOFF VOLUME    (mm)=  10.819
     TOTAL RAINFALL   (mm)=  42.928
     RUNOFF COEFFICIENT   =   0.252

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0101)|   Area    (ha)=  10.38   Curve Number   (CN)= 74.6
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.81

     Unit Hyd Qpeak  (cms)=   0.489

     PEAK FLOW       (cms)=   0.161 (i)
     TIME TO PEAK    (hrs)=   2.250
     RUNOFF VOLUME    (mm)=  11.066
     TOTAL RAINFALL   (mm)=  42.928
     RUNOFF COEFFICIENT   =   0.258

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

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

--------------------
| ADD HYD  (  0021)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0101):    10.38   0.161     2.25    11.07
      + ID2= 2 (  0002):     0.80   0.037     1.33    10.82
        ================================================
        ID = 3 (  0021):    11.18   0.168     2.17    11.05

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0022)|
| IN= 2---> OUT= 1 |
| SHIFT=149.6 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0021):   11.18     0.17      2.17     11.05
    SHIFT ID= 1 (  0022):   11.18     0.17      4.58     11.05

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

```
| CALIB            |
| NASHYD   (  0100)|   Area    (ha)=  39.24   Curve Number   (CN)= 74.9
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.79

     Unit Hyd Qpeak  (cms)=   1.897

     PEAK FLOW       (cms)=   0.629 (i)
     TIME TO PEAK    (hrs)=   2.167
     RUNOFF VOLUME    (mm)=  11.182
     TOTAL RAINFALL   (mm)=  42.928
     RUNOFF COEFFICIENT   =   0.260

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

--------------------------------------------------------------------------------
-------------------
| SHIFT HYD(  0020)|
| IN= 2---> OUT= 1 |
| SHIFT=244.7 min  |      AREA     QPEAK     TPEAK      R.V.
-------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0100):   39.24     0.63      2.17     11.18
    SHIFT ID= 1 (  0020):   39.24     0.63      6.17     11.18

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0102)|   Area    (ha)=   8.90   Curve Number   (CN)= 71.7
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.26   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.91

     Unit Hyd Qpeak  (cms)=   0.374

     PEAK FLOW       (cms)=   0.107 (i)
     TIME TO PEAK    (hrs)=   2.333
     RUNOFF VOLUME    (mm)=   9.346
     TOTAL RAINFALL   (mm)=  42.928
     RUNOFF COEFFICIENT   =   0.218

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

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

-------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0102):     8.90   0.107     2.33     9.35
      + ID2= 2 (  0020):    39.24   0.629     6.17    11.18
        ================================================
```

```
        ID = 3 (  0023):    48.14   0.630     6.17    10.84

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

--------------------
| ADD HYD  (  0023)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0023):    48.14   0.630     6.17    10.84
      + ID2= 2 (  0022):    11.18   0.168     4.58    11.05
        ================================================
        ID = 1 (  0023):    59.32   0.687     6.08    10.88

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0024)|
| IN= 2---> OUT= 1 |
| SHIFT= 50.6 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0023):   59.32     0.69      6.08     10.88
    SHIFT ID= 1 (  0024):   59.32     0.69      6.92     10.88

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   5.60   Curve Number   (CN)= 77.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.11   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.39

     Unit Hyd Qpeak  (cms)=   0.548

     PEAK FLOW       (cms)=   0.153 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  11.717
     TOTAL RAINFALL   (mm)=  42.928
     RUNOFF COEFFICIENT   =   0.273

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

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

--------------------
| ADD HYD  (  0025)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0024):    59.32   0.687     6.92    10.88
      + ID2= 2 (  0003):     5.60   0.153     1.67    11.72
        ================================================
```

```
        ID = 3 (  0025):    64.92   0.687     6.92    10.95

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
******************************
** SIMULATION:Timmins Storm   **
******************************

--------------------
|    READ STORM    |    Filename: C:\Users\chrslo4129\AppD
|                  |              ata\Local\Temp\
|                  |              8fd95b66-3f6b-4536-a12b-4339e11b5777\9953f822
| Ptotal=193.00 mm |    Comments: Timmins Storm
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00   15.00 |  3.00    3.00 |  6.00   43.00 |  9.00   13.00
                1.00   20.00 |  4.00    5.00 |  7.00   20.00 | 10.00   13.00
                2.00   10.00 |  5.00   20.00 |  8.00   23.00 | 11.00    8.00

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

--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   0.80   Curve Number   (CN)= 76.1
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.45   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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


                          ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083   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)= 0.218

PEAK FLOW (cms)= 0.076 (i)
TIME TO PEAK (hrs)= 7.000
RUNOFF VOLUME (mm)= 128.683
TOTAL RAINFALL (mm)= 193.000
RUNOFF COEFFICIENT = 0.667

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

CALIB					
NASHYD (0101)	Area (ha)=	10.38	Curve Number (CN)=	74.6	
ID= 1 DT= 5.0 min	Ia (mm)=	6.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.81			

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

Unit Hyd Qpeak (cms)= 0.489

PEAK FLOW (cms)= 0.701 (i)
TIME TO PEAK (hrs)= 7.500
RUNOFF VOLUME (mm)= 127.950
TOTAL RAINFALL (mm)= 193.000
RUNOFF COEFFICIENT = 0.663

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

ADD HYD (0021)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0101):	10.38	0.701	7.50	127.95
+ ID2= 2 (0002):	0.80	0.076	7.00	128.68

```
        ID = 3 (  0021):    11.18   0.739     7.50   128.00

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0022)|
| IN= 2---> OUT= 1 |
| SHIFT=149.6 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0021):   11.18     0.74      7.50    128.00
    SHIFT ID= 1 (  0022):   11.18     0.74      9.92    128.00

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0100)|   Area    (ha)=  39.24   Curve Number   (CN)= 74.9
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.79

         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

Unit Hyd Qpeak (cms)= 1.897

PEAK FLOW (cms)= 2.690 (i)
TIME TO PEAK (hrs)= 7.500
RUNOFF VOLUME (mm)= 128.548
TOTAL RAINFALL (mm)= 193.000
RUNOFF COEFFICIENT = 0.666

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

SHIFT HYD(0020)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
IN= 2---> OUT= 1					
SHIFT=244.7 min	ID= 2 (0100):	39.24	2.69	7.50	128.55
	SHIFT ID= 1 (0020):	39.24	2.69	11.50	128.55

CALIB					
NASHYD (0102)	Area (ha)=	8.90	Curve Number (CN)=	71.7	
ID= 1 DT= 5.0 min	Ia (mm)=	7.26	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.91			

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

Unit Hyd Qpeak (cms)= 0.374

PEAK FLOW (cms)= 0.539 (i)
TIME TO PEAK (hrs)= 7.667
RUNOFF VOLUME (mm)= 120.545
TOTAL RAINFALL (mm)= 193.000
RUNOFF COEFFICIENT = 0.625

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

ADD HYD (0023)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0102):	8.90	0.539	7.67	120.55
+ ID2= 2 (0020):	39.24	2.690	11.50	128.55

```
        ID = 3 (  0023):    48.14   2.974    11.42   127.07

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

--------------------
| ADD HYD  (  0023)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0023):    48.14   2.974    11.42   127.07
      + ID2= 2 (  0022):    11.18   0.739     9.92   128.00
        ================================================
        ID = 1 (  0023):    59.32   3.582    11.42   127.24

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| SHIFT HYD(  0024)|
| IN= 2---> OUT= 1 |
| SHIFT= 50.6 min  |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
          ID= 2 (  0023):   59.32     3.58     11.42    127.24
    SHIFT ID= 1 (  0024):   59.32     3.58     12.25    127.24

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   5.60   Curve Number   (CN)= 77.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.11   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.39

         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)= 0.548

PEAK FLOW (cms)= 0.504 (i)
TIME TO PEAK (hrs)= 7.083
RUNOFF VOLUME (mm)= 133.117
TOTAL RAINFALL (mm)= 193.000
RUNOFF COEFFICIENT = 0.690

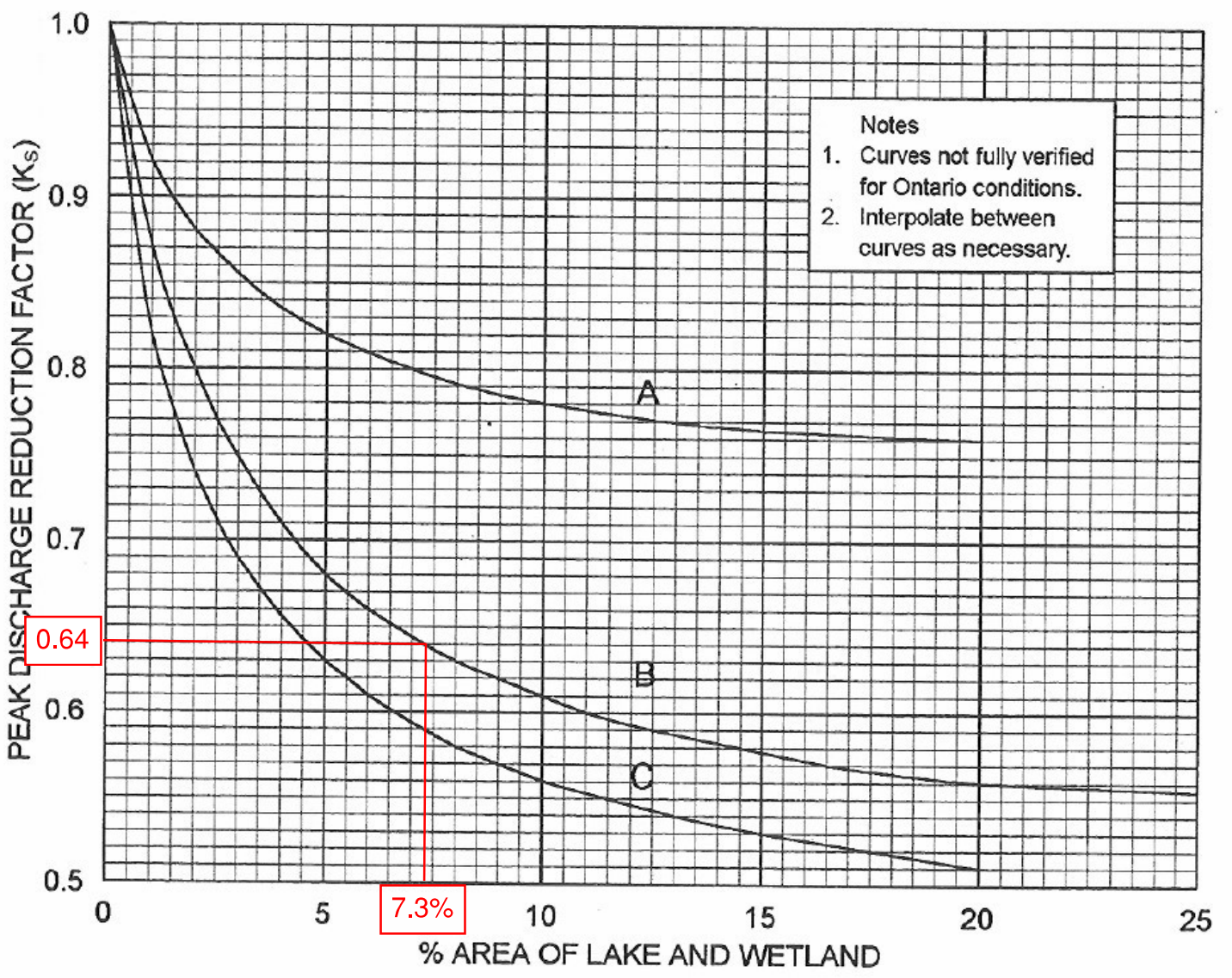
(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0025)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0024):	59.32	3.582	12.25	127.24
+ ID2= 2 (0003):	5.60	0.504	7.08	133.12
ID = 3 (0025):	64.92	3.678	12.25	127.75

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

B.8. MTO Hydrotechnical Design Chart 1.06

Design Chart 1.06: Peak Discharge Reduction Factor to Allow for Storage



Curve A - Significant portion of flow passes through detention areas in upper reaches, or elsewhere in basin not in path of flow.

Curve B - Significant portion of flow passes through detention areas distributed throughout basin or in the middle reaches only.

Curve C - Most of detention is located in path of flow at lower end of basin.

B.9. Channel and Box Culvert Design Calculations

Existing Westerly Channel Channel Design

Manning's n :	n =	0.035	
Bottom Width:	W =	2	
Depth of Flow:	d =	0.42	
Side Slopes:	Ss =	20	:1
Channel Slope:	Sc =	0.0025	m/m
Top Width:	Tw =	18.96	m
Sectional Area:	A =	4.444	m^2
Wetted Perimeter:	P =	18.98	m
Hydraulic Radius:	R =	0.234	m
Flow:	Q =	2.411	m^3/s
Velocity:	V =	0.54	m/s
Gravity:	g =	9.806	m/s^2
Isbash Constant:	C =	0.9	(0.86 - 1.2)
Specific Gravity:	S =	2.5	OPSS.PORV 1004
Mean Stone Diameter:	dm =	12.4	mm

Off-Site Rail Trail Ditch Design

Manning's n :	n =	0.035	
Bottom Width:	W =	1	
Depth of Flow:	d =	1.1	
Side Slopes:	Ss =	2	:1
Channel Slope:	Sc =	0.006	m/m
Top Width:	Tw =	5.40	m
Sectional Area:	A =	3.520	m^2
Wetted Perimeter:	P =	5.92	m
Hydraulic Radius:	R =	0.595	m
Flow:	Q =	5.509	m^3/s
Velocity:	V =	1.57	m/s
Gravity:	g =	9.806	m/s^2
Isbash Constant:	C =	0.9	(0.86 - 1.2)
Specific Gravity:	S =	2.5	OPSS.PORV 1004
Mean Stone Diameter:	dm =	102.8	mm

Proposed Westerly Channel Channel Design

Manning's n :	n =	0.035	
Bottom Width:	W =	3	
Depth of Flow:	d =	0.42	
West Side Slope:	Ss =	5	:1
East Side Slope:	Ss =	30	:1
Channel Slope:	Sc =	0.0025	m/m
Top Width:	Tw =	17.7	m
Sectional Area:	A =	4.347	m^2
Wetted Perimeter:	P =	17.75	m
Hydraulic Radius:	R =	0.245	m
Flow:	Q =	2.431	m^3/s
Velocity:	V =	0.56	m/s
Gravity:	g =	9.806	m/s^2
Isbash Constant:	C =	0.9	(0.86 - 1.2)
Specific Gravity:	S =	2.5	OPSS.PORV 1004
Mean Stone Diameter:	dm =	13.1	mm

Box Culvert Full Flow Capacity

Manning's n :	n =	0.011	
Height:	h =	1.2	m
Width:	w =	2.4	m
Depth of Flow:	d =	0.46	m
Culvert Slope:	Sp =	0.0025	m/m
Area:	A =	1.104	m^2
Wetted Perimeter:	P =	3.320	m
Hydraulic Radius:	R =	0.333	m
Pipe Flow:	Q =	2.409	m^3/s
Flow Velocity :	V =	2.182	m/s
Gravity:	g =	9.806	m/s^2
Isbash Constant:	C =	0.9	(0.86 - 1.2)
Specific Gravity:	S =	2.5	OPSS.PORV 1004
Mean Stone Diameter:	dm =	199.8	mm