LANARK COUNTY

PLANNING DEPARTMENT

09-T-23007
400 Lanark Street

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LandPro Planning Solutions Inc.
110 James St., Suite 204
St. Catharines, ON L2R 7E8
56 Norfolk St. South
Simcoe, ON, N3Y 2W2

September 21, 2023

Koren Lam, RPP
Senior Planner
Lanark County
99 Christie Lake Road,
Perth, ON, K7H 3C6

Email: klam@lanarkcounty.ca

Re: Plan of Subdivision Application
Wintergreen Ridge Ltd
400 Lanark Street
Town of Carleton Place

LandPro Planning Solutions Inc. ("LandPro") has been retained by Wintergreen Ridge Ltd, owner of 400 Lanark Street in Town of Carleton Place. This application seeks to attain County approval for a residential Draft Plan of Subdivision. This submission is to address the County's technical requirements to be considered a complete application.

We have prepared this cover letter to provide clarity for the County and Town, in order to demonstrate our collective professional approach to this application. This approach is used to aid County and Town staff in their review of the application and to continue to operate on a good faith basis.

1. Proposed Development

The proposal seeks to redevelop a 6.27-hectare parcel into a residential subdivision which will include 35 single detached dwellings, 32 street townhome dwellings, 58 stacked townhome dwellings and 125 apartment dwellings. This 250-unit proposal will bring a mix of densities, including 20% of affordable housing units.

2. Purpose

In support of the application for a Draft Plan of Subdivision, we are pleased to include the following technical support:

Report Title	Principal Author
1. Completed and Signed Plan of Subdivision Application	LandPro Planning Solutions
2. Planning Justification Report	LandPro (September 2023)
3. Draft Plan of Subdivision	LandPro & McIntosh Perry Engineers and Surveyors (September 2023)
4. Urban Design Brief	LandPro & BR2 Architects (September 2023)
5. Environmental Site Assessment	McIntosh Perry (September 2023)
6. Parcel Register – PIN 05303-0287	ServiceOntario (Laywer)
7. Traffic Impact Study	McIntosh Perry (September 2023)
8. Stormwater Management Plan	McIntosh Perry (September 2023)
9. Servicing & Stormwater Management Report	McIntosh Perry (September 2023)
10. Registered Plan – 27R12109	OLS
11. Registered PIN Consolidation	ServiceOntario (lawyer)
12. Town Pre-Consultation Notes	October 2022
13. County application fees	Paid directly by owner

This letter addresses the key items needed to justify the proposed development on the subject property, as required by the County's Pre-Consultation notes. We trust this submission fulfills the County's requirements for a complete application and look forward to receiving confirmation of the same.

3. Summary of Application

Through this submission, we have demonstrated and justified that 250 residential units are appropriate in this location, based on full municipal servicing, efficient internal road network for resident access, and a range of densities to meet a variety of housing needs.

More specifically, this application proposes a built from that is compatible with the existing and proposed uses in the neighbourhood, respects, and enhances existing vegetation, while also enhancing the area by refreshing the urban design and bringing additional, well considered housing units to the area.

4. Additional Information

4.1 Land Titles Absolute

The subject property is the result of a significant effort and expense made to consolidate multiple properties/PINs into the property represented in the attached R Plan.

The owners confirm that the subject property has successfully completed the Land Titles Absolute process, as represented in the attached drawings.

4.1 Parcel Register & RPlan

For the County's benefit, the Parcel Registry is attached that demonstrates all properties are now registered as PIN 05303-0287 with a Registered PIN consolidation LC241250

5.0 Closing

The above and attached has been prepared to address the Planning Act requirements for a Complete Application, as represented in the County's Pre-Consultation notes. We look forward to receiving confirmation of complete application in the near future.

You are welcome to contact me at mike@landproplan.ca or by phone at 289-680-3644, to discuss this application further.

LANDPRO PLANNING SOLUTIONS Inc.

Michael Sullivan, M.Plan, RPP
President | Founder
289-680-3644
mike@landproplan.ca

Mehreen Khan, BA, OCGC
Planning Technician | Designer
289-480-5188
mehreen@landproplan.ca

Authentisign ID: 5DB605FB-8ABA-42F6-AC5A-4889B934C8C4

TYPE OF APPLICATION

Plan of Subdivision

OFFICE USE ONLY:

Date Application Received: ______________ File Number: ______________

Date Application Deemed Complete: ______________ Application Fee: ______________ Receipt: ______________

Print in black or blue ink, complete or (✓)appropriate box(es)

1. APPLICATION INFORMATION

➢ **1.1 Name of Owner(s).** An owner's authorization is required in Section 11.1, if the applicant is not the owner.

Name of Owner(s)	Home Telephone No.	Business Telephone No.
Wintergreen Ridge Ltd	(613)859-8474	
Address	**Postal Code**	**Fax No.**
39 Wheatland Avenue, Ottawa ON	K2M 2L2	
	Email Address	
	Natalie@nataliemcguire.ca	

➢ **1.2 Agent/Applicant** - Name of the person who is to be contacted about the application, if different than the owner. (This may be a person or firm acting on behalf of the owner.)

Name of Contact Person	Home Telephone No.	Business Telephone No.
Derek Crupi	(613)324-4604	
Address	**Postal Code**	**Fax No.**
50 Bernier Terrace, Kanata,ON	K2L 2V2	
	Email Address	
	dlcrupiltd@gmail.com	

1.3 Planner

Name of Planner		Business Telephone No.
LandPro Planning Solutions Inc. c/o Mike Sullivan		(289) 687-3730
Address	**Postal Code**	**Fax No.**
110 James Street, Unit 204 St. Catharines, ON	L2R 7E8	
	Email Address	
	info@landproplan.ca	

1.4 Ontario Land Surveyor

Name of Surveyor		Business Telephone No.
McIntosh Perry Surveying Inc. c/o Jack Gauthier		(613) 267-6524
Address	**Postal Code**	**Fax No.**
3240 Drummond Con. 5A, R.R. #7, Perth, ON	K7H 3C9	(613) 267-7992
	Email Address	
	j.gauthier@mcintoshperry.com	

2. LOCATION OF THE SUBJECT LAND (Complete applicable boxes in Section 2.1)

2.1 Local Municipality	Geographic Village/Town/Township	Concession No.	Lot(s)
Town of Carleton Place	Carleton Place		17, 20, 23, 26, 29, 32, 89-
		Registered Plan No	Lot(s) Block(s)
		787 AKA 970	Various - See Plan
Name of Street/Road	Street No.	Reference Plan No.	Part(s)
Lanark Street	400		Part of Lots 4 & 12

Assessment Roll No(s).

092801001021000000

➢ 2.2 Are there any easements or restrictive covenants affecting the subject land?

No ☐ Yes ☒ If **Yes**, describe the easement or covenant and its effect.

Hydro easement and parking access easement.

3. PROPOSED AND CURRENT LAND USE

➢ 3.1 Complete **Table A** on Proposed Land Use

Table A - Proposed Land Use

Proposed Land Use		Number of Units or Dwellings	Number of Lots and/or Blocks on Draft Plan	Area (ha.)	Density (Units/Dwellings per ha.)	Number of Parking Spaces
Residential	Detached	35	35 lots	1.38	25.4	72 (1)
	Semi-Detached					(1)
(Townhouses)	Multiple Attached	90	13 blocks	1.20	74.8	232 + 25
	Apartment	125	3 blocks	0.86	145.3	201
	Seasonal					
	Mobile Home					
	Other (specify)					
Commercial						
Industrial						
Institutional (specify)						
Park, Open Space		nil	6 blocks	0.39	nil	nil
Roads		nil			nil	nil
Other (specify)	SWM	nil	1 block	0.15	0	0
Totals				3.98		530

(1) Complete only if for approval of condominium description

3.2 What is the current use of the subject land?

Vacant Residential

➢ 3.3 How the subject land is currently designated in the County Official Plan, local Official Plan or any Official Plan Amendment?

County Official Plan: Settlement Area

Town of Carleton Place Official Plan: Residential District

3.4 Has there been an industrial or commercial use, or an orchard on the subject land or adjacent land?
☐ Yes ☒ No If **Yes**, specify the uses.

	Yes	No	Unknown
3.5 Has the grading of the subject land been changed by adding earth or other material?	☐	☒	■
3.6 Has a gas station been located on the subject land or adjacent land at any time?	☐	■	☐
3.7 Has there been petroleum or other fuel stored on the subject land or adjacent land?	☐	■	☐
3.8 Has the site ever been used for the spreading of septage or sludge?	☐	■	☐
3.9 Is there reason to believe the subject land may have been contaminated by former uses on the site or adjacent sites?	☐	☒	■

3.10 What information did you use to determine the answers to the above questions?

Local knowledge.

	Yes	No
3.11 If **Yes**, to (3.4), (3.5), (3.6), (3.7), (3.8) or (3.9), a previous use inventory showing all former uses of the subject land or, if appropriate, of the adjacent land, is needed. Is the previous use inventory attached? If not, when will it be provided?	☐	■

Inventory for all uses near the subdivision is included in the Planning Justification Report.

4. CONSULTATION WITH COUNTY and LOCAL MUNICIPALITY

4.1 Has the draft plan of subdivision or condominium description that is subject of this application been presented to the local Municipal Council?
☐ Yes ■ No

4.2 Have you confirmed with the local municipality that the proposed development meets all of the requirements of the applicable official plans?
■ Yes ☐ No **If an official plan amendment is needed, it should be submitted prior to or concurrently with this application.**

4.3 Have you confirmed with the County that the proposed development meets all of the requirements of the county official plan?
■ Yes ☐ No **If an official plan amendment is needed, it should be submitted prior to or concurrently with this application.**

5. STATUS OF OTHER APPLICATIONS UNDER THE PLANNING ACT

➢ 5.1 Has the subject land ever been the subject of an application for approval of a plan of subdivision under Section 51 of the Act or consent under Section 53 of the Act, for a minor variance, for approval of a site plan, or for an amendment to an official plan, a zoning by-law , development permit by-law or a Minister's zoning order.

☐ Yes ☐ No ☒ Unknown If **Yes** and if **Known**, indicate the application file number and the decision made on the application.

➢ 5.2 Is the subject also subject of a proposed official plan or plan amendment that has been submitted for approval?

☐ Yes ☐ No ☒ Unknown If **Yes** and if **Known**, indicate the application file number and status of the application.

➢ 5.3 Is the subject land also subject of an application for consent, approval of a site plan, minor variance, zoning by-law, development permit by-law or zoning order amendment?

☐ Yes ☐ No ☒ Unknown If **Yes** and if **Known**, indicate the application file number and status of the application.

➢ 5.4 If the subject land is covered by a Minister's zoning order, what is the Ontario Regulation Number? ____________

5.5 Are the water, sewage or road works associated with the proposed development subject to the provisions of the **Environmental Assessment Act**? ☐ Yes ☒ No

If **Yes**, will the notice of public meeting for this application be modified to state that the public meeting will address the requirements of both the **Planning Act** and the **Environmental Assessment Act**? ☐ Yes ☐ No

6. PROVINCIAL POLICY

➢ 6.1 Briefly explain how this proposal is consistent with the Provincial Policy Statement issued under Section 3(1) of the **Planning Act**.

Please see the attached Planning Report.

➢ 6.2 Is this application within an area of land designated under any provincial plan or plans?

☐ Yes ☒ No If Yes, please specify which plan and whether the application conforms or conflicts with the applicable plan or plans.

6.3 Table B below lists the features or development circumstances of interest to the Province. Complete Table B and be advised of the potential information requirements in noted section.

TABLE B - Significant Features Checklist

Feature or Development Circumstances	(1) If a feature, is it on site or within 500m OR (2) if a development circumstance, does it apply? Yes (✓)	No (✓)	**If a feature, specify distances in metres**	**Potential Information Needs**
Non-farm development near designated urban areas or rural settlement area	☐	☑	_______ metres	Demonstrate sufficient need within 20-year projections and that proposed development will not hinder efficient expansion of urban or rural settlement areas
Class 1 industry[1]	☐	☑	_______ metres	Assess development for residential and other sensitive uses within 70m
Class 2 industry[2]	☐	☑	_______ metres	Assess development for residential and other sensitive uses within 300m
Class 3 industry[3]	☐	☑	_______ metres	Assess development for residential and other sensitive uses within 1000m
Land Fill Site	☐	☑	_______ metres	Address possible leachate, odour, vermin and other impacts
Sewage Treatment Plan	☐	☑	_______ metres	Assess the need for a feasibility study for residential and other sensitive land uses
Waste Stabilization pond	☐	☑	_______ metres	Assess the need for a feasibility study for residential and other sensitive land uses
Active railway line	☐	☑	_______ metres	Evaluate impacts within 100m
Controlled access highways or freeways including designated future ones	☐	☑	_______ metres	Evaluate impacts within 100m
Operating mine site	☐	☑	_______ metres	Will development hinder continuation or expansion of operations?
Non-operating mine site within 1000m	☐	☑	_______ metres	Have potential impacts been address? Has the mine been rehabilitated so there will be no adverse effects?
Airports where noise exposure forecast (NEF) or noise exposure projection (NEP) is 28 or greater	☐	☑	_______ metres	Demonstrate feasibility of development above 28 NEF for sensitive land uses.. Above the 35 NEF/NEP, development of sensitive land uses is not permitted
Electric transformer station	☐	☑	_______ metres	

Feature or Development Circumstances	(1) If a feature, is it on site or within 500m OR (2) if a development circumstance, does it apply? Yes (✓)	No (✓)	If a feature, specify distances in metres	Potential Information Needs
High voltage electric transmission line	☐	☑	_______ metres	Consult the appropriate electric power service
Transportation and infrastructure corridors	☐	☑	_______ metres	Will the corridor be protected?
Prime agricultural land	☐	☑	_______ metres	Demonstrate need for use other than agricultural and indicate how impacts are to be mitigated
Agricultural operations	☐	☑	_______ metres	Development to comply with the Minimum Distance Separation Formulae
Mineral aggregate resource areas	☐	☑	_______ metres	Will development hinder access to the resource or the establishment of new resource operations?
Mineral aggregate operations	☐	☑	_______ metres	Will development hinder continuation of extraction?
Mineral and petroleum resource areas	☐	☑	_______ metres	Will development hinder access to the resource or the establishment of new resource operations?
Existing pits and quarries	☐	☑	_______ metres	Will development hinder continued operation or expansion?
Significant wetlands	☐	☑	_______ metres	Development is not permitted
Significant portions of habitat of endangered and threatened species	☐	☑	_______ metres	Development is not permitted
Significant fish habitat, woodlands south and east of the Canadian Shield, valley lands, areas of natural and scientific interest, wildlife habitat	☐	☑	_______ metres	Demonstrate no negative impacts
Sensitive groundwater recharge areas, headwaters and aquifers	☐	☑	_______ metres	Demonstrate that groundwater recharge areas, headwaters and aquifers will be protected
Significant built heritage resources and cultural heritage landscapes	☐	☑	_______ metres	Development should conserve significant built heritage resources and cultural heritage landscapes
Archaeological resources	☐	☑	_______ metres	Assess development proposed in areas of archaeological potential. Assessment to be prepared by person licensed under Part VI of the *Ontario Heritage Act.* Conservation plan for any archaeological resources identified in the assessment.
Erosion hazards	☐	☑	_______ metres	Determine feasibility within the 1:100 year erosion limits of ravines, river valleys and streams
Floodplains	☐	☑	_______ metres	Where one-zone flood plain management is in effect, development is not permitted within the floodplain Where two-zone flood plain management is in effect, development is not permitted within the floodway Where a Special Policy Area (SPA) is in effect, development must conform with official plan policies for the SPA

Hazardous sites[4]	☐	☑	_______ metres	Demonstrate that hazards can be addressed
Rehabilitated mine sites	☐	☑	_______ metres	Application for approval from Ministry of Northern Development and Mines should be made concurrently
Contaminated sites	☐	☑	_______ metres	Assess an inventory or previous uses in areas of possible soil contamination

1. Class 1 industry - small scale, self-contained plant, no outside storage, low probability of fugitive emissions and daytime operations only.
2. Class 2 industry - medium scale processing and manufacturing with outdoor storage, periodic output of emissions, shift operations and daytime truck traffic.
3. Class 3 industry - indicate if within 1000m - processing and manufacturing with frequent and intense off-site impacts and a high probability of fugitive emissions.
4. Hazardous sites - property or lands that could be unsafe for development or alteration due to naturally occurring hazard. These hazards may include unstable soils (sensitive marine clays (Leda), organic soils) or unstable bedrock (Karst topography).

6.4 For applications that include permanent housing (i.e. not seasonal) complete Table C - Housing Affordability. For each type of housing and unit size, complete the rest of the row. If lots are to be sold as vacant lots, indicate the lot frontage. Information should be based on the best information available at the time of application. If additional space is needed, attach on a separate page.

Table C - Housing Affordability

For example: Semi-detached - 10 units; 1000 sq. ft./5.5 metres, $119,900

Housing Type	# of Units	Unit Size (sq. ft.) and/or Lot Frontage	Estimated Selling Price/Rent
Semi-Detached			
Link/Semi-Detached			
Row or Townhouse			
Apartment Block	50 units	+ 700 sq. ft.	Currently Unknown
Other Types or Multiples			

6.5 Is there any other information which may relate to the Affordability of the proposed housing, or the type of housing needs served by the proposal? ☐ Yes ■ No If **Yes**, explain in Section. 9.1 or attach on a separate page.

7. SERVICING

7.1 Indicate in a) and b) the proposed servicing type for the subject land. Select the appropriate servicing type from **Table D**. Attach and provide the title of the servicing information/reports as indicated in Table D.

➢ a) Indicate the proposed sewage disposal system

Public piped sewage system

➢ b) Indicate the proposed water supply system

Public piped water system

Table D - Sewage Disposal and Water Supply

Sewage Disposal	a)	Public piped sewage system	Municipality should confirm that capacity will be available to service the development at the time of lot creation or re-zoning
	b)	Public or private communal septic	Communal systems for the development of **5 or more lots/units**: servicing options report[1], hydrogeological report[2], and indication whether a public body is willing to own and operate the system[3] Communal systems for the development of **less than 5 lots/units** and generating **more than 4,500 litres per day effluent**: servicing options report[1], hydrogeological report[2]
	c)	Individual septic system(s)	Individual septic systems with daily sewage flow of less than 4,500 l/day and system entirely located on each property: hydrogeological report[2] and site development plan[4] Individual septic systems with daily sewage flow of more than 4,500 l/day and system entirely located on each property: servicing options report[1], hydrogeological report[2]
	d)	Other	To be described by applicant
Water Supply	a)	Public piped water system	Municipality should confirm that capacity will be available to service development at the time of lot creation or re-zoning
	b)	Public or private communal well(s)	Communal well systems for the development of **more than 5 lots/units**: servicing options statement[1], hydrogeological report[2] and indication whether a public body is willing to own and operate the system[3] Communal well systems for **non-residential development where water will be used for human consumption**: hydrogeological report[2]
	c)	Individual well(s)	Individual wells for the development of **more than 5 lots/units**: servicing options statement[1], hydrogeological report[2] Individual wells for **non-residential development where water will be used for human consumption**: hydrogeological report[2]
	d)	Communal surface water	Approval of a "water taking permit" under section 34 of the Ontario Water Resources Act is necessary for this type of servicing
	e)	Individual surface water	Servicing options report
	f)	Other	To be described by applicant

NOTES:
1. Confirmation that the municipality concurs with the servicing options statement will facilitate the review of the proposal
2. Before undertaking a hydrogeological report, consult the Subdivision Approval Authority about the type of hydrogeological assessment that is expected given the nature and location of the proposal
3. Where communal services are proposed (water and/or sewage), these services will include a responsibility agreement with the municipality
4. Comments from the Health Unit for individual sewage disposal systems (Section C-Sewage disposal), or a certificate of approval from MOE for all other sections, submitted with this application will facilitate the review.

7.2 Indicate in a) and b) the proposed type of storm drainage and access to the subject land. Select the appropriate type from **Table E**. Attach and provide the servicing information as indicated in Table E.

➢ a) Indicate the proposed storm drainage system

Sewers

➢ b) Indicate the proposed road access

Municipal or other public road maintained all year

➢ c) Is water access proposed?

☐ Yes ☒ No — If **Yes**, attach a description of the parking and docking facilities to be used and the approximate distance of these facilities from the subject land and the nearest public road ☐ Attached

➢ d) Is the preliminary stormwater management report attached?

☒ Yes ☐ No — If not attached as a separate report, in what report can it be found?

Table E - Storm Drainage, Road Access and Water Access

Service Type			Potential Information/Reports
Storm Drainage	a)	Sewers	A preliminary stormwater management report is recommended and should be prepared concurrent with any hydrogeological reports for submission with the application. A stormwater management plan will be needed prior to final approval of a plan of subdivision or as a requirement of site plan approval
	b)	Ditches or Swales	
	c)	Other	
Road Access	a)	Provincial highway	Application for an access permit should be made prior to submitting this application. An access permit is required from MTO before any development can occur
	b)	Municipal or other public road maintained all year	Detailed road alignment and access will be confirmed when the development application is made
	c)	Municipal road maintained seasonally	Subdivision or condominium development may not be permitted on seasonally maintained roads. Confirm with the local municipality.
	d)	Right of way	Access by right of ways on private roads may be permitted, in certain areas and as part of condominium. Confirm with the local municipality.
Water Access			Information from the owner of the docking facility on the capacity to accommodate the proposal will assist the review

➢ 7.3 Name of servicing information/reports

Hydrogeological Report –

N/A

Servicing Options Report –

SERVICING & STORMWATER MANAGEMENT REPORT 400 LANARK SUBDIVISION

Preliminary Stormwater Management Report –

PRELIMINARY STORMWATER MANAGEMENT REPORT WINTERGREEN RIDGE SUBDIVISION

NOTES:

1. If the plan would permit development of more than five lots or units on privately owned and operated individual or communal wells, (a) a servicing options report and (b) a hydrogeological report are required.

2. If the plan would permit development of five or more lots or units on privately owned and operated individual or communal septic systems, (a) a servicing options report and (b) a hydrogeological report are required.

3. If the plan would permit development of fewer than five lots or units on privately owned and operated individual or communal septic systems, and more than 4500 litres of effluent would be produced per day as a result of the development being completed, (a) a servicing options report and (b) a hydrogeological report.

4 If the plan would permit development of fewer than five lots or units on privately owned and operated individual or communal septic systems, and 4500 litres of effluent or less would be produced per day as a result of the development being completed, a hydrogeological report is required.

8. OTHER INFORMATION

8.1 Is there any other information that may be useful to the County in reviewing this development proposal (e.g. efforts made to resolve outstanding objections or concerns)? If so, explain below or attach a separate page.

Please see the attached Planning Report.

9. AFFIDAVIT OR SWORN DECLARATION

➢ I/We, ____ of the _______________________________________ in the ______________________________ make oath and say (or solemnly declare) that the information contained in this application is true and that the information contained in the documents that accompany this application is true.

Sworn (or declared) before me
at the _________________________
in the _________________________
this _______ day of _______________, ______.

_____________________________________ Commissioner of Oaths

_____________________________________ Applicant

_____________________________________ Applicant

10. AUTHORIZATIONS

10.1 If the applicant is not the owner of the land that is the subject of this application, the written authorization of the owner that the applicant is authorized to make the application must be included with this form or the authorization set out below must be completed.

Authorization of Owner(s) for Agent to Make the Application

➢ I/We, ____am/are the owner(s) of the land that is the subject of this application for approval of a plan of subdivision (or condominium description) and I authorize ______________________________ to make this application on my behalf.

_________________________ Date

_____________________________________ Signature of Owner

_____________________________________ Signature of Owner

_________________________ Date

10.2 **If the applicant is not the owner of the land** that is the subject of this application, complete the authorization of the owner concerning personal information set out below.

Authorization of Owner(s) for Agent to Provide Personal Information

I/We, ___________________________________ am /are the owner (s) of the land that is the subject of this application for approval of a plan of subdivision (or condominium description) and for the purposes of the **Freedom of Information and Protection of Privacy Act**, I authorize ______________________________ , as my agent for this application, to provide any of my personal information that will be included in this application or collected during the processing of the application.

________________________ Date

____ Signature of Owner

________________________ Date

____ Signature of Owner

11. CONSENT OF THE OWNER(S)

Complete the consent of the owner concerning personal information set out below.

Consent of the Owner(s) to the Use and Disclosure of Personal Information

I/We, Wintergreen Ridge Ltd. am/are the owner(s) of the land that is the subject of this application for approval of a plan of subdivision (or condominium description) and acknowledge that certain personal information is collected and distributed to public bodies under the authority of the **Planning Act**.

For the purposes of the **Freedom of Information and Protection of Privacy Act**, I further authorize and consent to the use of my name in any Notices required under the authority of the Planning Act for the purpose of processing this application.

09/26/2023
Date

AuthentiSIGN
Natalie McGuire
Signature of Owner
9/26/2023 4:08:27 PM EDT

09/26/2023
Date

AuthentiSIGN
Tom OH
Signature of Owner
9/26/2023 4:07:26 PM EDT

12. AGREEMENT TO INDEMNIFY

The Owner/Applicant agrees to reimburse and indemnify the Corporation of the County of Lanark (hereinafter referred to as the *"County"*) for all fees and expenses incurred by the County to process the application for plan of subdivision or condominium, as the case may be, including any fees and expenses attributable to proceedings before the Ontario Municipal Board or any court or other administrative tribunal if necessary to defend the County's decision to support the application.

Without limiting the foregoing, such fees and expenses shall include the fees and expenses of consultants, planners, engineers, lawyers and such other professional and technical advisors as the County may, in its absolute discretion acting reasonably, consider necessary or advisable to more properly process and support the application.

Attached to this application is a cheque payable to "*Lanark County*" representing payment of the application fee.

The Owner/Applicant further agrees to provide the municipality, upon request, a deposit against which the County may, from time to time charge against the deposit any fees and expenses incurred by the County in order to process the application. If such fees and expenses exceed the deposit, the Owner/Applicant shall pay the difference forthwith upon being billed by the County with interest at the rate of 1.25% per month (15% per annum) on accounts overdue more than 30 days.

The Owner/Applicant further agrees that, upon request by the County from time to time, the Owner/Applicant shall make such additional deposits as the County considers necessary, and until such requests have been complied with, the County will have no continuing obligation to process the application or attend or be represented at the Ontario Municipal Board or any court or other administrative proceeding in connection with the application.

09/26/2023
____
Date

Natalie McGuire
9/26/2023 4:08:25 PM EDT
Signature of Owner

09/26/2023
____
Date

Tom OH
9/26/2023 4:17:28 PM EDT
Signature of Owner

The County will assign a File Number for complete applications and this number should be used in all communications with the County.

Applicant's Checklist:

Have you remembered to attach: Yes

- 5 completed application forms (1 original and 4 copies)? (Ensure you have a copy for yourself) ☐
- 5 copies of the draft plan with key maps, folded to 8½" X 14" size? ☐
- 5 copies of the draft plan reduced to 8½" X 14" size? ☐
- 5 copies of the information/reports as indicated in the application form? ☐
- 2 copy of the registered transfer/deed for the subject lands? ☐
- 5 copies of the planning rationale? ☐
- 15 CD's containing a copy of the plan, application form, all relevant Reports and the planning rationale? ☐
- The required fee and deposit, either as a certified cheque or money order, payable to Lanark County? ☐

FORWARD TO:

Lanark County
Planning Department
99 Christie Lake Rd.
Perth, Ontario K7H 3C6

AuthentiSIGN®

Signing Certificate

Certificate ID: 5DB605FB-8ABA-42F6-AC5A-4889B934C8C4 **Date:** 9/26/2023 3:13:54 PM EDT

Signing Information:

Signing Name:	Wintergreen Ridge - County Submission		
ID:	5DB605FB-8ABA-42F6-AC5A-4889B934C8C4		
Status:	Document has been signed by all parties.		
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MacOSX10.5 (Leopard ™)	N/A	5.0 or higher	23 or higher	N/A	N/A
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LAND PRO
PLANNING SOLUTIONS

PLANNING JUSTIFICATION REPORT

Plan of Subdivision & Development Permit

400 Lanark Street, Carleton Place

September 2023

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Michael Sullivan, M.Pl. RPP	Project Manager, Quality Control
Adam Moote, M.Pl., RPP	Report Author
Mehreen Khan, BA, OCGC	Research, Design

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LandPro Planning Solutions Inc.

Adam Moote

Adam Moote, M.Pl., RPP
Senior Planner

Michael Sullivan, M.Pl., RPP, MCIP
President | Founder

Table of Contents

Introduction

LandPro Planning Solutions Inc. (LandPro) has been working with Wintergreen Ridge Ltd and its predecessor McGuire Crupi Investments since 2021 redevelopment the property at 400 Lanark St as a residential subdivision.

The project is located at 400 Lanark Street, with frontage also on Townline Road East in Carleton Place. This property is proposed to be a redevelopment of a 6.27-hectare parcel into a residential subdivision. The current plan includes a mix of apartment buildings, stacked and street townhomes, and detached homes for a total of 250 units.

PURPOSE

This report serves two purposes:

1. To address the County and Town's technical requirements, including a Development Permit (re-zoning) and a Plan of Subdivision, and
2. To demonstrate how this application should be considered "good planning."

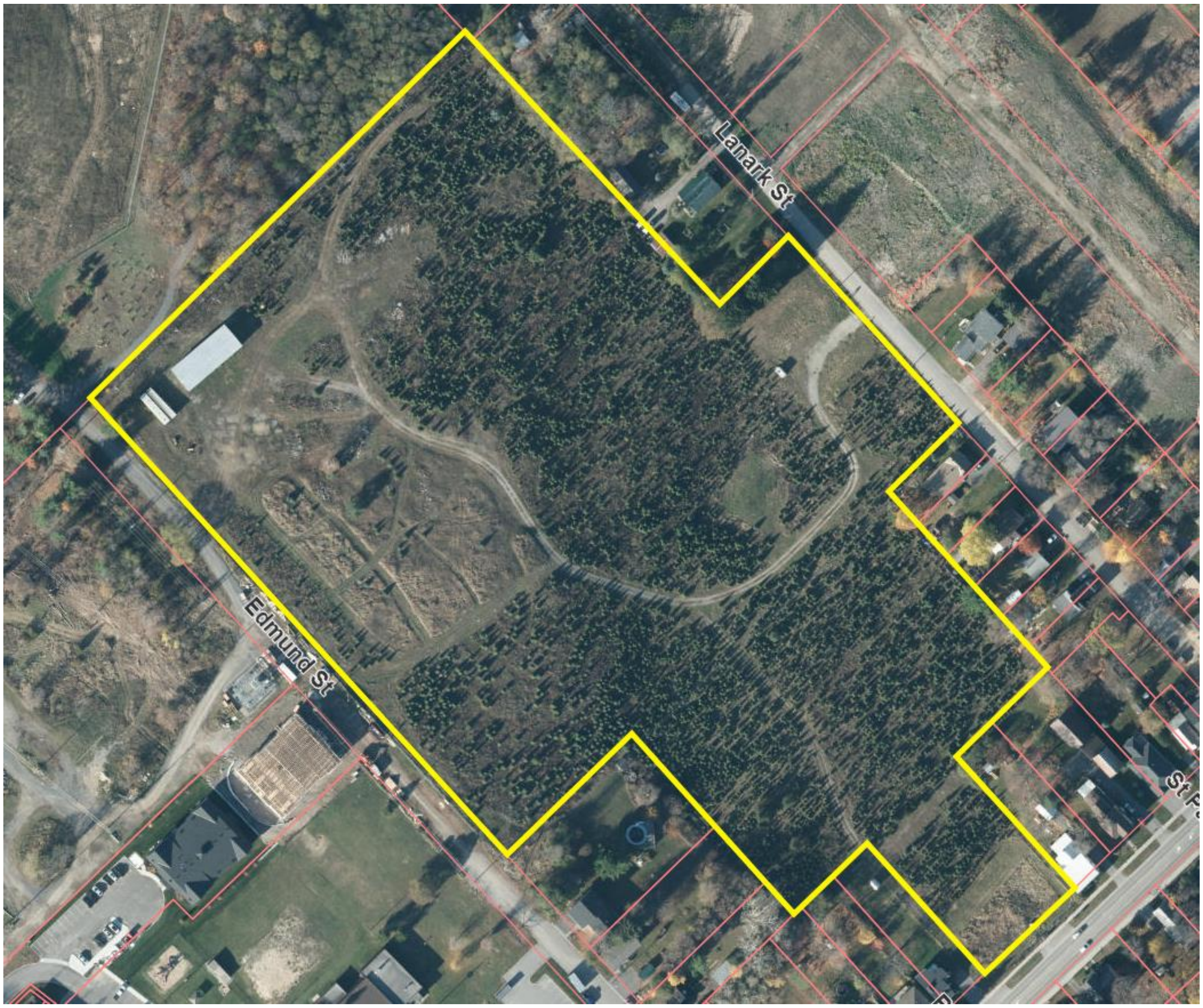
To accomplish this, we will demonstrate compliance with Provincial, Lanark County, and Town of Carleton Place planning policy towards concluding that this application should be considered "good planning."

SITE CONTEXT

The property is situated between Edmund Street and Lanark Street, north of Townline Road East in Carleton Place. It is within the Town's urban boundary approximately 300 metres north-west of the Mississippi River.

The location is presented in **Figure 1**, below.

Figure 1. (Property Location). Source: Town of Carleton Place Interactive Mapping.



Legal Description & Land Use Context

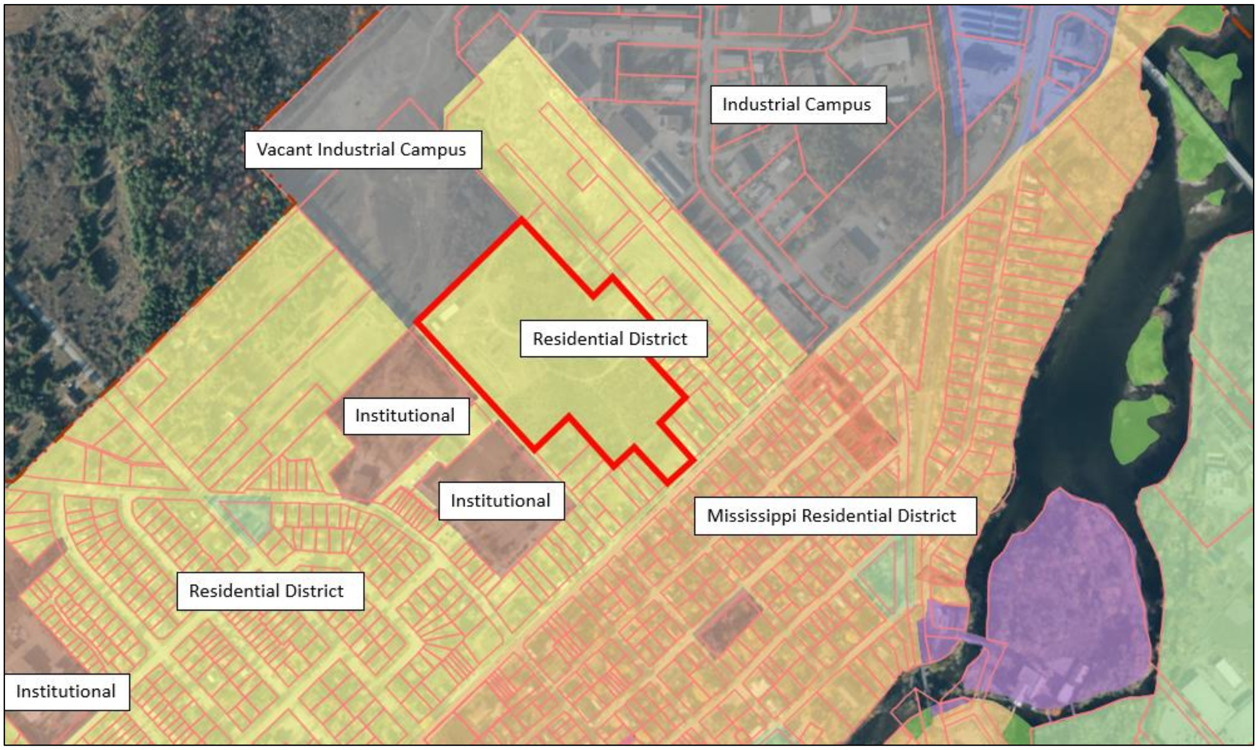
The property is legally described as Lots 7 – 27 (inclusive), Lots 35 – 54 (inclusive), Lots 67 – 81 (inclusive), Lots 89 – 121 (inclusive), Registered Plan 3469, Town of Carleton Place, County of Lanark.

The property is vacant and was previously used as a tree farm. Surrounding land uses include:

North	=	Vacant land | Residential | Industrial Campus
South	=	Residential | Institutional (community centre/pool)
East	=	Residential | Industrial Campus
West	=	Residential | Institutional

These uses are presented in **Figure 2,** below.

Figure 2. Surrounding Land Uses (Subject lands outlined in red). Image from Town of Carleton Place Interactive Mapping.



Property Dimensions & Physical Attributes

The property fronts onto Lanark Street, Edmund Street and Townline Road East and has access to municipal servicing from Townline Road (water) and through the industrial campus (sewage). The property is generally open, with tree lines along most property lines. Topographically, the property slopes from the north to the south. According to the *Ontario Geological Survey*, the study area lies within a region of shallow till and rock ridges. The property and subject land's dimensions are presented in **Table 1**.

Table 1. Property Dimensions, according to survey completed by Ontario Land Surveyor, February 2023.

Item	Entire Property
Lot Frontage	106.666 metres (Lanark St.) & 48.77 metres (Town Line Road)
Lot Depth	Varies - maximum of 386.33 metres
Lot Area	6.27 hectares (15.4 acres)

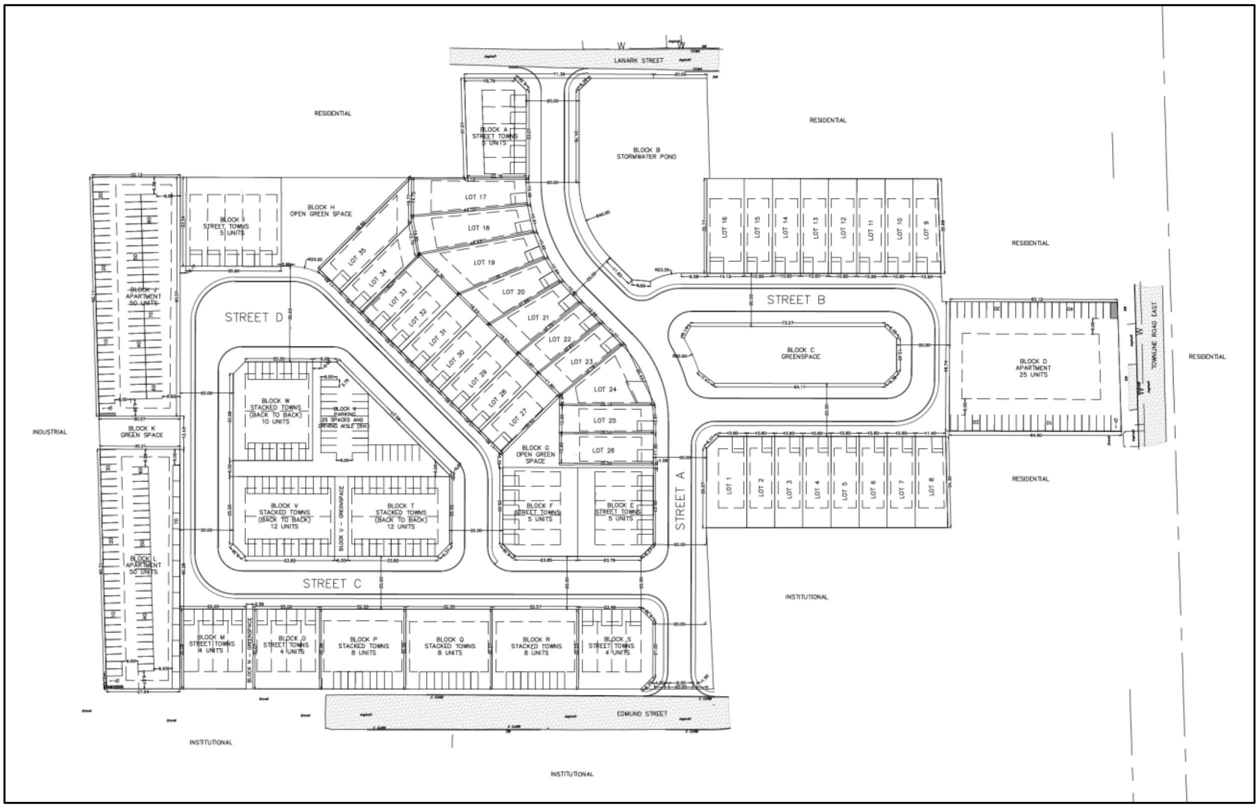
PROPOSED DEVELOPMENT

The property owner is proposing to develop the site residentially, with a mix of single-detached, townhomes, and apartment complexes. To achieve this the application is seeking a Plan of Subdivision from Lanark County to permit the development. Subsequently, it will require a Class 3 Development Permit from the Town of Carleton Place as a condition of draft approval. **Figure 3**, below, is a conceptual sketch of the development, it includes a mix of single, townhome, and apartment dwellings. The breakdown of each includes:

- Single Detached Dwellings – 35
- Street Townhome Dwellings – 32
- Stacked Townhome Dwellings - 58
- Apartment Dwellings – 125

TOTALS UNITS 250

Figure 3 – Draft Plan of Subdivision. LandPro Planning Solutions Inc., September 2023.



Pre-Consultation Meetings

Two pre-consultation meetings have been held to date regarding this proposal.

The first meeting was held with the Town of Carleton Place on April 7th, 2021. The notes from this meeting indicated that a Plan of Subdivision and a Class 3 Permit (a condition of the Plan of Subdivision) were required for a complete application, in addition to a number of supporting studies and reports.

A subsequent pre-consultation meeting was held with Lanark County on October 13th, 2022, at the request of the agents to review a revised concept plan. This meeting provided the agents with confirmations and recommendations for what the planning authorities would like to see in the final reports.

It is our understanding from these meetings that the Plan of Subdivision is the first application, through the County. This will be followed by Development Permit submitted to the Town.

Land Use Planning Framework

In preparing this application, several policy and regulatory documents were reviewed that need to be addressed to demonstrate good planning. They include the following:

1. The Planning Act, RSO, 1990, as amended,
2. The Provincial Policy Statement (2020),
3. Lanark County Sustainable Communities Official Plan (2012),
4. Town of Carleton Plan Official Plan (2021), and the
5. Town of Carleton Place Development Permit By-law 15-2015 (2015).

The proposed development was assessed against these policies and associated regulations. A detailed analysis is presented below.

PLANNING ACT, RSO, 1990

The purposes of the Planning Act (PA) are:

a) to promote sustainable economic development in a healthy natural environment within the policy and by the means provided under this Act;
b) to provide for a land use planning system led by provincial policy;
c) to integrate matters of provincial interest in provincial and municipal planning decisions;
d) to provide for planning processes that are fair by making them open, accessible, timely and efficient;
e) to encourage co-operation and co-ordination among various interests;
f) to recognize the decision-making authority and accountability of municipal councils in planning.

This application has regard to **Section 2 (Provincial Interest),** particularly subsections **f, h, j, p.**

Regarding **2(f),** "*the adequate provision and efficient use of communication, transportation, sewage and water services and waste management systems*;" the proposed development features engineered stormwater management facilities and will be connected to municipal services.

Regarding **2(h)**, "*the orderly development of safe and healthy communities*," the proposed development is mixed density and is serviced by meandering streets and one thoroughfare. The streetscape is intentionally designed to provide traffic calming measures, and the thoroughfare provides two ingress and egress points to two local roads, which connect to a County arterial road.

Regarding **2(j)**, "*the adequate provision of a full range of housing, including affordable housing*," the proposed development is mixed in density, including single detached dwellings, townhomes and apartment buildings. Further, a minimum of 20% is required to be affordable housing units by the Town. This means that out of the 250 units in the Plan of Subdivision, at least 50 units will be affordable housing, and this will be allocated to the apartment buildings.

Finally, regarding **2(p)**, "*the appropriate location of growth and development*," the proposed development is located within the Town of Carleton Place designated as a Settlement Area of Lanark County. Further, it is in an area designated by the Town's Official Plan as Residential and is zoned as Residential.

This application seeks the appropriate Planning Act permissions and meets the criteria noted to be considered good planning.

Provincial Policy Statement, 2020 (PPS)

The PPS provides policy direction on matters of provincial interest that affects all land use development throughout Ontario. It provides direction for appropriate development while protecting resources of provincial interest, public health and safety, and the quality of the natural and built environment.

The PPS promotes communities that are developed efficiently, accommodate a range of housing options, and use existing servicing and infrastructure efficiently; and promotes transit-supportive development and improves accessibility for disabled persons (**1.1.1**). This application will connect to municipal water and sanitary systems. In addition, Townline Road is an arterial road which affords this site direct access to public transit, and active transportation assets. It directs growth and development to settlement areas, where land and resources are used most efficiently, active transportation is supported, and intensification and redevelopment are accommodated (**1.1.3.1-2**). Further, as per the PPS, development should facilitate *intensification*, *redevelopment* and compact form, while avoiding or mitigating risks to public health and safety (**1.1.3.4**) and take place in designated growth areas near existing built-up areas and should have a compact form with a mix of densities (**1.1.3.6**).

Regarding housing, the PPS requires planning authorities to utilize residential intensification and redevelopment to provide the desired range of housing types and densities (**1.4.1**). The planning authority provides for the provisions of housing targeting affordable to low- and moderate-income households (**1.4.3.a**). This application provides a variety of housing types and tenures, resulting in a wide price range, including housing considered affordable. They also permit and facilitate that all housing options meet the social, health, economic and well-being requirements for current and future residents, including special needs requirements (**1.4.3.b.1**) and all types of residential intensification (**1.4.3.b.2**). This application proposes singles, townhouses and low-rise apartment buildings, which represents intensification. It directs new housing to areas where new development can be supported by the existing infrastructure (**1.4.3.c-d**), prioritizes intensification (**1.4.3.e**), and establishes development standards for residential intensification, redevelopment, and new residential development that minimizes the cost of housing and facilitates compact form, while maintaining public health and safety (**1.4.3.f**).

The PPS also promotes healthy and active communities (**1.5.1**) by: planning safe publics streets, spaces and facilities, meeting the needs of pedestrians, and facilitates active transportation, and fosters social interaction and community connectivity (**1.5.1.a**). Communities should also be promoted by publicly accessible built and natural settings for recreation, including facilities, parklands, public spaces, open spaces, trails and linkages (**1.5.1.b**). No natural heritage features have been identified on the subject property (**2.1**) and will provide parkland and other amenities, the details of which will be discussed with the Town.

The proposed development will incorporate existing municipal servicing and infrastructure into the development in an efficient manner to prepare for impacts of climate change and accommodate projected needs (**1.6**). Required capacity is confirmed in the attached Functional Servicing Report, summarized in the Technical Studies & Additional Reports section of this report, below.

This application involves a residential redevelopment in a settlement area and includes a mix of housing options including some considered to be affordable or attainable. It demonstrates design in conformity with the character of the existing adjacent residential neighbourhood and provides transition between the residential and industrial areas. Further it promotes healthy and active communities by providing safe streetscapes, parklands and open spaces, and utilizes existing nearby municipal servicing.

This application meets the general intent of the Provincial Policy Statement.

Sustainable Communities Official Plan, 2012 (SCOP)

The County of Lanark is responsible for approving this Plan of Subdivision, through County Council. The Lanark County Sustainable Communities Official Plan (SCOP) provides the implementation of land use policies through zoning and lot creation.

Lanark County consists of Towns, Villages, and Hamlets with varying levels of servicing infrastructure (water and wastewater). The subject property is in the Town of Carleton Place which is a fully serviced Settlement Area within the County. The settlement policies for the County intend to create a planning framework that encourages and supports diversified, mixed use Settlement Areas. The policies intend to ensure that the local Councils have the ability and authority to shape development in accordance with local needs and characteristics, further the policies intend that development occurs to avoid costly unplanned engineered water and wastewater problems in the future (**2.1**). The SCOP requires that Local Official Plans (LOPs) include policies to address the two predominate settlement pattern types, of which this application pertains to a fully serviced Town (**2.2.1**)

General policies of the SCOP that apply to this application include that LOPs shall designate Settlement Areas to accommodate a broad range of uses and accommodate current and future population needs (**2.3.1.2**) and distinguish between fully, partially, and un-serviced settlement areas and provide the applicable land use policies (**2.3.1.3**). Carleton Place is a designated settlement area that is fully serviced. The LOPs shall promote intensification in the built-up areas based on servicing infrastructure (**2.3.1.4**). This application represents intensification, at varying levels for maximum affordability options. Efficient development patterns are encouraged to optimize the use of land, resources, infrastructure, and public service facilities (**2.3.1.5**), as is presented in this application. Further, local land use policies shall provide for mixed uses (**2.3.1.6**). This application presents various housing densities, which support local public service facilities, such as the community centre and school to the west and the industrial campus to the north and east.

Section 2.6 contains policies for the Settlement Area Land Use. An applicable objective in this section includes providing "*for a range and mix of low, medium and high-density housing types in accordance with servicing capacities*," (**2.6.1.2**). The proposed development provides housing options in all three densities, ranging from single detached houses to apartment blocks. Regarding the creation of new lots, **Section 3.6.3 (Lot Creation)** states that *"The creation of new lots in Settlement Areas shall generally occur through plans of subdivision or consent."* This application proposes lot creation through a Plan of Subdivision.

The general policies of the SCOP provide the local municipalities with the required policy framework to utilize land use controls through various pieces of legislation (**8.0**) Lanark County is the approval authority for Plans of Subdivision, implemented through the SCOP. Sections **8.2.1.1** through **8.2.1.3** summarizes the common submission requirements for Plans of Subdivisions; although the list of 16 items in these sections are not an exhaustive list and other requirements may be required at the discretion of the approval authorities (**8.2.1**). The Plan of Subdivision authority rests with Lanark County, the Development Permit By-law is an implementation tool of the LOP, and it must conform with the Official Plan designations and directions. Nonetheless, Development Permit By-laws may be tailored by municipalities to their specific conditions and development requirements (**8.2.5**). Lastly, both Lanark County and the Town of Carleton Place are seeking to provide affordable housing options by enabling a full range of housing options with differing densities (**8.2.9**).

The subject property is in the Settlement Area of the Town of Carleton Place. The planning framework of the County supports this application as it is a diversification of land uses and contributes to the mixed uses of the area. This report addresses both County and Town policies, both needed to demonstrate this application represents good planning.

Lastly, the SCOP requires that the Algonquins of Ontario shall be consulted on any Environmental Impact Studies (EIS) related to proposed developments (8.2.10). While no natural features were identified on or adjacent to the property, the County has requested a Species at Risk Screening and Tree Saving Plan to be prepared, this is summarized below in the Technical Studies section below and the full report is included as part of this application. Lastly, to satisfy policy 8.2.10, the applicant's agent has reached out to the Algonquins of Ontario on three separate occasions and no responses were received.

This application is compatible with Lanark County's Sustainable Communities Official Plan. We note that the approval of Stacked Townhouses requires Town approval.

Town of Carleton Place Official Plan, 2021 (CPOP)

The design criteria are established in **Section 2.0** of the Town of Carleton Place Official Plan (CPOP) and are reviewed in this section of the report (**2.0**).

The Town of Carleton Place, through their Official Plan has indicated that it is of vital importance that the design and built form be of high quality and integrate into the surrounding community (**2.1**). Objectives of this section are to ensure high-quality built form design reflecting the Town's heritage and character (**2.2.1**), providing design principals that can be implemented through the Town's Development Permit By-law (**2.2.2**), incorporating pedestrian, cycling and public infrastructure into new development where appropriate (**2.2.3**). Additionally, the objectives are to enhance the image of Carleton place by contributing to local character in landmarks and being consistent with area surroundings while providing linkages within the area (**2.3.1**). The design of new development shall complement existing development through overall massing orientation and set back. Further it is to provide links with pedestrian cycling and road networks and maintain and enhance cultural and heritage resource, and natural features and functions (**2.3.6**). Development is also to strive for patterns that support a range of uses, transportation connections, including pedestrian and cycling connections (**2.3.7**).

The Town of Carleton Place is divided into five land use districts, each having their own distinct land use policies that apply for a 20 year time frame (**3.0**). The subject property is designated Residential District in the CPOP. Please see **Appendix 1** for the relevant schedule.

Section 3.5 (Residential District) pertains to this development. The areas identified in Residential Districts are the main locations for housing and a broad range of housing types along with services and amenities are permitted to maximize infrastructure efficiency (**3.5**). The objectives of this policy are to promote sustainable, efficient and diverse residential neighbourhoods, and to provide a diverse range of housing types and densities (**3.5.1**), while also permitting uses such as residential, and parks and recreational facilities (**3.5.2**). The residential types are a range of options that include single detached, semi-detached, duplexes, triplexes, townhouses and apartment dwellings (**3.5.3.1**). Other uses like schools, parks, trails, places of worship, home occupations, and community/social service facilities shall be permitted subject to compatibility and complementary with residential uses; they serve as focal points for residential uses; and have a detailed development and design standard (**3.5.3.2**). These policies generally describe the proposed development, being a development that provides a range of housing types and densities, while permitting parks and recreational opportunities. It is also compatible and complementary to the existing uses such as schools, parks, and community facilities.

Section 3.5.4 contains density policies "*to ensure that new development will include a mix of residential densities in order to address a full range of housing requirements.*" The policies are listed below, in **Table 2.**

Table 2. Density Provisions, Section 3.5.4

Provision	Proposed	Note
1. The average density target for new development in the Residential District will be calculated on a site by site basis and shall be 30 units per net hectare with a range of 26 to 34 units per net hectare. Net hectare is defined as those lands which are utilized for residential development exclusive of roads, easements, infrastructure services and required parkland.	The average density proposed is 72.2 units per net hectare. The proposed development ranges from 25.4 units per hectare (single detached) to 145.3 units per hectare (apartments).	Proposed density is higher by an average of 50.6 UPNH. Section 3.5.5 of the CPOP permits Increased Density and Bonusing, this is to be discussed with the applicant and the planning authority.
2. Notwithstanding Section 3.5.4.1, where development is proposed on infill sites or sites which are the result of lot consolidations, and which infill sites or consolidated sites have areas of 3 hectares or less, residential density may be increased. In such cases density will be controlled through the regulatory framework of the Development Permit By-law	N/A as site is larger than 3 ha.	N/A
3. In areas subject to Section 3.5.4.2 above, the requirement for a mix of dwelling types as required in Section 3.5.4.6 shall not apply.	N/A	N/A
4. The following residential density classifications shall apply: Low density: includes single detached dwellings, semi-detached dwellings, duplex dwellings, triplex dwellings and converted single detached dwellings up to a maximum density of 22 units per net hectare (9 units per net acre). Medium density: includes town or row houses and apartments in a range of greater than 22 units per net hectare (9 units per net acre) up to a maximum of 35	The proposed low-density built form (single detached) are 25.4 units per net hectare. The proposed medium-density built form (townhouses) are 55 units per net hectare. The proposed high-density built form (stacked townhouses and apartments) are 91.3 and 145.3 units per net hectare respectively.	Section 3.5.5 of the CPOP permits Increased Density and Bonusing, this is to be discussed with the applicant and the planning authority.

Provision	Proposed	Note
units per net hectare (14 units per net acre). High density: includes apartments in excess of 35 units per net hectare (14 units per net acre).		
5. New medium or high density residential development shall be subject to the following policies: • The proposed design of the residential development is compatible in scale with the character of surrounding uses; • The site is physically suited to accommodate the proposed development; • The proposed site can be serviced with adequate water and waste water services; • The property shall have appropriate access to an arterial or collector road maintained to a municipal standard with capacity to accommodate traffic generated from the site; • Sufficient off-street parking facilities is provided in accordance with the standards set out in the Development Permit By-law; and • The development can take place in accordance with the policies of Section 2.0.	**• The proposed design is compatible in scale and with the character of surrounding uses. Please see the attached Urban Design Brief for further information. • The site is physically suited to accommodate the proposed development. • The proposed site can be serviced with adequate water and waste water services. Please see the attached Functional Servicing Report for further information. • The property has access to multiple municipally maintained roads. • Parking provisions of the Development Permit By-law are met. • The development can take place in accordance with the policies of Section 2.0.**	**Complies**
6. New residential development shall include a mix of residential densities. Residential development which does not provide a diversity of dwelling types shall be discouraged.	The proposed development includes a mix of residential densities, from single-detached to apartment blocks. By the definition of this Plan, the densities are a mix of medium and high.	**Complies**
7. Development shall be integrated with surrounding development, through connected street networks, appropriate	The proposed development is integrated with the surrounding	**Complies**

Provision	Proposed	Note
transition of housing types and densities and through supporting infrastructure including recreational pathways and parks.	street networks and housing types.	

Section 3.5.5 (Increased Density and Bonusing) permits an increase in height or density depending on the eligibility of the development. Items that may make a proposed development eligible for such increases include "*The provision of affordable housing, assisted housing or housing for those with special needs,"* and "*The dedication or provision of open space, recreation or community facilities, parks, waterfront lands, or trail systems, provided that such lands and amenities are significantly in excess of any parkland dedication requirements of this Plan*." By proposing to increase density from 30 uph to over 72 uph, the design of this subdivision has freed up additional space for parkland, stormwater ponds, and general open space for the public. The result is that this proposal can offer more affordable housing options, while also providing more open space amenities to future residents, both of which are desired outcomes. Currently, this development is offering 20% (50 units) of affordable apartment units. To this point, the Planning Act requires a minimum of 5% of lands for parkland, while this application proposes 12.3%, which is a very significant increase.

Section 6.7.1 (Plans of Subdivision) outlines the technical considerations and typical documentation to be submitted with such an application. These considerations and documentation, notably those discussed at the Pre-Consultations, can be found attached to this report. Please see the Technical Studies and Additional Reports section of this report.

We believe this is an appropriate mix of uses and densities for this site and recognize that the average density is higher than anticipated by the Town's planning policies. As the primary outstanding issue to demonstrate conformity, we also note that the Town's planning policies provide some flexibility with density so anticipate some negotiation on this matter.

This application, once approved by County and Town Council, will conform to the Town of Carleton Place Official Plan.

Town of Carleton Place Development Permit By-Law 15-2015 (DP)

The Town of Carleton Place Development Permit By-law 15-2015 (DP) is used to manage land use compatibility, character, and appearance of communities, and to implement the policies of the Official Plan. The property is currently considered Residential District in the DP. Please see **Appendix 2** for a visual of the property's current land use per the DP.

All three proposed built forms – single detached dwellings, townhouse dwellings, and apartment dwellings – are permitted uses in the Residential District.

Please see **Tables 3.1-3**, below, for the Residential District provisions for the three proposed built forms.

Table 3.1 Residential District Provisions – Single Detached

Provision	Required	Proposed	Note
Minimum Lot Area	N/A	318.00 m^2	**Complies**
Maximum Lot Coverage	60%	TBD	**Complies**
Minimum Lot Frontage	10.6 m	10.6 m	**Complies**
Front Yard	4.5m – 7.5 m	4.5 m	**Complies**
Exterior Side Yard	4.5m – 7.5 m	4.5 m	**Complies**
Minimum Interior Side Yard	1.2 m	1.2 m	**Complies**
Minimum Rear Yard	7.5 m	7.5 m	**Complies**
Minimum Usable Landscaped Open Space in the Rear Yard	50 m^2	50 m^2 +	**Complies**
Maximum Building Height	11 m	<11 m	**Complies**
Minimum Dwelling Unit Area	92.9 m^2	TBD	**Complies**
Parking	2 spaces (1 may be in garage)	2 spaces	**Complies**

Table 3.2 Residential District Provisions – Townhouse (Street)

Provision	Required	Proposed	Note
Minimum Lot Area	N/A	143.00 m^2	**Complies**
Maximum Lot Coverage	60%	TBD	**Complies**
Minimum Lot Frontage	5.5 m per unit	5.5 m	**Complies**
Minimum Front Yard	4.5m – 7.5 m	4.5 m	**Complies**

Provision	Required	Proposed	Note
Exterior Side Yard	4.5m – 7.5 m	4.5 m	Complies
Minimum Interior Side Yard (for end units)	1.5 m	1.5 m	Complies
Minimum Rear Yard	6.5 m	6.5 m	Complies
Minimum Usable Landscaped Open Space in the Rear Yard	30 m^2	30 m^2 +	Complies
Maximum Building Height	11 m	<11 m	Complies
Minimum Dwelling Unit Area	83.1 m^2	TBD	Complies
Parking	2 spaces	2 spaces	Complies

Table 3.3 Residential District Provisions – Apartment

Provision	Required	Proposed	Note
Minimum Lot Area	N/A	2611.43 m^2	Complies
Maximum Lot Coverage	60%	TBD	Complies
Minimum Lot Frontage	35 m	48.74 m	Complies
Minimum Front Yard	4.5m – 7.5 m	4.5 m	Complies
Exterior Side Yard	4.5m – 7.5 m	4.5 m	Complies
Minimum Interior Side Yard (for end units)	3 m	3 m	Complies
Minimum Rear Yard	7.5 m	7.5 m	Complies
Minimum Usable Landscaped Open Space in the Rear Yard	20% of lot area	TBD	Complies
Maximum Building Height	14 m or 4 storeys	4 to 5 storeys	Section 3.5.5 of the CPOP permits Increased Density and Bonusing (including height),

Provision	Required	Proposed	Note
			this is to be discussed with the applicant and the planning authority.
Parking	1.50 spaces per unit	1.6 spaces per units	**Complies**

We recognize that Stacked Townhouses, as proposed in this application, are presently not permitted by the Town's Development By-law. This report demonstrates that Stacked Townhouses are appropriate for this site, based on density. Accordingly, the Development Permit application to the Town will include a request to include this as a permitted use.

As noted in the table above, the proposed development requires relief from two By-law provisions:

1. Reduced minimum front yard setback. The front yard setback of the proposed dwelling is comparable to that of the current dwelling (4.83 metres). However, due to the slope limitation to the rear of the property, the front yard setback cannot be increased any further; and
2. Recognize stacked townhouses as a permitted use.

This application proposes that these deficiencies be recognized in the Development Permit application.

Subject to approval of this Plan of Subdivision and Development Permit application, the proposed development will conform to the County's Zoning By-law.

Technical Studies & Additional Reports

To support the proposed development a number of studies were requested by the County and the Town to demonstrate its viability. Below are summaries of the viability and recommendations of the studies requested.

Environmental Site Assessment

A scoped Environmental Impact Statement (EIS) and Tree Preservation Plan was a requirement of the Town of Carleton Place to meet development approval. It has been prepared in accordance with the Official Plan for the Lanark County (2012) and the Town of Carleton Place Official Plan (2013). This EIS includes an assessment of the identified and potential environmental constraints and the potential for Species at Risk.

The subject property is located within the Mississippi Valley Conservation Authority's (MVCA) jurisdiction and consists of habitat that is disturbed in nature as it is a decommissioned Christmas Tree farm. The EIS report assesses the potential impacts that the construction of a subdivision may have upon the existing natural heritage features, including wetlands and their function, woodlands and their function and specifically focused on species at risk (SAR), and their habitat as the other functions are limited within the property.

The EIS summarizes the findings of the surveys, outlines potential impacts from the proposed development, and provides recommendations to mitigate anticipated impacts on natural heritage features. The information contained in the report represented a single survey undertaken on June 29, 2023 and does not represent year-round data.

The report has also included recommended mitigation efforts that can minimize or eliminate ecological and environmental impacts from the proposed construction and development. 14 items were identified, for full details please see attached Environmental Impact Statement (EIS) and Tree Preservation Plan, in full detail.

Overall, the EIS supports the development of a subdivision on the subject property.

This EIS has assessed existing land use and determined the impacts to the natural heritage features (i.e. wildlife habitat, etc.), as well as Species at Risk and their habitat as a result of the proposed development.

The report offers that the project should incorporate the mitigation measures to protect natural heritage features or replace potential loss of these features that may occur outside of the area needed for the structures. The mitigation measures should include various strategies to achieve no residual effects on the natural heritage features (i.e. erosion and sediment control).

If the recommendations and mitigation measures provided in Sections 5.0 and 6.0 of the report are followed, the proposed development is not anticipated to negatively impact the function of the natural heritage features observed to be present within the subject property and surrounding lands.

Traffic Impact Study

McIntosh Perry Consulting Engineers Ltd. (MP) was retained by Wintergreen Ridge Ltd. to complete a Traffic Impact Analysis (TIA) in support of the proposed subdivision at 400 Lanark Street located in Carleton Place, Ontario.

The subject site is anticipated to have a 2026-year full buildout for the residential subdivision. The TIA determined the net site traffic changes due to the proposed development during the critical weekday AM and PM peak periods and assessed the impact of this traffic on the study road network. The findings and conclusion are summarized as follows:

- The proposed residential development is expected to consist of a 250 fully serviced dwelling units consisting of three medium density apartments consisting of a total of 125 units, 32 street townhouses, 58 stacked townhouses, and 35 low densities single detached homes.

- The existing transportation network within the study area currently operates well with all movements at all intersections operating at an Level of Service of D or better (see report for full details).
- The proposed development is anticipated to generate 124 trips during the AM peak hour and 146 total trips during the PM peak hour.
- The development generated trips are expected to have minimal impact on the existing roadway with all movements at all intersections operating under acceptable levels for all analysis periods.
- Sight Lines were reviewed, and no concerns were presented.

The conclusion of the report indicates that the forecasted development site traffic can be accommodated at boundary road intersections for both the buildout (2026) and post-build-out (2031) future horizons without significant impact on study area operations. The available sight distances at the proposed site accesses are in conformance with Transportation Association of Canada guidelines. As such the proposed development does not trigger the need for any changes to the existing roadway infrastructure.

Stormwater Management Plan

McIntosh Perry Consulting Engineers Ltd. (MP) was retained by Wintergreen Ridge Ltd. to prepare a Preliminary Stormwater Management Report in support of an application for Draft Plan Approval of the development at 400 Lanark Street, Carleton Place, ON.

The objective of this stormwater management report is to evaluate the drainage characteristics of the site under existing and proposed conditions and to advance an integrated approach to facilitate the proposed development with no adverse impacts to the receiving drainage systems and/or properties.

The summary of the report is that:

- Runoff from the proposed development will be collected and conveyed via the internal storm sewer system to the end-of-pipe SWM facility. The proposed on-site storm sewers and overland conveyance systems will be adequately designed to safely convey both minor and major storm events.
- The quality control objective of reaching “Enhanced” level of protection will be achieved by implementing a settling forebay basin and extended detention in the proposed wet pond.
- Quantity control objectives will be achieved by the adequately sized active retention basin with flow control structures, which will also regulate the post-development peak flows to existing levels. Specifications of the flow control structures will be provided during the detailed design phase.
- The discharge from the proposed stormwater management facility will remain within the allocated capacity of the storm sewer infrastructure of the neighboring subdivision.
- Best Management Practices are provided to mitigate and minimize the temporary and permanent erosion and sediment transport during and after construction.

The recommendation from the consultant is that the municipalities of Lanark County and Carleton Place, and the Mississippi Valley Conservation Authority accept and approve the Preliminary Stormwater Management Report in support of the development.

Servicing & Stormwater Management Report

McIntosh Perry Consulting Engineers Ltd. (MP) was retained by Wintergreen Ridge Ltd. to prepare a Servicing and Stormwater Management Report in support of an application for Draft Plan Approval of the development at 400 Lanark Street, Carleton Place, ON.

The purpose of this report is to present a servicing design for the development in accordance with the recommendations and guidelines provided by the Town of Carleton Place, the Mississippi Valley Conservation Authority (MVCA), and the Ministry of the Environment, Conservation and Parks (MECP) and addresses the water, sanitary and storm sewer servicing for the development, ensuring that existing and available services will adequately service the proposed development. The report proposes the following:

- The proposed water distribution system will include 200mm diameter watermain piping, 5 new fire hydrants, water supply to the single-family homes and townhomes will be provided by individual water service connections to municipal watermain, curb stops will be installed to all water services at property line and watermain is designed to have 2.4m cover.
- The calculated range of working pressures anticipated within the development under average day conditions were between 55 psi and 60 psi, and under peak hour conditions were between 50 psi and 57 psi which meets the minimum 40psi pressure requirement as stated by the MECP guidelines.
- The proposed site development area (8.19ha) will generate a peak design flow of 8.83 L/s.
- The proposed gravity sanitary sewers will be installed throughout the subject property with a minimum full flow target velocity (cleansing velocity) of 0.6 m/s and a full flow velocity of not more than 3.0 m/s. This may not be feasible on every length of pipe. This issue has been dealt with by increasing the slopes of the sanitary sewers. Design parameters for the site include an infiltration rate of 0.33 l/s/ha.
- The proposed sanitary main will be connected to sanitary stub from the future proposed Carleton / Lanark Development to the Northeast of the property under the proposed road connection to Lanark Street.
- A preliminary review of the updated HGL results indicates that, though there are increases, the increased elevations remain below the USF elevations. Additional analysis will be required to confirm this during the detailed design stage.

Based on the information presented, the preliminary assessment determined the proposed site can achieve adequate capacity for water, wastewater, and storm servicing to accommodate the proposed development and is supported.

PLANNING ANALYSIS

Applicable purposes of the Planning Act for this application include integrating matters of provincial interest in municipal planning decisions, recognizing municipal decision-making authority and accountability, and providing a planning process that is open, accessible, timely and efficient.

Specific to the Provincial Interests of this proposed development include; the adequate provision and efficient use of communication, transportation, sewage and water services and waste management systems; the orderly development of safe and healthy communities; adequately providing for a full range of housing, including affordable housing; and the appropriate location of growth and development.

Subsequently the Provincial Policy Statement (PPS) provides policy direction on matters of provincial interest that affects all land use development in Ontario, while protecting resources, public health and safety, and the natural and built environment.

This proposed development is supported by numerous policies within the PPS. Specifically outlined above in this report, the proposed development will be developed efficiently through intensification and compact form; and utilize existing municipal servicing and infrastructure.

The housing will provide a range of housing options and a mix of densities, including single detached, townhome, and apartment units. These housing options will meet the social, health, economic and well-being of current and future residents, including residents with special needs. Further, the applicant is seeking direction from the planning authorities on the provision of affordable housing to identify units to meet this policy.

The design of the community intends to provide for safe publics streets, spaces and facilities, meeting the needs of pedestrians, and facilitates active transportation, and fosters social interaction and community connectivity. While also promoting publicly accessible built and natural settings for recreation, including facilities, parklands, public spaces, open spaces, trails and linkages.

Lanark County, the upper-tier municipality, is responsible for approving the Plan of Subdivision to permit the development. Through their planning document, the Sustainable Communities Official Plan (SCOP), it provides policy direction. A general overarching policy from the SCOP that supports this development is the provision of encouraging and supporting diversified, mixed use Settlement Areas; thus avoiding costly unplanned engineering water and wastewater problems in the future. It also designates that the Settlement Areas accommodate a range of uses, and accommodate current and future population needs. Again, the SCOP reflects the PPS in that it promotes development efficiency optimizing use of land, resources, infrastructure, and public service facilities. The proposed development also meets an objective of the SCOP reflective of the PPS, the provision of a range and mix of low, medium and high-density housing types in accordance with servicing capacities.

The Carleton Place Official Plan builds upon the previous policy initiatives. Indicating the importance of design and built form being of a high quality and integration into the surrounding community reflecting the Town's heritage and character. The proposed development also intends to incorporate pedestrian, cycling and public infrastructure.

The subject lands are in the Residential District of the Town, identified in the CPOP as the main areas for housing. The CPOP objective is to promote sustainable, efficient, and diverse residential neighbourhoods, and to provide a diverse range of housing types and densities. Identified residential types include those the application is proposing. Further the CPOP contains density policies of which the applicant looks forward to discussing with the planning authorities, as the density proposed is higher than permitted but the CPOP provides for an increase with the provision of affordable housing within the development.

The last planning document reviewed is the Town of Carleton Place Development Permit By-law 15-2015. It manages the land use compatibility, character, and appearance of communities; and implements the policies of the Official Plan. As indicated previously, the subject property is within the Residential District of the Town. Permitted residential built form within these areas include each of the proposed housing types, single, townhome and apartment units. Further, the design of the community meets all of the development provisions found within the by-law.

The evaluation of the planning policies and by-laws with regard to the proposed development indicate that it is considered "good planning" and should be approved by the municipal planning authorities.

Subject to the approval of this application, the development will conform to both the Town's Official Plan and Development Permit By-law.

CLOSING

This application meets provincial and County planning policy for new residential development, subject to Council's approval of this rezoning and redesignation. It is our opinion that this application represents good planning and should be approved.

Respectfully Submitted by,

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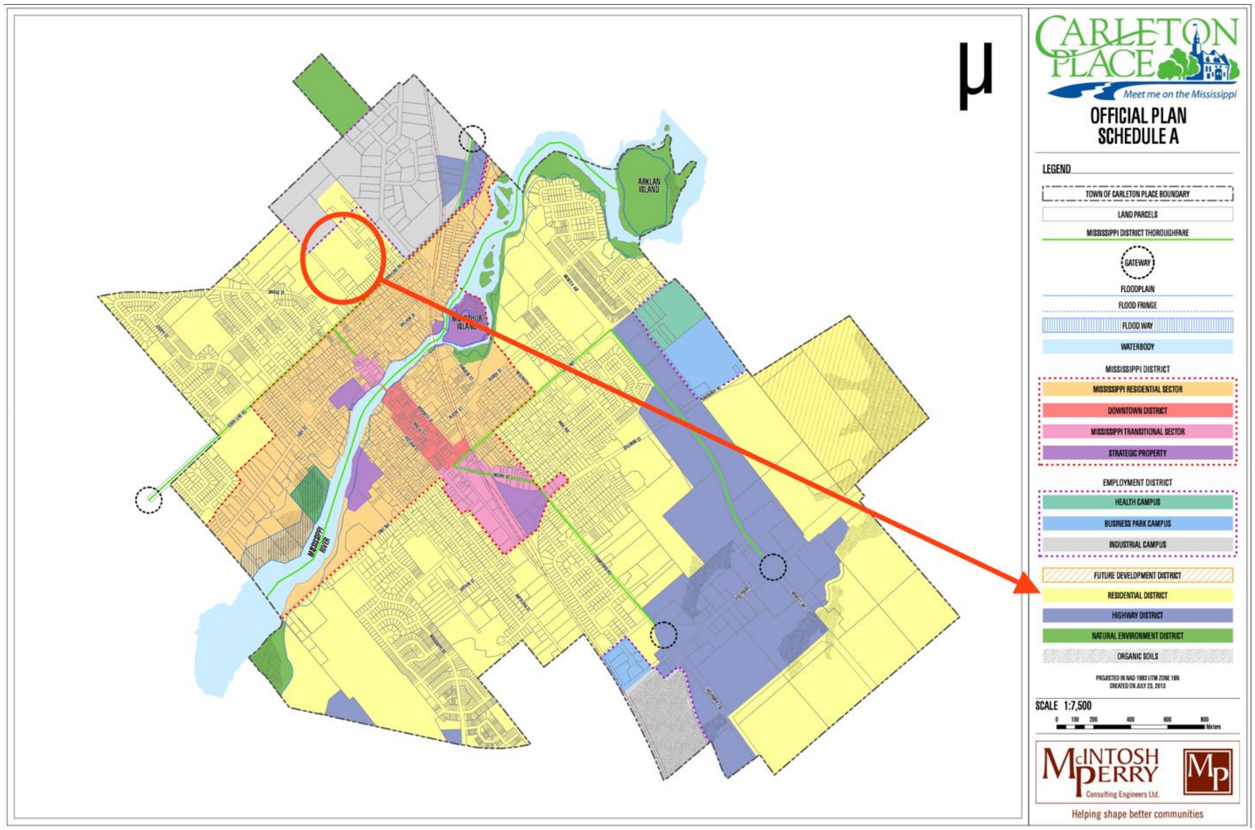
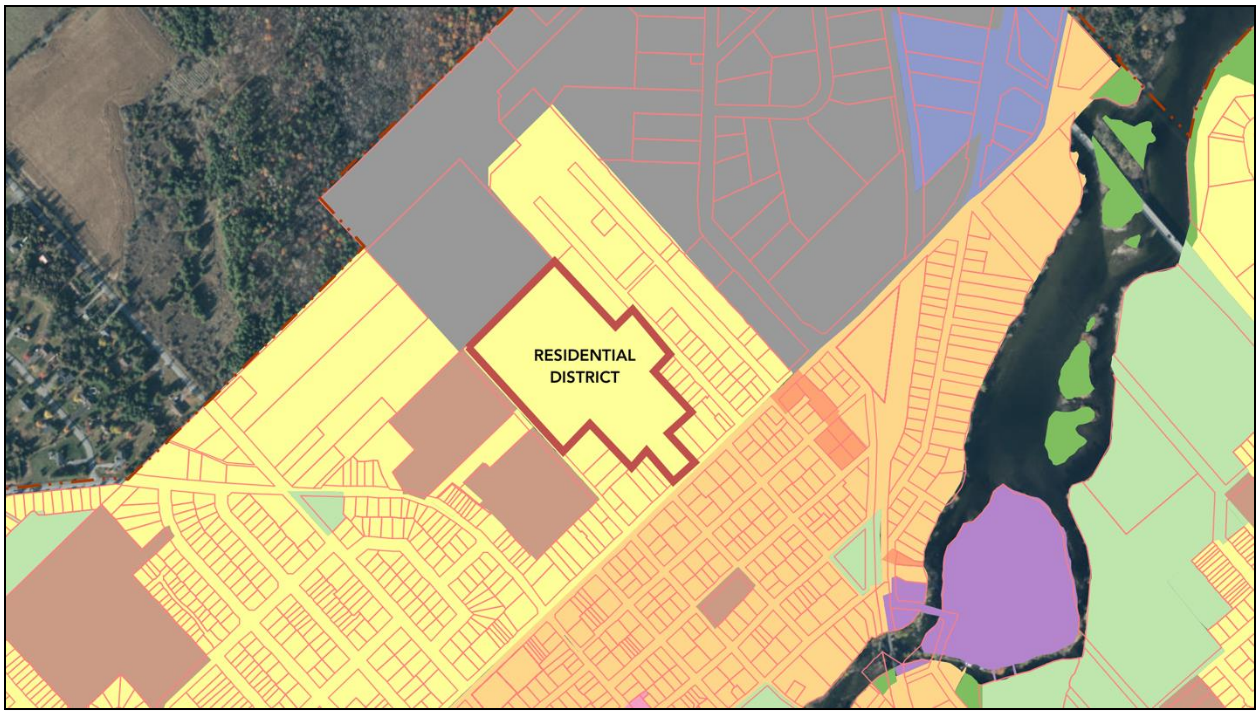
APPENDIX 1: TOWN OF CARLETON PLACE OFFICIAL PLAN, SCHEDULE A

Subject property indicated by red circle.



APPENDIX 2: PROPERTY'S DEVELOPMENT PERMIT LAND USE (CARLETON PLACE GIS)

Subject property outlined in red.



APPENDIX 3: TRAFFIC IMPACT STUDY, MCINTOSH PERRY (SEPTEMBER 2023)

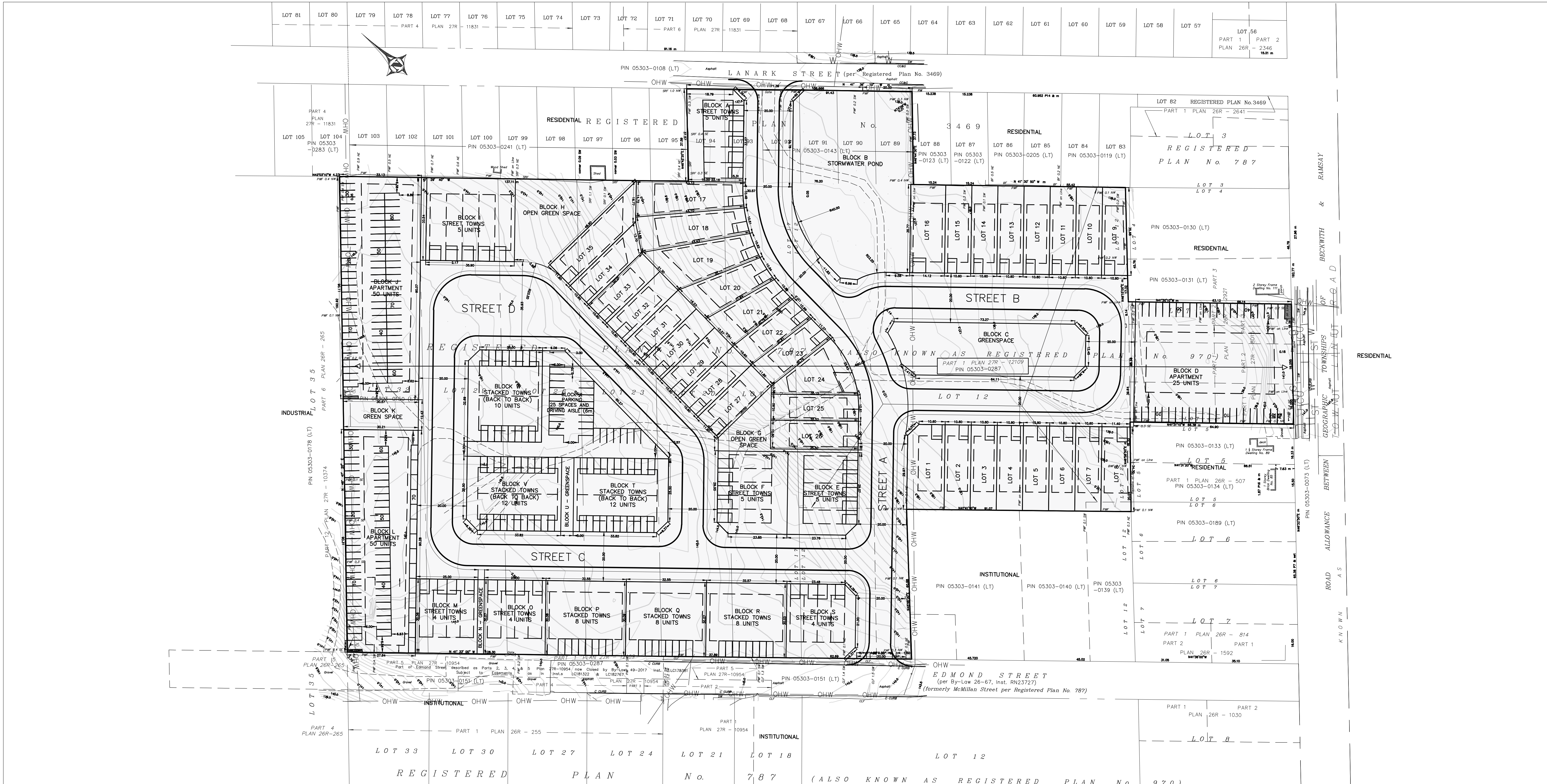
See attached.

APPENDIX 4: STORMWATER MANAGEMENT PLAN, MCINTOSH PERRY (SEPTEMBER 2023)

See attached.

APPENDIX 5: SERVICING & STORMWATER MANAGEMENT REPORT, MCINTOSH PERRY (SEPTEMBER 2023)

See attached.



DRAFT PLAN OF SUBDIVISION

400 LANARK STREET, CARLETON PLACE

LOTS 17, 20, 23, 26, 29 & 32 R PLAN 787 & LOTS 85 TO 94 R PLAN 3469, TOWN OF CARLETON PLACE, COUNTY OF LANARK

LANDPRO PLANNING SOLUTIONS INC.
110 James Street, Suite 204
St. Catharines, ON
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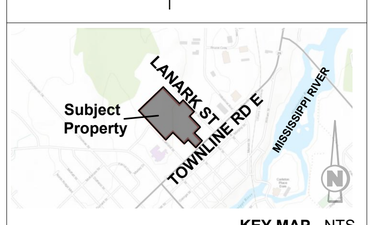

KEY MAP - NTS

LOT INFORMATION

LOT	AREA	LOT	AREA	LOT	AREA
1	521.44m²	13	378.59m²	26	411.80m²
2	364.95m²	14	378.74m²	27	354.18m²
3	364.72m²	15	378.89m²	28	318.11m²
4	364.50m²	16	504.87m²	29	318.11m²
5	364.27m²	17	548.37m²	30	318.11m²
6	364.05m²	18	554.54m²	31	318.11m²
7	363.82m²	19	581.34m²	32	318.11m²
8	406.00m²	20	441.81m²	33	318.11m²
9	353.98m²	21	402.71m²	34	354.24m²
10	378.13m²	22	330.74m²	35	505.15m²
11	378.29m²	23	354.72m²		
12	378.44m²	24	469.44m²		
		25	375.88m²		

LAND USE SCHEDULE

LAND USE	AREA	UNITS	DENSITY
RESIDENTIAL	34,622.39m²	250	72.2 UPH
SINGLE DETACHED	13,803.32m²	35	25.4 UPH
STREET TOWNHOUSE	5,866.80m²	32	55.0 UPH
STACKED TOWNHOUSE	6,352.31m²	58	91.3 UPH
APARTMENT	8,599.96m²	125	145.3 UPH
ROW	18,901.23m²		
BLOCK B SWM POND	3,388.68m²		
BLOCK C GREEN SPACE	1,617.27m²		
BLOCK G GREEN SPACE	377.26m²		
BLOCK H GREEN SPACE	1,083.73m²		
BLOCK K GREEN SPACE	377.93m²		
BLOCK N GREEN SPACE	77.88m²		
BLOCK U GREEN SPACE	150.00m²		

BLOCK X PARKING 1,503.94m²

PARKING	# OF SPACES	SPACES REQUIRED FROM PARKING LOT
SINGLES	72	0
TOWNS	232	16
APARTMENTS	201	0

REQUIREMENTS OF THE PLANNING ACT, R.S.O, 1990 - SECTION 51(17):
(A) SEE PLAN.
(B) SEE PLAN.
(C) SEE KEY MAP.
(D) SEE LAND USE SCHEDULE.
(E) SEE PLAN.
(F) SEE PLAN.
(G) SEE PLAN.
(H) MUNICIPAL SERVICING.
(I)
(J) SEE PLAN.
(K) MUNICIPAL SERVICING AVAILABLE.
(L) NOT APPLICABLE.

OWNER'S CERTIFICATE:
I HEREBY AUTHORIZE LANDPRO PLANNING SOLUTIONS INC. TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION FOR APPROVAL.

Natalie McGuire — Sept.27.2023
OWNER **DATE**

SURVEYOR'S CERTIFICATE:
I HEREBY AUTHORIZE THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AS SHOWN ON THIS PLAN AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE ACCURATELY SHOWN.

Sept 26 2023
SURVEYOR (MCINTOSH PERRY) **DATE**

REVISIONS

No.	Updates
1	26-05-2023 Adjusted lot sizes, created 1 lot.
2	07-06-2023 Added singles, stacked towns.
3	15-08-2023 Adjusted ROW, singles, street blocks, created larger lots and blocks.
4	22-08-2023 Adjusted singles lot lines
6	15-09-2023 Adjusted Town lot lines, added parking and building envelopes to apartments, towns and singles.

0 4 10 20 40

SCALE: 1:1500

DATE: 09-26-2023

DRAWING NO: 1/1

PLOT: 11x17"

DESIGNED BY: MK

REVIEWED BY: MS

URBAN DESIGN BRIEF

400 Lanark Street
Carleton Place, Ontario

Prepared For:

WinterGreen Ridge Ltd.

Report Date:

September 2023

LAND PRO
PLANNING SOLUTIONS

Addressed To:

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Niki Dwyer, Director of Development Services

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Prepared By:

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TABLE OF CONTENTS

1.0 INTRODUCTION

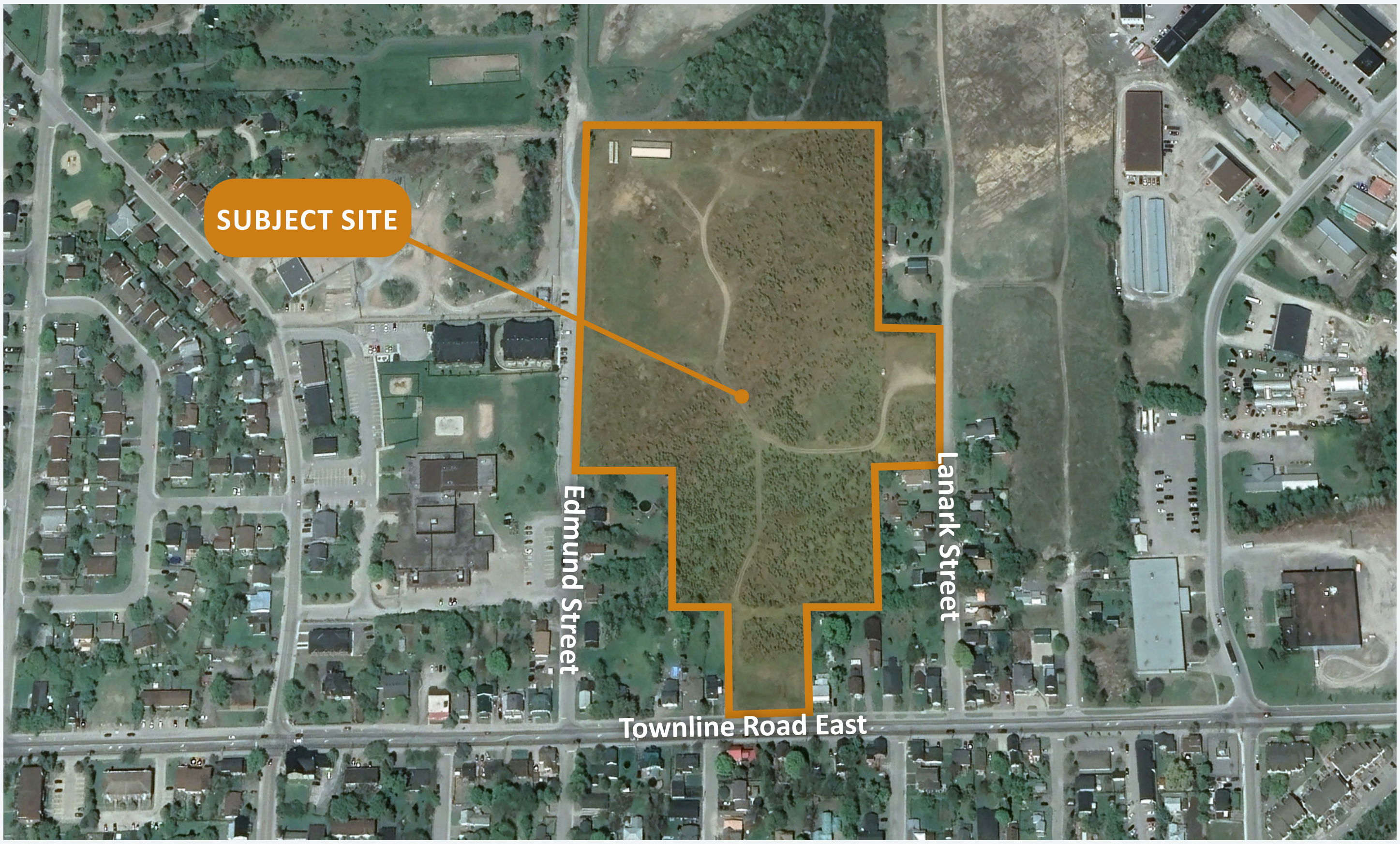


Figure 1: Subject Site

LandPro Planning Solutions Inc. (“LandPro”) has been retained by Wintergreen Ridge Ltd. and its predecessor, McGuire Crupi Investments (“the applicant”), since 2021 to redevelop the property at 400 Lanark Street (“the subject site”) for residential purposes.

1.1 PURPOSE & VISION

The purpose of this brief is to demonstrate how the proposed development meets the applicable urban design guidelines and requirements, and includes an overview of the site location, the surrounding context and the proposed form and patterns in accordance with the Town’s policies and design guidelines in relation to the subject site.

The subject site is a redevelopment of a 6.27-hectare parcel into a residential subdivision. The current plan includes a mix of apartment buildings, townhomes, and detached homes for a total of 250 units. LandPro has prepared this Urban Design Brief jointly with BR2 Architecture, in support of the Plan of Subdivision and Development Permit applications, that proposes to re-develop this property with:

- Single Detached Dwellings – 35
- Street Townhome Dwellings – 32

- Stacked Townhome Dwellings- 58
- Apartment Dwellings – 125
- Internal road network
- Municipal servicing
- Open space & stormwater management facilities
- Off-street parking

Please see **Figure 2**, for the conceptual plan of the proposed development.

Figure 2: Proposed Conceptual Plan

2.0 SITE CONTEXT ANALYSIS

2.1 SITE LOCATION

The subject site is located at 400 Lanark Street, north of Townline Road East and west of Lanark Street in the Town of Carleton Place, in Lanark County. The site is north of Mississippi Creek and Grape Island, adjacent to Carambeck Community Centre and approximately 400 meters from Ferril Park.

The site is an irregular shape, consisting of 15 lots, with 49 metres fronting onto Townline Road East and 107 metres fronting Lanark Street. The site has a depth of 386 metres and a total lot area of 6.27 hectares.

The property is legally described as Lots 7 – 27 (inclusive), Lots 35 – 54 (inclusive), Lots 67 – 81 (inclusive), Lots 89 – 121 (inclusive), Registered Plan 3469, Town of Carleton Place, County of Lanark.

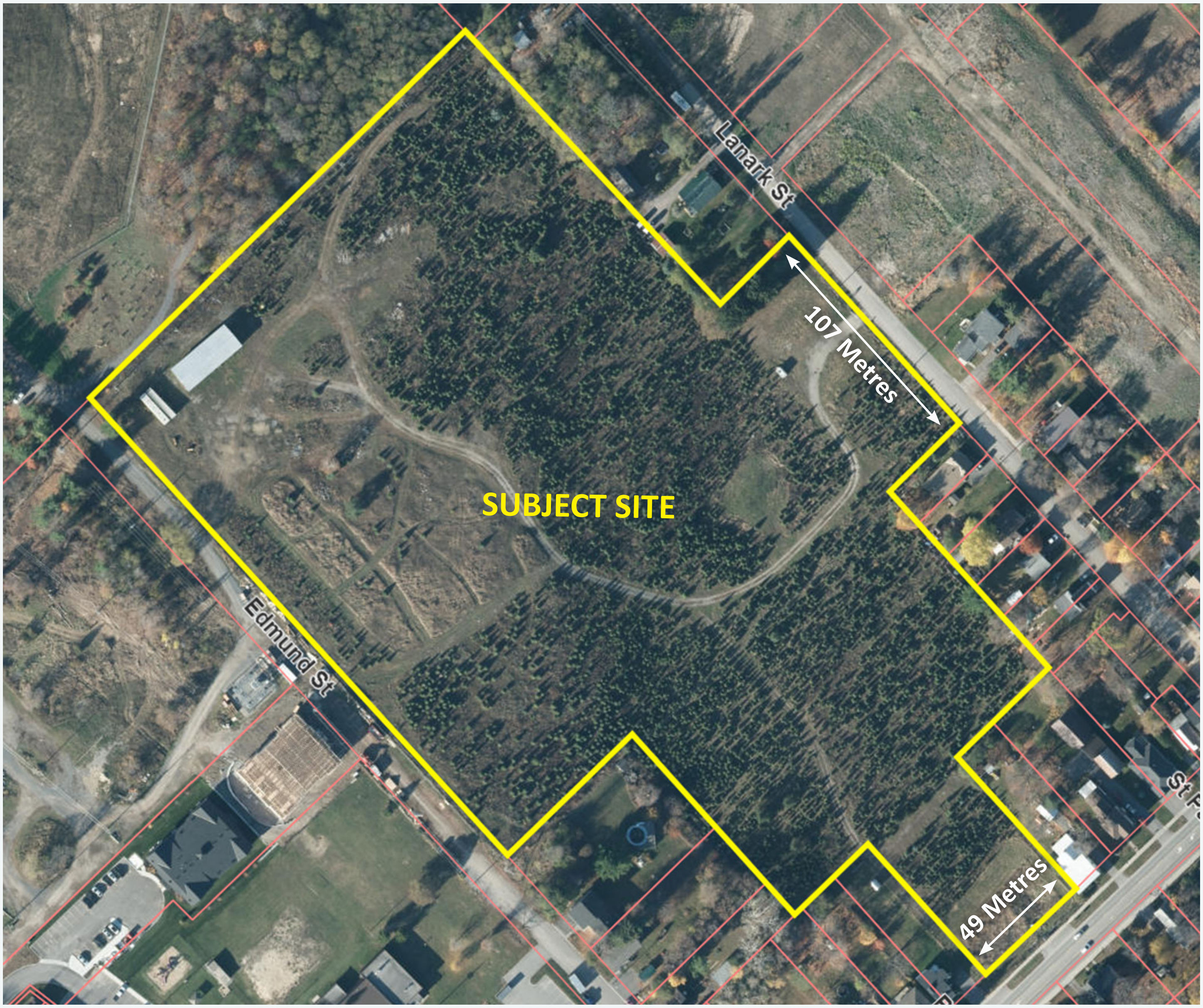


Figure 3: Property Location

The subject site is a vacant property that was previously used as a tree farm. Currently, the site has been cleared of most vegetation. Municipal servicing is to be used for the re-development, which we understand is located proximate to the site. The topography of the site slopes down from the north end to the southern point.

2.2 SURROUNDING CONTEXT

Northwest of the site consists of vacant land. Directly adjacent to the subject site, on the northeast side, is more vacant land, which is in the process of a development proposal consisting of single detached houses and townhouses. Currently, there are single detached homes surrounding the subject site towards Lanark Street and Townline Road East as depicted in **Figure 6** and **Figure 7**.

Further east of the site, there are industrial buildings as shown in **Figure 8**. To the west of the site, there are both institutional and residential uses and the site's closest park, Ferril Park. South of the site are more single detached housing.

These neighbouring properties have large lots, which spread out the built form and provide an abundance of space, greenery and light. However, these streets are highly underutilized, with little to no street furniture or lighting, and consist of a lot of overhead electrical poles which take away from the site's natural essences.

To address the purpose of this report, it is necessary to review and address the policy framework that applies, specifically including the design criteria included in the Town's Development Permit By-law.

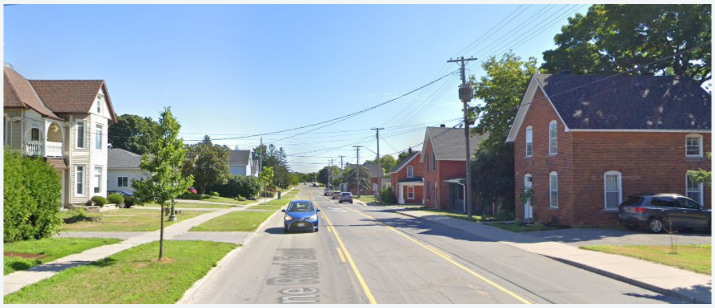


Figure 5: Detached homes along townline road east (2022)

Figure 6: Community Centre near subject site (2022)

Figure 7: Detached home adjacent to subject site (2022)

Figure 8: Industrial building near subject site (2022)

Figure 4: Subject site's previous tree farm use (2012)

Figure 9: Surrounding Amenities

2.3 EXISTING POLICIES

Based on Lanark County's Official Plan, the subject site is designated as "Settlement Area" including all surrounding lands nearby. The Town of Carleton Place Official Plan designates the subject site as "Residential District", which is ideal for the proposed project.

The surrounding land uses based on the Town of Carleton Place Official Plan are as follows:

North	=	Industrial Campus
South	=	Mississippi Residential Sector
East	=	Residential District | Industrial Campus
West	=	Residential District

Based on the Town of Carleton Place Development Permit Land Use Map, the surrounding land uses slightly differ. North of the site is still “Industrial Campus” and is currently a vacant lot currently used as St. James Woods Parking Lot.

Towards the south end of the subject site includes both “Mississippi Residential Sector” which consist of dwellings, but also “Institutional” which is used by the Carleton Place and Beckwith Heritage Museum.

The “Residential District” towards the east side is currently a vacant lot and past those lots is the “Industrial Campus” which has manufacturing buildings including Eteros East, Intelcan, Ricks Glass Medic & Tinting Ltd and Mississippi Flooring.

Finally, the west side is designated as “Residential District” and “Institutional” where the Carambeck Community Centre is located.

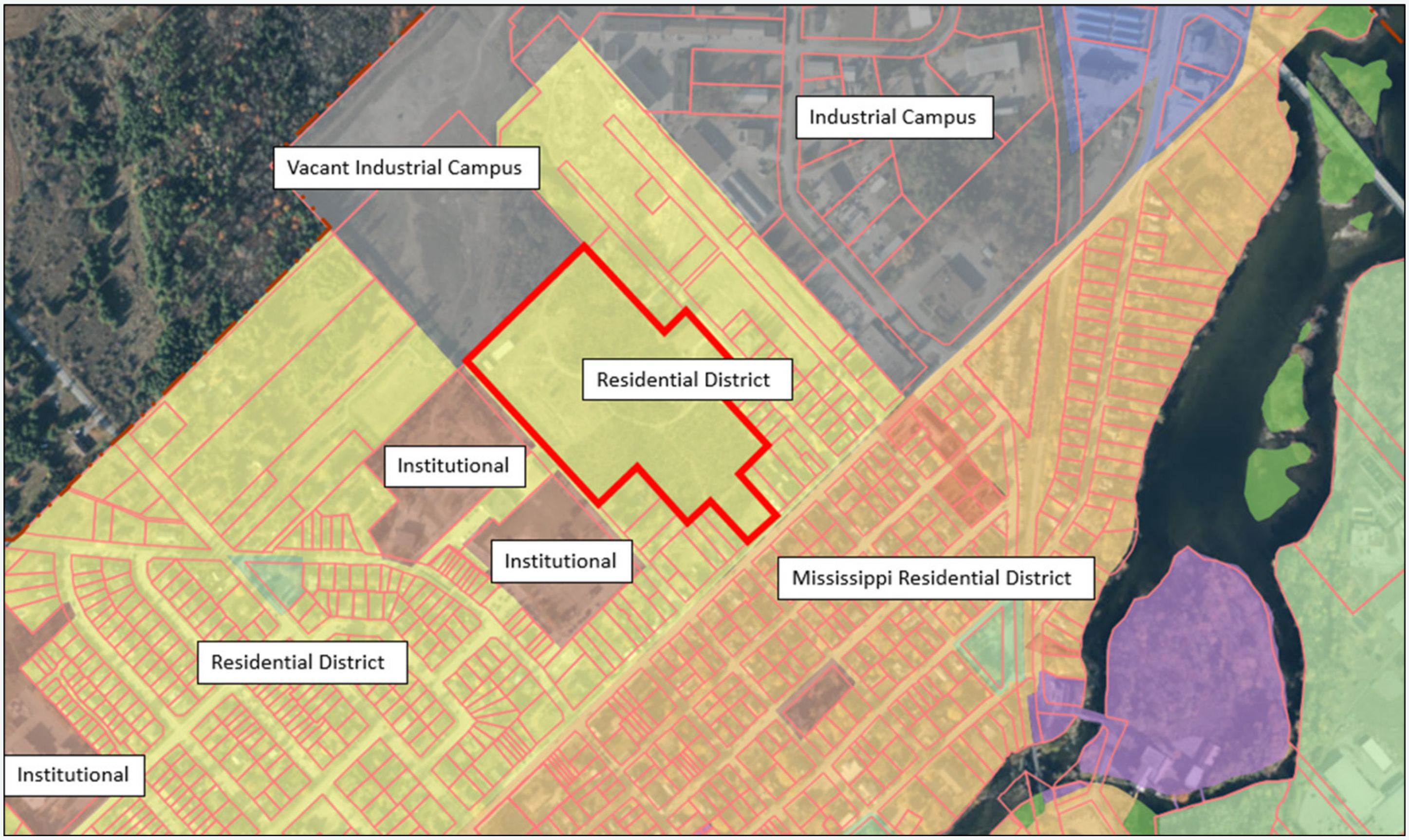


Figure 10: Land Use Map of Subject Site

2.4 EXISTING TRANSPORTATION NETWORKS

Continuous and connected active transportation will support sustainable transit systems, which will increase neighborhood accessibility within the Town and improve road safety for cyclists. Based on the needs of the Town of Carleton Place, the Active Transportation Network Strengthening Plan focuses on key destinations (e.g. schools, residential, commercial, and recreational areas), crossing of major barriers (e.g. the Mississippi River), available right-of-way, future growth plans, traffic volumes, safety, physical feasibility, and costing and identifies sidewalk gaps. These gaps will be tailored towards expanding the Cycling Priority Route network over a 20-year plan.

Based on the Town of Carleton Place's Transportation Master Plan, Townline Road East will be subject to major changes and improvements in the future. Currently along Town Line East Road, between Edmund Street and Carleton Street, it is not considered a safe cycling route. To change this, it needs to be recognized by "Share The Road" as an adequate transportation route for cyclists. This includes having wider shoulders, less daily traffic and no major intersections without crosswalks.

The active Transportation Implementation plan will look to rebalance the street between Industrial Avenue and McNeely Avenue within the next six to ten years. Potential long-term projects beyond the 20-year mark include widening the street from two lanes to four lanes from McNeely Avenue to East Town Limit. Townline East Road, a part of the long-term incremental improvements plan to have Multi-Use Pathways on both sides or on one side if constrained and is also a part of the city's recommended cycling priority routes. **Figure 12** and **Figure 13** illustrate the existing active transportation network as well as the future strengthening plan which will work in favor of the future development applications on Townline East Road.

Based on the Development Permit By-law and the goals of the Transportation Master Plan, it is recommended that development within the "Residential District" include internal pathways for cyclists and pedestrians that link to new or existing parks and open spaces. All developments require sidewalks on at least one side of the street.

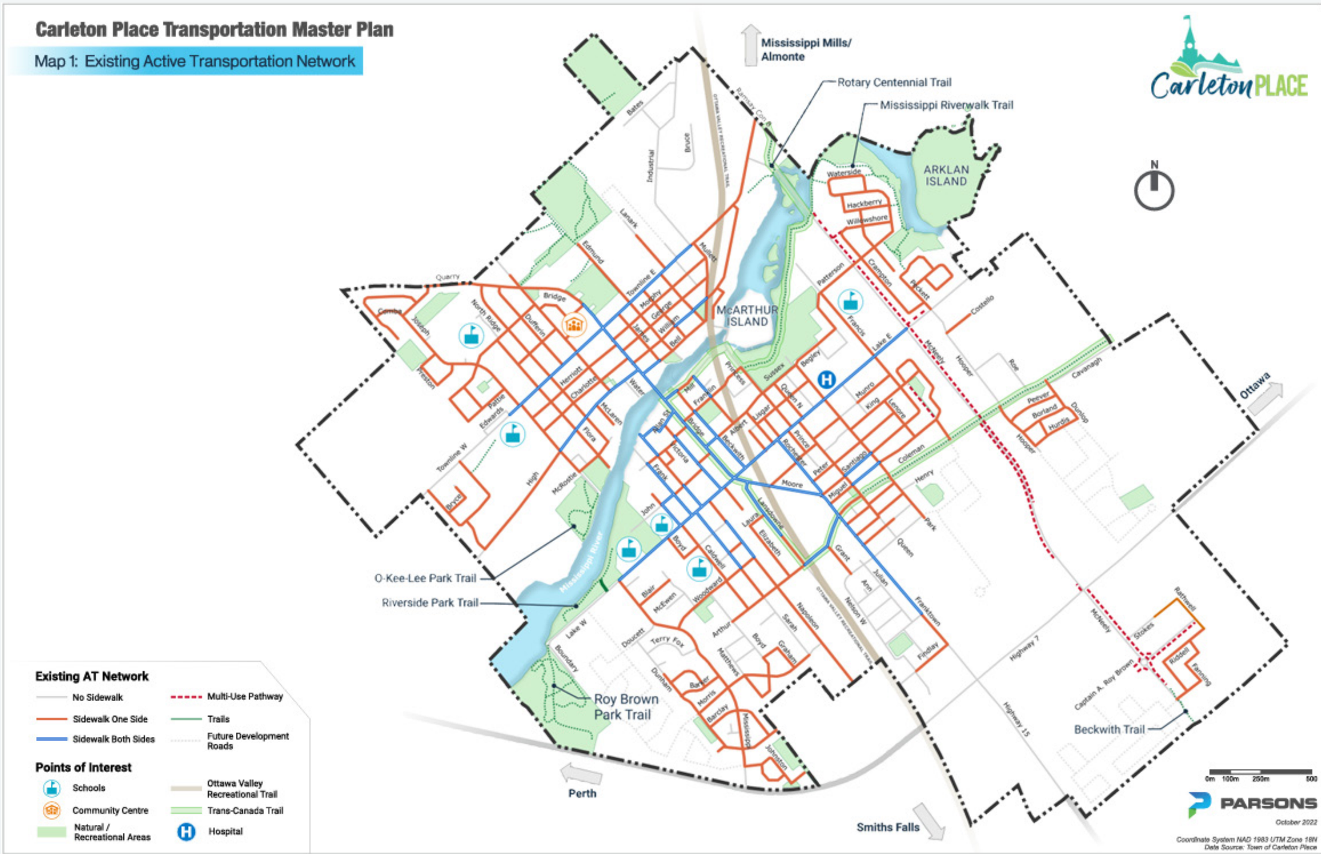
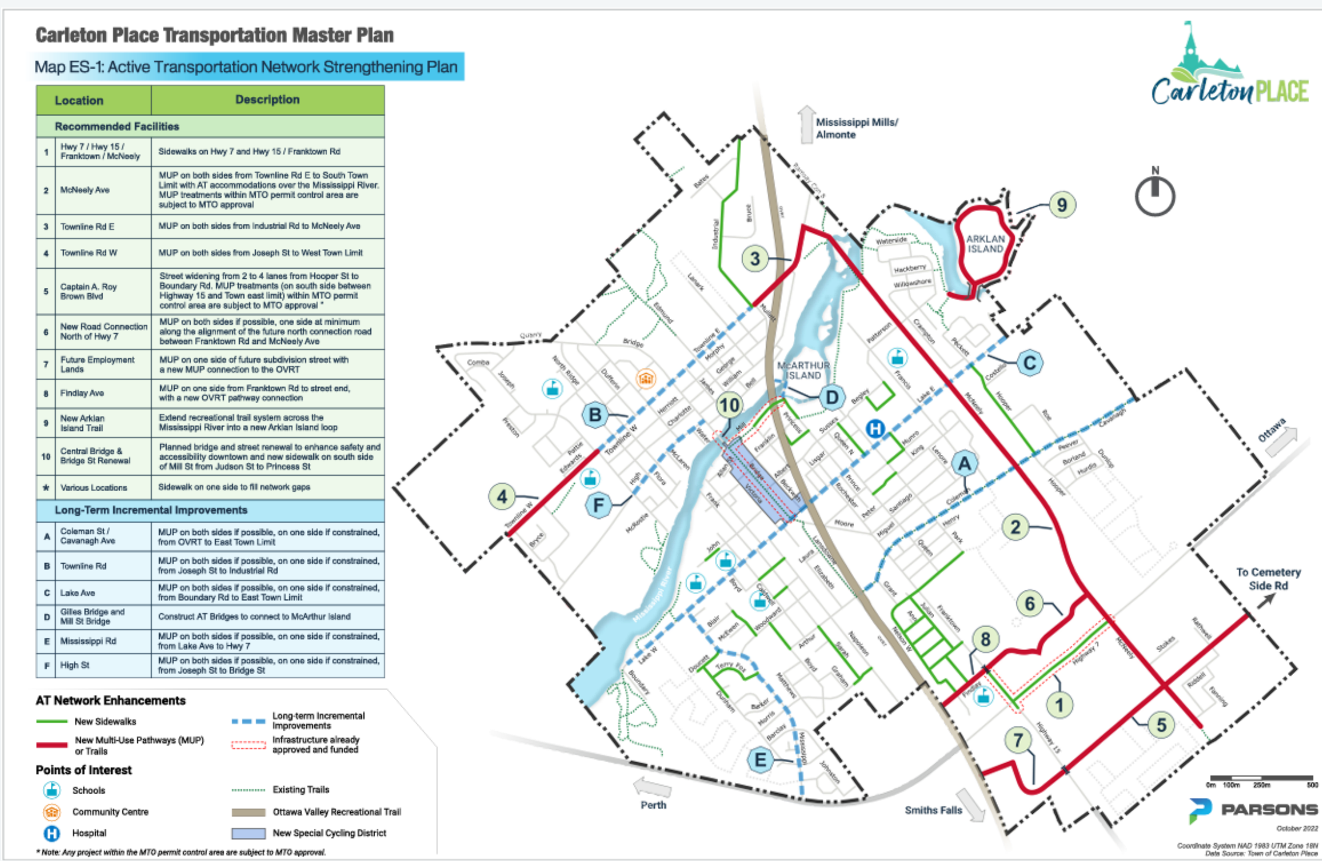


Figure 11: Existing Active Transportation Network



	Location	Description
	Recommended Facilities	
1	Hwy 7 / Hwy 15 / Franktown / McNeely	Sidewalks on Hwy 7 and Hwy 15 / Franktown Rd
2	McNeely Ave	MUP on both sides from Townline Rd E to South Town Limit with AT accommodations over the Mississippi River. MUP treatments within MTO permit control area are subject to MTO approval
3	Townline Rd E	MUP on both sides from Industrial Rd to McNeely Ave
4	Townline Rd W	MUP on both sides from Joseph St to West Town Limit
5	Captain A. Roy Brown Blvd	Street widening from 2 to 4 lanes from Hooper St to Boundary Rd. MUP treatments (on south side between Highway 15 and Town east limit) within MTO permit control area are subject to MTO approval *
6	New Road Connection North of Hwy 7	MUP on both sides if possible, one side at minimum along the alignment of the future north connection road between Franktown Rd and McNeely Ave
7	Future Employment Lands	MUP on one side of future subdivision street with a new MUP connection to the OVRT
8	Findlay Ave	MUP on one side from Franktown Rd to street end, with a new OVRT pathway connection
9	New Arklan Island Trail	Extend recreational trail system across the Mississippi River into a new Arklan Island loop
10	Central Bridge & Bridge St Renewal	Planned bridge and street renewal to enhance safety and accessibility downtown and new sidewalk on south side of Mill St from Judson St to Princess St
★	Various Locations	Sidewalk on one side to fill network gaps
	Long-Term Incremental Improvements	
A	Coleman St / Cavanagh Ave	MUP on both sides if possible, on one side if constrained, from OVRT to East Town Limit
B	Townline Rd	MUP on both sides if possible, on one side if constrained, from Joseph St to Industrial Rd
C	Lake Ave	MUP on both sides if possible, on one side if constrained, from Boundary Rd to East Town Limit
D	Gillies Bridge and Mill St Bridge	Construct AT Bridges to connect to McArthur Island
E	Mississippi Rd	MUP on both sides if possible, on one side if constrained, from Lake Ave to Hwy 7
F	High St	MUP on both sides if possible, on one side if constrained, from Joseph St to Bridge St

Figure 12: Active Transportation Network Strengthening Plan

3.0 DESIGN PROPOSAL

3.1 OVERVIEW

This Urban Design Brief promotes the infill development of a 250-unit residential development that comprises of 3 apartment buildings (125 units total), 90 townhouses (a mix of street and stacked) and 35 single detached homes.

The site has ample of green and open space for residents and the community to use, including a green space located within the centre of the single detached homes as well as smaller open green spaces throughout the site which is not only visually appealing, but also provides a buffer between the adjacent lots. The variety of housing and unit types creates a dynamic community and attracts new residents to the neighborhood. Having high and low density levels will bring resilience and promote racial and income diversity. Parking is distributed accordingly based on the number of units and type of dwelling. This includes the use of driveway and garage spaces, under-building parking for the apartment units and a parking lot to accommodate visitor parking for the stacked townhouses. Trees and landscaping will be distributed evenly throughout the plan and street lighting will also be added at an appropriate level to create attractive streets and a vibrant community.

3.2 GOALS AND GUILDING PRINCIPLES

Vision Statement

This proposal aims to meet the provincial and municipal goals of achieving more communities which takes into consideration the existing and planned context to promote positive contribution and future intensification.

This urban design brief uses the following overarching principles:

1. Sustainability
2. Mixed-Use Development
3. Quality of Life
4. Social Equity

Project Goals

In order to achieve these principles, the following goals have been set:

- Promoting sustainable and environmentally friendly development by integrating social and economic considerations into the design process
- Creating a diverse and evironmentally sensitive community with a mix of building density
- Designing pedestrian-friendly streets that prioritize the comfort, safety and accessibility of residents and visitors
- Designing the streetscape to harbor new trees and landscaping
- Integrating access to services, amenities and open spaces
- Providing affordable housing units
- Engagement and collaboration to establish a ***community***


Figure 13: Aerial Perspective Rendering of Subject Site


Figure 14: Top View Rendering of Subject Site

3.3 SITE DESIGN

The site design is intended to redevelop this former tree farm into a new residential community that will include refined landscaping techniques, new public outdoor amenities, a variety of building densities and careful site circulation (traffic and pedestrians).

Design details included the following:

- **2** x 50 unit apartments to the to the north-west edges of the site. Both buildings share a small green space between the two lots.
- **12** street townhouses and **24** stacked townhouses towards the west edge of the site, beside
- Edmund street.
- The northern center of the site will have **34** back-to-back townhouses and one parking lot.
- The north-east edge and centre of the site will have a total of **20** street townhouses, **19** single detached houses that are seperated by two open green spaces.
- The southern center of the site has a green space, and **8** single detached homes surrounding it as well as a stormwater pond above.
- The southern edge will have **1** x 25 unit apartment building.

The single detached homes will have single garage parking and one to two driveway parking spots per dwelling. Each townhouse will have one garage and one driveway parking space. The 50-storey apartment buildings will have parking at grade level (under-building rather than underground), with 4-storeys of housing above, making it 5-storeys in total. The 1 x 25 unit apartment building will have surface parking and 4-storeys of residential units above.

Building Type	Depth	Frontage
50-Unit Apartment	27.64 - 33.13 Metres	90.07 - 90.31 Metres
25-Unit Apartment	63.12 - 64.90 Metres	48.74 - 48.75 Metres
12-Unit Back-to-Back Townhouses	30.00 Metres	38.32 - 38.35 Metres
10-Unit Back-to-Back Townhouses	37.19 Metres	29.99 Metres
8-Unit Stacked Townhouses	30.03 - 30.08 Metres	32.55 - 32.57 Metres
Street Townhouses	18.79 - 33.54 Metres	5.50 - 9.10 Metres
Single Detached House	29.97 - 48.90 Metres	10.60 - 25.43 Metres

Table 1: Lot Depth and Frontage Based on Building Type

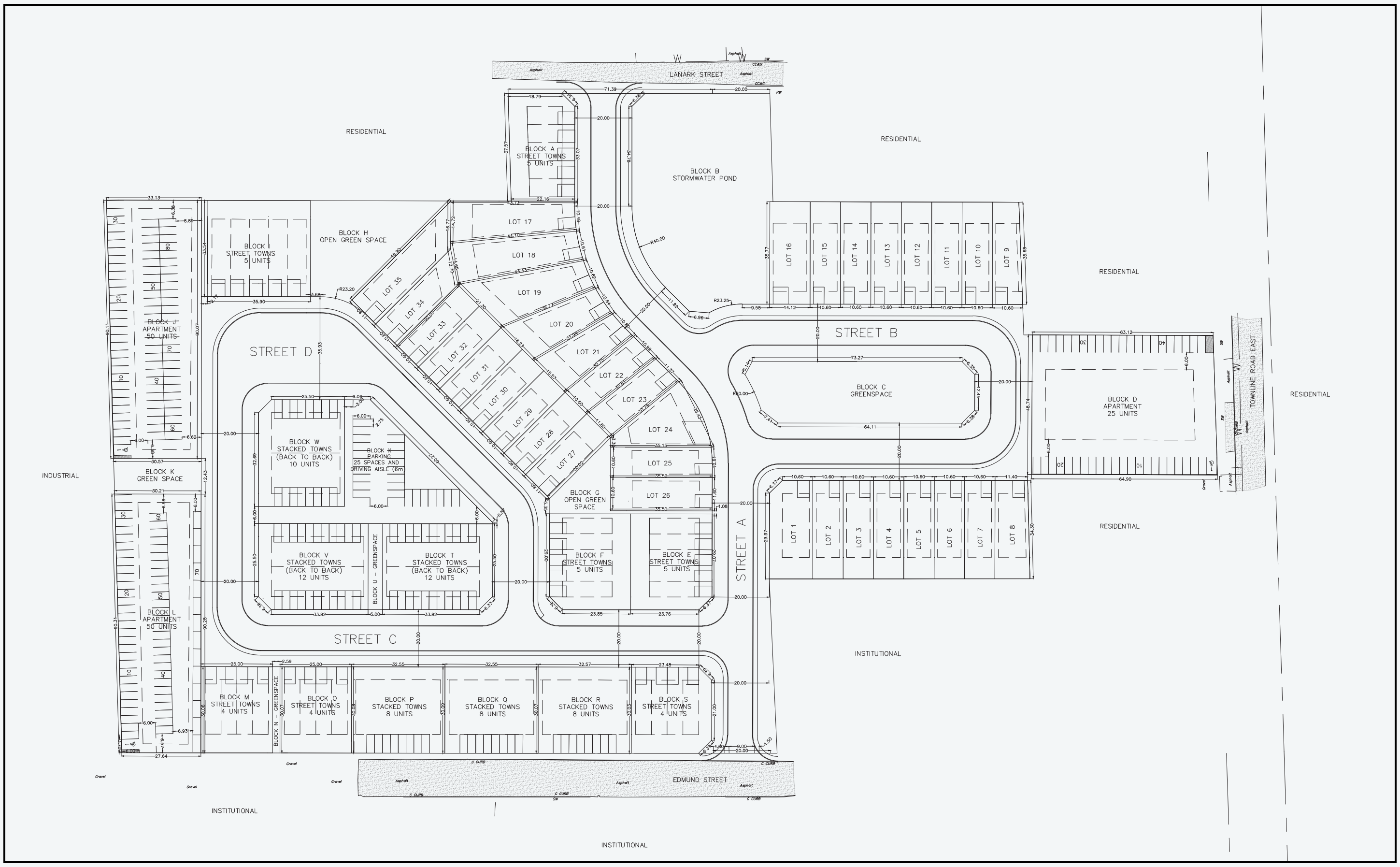


Figure 15: Top View Plan of Subject Site

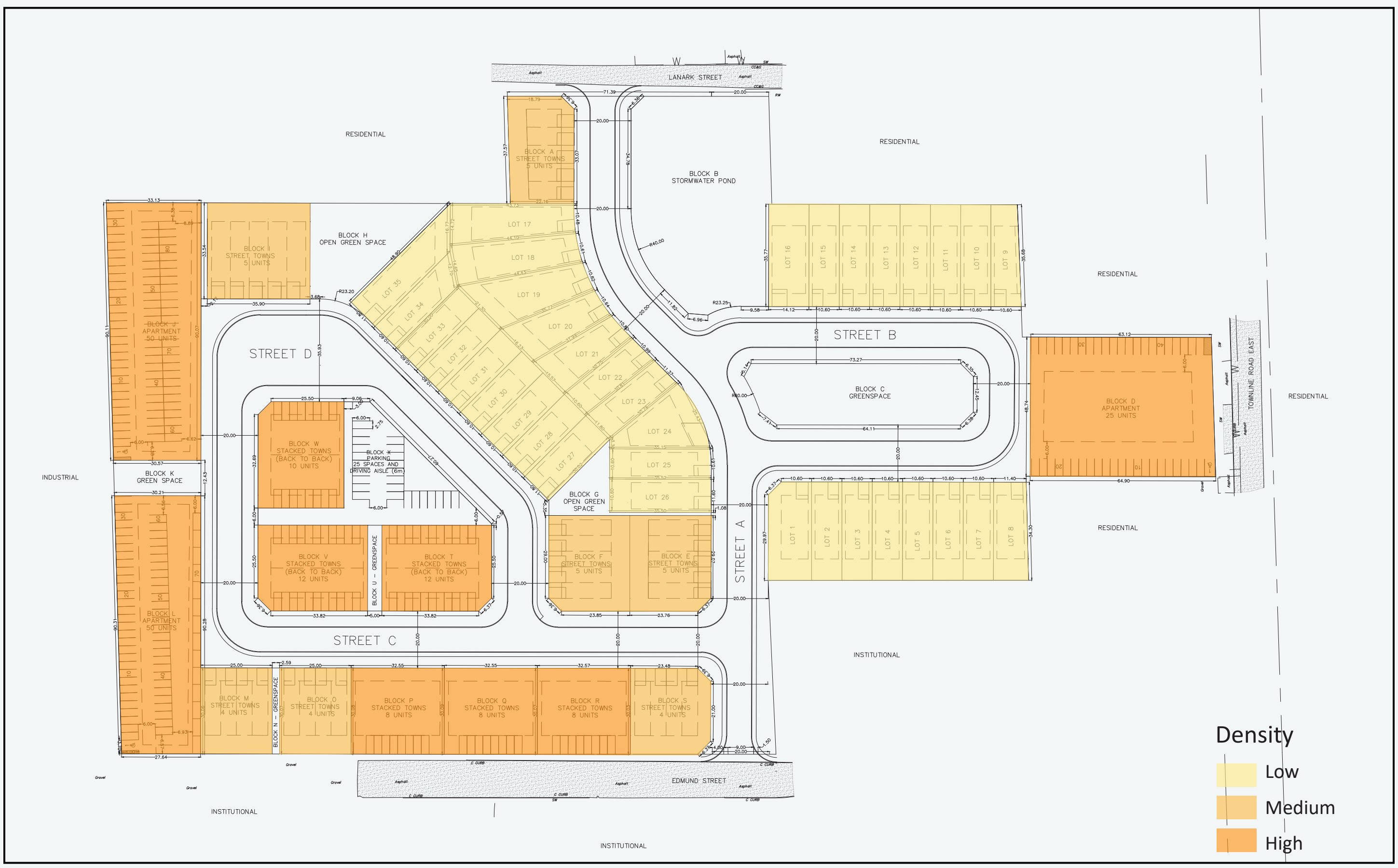


Figure 16: Density Map

3.4 BUILT FORM

In compliance with the Town of Carleton Development Permit By-law, new residential development within Residential Greenfields needs to be in accordance with provisions of Section 6.0. The architectural built forms will demonstrate good design principles including form, mass, scale, height, texture and colour. It will work to enhance the site's character by adding modernization to the rural site while also being compatible with adjacent neighbourhoods. The built form will incorporate scenic elements including diverse landscaping techniques, intricate paving elements, diverse facades to represent different building types and uses and lighting. Renderings of built forms are as followed:

Figure 17: Site Rendering

Figure 18: Townhouse Rendering

Figure 19: Apartment Building Rendering

Figure 20: Signle Detach House Rendering

3.5 SERVICING, TRANSPORTATION, PARK LAND

Currently, there are two access points into the site, one entering from Lanark Street and one entering from Edmund Street, which enter and exit from Street A and connects to Street B and C. Street A is also used by the freehold townhouses to provide access into their driveway.

Street B circles around back to Street A and allows access to the single detached houses and Block B (25-unit apartment). Street C is connected to multiple roads including Street A, D, and E and provides access to the stacked townhouses and freehold townhouses.

Once at Street D, it links to an inner street and Street E and halts at a dead end. It provides access to the two apartment complexes. Street E provides access to the freehold lots and single detached lots as well as another entrance to the inner street used by Block H, J and L which are back-to-back stacked townhouses.

Park land is demonstrated on the Draft Plan of Subdivision, which is in excess of the 5% minimum required by the Planning Act. The applicant will work with the Town and County to ensure their parkland contribution is appropriate.

Servicing and garbage access to be determined.

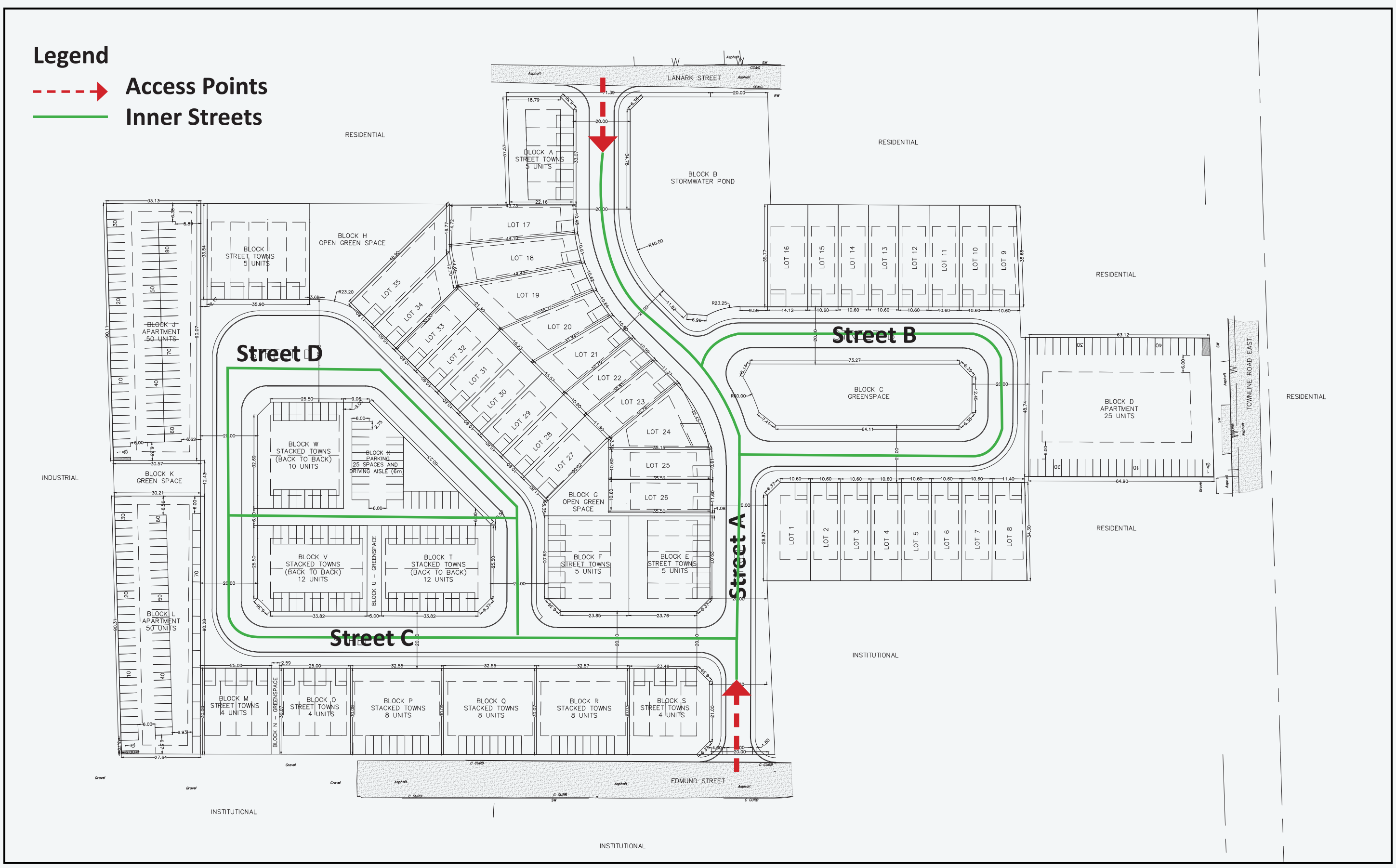


Figure 21: Top View Plan of Subject Site Showing Access Points

4.0 RELATED POLICIES

4.1 TOWN OF CARLETON PLACE OFFICIAL PLAN (SCOP)

Community Design Framework

Section 2.2 Objectives

The proposed development will meet the objectives of the applicable design guidelines. The development will be designed to fit appropriately within the existing neighbourhood's built form, including the addition of site landscaping and street trees, as well as pedestrian and cycling connections.

The Town's urban design objectives are noted below.

1. *To ensure high quality design of the built form which reflects the Town's heritage and character;*
2. *To provide general design principles applicable to the entire municipality which can be imple mented through the Town's Development Permit By-law;*
3. *Incorporate pedestrian and cycling amenities into new development and public infrastructure projects where appropriate;*
4. *Enhance the pedestrian experience through site design and way finding initiatives where appropriate;*
5. *Improve the esthetic appeal of gateways and thoroughfares leading into the Town core; and*
6. *Recognize the importance of street trees and the need to enhance public lands through additional plantation.*

Please see **Table 2** below, for the Carleton Place Official Plan's General Design Policies.

2.3 General Design Policies		
Policy	**Proposed**	**Comments**
1. Proposed developments shall enhance the image of the Town of Carleton Place by complementing and contributing to: • the character of the area; • local landmarks; • the consistency and continuity of the area with its surroundings; • the edges of the area; and • linkages within, to and from the area.	The proposed development is designed to complement the existing character of the area in terms of built form, and create continuity with the existing surrounding neighbourhoods. The end result is intended to contain pedestrian and cycling connections throughout the site. The site will be connected to Lanark Street and Edmund Street through a roadway and sidewalks, and sidewalks are provided throughout the site.	**Complies**

2.3 General Design Policies		
Policy	**Proposed**	**Comments**
2. Significant views and vistas of landmarks and features, such as the Mississippi River, shall generally not be obstructed, dominated or marred by a proposed development or infrastructure undertaking.	The site does not currently contain any significant views or vistas, and so the proposed development will not be obstructive in this sense.	**N/A**
3. The municipality encourages the development or redevelopment of buildings and spaces that establish a pedestrian scale by promoting: • the placement of continuous horizontal features on the first two stories adjacent to the road; • the repetition of landscaping elements, such as trees, shrubs or paving modules; and • the use of familiar sized architectural elements such as doorways and windows.	The nature of the proposed design fosters elements that encourage a sense of community through the planning of the buildings, both location and types. The development will encourage internal and external pedestrian traffic through the use of landscaped paths through the property.	**Complies**
4. The provision of furniture, stairs, walls and benches in public spaces that provide comfortable rest areas for pedestrians, provided such elements do not obstruct pedestrian movement, shall be supported.	In an effort to encourage pedestrian traffic, the use of landscaping features such as benches, informal gathering spaces and culturally significant signage will further establish this devleopment as a destination among neighbouring residents.	**Complies**
5. The retrofitting of buildings with barrier-free features shall not be detrimental to the architectural, historical or aesthetic value of cultural and heritage resources and buildings and shall not impede pedestrian movement.	The redevelopment does not include existing buildings (as there are none currently on the site) and so there will be no retrofitting.	**N/A**
6. The design of new development shall: • be complementary to adjacent development in terms of its overall massing, orientation and setback; • provide links with pedestrian, cycling and road networks; • enhance orientation and integrate newly developing areas of the Town of Carleton Place; and • maintain and enhance valued cultural and heritage resources and natural features and functions.	The proposed development is designed to complement the adjacent areas in terms of massing and follows the municipal provisions regarding setbacks. The end result is intended to contain pedestrian and cycling connections throughout the site. The site will be connected to Lanark Street and Edmund Street through a roadway and sidewalks, and sidewalks are provided throughout the site.	**Complies**

2.3 General Design Policies		
Policy	**Proposed**	**Comments**
7. Development or redevelopment design shall strive to achieve the following: • provide a development pattern that supports a range of uses; • provide transportation connections, including pedestrian and cycling connections to adjacent areas; and • maintain and enhance valued historic development patterns and resources.	The proposed development is designed to support principally residential uses, as is intended by the site's Residential designation. Multiple transportation connections, including pedestrian and cycling connections, are to be offered to adjacent areas. The proposed development has direct roadway connections to Lanark Street and Edmund Street.	**Complies**
8. Proposed development within an established neighbourhood shall be designed to function as an integral and complementary part of that area's existing development pattern by having regard for: • massing; • building height; • architectural proportion; • volumes of defined space; • lot size; • position relative to the road; and • building area to size area ratios.	The proposed development is located adjacent to existing neighbourhoods but not necessarily within an established neighbourhood. It will, however, function as complementary to the surrounding areas in terms of massing (including heigh and proportion) and will meet municipal provisions related to size, setbacks, and areas.	**Complies**
9. New development shall support continuous building facades in the central business district through the street level presence of: • community facilities, retail shops and other frequently visited uses; and • architectural features and elements which can be experienced by pedestrians.	The proposed development is not located within the central business district.	**N/A**
10. The Town shall promote and encourage building facades to be visually interesting through extensive use of street level entrances and windows. Functions that do not directly serve the public, such as loading bays and blank walls, should not be located directly facing the street.	As part of the project vision to generate pedestrian friendly streetscapes, the building facades will be developed in such a manner to reinforce the sense of community. It is important to establish a sense of community which will result in increased safety.	**Will Comply**
11. The use of exterior signs and other exterior advertising devices within the Town of Carleton Place shall be regulated through a sign by-law that addresses, but is not limited to, the following:	No signage is anticipated, but any such signage proposed in the future will be subject to the Town's sign by-law.	**Will Comply**

2.3 General Design Policies		
Policy	**Proposed**	**Comments**
• location; • size; • number; and • construction, alteration, repair and maintenance.		
12. The design and development of new residential, commercial and employment generating uses shall accommodate postal services. Accordingly, where centralized mail delivery is provided, such areas should be designed to provide focal points and amenity areas to the surrounding neighbourhood.	The proposed development shall accommodate postal services.	**Will Comply**

Table 2: Town of Carleton Place Official Plan, Policy 2.3

As noted in **Table 2** above, the proposed design complies with all applicable General Design policies within the Community Design Framework of the Carleton Place Official Plan.

Section 3.5 Residential District

The subject property is designated Residential District, which is a designation intended to provide the main locations for housing in Carleton Place. The objectives of this designation include "to promote sustainable, efficient and diverse residential neighbourhoods; and to provide a diverse range of housing types and densities," **(3.5.1)**. Permitted uses include all density types of residential, parks and recreational facilities, institutional uses, and others **(3.5.2)**.

Please see **Table 3** below, for Residential District Policies.

3.5.3 Residential District Policies		
Policy	**Proposed**	**Comments**
1. Where land is designated Residential District on Schedule A to this Plan, a range of residential dwelling types and densities shall be permitted, including single detached, semi-detached, duplex dwellings, triplex dwellings, townhouse dwellings and apartment dwellings.	The proposed development includes a range of residential dwelling types and densities, including single detached, townhouse and apartment dwellings.	**Complies**
2. Ancillary uses such as schools, neighbourhood and community parks, trail connections, places of worship, home occupations, and community and social	The proposed development will include pedestrian trail connections compatible to the residential uses proposed and will have adequate buffering associated. No other	**Will Comply**

3.5.3 Residential District Policies		
Policy	**Proposed**	**Comments**
service facilities, shall also be permitted subject to the following: • Only those uses which are compatible with and complementary to residential uses and where the amenities of adjacent residential areas are preserved through the provision of adequate buffering, landscaping, off-street parking, and vehicular access shall be permitted. • Where possible, ancillary uses shall be grouped together to serve as focal points for residential areas, and to encourage the integration of parking, landscaping, and other facilities. Detailed development and design standards for ancillary uses permitted within the Residential District designation shall be established in the implementing Development Permit By-law.	uses are proposed.	
3. Accessory residential dwelling units also known as secondary suites, are permitted in a single detached or semi-detached dwelling, in row housing or in ancillary structures in the Residential District designation, subject to the requirements of the Ontario Building Code.	No accessory residential dwelling units are proposed at this time.	**N/A**
4. Special need Needs Housing in accordance with the relevant policies of Section 6.0- Implementation, shall be permitted in the Residential District.	No special needs housing is proposed at this time.	**N/A**
5. Existing commercial uses may be designated in the implementing Development Permit By-law as a permitted use.	The site does not contain existing commercial uses.	**N/A**
6. Where lots designated Residential District have frontage on a Mississippi District Thoroughfare, new high density residential uses and new commercial uses may be permitted provided that such new development can be undertaken in accordance with the policies of Section 2.0.	The site has frontage on Townline Road East to the southeast, which is shared with the Mississippi Residential District. A high-density use is proposed on this part of the site in the form of a 25-unit apartment building. This building will comply with the Community Design Framework of Section 2.0, as seen in **Table 2**, above.	**Complies**

Table 3: Town of Carleton Place Official Plan, Policy 3.5.3

As noted in **Table 3** above, the proposed design complies with all applicable Residential District policies of the Carleton Place Official Plan.

Section 3.5.4 Density Provisions

The Carleton Place Official Plan contains density policies intended "to ensure that new development will include a mix of residential densities in order to address a full range of housing requirements." The following policies, listed in **Table 4**, shall apply:

3.5.4 Density Provisions		
Provision	**Proposed**	**Comments**
1. The average density target for new development in the Residential District will be calculated on a site-by-site basis and shall be 30 units per net hectare with a range of 26 to 34 units per net hectare. Net hectare is defined as those lands which are utilized for residential development exclusive of roads, easements, infrastructure services and required parkland.	The average density proposed is 72.2 units per net hectare. The proposed develop-ment ranges from 25.4 units per hectare (single detached) to 145.3 units per hectare (apartments).	Proposed density is higher by an average of 50.6 UPNH. **Section 3.5.5 of the CPOP permits Increased Density and Bonusing, this is to be discussed with the applicant and the planning authority.**
2. Notwithstanding Section 3.5.4.1, where development is proposed on infill sites or sites which are the result of lot consolidations, and which infill sites or consolidated sites have areas of 3 hectares or less, residential density may be increased. In such cases density will be controlled through the regulatory framework of the Development Permit By-law.	N/A as site is larger than 3 ha.	**N/A**
4. The following residential density classifications shall apply: Low density: includes single detached dwellings, semi-detached dwellings, duplex dwellings, triplex dwellings and converted single detached dwellings up to a maximum density of 22 units per net hectare (9 units per net acre). Medium density: includes town or row houses and apartments in a range of greater than 22 units per net hectare (9 units per net acre) up to a maximum	The proposed low-density built form (single detached) are 25.4 units per net hectare. The proposed medium-density built form (townhouses) are 55 units per net hectare.	**Section 3.5.5 of the CPOP permits Increased Density and Bonusing, this is to be discussed with the applicant and the planning authority.**

3.5.4 Density Provisions		
Provision	**Proposed**	**Comments**
maximum of 35 units per net hectare (14 units per net acre). High density: includes apartments in excess of 35 units per net hectare (14 units per net acre).	 The proposed high-density built form (stacked townhouses and apartments) are 91.3 and 145.3 units per net hectare respectively.	
5. New medium or high density residential development shall be subject to the following policies: • The proposed design of the residential development is compatible in scale with the character of surrounding uses; • The site is physically suited to accommodate the proposed development; • The proposed site can be serviced with adequate water and waste water services; • The property shall have appropriate access to an arterial or collector road maintained to a municipal standard with capacity to accommodate traffic generated from the site; • Sufficient off-street parking facilities is provided in accordance with the standards set out in the Development Permit By-law; and • The development can take place in accordance with the policies of Section 2.0.	• The proposed design is compatible in scale and with the character of surrounding uses. Adjacent neighbourhoods will border with single-detached dwellings and two-to-three storey townhouses. • The site is physically suited to accommodate the proposed development. • The proposed site can be serviced with adequate water and waste water services. Please see the attached Servicing Report for further information. • The property has access to multiple municipally maintained roads. • Parking provisions of the Development Permit By-law are met. • The development can take place in accordance with the policies of Section 2.0.	**Complies**
6. New residential development shall include a mix of residential densities. Residential development which does not provide a diversity of dwelling types shall be discouraged.	The proposed development includes a mix of residential densities, from single-detached to apartment blocks. By the definition of this Plan, the densities are a mix of medium and high.	**Complies**
7. Development shall be integrated with surrounding development, through connected street networks, appropriate transition of housing types and densities and through supporting infrastructure including recreational pathways and parks.	The proposed development is integrated with the surrounding street networks and housing types. The site will be connected to Lanark Street and Edmund Street through a roadway and sidewalks, and sidewalks are provided throughout the site.	**Complies**

Table 4: Town of Carleton Place Official Plan, Policy 3.5.4

As noted in **Table 4** above, the proposed design does not comply with two applicable density provisions of the Carleton Place Official Plan. The proposed density on the site is higher than permitted by an average of 50.6 units per net hectare. The low- and medium-density units are higher in density than permitted as well. We propose that the single-detached units be considered medium-density for the purposes of this development, and all other built form (street townhouses, stacked townhouses, and apartment buildings) be considered high-density. These categorizations are better suited for the densities proposed.

Section 3.5.5 (Increased Density and Bonusing) permits an increase in height or density depending on the eligibility of the development. Items that may make a proposed development eligible for such increases include "The provision of affordable housing, assisted housing or housing for those with special needs," and "The dedication or provision of open space, recreation or community facilities, parks, waterfront lands, or trail systems, provided that such lands and amenities are significantly in excess of any parkland dedication requirements of this Plan." With this in mind, the proposed development includes 20% of the proposed units being considered affordable housing (per the Town's Official Plan definition), for a total of 50 units.

4.2 CARLETON PLACE DEVELOPMENT PERMIT BY-LAW

14. Built Form Design Criteria

14.3.2 Residential Greenfields

Please see **Table 5** below, for Residential Greenfields Built Form Design Criteria. According to **section 14.3.2**, "*Structures shall demonstrate the general principles of good design including but not limited to those dealing with form, mass, scale, height, texture and colour. Specific consideration shall be given to compatibility with adjacent neighbourhoods where such structures are substantially in compliance with the following:*"

14.3.2 Residential Greenfield Built Form Design Criteria		
Criteria	**Proposed**	**Comments**
Long monotonous façade designs including, but not limited to, those characterized by unrelieved repetition of shape or form or by unbroken extension of line shall be avoided. Excessive ornamentation shall be avoided to prevent visual clutter.	The facades of the buildings will be designed within the context of the project visions, 'creating a community'. This criteria will influence and ensure that the building forms provide a pedestrian and aesthetically friendly facades.	**Will Comply**
Façade, side and rear elevations adjacent to pathways or roadways and roof lines shall be constructed to provide a varied and diverse product in order to create streetscape interest and walkable communities.	The importance of the 'community aspect' of this development leads into ensuring all elevations of the development with enhancements to generate aesthetic interest adjacent to pathways and roadways.	**Complies**
All development shall be serviced by a public water supply and a public sanitary sewage system.	The proposed development will be serviced by public water supply and public sanitary sewage system.	**Complies**

14.3.2 Residential Greenfield Built Form Design Criteria		
Criteria	**Proposed**	**Comments**
Commercial communication towers and wind generators are not permitted in any residential designation.	No commercial communication towers or wind generators are proposed.	**Complies**
Street trees shall generally be provided every 10.6 metres (35 feet) on average to create a canopy on residential streets.	The use of street landscaping like trees will be developed in a manner that respects the community aspect' and to meet the 'Built Form Desgin Criteria' to the best of our ability. Selectively identifying the streets where we create a canopy of trees will further enhance the pedestrian friendly street scape the development is seeking.	**Will Comply**
Buildings will be oriented to the street and shall provide architectural interest to contribute to the esthetics and visual appeal of the community. Corner lots will require orientation to both street fronts.	All proposed buildings are designed to be oriented to the streets. The importance of the 'community aspect' of this development leads into ensuring all elevations of the development with enhancements to generate aesthetic interest adjacent to pathways and roadways including corner lots to both street fronts.	**Complies**
The width of the garage for both single family dwellings and semi-detached dwellings and duplex shall not exceed 45% of the overall lot frontage. The width of the garage for townhome dwellings shall not exceed 70% of the overall lot frontage. The main wall for the garage doors shall be setback a minimum 6.0 metres (19.6 feet) from the front or exterior side lot line.	The width of all garages will not exceed 45% of the overall lot frontage. This has been accommodated in the current concept.	**Complies**
Internal pathways for cyclists and pedestrians shall be provided with linkages to new and existing park and open space systems. All development will require sidewalks on one side of the street.	Pedestrian and cycling paths are proposed to link to existing neighbourhoods and proposed greenspaces. Sidewalks are proposed on all proposed streets.	**Complies**
A modified grid pattern of street design and layout will be provided. New developments shall be linked to existing neighbourhoods and provide multiple entrance points.	The proposed development is designed in a logical grid-like pattern and will have roads linked to two entrance points, to Lanark Street and Edmund Street.	**Complies**

14.3.2 Residential Greenfield Built Form Design Criteria		
Criteria	**Proposed**	**Comments**
Outdoor garbage enclosures for multi-residential buildings are to be fenced with wood screen and buffered with soft landscape elements. Garbage receptacles require privacy screening (wood or ornamental metal fencing and shrubs screening). Recommended locations include inside parking courts or at the end of parking bays. Locations should be conveniently accessible for garbage collection and maintenance and should not block access drives.	Leveraging the 'project vision' it is important to ensure that all items such as garbage receptacles are screened in a manner that respects the sense of community. We propose to ensure these items are enclosed in such way that they blend in with the facades of the buildings.	**Will Comply**
Parking Lots shall be screened from the street edge by both hard features (fencing) and soft landscape elements such as trees, shrubs, planters and urns. Street trees will be deciduous. Parking lots shall not be permitted in the front yard or exterior side yard within the Residential District.	As part of the 'project vision' it is important to that parking area boundaries respect the overall aesthetics of the project. These boundares will be used in such way to foster pedestrian friendly street scapes.	**Complies**

Table 5: Town of Carleton Place Development Permit By-law (15-2015), Section 14.3.2.

As noted in **Table 5** above, the proposed development complies with all Residential Greenfield Built Form Design Criteria per the Town of Carleton Place Development Permit By-law (15-2015).

5.0 CONCLUSION

5.1 ANALYSIS

This Urban Design Brief demonstrates how the proposed development meets the applicable urban design guidelines and requirements and the proposed form and patterns in accordance with the Town of Carleton Place's policies and design guidelines in relation to the subject site, 400 Lanark Street. The infill development of the 6.27-hectare parcel includes a variety of building types, ample green spaces and local road networks that are addressed within the policy framework including design criteria set by the Town's Development Permit By-law.

In accordance with the Town's vision, our proposal addresses the importance of active transportation systems and safety including the use of pathways for cyclists and pedestrians to new or existing parks and open spaces and the need for sidewalks. Our site includes green spaces and open spaces for residents and community use which adds to the visual appearance of the subject site. As well, architectural built forms will be in accordance with the provisions set by the by-law including demonstrating good design principles including the use of form, mass, scale, height, texture and colour while integrating with surrounding neighbourhoods.

The Town of Carleton Place has multiple sets of guidelines and criteria for residential development in the Town, including the Official Plan's General Design Policies, Residential District Policies, and Density Provisions, and the Development Permit By-law's Built Form Design Criteria. As demonstrated in **Tables 2 to 5**, the proposed development meets all applicable policies, provisions, and criteria, except for two Density Provisions (**Section 3.5.4.1 and 3.5.4.4**). These density provisions are not met due to the proposed density surpassing that which is typically permitted in on a site such as this. To remedy this proposed increase in density, the proposal includes 20% of its units being affordable housing, and so is eligible for increased density per the Official Plan (**Section 3.5.5**). Otherwise, the proposed development meets all municipal standards of compatibility, landscaping, architectural design, transportation connectivity, and use.

5.2 CLOSING

We trust this Urban Design Brief addresses the Town's policies and criteria for residential urban design.

Sincerely,

LandPRO Planning Solutions Inc. & BR2 ARCHITECTURE

Michael Sullivan, M.Pl., RPP, MCIP

Principal Planner & President
LandPro Planning Solutions Inc.

Shaun Visser, M.Arch, AAA, AIBC, SAA, OAA

Architect
BR2 Architecture

SCOPED ENVIRONMENTAL IMPACT STATEMENT AND TREE PRESERVATION PLAN

400 Lanark Street, Carleton Place, Ontario

Project No.: CCO-22-0957

Prepared for:

Wintergreen Ridge Ltd.

Prepared by:

McIntosh Perry Consulting Engineers Ltd.
115 Walgreen Road, R.R. 3
Carp, Ontario
K0A 1L0

McINTOSH PERRY

SCOPED ENVIRONMENTAL IMPACT STATEMENT AND TREE PRESERVATION PLAN
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McIntosh Perry Consulting Engineers Ltd.
115 Walgreen Road, R.R. 3
Carp, Ontario
K0A 1L0

August 31, 2023

Written by: Danica Rice, B. Sc.
Junior Biologist
McIntosh Perry Consulting Engineers Ltd.

Reviewed by: Jeff King
Vice President (Environmental)
McIntosh Perry Consulting Engineers Ltd.

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Appendices

1.0 PROPERTY INFORMATION AND INTRODUCTION

The subject property for this Environmental Impact Statement (EIS) is an approximately 7.40 acre parcel of land located at 400 Lanark Street, Carleton Place , Ontario, directly off of Townline Road East (**Figure 1**).

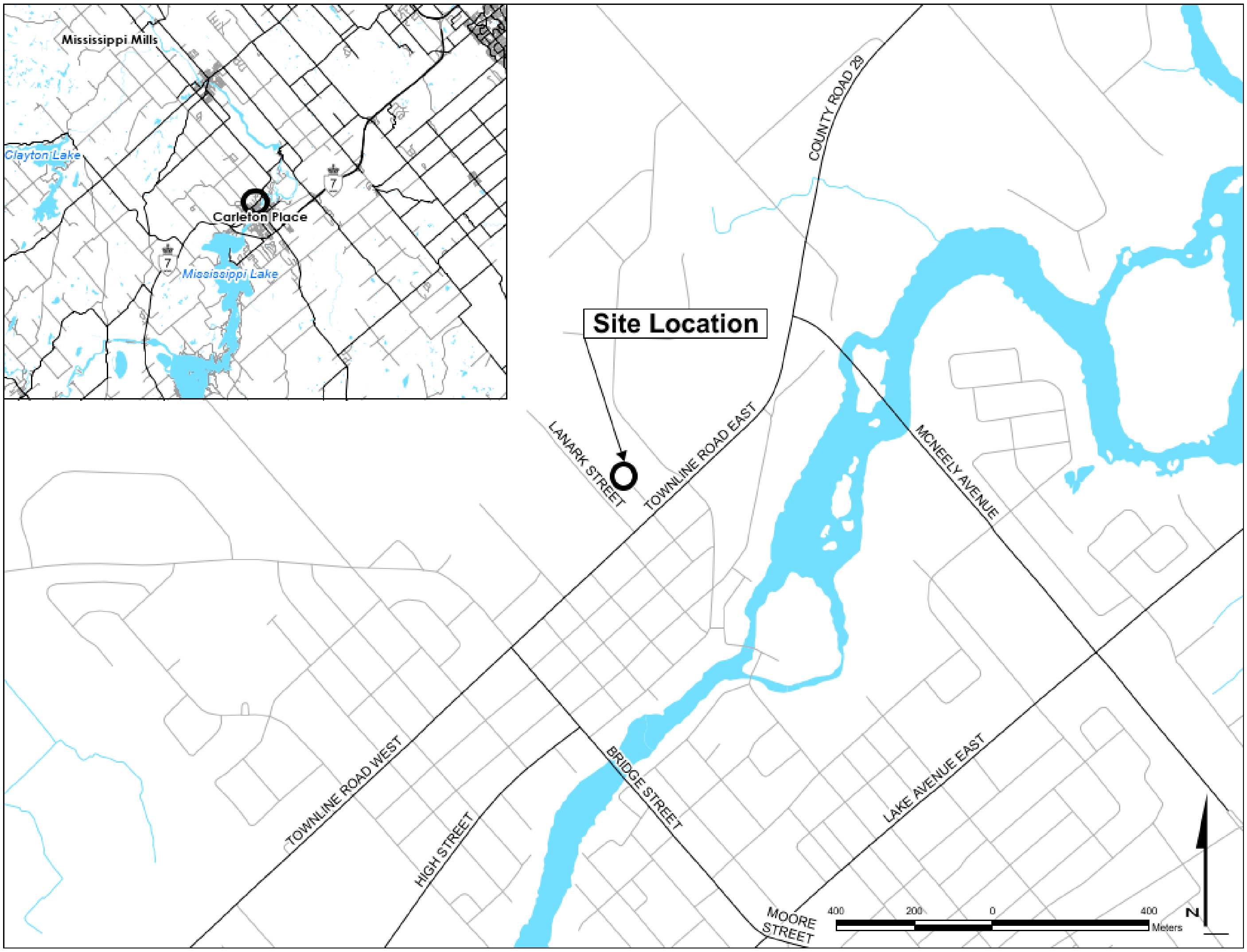


Figure 1: Study Area Key Map

The subject property is located within the jurisdiction of the Ministry of Natural Resources and Forestry's (MNRF) - Kemptville District and the Ministry of Environment, Conservation and Park's (MECP) – Ottawa District.

The subject property is located within the Mississippi Valley Conservation Authority's (MVCA) jurisdiction and consists of habitat that is disturbed in nature as it is a decommissioned Christmas Tree farm. The existing landscape on the property consists of sparse meadow and of stands of young trees both coniferous and deciduous. This EIS report assesses the potential impacts that the construction of a subdivision may have upon the existing natural heritage features, including wetlands and their function, woodlands and their function and specifically focussed on species at risk (SAR), and their habitat as the other functions are limited within the property.

McIntosh Perry Consulting Engineers Ltd. (McIntosh Perry) was retained by Wintergreen Ridge Ltd. to carry out an EIS to assess the existing natural heritage features. This EIS summarizes the findings of the surveys, outlines potential impacts from the proposed development, and provides recommendations to mitigate anticipated impacts on natural heritage features. The information contained in this report represents a single survey undertaken on June 29, 2023 and does not represent year-round data.

This scoped EIS report is a requirement of the Town of Carleton Place in order to meet development approval. It has been prepared in accordance with the Official Plan for the Lanark County (2012) and the Town of Carleton Place Official Plan (2013). This EIS includes an assessment of the identified and potential environmental constraints and the potential for Species at Risk.

2.0 METHODOLOGY

To acquire information on habitat present within and adjacent to the area of the proposed development, field investigations were carried out June 29, 2023, by L. Bennett of McIntosh Perry (**Table 1**). The field investigations were carried out for the entire property. The subject property is primarily covered by stands of young White spruce (*Picea glauca*) and saplings of other species such as Black walnut (*Juglans nigra*) and Trembling aspen (*Populus tremuloides*) and disturbed/meadow habitat. The property surveyed will be hereafter referred to in this report as the "study area." The field investigation was conducted to provide an inventory and assessment of the natural heritage features of the study area. The field investigation included the identification (where applicable) of the following features within the study area:

- Existing vegetation communities and soil types according to the Ecological Land Classification survey protocol (Lee et al. 1998) as applicable;
- Significant woody vegetation;
- Areas of critical or significant habitat (i.e., Significant Valleylands, Significant Woodlands, Significant Wildlife Habitat, PSW's, etc.);
- Areas of groundwater recharge and discharge, drainage patterns, watercourses, wetland habitat, other areas of surface water;
- SAR and their habitat, and
- Resident or migratory birds and other wildlife species.

Table 1 outlines activities carried out within the study area during the field investigations.

Table 1: Summary of Field Investigation Activities

Date	Personnel Involved	Time of Survey	Weather Conditions	Purpose of Visit
June 29, 2023	L. Bennett	0900-1300	20°C, 60% C.C.,	Habitat assessment.

Table 1: Summary of Field Investigation Activities				
Date	Personnel Involved	Time of Survey	Weather Conditions	Purpose of Visit
			Moderate Breeze	

The vegetation communities observed within the study area were assessed using the Ecological Land Classification (ELC) protocol (Lee et al., 1998) if possible. During the field investigations, observations of wildlife species were made through sight, sound, and physical evidence.

Photographs were taken during the field investigations depicting vegetation communities and natural heritage features observed within the study area. This photographic record can be found in **Appendix A** of this report.

Background information on wildlife and plant species, and other significant natural heritage features known to occur within or adjacent to the study area was obtained from the following sources:

- The Natural Heritage Information Centre (NHIC) database accessed via the MNRF's Make a Map: Natural Heritage Areas. This search tool allows areas to be searched at up to 1 km^2 grid resolution and provides reports concerning rare species tracked by the NHIC. Information for each 1 km^2 square within the proposed alignment options was reviewed for occurrences of rare species tracked by NHIC (MNRF, 2023a);
- The MNRF's Land Information Ontario (LIO) Metadata Management Tool this tool contains information (e.g., location of PSWs, SAR element occurrences, etc.) licensed under the Open Government Licence for Ontario (MNRF, 2023b);
- Fish ON-Line sport fish and stocking resource (MNRF, 2023c);
- Fisheries and Oceans Canada (DFO) Aquatic SAR Mapping (DFO, 2023);
- Data from the Ontario Breeding Bird Atlas Database (OBBA) was accessed from the data summaries page of the Atlas of the Breeding Birds of Ontario website. Information for each 10 km^2 grid square was reviewed for the proposed alignment options (Bird Studies Canada et al., 2006);
- Ontario Reptile and Amphibian Atlas (ORRA) was accessed for the data summaries. Information for each 10 km^2 grid square was reviewed for the proposed alignment options (Ontario Nature, 2023);
- Ontario Butterfly Atlas was accessed for data summaries. Information for each 10 km^2 grid square was reviewed for the proposed alignment options (Toronto Entomologists' Association, 2023);
- Habitat in the proposed alignment options was evaluated using aerial photography accessed through Google Earth aerials and StreetView mapping (Maxar Technologies, 2023);
- The Cornell Lab, online database of bird distribution and habitat was accessed for background screening of potential SAR (Cornell University, 2023); and
- Data from Ontario Geological Survey. (MNRF, 2010d)

3.0 DESCRIPTION OF THE SITE AND THE NATURAL ENVIRONMENT

3.1 Existing Land Use

The subject property is currently a decommissioned Christmas tree farm and consists primarily of White spruce stands (which due to neglect are beginning to see the addition of other species such as Black walnut and Trembling aspen as well as other successional species) and disturbed mixed meadows. There are two barn structures located in the westernmost portion of the property as well.

3.2 Natural Heritage System Components

The following background information was collected from various sources (refer to Section 2.0 of this report):

- According to the MNRF's Land Information Ontario (LIO) Metadata Management Tool , the following occurrences and natural features have been identified within the vicinity (2 km) of the study area:
  - Blandings Turtle Occurrence Square Associated with the Mississippi River
  - Surface Water features (The Mississippi River)
  - Ok Kee Lee Wetland (non-PSW)
  - Waterfowl Staging Area

3.3 Landforms, Soils and Geology

According to the *Ontario Geological Survey*, the study area lies within a region of shallow till and rock ridges. It is part of the Smith Falls' Ecodistrict 6E-11, where the geology of the area is influenced by the underlying Paleozoic bedrock. The land was formed by glaciers that left behind morainal material (89% of deposition), a gently rolling topography, escarpments, and faults.

3.4 Surface Water and Fish Habitat

The property itself is reasonably flat with no areas of surface water or fish habitat noted within available background information or as a result of the field review. Due to its urban nature it is expected that overland flow drains into the municipal system.

3.4.1 Fish Habitat

No fish habitat exists within 30 m of the subject property/study area. The nearest fish bearing watercourse is the Mississippi River which has habitat for baitfish species and is known to contain habitat for species such a Northern Pike (*Esox lucius*), Largemouth Bass (*Micropterus salmoides*), and Yellow Perch (*Perca flavescens*). Due to the distance from the property fish habitat will not be further discussed.

3.4.2 Wetland

Ok Kee Lee Wetland is located along the Mississippi River and is greater than 30 m from the study area and is separated by urban development from the subject property. This area was not reviewed as part of this study and is not applicable to this assessment. Provincially Significant Wetland (PSW) habitat is located greater than 120 m from the study area.

3.5 Vegetation Cover

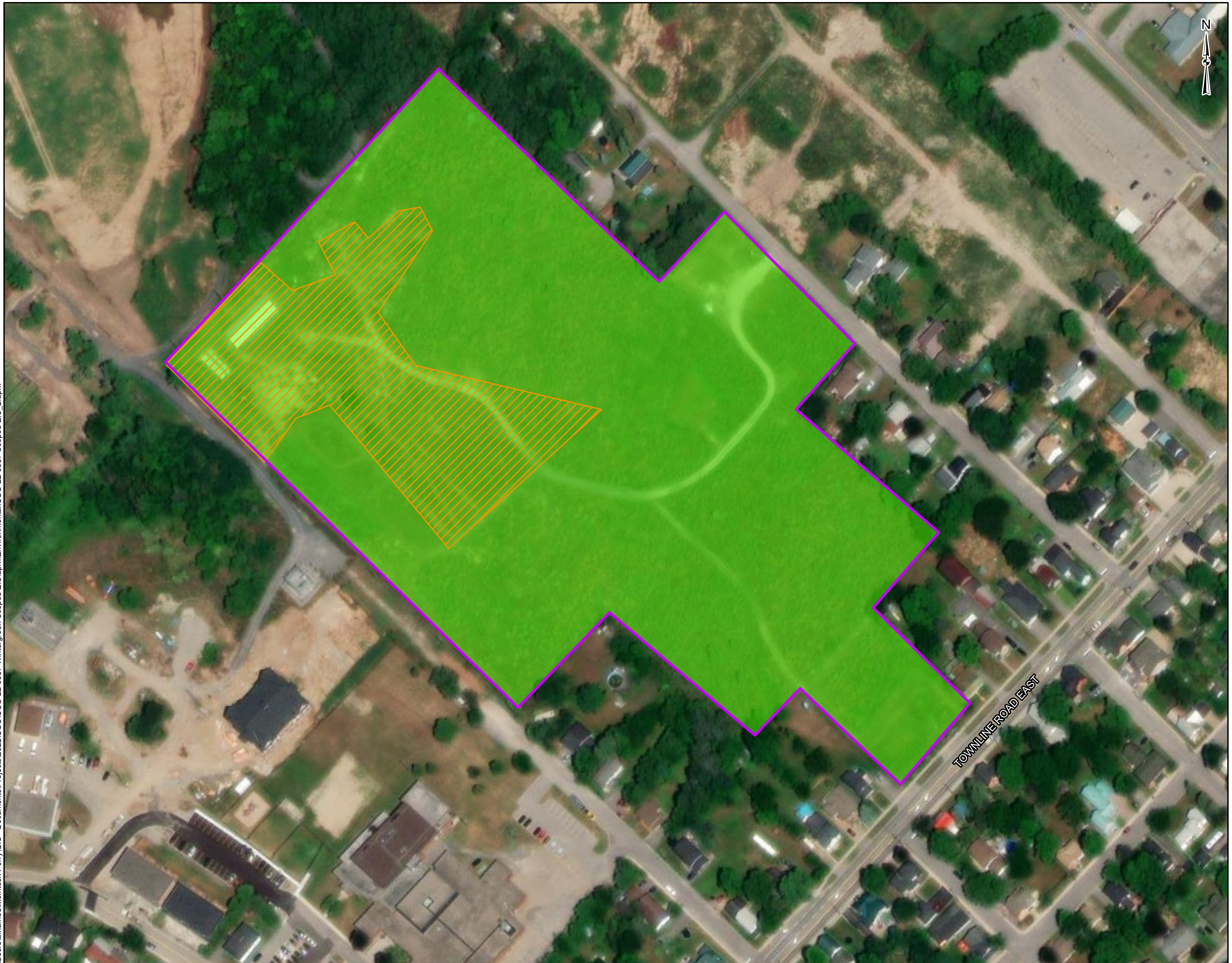
A summer vegetation survey was completed on June 29, 2023. Habitat observed during the field investigation included approximately two vegetation communities, including a mixed meadow (MEM), and a coniferous plantation (TAGM1). The following section outlines the existing vegetation identified within the study area. Vegetation species observed within the study area during the field investigations are found within the text of this report below. No species at risk (SAR) vegetation was observed on the property during field investigations.

3.5.1 Vegetation Community 1: Coniferous Plantation (TAGM1)

Vegetation Community 1 was dominated by young white spruce trees (*Picea glauca*) (**Photos 1 – 6**). This community occupies more than half of the property and due to its decommissioned and neglected state has begun to see woody growth of other species within the white spruce stands. Additional woody vegetation included species such as trembling aspen (*Populus tremuloides*), Manitoba maple (*Acer negundo*), black walnut (*Juglans nigra*), honey locust (*Gleditsia triacanthos*), red-osier dogwood (*Cornus sericea*), red raspberry (*Rubus idaeus*), sumac (*Rhus sp*.), and white ash (*Fraxinus americana*). Additional species observed in the understorey included milkweed (*Asclepias sp*.), Philadelphia fleabane (*Erigeron philadelphicus*), grasslands lancelot (*Plantago Lancelot),* red clover (*Trifolium pratense),* and goldenrod *(Solidago sp.).*

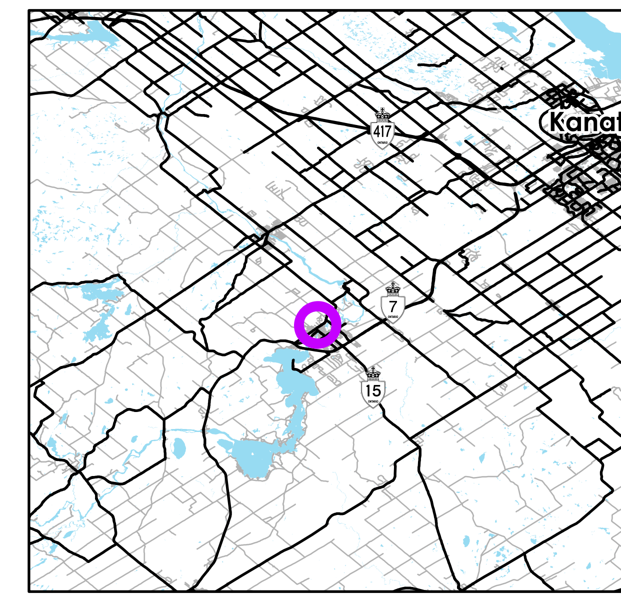
3.5.2 Vegetation Community 2: Mixed meadow (MEM)

Vegetation Community 2 was classified as a Mixed Meadow (MEM) (**Photos 1, 6-9**). This community lacked significant woody vegetation. This community was noted primarily within the western and central region of the property (Figure 2), though due to the decommissioned and neglected nature of this site, small patches of meadowlike habitat existed within the coniferous plantation community as well. This community included species such as milkweed (*Asclepias sp*.), Philadelphia fleabane (*Erigeron philadelphicus*), grasslands lancelot (*Plantago Lancelot),* silvery cinquefoil (*Potentilla argentea*), goldenrod (*Solidago sp*.), and spotted knapweed (*Centaurea stoebe).* The herbaceous vegetation within the community was sparse at times, likely due to past uses and areas of surficial bedrock.



LEGEND

- Study Area
- Mixed Meadow (MEM)
- Coniferous Plantation (TAGM1)



REFERENCE

GIS data provided by the Ontario Ministry of Natural Resources and Forestry, 2023.

50 25 0 50

Scale 1:1,750 Metres

CLIENT: WINTERGREEN RIDGE LTD.

PROJECT: 400 LANARK SUBDIVISION

TITLE: VEGETATION COMMUNITIES MAP

McINTOSH PERRY
115 Walgreen Road, RR3, Carp, ON K0A1L0
Tel: 613-836-2184 Fax: 613-836-3742
www.mcintoshperry.com

PROJECT NO:	CCO-22-0957
Date	Sep., 01, 2023
GIS	MG
Checked By	LB

FIGURE: 2

C:\Users\a.hamed\McIntosh Perry\GIS - Documents\Projects\2022\CCO\CCO-22-0957 Wintergreen Scoped EIS\aprx\Environmental\CCO-22-0957 Scoped EIS_2.aprx

3.6 Habitat for Species at Risk

Background information obtained from the sources listed in Section 2.0 of this report, indicated that SAR and their habitat were potentially present within the study area. These species are listed in **Table 2**. Given habitat observed during the field investigation, a determination was made as to whether these species had the potential to be (or were) present within the study area.

Table 2: Species at Risk Potentially present or Confirmed to be Present within the Study Area

*Common Name	Scientific Name	Provincial Status (ESA, 2007)	Federal Status (SARA Schedule 1)	Potential/Unconfirmed or Confirmed Habitat Present within Property Boundaries
Plants				
Black ash	*Fraxinus nigra*	Endangered	No status	No habitat present, no individual trees.
Butternut	*Juglans cinerea*	Endangered	Endangered	Habitat present, no individual trees.
Insects				
Monarch	*Danaus plexippus*	Special Concern	Special Concern	Limited habitat
Reptiles and Amphibians				
Blanding's Turtle (Great Lakes/St. Lawrence population)	*Emydoidea blandingii*	Threatened	Threatened	Known in Mississippi River. No habitat present.
Common Snapping Turtle	*Chelydra serpentina*	Special Concern	Special Concern	No habitat present.
Eastern Milksnake	*Lampropeltis triangulum triangulum*	No Status	Special Concern	Habitat present; It was determined that the foundation of the structures in the western portion of the study area is suitable snake hibernacula. However, species is a habitat generalist, and may be found anywhere within the study area. No individuals were observed during field investigations.
Eastern Musk Turtle	*Sternotherus odorata*	Special Concern	Special Concern	No habitat present.
Northern Map Turtle	*Graptemys geographica*	Special Concern	Special Concern	No habitat present.
Western Chorus Frog	*Pseudacris*	No status	Threatened	No habitat present

Table 2: Species at Risk Potentially present or Confirmed to be Present within the Study Area				
***Common Name**	**Scientific Name**	**Provincial Status (ESA, 2007)**	**Federal Status (SARA Schedule 1)**	**Potential/Unconfirmed or Confirmed Habitat Present within Property Boundaries**
	triseriata			
Midland painted turtle	*Chrysemys picta marginata*	No status	Special concern	No habitat present.
Birds				
Bank Swallow	*Riparia riparia*	Threatened	Threatened	No habitat present
Barn Swallow	*Hirundo rustica*	Special Concern	Threatened	Marginal habitat present associated with the structures in the western portion of the study area, which could provide nesting for this species. None was observed. Could nest in the structures however based on the timing of the field visit species would have been observed.
Bobolink	*Dolichonyx oryzivorus*	Threatened	Threatened	No habitat present
Canada Warbler	*Cardellina canadensis*	Special Concern	Threatened	No habitat present
Chimney Swift	*Chaetura pelagica*	Threatened	Threatened	No habitat present. Seen flying over houses adjacent to study area.
Common Nighthawk	*Chordeiles minor*	Special Concern	Special Concern	No habitat present
Eastern Meadowlark	*Sturnella magna*	Threatened	Threatened	Marginal habitat present. Based on location and sparse vegetation and surficial bedrock and lack of observation of species (would have been flushed during field investigation) this species is not present.
Golden-winged Warbler	*Vermivora chrysoptera*	Special Concern	Threatened	No habitat present
Least Bittern	*Ixobrychus exilis*	Threatened	Threatened	No habitat present
Olive-sided Flycatcher	*Contopus cooperi*	Special Concern	Special Concern	No habitat present

Table 2: Species at Risk Potentially present or Confirmed to be Present within the Study Area				
***Common Name**	**Scientific Name**	**Provincial Status (ESA, 2007)**	**Federal Status (SARA Schedule 1)**	**Potential/Unconfirmed or Confirmed Habitat Present within Property Boundaries**
Wood Thrush	*Hylocichla mustelina*	Special Concern	Threatened	No habitat present.
Mammals				
Eastern Small-footed Myotis	*Myotis leibii*	Endangered	N/A	Marginal habitat present associated with the structures in the western portion of the study area, which could provide roosting for this species
Little Brown Myotis	*Myotis lucifugus*	Endangered	Endangered	Marginal habitat present associated with structures in the western portion of the study area, which could provide roosting for this species
Northern Myotis	*Myotis septentrionalis*	Endangered	Endangered	No habitat present
Tri-coloured Bat	*Perimyotis subflavus*	Endangered	Endangered	No habitat present

*This table was assembled from various sources of background information. The following information sources were consulted to compile background information: 1 – LIO geodatabase (MNRF, 2022); 2 – Ontario Reptile and Amphibian Atlas (Ontario Nature, 2019); 3 – Atlas of the Breeding Birds of Ontario (Bird Studies Canada et al., 2008); 4 – NHIC data (MNRF, accessed June 2022); 5 – General range

Marginal habitat for Eastern Small-footed Myotis and Little Brown Myotis was determined to be present due to the structures in the western region of the study area which have potential to be suitable for roosting present in the western portion of the study area (**Photos 8, 11, 12**). No evidence of usage of the location of the property by bats was observed during the 2023 field investigation (i.e. droppings, etc.). The study area has only marginal suitability which was confirmed by the lack of appropriately sized snags for maternity colonies within the areas for building sites as well as the lack of suitable tree size/ species some of these bats would use for roosting, maternity colonies, or overwintering.

Eastern Milksnake potential habitat is present within the general study area itself and in association with the structures on the subject property, which were found to have crumbling foundations during the summer 2023 field investigation (**Photo 10**). Milksnakes can often be found hibernating underneath building such as this, however no evidence of the species was observed within the property and due to the limited availability of water and the cut off and small nature of the habitat it is unlikely that the Milksnake is present. This species is listed as 'Special Concern' under the ESA and do not receive habitat protection. No individuals or evidence of these species was observed during the field investigation.

The Barn Swallow can be found nesting in barns and other structures, and forages in open areas for flying insect. This species may have potential marginal habitat within the study area as the structures within the study area could provide roosting habitat for it (**Photos 8,11,12**). This species is listed as 'Special Concern' under the ESA and do not receive habitat protection. No individuals of these species were observed during the field investigation. Eastern Meadowlarks have been known to breed in many kinds of grassy areas which are at a minimum 6 acres. Due to the fractured and non-continuous nature of this site, it is very unlikely that the study area would act as habitat for this species and the area that is marginally suitable is well under 6 acres. No individuals of this species were observed during the field investigations. The Eastern Meadowlark is listed as 'Threatened' under the ESA.

Monarch Butterflies have potential restricted habitat within the study area due to the presence of meadow habitat containing flowering plants which provides food for it (**Photos 6,7**), as well as Milkweed which is especially important for monarch caterpillars to grow and develop. Because of the small size of and discontinuous nature of this area, this is only considered limited Monarch habitat. This species is listed as 'Special Concern' under the ESA and do not receive habitat protection. No individuals of these species were observed during the field investigation.

Butternut is listed as 'Endangered' under the *Endangered Species Act* (ESA, 2007) and 'Threatened' under the *Species at Risk Act* (SARA, 2002). During the field investigation, no butternut were observed.

3.7 Wildlife & Significant Wildlife Habitat

Characteristic wildlife present within this Ecoregion includes: white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mepthitis*), Red-spotted Newt (*Notophthalmus viridescens*), Snapping Turtle, Eastern Garter Snake (*Thamnophis sirtalis sirtalis*) and Common Watersnake (*Nerodia sipedon*). Representative bird species include Field Sparrow (*Spizella pusilla*), Grasshopper Sparrow and Eastern Meadowlark (Crins et al., 2009). Wildlife observed during the summer 2023 field investigation included American Goldfinch (*Spinus tristis*), Blue Jay (*Cyanocitta cristata*), Pine Siskin (*Spinus pinus*), American Redstart (*Setophaga ruticilla*), Warbling vireo (*Vireo gilvus*), Song Sparrow (*Melospiza melodia*) and *Leporidae sp.*

For those observations of birds, the time of assessment was within the breeding bird window for some species. Migratory birds, their nests, and eggs are protected under the MBCA. Species expected to use the site such as the American Crow, Common Grackle (*Quiscalus quiscula*), and European Starling (*Sturnus vulgaris*) are not afforded protection under the MBCA or FWCA. Habitat for many species observed within the study area is limited on the property or within the greater study area.

The study area was examined under the *Significant Wildlife Habitat Technical Guide* (MNRF, 2000) and its supporting document *Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E* (MNRF 2015) to determine if significant wildlife habitat is present within the existing study area. **Table 3** outlines the various significant wildlife habitat (SWH) categories and their designation within the study area.

Table 3: Significant Wildlife Habitat within the Study Area		
Specialized Wildlife Habitat Category	**Candidate Significant Wildlife Habitat (Y/N)**	**Confirmed Significant Wildlife Habitat (Y/N)**
Waterfowl Stopover and Staging Areas (Terrestrial)	No	No
Waterfowl Stopover and Staging Areas (Aquatic)	No	No
Shorebird Migratory Stopover Area	No	No
Raptor Wintering Area	No	No
Bat Hibernacula	No	No
Bat Maternity Colonies	No	No
Turtle Wintering Area	No	No
Reptile Hibernaculum	No	No
Colonially-Nesting Bird Breeding Habitat (Bank and Cliff)	No	No
Colonially-Nesting Bird Breeding Habitat (Tree/Shrubs)	No	No
Colonially-Nesting Bird Breeding Habitat (Ground)	No	No
Migratory Butterfly Stopover Area	No	No
Landbird Migratory Stopover Areas	No	No
Deer Winter Congregation Areas	No	No
Cliff and Talus Slopes	No	No
Sand Barren	No	No
Alvar	No	No
Old Growth Forest	No	No
Savannah	No	No
Tallgrass Prairie	No	No
Other Rare Vegetation Communities	No	No
Waterfowl Nesting Area	No	No
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	No	No
Woodland Raptor Nesting Habitat	No	No
Turtle Nesting Areas	No	No
Seeps and Springs	No	No
Amphibian Breeding Habitat (Woodland)	No	No
Amphibian Breeding Habitat (Wetlands)	No	No
Woodland Area-Sensitive Bird Breeding Habitat	No	No

Table 3: Significant Wildlife Habitat within the Study Area		
Specialized Wildlife Habitat Category	**Candidate Significant Wildlife Habitat (Y/N)**	**Confirmed Significant Wildlife Habitat (Y/N)**
Marsh Bird Breeding Habitat	No	No
Open Country Bird Breeding Habitat	No	No
Shrub/Early Successional Bird Breeding Habitat	No	No
Terrestrial Crayfish	No	No
Special Concern and Rare Wildlife Species	No	No
Amphibian Movement Corridors	No	No
Deer Movement Corridors	No	No

4.0 DESCRIPTION OF THE PROPOSED PROJECT

The proposed development will be for a subdivision (**Figure 3**). The subdivision will result in the removal of most of the vegetation on site, with the exception of the 'greenspace' areas seen in the proposed development sketch.

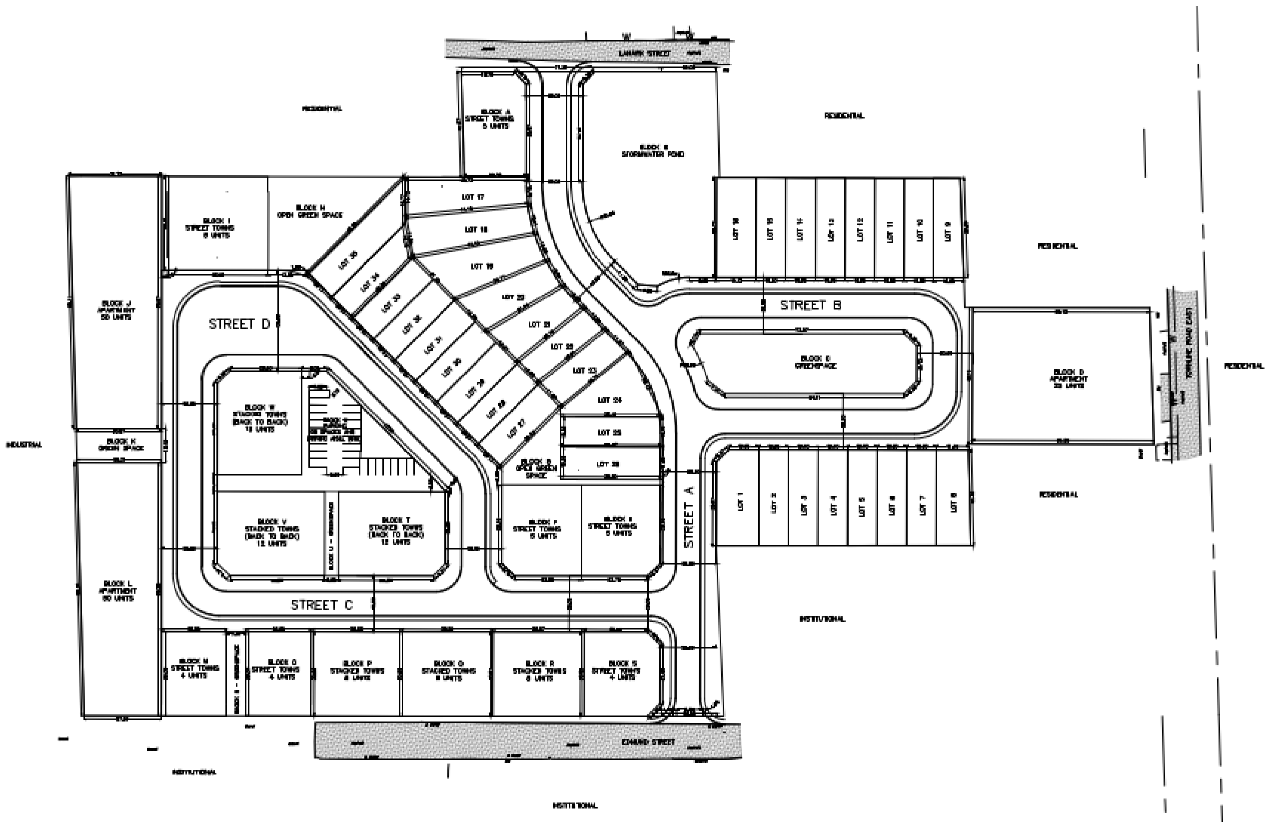


Figure 3: Proposed Development Sketch

5.0 IMPACT ASSESSMENT & RECOMMENDATIONS

The following sections outline and assess any potential impacts that are expected as a result of the proposed development. Recommendations for mitigation measures to avoid/reduce these impacts are outlined in Section 6.0 of this report.

5.1 Natural Heritage System Components, Surface Water, Groundwater and Fish Habitat

5.1.1 Natural Heritage System

There are no Natural Heritage systems identified on the subject property. The property is generally disturbed and is found within a generally urban surrounding. There are no migration corridors that extend to the property. The closest wetland and fish habitats are found approximately 450 m from the study area.

Removal of the trees and property grading will result in changes to the water retention, species composition, wildlife habitat, and surface water contaminants. Grading, and excavation for the proposed development will result in changes to surface water and groundwater quality however since this is an urban area there is infrastructure that will be built and is already in place to deal with this. The impacts of this are expected to be negligible beyond the existing site.

5.1.2 Fish Habitat

Fish habitat is located approximately 450 m from the study area and therefore is not a factor for this report/project.

5.1.3 Provincially Significant Wetland

There are no PSW's in close proximity to the study area that will be impacted by proposed site works.

5.2 Vegetation Cover

5.2.1 Vegetation communities

The proposed works will include the removal and clearing of most of the trees and vegetation within the study area except for the vegetation within the designated areas (**Figure 3**) and some of the fringe vegetation. Due to the nature of the plantation/meadow as an already disturbed part of the property, there is no expectation of significant loss of wildlife habitat or ecosystem functionality. No rare, significant, or SAR vegetation was identified within this area and it is likely that there are no rare or SAR species utilizing this habitat.

Clearing the area for the development of the subdivision will also remove the bulk of the trees within the property. Due to the limited function that this habitat serves and that there is no connectivity for this small area to any other wildlife habitat the impacts of its removal are expected to be minimal. The species that were observed within the subject property generally thrive in an urban context. No significant vegetation species were observed within the area to be disturbed during the field investigation. A significant number of young black walnut were observed within the study area during the field review. These trees provide food for squirrels and other animals. Maintenance of some of these trees, if possible, is recommended.

To reduce potential impact to wildlife, it is recommended clearing of vegetation occur outside the breeding bird window of April 1st to September 5th of any year to avoid killing, harming, and harassing birds that receive protection under the MBCA and FWCA. This timing window is a general guideline based on the species expected to be present and observed within the study area during the 2023 field investigations as well as early and late nesting dates for these species outlined in the Bird Studies Canada Nesting Calendar Query Tool (Hussell and Lepage, 2015). Alternatively, if removal of vegetation is proposed from April 1st to September 5th, of any year, a visual inspection of the areas to be cleared should be conducted by a qualified avian specialist before disturbance to ensure that no birds are using the area for nesting. If migratory bird breeding and/or nesting activity is encountered at any time of year within the study area, an appropriate setback distance should be maintained from the nest/nesting birds. Works should not continue in the location of the nest until after it has been determined by an avian specialist that the young have fledged and vacated the nest and work areas. It is also recommended that tree removals not occur during the migratory bird nesting window as this period overlaps with much of the bat maternity period when various species of bats (both at risk and not at risk) may be actively rearing young. Even though no bat habitat was identified onsite within the building locations, bats may still use the property for aerial foraging, and as a result may be impacted by vegetation removals.

5.3 Habitat for Species at Risk

No SAR were observed within the property limits. Habitat for SAR is considered very limited to not existent and no critical habitat for SAR exists.

Bat habitat, in the form of roosting habitat, was observed within the study area due to the existing structures. No snags or maternal roosting areas or confirmed cavity trees were observed in the area to be disturbed. It is recommended that the demolition of the existing structures be completed outside of the active bat maternity window (May 1 to July 31 of any year) to avoid killing, harming, and harassing SAR bats that may be roosting there, or alternatively that a visual inspection of the structures to be demolished should be conducted by a qualified bat specialist before disturbance to ensure that no bats are using the area for roosting.

Eastern Meadowlark were not observed and based on the small area of meadow are unlikely to utilize the property. This habitat is not usable or at best marginal for these species. No Barn Swallows were observed within the study area and were not seen utilizing the existing structures. It is anticipated that this habitat will be removed however no impacts to SAR will occur. However, it is recommended that demolition of the structures occurs outside of the breeding bird window of April 1st to September 5th, or alternatively that a visual inspection of the structures to be demolished should be conducted by a qualified avian specialist before disturbance to year to avoid killing, harming, and harassing birds that receive protection under the MBCA and FWCA.

Potential hibernacula for Eastern Milksnake is present underneath the existing structures. However due to the limited availability of water and the cut off and small nature of the habitat it is unlikely that the Milksnake is present within this study area.

5.4 Wildlife & Significant Wildlife Habitat

Migratory birds are anticipated to be encountered during construction nesting within the vegetation present in the study area. Timing windows allow vegetation removal activities to avoid periods when birds are actively nesting. The migratory bird nesting period for this project is from April 25 to September 5, of any year (i.e., the period when most birds are anticipated to be actively nesting). The period when a bird is actively nesting is considered its most critical life stage as many species are highly dependant on the habitat around their nest site to supply food for nestlings and to conceal their nest, eggs, and young.

Given that the proposed work will be completed within a meadow as well as forested area, it is important to note that this timing window should not be applied only to the removal of trees but should also include all vegetation clearing.

If vegetation removal must occur within the nesting window, a qualified avian specialist should conduct a nesting survey before vegetation removal or clearing. If migratory birds exhibiting nesting behaviours or their nests are encountered at any time of the year, works should not continue in the location of the nest until:

- After it has been determined by an avian specialist that the young have fledged and vacated the nest and work area; **or**
- An avian specialist determines a suitable buffer distance at which work may continue to prevent disturbance of the bird(s); **and**,
- Where a buffer distance has been implemented, an avian specialist must undertake monitoring during construction to ensure migratory birds and their eggs are not disturbed, destroyed, or taken.

5.5 Tree Conservation and Protection

The Town of Carleton Place official plan stipulates tree planting and tree preservation will occur so that all areas of the town are provided with a sufficient number of trees to maintain a high standard of amenity and appearance. Where new development will result in the loss of existing wooded areas, a condition of development approval will require that the lost trees be replaced at a 1 to 3 ratio (1 new tree for every 3 trees). The replacement ratios will only apply to the removal of trees having a minimum caliper of 20 cm or more. The new trees will be planted within the boundary of the proposed development to the greatest extent possible with the remaining trees to be planted in public parks or on publicly owned lands as directed by the Town.

A review of the trees within the study area was completed during the 2023 field investigation. Based on the field review there are no trees within the study are boundaries which have a caliper of 20 cm or greater. As such, no compensation trees are required. However, where trees are not currently growing, but green space is designated a planting plan with native vegetation should be prepared. It is recommended that trees be conserved wherever possible during the proposed works, and acknowledged that all trees within the green spaces (**Figure 3**) of the development plan are to be protected throughout the proposed works.

6.0 RECOMMENDED MITIGATION

To minimize or eliminate environmental impacts and to help achieve ecological and environmental improvements from the proposed construction and development, the following mitigation measures are recommended:

- All lands cleared as part of development should be revegetated as soon as practical to stabilize disturbed soils and prevent the mobilization of sediment-laden surface runoff;
- It is recommended that only locally appropriate native species be used to plant within the Project Area, as well as any cleared areas are to be re-established after use (i.e., laydown areas). This would contribute to re-establishing native plants within the wider landscape, reduce runoff created from project works, and potentially have a positive impact for biodiversity. Use of non-native plant material should be discouraged. Locally appropriate, native species of trees can include, but are not limited to:
    - Large trees: bur oak (*Quercus macrocarpa*), eastern white pine (*Pinus strobus*), red maple (*Acer rubrum*), paper birch (*Betula papyrifera*), and white elm (*Ulmus americana*); and
    - Small trees (smaller specimens that are considered shrubs but are also considered trees when larger): alternate-leaved dogwood (*Cornus alternifolia*), American mountain-ash (*Sorbus americana*), Canada plum (*Prunus nigra*), silky dogwood (*Cornus obliqua*), downy serviceberry (*Amelanchier arborea*), and red-osier dogwood (*Cornus sericea*).
- Exposed soils should be revegetated as soon as possible using a seed mix composed of native species such as OSC's native seed mix, native trees and shrubs, which are appropriate for the site conditions. Revegetation should consist of vegetation native to the area;
- If there is insufficient time in the growing season for the seed to sprout, the site shall be stabilized with temporary erosion and sediment control measures and seeded in the following spring. It is important to note that many of the seed mixes outlined above are best established through fall seeding to allow normal dormancy and then germination the following spring as these species are adapted to the Ontario environment.
- An erosion and sediment control (ESC) plan should be developed and all applicable measures to mitigate erosion and sediment transport and maintained until disturbed soils are stabilized by successful revegetation or other permanent means of soil stabilization;
- Natural areas to be retained, should be isolated by sturdy construction fencing or similar barriers at least 1 m in height during construction in order to ensure their retention.;
- To prevent the introduction and spread of invasive plant species, equipment utilized during construction should be inspected and cleaned in accordance with the *Clean Equipment Protocol for Industry.* The Invasive Species Act should be followed for all activities;
- During construction, the Contractor should have a spill kit on-hand at all times, in case of spills;
- To prevent the harm, harassment or death of birds, their eggs, or their nests no clearing of any vegetation should occur from April 1 to September 5, unless a qualified biologist has determined that no nesting is occurring within 5 days prior to the clearing. Note: these dates are based upon breeding bird nesting data for eastern Ontario, provided by Environment Canada. The nests and eggs of many species are protected under federal and/or provincial legislation (i.e., MBCA, FWCA).

- It is recommended that demolition of the structures occurs outside of the breeding bird window of April 1st to September 5th, or alternatively that a visual inspection of the structures to be demolished should be conducted by a qualified avian specialist before disturbance to year to avoid killing, harming, and harassing birds that receive protection under the MBCA and FWCA.
- Demolition of the existing structures should be completed outside of the active bat maternity window (May 1 to July 31 of any year) to avoid killing, harming, and harassing SAR bats that may be roosting there, or alternatively that a visual inspection of the structures to be demolished should be conducted by a qualified bat specialist before disturbance to ensure that no bats are using the area for roosting.
- Conservation of existing young Black walnut trees on site, where possible, is recommended as these trees provide food for wildlife such as squirrels and other animals.
- Should any SAR be discovered during construction, a management biologist at MECP – Eastern District should be contacted immediately, and operations modified to avoid any negative impacts to SAR or their habitat until further direction is provided.
- In order to protect any trees adjacent to the study area, proper fencing should be erected outside of each trees critical root zone (CRZ). This area can be measured as 10 centimetres from the trunk of a tree for every centimetre of trunk diameter (i.e. 1 m away from a tree with a 10 cm diameter).

7.0 SUMMARY

This EIS supports the development of a subdivision on the subject property.

This EIS has assessed existing land use and determined the impacts to the natural heritage features (i.e. wildlife habitat, etc.), as well as SAR and SAR habitat as a result of the proposed development. The project should incorporate mitigation measures to protect natural heritage features or replace potential loss of these features that may occur outside of the area needed for the structures. The mitigation measures should include various strategies to achieve no residual effects on the natural heritage features (i.e. erosion and sediment control).

If the recommendations and mitigation measures provided in Sections 5.0 and 6.0 of this report are followed, the proposed development is not anticipated to negatively impact the function of the natural heritage features observed to be present within the subject property and surrounding lands.

8.0 LIMITATIONS

The investigations undertaken by McIntosh Perry with respect to this report and any conclusions or recommendations made in this report reflect McIntosh Perry's judgment based on the site conditions observed at the time of the site inspection on the date set out in this report and on information available at the time of the preparation of this report.

This report has been prepared for specific application to this site, and it is based, in part, upon visual observation of the site and terrestrial investigations at various locations during a specific time interval, as described in this report. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, or portions of the site which were unavailable for direct investigation.

If site conditions or applicable standards change or if any additional information becomes available at a future date, modifications to the findings, conclusions, and recommendations in this report may be necessary.

If you have any question, comments, or concerns, please do not hesitate to contact the undersigned at McIntosh Perry.

Sincerely,
McIntosh Perry Consulting Engineers Ltd.

____

Danica Rice
Junior Biologist
Phone: 613-804-9203
Email: d.rice@mcintoshperry.com

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APPENDIX A – SITE PHOTOGRAPHS

Photo 1: View from eastern side of the property looking southwest. White spruce stands can be seen in the background. June 29, 2023.

Photo 2: Study Area existing conditions, mixed meadow (MEM) in the foreground, White spruce in the middle ground (TAGM1). The large deciduous trees in the background are outside of the study area and therefore not within the purview of this report. Facing south , June 29, 2023.

Photo 3: A White spruce being overtaken by a Black walnut, June 29, 2023.

Photo 4: A White spruce plantation (TAGM1) makes up the majority of the study area, June 29, 2023.

Photo 5: Overgrown pathways cutting through the TAGM1 area of the property, June 29, 2023.

Photo 6: Meadow habitat (MEM) encroaching on the Christmas tree plantation (TAGM1), June 29, 2023.

Photo 7: Existing conditions within the study area, illustrating Milkweed which is the host species of Monarch, June 29, 2023.

Photo 8: Meadow habitat (MEM) surrounding one of the existing structures in the western portion of the study area, June 29, 2023.

Photo 9: Existing conditions, illustrating poor drainage within the northwestern portion of the property, June 29, 2023.

Photo 10: A view of the bottom of the structure in the western portion of the study area (potential snake hibernacula), June 29, 2023.

Photo 11: Side view of on of the structures, illustrating potential roosting opportunities for Barn Swallows, June 29, 2023.

Photo 12: Structure within the study area, holes indicate it has potential to be used as a roost for bats and barn Swallows, June 29, 2023.

PROPERTY DESCRIPTION: LOTS 17, 20, 23, 26, 29, 32 AND PART LOTS 4 & 12 PLAN 787, LOTS 89, 90, 91, 92, 93, 94 PLAN 3469 PART 1, 27R12109; TOWN OF CARLETON PLACE

PROPERTY REMARKS: PLAN 787, AKA PL 970; FOR THE PURPOSE OF THE QUALIFIER THE DATE OF REGISTRATION OF ABSOLUTE TITLE IS 2023/07/17.

ESTATE/QUALIFIER:
FEE SIMPLE
LT ABSOLUTE PLUS

RECENTLY:
RE-ENTRY FROM 05303-0286

PIN CREATION DATE:
2023/07/17

OWNERS' NAMES: WINTERGREEN RIDGE LTD.

CAPACITY: ROWN

SHARE:

REG. NUM.	DATE	INSTRUMENT TYPE	AMOUNT	PARTIES FROM	PARTIES TO	CERT/ CHKD
*** PRINTOUT INCLUDES ALL DOCUMENT TYPES (DELETED INSTRUMENTS NOT INCLUDED) ***						
***SUBJECT TO SUBSECTION 44(1) OF THE LAND TITLES ACT, EXCEPT PARAGRAPHS 3 AND 14 AND **						
****	*PROVINCIAL SUCCESSION DUTIES AND EXCEPT PARAGRAPH 11 AND ESCHEATS OR FORFEITURE ***					
****	*TO THE CROWN UP TO THE DATE OF REGISTRATION WITH AN ABSOLUTE TITLE. ***					
RN51277	1979/06/25	BYLAW				C
LC233641	2022/01/21	TRANSFER	$695,415	SOBCZAK, CHRISTOPHER LAWRENCE SOBCZAK, CRAIG THOMAS SOBCZAK, SHARON JUNE	WINTERGREEN RIDGE LTD.	C
REMARKS: PLANNING ACT STATEMENTS.						
LC233642	2022/01/21	TRANSFER	$127,507	SOBCZAK, LORRAINE MARY SOBCZAK, SHARON JUNE SOBCZAK, CHRISTOPHER LAWRENCE SOBCZAK, CRAIG THOMAS	WINTERGREEN RIDGE LTD.	C
REMARKS: PLANNING ACT STATEMENTS.						
LC233643	2022/01/21	TRANSFER	$695,415	SOBCZAK, CHRISTOPHER LAWRENCE	WINTERGREEN RIDGE LTD.	C
REMARKS: PLANNING ACT STATEMENTS.						
LC233644	2022/01/21	TRANSFER	$695,415	SOBCZAK, SHARON JUNE	WINTERGREEN RIDGE LTD.	C
REMARKS: PLANNING ACT STATEMENTS.						
LC233645	2022/01/21	TRANSFER	$695,415	SOBCZAK, CHRISTOPHER LAWRENCE	WINTERGREEN RIDGE LTD.	C
REMARKS: PLANNING ACT STATEMENTS.						
LC233646	2022/01/21	TRANS PERSONAL REP	$695,415	SOBCZAK, CHRISTOPHER LAWRENCE SOBCZAK, CRAIG THOMAS SOBCZAK, SHARON JUNE	WINTERGREEN RIDGE LTD.	C
REMARKS: PLANNING ACT STATEMENTS.						

NOTE: ADJOINING PROPERTIES SHOULD BE INVESTIGATED TO ASCERTAIN DESCRIPTIVE INCONSISTENCIES, IF ANY, WITH DESCRIPTION REPRESENTED FOR THIS PROPERTY.
NOTE: ENSURE THAT YOUR PRINTOUT STATES THE TOTAL NUMBER OF PAGES AND THAT YOU HAVE PICKED THEM ALL UP.

REG. NUM.	DATE	INSTRUMENT TYPE	AMOUNT	PARTIES FROM	PARTIES TO	CERT/ CHKD
LC233649	2022/01/21	TRANSFER	$695,415	SOBCZAK, CRAIG THOMAS	WINTERGREEN RIDGE LTD.	C
REMARKS: PLANNING ACT STATEMENTS.						
LC233650	2022/01/24	CHARGE	$3,500,000	WINTERGREEN RIDGE LTD.	MERIDIAN CREDIT UNION LIMITED	C
27R12109	2023/07/17	PLAN REFERENCE				C
LC250562	2023/07/17	APL ABSOLUTE TITLE		WINTERGREEN RIDGE LTD.	WINTERGREEN RIDGE LTD.	C
REMARKS: LC245945						

400 LANARK STREET, CARLETON PLACE TRANSPORTATION IMPACT ANALYSIS

Project No.: CCO-22-0597

Prepared for:

Wintergreen Ridge Ltd

Prepared by:

McIntosh Perry Consulting Engineers Ltd.
6240 Highway 7, Suite 200
Woodbridge, ON
L4H 4G3

September 2023

McINTOSH PERRY

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1.0 INTRODUCTION

McIntosh Perry Consulting Engineers Ltd. (MP) was retained by Wintergreen Ridge Ltd. to complete a Traffic Impact Analysis (TIA) in support of the proposed subdivision at 400 Lanark Street located in Carleton Place, Ontario.

The subject site is anticipated to have a 2026-year full buildout for the residential subdivision. This TIA will determine the net site traffic changes due to the proposed development during the critical weekday AM and PM peak periods and assess the impact of this traffic on the study road network.

2.0 SITE CHARACTERISTICS

2.1 Study Location

The proposed development is located on the north side of Townline Road East between Lanark Street and Edmund Street in Lanark County, as illustrated in Figure 2-1. The land falls under schedule A of Lanark County's Official Plan (revised January 2017) the proposed development is located in a settlement area. As per the town of Carleton Place Official Plan, the proposed development is within the residential district zoning.

Figure 2-1: Proposed Development and Surrounding Area

3.0 PROPOSED DEVELOPMENT

The site is expected to consist of 250 fully serviced dwelling units which includes three medium density apartments with a total of 125 units, 32 street townhouses, 58 stacked townhouses, and 35 low density single detached homes. The lands have frontage on Townline Road East to the south, Lanark Street to the east, and Edmund Street to the west. The subject property has a total area of 6.27 hectares. The site plan and detailed site statistics for the proposed development has been provided in Appendix A.

4.0 EXISTING CONDITIONS

The following subsections outline the existing traffic conditions and site characteristics.

4.1 Existing Site

The Town has designated these lands for residential land use. Our desktop review shows the proposed land is currently occupied by the Sobczak tree farm. In addition, there are existing residential developments to the south and west of the site. We also understand a residential development is proposed to the east fronting onto Lanark Street.

4.2 Existing Road Network

Townline Road is classified as an arterial roadway and is under the jurisdiction of Lanark County. The roadway cross section is 2-lanes consisting of one lane per direction and has a dedicated turning lanes near intersections. There is a shared left turn lane between east-west bound traffic to take left turns at the driveways/intersections. There are sidewalks on both the sides of the road within the vicinity of study area. However east of Mullete Street/ Industrial Avenue intersection sidewalk is provided only on the south side of the road. The posted speed limit is 50 kilometres per hour east of Baines Street and 40 kilometer per hour west of Baines Street.

McNeely Avenue is classified as an arterial roadway and is under the jurisdiction of Lanark County. The roadway cross section is 2-lanes consisting of one lane per direction and has a dedicated turning lanes near intersections. There are paved shoulders on both the sides of the road and sidewalk is provided on the west side of the roadway. The posted speed limit is 60 kilometres per hour.

Bridge Street is classified as collector roadway and is under the jurisdiction of Carleton Place. The roadway run generally north–south direction, has a two-lane cross section. The sidewalk is provided on both the sides of the roadway. The posted speed limit is 50 kilometres per hour.

Edmund Street is classified as a local road and is under the jurisdiction of the Carleton Place. This roadway provides access to residential neighborhoods. Sidewalk is provided on the east side of the roadway south to the Townline Road intersection and on the west side north of the Townline Road intersection. The speed limit is assumed to be 40 kilometres per hour.

Lanark Street is classified as a local road and is under the jurisdiction of the Town of Carleton Place. This roadway has a two-lane cross section and provides access to residential neighborhoods. Sidewalk is provided on the east side of the roadway. The roadway runs north-south direction with a posted speed limit is 40 kilometres per hour.

The existing road network is provided in Figure 4-1

Figure 4-1: Existing Road Network

4.3 Existing Intersections

The existing study area intersections to be included in this report are as follows:

- Townline Road and Bridge Street;
- Townline Road and Edmund Street;
- Townline Road and Lanark Street and,
- Townline Road and McNeely Avenue

The following is a description of the lane configurations and traffic control at these intersections:

Townline Road and Bridge Street as illustrated in Figure 4-2. is a signalised intersection. Westbound the intersection has a dedicated left, through and right turning lanes, eastbound a left turn lane and a shared through-right turning lane whereas the north-south bound a shared left-through-right turning lane is provided. Protected pedestrian crossing is provided across all four approaches.

Figure 4-2: Townline Road and Bridge Street

Townline Road and Edmund Street as illustrated in Figure 4-3 is a two way stop-controlled intersection with stop-signs on the minor legs, Edmund Street. The eastbound traffic has a dedicated left, through and right turning lanes, westbound traffic has a left turn lane and a shared through-right turning lane whereas the north-south bound traffic has a single shared left-through-right turning lane. There is no pedestrian crossing at this intersection, however a sidewalk is provided on east side of Edmund Street south of the intersection and on west side of Edmund Street north of the intersection.

Figure 4-3: Townline Road and Edmund Street

Townline Road and Lanark Street as illustrated in Figure 4-4. is stop-controlled intersection with stop-sign at the minor leg, Lanark Street. Westbound left, through and right turn lanes are provided, eastbound a dedicated left turning lane and a shared through-right turning lane are present at the intersection. The south bound traffic has a single shared left-through-right turning lane. There is no protected pedestrian crossing at this intersection, however a sidewalk is provided on both the sides of Townline Road and on the east side of Lanark Street.

It is noted this segment of Townline Road has a continuous two-way left-turn lane.

Figure 4-4: Townline Road and Lanark Street

Townline Road and McNeely Avenue as illustrated in Figure 4-5 is a signalised intersection. The eastbound traffic has a dedicated through and right turning lanes, westbound traffic has a dedicated left and through turning lane. The northbound traffic has a dedicated left and right turning lane. Protected pedestrian crossing is provided across all three approaches.

Figure 4-5: Townline Road and McNeely Avenue

4.4 Existing Pedestrian and Cycling Facilities

Sidewalks are provided on both sides of Townline Road west of Mullete Street/Industrial Avenue. East of Mullete Street/ Industrial Avenue intersection sidewalk is provided only on the south side of the Townline Road. Protected pedestrian crossings are provided at the signalized study intersections.

The sidewalk locations are presented in Figure 4-6.

Figure 4-6: Existing Sidewalks

Figure 4-7 illustrates the existing cycle network within Carleton Place. As shown, below within the vicinity of the proposed development, both of Townline Road and McNeely Avenue are both part of the existing town recommended cycle route.

Figure 4-7: Existing Cycling Network

4.5 Existing Transit System

Classic Alliance Motorcoach (a division of Leduc Bus Lines Ltd.) provides commuter service between Carleton Place, adjacent municipalities, and the City of Ottawa. Leduc Bus Lines operates the Routes 502 & 503 (between Almonte, Carleton Place and Perth), with a stop at Bridge Street and Townline Road.

4.6 Existing Traffic Volumes

MP used *Appendix B1* from the Carleton Place TMP as reference for the existing condition traffic volumes for the intersection of Bridge Street at Townline Road and McNeely Avenue at Townline Road. MP referred to the Inverness Homes development TIS located approximately 670 m west of the intersection of Townline Road and McNeely Avenue completed on November 16, 2022, by D. J. Halpenny & Associates Ltd., to obtain the turning movement count for the Lanark Street and Townline Road intersection. MP conducted 2-hour counts for AM and PM peak hours at the intersection of Edmund Street and Townline Road on August 24, 2023. Traffic data used for this study is provided in Appendix B. Traffic volumes for existing study conditions are provided in Figure 4-8.

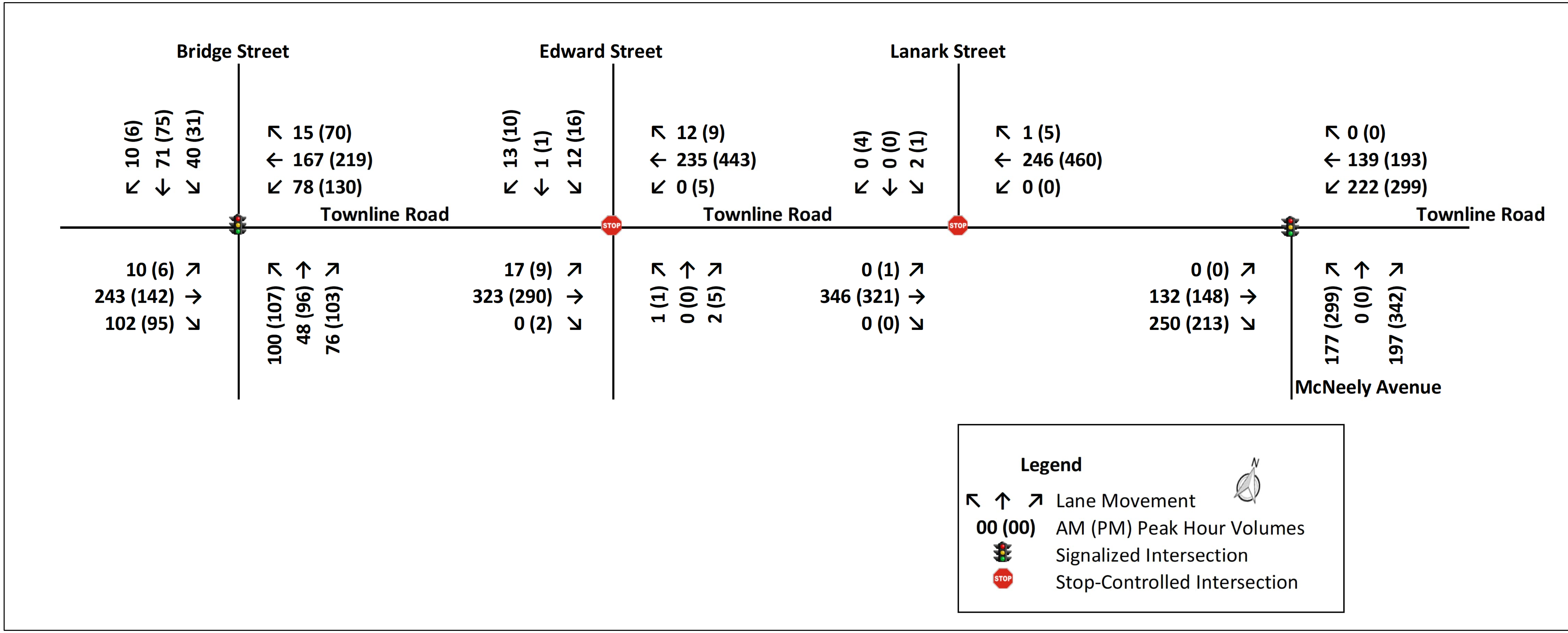

Figure 4-8: Existing (2023) Traffic Volumes

4.7 Existing Traffic Analysis

Intersection operations were assessed using the Synchro 11 software which utilizes the Highway Capacity Manual (HCM) 6th Edition methodology published by the Transportation Research Board National Research Council. Synchro 11 can analyze both signalized and unsignalized intersections in a road corridor or network.

Intersection operations performance metrics are reported in terms of Level of Service (LOS), delays, volume-to-capacity (v/c) ratios, and 95th percentile queues. Level of service is based on the average control delay per vehicle for a given movement. Delay is an indicator of how long a vehicle must wait to complete a movement and is represented by a letter between 'A' and 'F', with 'F' being the longest delay. Table 4:1 summarizes the LOS criteria for signalized and unsignalized intersections.

Table 4:1: LOS Criteria for Signalized and Unsignalized Intersections

Level of Service	Average Control Delay per Vehicle (seconds / vehicle)	
	Signalized Intersection[1]	Unsignalized Intersection[1]
A	≤ 10	≤ 10
B	>10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

[1] HCM 2000 Methodology
[2] *LOS F is reached if any movement exceeds capacity (i.e., v/c > 1.0)*

The existing intersection operations were analyzed for the weekday AM and weekday PM peak hours. Analysis indicates that all turning movements will operate with acceptable LOS and delay during both the AM and PM peak hour periods. Maximum queue of 58 m was observed during PM peak hour on the northbound left movement at the intersection of McNeely Avenue and Townline Road. All the study intersections are expected to have reserve capacity to accommodate any increase in traffic volume. The overall signalized and unsignalized intersections operation results are provided in Table 4:2. Detailed Synchro 11 results are provided in Appendix C.

Table 4:2: Existing (2023) Conditions Capacity Analysis Summary

Intersection	Approach	AM Peak Hour				PM Peak Hour			
		LOS	v/c Ratio	Delay (s)	Queue (m)	LOS	v/c Ratio	Delay (s)	Queue (m)
Bridge Street & Townline Road	EB-L	B	0.03	14	8	B	0.02	14	6
	EB-TR	B	0.59	19	56	B	0.40	14	42
	WB-L	A	0.18	8	20	A	0.24	8	25
	WB-T	A	0.21	10	31	B	0.27	10	39
	WB-R	A	0.02	1	9	A	0.10	3	16
	NB-LTR	B	0.49	17	38	C	0.64	22	46
	SB-LTR	B	0.26	16	21	B	0.23	16	21
Edmund Street and Townline Road	EB-L	A	0.01	8	6	A	0.01	8	5
	WB-L	A	-	-	-	A	0.00	8	4
	NB-LTR	B	0.01	12	5	B	0.01	11	7
	SB-LTR	B	0.06	12	9	C	0.08	16	10
Townline Road & Lanark Street	EB-LT	A	0.00	-	2	A	0.00	8	2
	SB-LR	B	0.00	12	5	B	0.01	12	6
McNeely Avenue & Townline Road	EB-T	B	0.19	12	26	B	0.23	14	29
	EB-R	A	0.34	3	30	A	0.31	4	27
	WB-L	A	0.34	7	32	B	0.49	10	44
	WB-T	A	0.14	6	21	A	0.21	8	26
	NB-LTR	C	0.49	23	39	C	0.71	28	58
	NB-R	A	0.42	6	22	A	0.54	6	39

5.0 FUTURE BACKGROUD CONTIDIONS

Future background conditions were reviewed for a 2026 full build out condition and a 2031, 5-year post build condition.

5.1 Background Growth

Background traffic growth is a function of the projected population growth, changes to employment, roadway network modifications and other external factors. The Carleton Place Transportation Master Plan indicates that a linear background growth rate should be applied for key corridors such as:

- McNeely Avenue – 3.0%
- Townline Road/Bridge Street – 2.5%
- Collector Streets – 1%

This growth rate is assumed to account for the background growth within the vicinity of the subjected development. As such MP applied a 3.0% linear background traffic growth rate to McNeely Avenue and a 2.5% linear background traffic growth rate to Townline Road and Bridge Street and 1% growth rate to the remaining roadways within the study area to remain conservative in the estimation of the future scenario traffic volumes.

5.2 Background Developments

Two background developments have been identified for consideration for inclusion in this study.

The development at 28 High Street, Carleton Place is expected to include a mix of residential and restaurant land uses. The development consists of 5-storey and 7-storey residential buildings, respectively, with a total combined Gross Floor Area (GFA) of 17,839 m^2 and 213 residential units as well as 200 m^2 of restaurant GFA. Construction for the development is proposed to be completed in a single phase with the buildout year anticipated in 2024.

The Inverness Homes Development is located 670 m west of the intersection of Townline Road East and McNeely Avenue, fronting onto Lanark Street. The development will consist of 248 semi-detached homes and townhomes. The subdivision is expected to be completed in 2026.

The anticipated site-generated traffic for both the development was extracted from the completed TIS and was applied to the Build-out year (2026) and Horizon year (2031) background traffic volumes.

Traffic volumes generated from these two area developments are shown in Figure 5-1.

5.3 Background Traffic Volume

Background traffic volumes were determined by adding existing volumes, background area development traffic and background growth. The Build-out (2026) background traffic volumes and Future Horizon (2031) Traffic Volumes are provided in Figure 5-2 and Figure 5-3.

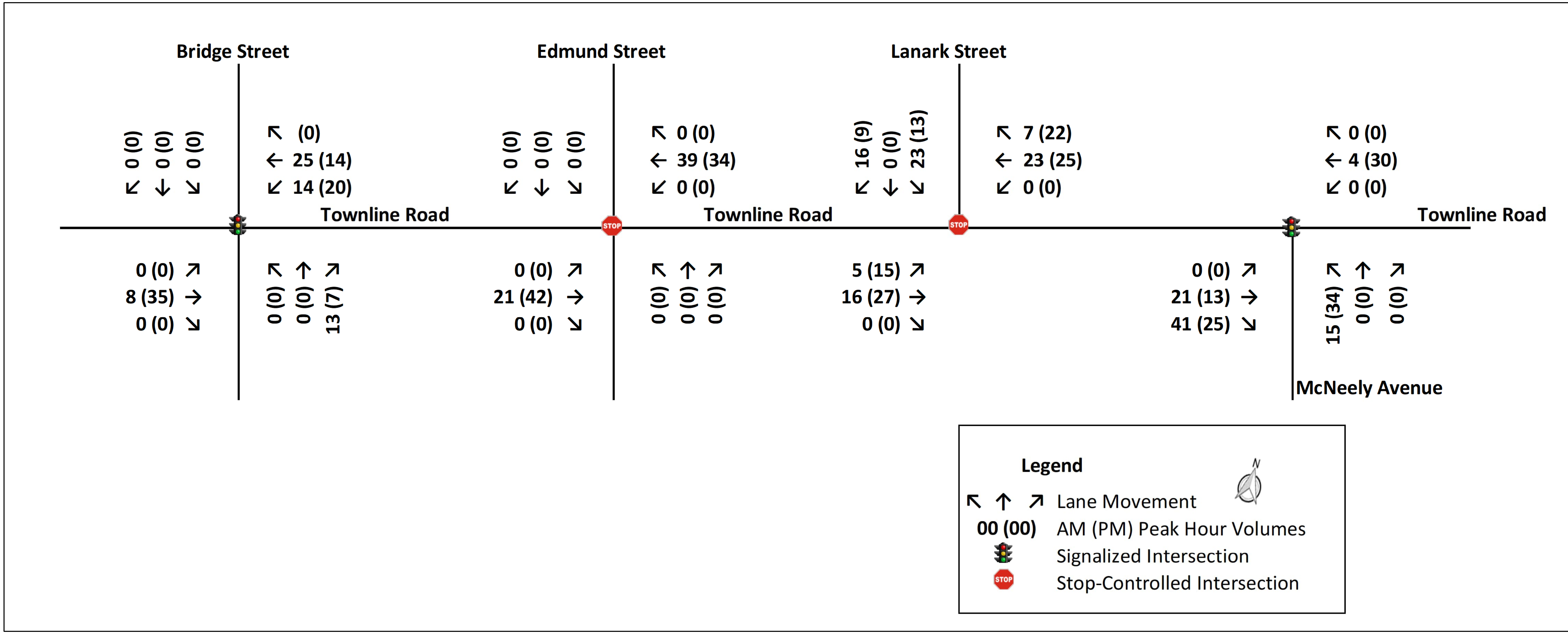

Figure 5-1: Area Development Background Traffic Volume

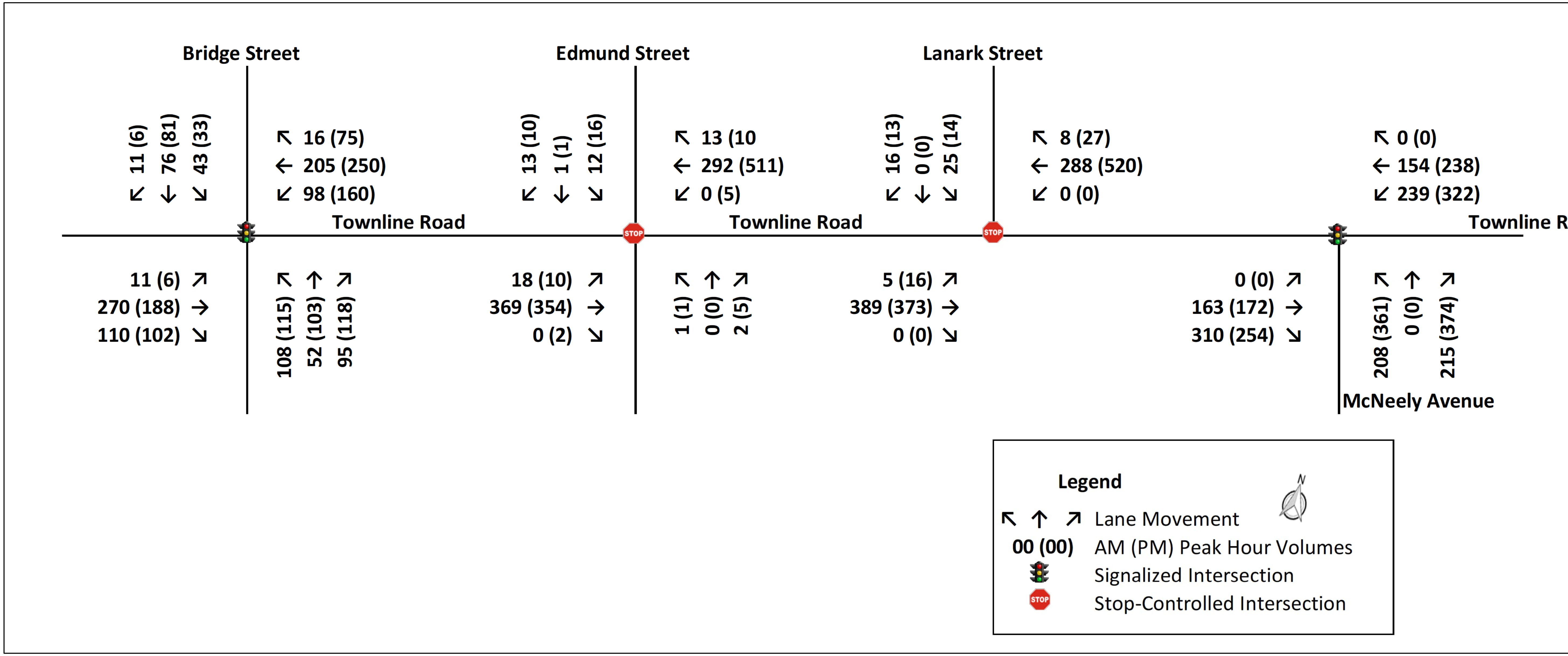

Figure 5-2: Background (2026) Traffic Volumes

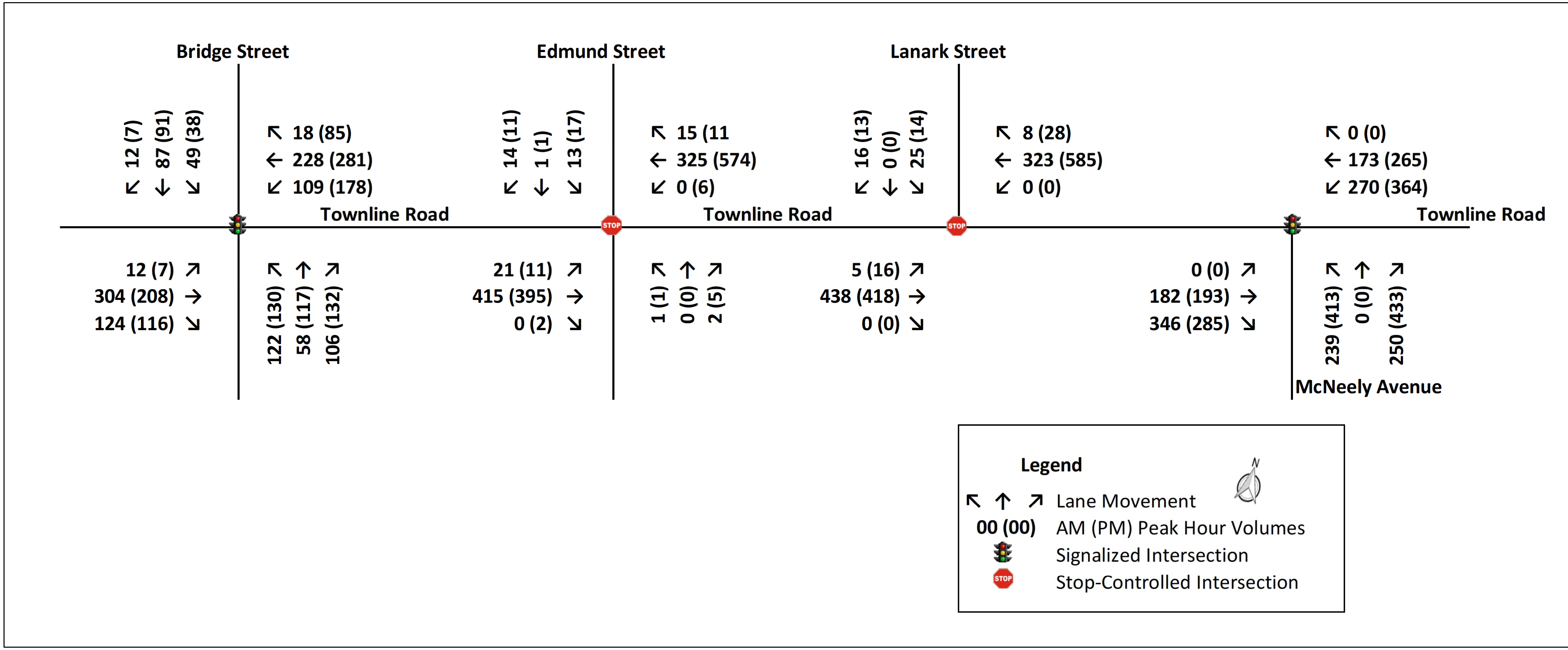

Figure 5-3: Background (2031) Traffic Volumes

5.4 Background (2026) Traffic Analysis

Intersection capacity analysis for background (2026) traffic conditions were completed for study area intersections to determine future operational measures of performance during the weekday AM and PM peak periods.

Intersection analysis for the 2026 background conditions indicate study intersections will continue to operate good level of service B or better in both the AM and PM peak hours within minimal delay similar to existing condition operations.

Analysis indicate that turning movements at all intersections will operate with significant reserve capacity. As such, network improvements would not be required under 2026 background conditions. With the increase of traffic volumes due to background conditions the network exhibits no operational constraints. The study area has the potential to accommodate increased development given the available capacity along the boundary road network. A summary of the results is provided in Table 5:1

Table 5:1: Background (2026) Conditions Capacity Analysis Summary

Intersection	Approach	AM Peak Hour				PM Peak Hour			
		LOS	v/c Ratio	Delay (s)	Queue (m)	LOS	v/c Ratio	Delay (s)	Queue (m)
Bridge Street & Townline Road	EB-L	B	0.03	14	9	B	0.02	14	6
	EB-TR	C	0.65	21	62	B	0.49	16	52
	WB-L	A	0.24	8	24	A	0.32	9	32
	WB-T	A	0.25	10	37	B	0.31	10	41
	WB-R	A	0.02	1	9	A	0.10	3	18
	NB-LTR	B	0.54	18	41	C	0.69	24	58
	SB-LTR	B	0.28	16	23	B	0.25	16	24
Edmund Street and Townline Road	EB-L	A	0.02	8	7	A	0.01	9	6
	WB-L	A	-	0	-	A	0.01	8	4
	NB-LTR	B	0.01	13	5.2	B	0.01	12	7
	SB-LTR	B	0.06	14	10	C	0.10	19	10
Townline Road & Lanark Street	EB-LT	A	0.00	8	1	A	0.02	9	21
	SB-LR	A	0.08	12	15	B	0.07	14	13
McNeely Avenue & Townline Road	EB-T	B	0.24	13	32	B	0.27	15	33
	EB-R	A	0.41	4	34	A	0.37	4	32
	WB-L	A	0.38	8	36	B	0.55	12	46
	WB-T	A	0.16	7	23	A	0.26	9	35
	NB-LTR	C	0.56	24	41	C	0.80	33	78
	NB-R	A	0.43	6	24	A	0.56	5	53

5.5 Background (2031) Traffic Analysis

Intersection capacity analysis for background (2026) traffic conditions were completed for study area intersections to determine future operational measures of performance during the weekday AM and PM peak periods.

Intersection analysis for the 2031 future background conditions indicate study intersections will continue to operate good level of service B or better in both the AM and PM peak hours within minimal delay.

Similar to 2026 background assessment, analysis for future 2031 background conditions continue to indicate that turning movements at all intersections will operate with significant reserve capacity. Improvements for the 2031 background network would not be required based on the minimal level of development anticipated. The network continues to exhibit no operational constraints and the available network capacity continues to provide potential to accommodate increased area development. A summary of the results is provided in Table 5:2.

Table 5:2: Background (2031) Conditions Capacity Analysis Summary

Intersection	Approach	AM Peak Hour				PM Peak Hour			
		LOS	v/c Ratio	Delay (s)	Queue (m)	LOS	v/c Ratio	Delay (s)	Queue (m)
Bridge Street & Townline Road	EB-L	B	0.03	14	8	B	0.02	14	7
	EB-TR	C	0.73	25	69	B	0.57	18	59
	WB-L	A	0.29	9	26	A	0.38	9	36
	WB-T	B	0.28	10	39	B	0.33	11	38
	WB-R	A	0.03	1	9	A	0.11	3	18
	NB-LTR	C	0.61	20	49	C	0.81	32	65
	SB-LTR	B	0.32	17	32	B	0.30	17	26
Edmund Street and Townline Road	EB-L	A	0.02	8	8	A	0.01	9	7
	WB-L	A	-	0		A	0.01	8	4
	NB-LTR	B	0.01	14	4.7	B	0.02	13	8
	SB-LTR	B	0.08	15	11	C	0.13	22	10
Townline Road & Lanark Street	EB-LT	A	0.01	8	7	A	0.02	9	12
	SB-LR	A	0.09	13	15	A	0.07	15	14
McNeely Avenue & Townline Road	EB-T	B	0.28	14	34	B	0.31	16	36
	EB-R	A	0.45	4	38	A	0.40	4	37
	WB-L	A	0.44	9	39	B	0.65	15	67
	WB-T	A	0.18	7	24	A	0.30	9	36
	NB-LTR	C	0.61	25	48	D	0.87	40	121
	NB-R	A	0.46	6	27	A	0.59	6	80

6.0 FUTURE TOTAL CONDITIONS

6.1 Trip Generation

Trip generation for the proposed development was calculated in accordance with Institute of Transportation Engineers (ITE) Trip Generation 11th Edition methodologies and data. The development consists of residential developments including single family detached homes (Land-Use Code 210), street townhouse (Land-Use Code 215), stacked townhouse (Land-Use Code 220), and apartment building (Land-Use Code 221). All trip generation rates were taken for the weekday AM and PM peak hour of adjacent street traffic using the number of units for residential uses. A total of 126 new trips will be generated during AM Peak hour and 146 trips will be generated around PM Peak Hour. Table 6:1 summarize the proposed developments trip generation.

Table 6:1: Trip Generation

Site Component	Units	ITE Code	Item	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Single Detached Home	35	Single-Family Detached Housing (210)	Directional Distribution	25%	75%	100%	63%	37%	100%
			(Fitted Curve)	T= 0.91 Ln(X) + 0.12			Ln(T) = 0.94 Ln(X) + 0.27		
			Gross Trips	7	22	29	23	14	37
Street Townhouse	32	Single-Family Attached Housing (215)	Directional Distribution	25%	75%	100%	59%	41%	100%
			(Fitted Curve)	T = 0.52(X) - 5.70			T = 0.60(X) - 3.93		
			Gross Trips	3	8	11	9	6	15
Stacked Townhouse	58	Multifamily Housing (Low-Rise) (220)	Directional Distribution	24%	76%	100%	63%	37%	100%
			(Fitted Curve)	T = 0.31(X) + 22.85			T = 0.43(X) + 20.55		
			Gross Trips	10	31	41	29	16	45
Apartment	125	Multifamily Housing (Mid-Rise) (221)	Directional Distribution	23%	77%	100%	61%	39%	100%
			(Fitted Curve)	T = 0.44(X) - 11.61			T = 0.39(X) + 0.34		
			Gross Trips	10	33	43	30	19	49
Total				30	94	124	91	55	146

6.2 Trip Distribution and Assignment

The distribution of trips is developed considering the site layout. A new street is proposed within the site connecting both the site accesses. Site trip distribution and assignment to the study area network was developed based on network connectivity, consideration of splits from Carleton Place TMP and existing traffic patterns.

Distribution of site generated to the study area network has been summarized in Table 6:2. The assignment of forecasted site traffic volumes has been provided in Figure 6-1.

Table 6:2 Trip Distribution, Origin/Destination Review

To/From	Percentage
East (Ottawa, Gatineau, Internal Carleton Place)	71%
West (Perth, Tay Valley)	3%
North (Mississippi Mills)	6%
South (Internal Carleton Place, Smith's Falls, Beckwith)	20%

6.3 Build-Out (2026) Total Traffic Volumes

The Build-Out (2026) total traffic volumes were derived by summing Build-Out (2026) background traffic volumes and forecasted site traffic volume for the AM and PM peak periods. The Future (2026) total traffic volumes are presented in Figure 6-2.

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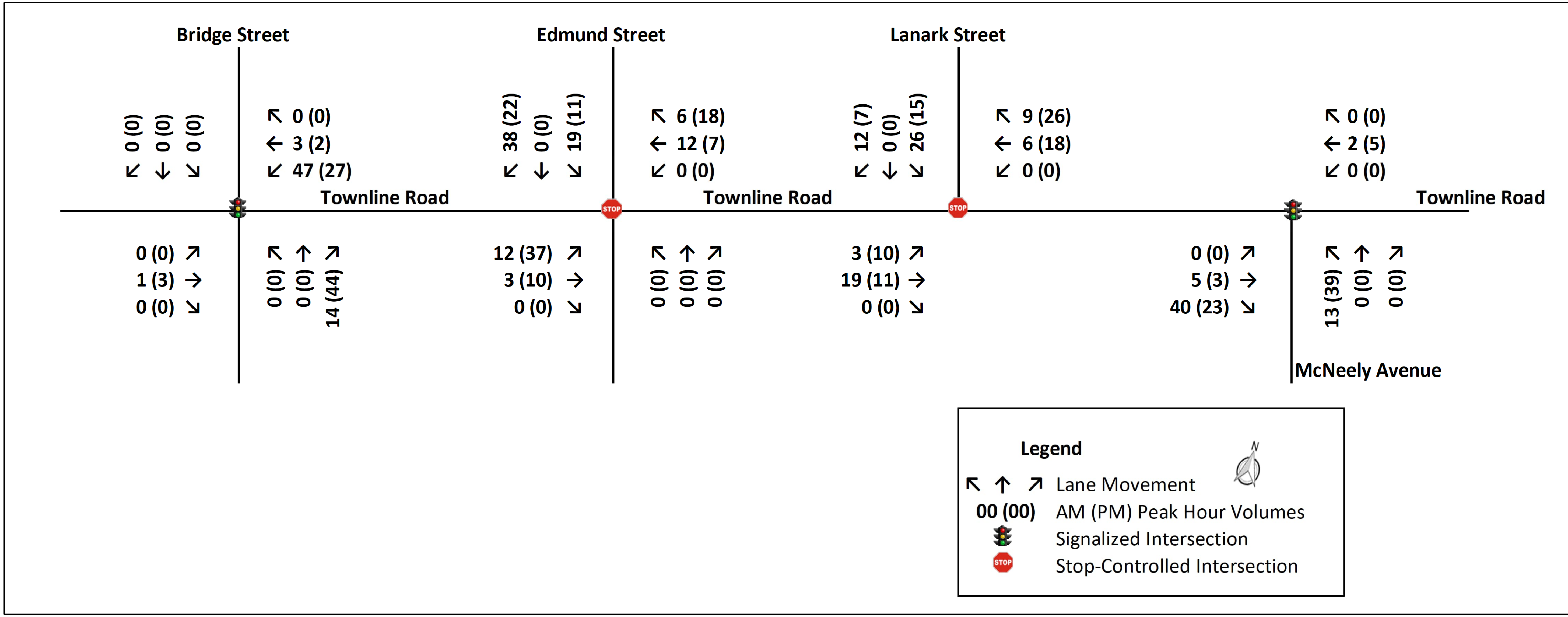

Figure 6-1: Site Traffic Volumes

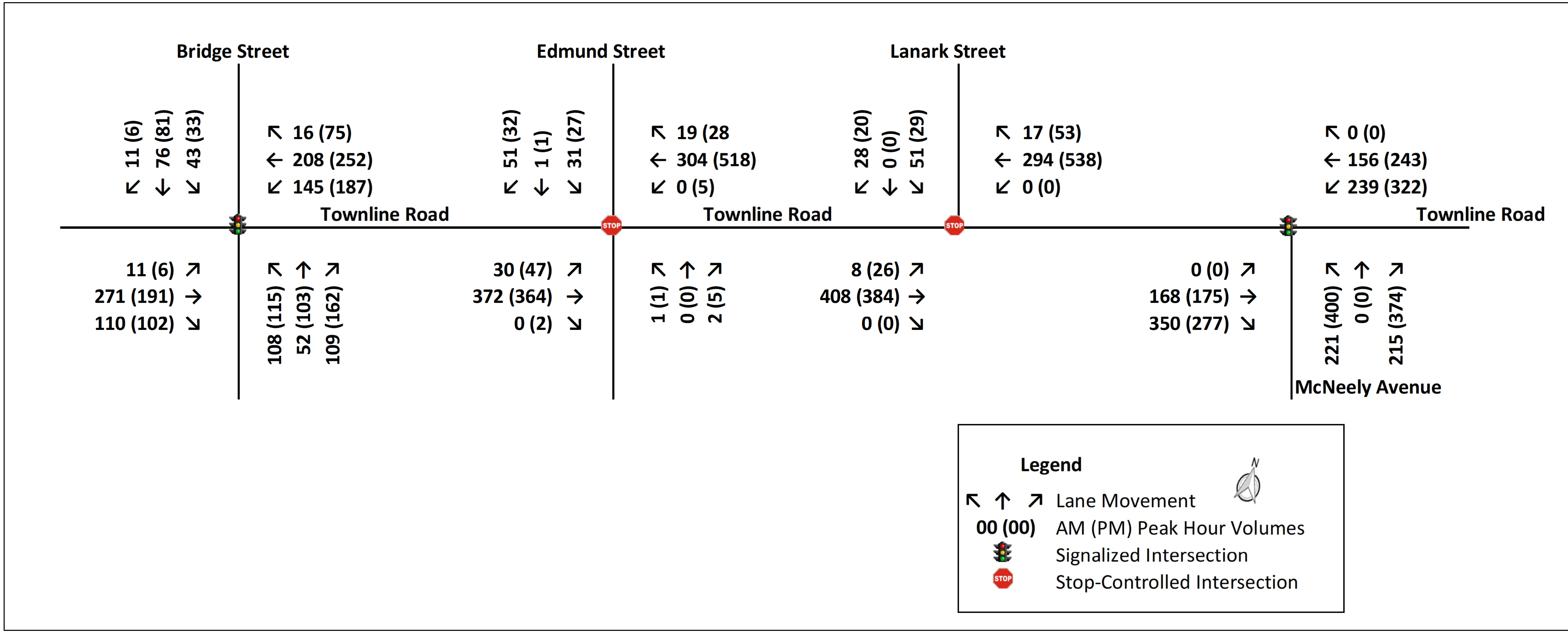

Figure 6-2: Build-Out (2026) Total Traffic Volumes

6.4 Build-Out (2026) Total Traffic Analysis

Intersection capacity analysis for the Build-Out (2026) total traffic conditions was completed for study area intersections to determine the future operational measures of performance during the AM and PM weekday peak periods. Lane configurations remained the same as the existing conditions.

With the addition development generated trips to the network, peak hour traffic volumes continue to operate with significant reserve capacity without any capacity constraints or concerns. However, at McNeely Avenue and Townline Road intersection, 95th percentile queue of 129 m is observed. The movement operates with LOS D and v/c ratio of 0.85. Based on the level of development and available capacity for the future total 2031 study horizon no network improvements are currently proposed for the study area. A summary of the results is provided in Table 6:3.

Table 6:3: Build-Out (2026) Total Conditions Capacity Analysis Summary

Intersection	Approach	AM Peak Hour				PM Peak Hour			
		LOS	v/c Ratio	Delay (s)	Queue (m)	LOS	v/c Ratio	Delay (s)	Queue (m)
Bridge Street & Townline Road	EB-L	B	0.03	14	8	B	0.02	14	9
	EB-TR	C	0.65	21	62	B	0.51	17	49
	WB-L	A	0.35	9	31	A	0.37	9	36
	WB-T	A	0.26	10	34	B	0.30	10	39
	WB-R	A	0.02	1	9	A	0.10	3	18
	NB-LTR	B	0.56	18	44	C	0.79	29	66
	SB-LTR	B	0.28	16	30	B	0.27	17	27
Edmund Street and Townline Road	EB-L	A	0.03	8	8	A	0.05	9	12
	WB-L	A	-	0	-	A	0.01	8	3
	NB-LTR	B	0.01	13	5	B	0.02	13	7
	SB-LTR	B	0.20	15	15	C	0.23	21	15
Townline Road & Lanark Street	EB-LT	A	0.01	8	6	A	0.03	9	21
	SB-LR	B	0.16	13	17	C	0.13	15	16
McNeely Avenue & Townline Road	EB-T	B	0.25	14	31	B	0.28	15	32
	EB-R	A	0.45	4	37	A	0.39	4	32
	WB-L	A	0.39	8	36	B	0.56	12	61
	WB-T	A	0.16	7	23	A	0.27	9	36
	NB-LTR	C	0.58	24	45	D	0.85	38	129
	NB-R	A	0.42	5	26	A	0.55	5	65

6.5 Future (2031) Total Traffic Volumes

The Future (2031) total traffic volumes were derived by summing future (2031) background traffic volumes and forecasted site traffic volume for the AM and PM peak periods. The Future (2031) total traffic volumes are presented in Figure 6-3.

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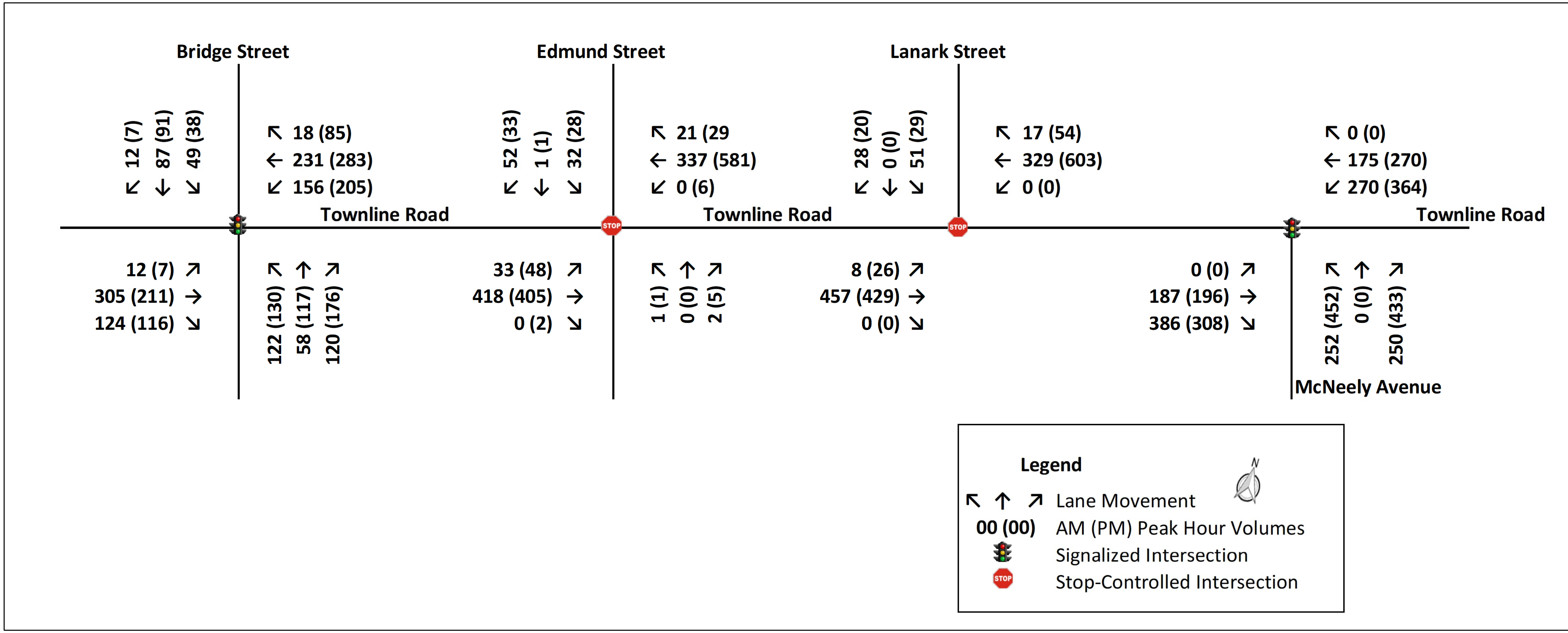

Figure 6-3: Future Total (2031) Traffic Volumes

6.6 Future (2031) Total Traffic Analysis

Intersection capacity analysis for the future (2031) total traffic conditions was completed for study area intersections to determine the future operational measures of performance during the AM and PM weekday peak periods. Lane configurations remained the same as the existing conditions.

Like Build-Out (2026) Total Conditions, the results for 2031 total conditions shows that all the study intersections will operate well under capacity. The northbound left movement at McNeely Avenue and Townline Road operates with a v/c ratio of 0.93 and a 95th percentile queue of 121 m, signal timing adjustments might be required to improve the operations at this intersection in future. The overall study network will be well situated to accommodate future development growth and increase traffic related to this growth. A summary of the results is provided in Table 6:4.

Table 6:4: Future (2031) Total Conditions Capacity Analysis Summary

Intersection	Approach	AM Peak Hour				PM Peak Hour			
		LOS	v/c Ratio	Delay (s)	Queue (m)	LOS	v/c Ratio	Delay (s)	Queue (m)
Bridge Street & Townline Road	EB-L	B	0.03	14	10	B	0.02	14	7
	EB-TR	C	0.73	25	70	B	0.57	18	57
	WB-L	B	0.42	10	32	B	0.44	10	38
	WB-T	B	0.29	10	35	B	0.34	11	42
	WB-R	A	0.03	1	8	A	0.11	3	18
	NB-LTR	C	0.63	21	54	D	0.88	38	83
	SB-LTR	B	0.32	17	33	B	0.31	17	27
Edmund Street and Townline Road	EB-L	A	0.03	8	8	A	0.06	9	12
	WB-L	A	-	0	-	A	0.01	8	4
	NB-LTR	B	0.01	15	5	B	0.02	14	8
	SB-LTR	C	0.22	16	15	D	0.28	26	15
Townline Road & Lanark Street	EB-LT	A	0.01	8	5	A	0.03	9	21
	SB-LR	B	0.17	14	17	C	0.14	16	18
McNeely Avenue & Townline Road	EB-T	B	0.28	14	34	B	0.32	16	38
	EB-R	A	0.49	4	42	A	0.43	4	35
	WB-L	A	0.45	9	45	B	0.66	15	78
	WB-T	A	0.18	7	27	A	0.30	9	47
	NB-LTR	C	0.63	26	49	D	0.93	48	121
	NB-R	A	0.46	5	32	A	0.59	5	88

7.0 FINDINGS AND CONCLUSIONS

7.1 Study Findings

The findings and conclusion of this Traffic Impact Study for the proposed residential development located at 400 Lanark Street are summarized as follows:

- The proposed residential development is expected to consist of a 250 fully serviced dwelling units consisting of three medium density apartments consisting of a total of 125 units, 32 street townhouses, 58 stacked townhouses, and 35 low densities single detached homes.
- The existing transportation network within the study area currently operates well with all movements at all intersections operate at an LOS of D or better.
- The proposed development is anticipated to generate 124 trips during the AM peak hour and 146 total trips during the PM peak hour.
- The development is expected to be completed by 2026.
- The development generated trips are expected to have minimal impact on the existing roadway with all movements at all intersections operating under acceptable levels for all analysis periods.
- Sight Lines were reviewed, and no concerns were presented.

7.2 Conclusions

Forecasted development site traffic can be accommodated at boundary road intersections for both the build-out (2026) and post-build-out (2031) future horizons without significant impact on study area operations. The available sight distances at the proposed site accesses are in conformance with TAC guidelines. As such the proposed development does not trigger the need for any changes to the existing roadway infrastructure.

Prepared by,

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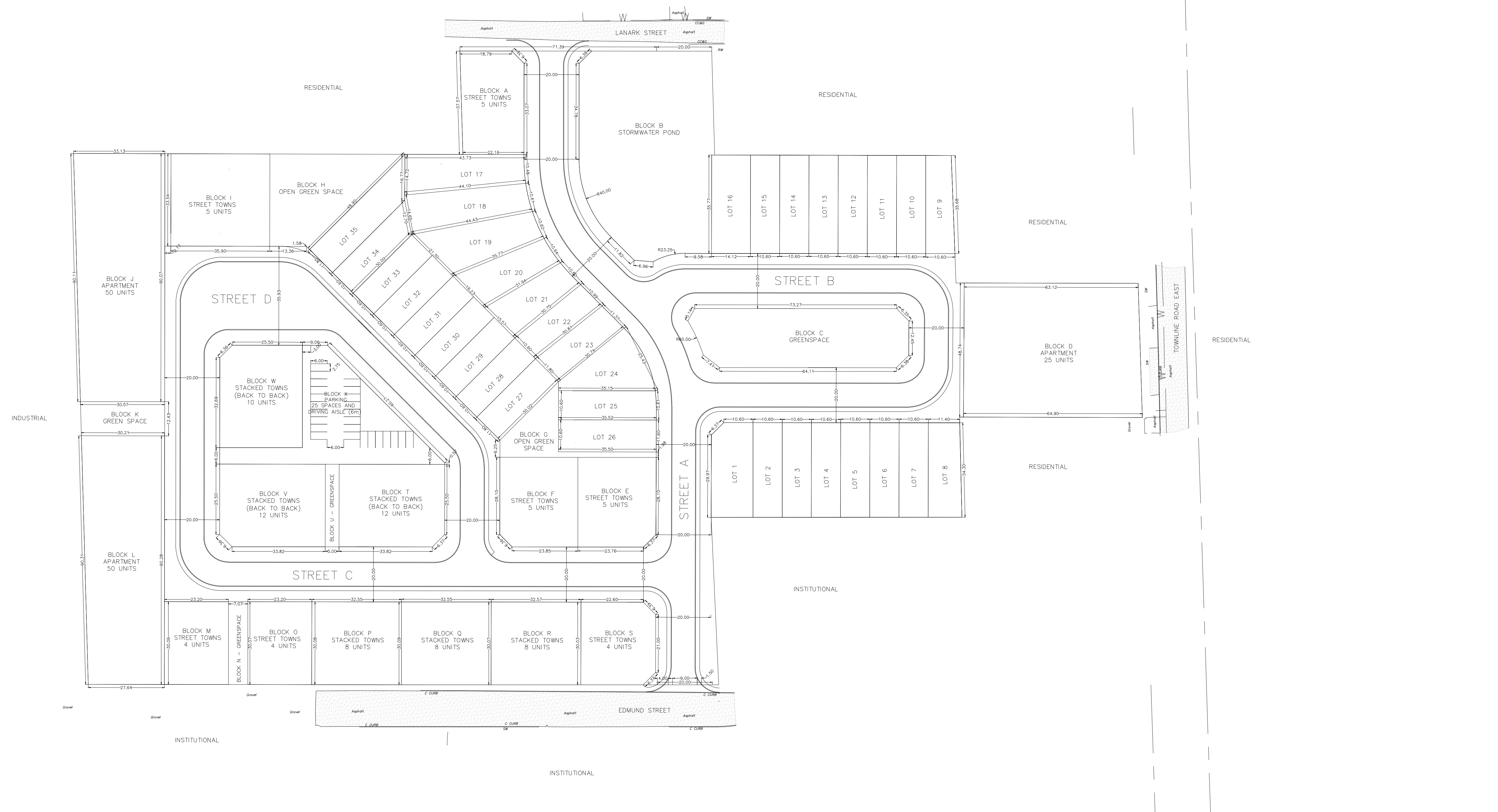
365.509.2040

APPENDIX A – SITE PLAN

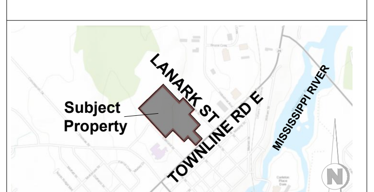


DRAFT PLAN OF SUBDIVISION

400 LANARK STREET, CARLETON PLACE

LOTS 17, 20, 23, 26, 29 & 32 R PLAN 787 & LOTS 85 TO 94 R PLAN 3469, TOWN OF CARLETON PLACE, COUNTY OF LANARK

LANDPRO PLANNING SOLUTIONS INC.
110 James Street, Suite 204
St. Catharines, ON
289-687-3730
info@landproplan.ca



KEY MAP - NTS

LOT INFORMATION

LOT	AREA	LOT	AREA	LOT	AREA
1	521.44m²	13	378.59m²	26	411.80m²
2	364.95m²	14	378.74m²	27	354.18m²
3	364.72m²	15	378.89m²	28	318.11m²
4	364.50m²	16	504.87m²	29	318.11m²
5	364.27m²	17	548.37m²	30	318.11m²
6	364.05m²	18	554.54m²	31	318.11m²
7	363.82m²	19	581.34m²	32	318.11m²
8	406.00m²	20	441.81m²	33	318.11m²
9	353.98m²	21	402.71m²	34	354.24m²
10	378.13m²	22	330.74m²	35	505.15m²
11	378.29m²	23	354.72m²		
12	378.44m²	24	469.44m²		
		25	375.88m²		

LAND USE SCHEDULE

LAND USE	AREA	UNITS	DENSITY
RESIDENTIAL	34,436.91m²	250	72.6 UPH
SINGLE DETACHED	13,803.32m²	35	25.4 UPH
STREET TOWNHOUSE	5,681.32m²	32	56.3 UPH
STACKED TOWNHOUSE	6,352.31m²	58	91.3 UPH
APARTMENT	8,599.96m²	125	145.3 UPH
ROW	18,901.23m²		
BLOCK B SWM POND	3,388.68m²	BLOCK X PARKING	1,503.94m²
BLOCK C GREEN SPACE	1,617.27m²		
BLOCK G GREEN SPACE	427.89m²		
BLOCK H GREEN SPACE	1,083.73m²		
BLOCK K GREEN SPACE	377.93m²		
BLOCK N GREEN SPACE	212.73m²		
BLOCK U GREEN SPACE	150.00m²		

REQUIREMENTS OF THE PLANNING ACT, R.S.O, 1990 - SECTION 51(17):
(A) SEE PLAN.
(B) SEE PLAN.
(C) SEE KEY MAP.
(D) SEE LAND USE SCHEDULE.
(E) SEE PLAN.
(F) SEE PLAN.
(G) SEE PLAN.
(H) MUNICIPAL SERVICING.
(I)
(J) SEE PLAN.
(K) MUNICIPAL SERVICING AVAILABLE.
(L) NOT APPLICABLE.

OWNER'S CERTIFICATE:
I HEREBY AUTHORIZE LANDPRO PLANNING SOLUTIONS INC. TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION FOR APPROVAL.

OWNER DATE

REVISIONS

No.	Updates
1	26-05-2023 Adjusted lot sizes, created 1 lot.
2	07-06-2023 Added singles, stacked towns.
3	15-08-2023 Adjusted ROW, singles, street blocks, created larger lots and blocks.
4	
5	
6	

SURVEYOR'S CERTIFICATE:
I HEREBY AUTHORIZE THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AS SHOWN ON THIS PLAN AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE ACCURATELY SHOWN.

SURVEYOR (MCINTOSH PERRY) DATE

SCALE: 1:1500

DATE: 08-15-2023

DRAWING NO: 1/1

PLOT: 11x17"

DESIGNED BY: MK

REVIEWED BY: MS

EXHIBIT B – TRAFFIC DATA

Figure B1-1: Existing Peak Hour Traffic Volumes

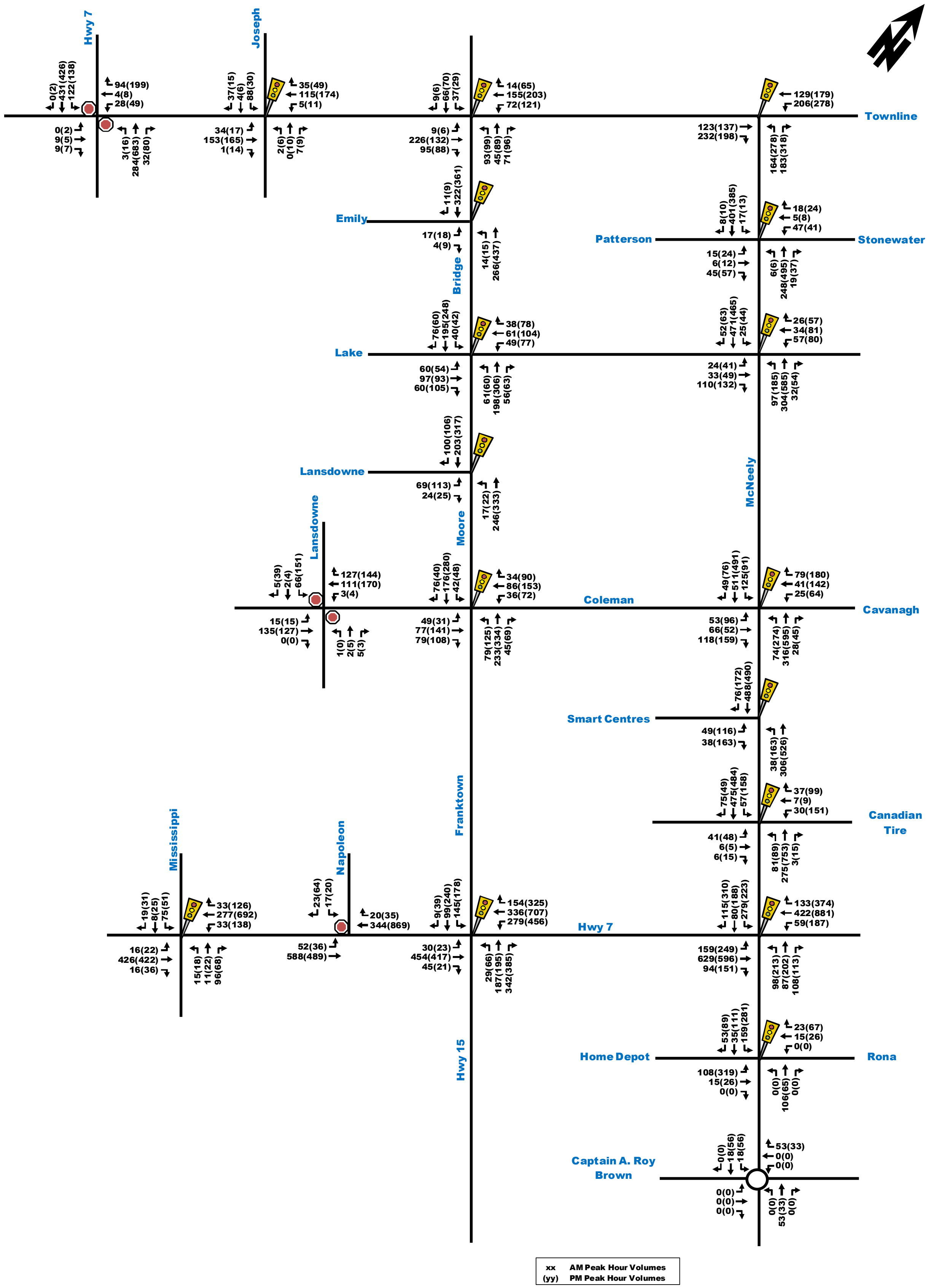
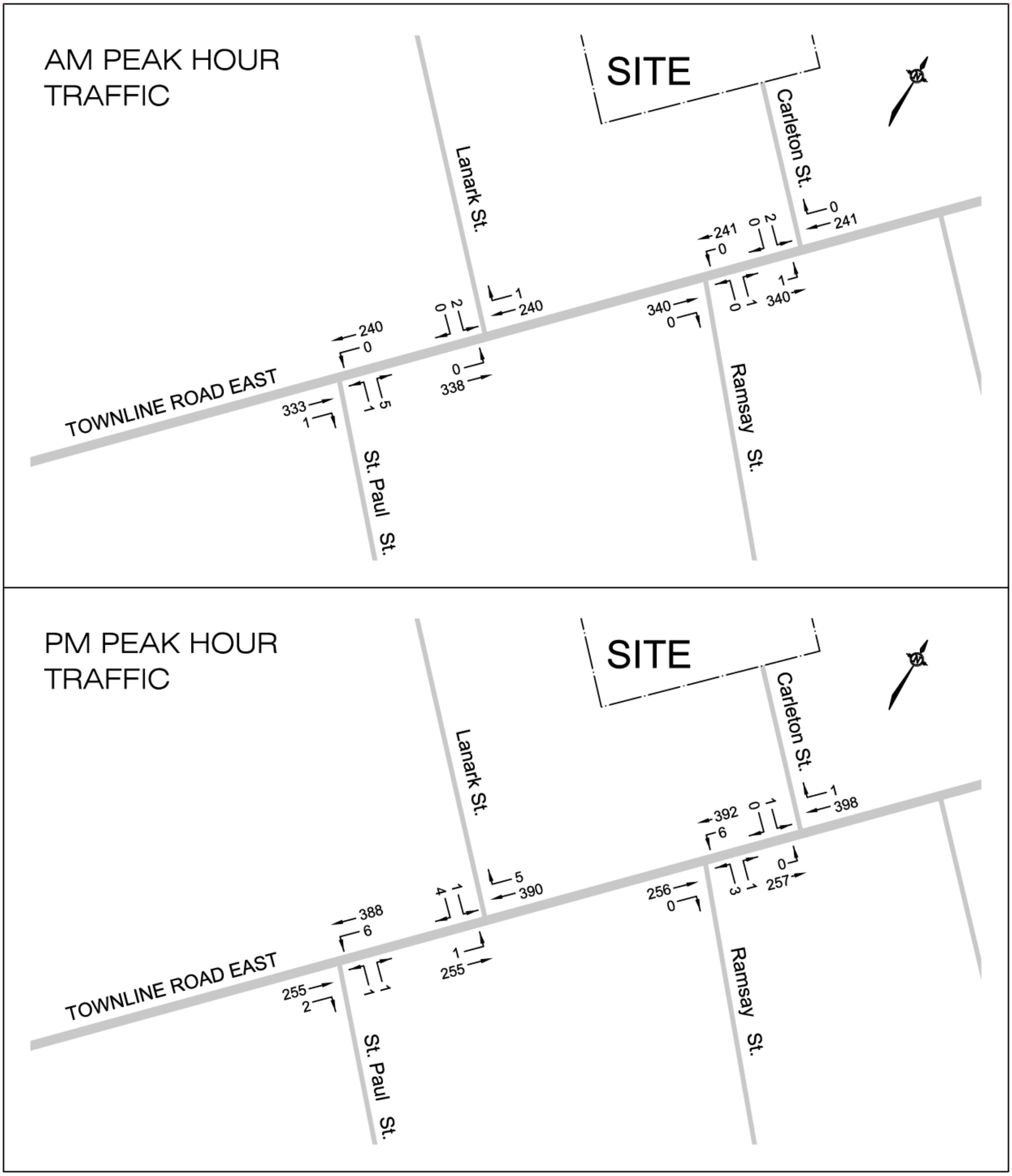


FIGURE 2.1
EXISTING PEAK AM AND PM HOUR TRAFFIC COUNTS



NOT TO SCALE

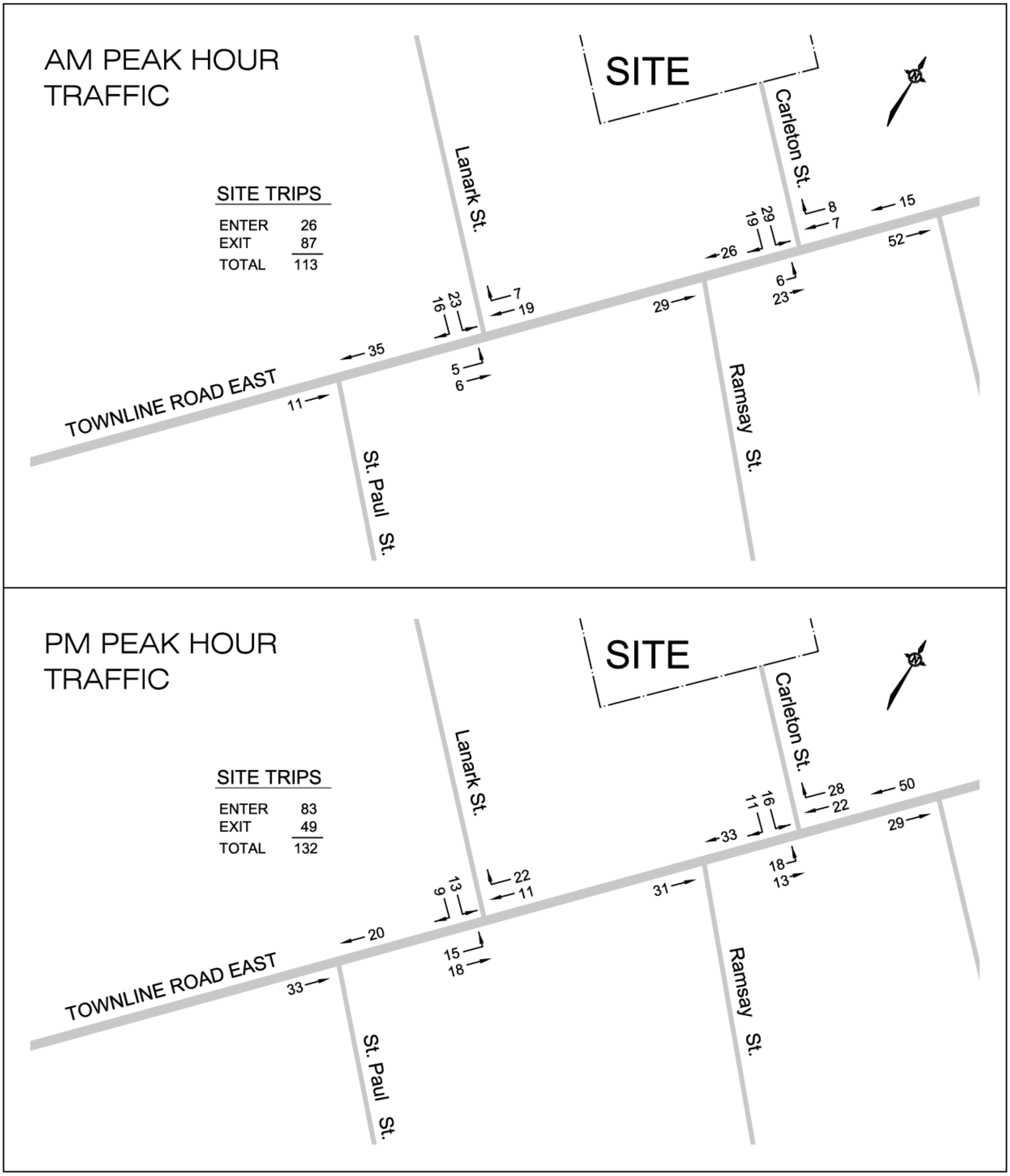
Townline and Edmund Street
Townline (Eastbound)
August 23rd 2023

Vehicles

Time	Eastbound			Westbound			Northbound			Southbound			Total
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
8:00	1	48	0	0	33	0	0	0	0	1	0	1	84
Heavy %	0%	2%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	
8:15	1	56	0	1	46	0	0	0	0	3	0	2	109
Heavy %	0%	4%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%	
8:30	4	79	0	0	44	1	1	0	0	4	0	2	135
Heavy %	0%	3%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%	
8:45	5	71	0	0	47	2	0	0	1	2	0	3	131
Heavy %	0%	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	
9:00	5	60	0	0	34	5	0	0	0	3	1	3	111
Heavy %	0%	2%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	
9:15	3	53	0	0	50	4	0	0	1	3	0	5	119
Heavy %	33%	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	
9:30	3	66	1	1	36	2	0	1	1	0	1	0	112
Heavy %	0%	5%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%	
9:45	1	47	0	0	38	2	1	1	1	1	0	4	96
Heavy %	0%	2%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	
3:00	1	61	0	1	81	1	1	0	1	3	2	2	154
Heavy %	0%	3%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	
3:15	2	79	0	1	82	2	0	0	0	0	0	3	169
Heavy %	50%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
3:30	3	64	0	2	129	0	1	0	2	5	0	2	208
Heavy %	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	
3:45	2	60	1	0	91	6	0	0	0	4	0	2	166
Heavy %	0%	0%	0%	0%	0%	17%	0%	0%	0%	0%	0%	0%	
4:00	3	87	1	2	122	1	0	0	2	5	1	3	227
Heavy %	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	
4:15	1	79	0	1	101	2	0	0	1	2	0	3	190
Heavy %	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
4:30	1	65	0	1	92	1	0	0	0	1	0	2	163
Heavy %	0%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	
4:45	2	68	0	0	89	2	1	0	1	2	1	3	169
Heavy %	0%	3%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	

EXHIBIT B – TRAFFIC DATA (BACKGROUND DEVELOPMENT)

FIGURE 4.1
PEAK AM AND PM HOUR SITE GENERATED TRIPS

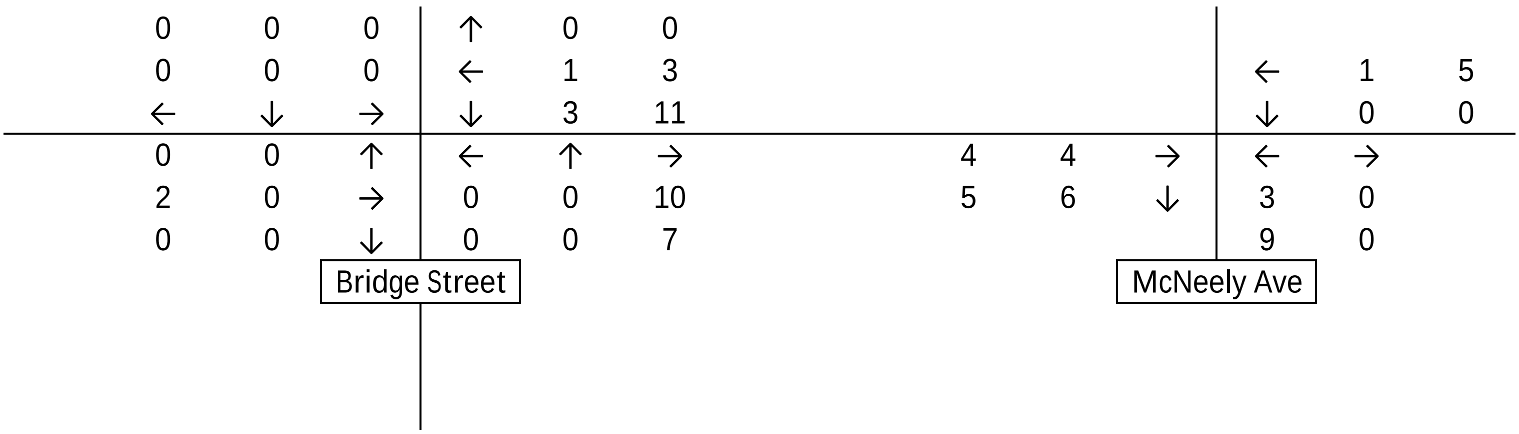


NOT TO SCALE

Development Generated Trip Assignment

AM Peak XX

PM Peak XX



APPENDIX C: CAPACITY ANALYSIS RESULTS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	243	102	78	167	15	100	48	76	40	71	10
Future Volume (vph)	10	243	102	78	167	15	100	48	76	40	71	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	119.0		40.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (m)	7.5			10.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.956				0.850		0.954			0.989	
Flt Protected	0.950			0.950				0.978			0.984	
Satd. Flow (prot)	1770	1781	0	1770	1863	1583	0	1738	0	0	1813	0
Flt Permitted	0.643			0.376				0.800			0.841	
Satd. Flow (perm)	1198	1781	0	700	1863	1583	0	1422	0	0	1549	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38				44		45			8	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		336.7			176.5			231.3			144.8	
Travel Time (s)		30.3			15.9			16.7			10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	264	111	85	182	16	109	52	83	43	77	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	375	0	85	182	16	0	244	0	0	131	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	26.2	26.2		9.5	26.2	26.2	23.2	23.2		23.4	23.4	
Total Split (s)	26.2	26.2		9.5	35.7	35.7	24.3	24.3		24.3	24.3	
Total Split (%)	43.7%	43.7%		15.8%	59.5%	59.5%	40.5%	40.5%		40.5%	40.5%	
Maximum Green (s)	20.0	20.0		6.5	29.5	29.5	19.1	19.1		18.9	18.9	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.3	3.3		3.0	3.0	
All-Red Time (s)	3.2	3.2		0.0	3.2	3.2	1.9	1.9		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2		3.0	6.2	6.2		5.2			5.4	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0		0	0	
Act Effct Green (s)	20.1	20.1		30.6	27.4	27.4		19.2			19.0	
Actuated g/C Ratio	0.35	0.35		0.53	0.47	0.47		0.33			0.33	
v/c Ratio	0.03	0.59		0.18	0.21	0.02		0.49			0.26	
Control Delay	13.8	19.1		7.5	9.5	0.9		17.3			16.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	13.8	19.1		7.5	9.5	0.9		17.3			16.1	
LOS	B	B		A	A	A		B			B	
Approach Delay		18.9			8.4			17.3			16.1	
Approach LOS		B			A			B			B	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 58

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

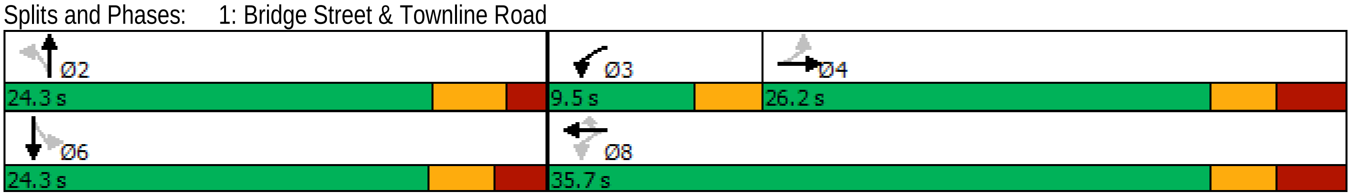
Maximum v/c Ratio: 0.59

Intersection Signal Delay: 15.3 Intersection LOS: B

Intersection Capacity Utilization 67.0% ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Bridge Street & Townline Road

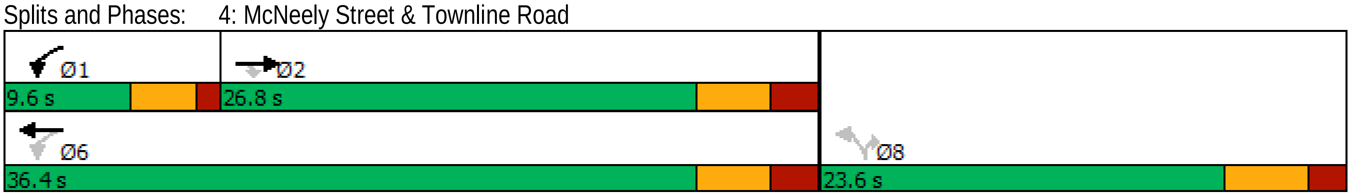


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	132	250	222	139	177	197
Future Volume (vph)	132	250	222	139	177	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	38.0		0.0	45.0
Storage Lanes		1	1		1	1
Taper Length (m)			74.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.561		0.950	
Satd. Flow (perm)	1863	1583	1045	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		272				214
Link Speed (k/h)	50			50	60	
Link Distance (m)	517.7			311.7	615.9	
Travel Time (s)	37.3			22.4	37.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	143	272	241	151	192	214
Shared Lane Traffic (%)						
Lane Group Flow (vph)	143	272	241	151	192	214
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes					
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases		2	6		8	8

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.0	24.0	9.5	24.0	23.5	23.5
Total Split (s)	26.8	26.8	9.6	36.4	23.6	23.6
Total Split (%)	44.7%	44.7%	16.0%	60.7%	39.3%	39.3%
Maximum Green (s)	21.3	21.3	5.6	30.9	18.1	18.1
Yellow Time (s)	3.3	3.3	3.0	3.3	3.7	3.7
All-Red Time (s)	2.2	2.2	1.0	2.2	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	None	Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	21.3	21.3	32.4	30.9	11.8	11.8
Actuated g/C Ratio	0.40	0.40	0.60	0.58	0.22	0.22
v/c Ratio	0.19	0.34	0.34	0.14	0.49	0.42
Control Delay	12.1	3.4	6.9	6.2	23.1	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.1	3.4	6.9	6.2	23.1	5.9
LOS	B	A	A	A	C	A
Approach Delay	6.4			6.6	14.0	
Approach LOS	A			A	B	

Intersection Summary	
Area Type: Other	
Cycle Length: 60	
Actuated Cycle Length: 53.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 42.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: McNeely Street & Townline Road



Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	323	0	0	235	12	1	0	2	12	1	13
Future Vol, veh/h	17	323	0	0	235	12	1	0	2	12	1	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	31	-	-	39	-	17	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	351	0	0	255	13	1	0	2	13	1	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	268	0	0	351	0	0	656	655	351	643	642	255
Stage 1	-	-	-	-	-	-	387	387	-	255	255	-
Stage 2	-	-	-	-	-	-	269	268	-	388	387	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1296	-	-	1208	-	-	379	386	692	386	392	784
Stage 1	-	-	-	-	-	-	637	610	-	749	696	-
Stage 2	-	-	-	-	-	-	737	687	-	636	610	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1296	-	-	1208	-	-	367	381	692	381	387	784
Mov Cap-2 Maneuver	-	-	-	-	-	-	367	381	-	381	387	-
Stage 1	-	-	-	-	-	-	628	601	-	739	696	-
Stage 2	-	-	-	-	-	-	723	687	-	625	601	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	11.8	12.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	534	1296	-	-	1208	-	-	513
HCM Lane V/C Ratio	0.006	0.014	-	-	-	-	-	0.055
HCM Control Delay (s)	11.8	7.8	-	-	0	-	-	12.4
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	346	246	1	2	0
Future Vol, veh/h	0	346	246	1	2	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	376	267	1	2	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	268	0	-	0	644	268
Stage 1	-	-	-	-	268	-
Stage 2	-	-	-	-	376	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1296	-	-	-	437	771
Stage 1	-	-	-	-	777	-
Stage 2	-	-	-	-	694	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1296	-	-	-	437	771
Mov Cap-2 Maneuver	-	-	-	-	532	-
Stage 1	-	-	-	-	777	-
Stage 2	-	-	-	-	694	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1296	-	-	-	532
HCM Lane V/C Ratio	-	-	-	-	0.004
HCM Control Delay (s)	0	-	-	-	11.8
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	8:25	8:25	8:25	8:25	8:25	8:25
End Time	9:45	9:45	9:45	9:45	9:45	9:45
Total Time (min)	80	80	80	80	80	80
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	1503	1543	1502	1501	1484	1508
Vehs Exited	1500	1538	1523	1505	1482	1508
Starting Vehs	48	48	59	55	37	49
Ending Vehs	51	53	38	51	39	44
Travel Distance (km)	1774	1846	1814	1763	1780	1795
Travel Time (hr)	46.4	48.3	47.6	46.0	46.2	46.9
Total Delay (hr)	7.7	8.3	8.4	7.8	7.6	8.0
Total Stops	1298	1357	1363	1263	1271	1310
Fuel Used (l)	140.3	147.4	144.1	139.8	139.9	142.3

Interval #0 Information Seeding

Start Time	8:25
End Time	8:45
Total Time (min)	20

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	8:45
End Time	9:45
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1503	1543	1502	1501	1484	1508
Vehs Exited	1500	1538	1523	1505	1482	1508
Starting Vehs	48	48	59	55	37	49
Ending Vehs	51	53	38	51	39	44
Travel Distance (km)	1774	1846	1814	1763	1780	1795
Travel Time (hr)	46.4	48.3	47.6	46.0	46.2	46.9
Total Delay (hr)	7.7	8.3	8.4	7.8	7.6	8.0
Total Stops	1298	1357	1363	1263	1271	1310
Fuel Used (l)	140.3	147.4	144.1	139.8	139.9	142.3

Intersection: 1: Bridge Street & Townline Road

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	R	LTR	LTR
Maximum Queue (m)	13.0	66.9	22.1	37.3	9.2	45.9	25.7
Average Queue (m)	1.8	31.7	11.1	16.5	2.4	20.7	10.7
95th Queue (m)	8.1	55.6	20.2	30.8	8.8	37.8	21.3
Link Distance (m)	327.7	327.7		158.8		220.6	129.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			119.0		40.0		
Storage Blk Time (%)				0			
Queuing Penalty (veh)				0			

Intersection: 2: Edmund Street & Townline Road

Movement	EB	NB	SB
Directions Served	L	LTR	LTR
Maximum Queue (m)	8.9	9.0	7.9
Average Queue (m)	1.0	0.7	3.8
95th Queue (m)	5.5	4.8	9.1
Link Distance (m)		297.5	217.5
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	31.0		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Townline Road & Lanark Street

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	1.8	7.2
Average Queue (m)	0.1	0.7
95th Queue (m)	1.6	4.5
Link Distance (m)	21.3	303.5
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: McNeely Street & Townline Road

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	R	L	T	L	R
Maximum Queue (m)	31.0	38.3	35.5	24.8	46.7	24.3
Average Queue (m)	13.0	16.9	18.3	9.7	21.9	12.5
95th Queue (m)	26.1	30.2	32.4	20.9	38.5	21.7
Link Distance (m)	499.0	499.0		300.2	601.9	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			38.0			45.0
Storage Blk Time (%)			0		0	
Queuing Penalty (veh)			0		1	

Network Summary

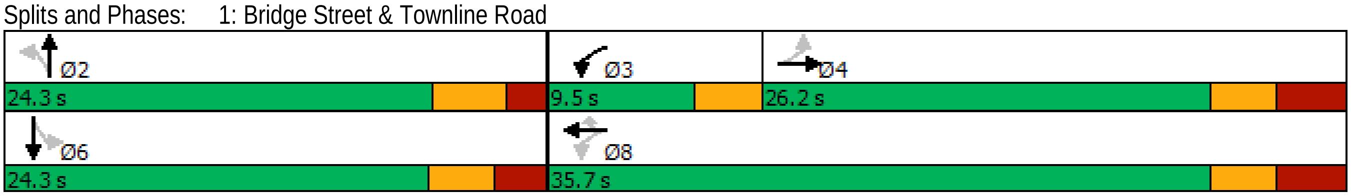
Network wide Queuing Penalty: 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	142	95	130	219	70	107	96	103	31	75	6
Future Volume (vph)	6	142	95	130	219	70	107	96	103	31	75	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	119.0		40.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (m)	7.5			10.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.940				0.850		0.954			0.992	
Flt Protected	0.950			0.950				0.983			0.986	
Satd. Flow (prot)	1770	1751	0	1770	1863	1583	0	1747	0	0	1822	0
Flt Permitted	0.611			0.516				0.837			0.870	
Satd. Flow (perm)	1138	1751	0	961	1863	1583	0	1487	0	0	1608	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		60				76		45			5	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		336.7			176.5			231.3			144.8	
Travel Time (s)		30.3			15.9			16.7			10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	154	103	141	238	76	116	104	112	34	82	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	257	0	141	238	76	0	332	0	0	123	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	26.2	26.2		9.5	26.2	26.2	23.2	23.2		23.4	23.4	
Total Split (s)	26.2	26.2		9.5	35.7	35.7	24.3	24.3		24.3	24.3	
Total Split (%)	43.7%	43.7%		15.8%	59.5%	59.5%	40.5%	40.5%		40.5%	40.5%	
Maximum Green (s)	20.0	20.0		6.5	29.5	29.5	19.1	19.1		18.9	18.9	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.3	3.3		3.0	3.0	
All-Red Time (s)	3.2	3.2		0.0	3.2	3.2	1.9	1.9		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2		3.0	6.2	6.2		5.2			5.4	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0		0	0	
Act Effct Green (s)	20.1	20.1		30.7	27.5	27.5		19.2			19.0	
Actuated g/C Ratio	0.35	0.35		0.53	0.47	0.47		0.33			0.33	
v/c Ratio	0.02	0.40		0.24	0.27	0.10		0.64			0.23	
Control Delay	13.7	13.8		7.9	10.0	2.8		21.7			16.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	13.7	13.8		7.9	10.0	2.8		21.7			16.2	
LOS	B	B		A	B	A		C			B	
Approach Delay		13.8			8.2			21.7			16.2	
Approach LOS		B			A			C			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 60	
Actuated Cycle Length: 58.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 14.1	Intersection LOS: B
Intersection Capacity Utilization 71.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Bridge Street & Townline Road

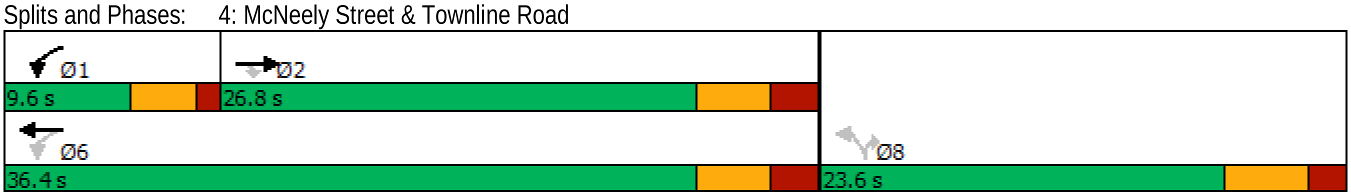


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	148	213	299	193	299	342
Future Volume (vph)	148	213	299	193	299	342
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	38.0		0.0	45.0
Storage Lanes		1	1		1	1
Taper Length (m)			74.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.552		0.950	
Satd. Flow (perm)	1863	1583	1028	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		232				372
Link Speed (k/h)	50			50	60	
Link Distance (m)	517.7			311.7	615.9	
Travel Time (s)	37.3			22.4	37.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	161	232	325	210	325	372
Shared Lane Traffic (%)						
Lane Group Flow (vph)	161	232	325	210	325	372
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes					
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases		2	6		8	8

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.0	24.0	9.5	24.0	23.5	23.5
Total Split (s)	26.8	26.8	9.6	36.4	23.6	23.6
Total Split (%)	44.7%	44.7%	16.0%	60.7%	39.3%	39.3%
Maximum Green (s)	21.3	21.3	5.6	30.9	18.1	18.1
Yellow Time (s)	3.3	3.3	3.0	3.3	3.7	3.7
All-Red Time (s)	2.2	2.2	1.0	2.2	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	None	Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	21.4	21.4	32.5	31.0	14.8	14.8
Actuated g/C Ratio	0.38	0.38	0.57	0.55	0.26	0.26
v/c Ratio	0.23	0.31	0.49	0.21	0.71	0.54
Control Delay	14.1	3.7	10.2	8.0	28.1	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	3.7	10.2	8.0	28.1	5.5
LOS	B	A	B	A	C	A
Approach Delay	7.9			9.3	16.1	
Approach LOS	A			A	B	

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 56.8	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 11.9	Intersection LOS: B
Intersection Capacity Utilization 54.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: McNeely Street & Townline Road



Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	290	2	5	443	9	1	0	5	16	1	10
Future Vol, veh/h	9	290	2	5	443	9	1	0	5	16	1	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	31	-	-	39	-	17	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	315	2	5	482	10	1	0	5	17	1	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	492	0	0	317	0	0	839	838	316	831	829	482
Stage 1	-	-	-	-	-	-	336	336	-	492	492	-
Stage 2	-	-	-	-	-	-	503	502	-	339	337	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1071	-	-	1243	-	-	285	302	724	289	306	584
Stage 1	-	-	-	-	-	-	678	642	-	558	548	-
Stage 2	-	-	-	-	-	-	551	542	-	676	641	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1071	-	-	1243	-	-	276	298	724	284	302	584
Mov Cap-2 Maneuver	-	-	-	-	-	-	276	298	-	284	302	-
Stage 1	-	-	-	-	-	-	672	636	-	553	546	-
Stage 2	-	-	-	-	-	-	537	540	-	665	635	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.1	11.4	16.2
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	570	1071	-	-	1243	-	-	352
HCM Lane V/C Ratio	0.011	0.009	-	-	0.004	-	-	0.083
HCM Control Delay (s)	11.4	8.4	-	-	7.9	-	-	16.2
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.3

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	321	460	5	1	4
Future Vol, veh/h	1	321	460	5	1	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	349	500	5	1	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	505	0	-	0	854	503
Stage 1	-	-	-	-	503	-
Stage 2	-	-	-	-	351	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1060	-	-	-	329	569
Stage 1	-	-	-	-	607	-
Stage 2	-	-	-	-	713	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1060	-	-	-	329	569
Mov Cap-2 Maneuver	-	-	-	-	447	-
Stage 1	-	-	-	-	606	-
Stage 2	-	-	-	-	713	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1060	-	-	-	540
HCM Lane V/C Ratio	0.001	-	-	-	0.01
HCM Control Delay (s)	8.4	0	-	-	11.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	3:10	3:10	3:10	3:10	3:10	3:10
End Time	4:30	4:30	4:30	4:30	4:30	4:30
Total Time (min)	80	80	80	80	80	80
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	1915	1831	1956	1800	1912	1883
Vehs Exited	1918	1844	1944	1804	1911	1886
Starting Vehs	73	62	55	63	55	58
Ending Vehs	70	49	67	59	56	61
Travel Distance (km)	2302	2203	2347	2133	2255	2248
Travel Time (hr)	61.3	58.9	62.7	56.8	59.9	59.9
Total Delay (hr)	11.9	11.5	12.3	10.7	11.5	11.6
Total Stops	1742	1689	1770	1596	1733	1705
Fuel Used (l)	180.7	174.8	184.4	168.3	178.2	177.3

Interval #0 Information Seeding

Start Time	3:10
End Time	3:30
Total Time (min)	20

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	3:30
End Time	4:30
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1915	1831	1956	1800	1912	1883
Vehs Exited	1918	1844	1944	1804	1911	1886
Starting Vehs	73	62	55	63	55	58
Ending Vehs	70	49	67	59	56	61
Travel Distance (km)	2302	2203	2347	2133	2255	2248
Travel Time (hr)	61.3	58.9	62.7	56.8	59.9	59.9
Total Delay (hr)	11.9	11.5	12.3	10.7	11.5	11.6
Total Stops	1742	1689	1770	1596	1733	1705
Fuel Used (l)	180.7	174.8	184.4	168.3	178.2	177.3

Intersection: 1: Bridge Street & Townline Road

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	R	LTR	LTR
Maximum Queue (m)	9.9	48.4	27.8	47.1	18.9	53.9	26.0
Average Queue (m)	1.2	24.2	14.6	21.3	6.9	27.9	11.1
95th Queue (m)	6.2	41.7	25.2	39.0	16.1	45.6	21.3
Link Distance (m)	327.7	327.7		158.8		220.6	129.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			119.0		40.0		
Storage Blk Time (%)				1			
Queuing Penalty (veh)				1			

Intersection: 2: Edmund Street & Townline Road

Movement	EB	WB	WB	NB	SB
Directions Served	L	L	R	LTR	LTR
Maximum Queue (m)	8.9	7.2	1.3	9.1	10.4
Average Queue (m)	0.7	0.4	0.1	1.4	4.1
95th Queue (m)	4.7	3.5	1.3	6.7	9.7
Link Distance (m)				297.5	217.5
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)	31.0	39.0	17.0		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Townline Road & Lanark Street

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	5.4	9.1
Average Queue (m)	0.2	1.3
95th Queue (m)	2.3	6.4
Link Distance (m)	21.3	303.5
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: McNeely Street & Townline Road

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	R	L	T	L	R
Maximum Queue (m)	37.2	33.5	48.0	34.3	69.1	51.1
Average Queue (m)	15.3	15.4	26.6	13.4	36.6	22.4
95th Queue (m)	29.2	26.8	43.5	26.4	57.9	39.3
Link Distance (m)	499.0	499.0		300.2	601.9	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			38.0			45.0
Storage Blk Time (%)			2	0	4	0
Queuing Penalty (veh)			4	0	13	0

Network Summary

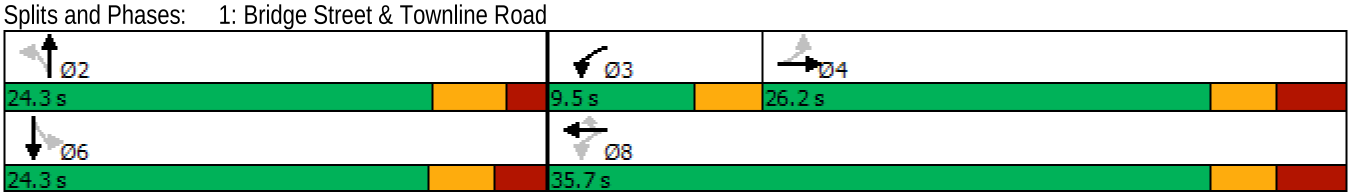
Network wide Queuing Penalty: 18

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	270	110	98	205	16	108	52	95	43	76	11
Future Volume (vph)	11	270	110	98	205	16	108	52	95	43	76	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	119.0		40.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (m)	7.5			10.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.956				0.850		0.950			0.989	
Flt Protected	0.950			0.950				0.979			0.984	
Satd. Flow (prot)	1770	1781	0	1770	1863	1583	0	1732	0	0	1813	0
Flt Permitted	0.619			0.333				0.819			0.848	
Satd. Flow (perm)	1153	1781	0	620	1863	1583	0	1449	0	0	1562	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		37				44		52			8	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		336.7			176.5			231.3			144.8	
Travel Time (s)		30.3			15.9			16.7			10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	293	120	107	223	17	117	57	103	47	83	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	413	0	107	223	17	0	277	0	0	142	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	26.2	26.2		9.5	26.2	26.2	23.2	23.2		23.4	23.4	
Total Split (s)	26.2	26.2		9.5	35.7	35.7	24.3	24.3		24.3	24.3	
Total Split (%)	43.7%	43.7%		15.8%	59.5%	59.5%	40.5%	40.5%		40.5%	40.5%	
Maximum Green (s)	20.0	20.0		6.5	29.5	29.5	19.1	19.1		18.9	18.9	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.3	3.3		3.0	3.0	
All-Red Time (s)	3.2	3.2		0.0	3.2	3.2	1.9	1.9		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2		3.0	6.2	6.2		5.2			5.4	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0		0	0	
Act Effct Green (s)	20.1	20.1		30.7	27.5	27.5		19.2			19.0	
Actuated g/C Ratio	0.35	0.35		0.53	0.47	0.47		0.33			0.33	
v/c Ratio	0.03	0.65		0.24	0.25	0.02		0.54			0.28	
Control Delay	13.9	20.8		8.0	9.9	1.1		18.2			16.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	13.9	20.8		8.0	9.9	1.1		18.2			16.4	
LOS	B	C		A	A	A		B			B	
Approach Delay		20.6			8.9			18.2			16.4	
Approach LOS		C			A			B			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 60	
Actuated Cycle Length: 58.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 16.1	Intersection LOS: B
Intersection Capacity Utilization 69.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Bridge Street & Townline Road



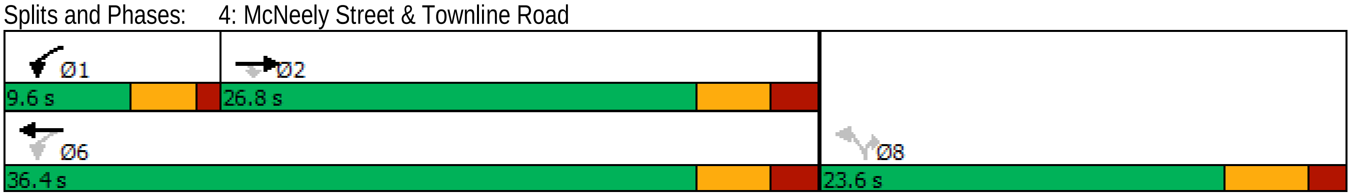
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	163	310	238	154	208	215
Future Volume (vph)	163	310	238	154	208	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	38.0		0.0	45.0
Storage Lanes		1	1		1	1
Taper Length (m)			74.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.544		0.950	
Satd. Flow (perm)	1863	1583	1013	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		337				234
Link Speed (k/h)	50			50	60	
Link Distance (m)	517.7			311.7	615.9	
Travel Time (s)	37.3			22.4	37.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	177	337	259	167	226	234
Shared Lane Traffic (%)						
Lane Group Flow (vph)	177	337	259	167	226	234
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes					
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases		2	6		8	8

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.0	24.0	9.5	24.0	23.5	23.5
Total Split (s)	26.8	26.8	9.6	36.4	23.6	23.6
Total Split (%)	44.7%	44.7%	16.0%	60.7%	39.3%	39.3%
Maximum Green (s)	21.3	21.3	5.6	30.9	18.1	18.1
Yellow Time (s)	3.3	3.3	3.0	3.3	3.7	3.7
All-Red Time (s)	2.2	2.2	1.0	2.2	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	None	Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	21.4	21.4	32.5	31.0	12.6	12.6
Actuated g/C Ratio	0.39	0.39	0.60	0.57	0.23	0.23
v/c Ratio	0.24	0.41	0.38	0.16	0.56	0.43
Control Delay	13.1	3.6	7.7	6.8	24.0	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.1	3.6	7.7	6.8	24.0	5.6
LOS	B	A	A	A	C	A
Approach Delay	6.9			7.4	14.7	
Approach LOS	A			A	B	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 54.6
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 9.6 Intersection LOS: A
Intersection Capacity Utilization 45.8% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: McNeely Street & Townline Road



Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	369	0	0	292	13	1	0	2	12	1	13
Future Vol, veh/h	18	369	0	0	292	13	1	0	2	12	1	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	31	-	-	39	-	17	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	20	401	0	0	317	14	1	0	2	13	1	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	331	0	0	401	0	0	773	772	401	759	758	317
Stage 1	-	-	-	-	-	-	441	441	-	317	317	-
Stage 2	-	-	-	-	-	-	332	331	-	442	441	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1228	-	-	1158	-	-	316	330	649	323	336	724
Stage 1	-	-	-	-	-	-	595	577	-	694	654	-
Stage 2	-	-	-	-	-	-	681	645	-	594	577	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1228	-	-	1158	-	-	305	325	649	318	331	724
Mov Cap-2 Maneuver	-	-	-	-	-	-	305	325	-	318	331	-
Stage 1	-	-	-	-	-	-	585	568	-	683	654	-
Stage 2	-	-	-	-	-	-	667	645	-	582	568	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	12.7	13.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	472	1228	-	-	1158	-	-	443
HCM Lane V/C Ratio	0.007	0.016	-	-	-	-	-	0.064
HCM Control Delay (s)	12.7	8	-	-	0	-	-	13.7
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	389	288	8	25	16
Future Vol, veh/h	5	389	288	8	25	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	423	313	9	27	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	322	0	-	0	751	318
Stage 1	-	-	-	-	318	-
Stage 2	-	-	-	-	433	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1238	-	-	-	378	723
Stage 1	-	-	-	-	738	-
Stage 2	-	-	-	-	654	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1238	-	-	-	376	723
Mov Cap-2 Maneuver	-	-	-	-	486	-
Stage 1	-	-	-	-	734	-
Stage 2	-	-	-	-	654	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1238	-	-	-	557
HCM Lane V/C Ratio	0.004	-	-	-	0.08
HCM Control Delay (s)	7.9	0	-	-	12
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	8:25	8:25	8:25	8:25	8:25	8:25
End Time	9:45	9:45	9:45	9:45	9:45	9:45
Total Time (min)	80	80	80	80	80	80
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	1700	1757	1715	1706	1709	1717
Vehs Exited	1712	1757	1730	1718	1713	1725
Starting Vehs	65	51	66	57	58	58
Ending Vehs	53	51	51	45	54	50
Travel Distance (km)	2084	2150	2062	2052	2063	2082
Travel Time (hr)	55.5	57.4	54.7	54.5	54.2	55.3
Total Delay (hr)	10.1	10.6	9.9	9.7	9.5	10.0
Total Stops	1609	1633	1606	1595	1516	1590
Fuel Used (l)	167.3	172.5	164.6	164.0	164.6	166.6

Interval #0 Information Seeding

Start Time	8:25
End Time	8:45
Total Time (min)	20

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	8:45
End Time	9:45
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1700	1757	1715	1706	1709	1717
Vehs Exited	1712	1757	1730	1718	1713	1725
Starting Vehs	65	51	66	57	58	58
Ending Vehs	53	51	51	45	54	50
Travel Distance (km)	2084	2150	2062	2052	2063	2082
Travel Time (hr)	55.5	57.4	54.7	54.5	54.2	55.3
Total Delay (hr)	10.1	10.6	9.9	9.7	9.5	10.0
Total Stops	1609	1633	1606	1595	1516	1590
Fuel Used (l)	167.3	172.5	164.6	164.0	164.6	166.6

Intersection: 1: Bridge Street & Townline Road

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	R	LTR	LTR
Maximum Queue (m)	11.7	77.7	30.6	50.1	10.6	50.3	27.5
Average Queue (m)	2.5	36.3	13.3	19.3	2.3	23.7	11.5
95th Queue (m)	9.2	62.1	24.3	36.9	9.0	41.4	22.7
Link Distance (m)	327.7	327.7		158.8		220.6	129.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			119.0		40.0		
Storage Blk Time (%)				0			
Queuing Penalty (veh)				0			

Intersection: 2: Edmund Street & Townline Road

Movement	EB	NB	SB
Directions Served	L	LTR	LTR
Maximum Queue (m)	10.4	9.1	10.4
Average Queue (m)	1.3	0.9	3.8
95th Queue (m)	6.8	5.2	9.5
Link Distance (m)		297.5	217.5
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	31.0		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Townline Road & Lanark Street

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	1.8	15.7
Average Queue (m)	0.1	7.7
95th Queue (m)	1.3	15.0
Link Distance (m)	21.3	303.5
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: McNeely Street & Townline Road

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	R	L	T	L	R
Maximum Queue (m)	34.4	39.6	43.4	27.9	47.0	29.6
Average Queue (m)	17.1	20.2	21.5	10.5	24.4	13.5
95th Queue (m)	31.9	34.4	35.6	23.2	41.0	23.5
Link Distance (m)	499.0	499.0		300.2	601.9	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			38.0			45.0
Storage Blk Time (%)			1		0	
Queuing Penalty (veh)			1		1	

Network Summary

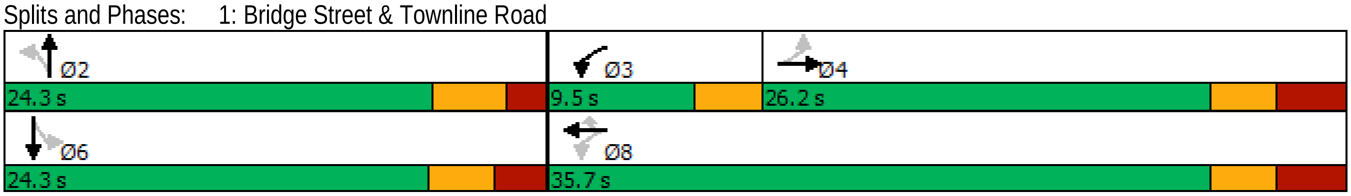
Network wide Queuing Penalty: 2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	188	102	160	250	75	115	103	118	33	81	6
Future Volume (vph)	6	188	102	160	250	75	115	103	118	33	81	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	119.0		40.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (m)	7.5			10.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.947				0.850		0.953			0.993	
Flt Protected	0.950			0.950				0.983			0.986	
Satd. Flow (prot)	1770	1764	0	1770	1863	1583	0	1745	0	0	1824	0
Flt Permitted	0.592			0.446				0.846			0.860	
Satd. Flow (perm)	1103	1764	0	831	1863	1583	0	1502	0	0	1591	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		49				82		48			5	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		336.7			176.5			231.3			144.8	
Travel Time (s)		30.3			15.9			16.7			10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	204	111	174	272	82	125	112	128	36	88	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	315	0	174	272	82	0	365	0	0	131	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	26.2	26.2		9.5	26.2	26.2	23.2	23.2		23.4	23.4	
Total Split (s)	26.2	26.2		9.5	35.7	35.7	24.3	24.3		24.3	24.3	
Total Split (%)	43.7%	43.7%		15.8%	59.5%	59.5%	40.5%	40.5%		40.5%	40.5%	
Maximum Green (s)	20.0	20.0		6.5	29.5	29.5	19.1	19.1		18.9	18.9	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.3	3.3		3.0	3.0	
All-Red Time (s)	3.2	3.2		0.0	3.2	3.2	1.9	1.9		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2		3.0	6.2	6.2		5.2			5.4	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0		0	0	
Act Effct Green (s)	20.1	20.1		30.7	27.5	27.5		19.2			19.0	
Actuated g/C Ratio	0.35	0.35		0.53	0.47	0.47		0.33			0.33	
v/c Ratio	0.02	0.49		0.32	0.31	0.10		0.69			0.25	
Control Delay	13.7	16.4		8.7	10.4	2.7		24.1			16.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	13.7	16.4		8.7	10.4	2.7		24.1			16.4	
LOS	B	B		A	B	A		C			B	
Approach Delay		16.3			8.7			24.1			16.4	
Approach LOS		B			A			C			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 60	
Actuated Cycle Length: 58.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 15.4	Intersection LOS: B
Intersection Capacity Utilization 73.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Bridge Street & Townline Road

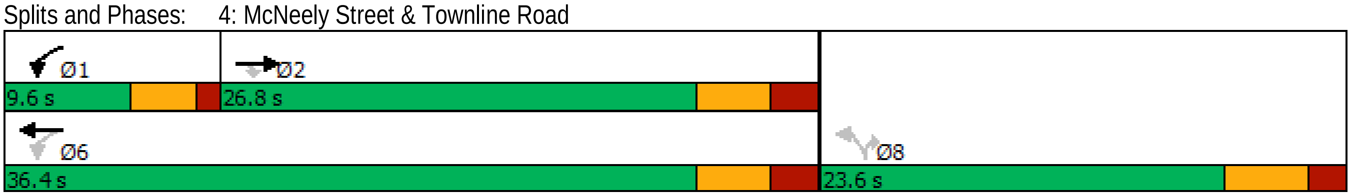


	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰	↱
Traffic Volume (vph)	172	254	322	238	361	374
Future Volume (vph)	172	254	322	238	361	374
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	38.0		0.0	45.0
Storage Lanes		1	1		1	1
Taper Length (m)			74.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.539		0.950	
Satd. Flow (perm)	1863	1583	1004	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		276				407
Link Speed (k/h)	50			50	60	
Link Distance (m)	517.7			311.7	615.9	
Travel Time (s)	37.3			22.4	37.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	187	276	350	259	392	407
Shared Lane Traffic (%)						
Lane Group Flow (vph)	187	276	350	259	392	407
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes					
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases		2	6		8	8

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.0	24.0	9.5	24.0	23.5	23.5
Total Split (s)	26.8	26.8	9.6	36.4	23.6	23.6
Total Split (%)	44.7%	44.7%	16.0%	60.7%	39.3%	39.3%
Maximum Green (s)	21.3	21.3	5.6	30.9	18.1	18.1
Yellow Time (s)	3.3	3.3	3.0	3.3	3.7	3.7
All-Red Time (s)	2.2	2.2	1.0	2.2	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	None	Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	21.4	21.4	32.5	31.0	16.2	16.2
Actuated g/C Ratio	0.37	0.37	0.56	0.53	0.28	0.28
v/c Ratio	0.27	0.37	0.55	0.26	0.80	0.56
Control Delay	15.0	3.7	11.8	8.8	33.4	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	3.7	11.8	8.8	33.4	5.4
LOS	B	A	B	A	C	A
Approach Delay	8.3			10.5	19.1	
Approach LOS	A			B	B	

Intersection Summary	
Area Type: Other	
Cycle Length: 60	
Actuated Cycle Length: 58.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 13.6	Intersection LOS: B
Intersection Capacity Utilization 59.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 4: McNeely Street & Townline Road



Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	354	2	5	511	10	1	0	5	16	1	10
Future Vol, veh/h	10	354	2	5	511	10	1	0	5	16	1	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	31	-	-	39	-	17	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	385	2	5	555	11	1	0	5	17	1	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	566	0	0	387	0	0	985	984	386	976	974	555
Stage 1	-	-	-	-	-	-	408	408	-	565	565	-
Stage 2	-	-	-	-	-	-	577	576	-	411	409	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1006	-	-	1171	-	-	227	248	662	230	252	531
Stage 1	-	-	-	-	-	-	620	597	-	510	508	-
Stage 2	-	-	-	-	-	-	502	502	-	618	596	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1006	-	-	1171	-	-	219	244	662	225	248	531
Mov Cap-2 Maneuver	-	-	-	-	-	-	219	244	-	225	248	-
Stage 1	-	-	-	-	-	-	613	590	-	504	506	-
Stage 2	-	-	-	-	-	-	489	500	-	606	589	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.1	12.4	19
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	495	1006	-	-	1171	-	-	287
HCM Lane V/C Ratio	0.013	0.011	-	-	0.005	-	-	0.102
HCM Control Delay (s)	12.4	8.6	-	-	8.1	-	-	19
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.3

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	373	520	27	14	13
Future Vol, veh/h	16	373	520	27	14	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	405	565	29	15	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	594	0	-	0	1019	580
Stage 1	-	-	-	-	580	-
Stage 2	-	-	-	-	439	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	982	-	-	-	263	514
Stage 1	-	-	-	-	560	-
Stage 2	-	-	-	-	650	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	982	-	-	-	257	514
Mov Cap-2 Maneuver	-	-	-	-	387	-
Stage 1	-	-	-	-	548	-
Stage 2	-	-	-	-	650	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	13.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	982	-	-	-	439
HCM Lane V/C Ratio	0.018	-	-	-	0.067
HCM Control Delay (s)	8.7	0	-	-	13.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	3:10	3:10	3:10	3:10	3:10	3:10
End Time	4:30	4:30	4:30	4:30	4:30	4:30
Total Time (min)	80	80	80	80	80	80
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2184	2182	2230	2107	2173	2174
Vehs Exited	2184	2192	2234	2129	2160	2180
Starting Vehs	81	73	81	85	64	77
Ending Vehs	81	63	77	63	77	73
Travel Distance (km)	2662	2676	2709	2549	2646	2648
Travel Time (hr)	72.5	74.3	73.7	69.2	72.3	72.4
Total Delay (hr)	15.1	16.7	15.4	14.3	15.3	15.4
Total Stops	2089	2232	2157	1977	2123	2116
Fuel Used (l)	211.8	215.9	215.1	202.2	210.9	211.2

Interval #0 Information Seeding

Start Time	3:10
End Time	3:30
Total Time (min)	20

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	3:30
End Time	4:30
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2184	2182	2230	2107	2173	2174
Vehs Exited	2184	2192	2234	2129	2160	2180
Starting Vehs	81	73	81	85	64	77
Ending Vehs	81	63	77	63	77	73
Travel Distance (km)	2662	2676	2709	2549	2646	2648
Travel Time (hr)	72.5	74.3	73.7	69.2	72.3	72.4
Total Delay (hr)	15.1	16.7	15.4	14.3	15.3	15.4
Total Stops	2089	2232	2157	1977	2123	2116
Fuel Used (l)	211.8	215.9	215.1	202.2	210.9	211.2

Intersection: 1: Bridge Street & Townline Road

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	R	LTR	LTR
Maximum Queue (m)	8.8	62.9	39.1	44.8	20.4	66.0	29.0
Average Queue (m)	1.0	30.0	18.6	23.6	8.2	33.5	11.9
95th Queue (m)	5.6	51.8	32.1	41.2	18.4	57.7	24.0
Link Distance (m)	327.7	327.7		158.8		220.6	129.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			119.0		40.0		
Storage Blk Time (%)				1			
Queuing Penalty (veh)				2			

Intersection: 2: Edmund Street & Townline Road

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (m)	8.4	7.3	9.1	12.1
Average Queue (m)	1.0	0.6	1.5	4.2
95th Queue (m)	5.7	4.3	6.9	10.1
Link Distance (m)			297.5	217.5
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	31.0	39.0		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Townline Road & Lanark Street

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	27.4	14.4
Average Queue (m)	3.4	5.1
95th Queue (m)	15.4	13.0
Link Distance (m)	21.3	303.5
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	1	
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: McNeely Street & Townline Road

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	R	L	T	L	R
Maximum Queue (m)	40.3	37.2	56.7	41.4	87.4	59.3
Average Queue (m)	19.6	19.3	28.9	17.9	45.4	25.5
95th Queue (m)	33.2	32.2	46.4	34.8	78.4	52.5
Link Distance (m)	499.0	499.0		300.2	601.9	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			38.0			45.0
Storage Blk Time (%)			3	0	9	0
Queuing Penalty (veh)			7	1	32	1

Network Summary

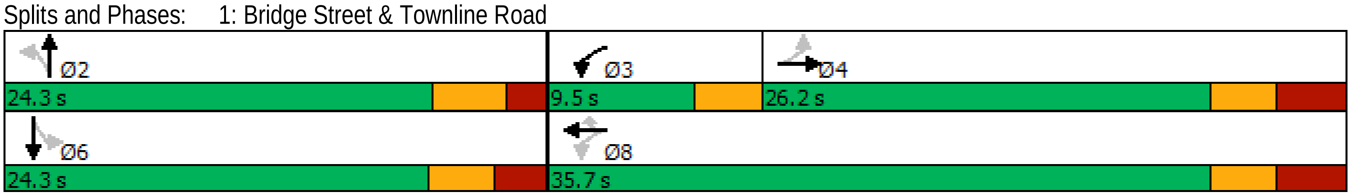
Network wide Queuing Penalty: 44

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	304	124	109	228	18	122	58	106	49	87	12
Future Volume (vph)	12	304	124	109	228	18	122	58	106	49	87	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	119.0		40.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (m)	7.5			10.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.956				0.850		0.950			0.989	
Flt Protected	0.950			0.950				0.979			0.984	
Satd. Flow (prot)	1770	1781	0	1770	1863	1583	0	1732	0	0	1813	0
Flt Permitted	0.605			0.276				0.812			0.833	
Satd. Flow (perm)	1127	1781	0	514	1863	1583	0	1437	0	0	1535	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		37				44		52			8	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		336.7			176.5			231.3			144.8	
Travel Time (s)		30.3			15.9			16.7			10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	330	135	118	248	20	133	63	115	53	95	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	465	0	118	248	20	0	311	0	0	161	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	26.2	26.2		9.5	26.2	26.2	23.2	23.2		23.4	23.4	
Total Split (s)	26.2	26.2		9.5	35.7	35.7	24.3	24.3		24.3	24.3	
Total Split (%)	43.7%	43.7%		15.8%	59.5%	59.5%	40.5%	40.5%		40.5%	40.5%	
Maximum Green (s)	20.0	20.0		6.5	29.5	29.5	19.1	19.1		18.9	18.9	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.3	3.3		3.0	3.0	
All-Red Time (s)	3.2	3.2		0.0	3.2	3.2	1.9	1.9		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2		3.0	6.2	6.2		5.2			5.4	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0		0	0	
Act Effct Green (s)	20.1	20.1		30.7	27.5	27.5		19.2			19.0	
Actuated g/C Ratio	0.35	0.35		0.53	0.47	0.47		0.33			0.33	
v/c Ratio	0.03	0.73		0.29	0.28	0.03		0.61			0.32	
Control Delay	13.9	24.5		8.6	10.1	1.3		20.3			17.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	13.9	24.5		8.6	10.1	1.3		20.3			17.0	
LOS	B	C		A	B	A		C			B	
Approach Delay		24.2			9.2			20.3			17.0	
Approach LOS		C			A			C			B	

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 58.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 18.1	Intersection LOS: B
Intersection Capacity Utilization 71.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Bridge Street & Townline Road

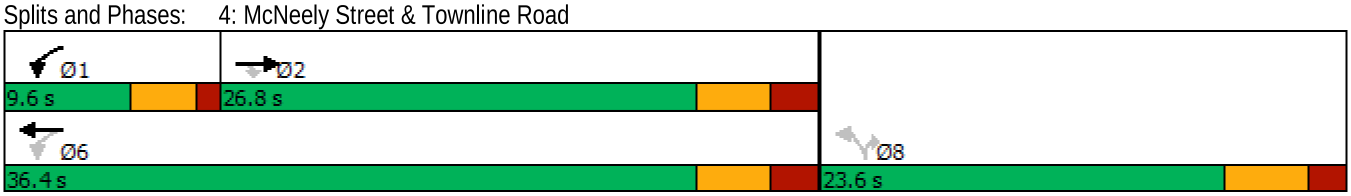


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	182	346	270	173	239	250
Future Volume (vph)	182	346	270	173	239	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	38.0		0.0	45.0
Storage Lanes		1	1		1	1
Taper Length (m)			74.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.534		0.950	
Satd. Flow (perm)	1863	1583	995	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		376				272
Link Speed (k/h)	50			50	60	
Link Distance (m)	517.7			311.7	615.9	
Travel Time (s)	37.3			22.4	37.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	198	376	293	188	260	272
Shared Lane Traffic (%)						
Lane Group Flow (vph)	198	376	293	188	260	272
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes					
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases		2	6		8	8

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.0	24.0	9.5	24.0	23.5	23.5
Total Split (s)	26.8	26.8	9.6	36.4	23.6	23.6
Total Split (%)	44.7%	44.7%	16.0%	60.7%	39.3%	39.3%
Maximum Green (s)	21.3	21.3	5.6	30.9	18.1	18.1
Yellow Time (s)	3.3	3.3	3.0	3.3	3.7	3.7
All-Red Time (s)	2.2	2.2	1.0	2.2	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	None	Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	21.4	21.4	32.5	31.0	13.4	13.4
Actuated g/C Ratio	0.39	0.39	0.59	0.56	0.24	0.24
v/c Ratio	0.28	0.45	0.44	0.18	0.61	0.46
Control Delay	13.9	3.8	8.9	7.3	25.1	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.9	3.8	8.9	7.3	25.1	5.5
LOS	B	A	A	A	C	A
Approach Delay	7.3			8.3	15.1	
Approach LOS	A			A	B	

Intersection Summary	
Area Type: Other	
Cycle Length: 60	
Actuated Cycle Length: 55.4	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 10.2	Intersection LOS: B
Intersection Capacity Utilization 50.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: McNeely Street & Townline Road



Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	415	0	0	325	15	1	0	2	13	1	14
Future Vol, veh/h	21	415	0	0	325	15	1	0	2	13	1	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	31	-	-	39	-	17	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	23	451	0	0	353	16	1	0	2	14	1	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	369	0	0	451	0	0	866	866	451	851	850	353
Stage 1	-	-	-	-	-	-	497	497	-	353	353	-
Stage 2	-	-	-	-	-	-	369	369	-	498	497	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1190	-	-	1109	-	-	274	291	608	280	298	691
Stage 1	-	-	-	-	-	-	555	545	-	664	631	-
Stage 2	-	-	-	-	-	-	651	621	-	554	545	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1190	-	-	1109	-	-	263	285	608	275	292	691
Mov Cap-2 Maneuver	-	-	-	-	-	-	263	285	-	275	292	-
Stage 1	-	-	-	-	-	-	544	535	-	651	631	-
Stage 2	-	-	-	-	-	-	636	621	-	541	535	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	13.6	14.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	423	1190	-	-	1109	-	-	395
HCM Lane V/C Ratio	0.008	0.019	-	-	-	-	-	0.077
HCM Control Delay (s)	13.6	8.1	-	-	0	-	-	14.9
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.2

Intersection						
Int Delay, s/veh	0.7					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	438	323	8	25	16
Future Vol, veh/h	5	438	323	8	25	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	476	351	9	27	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	360	0	-	0	842	356
Stage 1	-	-	-	-	356	-
Stage 2	-	-	-	-	486	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1199	-	-	-	334	688
Stage 1	-	-	-	-	709	-
Stage 2	-	-	-	-	618	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1199	-	-	-	332	688
Mov Cap-2 Maneuver	-	-	-	-	451	-
Stage 1	-	-	-	-	705	-
Stage 2	-	-	-	-	618	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1199	-	-	-	521
HCM Lane V/C Ratio	0.005	-	-	-	0.086
HCM Control Delay (s)	8	0	-	-	12.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	8:25	8:25	8:25	8:25	8:25	8:25
End Time	9:45	9:45	9:45	9:45	9:45	9:45
Total Time (min)	80	80	80	80	80	80
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	1971	2035	2017	1906	2035	1991
Vehs Exited	1963	2061	2011	1913	2021	1996
Starting Vehs	61	81	61	63	59	62
Ending Vehs	69	55	67	56	73	61
Travel Distance (km)	2380	2473	2398	2303	2444	2399
Travel Time (hr)	64.2	67.3	65.0	61.8	66.6	65.0
Total Delay (hr)	12.5	13.6	12.9	11.8	13.3	12.8
Total Stops	1820	1971	1917	1792	2003	1902
Fuel Used (l)	189.4	199.1	192.9	184.8	197.1	192.6

Interval #0 Information Seeding

Start Time	8:25
End Time	8:45
Total Time (min)	20

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	8:45
End Time	9:45
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1971	2035	2017	1906	2035	1991
Vehs Exited	1963	2061	2011	1913	2021	1996
Starting Vehs	61	81	61	63	59	62
Ending Vehs	69	55	67	56	73	61
Travel Distance (km)	2380	2473	2398	2303	2444	2399
Travel Time (hr)	64.2	67.3	65.0	61.8	66.6	65.0
Total Delay (hr)	12.5	13.6	12.9	11.8	13.3	12.8
Total Stops	1820	1971	1917	1792	2003	1902
Fuel Used (l)	189.4	199.1	192.9	184.8	197.1	192.6

Intersection: 1: Bridge Street & Townline Road

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	R	LTR	LTR
Maximum Queue (m)	10.3	82.7	30.7	46.4	9.1	56.9	44.0
Average Queue (m)	2.1	43.4	15.0	20.0	2.5	29.4	15.7
95th Queue (m)	8.2	69.2	26.2	39.4	9.0	49.0	32.2
Link Distance (m)	327.7	327.7		158.8		220.6	129.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			119.0		40.0		
Storage Blk Time (%)				1			
Queuing Penalty (veh)				1			

Intersection: 2: Edmund Street & Townline Road

Movement	EB	NB	SB
Directions Served	L	LTR	LTR
Maximum Queue (m)	10.2	9.1	14.1
Average Queue (m)	1.7	0.7	4.2
95th Queue (m)	7.5	4.7	10.5
Link Distance (m)		297.5	217.5
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	31.0		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Townline Road & Lanark Street

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (m)	11.3	1.2	15.9
Average Queue (m)	1.0	0.0	7.1
95th Queue (m)	6.6	0.9	14.8
Link Distance (m)	21.3	163.6	303.5
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: McNeely Street & Townline Road

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	R	L	T	L	R
Maximum Queue (m)	41.4	46.0	48.7	29.2	60.0	32.1
Average Queue (m)	18.2	22.7	24.0	12.7	29.2	15.6
95th Queue (m)	34.2	37.8	39.3	24.1	48.1	27.3
Link Distance (m)	499.0	499.0		300.2	601.9	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			38.0			45.0
Storage Blk Time (%)			1	0	1	
Queuing Penalty (veh)			2	0	4	

Network Summary

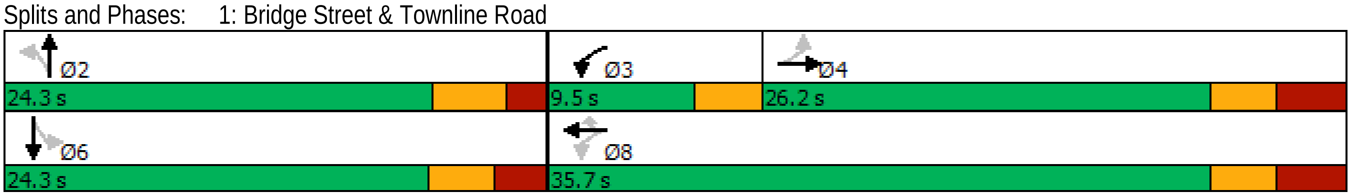
Network wide Queuing Penalty: 7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	208	116	178	281	85	130	117	132	38	91	7
Future Volume (vph)	7	208	116	178	281	85	130	117	132	38	91	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	119.0		40.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (m)	7.5			10.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.946				0.850		0.953			0.993	
Flt Protected	0.950			0.950				0.983			0.986	
Satd. Flow (prot)	1770	1762	0	1770	1863	1583	0	1745	0	0	1824	0
Flt Permitted	0.574			0.394				0.847			0.828	
Satd. Flow (perm)	1069	1762	0	734	1863	1583	0	1504	0	0	1532	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		50				92		47			5	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		336.7			176.5			231.3			144.8	
Travel Time (s)		30.3			15.9			16.7			10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	226	126	193	305	92	141	127	143	41	99	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	352	0	193	305	92	0	411	0	0	148	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	26.2	26.2		9.5	26.2	26.2	23.2	23.2		23.4	23.4	
Total Split (s)	26.2	26.2		9.5	35.7	35.7	24.3	24.3		24.3	24.3	
Total Split (%)	43.7%	43.7%		15.8%	59.5%	59.5%	40.5%	40.5%		40.5%	40.5%	
Maximum Green (s)	20.0	20.0		6.5	29.5	29.5	19.1	19.1		18.9	18.9	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.3	3.3		3.0	3.0	
All-Red Time (s)	3.2	3.2		0.0	3.2	3.2	1.9	1.9		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2		3.0	6.2	6.2		5.2			5.4	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0		0	0	
Act Effct Green (s)	20.0	20.0		32.7	29.5	29.5		19.1			18.9	
Actuated g/C Ratio	0.33	0.33		0.54	0.49	0.49		0.32			0.32	
v/c Ratio	0.02	0.57		0.38	0.33	0.11		0.81			0.30	
Control Delay	13.7	18.2		9.3	10.6	2.6		31.6			17.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	13.7	18.2		9.3	10.6	2.6		31.6			17.2	
LOS	B	B		A	B	A		C			B	
Approach Delay		18.1			8.9			31.6			17.2	
Approach LOS		B			A			C			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 60	
Actuated Cycle Length: 60	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 18.1	Intersection LOS: B
Intersection Capacity Utilization 76.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Bridge Street & Townline Road

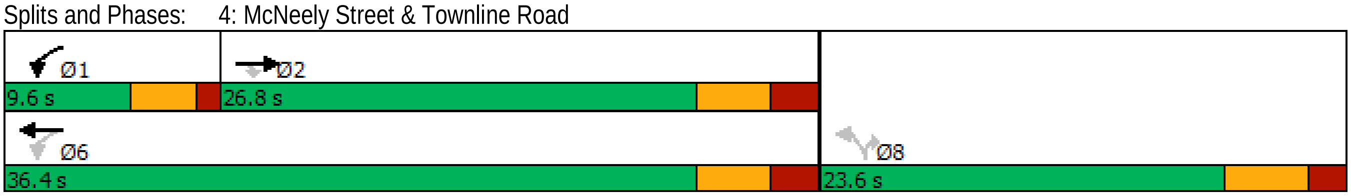


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	193	285	364	265	413	433
Future Volume (vph)	193	285	364	265	413	433
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	38.0		0.0	45.0
Storage Lanes		1	1		1	1
Taper Length (m)			74.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.527		0.950	
Satd. Flow (perm)	1863	1583	982	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		310				471
Link Speed (k/h)	50			50	60	
Link Distance (m)	517.7			311.7	615.9	
Travel Time (s)	37.3			22.4	37.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	210	310	396	288	449	471
Shared Lane Traffic (%)						
Lane Group Flow (vph)	210	310	396	288	449	471
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes					
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases		2	6		8	8

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.0	24.0	9.5	24.0	23.5	23.5
Total Split (s)	26.8	26.8	9.6	36.4	23.6	23.6
Total Split (%)	44.7%	44.7%	16.0%	60.7%	39.3%	39.3%
Maximum Green (s)	21.3	21.3	5.6	30.9	18.1	18.1
Yellow Time (s)	3.3	3.3	3.0	3.3	3.7	3.7
All-Red Time (s)	2.2	2.2	1.0	2.2	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	None	Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	21.3	21.3	32.4	30.9	17.3	17.3
Actuated g/C Ratio	0.36	0.36	0.55	0.52	0.29	0.29
v/c Ratio	0.31	0.40	0.65	0.30	0.87	0.59
Control Delay	15.6	3.8	14.5	9.3	40.2	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.6	3.8	14.5	9.3	40.2	5.5
LOS	B	A	B	A	D	A
Approach Delay	8.6			12.3	22.4	
Approach LOS	A			B	C	

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 59.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 15.8	Intersection LOS: B
Intersection Capacity Utilization 65.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 4: McNeely Street & Townline Road



Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	395	2	6	574	11	1	0	5	17	1	11
Future Vol, veh/h	11	395	2	6	574	11	1	0	5	17	1	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	31	-	-	39	-	17	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	429	2	7	624	12	1	0	5	18	1	12

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	636	0	0	431	0	0	1105	1104	430	1095	1093	624
Stage 1	-	-	-	-	-	-	454	454	-	638	638	-
Stage 2	-	-	-	-	-	-	651	650	-	457	455	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	947	-	-	1129	-	-	188	211	625	191	214	485
Stage 1	-	-	-	-	-	-	586	569	-	465	471	-
Stage 2	-	-	-	-	-	-	457	465	-	583	569	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	947	-	-	1129	-	-	180	207	625	187	210	485
Mov Cap-2 Maneuver	-	-	-	-	-	-	180	207	-	187	210	-
Stage 1	-	-	-	-	-	-	578	562	-	459	468	-
Stage 2	-	-	-	-	-	-	442	462	-	571	562	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.1	13.2	21.9
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	443	947	-	-	1129	-	-	245
HCM Lane V/C Ratio	0.015	0.013	-	-	0.006	-	-	0.129
HCM Control Delay (s)	13.2	8.8	-	-	8.2	-	-	21.9
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.4

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	418	585	28	14	13
Future Vol, veh/h	16	418	585	28	14	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	454	636	30	15	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	666	0	-	0	1139	651
Stage 1	-	-	-	-	651	-
Stage 2	-	-	-	-	488	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	923	-	-	-	223	469
Stage 1	-	-	-	-	519	-
Stage 2	-	-	-	-	617	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	923	-	-	-	217	469
Mov Cap-2 Maneuver	-	-	-	-	351	-
Stage 1	-	-	-	-	506	-
Stage 2	-	-	-	-	617	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	14.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	923	-	-	-	399
HCM Lane V/C Ratio	0.019	-	-	-	0.074
HCM Control Delay (s)	9	0	-	-	14.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	3:10	3:10	3:10	3:10	3:10	3:10
End Time	4:30	4:30	4:30	4:30	4:30	4:30
Total Time (min)	80	80	80	80	80	80
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2432	2500	2481	2483	2445	2469
Vehs Exited	2450	2496	2451	2491	2445	2467
Starting Vehs	94	89	74	101	87	89
Ending Vehs	76	93	104	93	87	90
Travel Distance (km)	2993	3029	3004	2970	2974	2994
Travel Time (hr)	85.1	86.9	86.3	83.0	84.1	85.1
Total Delay (hr)	20.7	21.5	21.6	18.9	19.6	20.5
Total Stops	2489	2609	2670	2428	2497	2536
Fuel Used (l)	242.4	243.3	241.6	238.2	238.8	240.9

Interval #0 Information Seeding

Start Time	3:10
End Time	3:30
Total Time (min)	20

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	3:30
End Time	4:30
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2432	2500	2481	2483	2445	2469
Vehs Exited	2450	2496	2451	2491	2445	2467
Starting Vehs	94	89	74	101	87	89
Ending Vehs	76	93	104	93	87	90
Travel Distance (km)	2993	3029	3004	2970	2974	2994
Travel Time (hr)	85.1	86.9	86.3	83.0	84.1	85.1
Total Delay (hr)	20.7	21.5	21.6	18.9	19.6	20.5
Total Stops	2489	2609	2670	2428	2497	2536
Fuel Used (l)	242.4	243.3	241.6	238.2	238.8	240.9

Intersection: 1: Bridge Street & Townline Road

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	R	LTR	LTR
Maximum Queue (m)	10.0	71.6	41.9	42.4	21.4	78.6	36.7
Average Queue (m)	1.5	33.4	20.3	22.0	8.4	38.7	13.0
95th Queue (m)	7.0	58.5	35.8	38.3	18.0	64.9	25.8
Link Distance (m)	327.7	327.7		158.8		220.6	129.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			119.0		40.0		
Storage Blk Time (%)				1			
Queuing Penalty (veh)				2			

Intersection: 2: Edmund Street & Townline Road

Movement	EB	WB	WB	NB	SB
Directions Served	L	L	R	LTR	LTR
Maximum Queue (m)	9.0	7.2	1.4	9.1	12.9
Average Queue (m)	1.5	0.5	0.0	1.9	3.8
95th Queue (m)	7.0	3.7	1.0	8.0	9.9
Link Distance (m)				297.5	217.5
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)	31.0	39.0	17.0		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Townline Road & Lanark Street

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	22.2	13.6
Average Queue (m)	2.4	5.5
95th Queue (m)	11.5	13.6
Link Distance (m)	21.3	303.5
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	1	
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: McNeely Street & Townline Road

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	R	L	T	L	R
Maximum Queue (m)	49.7	43.8	72.0	42.7	163.1	85.0
Average Queue (m)	20.4	21.8	39.9	19.5	61.9	37.6
95th Queue (m)	36.2	36.8	66.8	35.7	120.9	79.5
Link Distance (m)	499.0	499.0		300.2	601.9	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			38.0			45.0
Storage Blk Time (%)			15	0	20	2
Queuing Penalty (veh)			39	2	87	9

Network Summary

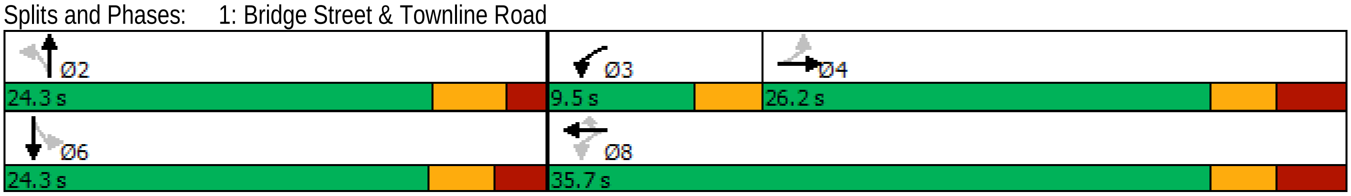
Network wide Queuing Penalty: 139

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	271	110	145	208	16	108	52	109	43	76	11
Future Volume (vph)	11	271	110	145	208	16	108	52	109	43	76	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	119.0		40.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (m)	7.5			10.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.957				0.850		0.945			0.989	
Flt Protected	0.950			0.950				0.980			0.984	
Satd. Flow (prot)	1770	1783	0	1770	1863	1583	0	1725	0	0	1813	0
Flt Permitted	0.617			0.331				0.826			0.845	
Satd. Flow (perm)	1149	1783	0	617	1863	1583	0	1454	0	0	1557	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		37				44		60			8	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		336.7			176.5			231.3			144.8	
Travel Time (s)		30.3			15.9			16.7			10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	295	120	158	226	17	117	57	118	47	83	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	415	0	158	226	17	0	292	0	0	142	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	26.2	26.2		9.5	26.2	26.2	23.2	23.2		23.4	23.4	
Total Split (s)	26.2	26.2		9.5	35.7	35.7	24.3	24.3		24.3	24.3	
Total Split (%)	43.7%	43.7%		15.8%	59.5%	59.5%	40.5%	40.5%		40.5%	40.5%	
Maximum Green (s)	20.0	20.0		6.5	29.5	29.5	19.1	19.1		18.9	18.9	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.3	3.3		3.0	3.0	
All-Red Time (s)	3.2	3.2		0.0	3.2	3.2	1.9	1.9		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2		3.0	6.2	6.2		5.2			5.4	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0		0	0	
Act Effct Green (s)	20.1	20.1		30.7	27.5	27.5		19.2			19.0	
Actuated g/C Ratio	0.35	0.35		0.53	0.47	0.47		0.33			0.33	
v/c Ratio	0.03	0.65		0.35	0.26	0.02		0.56			0.28	
Control Delay	13.9	20.9		9.2	9.9	1.1		18.3			16.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	13.9	20.9		9.2	9.9	1.1		18.3			16.4	
LOS	B	C		A	A	A		B			B	
Approach Delay		20.7			9.2			18.3			16.4	
Approach LOS		C			A			B			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 60	
Actuated Cycle Length: 58.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 16.0	Intersection LOS: B
Intersection Capacity Utilization 69.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Bridge Street & Townline Road

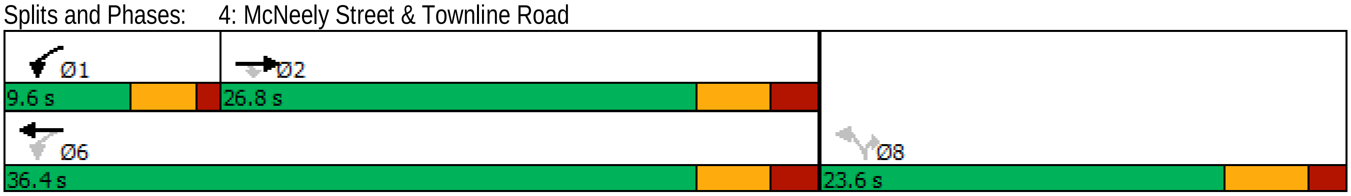


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	168	350	239	156	221	215
Future Volume (vph)	168	350	239	156	221	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	38.0		0.0	45.0
Storage Lanes		1	1		1	1
Taper Length (m)			74.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.541		0.950	
Satd. Flow (perm)	1863	1583	1008	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		380				234
Link Speed (k/h)	50			50	60	
Link Distance (m)	517.7			311.7	615.9	
Travel Time (s)	37.3			22.4	37.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	183	380	260	170	240	234
Shared Lane Traffic (%)						
Lane Group Flow (vph)	183	380	260	170	240	234
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes					
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases		2	6		8	8

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.0	24.0	9.5	24.0	23.5	23.5
Total Split (s)	26.8	26.8	9.6	36.4	23.6	23.6
Total Split (%)	44.7%	44.7%	16.0%	60.7%	39.3%	39.3%
Maximum Green (s)	21.3	21.3	5.6	30.9	18.1	18.1
Yellow Time (s)	3.3	3.3	3.0	3.3	3.7	3.7
All-Red Time (s)	2.2	2.2	1.0	2.2	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	None	Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	21.4	21.4	32.5	31.0	13.0	13.0
Actuated g/C Ratio	0.39	0.39	0.59	0.56	0.24	0.24
v/c Ratio	0.25	0.45	0.39	0.16	0.58	0.42
Control Delay	13.5	3.8	8.0	7.0	24.3	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	3.8	8.0	7.0	24.3	5.4
LOS	B	A	A	A	C	A
Approach Delay	6.9			7.6	15.0	
Approach LOS	A			A	B	

Intersection Summary	
Area Type: Other	
Cycle Length: 60	
Actuated Cycle Length: 55	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 9.7	Intersection LOS: A
Intersection Capacity Utilization 46.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: McNeely Street & Townline Road



Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	372	0	0	304	19	1	0	2	31	1	51
Future Vol, veh/h	30	372	0	0	304	19	1	0	2	31	1	51
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	31	-	-	39	-	17	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	33	404	0	0	330	21	1	0	2	34	1	55

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	351	0	0	404	0	0	839	821	404	801	800	330
Stage 1	-	-	-	-	-	-	470	470	-	330	330	-
Stage 2	-	-	-	-	-	-	369	351	-	471	470	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1208	-	-	1155	-	-	285	309	647	303	318	712
Stage 1	-	-	-	-	-	-	574	560	-	683	646	-
Stage 2	-	-	-	-	-	-	651	632	-	573	560	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1208	-	-	1155	-	-	257	301	647	296	309	712
Mov Cap-2 Maneuver	-	-	-	-	-	-	257	301	-	296	309	-
Stage 1	-	-	-	-	-	-	559	545	-	665	646	-
Stage 2	-	-	-	-	-	-	599	632	-	555	545	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	0	13.4	14.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	430	1208	-	-	1155	-	-	462
HCM Lane V/C Ratio	0.008	0.027	-	-	-	-	-	0.195
HCM Control Delay (s)	13.4	8.1	-	-	0	-	-	14.7
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.7

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	8	408	294	17	51	28
Future Vol, veh/h	8	408	294	17	51	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	443	320	18	55	30

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	338	0	-	0	790	329
Stage 1	-	-	-	-	329	-
Stage 2	-	-	-	-	461	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1221	-	-	-	359	712
Stage 1	-	-	-	-	729	-
Stage 2	-	-	-	-	635	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1221	-	-	-	355	712
Mov Cap-2 Maneuver	-	-	-	-	469	-
Stage 1	-	-	-	-	722	-
Stage 2	-	-	-	-	635	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	13
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1221	-	-	-	534
HCM Lane V/C Ratio	0.007	-	-	-	0.161
HCM Control Delay (s)	8	0	-	-	13
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.6

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	8:25	8:25	8:25	8:25	8:25	8:25
End Time	9:45	9:45	9:45	9:45	9:45	9:45
Total Time (min)	80	80	80	80	80	80
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	1823	1828	1945	1791	1898	1858
Vehs Exited	1823	1842	1919	1796	1887	1853
Starting Vehs	60	80	48	58	52	59
Ending Vehs	60	66	74	53	63	64
Travel Distance (km)	2201	2196	2342	2189	2316	2249
Travel Time (hr)	59.1	58.6	62.8	58.5	62.9	60.4
Total Delay (hr)	10.9	10.9	11.6	10.8	12.3	11.3
Total Stops	1725	1808	1844	1734	1906	1802
Fuel Used (l)	177.5	177.5	187.9	176.5	187.3	181.3

Interval #0 Information Seeding

Start Time	8:25
End Time	8:45
Total Time (min)	20

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	8:45
End Time	9:45
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1823	1828	1945	1791	1898	1858
Vehs Exited	1823	1842	1919	1796	1887	1853
Starting Vehs	60	80	48	58	52	59
Ending Vehs	60	66	74	53	63	64
Travel Distance (km)	2201	2196	2342	2189	2316	2249
Travel Time (hr)	59.1	58.6	62.8	58.5	62.9	60.4
Total Delay (hr)	10.9	10.9	11.6	10.8	12.3	11.3
Total Stops	1725	1808	1844	1734	1906	1802
Fuel Used (l)	177.5	177.5	187.9	176.5	187.3	181.3

Intersection: 1: Bridge Street & Townline Road

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	R	LTR	LTR
Maximum Queue (m)	10.1	70.1	39.3	42.9	13.2	57.3	38.4
Average Queue (m)	2.1	37.9	17.7	16.7	2.1	25.4	13.7
95th Queue (m)	8.3	62.1	30.6	33.5	9.0	44.2	29.7
Link Distance (m)	327.7	327.7		158.8		220.6	129.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			119.0		40.0		
Storage Blk Time (%)				0			
Queuing Penalty (veh)				1			

Intersection: 2: Edmund Street & Townline Road

Movement	EB	NB	SB
Directions Served	L	LTR	LTR
Maximum Queue (m)	10.4	9.0	19.3
Average Queue (m)	1.8	0.9	7.8
95th Queue (m)	7.8	5.2	14.9
Link Distance (m)		297.5	217.5
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	31.0		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Townline Road & Lanark Street

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	11.3	19.3
Average Queue (m)	0.8	10.0
95th Queue (m)	6.3	17.3
Link Distance (m)	21.3	303.5
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: McNeely Street & Townline Road

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	R	L	T	L	R
Maximum Queue (m)	39.2	45.9	43.2	28.3	55.1	33.6
Average Queue (m)	16.9	22.5	21.8	11.5	27.3	14.7
95th Queue (m)	31.0	37.3	36.2	23.3	44.6	26.4
Link Distance (m)	499.0	499.0		300.2	601.9	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			38.0			45.0
Storage Blk Time (%)			1	0	1	
Queuing Penalty (veh)			2	0	2	

Network Summary

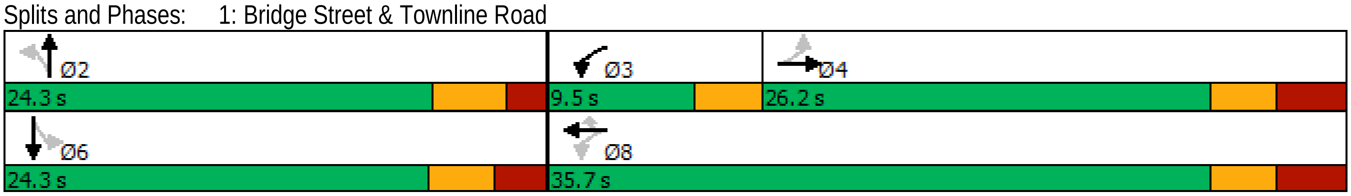
Network wide Queuing Penalty: 4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	191	102	187	252	75	115	103	162	33	81	6
Future Volume (vph)	6	191	102	187	252	75	115	103	162	33	81	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	119.0		40.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (m)	7.5			10.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.948				0.850		0.942			0.993	
Flt Protected	0.950			0.950				0.985			0.986	
Satd. Flow (prot)	1770	1766	0	1770	1863	1583	0	1728	0	0	1824	0
Flt Permitted	0.591			0.434				0.863			0.837	
Satd. Flow (perm)	1101	1766	0	808	1863	1583	0	1514	0	0	1548	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		48				82		65			5	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		336.7			176.5			231.3			144.8	
Travel Time (s)		30.3			15.9			16.7			10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	208	111	203	274	82	125	112	176	36	88	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	319	0	203	274	82	0	413	0	0	131	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	26.2	26.2		9.5	26.2	26.2	23.2	23.2		23.4	23.4	
Total Split (s)	26.2	26.2		9.5	35.7	35.7	24.3	24.3		24.3	24.3	
Total Split (%)	43.7%	43.7%		15.8%	59.5%	59.5%	40.5%	40.5%		40.5%	40.5%	
Maximum Green (s)	20.0	20.0		6.5	29.5	29.5	19.1	19.1		18.9	18.9	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.3	3.3		3.0	3.0	
All-Red Time (s)	3.2	3.2		0.0	3.2	3.2	1.9	1.9		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2		3.0	6.2	6.2		5.2			5.4	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0		0	0	
Act Effct Green (s)	20.0	20.0		32.7	29.5	29.5		19.1			18.9	
Actuated g/C Ratio	0.33	0.33		0.54	0.49	0.49		0.32			0.32	
v/c Ratio	0.02	0.51		0.37	0.30	0.10		0.79			0.27	
Control Delay	13.7	17.1		9.2	10.2	2.7		28.8			16.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	13.7	17.1		9.2	10.2	2.7		28.8			16.6	
LOS	B	B		A	B	A		C			B	
Approach Delay		17.0			8.8			28.8			16.6	
Approach LOS		B			A			C			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 60	
Actuated Cycle Length: 60	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 17.2	Intersection LOS: B
Intersection Capacity Utilization 76.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Bridge Street & Townline Road



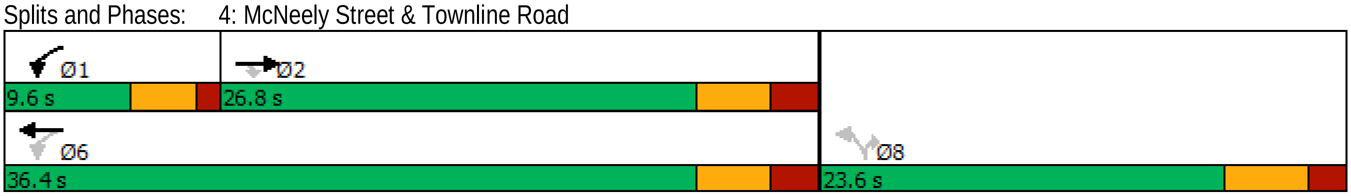
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	175	277	322	243	400	374
Future Volume (vph)	175	277	322	243	400	374
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	38.0		0.0	45.0
Storage Lanes		1	1		1	1
Taper Length (m)			74.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.537		0.950	
Satd. Flow (perm)	1863	1583	1000	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		301				407
Link Speed (k/h)	50			50	60	
Link Distance (m)	517.7			311.7	615.9	
Travel Time (s)	37.3			22.4	37.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	190	301	350	264	435	407
Shared Lane Traffic (%)						
Lane Group Flow (vph)	190	301	350	264	435	407
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes					
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases		2	6		8	8

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.0	24.0	9.5	24.0	23.5	23.5
Total Split (s)	26.8	26.8	9.6	36.4	23.6	23.6
Total Split (%)	44.7%	44.7%	16.0%	60.7%	39.3%	39.3%
Maximum Green (s)	21.3	21.3	5.6	30.9	18.1	18.1
Yellow Time (s)	3.3	3.3	3.0	3.3	3.7	3.7
All-Red Time (s)	2.2	2.2	1.0	2.2	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	None	Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	21.3	21.3	32.5	31.0	17.0	17.0
Actuated g/C Ratio	0.36	0.36	0.55	0.53	0.29	0.29
v/c Ratio	0.28	0.39	0.56	0.27	0.85	0.55
Control Delay	15.2	3.8	12.2	9.0	38.2	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.2	3.8	12.2	9.0	38.2	5.2
LOS	B	A	B	A	D	A
Approach Delay	8.2			10.8	22.3	
Approach LOS	A			B	C	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 59
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 15.1 Intersection LOS: B
Intersection Capacity Utilization 61.7% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: McNeely Street & Townline Road



Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	47	364	2	5	518	28	1	0	5	27	1	32
Future Vol, veh/h	47	364	2	5	518	28	1	0	5	27	1	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	31	-	-	39	-	17	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	51	396	2	5	563	30	1	0	5	29	1	35

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	593	0	0	398	0	0	1105	1102	397	1075	1073	563
Stage 1	-	-	-	-	-	-	499	499	-	573	573	-
Stage 2	-	-	-	-	-	-	606	603	-	502	500	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	983	-	-	1161	-	-	188	212	652	197	220	526
Stage 1	-	-	-	-	-	-	554	544	-	505	504	-
Stage 2	-	-	-	-	-	-	484	488	-	552	543	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	983	-	-	1161	-	-	167	200	652	187	208	526
Mov Cap-2 Maneuver	-	-	-	-	-	-	167	200	-	187	208	-
Stage 1	-	-	-	-	-	-	525	516	-	479	502	-
Stage 2	-	-	-	-	-	-	449	486	-	519	515	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1	0.1	13.3	21.3
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	439	983	-	-	1161	-	-	286
HCM Lane V/C Ratio	0.015	0.052	-	-	0.005	-	-	0.228
HCM Control Delay (s)	13.3	8.9	-	-	8.1	-	-	21.3
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0	0.2	-	-	0	-	-	0.9

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	26	384	538	53	29	20
Future Vol, veh/h	26	384	538	53	29	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	417	585	58	32	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	643	0	-	0	1087	614
Stage 1	-	-	-	-	614	-
Stage 2	-	-	-	-	473	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	942	-	-	-	239	492
Stage 1	-	-	-	-	540	-
Stage 2	-	-	-	-	627	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	942	-	-	-	230	492
Mov Cap-2 Maneuver	-	-	-	-	363	-
Stage 1	-	-	-	-	519	-
Stage 2	-	-	-	-	627	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	15.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	942	-	-	-	407
HCM Lane V/C Ratio	0.03	-	-	-	0.131
HCM Control Delay (s)	8.9	0	-	-	15.2
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	3:10	3:10	3:10	3:10	3:10	3:10
End Time	4:30	4:30	4:30	4:30	4:30	4:30
Total Time (min)	80	80	80	80	80	80
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2280	2359	2325	2289	2349	2321
Vehs Exited	2266	2367	2338	2293	2351	2323
Starting Vehs	72	77	88	66	79	74
Ending Vehs	86	69	75	62	77	74
Travel Distance (km)	2774	2840	2861	2745	2867	2818
Travel Time (hr)	77.3	79.7	83.0	76.0	80.3	79.2
Total Delay (hr)	17.1	18.1	21.0	16.3	18.0	18.1
Total Stops	2342	2374	2552	2228	2307	2362
Fuel Used (l)	223.4	228.0	231.5	218.6	230.8	226.5

Interval #0 Information Seeding

Start Time	3:10
End Time	3:30
Total Time (min)	20

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	3:30
End Time	4:30
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2280	2359	2325	2289	2349	2321
Vehs Exited	2266	2367	2338	2293	2351	2323
Starting Vehs	72	77	88	66	79	74
Ending Vehs	86	69	75	62	77	74
Travel Distance (km)	2774	2840	2861	2745	2867	2818
Travel Time (hr)	77.3	79.7	83.0	76.0	80.3	79.2
Total Delay (hr)	17.1	18.1	21.0	16.3	18.0	18.1
Total Stops	2342	2374	2552	2228	2307	2362
Fuel Used (l)	223.4	228.0	231.5	218.6	230.8	226.5

Intersection: 1: Bridge Street & Townline Road

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	R	LTR	LTR
Maximum Queue (m)	13.8	59.0	51.2	49.6	23.2	76.0	34.2
Average Queue (m)	1.4	29.2	20.3	21.9	7.8	39.5	13.2
95th Queue (m)	8.6	49.2	36.4	39.3	17.9	66.2	26.5
Link Distance (m)	327.7	327.7		158.8		220.6	129.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			119.0		40.0		
Storage Blk Time (%)				1			
Queuing Penalty (veh)				2			

Intersection: 2: Edmund Street & Townline Road

Movement	EB	WB	WB	NB	SB
Directions Served	L	L	R	LTR	LTR
Maximum Queue (m)	14.3	7.2	5.8	10.4	21.2
Average Queue (m)	4.2	0.4	0.2	1.3	7.1
95th Queue (m)	12.4	3.2	2.8	6.7	14.7
Link Distance (m)				297.5	217.5
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)	31.0	39.0	17.0		
Storage Blk Time (%)			0		
Queuing Penalty (veh)			0		

Intersection: 3: Townline Road & Lanark Street

Movement	EB	B14	SB
Directions Served	LT	T	LR
Maximum Queue (m)	32.2	4.1	20.2
Average Queue (m)	4.6	0.1	8.2
95th Queue (m)	18.7	2.9	16.2
Link Distance (m)	21.3	194.7	303.5
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	2		
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: McNeely Street & Townline Road

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	R	L	T	L	R
Maximum Queue (m)	39.0	41.3	80.5	53.5	157.6	76.2
Average Queue (m)	18.1	19.1	33.3	18.1	58.3	29.9
95th Queue (m)	32.2	31.8	61.2	36.2	128.9	64.9
Link Distance (m)	499.0	499.0		300.2	601.9	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			38.0			45.0
Storage Blk Time (%)			6	0	16	1
Queuing Penalty (veh)			15	1	59	3

Network Summary

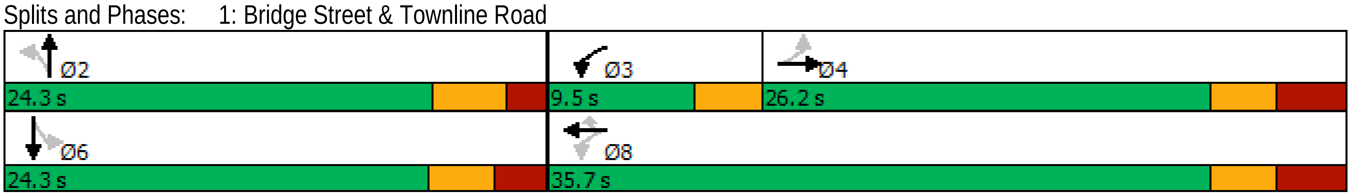
Network wide Queuing Penalty: 80

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	305	124	156	231	18	122	58	120	49	87	12
Future Volume (vph)	12	305	124	156	231	18	122	58	120	49	87	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	119.0		40.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (m)	7.5			10.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.957				0.850		0.946			0.989	
Flt Protected	0.950			0.950				0.980			0.984	
Satd. Flow (prot)	1770	1783	0	1770	1863	1583	0	1727	0	0	1813	0
Flt Permitted	0.603			0.274				0.819			0.826	
Satd. Flow (perm)	1123	1783	0	510	1863	1583	0	1443	0	0	1522	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		37				44		58			8	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		336.7			176.5			231.3			144.8	
Travel Time (s)		30.3			15.9			16.7			10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	332	135	170	251	20	133	63	130	53	95	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	467	0	170	251	20	0	326	0	0	161	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	26.2	26.2		9.5	26.2	26.2	23.2	23.2		23.4	23.4	
Total Split (s)	26.2	26.2		9.5	35.7	35.7	24.3	24.3		24.3	24.3	
Total Split (%)	43.7%	43.7%		15.8%	59.5%	59.5%	40.5%	40.5%		40.5%	40.5%	
Maximum Green (s)	20.0	20.0		6.5	29.5	29.5	19.1	19.1		18.9	18.9	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.3	3.3		3.0	3.0	
All-Red Time (s)	3.2	3.2		0.0	3.2	3.2	1.9	1.9		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2		3.0	6.2	6.2		5.2			5.4	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0		0	0	
Act Effct Green (s)	20.1	20.1		30.7	27.5	27.5		19.2			19.0	
Actuated g/C Ratio	0.35	0.35		0.53	0.47	0.47		0.33			0.33	
v/c Ratio	0.03	0.73		0.42	0.29	0.03		0.63			0.32	
Control Delay	13.9	24.6		10.2	10.2	1.3		20.9			17.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	13.9	24.6		10.2	10.2	1.3		20.9			17.1	
LOS	B	C		B	B	A		C			B	
Approach Delay		24.3			9.8			20.9			17.1	
Approach LOS		C			A			C			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 60	
Actuated Cycle Length: 58.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 18.1	Intersection LOS: B
Intersection Capacity Utilization 71.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Bridge Street & Townline Road

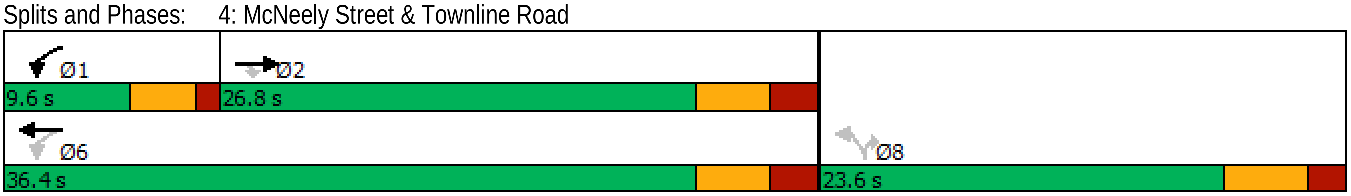


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	187	386	270	175	252	250
Future Volume (vph)	187	386	270	175	252	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	38.0		0.0	45.0
Storage Lanes		1	1		1	1
Taper Length (m)			74.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.531		0.950	
Satd. Flow (perm)	1863	1583	989	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		420				272
Link Speed (k/h)	50			50	60	
Link Distance (m)	517.7			311.7	615.9	
Travel Time (s)	37.3			22.4	37.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	203	420	293	190	274	272
Shared Lane Traffic (%)						
Lane Group Flow (vph)	203	420	293	190	274	272
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes					
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases		2	6		8	8

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.0	24.0	9.5	24.0	23.5	23.5
Total Split (s)	26.8	26.8	9.6	36.4	23.6	23.6
Total Split (%)	44.7%	44.7%	16.0%	60.7%	39.3%	39.3%
Maximum Green (s)	21.3	21.3	5.6	30.9	18.1	18.1
Yellow Time (s)	3.3	3.3	3.0	3.3	3.7	3.7
All-Red Time (s)	2.2	2.2	1.0	2.2	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	None	Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	21.4	21.4	32.5	31.0	13.7	13.7
Actuated g/C Ratio	0.38	0.38	0.58	0.56	0.25	0.25
v/c Ratio	0.28	0.49	0.45	0.18	0.63	0.46
Control Delay	14.1	3.9	9.1	7.4	25.7	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	3.9	9.1	7.4	25.7	5.4
LOS	B	A	A	A	C	A
Approach Delay	7.2			8.4	15.6	
Approach LOS	A			A	B	

Intersection Summary	
Area Type: Other	
Cycle Length: 60	
Actuated Cycle Length: 55.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 10.3	Intersection LOS: B
Intersection Capacity Utilization 51.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: McNeely Street & Townline Road



Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	33	418	0	0	337	21	1	0	2	32	1	52
Future Vol, veh/h	33	418	0	0	337	21	1	0	2	32	1	52
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	31	-	-	39	-	17	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	36	454	0	0	366	23	1	0	2	35	1	57

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	389	0	0	454	0	0	933	915	454	893	892	366
Stage 1	-	-	-	-	-	-	526	526	-	366	366	-
Stage 2	-	-	-	-	-	-	407	389	-	527	526	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1170	-	-	1107	-	-	246	273	606	262	281	679
Stage 1	-	-	-	-	-	-	535	529	-	653	623	-
Stage 2	-	-	-	-	-	-	621	608	-	535	529	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1170	-	-	1107	-	-	220	265	606	255	272	679
Mov Cap-2 Maneuver	-	-	-	-	-	-	220	265	-	255	272	-
Stage 1	-	-	-	-	-	-	518	513	-	633	623	-
Stage 2	-	-	-	-	-	-	568	608	-	517	513	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	0	14.5	16.2
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	382	1170	-	-	1107	-	-	413
HCM Lane V/C Ratio	0.009	0.031	-	-	-	-	-	0.224
HCM Control Delay (s)	14.5	8.2	-	-	0	-	-	16.2
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.8

Intersection						
Int Delay, s/veh	1.3					
Movement	**EBL**	**EBT**	**WBT**	**WBR**	**SBL**	**SBR**
Lane Configurations						
Traffic Vol, veh/h	8	457	329	17	51	28
Future Vol, veh/h	8	457	329	17	51	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	497	358	18	55	30

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	376	0	-	0	882	367
Stage 1	-	-	-	-	367	-
Stage 2	-	-	-	-	515	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1182	-	-	-	317	678
Stage 1	-	-	-	-	701	-
Stage 2	-	-	-	-	600	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1182	-	-	-	314	678
Mov Cap-2 Maneuver	-	-	-	-	435	-
Stage 1	-	-	-	-	693	-
Stage 2	-	-	-	-	600	-

Approach	EB		WB		SB
HCM Control Delay, s	0.1		0		13.7
HCM LOS					B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1182	-	-	-	498
HCM Lane V/C Ratio	0.007	-	-	-	0.172
HCM Control Delay (s)	8.1	0	-	-	13.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.6

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	8:10	8:10	8:10	8:10	8:10	8:10
End Time	9:30	9:30	9:30	9:30	9:30	9:30
Total Time (min)	80	80	80	80	80	80
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2071	2087	2118	2052	2150	2095
Vehs Exited	2048	2100	2109	2083	2139	2095
Starting Vehs	57	81	54	86	70	69
Ending Vehs	80	68	63	55	81	69
Travel Distance (km)	2481	2503	2506	2523	2594	2522
Travel Time (hr)	68.1	68.3	68.1	69.3	71.3	69.0
Total Delay (hr)	13.8	13.7	13.5	14.2	14.6	14.0
Total Stops	2056	2057	2026	2063	2182	2076
Fuel Used (l)	200.2	202.9	201.7	205.1	210.1	204.0

Interval #0 Information Seeding

Start Time	8:10
End Time	8:30
Total Time (min)	20

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	8:30
End Time	9:30
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2071	2087	2118	2052	2150	2095
Vehs Exited	2048	2100	2109	2083	2139	2095
Starting Vehs	57	81	54	86	70	69
Ending Vehs	80	68	63	55	81	69
Travel Distance (km)	2481	2503	2506	2523	2594	2522
Travel Time (hr)	68.1	68.3	68.1	69.3	71.3	69.0
Total Delay (hr)	13.8	13.7	13.5	14.2	14.6	14.0
Total Stops	2056	2057	2026	2063	2182	2076
Fuel Used (l)	200.2	202.9	201.7	205.1	210.1	204.0

Intersection: 1: Bridge Street & Townline Road

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	R	LTR	LTR
Maximum Queue (m)	14.2	83.7	39.2	40.3	9.2	66.0	42.8
Average Queue (m)	2.7	42.5	18.7	18.9	1.9	31.2	15.5
95th Queue (m)	9.8	70.2	32.1	34.6	7.9	53.7	32.7
Link Distance (m)	327.7	327.7		158.8		220.6	129.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			119.0		40.0		
Storage Blk Time (%)				0			
Queuing Penalty (veh)				0			

Intersection: 2: Edmund Street & Townline Road

Movement	EB	NB	SB
Directions Served	L	LTR	LTR
Maximum Queue (m)	9.0	9.1	18.6
Average Queue (m)	2.1	0.9	8.4
95th Queue (m)	8.3	5.4	15.2
Link Distance (m)		297.5	217.5
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	31.0		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Townline Road & Lanark Street

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	10.9	20.7
Average Queue (m)	0.6	9.8
95th Queue (m)	5.4	17.2
Link Distance (m)	21.3	303.5
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: McNeely Street & Townline Road

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	R	L	T	L	R
Maximum Queue (m)	42.8	48.9	56.3	32.6	60.5	42.3
Average Queue (m)	19.3	25.6	25.4	13.7	31.7	16.3
95th Queue (m)	34.2	41.9	44.5	26.8	48.9	31.6
Link Distance (m)	499.0	499.0		300.2	601.9	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			38.0			45.0
Storage Blk Time (%)			2	0	2	
Queuing Penalty (veh)			4	0	4	

Network Summary

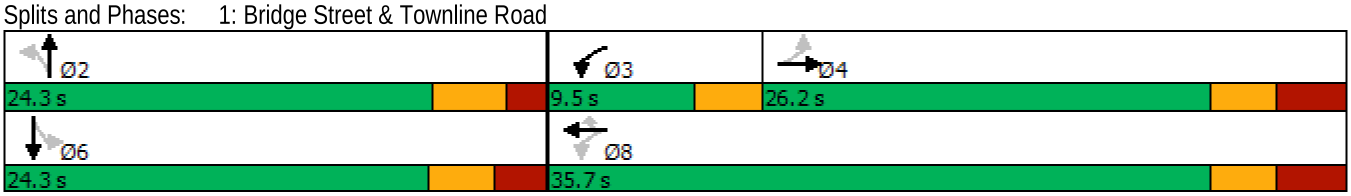
Network wide Queuing Penalty: 8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	211	116	205	283	85	130	117	176	38	91	7
Future Volume (vph)	7	211	116	205	283	85	130	117	176	38	91	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	119.0		40.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (m)	7.5			10.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.947				0.850		0.944			0.993	
Flt Protected	0.950			0.950				0.985			0.986	
Satd. Flow (prot)	1770	1764	0	1770	1863	1583	0	1732	0	0	1824	0
Flt Permitted	0.573			0.391				0.860			0.806	
Satd. Flow (perm)	1067	1764	0	728	1863	1583	0	1512	0	0	1491	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		50				92		63			5	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		336.7			176.5			231.3			144.8	
Travel Time (s)		30.3			15.9			16.7			10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	229	126	223	308	92	141	127	191	41	99	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	355	0	223	308	92	0	459	0	0	148	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	26.2	26.2		9.5	26.2	26.2	23.2	23.2		23.4	23.4	
Total Split (s)	26.2	26.2		9.5	35.7	35.7	24.3	24.3		24.3	24.3	
Total Split (%)	43.7%	43.7%		15.8%	59.5%	59.5%	40.5%	40.5%		40.5%	40.5%	
Maximum Green (s)	20.0	20.0		6.5	29.5	29.5	19.1	19.1		18.9	18.9	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.3	3.3		3.0	3.0	
All-Red Time (s)	3.2	3.2		0.0	3.2	3.2	1.9	1.9		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2		3.0	6.2	6.2		5.2			5.4	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0		0	0	
Act Effct Green (s)	20.0	20.0		32.7	29.5	29.5		19.1			18.9	
Actuated g/C Ratio	0.33	0.33		0.54	0.49	0.49		0.32			0.32	
v/c Ratio	0.02	0.57		0.44	0.34	0.11		0.88			0.31	
Control Delay	13.7	18.4		10.1	10.6	2.6		37.9			17.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	13.7	18.4		10.1	10.6	2.6		37.9			17.3	
LOS	B	B		B	B	A		D			B	
Approach Delay		18.3			9.2			37.9			17.3	
Approach LOS		B			A			D			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 60	
Actuated Cycle Length: 60	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 20.3	Intersection LOS: C
Intersection Capacity Utilization 78.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Bridge Street & Townline Road



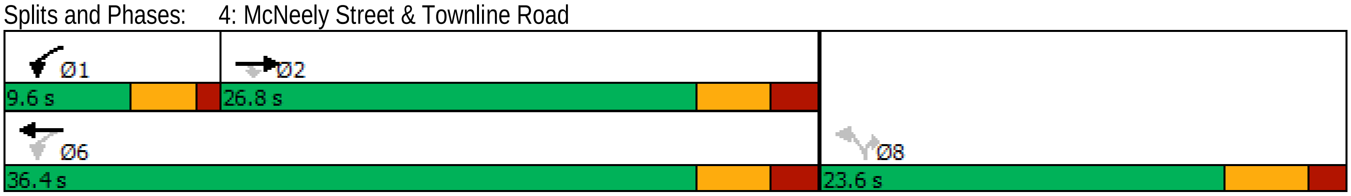
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	196	308	364	270	452	433
Future Volume (vph)	196	308	364	270	452	433
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	38.0		0.0	45.0
Storage Lanes		1	1		1	1
Taper Length (m)			74.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.526		0.950	
Satd. Flow (perm)	1863	1583	980	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		335				471
Link Speed (k/h)	50			50	60	
Link Distance (m)	517.7			311.7	615.9	
Travel Time (s)	37.3			22.4	37.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	213	335	396	293	491	471
Shared Lane Traffic (%)						
Lane Group Flow (vph)	213	335	396	293	491	471
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes					
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases		2	6		8	8

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.0	24.0	9.5	24.0	23.5	23.5
Total Split (s)	26.8	26.8	9.6	36.4	23.6	23.6
Total Split (%)	44.7%	44.7%	16.0%	60.7%	39.3%	39.3%
Maximum Green (s)	21.3	21.3	5.6	30.9	18.1	18.1
Yellow Time (s)	3.3	3.3	3.0	3.3	3.7	3.7
All-Red Time (s)	2.2	2.2	1.0	2.2	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	None	Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	21.3	21.3	32.4	30.9	17.9	17.9
Actuated g/C Ratio	0.36	0.36	0.54	0.52	0.30	0.30
v/c Ratio	0.32	0.43	0.66	0.30	0.93	0.59
Control Delay	15.8	3.9	14.9	9.4	48.4	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.8	3.9	14.9	9.4	48.4	5.4
LOS	B	A	B	A	D	A
Approach Delay	8.5			12.6	27.3	
Approach LOS	A			B	C	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 59.8
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 18.0 Intersection LOS: B
Intersection Capacity Utilization 68.0% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 4: McNeely Street & Townline Road



Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	48	405	2	6	581	29	1	0	5	28	1	33
Future Vol, veh/h	48	405	2	6	581	29	1	0	5	28	1	33
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	31	-	-	39	-	17	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	52	440	2	7	632	32	1	0	5	30	1	36

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	664	0	0	442	0	0	1226	1223	441	1194	1192	632
Stage 1	-	-	-	-	-	-	545	545	-	646	646	-
Stage 2	-	-	-	-	-	-	681	678	-	548	546	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	925	-	-	1118	-	-	155	179	616	163	187	480
Stage 1	-	-	-	-	-	-	523	519	-	460	467	-
Stage 2	-	-	-	-	-	-	440	452	-	521	518	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	925	-	-	1118	-	-	136	168	616	154	175	480
Mov Cap-2 Maneuver	-	-	-	-	-	-	136	168	-	154	175	-
Stage 1	-	-	-	-	-	-	494	490	-	434	464	-
Stage 2	-	-	-	-	-	-	404	449	-	487	489	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1	0.1	14.4	25.5
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	388	925	-	-	1118	-	-	242
HCM Lane V/C Ratio	0.017	0.056	-	-	0.006	-	-	0.278
HCM Control Delay (s)	14.4	9.1	-	-	8.2	-	-	25.5
HCM Lane LOS	B	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	1.1

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	26	429	603	54	29	20
Future Vol, veh/h	26	429	603	54	29	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	466	655	59	32	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	714	0	-	0	1207	685
Stage 1	-	-	-	-	685	-
Stage 2	-	-	-	-	522	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	886	-	-	-	203	448
Stage 1	-	-	-	-	500	-
Stage 2	-	-	-	-	595	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	886	-	-	-	194	448
Mov Cap-2 Maneuver	-	-	-	-	329	-
Stage 1	-	-	-	-	479	-
Stage 2	-	-	-	-	595	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	16.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	886	-	-	-	369
HCM Lane V/C Ratio	0.032	-	-	-	0.144
HCM Control Delay (s)	9.2	0	-	-	16.4
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	3:10	3:10	3:10	3:10	3:10	3:10
End Time	4:30	4:30	4:30	4:30	4:30	4:30
Total Time (min)	80	80	80	80	80	80
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2505	2652	2620	2598	2558	2585
Vehs Exited	2499	2655	2622	2570	2554	2581
Starting Vehs	90	82	77	70	91	81
Ending Vehs	96	79	75	98	95	88
Travel Distance (km)	3039	3219	3177	3178	3081	3139
Travel Time (hr)	87.6	92.8	92.9	92.3	90.4	91.2
Total Delay (hr)	22.0	23.0	24.3	23.4	23.6	23.3
Total Stops	2714	2773	2868	2863	2722	2789
Fuel Used (l)	246.4	263.1	257.1	257.6	250.0	254.8

Interval #0 Information Seeding

Start Time	3:10
End Time	3:30
Total Time (min)	20

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	3:30
End Time	4:30
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2505	2652	2620	2598	2558	2585
Vehs Exited	2499	2655	2622	2570	2554	2581
Starting Vehs	90	82	77	70	91	81
Ending Vehs	96	79	75	98	95	88
Travel Distance (km)	3039	3219	3177	3178	3081	3139
Travel Time (hr)	87.6	92.8	92.9	92.3	90.4	91.2
Total Delay (hr)	22.0	23.0	24.3	23.4	23.6	23.3
Total Stops	2714	2773	2868	2863	2722	2789
Fuel Used (l)	246.4	263.1	257.1	257.6	250.0	254.8

Intersection: 1: Bridge Street & Townline Road

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	R	LTR	LTR
Maximum Queue (m)	8.8	68.8	50.7	48.3	21.3	94.7	35.1
Average Queue (m)	1.4	33.3	23.0	23.9	8.7	46.4	13.5
95th Queue (m)	6.5	57.2	38.3	41.6	17.8	82.7	26.8
Link Distance (m)	327.7	327.7		158.8		220.6	129.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			119.0		40.0		
Storage Blk Time (%)				1			
Queuing Penalty (veh)				2			

Intersection: 2: Edmund Street & Townline Road

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (m)	12.9	7.0	9.1	18.5
Average Queue (m)	4.4	0.4	1.9	7.4
95th Queue (m)	12.3	3.5	7.9	14.8
Link Distance (m)			297.5	217.5
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	31.0	39.0		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Townline Road & Lanark Street

Movement	EB	B14	WB	SB
Directions Served	LT	T	TR	LR
Maximum Queue (m)	31.3	3.0	3.1	21.0
Average Queue (m)	4.9	0.1	0.1	9.3
95th Queue (m)	19.2	2.1	1.6	18.0
Link Distance (m)	21.3	194.7	163.6	303.5
Upstream Blk Time (%)	1			
Queuing Penalty (veh)	2			
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: McNeely Street & Townline Road

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	R	L	T	L	R
Maximum Queue (m)	47.5	42.4	98.9	82.6	157.4	85.0
Average Queue (m)	21.6	21.3	41.9	21.7	67.3	44.5
95th Queue (m)	37.9	35.2	77.6	47.2	120.7	87.6
Link Distance (m)	499.0	499.0		300.2	601.9	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			38.0			45.0
Storage Blk Time (%)			16	0	27	2
Queuing Penalty (veh)			43	1	115	11

Network Summary

Network wide Queuing Penalty: 175

PRELIMINARY STORMWATER MANAGEMENT REPORT WINTERGREEN RIDGE SUBDIVISION

Project No.: CCO-22-0957

Prepared for:

Wintergreen Ridge Ltd.

Prepared by:

McIntosh Perry Consulting Engineers Ltd.
3240 Drummond Concession 5A
Perth, Ontario
K7H 3C9

September 2023

MCINTOSH PERRY

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APPENDICES

1.0 PURPOSE

McIntosh Perry Consulting Engineers Limited (McIntosh Perry) has been retained by Wintergreen Ridge Ltd., to prepare a Preliminary Stormwater Management Report in support of an application for Draft Plan Approval of the development at 400 Lanark Street, Carleton Place, ON, known as Wintergreen Ridge Subdivision.

The objective of this stormwater management report is to evaluate the drainage characteristics of the site under existing and proposed conditions and to advance an integrated approach to facilitate the proposed development with no adverse impacts to the receiving drainage systems and/or properties. The purpose is to provide a preliminary stormwater management design in accordance with the recommendations and guidelines provided by the Ministry of the Environment, Conservation and Parks (MECP). These guidelines encourage the implementation of Best Management Practices (BMPs) for treating and controlling stormwater runoff.

The servicing constraints, design criteria, municipal standards, and project specific quality and quantity control objectives were established based on those outlined by the Mississippi Valley Conservation Authority (MVCA), Ramsay Township, and Lanark County regulatory areas.

During the detailed design stage, further information will be provided regarding the post-development peak flow rates, stormwater management pond configuration and design specifications, stormwater management outlet control features, and specifically how the proposed stormwater management strategy will meet quality and quantity control objectives.

2.0 SITE DESCRIPTION

The proposed development is located in the Town of Carleton Place, Ontario. The legal description of the land is Lots 17, 20, 23, 26, 29 & 32, and Part of Lots 4 and 12, Registered Plan No. 787 (also known as Registered Plan No. 970), and Lots 89 to 94 Inclusive, Registered Plan No. 3469, Town of Carleton Place, County of Lanark. The subject site is bound by Townline Road East to the southeast, Lanark Street to the northeast, Edmund Street to the southwest, as well as industrial yards and vacant land to the northwest. It is currently occupied by a Christmas tree farm, which is primarily comprised of sections of woodlands, range, grass, and gravel. The location plan can be found in Appendix A.

The subject property is approximately 6.26 hectares in area and the owner wishes to develop the lands into 250 fully serviced residential dwelling units, consisting of medium density apartments, townhouses, and low density single detached homes. The lots will be accessed via a new residential street, with access points proposed on both Lanark Street and Edmund Street.

As per the topographic survey prepared by McIntosh Perry Surveying Inc. (April 2022), the subject property is moderately sloped. In addition, the digital elevation model of both the site and its surroundings was procured through LiDAR data sourced from the DRAPE (Digital Raster Acquisition Project Eastern Ontario) package. This LiDAR data was tailored to align with the topographic survey and facilitate the characterization of flow patterns in the external drainage area, enabling an assessment of the current drainage conditions. There is a local low area oriented in a north-south direction close to the center of the property, which most of the surrounding lands slope down towards. The elevations range from approximately 137.0 to 145.5 metres above sea level.

2.1 SOIL CONDITIONS

As this preliminary design work is occurring concurrently with their work, for the purposes of this design, the Ontario GeoHub's soil survey complex was used to determine the underlying soil conditions and their respective hydrologic soil groups. Based on this information, the site is comprised of Farmington soil, which is classified as having a hydrological soil group 'B'.

Further investigations will be completed in the detailed design to optimize the site with regards to construction practices for the dwelling placements, road profiles, and stormwater management pond design placement and specifications.

3.0 DRAINAGE AREA CHARACTERIZATION

3.1 DESIGN CRITERIA

In Ontario, the watershed-level management and planning are typically done using watershed plans, sub-watershed plans and/or individual stormwater management plans, in that order. The subject property is not covered by any specific watershed or sub watershed plans and has no existing stormwater controls in place. As such, the subject site will require a site-specific stormwater management plan using the MECP Stormwater Management Planning and Design Manual (March 2003). This methodology promotes water management from an environmentally sustainable perspective. The intent of this stormwater management plan is to provide adequate stormwater treatment for both quantity and quality controls. Stormwater Best Management Practices (BMPs) will be implemented at the "Lot level", "Conveyance" and "End of Pipe" locations. To summarize, roof water will be directed to grass surfaces that in turn will be conveyed to a stormwater management facility prior to outletting from the development. Quantity and quality control objectives are expected to be achieved through the stormwater management pond which will provide temporary attenuation.

The following design criteria is established based on the Stormwater Management Manual, 2003:

- Stormwater quantity controls will be required to regulate the post-development peak flows to pre-development levels for all design storms including the 2-, 5-, 10-, 25-, 50-, and 100-year storm events,
- Stormwater quality controls will be required to achieve the "Enhanced" level of protection, which corresponds to 80% long term average removal of Total Suspended Solids (TSS) as recommended in the MECP SWMPD Manual, 2003; and
- To ensure a safe and acceptable outlet for all design storm events, the projected outflow rates from the proposed stormwater management facility must remain within the allocated outflow rates determined by the neighboring development.

3.2 METHODOLOGY

Runoff calculations were completed with the aid of a computer modelling program, Visual OTTHYMO (Version 6.0) (VO6). The proposed model was developed using NASHYD and STANDHYD hydrograph routines, which were established based on the imperviousness percentage of the catchment areas. The time of concentration for each of the drainage areas was derived using the recommended Bransby Williams Formula and/or Airport Formula based on the catchment runoff co-efficient. The time of concentration was used to estimate the time to peak through the relation that the time to peak occurs at approximately 67% of the time of concentration.

The following table contains the values that were used to develop a composite curve number and initial abstraction value for each drainage area. As described in Section 2.1, and as per the available Soil Survey Complex, the existing soils have generally been classified as Class B. The drainage areas and land classifications were delineated using AutoCAD Civil 3D and LiDAR data.

Table 1: Curve Numbers and Initial Abstraction Values

Land Use	Curve Number	Initial Abstraction (mm)
Meadow	69	8
Grass	69	5
Woods	60	8
Wetland	50	10
Gravel	85	2.5
Impervious	98	1.5

Typically for STANDHYD, which represent the urban catchments (imperviousness percentage >20%) the amount of runoff generated may vary depending on the actual percentage of directly connected impervious area within the overall impervious area. Directly connected impervious area refers to the fraction of the total impervious area which is hydraulically connected to the downstream drainage by a buried piped route. Based on the proposed development and the type of SWM feature, Sutherland's equation with average connectivity status below can used to determine the directly connected impervious area.

$$DCIA = 0.1(TIA)^{1.5}$$

Where,
DCIA – Directly connected impervious area (%)
TIA – Total imperious area (%)
Average Connectivity Status – Mostly storm sewered with curb and gutter, no dry wells or infiltration, residential rooftops not connected to the storm sewer or piped directly to the street curb

The MTO IDF curve lookup tool was used to acquire the rainfall intensity-duration values for the subject site, which were used to synthesise 6-hour, 12-hour, and 24-hour SCS design storm events. The SCS Type II distributions for 2-, 5-, 10-, 25-, 50- and 100-year storms (6-hour, 12-hour, and 24-hour) were simulated in VO6, and the results were reviewed in preparing the proposed design. As a conservative approach, the design storm with the maximum peak flow rate was used for design purposes. As such, SCS Type II 24-hour storm events are the governing storms for the subject area with maximum flow rates and are considered to produce conservative results in this case.

3.3 PRE-DEVELOPMENT DRAINAGE

The pre-development property boundary encompasses two (2) drainage areas, noted as A1 and A2. There are five (5) external drainage areas which contribute to the overall site drainage, referred to as EXT1 through EXT5, that were included in the analyses under pre-development conditions. Appendix B includes the pre-development drainage plan, which illustrates the pre-development and external drainage areas and overland flow routes. Additionally, the supporting pre-development hydrologic parameter calculations and VO model output results are provided in Appendix C and Appendix D, respectively.

Pre-development drainage area A1 is comprised of the majority of the subject property. The runoff generated generally flows towards the local low area near the center of the property, followed by flowing in a northerly direction and outletting to Lanark Street. The land uses present in A1 include vegetated meadows (or range), grass, woodlands, and some gravel areas.

Pre-development drainage area A2 is located in the western corner of the subject site. The runoff generated generally flows in a southwesterly direction before outletting to Edmund Street. It is mainly comprised of range, woodlands, gravel, and some impervious area with existing building structures.

External drainage area EXT1 is located northwest of pre-development drainage area A2, and is comprised of woodlands. The runoff generated in EXT1 will drain in a southeast direction onto area A2 before outletting to Edmund Street. External drainage area EXT2 is located northwest of drainage area A1, and is comprised of woods and gravel. The runoff generated in this area will drain in a southeast direction onto area A1. External drainage area EXT3 is located north of area A1, and is comprised of grass, woods, and impervious area with building structures. The runoff generated in this area will drain in a southeast direction onto area A1. External drainage area EXT4 is located east of area A1, and is comprised of grass, woods, gravel, and impervious area with several existing residential dwellings. The runoff generated in this area will drain in a westerly direction onto area A1. External drainage area EXT5 is located south of area A1, and is also mainly comprised of grass, woods, gravel, and impervious area with some existing residential dwellings. The runoff generated in this area will drain northeast onto area A1.

The VO model input parameters and results have been summarized in the following tables, while the full detailed output results can be found in Appendix D.

Table 2: Pre-Development Input Parameters

Catchment ID	Area (ha)	CN[1]	Ia[2] (mm)	Tp[3] (hr)
NASHYD				
A1	5.35	65.9	7.5	0.25
A2	0.91	75.9	5.6	0.19
EXT1	0.07	60.0	8.0	0.18
EXT2	0.40	61.3	7.7	0.23
EXT3	0.19	69.3	5.9	0.13
EXT4	0.58	74.1	4.7	0.12
EXT5	0.69	70.8	5.4	0.14
Total:	8.19			

Notes:
1. CN refers to the average weighted curve number based on the land cover and land use.
2. Ia refers to the initial abstraction
3. Tp refers to time to peak

Table 3: Pre-Development VO Model Peak Flow Results (m^3/s)

Catchment	24- Hour SCS Type II	
	5-Year	100-Year
NASHYD		
A1	0.211	0.539
A2	0.066	0.149
EXT1	0.003	0.008
EXT2	0.015	0.040
EXT3	0.013	0.032
EXT4	0.053	0.120
EXT5	0.048	0.115

3.4 POST-DEVELOPMENT DRAINAGE

The preliminary post-development drainage scheme for the proposed development is comprised of one (1) drainage area, noted as B1. The development will see the addition of residential asphalt roadways, along with 250 fully serviced residential dwelling units, consisting of medium density apartments, townhouses, and low density single detached homes. Appendix B includes the post-development drainage plan, which illustrates the post-development and external drainage areas and overland flow routes. The external drainage areas EXT1 through EXT5 are to remain unchanged under post-development conditions. Supporting hydrologic parameter calculations and associated VO model output results can also be found in Appendix C and Appendix D, respectively.

Post-development drainage area B1 encompasses all of subject property and proposed development. Once developed, it will contain the asphalt roadways, residential dwellings, driveways, parking lot, as well as designated green spaces which are assumed to mainly consist of grass. There will be a proposed stormwater management pond on the northeast side of the property. Runoff generated within this catchment area will drain towards the stormwater management pond before outletting in a northeast direction to the neighboring Carleton Lanark Subdivision, across Lanark Street. Stormwater from the Carleton Lanark Subdivision will be attenuated in a stormwater management facility before outletting to the northerly off-site roadside ditch along Industrial Avenue, which ultimately drains to the Mississippi River.

The external drainage areas will not be altered as a result of the development and will be comprised of their original land use covers. Runoff generated in all of the external areas will drain onto post-development area B1 before being collected by the proposed stormwater management pond.

The VO model input parameters and results have been summarized in the following tables, while the full detailed output results can be found in Appendix D.

Table 4: Post-Development Input Parameters

Catchment ID	Area (ha)	CN[1]	Ia[2] (mm)	Tp[3] (hr)
STANDHYD				
B1	6.26	69.0	5.0	0.18
NASHYD				
EXT1	0.07	60.0	8.0	0.18
EXT2	0.40	61.3	7.7	0.23
EXT3	0.19	69.3	5.9	0.13
EXT4	0.58	74.1	4.7	0.12
EXT5	0.69	70.8	5.4	0.14
Total:	8.19			

Notes:
1. CN refers to the average weighted curve number based on the land cover and land use.
2. Ia refers to the initial abstraction
3. Tp refers to time to peak

Table 5: Uncontrolled Post-Development VO Model Peak Flow Results (m^3/s)

Catchment	24- Hour SCS Type II	
	5-Year	100-Year
STANDHYD		
B1	0.443	0.898
NASHYD		
EXT1	0.003	0.008
EXT2	0.015	0.040
EXT3	0.013	0.032
EXT4	0.053	0.120
EXT5	0.048	0.115

4.0 STORMWATER MANAGEMENT

The proposed development leads to an increase of impervious surfaces, consequently causing an increase of runoff from the site under the proposed circumstances. As such, it becomes imperative to implement a stormwater management system to achieve the requisite quality and quantity regulations stipulated in Section 3.1, as mandated by statutory requirements.

4.1 STORMWATER QUANTITY CONTROL

The following is provided as a summary of pre-development peak flow rates in comparison to the uncontrolled post-development peak flow rates.

Table 6: Pre-Development and Uncontrolled Post-Development Peak Flow Results (m^3/s)

Design Storm (yr)	24-Hour SCS Type II		
	Pre.	Post.	Δ
A1+EXT2+EXT3+EXT4+EXT5 / B1+EXT1+EXT2+EXT3+EXT4+EXT5 (Lanark Street)			
5	0.321	0.496	0.175
100	0.797	1.164	0.367
A2+EXT1 (Edmund Street)			
5	0.069	0.000	-0.069
100	0.157	0.000	-0.157

Evidently from the results, the post-development peak flow rates for the runoff outletting in the direction of Lanark Street are increased compared to pre-development conditions and thus, stormwater management quantity controls will be required. Since none of the stormwater from the subject property will drain to Edmund Street under post-development conditions, no stormwater quantity controls will be necessary for this outlet.

The stormwater management pond to be constructed on-site will be equipped with permanent outlet control devices designed to restrict flows to specified flow rates and will examine both the 5- and 100-year design storm events. Detailed sizing of the outlet control structures will be provided during the detailed design stage; however, a preliminary estimate of the storage requirements has been performed in VO6 and are summarized in the table below.

Table 7: Quantity Control Storage Requirements

Outlet ID	5-Year Restricted Flow (m^3/s)	5-Year Required Storage (m^3)	100-Year Restricted Flow (m^3/s)	100-Year Required Storage (m^3)	100-Year Available Active Storage (m^3)
Lanark Street	0.251	1300	0.695	1600	1647

The exact location, geometry, and alignment of the pond will be confirmed during detailed design. According to the initial sizing of the stormwater management pond, it is verified that the proposed pond configuration possesses sufficient volume to fulfill the requisite quantity control. The precise discharge performance of the SWM pond at various stages under design storm events will be validated during the detailed design phase of the development.

4.2 POST-DEVELOPMENT PEAK FLOW RATES SUMMARY

Based on the storage requirements, the following table summarizes the anticipated peak flow rates from the subject property to the neighboring Carleton Lanark Subdivision under post-development conditions compared to pre-development levels. Full supporting calculations for the described storage conditions are provided in

Appendix E. The specifications of the flow control structures at the outlet will be determined during the comprehensive design phase of the development.

Table 8: Pre-Development and Controlled Post-Development Peak Flow Results (m^3/s)

Design Storm (yr)	24-Hour SCS Type II		
	Pre.	Post.	Δ
A1+EXT2+EXT3+EXT4+EXT5 / B1+EXT1+EXT2+EXT3+EXT4+EXT5 (Lanark Street)			
5	0.321	0.251	-0.070
100	0.797	0.695	-0.102

4.3 OUTLET CONFIGURATION - NEIGHBORING SUBDIVISION

The flow rates released from this development should be less than the allowable rates calculated in the 'Carleton/Lanark Residential Subdivision Servicing and Stormwater Management Report', prepared by Robinson Land Development (Dec 2022). The storm sewer system for the neighboring Carleton Lanark Subdivision was designed to include the 5-year pre-development flow from the subject property. As shown in the table above, the projected maximum outflow from the proposed stormwater management facility is 0.695 m^3/s, which is below the allotted capacity of 0.819 m^3/s found in the design of the neighboring subdivision. Consequently, our SWM facility is appropriately dimensioned to avoid any substantial impact on their stormwater management infrastructure.

That said, the storm sewer design sheet in the neighboring development SWM Report (Dec 2022) considers the outflow from our site, which directly connects to their stormwater management (SWM) facility. However, the storage calculations for their SWM facility appear to overlook this inflow from our site. It is advisable that the design of the relevant SWM facility be revised to encompass these flows or alternatively, a parallel bypass trunk sewer should be developed to mitigate the storage demands of the neighboring SWM facility. Additional collaboration with the design consultant of the neighboring development will be required to address these concerns and formulate a storm sewer infrastructure design with tie-ins that are mutually advantageous.

4.4 STORMWATER QUALITY CONTROL

The entire subdivision will employ Best Management Practices (BMPs) wherever possible. The intent of implementing stormwater BMPs throughout the entire development is to ensure that water quality and quantity concerns are addressed at all stages of the development. The stormwater BMPs will be implemented at the lot, conveyance, and end of pipe levels.

The lot grading in the subdivision conveys the overland sheet flow towards the proposed storm sewer network. The gradient of the system will be enough to ensure the continuous flow of stormwater, minimizing the amount for standing water.

The proposed stormwater management pond will serve as an end-of-pipe quality control measure and will be designed to achieve the "Enhanced" level of protection. A settling forebay will be included to provide sufficient length for the dispersion and settling of inflowing suspended sediments based on the MECP Stormwater Management Planning and Design Manual, 2003. Upon preliminary calculations based on the preliminary design, it was estimated that the forebay will need a length of approximately 36m and a width of 5m. The preliminary forebay calculations are provided in Appendix E. Detailed calculations and layout of the forebay will be provided during the detailed design stage.

Based on the design criteria established in Section 3.1, an "Enhanced" level of protection which includes 80% TSS removal is required to achieve the necessary quality control. An estimate for the volume required to meet quality control objectives was calculated using the MECP Table 3.2 guidelines for a wet pond, as well as the anticipated impervious area of the catchment being treated by the pond, and is summarized in the table below. The storage volume available within the proposed SWM facility exceeds the total storage requirements for quality and quantity control.

Table 9: Quality Control Storage Requirements

Average Impervious Area (%)	Total Area (ha)	Quality Control Storage Volume (m^3/ha)	Quality Control Storage Volume (m^3)
54.6%	8.19	190.3	1560

4.5 MAJOR DRAINAGE ROUTES

The proposed storm sewers throughout the subdivision will be designed to handle minor storm events without overtopping. Under the circumstances of events greater than the design 5-year storm event or any obstruction, the storm runoff will surcharge and overtop the roadway. The overland lot layouts and road profiles will be designed to convey the overtop towards the SWM facility. The receiving outlet storm sewer from the SWM facility to the neighboring subdivision will be designed to safely convey all design storm outflows without overtopping Lanark Street. The preliminary storm sewer design sheet and drainage plan can be found in Appendix F. It is recommended that the Town of Carleton Place review the existing storm sewer system and assess the need to modify the elevations (if necessary) in support of this development.

5.0 LOW IMPACT DEVELOPMENT

As the practice of SWM has evolved, increasing emphasis has been placed on treating the runoff as close as possible to the source using a sequence of treatment methods called "treatment train approach". As a result, Low Impact Development approaches were established to mimic the existing natural hydrologic environment and to allow the rainwater to infiltrate, filter and evaporate close to the source. Typical LID practices include Rainwater harvesting, green roofs, downspout disconnection, soak away pits, infiltration trenches and chambers, bio-retention, vegetated filter strips, enhanced grass swales and permeable pavements.

Based on the type of the proposed development and the existing geotechnical information, downspout disconnections are the most suitable LID features for the site, as shown in the figure below. Downspout disconnection involves directing the runoff from roof leader downspouts to a pervious area, which drains away from the building. This gives an opportunity for the runoff to infiltrate before it reaches the typical curb and gutter system on the street. This also prevents the stormwater runoff from directly entering the storm sewer system or flowing across a "connected" impervious surface such as driveways.

Alternative LID features, such as rainfall harvesting, green roofs, or soak away pits may not be suitable for the site. They require ongoing maintenance which may necessitate special operations and impose significant efforts to sustain their efficacy. Additionally, LID features on roadways, including permeable pavement or bioswales, may also present a challenge if they go unmaintained and can in turn be detrimental to the overall submission.

Figure 1 – Typical Downspout Disconnection (LID Planning and Design Guide, CVC 2011)

6.0 EROSION AND SEDIMENT CONTROL

A site-specific Erosion and Sediment Control Plan will be prepared during the design development stage of the application process, delineating the proposed features to be implemented on-site as temporary and permanent means of managing erosion and sediment control. Following Best Management Practices are recommended to be incorporated into the Erosion and Sediment Control plans.

6.1 TEMPORARY MEASURES

Before construction begins, applicable temporary light silt fence (OPSD 219.110), straw bale and rock flow check dams shall be installed at all natural runoff outlets from the property. It is crucial that these controls be maintained throughout construction and inspection of sediment and erosion control will be facilitated by the Contractor or Contract Administration staff throughout the construction period.

The Contractor, at their discretion or at the instruction of the Township, Conservation Authority or the Contract Administrator shall increase the quantity of sediment and erosion controls on-site to ensure that the site is operating as intended and no additional sediment finds its way offsite or into the adjacent wetlands. Measures shall be inspected weekly and after all rainfall events. Care shall be taken to properly remove sediment from the fences and check dams as required.

Work through winter months shall be closely monitored for erosion along sloped areas. Should erosion be noted, the Contractor shall be alerted and shall take all necessary steps to rectify the situation. Should the Contractor's efforts fail at remediating the eroded areas, the Contractor shall contact the Conservation Authority to review the site conditions and determine the appropriate course of action.

6.2 PERMANENT MEASURES

Rip rap will be placed at all locations that have the potential for concentrated flow. It is crucial that the Contractor ensure that the geotextile is keyed in properly to ensure runoff does not undermine the rip rapped area. Additional rip rap is to be placed at erosion prone locations as identified by the Contractor / Contract Administrator / Township / Conservation Authority.

It is expected that the Contractor will promptly ensure that all disturbed areas receive topsoil and seed/sod, and that grass be established as soon as possible. Any areas of excess fill shall be removed or levelled as soon as possible and must be located a sufficient distance from any outlet to ensure that no sediment is washed out into the existing storm sewer network. As the vegetation growth provides a key component to the control of sediment for the site, it must be properly maintained once established.

7.0 SUMMARY

- Runoff from the proposed development will be collected and conveyed via the internal storm sewer system to the end-of-pipe SWM facility. The proposed on-site storm sewers and overland conveyance systems will be adequately designed to safely convey both minor and major storm events.
- The quality control objective of reaching "Enhanced" level of protection will be achieved by implementing a settling forebay basin and extended detention in the proposed wet pond.
- Quantity control objectives will be achieved by the adequately sized active retention basin with flow control structures, which will also regulate the post-development peak flows to existing levels. Specifications of the flow control structures will be provided during the detailed design phase.
- The discharge from the proposed stormwater management facility will remain within the allocated capacity of the storm sewer infrastructure of the neighboring subdivision.
- Best Management Practices are provided to mitigate and minimize the temporary and permanent erosion and sediment transport during and after construction.

8.0 RECOMMENDATIONS

Based on the information presented in this report, we recommend that Beckwith Township and the Mississippi Valley Conservation Authority accept and approve this *Preliminary Stormwater Management Report* in support of the proposed development of Wintergreen Ridge Subdivision at 400 Lanark Street, Carleton Place, ON. It is further recommended that the Town of Carleton Place review the receiving storm sewer system and assess the need to modify the existing elevations in support of this development.

Sincerely,
McIntosh Perry Consulting Engineers Ltd.

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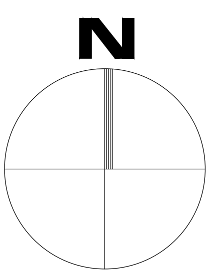
APPENDIX A
LOCATION PLAN

North:



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Client:	WINTERGREEN RIDGE LTD.
Project:	WINTERGREEN RIDGE SUBDIVISION 400 LANARK STREET, CARLETON PLACE, ON
Title:	LOCATION PLAN

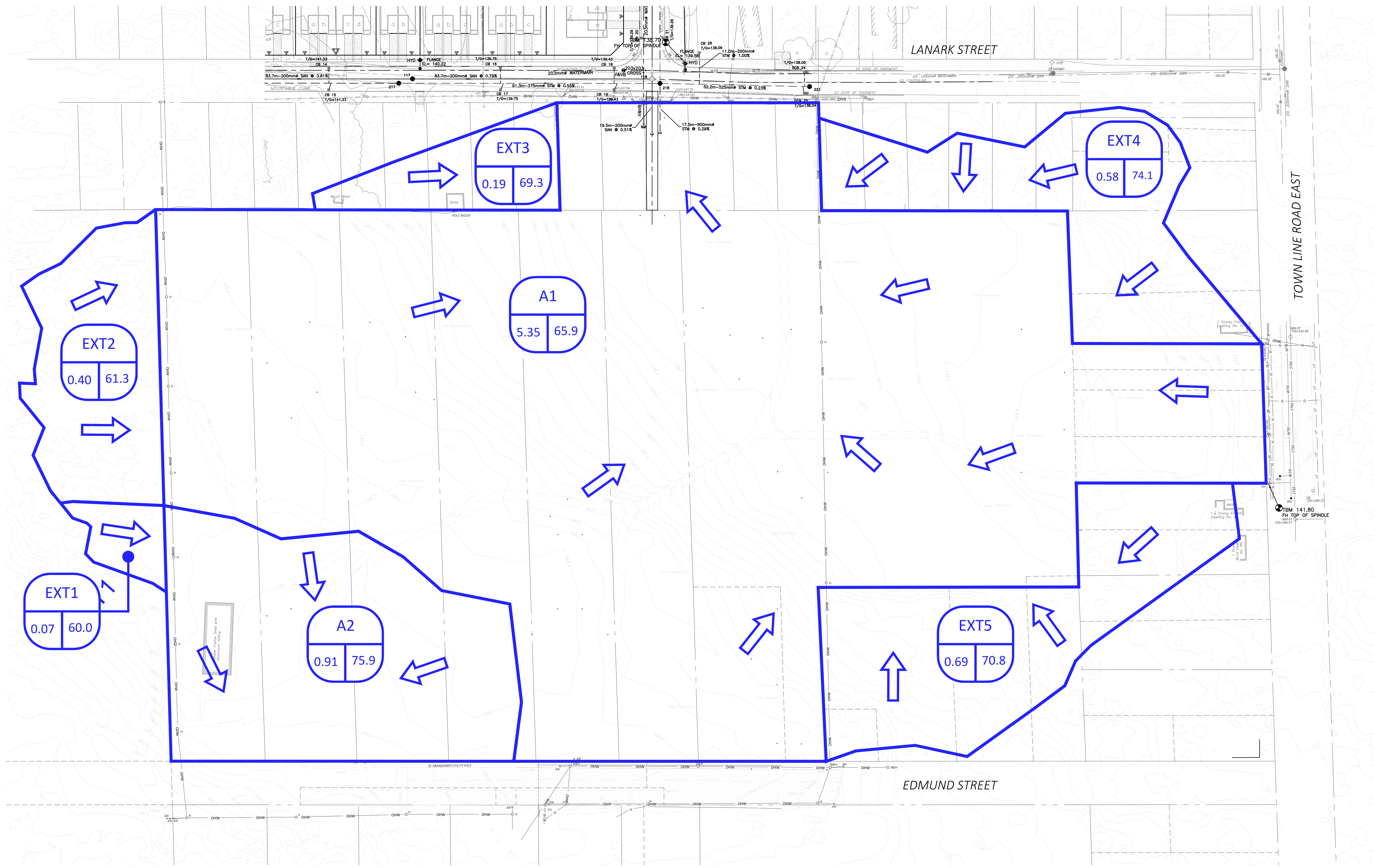
Drawn by: SH	Scale: N.T.S.
Checked By:	Date: DEC.08.2022
Project Number:	CCO-22-0957

No.	Revision / Issue	Date

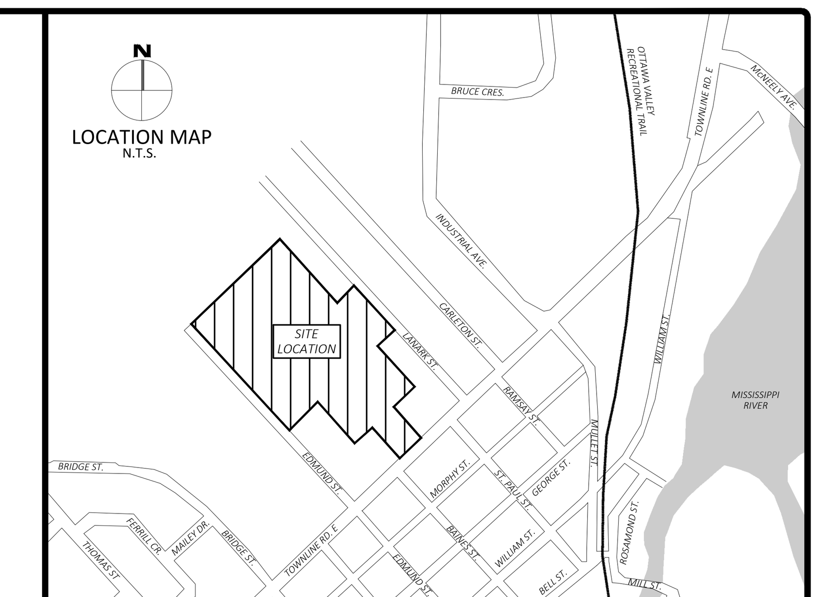
Drawing Number: LOC

FILENAME: U:\Perth\MPCE JOBS\MPCE Projects\2022\CCO\CCO-22-0957 - Wintergreen - Draft Plan of Subdivision - 400 Lanark Street\05 - Drawings\CCO-22-0957 - 400 Lanark Street-Conceptual Design.dwg
LAST SAVED: Thursday, July 27, 2023 LAST SAVED BY: l.gibson
LAST PLOTTED: Friday, July 28, 2023 CTB FILE USED: ----

APPENDIX B
PRE- AND POST-DEVELOPMENT DRAINAGE PLANS



LOCATION MAP
N.T.S.



LEGEND

PRE-DEVELOPMENT OVERLAND FLOW DIRECTION

A1 — CATCHMENT I.D.
1.00 — CATCHMENT AREA (HECTARES)
90.0 — CURVE NUMBER

FOR REVIEW ONLY
NOT FOR CONSTRUCTION

SCALE 1 : 750
0 25 50 75 Metres

No.	Revision/Issue	Date

Check and verify all dimensions before proceeding with the work

Do not scale drawings

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North:

Stamp:

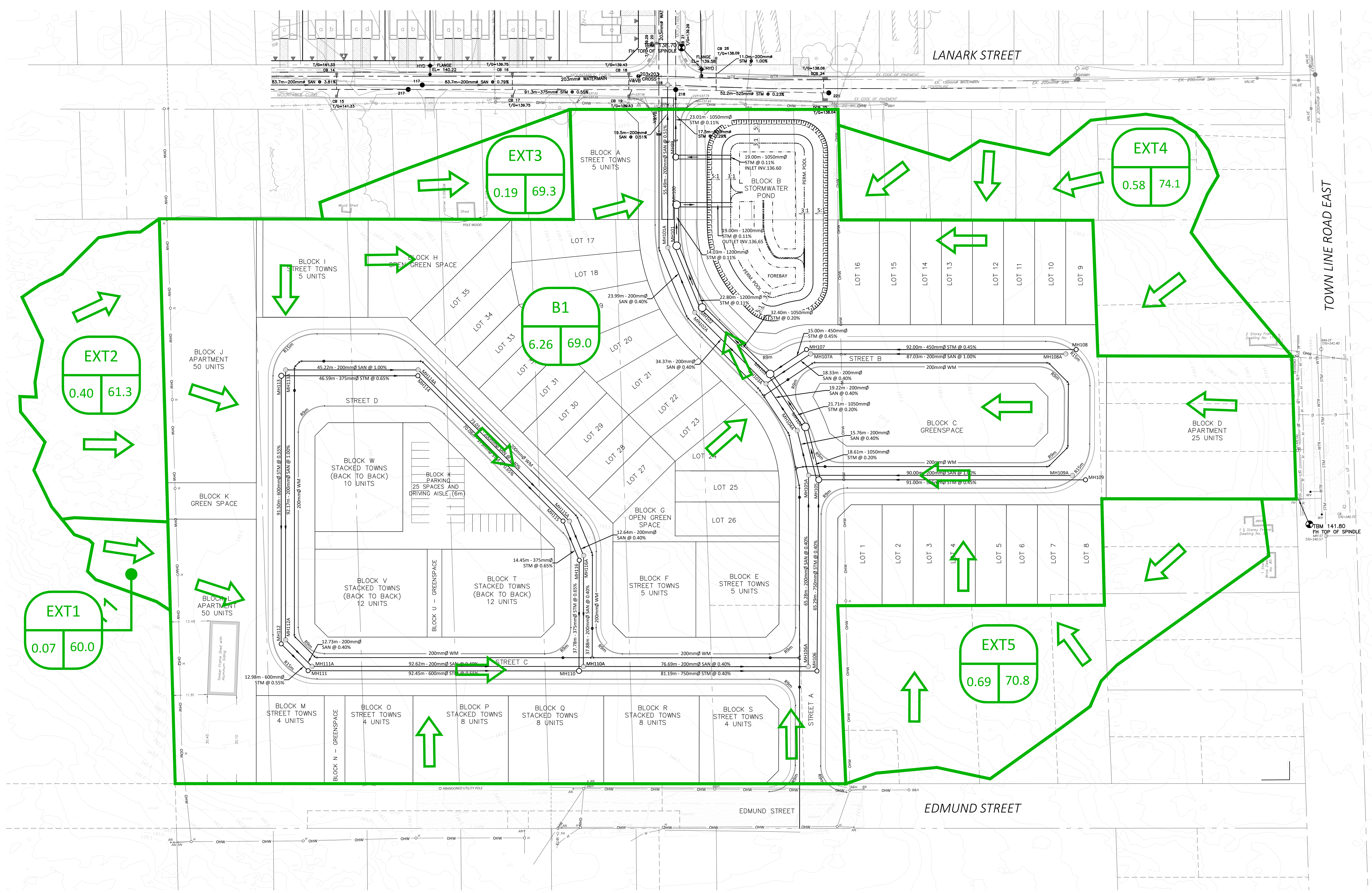
Client:
WINTERGREEN RIDGE LTD.

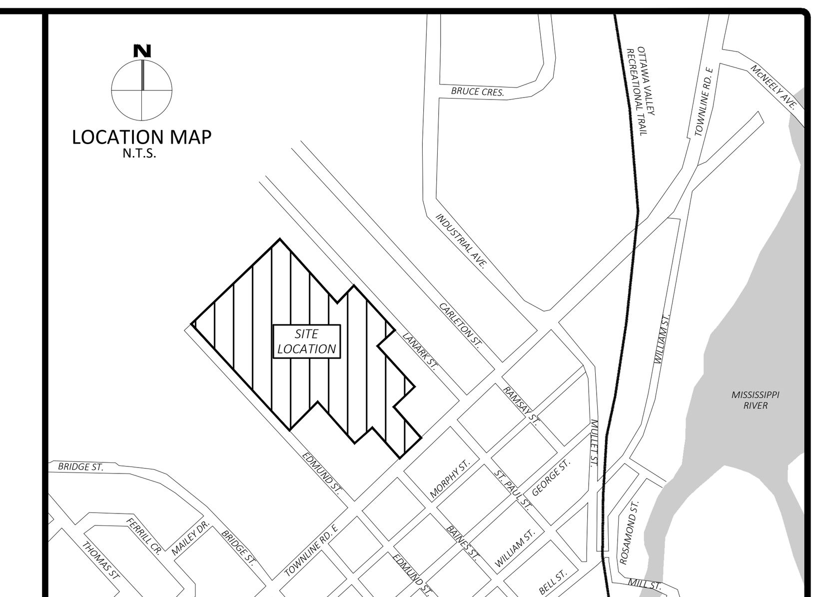
Project:
400 LANARK STREET
WINTERGREEN RIDGE SUBDIVISION

CARLETON PLACE ONTARIO

Drawing Title:
CONCEPTUAL PRE-DEVELOPMENT DRAINAGE PLAN

Scale: 1:750	Project Number: CCO-22-0957
Drawn by: S.H.	
Checked By: R.C.	Drawing Number: PRE
Designed By: M.O.	





LEGEND

POST-DEVELOPMENT OVERLAND FLOW DIRECTION

B1
1.00 90.0
CATCHMENT I.D.
CATCHMENT AREA (HECTARES)
CURVE NUMBER

FOR REVIEW ONLY
NOT FOR CONSTRUCTION

SCALE 1 : 750
0 25 50 75 Metres

No.	Revision/Issue	Date

Check and verify all dimensions before proceeding with the work

Do not scale drawings

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North:

Stamp:

Client:
WINTERGREEN RIDGE LTD.

Project:
400 LANARK STREET
WINTERGREEN RIDGE SUBDIVISION
CARLETON PLACE ONTARIO

Drawing Title:
CONCEPTUAL POST-DEVELOPMENT PLAN

Scale:	1:750	Project Number:	CCO-22-0957
Drawn by:	S.H.		
Checked By:	R.C.	Drawing Number:	POST
Designed By:	M.O.		

APPENDIX C
HYDROLOGIC PARAMETERS

OUTPUTS

Hydrologic Parameters for A1

Project Name:	400 Lanark Street Subdivision	Designed By:	RC
Project Number:	22-0957	Checked By:	JS
Catchment ID:	A1	Date:	2023-08-14

Drainage Area	5.35	ha
Precent Impervious	0.0	%

Rainfall Data

Guage Station:	Smiths Falls MTO Lookup	
100 Year 12 HR Rainfall Depth:	94.4	mm

Slope, Landuse and Soil Type Identification

Agriculture		ha		
Range	2.34	ha		
Grass	0.40	ha		
Woods	2.34	ha		
Wetland		ha		
Gravel	0.27	ha		
Impervious		ha		
	5.350	0	0	0
Sum	5.35	ha		
Soil Name	Farmington			
Soil Type	B			
Composite C	0.17			

	Pervious Areas	Impervious Areas	
Length	145.17	0	m
US Elev.	144.10	0	m
DS Elev.	137.30	0	m
Slope	4.68		%
Terrain	Rolling	`	

Note:
Flat:0-2% slopes
Rolling:2-6% slopes
Hilly:>6% slopes

Composite Runoff and Curve Number Calculations

Parameter	Hydrologic Soil Group	Land Use							Composite Values	
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Imperv.	Incl. Imperv. Nashyd	Not Incl. Imperv. Standhyd
Runoff Coefficient, C	RollingB	0.48	0.20	0.16	0.11	0.05	0.53	0.90	0.17	0.17
SCS Curve No., CN	B	78.00	69.00	69.00	60.00	50.00	85.00	98.00	65.87	65.87
Initial Abstraction, mm		5	8	5	8	10	2.5	1.5	7.5	7.5

Time of Concentration Calculations

Total Flow Length	US Elev.	DS Elev.	Avg. Slope	Terrain	Composite C	Airport Formula	Bransby Formula	Minimum	Tc (min)	Tp (hr)
145.17	144.10	137.3	4.68	Rolling	0.17	21.95	5.14	10	22.0	0.25

Hydrologic Parameters Summary

Catchment	5.35		ha
Impervious Percent	0.00		%
Slope	4.68		%
Runoff Co-efficient	0.17		
SCS Curve No:	65.87	65.87	
Modified CN*	64	64	
Initial Abstraction	7.5	7.5	mm
Time of Concentration, Tc	22.0		min
Time to Peak, Tp	0.25		hr

Notes:

1.Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.
2.Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, and Tables 4-5a to 4-5d, Maryland State Highway Administration.
3.SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and Table 2-2a, TR-55, page 2-5.
4.Use Airport Equation to calculate time of concentration for C < 0.40, and Bransby-Williams for C > 0.40.

OUTPUTS

Hydrologic Parameters for A2

Project Name:	400 Lanark Street Subdivision	Designed By:	RC
Project Number:	22-0957	Checked By:	JS
Catchment ID:	A2	Date:	2023-08-14

Drainage Area	0.91	ha
Precent Impervious	5.5	%

Rainfall Data

Guage Station: Smiths Falls MTO Lookup

100 Year 12 HR Rainfall Depth: 94.4 mm

Slope, Landuse and Soil Type Identification

Agriculture		ha		
Range	0.45	ha		
Grass		ha		
Woods	0.07	ha		
Wetland		ha		
Gravel	0.34	ha		
Impervious	0.05	ha		
	0.91	0	0	0
Sum	0.91	ha		
Soil Name	Farmington			
Soil Type	B			
Composite C	0.35			

	Pervious Areas	Impervious Areas	
Length	82.40	0	m
US Elev.	145.30	0	m
DS Elev.	143.50	0	m
Slope	2.18		%
Terrain	Rolling		

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Note:
Flat:0-2% slopes
Rolling:2-6% slopes
Hilly:>6% slopes

Composite Runoff and Curve Number Calculations

Parameter	Hydrologic Soil Group	Land Use							Composite Values	
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Imperv.	Incl. Imperv. Nashyd	Not Incl. Imperv. Standhyd
Runoff Coefficient, C	RollingB	0.48	0.20	0.16	0.11	0.05	0.53	0.90	0.35	0.32
SCS Curve No., CN	B	78.00	69.00	69.00	60.00	50.00	85.00	98.00	75.88	74.59
Initial Abstraction, mm		5	8	5	8	10	2.5	1.5	5.6	5.8

Time of Concentration Calculations

Total Flow Length	US Elev.	DS Elev.	Avg. Slope	Terrain	Composite C	Airport Formula	Bransby Formula	Minimum	Tc (min)	Tp (hr)
82.4	145.30	143.5	2.18	Rolling	0.35	17.16	4.06	10	17.2	0.19

Hydrologic Parameters Summary

Catchment	0.91		ha
Impervious Percent	5.5		%
Slope	2.18		%
Runoff Co-efficient	0.35		
SCS Curve No:	75.88	74.59	
Modified CN*	75	74	
Initial Abstraction	5.6	5.8	mm
Time of Concentration, Tc	17.2		min
Time to Peak, Tp	0.19		hr

Notes:

1.Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.
2.Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, and Tables 4-5a to 4-5d, Maryland State Highway Administration.
3.SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and Table 2-2a, TR-55, page 2-5.
4.Use Airport Equation to calculate time of concentration for C < 0.40, and Bransby-Williams for C > 0.40.

OUTPUTS

Hydrologic Parameters for B1

Project Name:	400 Lanark Street Subdivision	Designed By:	RC
Project Number:	22-0957	Checked By:	JS
Catchment ID:	B1	Date:	2023-08-14

Drainage Area	6.26	ha
Precent Impervious	67.9	%

Rainfall Data

Guage Station:	Smiths Falls MTO Lookup	
100 Year 12 HR Rainfall Depth:	94.4	mm

Slope, Landuse and Soil Type Identification

Agriculture		ha		
Range		ha		
Grass	2.01	ha		
Woods		ha		
Wetland		ha		
Gravel		ha		
Impervious	4.25	ha		
	6.26	0	0	0
Sum	6.26	ha		
Soil Name	Farmington			
Soil Type	B			
Composite C	0.66			

	Pervious Areas	Impervious Areas	
Length	30.00	330	m
US Elev.	140.50	142.2	m
DS Elev.	139.20	137.2	m
Slope	4.33	1.52	%
Terrain	Rolling	Flat	

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Note:
Flat:0-2% slopes
Rolling:2-6% slopes
Hilly:>6% slopes

Composite Runoff and Curve Number Calculations

Parameter	Hydrologic Soil Group	Land Use							Composite Values	
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Imperv.	Incl. Imperv. Nashyd	Not Incl. Imperv. Standhyd
Runoff Coefficient, C	RollingB	0.48	0.20	0.16	0.11	0.05	0.53	0.90	0.66	0.16
SCS Curve No., CN	B	78.00	69.00	69.00	60.00	50.00	85.00	98.00	88.69	69.00
Initial Abstraction, mm		5	8	5	8	10	2.5	1.5	2.6	5.0

Time of Concentration Calculations

Total Flow Length	US Elev.	DS Elev.	Avg. Slope	Terrain	Composite C	Airport Formula	Bransby Formula	Minimum	Tc (min)	Tp (hr)
360.00	142.20	137.2	1.39	Flat	0.66	24.41	15.99	10	16.0	0.18

Hydrologic Parameters Summary

Catchment		6.26	ha
Impervious Percent		67.9	%
Slope		1.39	%
Runoff Co-efficient		0.66	
SCS Curve No:	88.69	69.00	
Modified CN*	87	67	
Initial Abstraction	2.6	5.0	mm
Time of Concentration, Tc		16.0	min
Time to Peak, Tp		0.18	hr

Notes:

1.Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.
2.Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, and Tables 4-5a to 4-5d, Maryland State Highway Administration.
3.SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and Table 2-2a, TR-55, page 2-5.
4.Use Airport Equation to calculate time of concentration for C < 0.40, and Bransby-Williams for C > 0.40.

OUTPUTS

Hydrologic Parameters for EXT1

Project Name:	400 Lanark Street Subdivision	Designed By:	RC
Project Number:	22-0957	Checked By:	JS
Catchment ID:	EXT1	Date:	2023-08-14

Drainage Area	0.07	ha
Precent Impervious	0.0	%

Rainfall Data

Guage Station: Smiths Falls MTO Lookup

100 Year 12 HR Rainfall Depth: 94.4 mm

Slope, Landuse and Soil Type Identification

Agriculture		ha		
Range		ha		
Grass		ha		
Woods	0.07	ha		
Wetland		ha		
Gravel		ha		
Impervious		ha		
	0.07	0	0	0
Sum	0.07	ha		
Soil Name	Farmington			
Soil Type	B			
Composite C	0.08			

	Pervious Areas	Impervious Areas	
Length	26.00	0	m
US Elev.	146.00	0	m
DS Elev.	145.70	0	m
Slope	1.15		%
Terrain	Flat		

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Note:
Flat:0-2% slopes
Rolling:2-6% slopes
Hilly:>6% slopes

Composite Runoff and Curve Number Calculations

Parameter	Hydrologic Soil Group	Land Use							Composite Values	
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Imperv.	Incl. Imperv. Nashyd	Not Incl. Imperv. Standhyd
Runoff Coefficient, C	FlatB	0.43	0.18	0.11	0.08	0.05	0.43	0.90	0.08	0.08
SCS Curve No., CN	B	78.00	69.00	69.00	60.00	50.00	85.00	98.00	60.00	60.00
Initial Abstraction, mm		5	8	5	8	10	2.5	1.5	8.0	8.0

Time of Concentration Calculations

Total Flow Length	US Elev.	DS Elev.	Avg. Slope	Terrain	Composite C	Airport Formula	Bransby Formula	Minimum	Tc (min)	Tp (hr)
26	146.00	145.7	1.15	Flat	0.08	16.19	1.88	10	16.2	0.18

Hydrologic Parameters Summary

Catchment	0.07		ha
Impervious Percent	0.0		%
Slope	1.15		%
Runoff Co-efficient	0.08		
SCS Curve No:	60.00	60.00	
Modified CN*	60	60	
Initial Abstraction	8.0	8.0	mm
Time of Concentration, Tc	16.2		min
Time to Peak, Tp	0.18		hr

Notes:

1.Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.

2.Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, and Tables 4-5a to 4-5d, Maryland State Highway Administration.

3.SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and Table 2-2a, TR-55, page 2-5.

4.Use Airport Equation to calculate time of concentration for C < 0.40, and Bransby-Williams for C > 0.40.

OUTPUTS

Hydrologic Parameters for EXT2

Project Name:	400 Lanark Street Subdivision	Designed By:	RC
Project Number:	22-0957	Checked By:	JS
Catchment ID:	EXT2	Date:	2023-08-14

Drainage Area	0.40	ha
Precent Impervious	0.0	%

Rainfall Data

Guage Station: Smiths Falls MTO Lookup

100 Year 12 HR Rainfall Depth: 94.4 mm

Slope, Landuse and Soil Type Identification

Agriculture		ha		
Range		ha		
Grass		ha		
Woods	0.38	ha		
Wetland		ha		
Gravel	0.02	ha		
Impervious		ha		
	0.40	0	0	0
Sum	0.40	ha		
Soil Name	Farmington			
Soil Type	B			
Composite C	0.10			

	Pervious Areas	Impervious Areas	
Length	45.90	0	m
US Elev.	145.50	0	m
DS Elev.	144.90	0	m
Slope	1.31		%
Terrain	Flat		

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Note:

Flat:0-2% slopes

Rolling:2-6% slopes

Hilly:>6% slopes

Composite Runoff and Curve Number Calculations

Parameter	Hydrologic Soil Group	Land Use							Composite Values	
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Imperv.	Incl. Imperv. Nashyd	Not Incl. Imperv. Standhyd
Runoff Coefficient, C	FlatB	0.43	0.18	0.11	0.08	0.05	0.43	0.90	0.10	0.10
SCS Curve No., CN	B	78.00	69.00	69.00	60.00	50.00	85.00	98.00	61.25	61.25
Initial Abstraction, mm		5	8	5	8	10	2.5	1.5	7.7	7.7

Time of Concentration Calculations

Total Flow Length	US Elev.	DS Elev.	Avg. Slope	Terrain	Composite C	Airport Formula	Bransby Formula	Minimum	Tc (min)	Tp (hr)
45.9	145.50	144.9	1.31	Flat	0.10	20.20	2.72	10	20.2	0.23

Hydrologic Parameters Summary

Catchment	0.40		ha
Impervious Percent	0.0		%
Slope	1.31		%
Runoff Co-efficient	0.10		
SCS Curve No:	61.25	61.25	
Modified CN*	61	61	
Initial Abstraction	7.7	7.7	mm
Time of Concentration, Tc	20.2		min
Time to Peak, Tp	0.23		hr

Notes:

1.Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.

2.Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, and Tables 4-5a to 4-5d, Maryland State Highway Administration.

3.SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and Table 2-2a, TR-55, page 2-5.

4.Use Airport Equation to calculate time of concentration for C < 0.40, and Bransby-Williams for C > 0.40.

OUTPUTS			

Hydrologic Parameters for EXT3

Project Name:	400 Lanark Street Subdivision	Designed By:	RC
Project Number:	22-0957	Checked By:	JS
Catchment ID:	EXT3	Date:	2023-08-14

Drainage Area	0.19	ha
Precent Impervious	18.0	%

Rainfall Data

Guage Station: Smiths Falls MTO Lookup

100 Year 12 HR Rainfall Depth: 94.4 mm

Slope, Landuse and Soil Type Identification

Agriculture		ha		
Range		ha		
Grass	0.07	ha		
Woods	0.09	ha		
Wetland		ha		
Gravel		ha		
Impervious	0.03	ha		
	0.19	0	0	0
Sum	0.19	ha		
Soil Name	Farmington			
Soil Type	B			
Composite C	0.25			

	Pervious Areas	Impervious Areas	
Length	33.80	21.9	m
US Elev.	140.50	141.51	m
DS Elev.	138.50	140.5	m
Slope	5.92	4.61	%
Terrain	Rolling	Rolling	

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Note:
Flat:0-2% slopes
Rolling:2-6% slopes
Hilly:>6% slopes

Composite Runoff and Curve Number Calculations

Parameter	Hydrologic Soil Group	Land Use							Composite Values	
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Imperv.	Incl. Imperv. Nashyd	Not Incl. Imperv. Standhyd
Runoff Coefficient, C	RollingB	0.48	0.20	0.16	0.11	0.05	0.53	0.90	0.25	0.13
SCS Curve No., CN	B	78.00	69.00	69.00	60.00	50.00	85.00	98.00	69.32	63.94
Initial Abstraction, mm		5	8	5	8	10	2.5	1.5	5.9	6.7

Time of Concentration Calculations

Total Flow Length	US Elev.	DS Elev.	Avg. Slope	Terrain	Composite C	Airport Formula	Bransby Formula	Minimum	Tc (min)	Tp (hr)
55.7	141.51	138.5	5.40	Rolling	0.25	11.85	2.68	10	11.9	0.13

Hydrologic Parameters Summary

Catchment	0.19		ha
Impervious Percent	18.0		%
Slope	5.40		%
Runoff Co-efficient	0.25		
SCS Curve No:	69.32	63.94	
Modified CN*	67	61	
Initial Abstraction	5.9	6.7	mm
Time of Concentration, Tc	11.9		min
Time to Peak, Tp	0.13		hr

Notes:

1.Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.

2.Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, and Tables 4-5a to 4-5d, Maryland State Highway Administration.

3.SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and Table 2-2a, TR-55, page 2-5.

4.Use Airport Equation to calculate time of concentration for C < 0.40, and Bransby-Williams for C > 0.40.

OUTPUTS

Hydrologic Parameters for EXT4

Project Name:	400 Lanark Street Subdivision	Designed By:	RC
Project Number:	22-0957	Checked By:	JS
Catchment ID:	EXT4	Date:	2023-08-14

Drainage Area	0.58	ha
Precent Impervious	19.0	%

Rainfall Data

Guage Station: Smiths Falls MTO Lookup

100 Year 12 HR Rainfall Depth: 94.4 mm

Slope, Landuse and Soil Type Identification

Agriculture		ha		
Range		ha		
Grass	0.33	ha		
Woods	0.1	ha		
Wetland		ha		
Gravel	0.04	ha		
Impervious	0.11	ha		
	0.580	0	0	0
Sum	0.58	ha		
Soil Name	Farmington			
Soil Type	B			
Composite C	0.32			

	Pervious Areas	Impervious Areas	
Length	28.53	20.03	m
US Elev.	140.00	140.64	m
DS Elev.	138.50	140	m
Slope	5.26	3.20	%
Terrain	Rolling	Rolling	

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Note:

Flat:0-2% slopes

Rolling:2-6% slopes

Hilly:>6% slopes

Composite Runoff and Curve Number Calculations

Parameter	Hydrologic Soil Group	Land Use							Composite Values	
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Imperv.	Incl. Imperv. Nashyd	Not Incl. Imperv. Standhyd
Runoff Coefficient, C	RollingB	0.48	0.20	0.16	0.11	0.05	0.53	0.90	0.32	0.18
SCS Curve No., CN	B	78.00	69.00	69.00	60.00	50.00	85.00	98.00	74.05	68.45
Initial Abstraction, mm		5	8	5	8	10	2.5	1.5	4.7	5.4

Time of Concentration Calculations

Total Flow Length	US Elev.	DS Elev.	Avg. Slope	Terrain	Composite C	Airport Formula	Bransby Formula	Minimum	Tc (min)	Tp (hr)
48.56	140.64	138.5	4.41	Rolling	0.32	10.86	2.17	10	10.9	0.12

Hydrologic Parameters Summary

Catchment	0.58		ha
Impervious Percent	19.0		%
Slope	4.41		%
Runoff Co-efficient	0.32		
SCS Curve No:	74.05	68.45	
Modified CN*	73	66	
Initial Abstraction	4.7	5.4	mm
Time of Concentration, Tc	10.9		min
Time to Peak, Tp	0.12		hr

Notes:

1.Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.

2.Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, and Tables 4-5a to 4-5d, Maryland State Highway Administration.

3.SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and Table 2-2a, TR-55, page 2-5.

4.Use Airport Equation to calculate time of concentration for C < 0.40, and Bransby-Williams for C > 0.40.

OUTPUTS

Hydrologic Parameters for EXT5

Project Name:	400 Lanark Street Subdivision	Designed By:	RC
Project Number:	22-0957	Checked By:	JS
Catchment ID:	EXT5	Date:	2023-08-14

Drainage Area	0.69	ha
Precent Impervious	11.6	%

Rainfall Data

Guage Station: Smiths Falls MTO Lookup

100 Year 12 HR Rainfall Depth: 94.4 mm

Slope, Landuse and Soil Type Identification

Agriculture		ha		
Range		ha		
Grass	0.27	ha		
Woods	0.260	ha		
Wetland		ha		
Gravel	0.08	ha		
Impervious	0.08	ha		
	0.69	0	0	0
Sum	0.69	ha		
Soil Name	Farmington			
Soil Type	B			
Composite C	0.27			

	Pervious Areas	Impervious Areas	
Length	48.90	12.4	m
US Elev.	140.10	141	m
DS Elev.	137.70	140.1	m
Slope	4.91	7.26	%
Terrain	Rolling	Hilly	

Note:
Flat:0-2% slopes
Rolling:2-6% slopes
Hilly:>6% slopes

Composite Runoff and Curve Number Calculations

Parameter	Hydrologic Soil Group	Land Use							Composite Values	
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Imperv.	Incl. Imperv. Nashyd	Not Incl. Imperv. Standhyd
Runoff Coefficient, C	RollingB	0.48	0.20	0.16	0.11	0.05	0.53	0.90	0.27	0.19
SCS Curve No., CN	B	78.00	69.00	69.00	60.00	50.00	85.00	98.00	70.83	67.26
Initial Abstraction, mm		5	8	5	8	10	2.5	1.5	5.4	6.0

Time of Concentration Calculations

Total Flow Length	US Elev.	DS Elev.	Avg. Slope	Terrain	Composite C	Airport Formula	Bransby Formula	Minimum	Tc (min)	Tp (hr)
61.3	141.00	137.7	5.38	Rolling	0.27	12.16	2.59	10	12.2	0.14

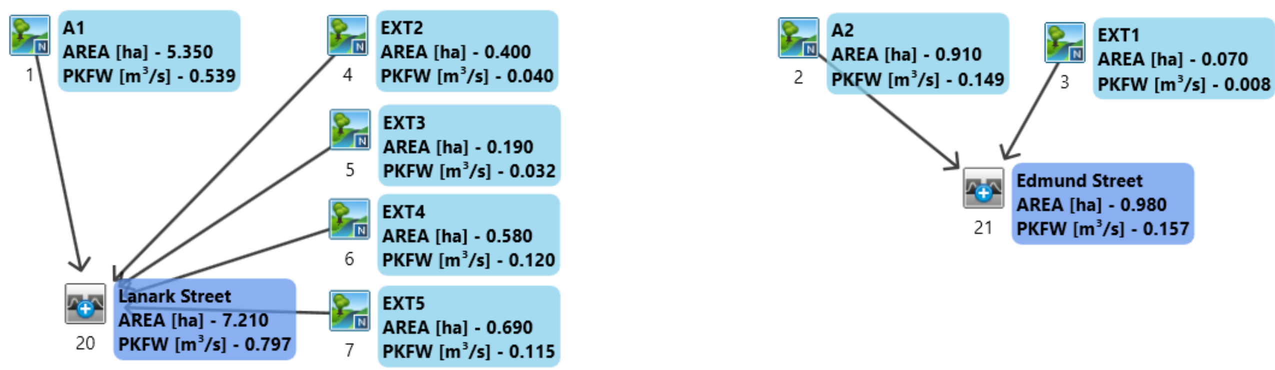
Hydrologic Parameters Summary

Catchment	0.69		ha
Impervious Percent	11.6		%
Slope	5.38		%
Runoff Co-efficient	0.27		
SCS Curve No:	70.83	67.26	
Modified CN*	68	64	
Initial Abstraction	5.4	6.0	mm
Time of Concentration, Tc	12.2		min
Time to Peak, Tp	0.14		hr

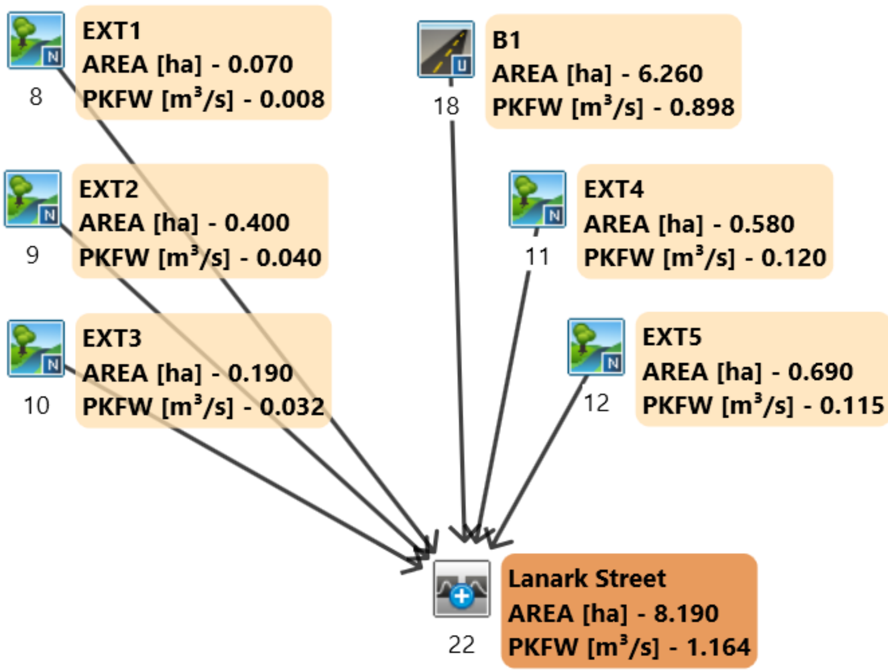
Notes:
1.Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.
2.Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, and Tables 4-5a to 4-5d, Maryland State Highway Administration.
3.SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and Table 2-2a, TR-55, page 2-5.
4.Use Airport Equation to calculate time of concentration for C < 0.40, and Bransby-Williams for C > 0.40.

APPENDIX D
PRE- AND POST-DEVELOPMENT VO MODELLING SCHEMATIC & RESULTS

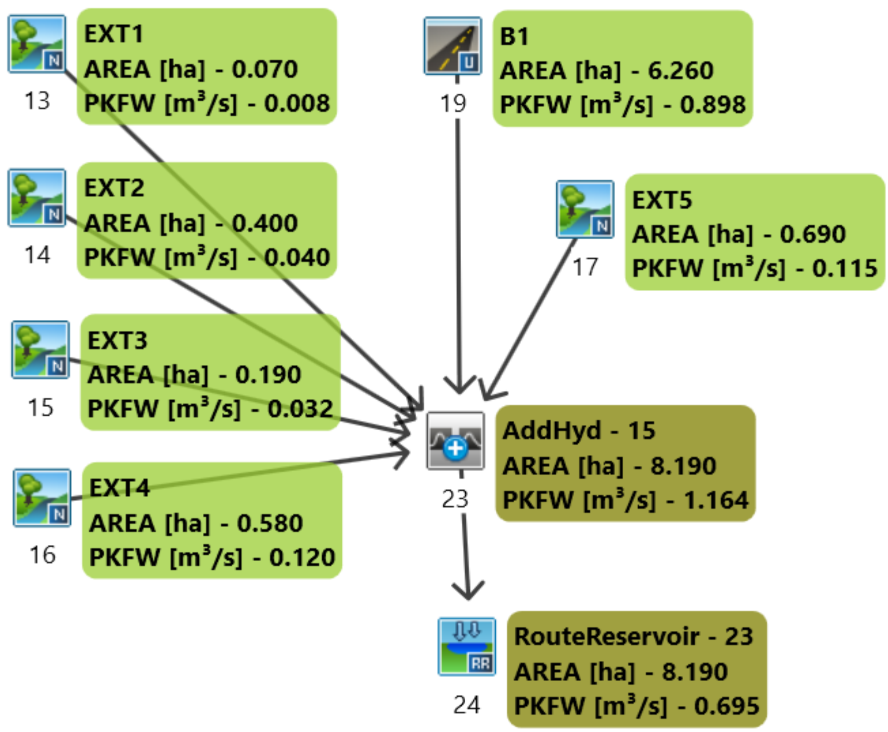
Pre-Development VO Model Schematic



Post-Development Uncontrolled VO Model Schematic



Post-Development Controlled VO Model Schematic



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************************************
** SIMULATION:100yr 12hr 5min SCS **
************************************

--------------------
|    READ STORM    |    Filename: C:\Users\m.orwin\AppD
|                  |              ata\Local\Temp\
|                  |              d5546b1a-54a6-497b-a8a5-5a1feca7b397\95c509a2
| Ptotal= 94.80 mm |    Comments: 100yr 12hr 5min SCS
--------------------
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                 0.08    0.00 |  3.17    3.79 |  6.25   17.06 |  9.33    3.32
                 0.17    2.37 |  3.25    3.79 |  6.33   17.06 |  9.42    3.32
                 0.25    2.37 |  3.33    3.79 |  6.42   17.06 |  9.50    3.32
                 0.33    2.37 |  3.42    3.79 |  6.50   17.06 |  9.58    3.32
                 0.42    2.37 |  3.50    3.79 |  6.58   17.06 |  9.67    3.32
                 0.50    2.37 |  3.58    3.79 |  6.67    7.58 |  9.75    3.32
                 0.58    2.37 |  3.67    3.79 |  6.75    7.58 |  9.83    3.32
                 0.67    2.37 |  3.75    3.79 |  6.83    7.58 |  9.92    3.32
                 0.75    2.37 |  3.83    3.79 |  6.92    7.58 | 10.00    3.32
                 0.83    2.37 |  3.92    3.79 |  7.00    7.58 | 10.08    3.32
                 0.92    2.37 |  4.00    3.79 |  7.08    7.58 | 10.17    1.90
                 1.00    2.37 |  4.08    3.79 |  7.17    5.69 | 10.25    1.90
                 1.08    2.37 |  4.17    5.69 |  7.25    5.69 | 10.33    1.90
                 1.17    2.37 |  4.25    5.69 |  7.33    5.69 | 10.42    1.90
                 1.25    2.37 |  4.33    5.69 |  7.42    5.69 | 10.50    1.90
                 1.33    2.37 |  4.42    5.69 |  7.50    5.69 | 10.58    1.90
                 1.42    2.37 |  4.50    5.69 |  7.58    5.69 | 10.67    1.90
                 1.50    2.37 |  4.58    5.69 |  7.67    5.69 | 10.75    1.90
                 1.58    2.37 |  4.67    7.58 |  7.75    5.69 | 10.83    1.90
                 1.67    2.37 |  4.75    7.58 |  7.83    5.69 | 10.92    1.90
                 1.75    2.37 |  4.83    7.58 |  7.92    5.69 | 11.00    1.90
                 1.83    2.37 |  4.92    7.58 |  8.00    5.69 | 11.08    1.90
                 1.92    2.37 |  5.00    7.58 |  8.08    5.69 | 11.17    1.90
                 2.00    2.37 |  5.08    7.58 |  8.17    3.32 | 11.25    1.90
                 2.08    2.37 |  5.17   11.38 |  8.25    3.32 | 11.33    1.90
                 2.17    2.84 |  5.25   11.38 |  8.33    3.32 | 11.42    1.90
                 2.25    2.84 |  5.33   11.38 |  8.42    3.32 | 11.50    1.90
                 2.33    2.84 |  5.42   11.38 |  8.50    3.32 | 11.58    1.90
                 2.42    2.84 |  5.50   11.38 |  8.58    3.32 | 11.67    1.90
                 2.50    2.84 |  5.58   11.38 |  8.67    3.32 | 11.75    1.90
                 2.58    2.84 |  5.67   45.50 |  8.75    3.32 | 11.83    1.90
                 2.67    2.84 |  5.75   45.50 |  8.83    3.32 | 11.92    1.90
                 2.75    2.84 |  5.83   45.50 |  8.92    3.32 | 12.00    1.90
                 2.83    2.84 |  5.92  125.14 |  9.00    3.32 | 12.08    1.90
                 2.92    2.84 |  6.00  125.14 |  9.08    3.32 |
                 3.00    2.84 |  6.08  125.14 |  9.17    3.32 |
                 3.08    2.84 |  6.17   17.06 |  9.25    3.32 |

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

```
--------------------
| CALIB            |
| NASHYD   (  0004)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW      (cms)=   0.032 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  30.373
     TOTAL RAINFALL   (mm)=  94.800
     RUNOFF COEFFICIENT   =   0.320

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0005)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW      (cms)=   0.026 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  36.563
     TOTAL RAINFALL   (mm)=  94.800
     RUNOFF COEFFICIENT   =   0.386

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0006)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW      (cms)=   0.099 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  43.520
     TOTAL RAINFALL   (mm)=  94.800
     RUNOFF COEFFICIENT   =   0.459

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

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```
| CALIB             |
| NASHYD   (  0007)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.094 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  37.967
     TOTAL RAINFALL   (mm)=  94.800
     RUNOFF COEFFICIENT   =   0.400

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0001)|   Area    (ha)=   5.35   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.817

     PEAK FLOW       (cms)=   0.443 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  33.084
     TOTAL RAINFALL   (mm)=  94.800
     RUNOFF COEFFICIENT   =   0.349

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

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     5.35   0.443     6.17    33.08
      + ID2= 2 (  0004):     0.40   0.032     6.17    30.37
        ==================================================
        ID = 3 (  0020):     5.75   0.475     6.17    32.90

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     5.75   0.475     6.17    32.90
      + ID2= 2 (  0005):     0.19   0.026     6.08    36.56
        ==================================================
        ID = 1 (  0020):     5.94   0.496     6.17    33.01

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0020):     5.94   0.496     6.17    33.01
      + ID2= 2 (  0006):     0.58   0.099     6.08    43.52
        ==================================================
        ID = 3 (  0020):     6.52   0.573     6.17    33.95

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     6.52   0.573     6.17    33.95
      + ID2= 2 (  0007):     0.69   0.094     6.08    37.97
        ==================================================
        ID = 1 (  0020):     7.21   0.656     6.17    34.33

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0002)|   Area    (ha)=   0.91   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

     Unit Hyd Qpeak  (cms)=   0.183

     PEAK FLOW       (cms)=   0.126 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  45.656
     TOTAL RAINFALL   (mm)=  94.800
     RUNOFF COEFFICIENT   =   0.482

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0003)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18
```

```
     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.006 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  29.325
     TOTAL RAINFALL   (mm)=  94.800
     RUNOFF COEFFICIENT   =   0.309

     (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 (  0002):     0.91   0.126     6.17    45.66
      + ID2= 2 (  0003):     0.07   0.006     6.17    29.33
        ===================================================
        ID = 3 (  0021):     0.98   0.132     6.17    44.49

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0010)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.026 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  36.563
     TOTAL RAINFALL   (mm)=  94.800
     RUNOFF COEFFICIENT   =   0.386

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0009)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.032 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  30.373
     TOTAL RAINFALL   (mm)=  94.800
```

```
     RUNOFF COEFFICIENT   =   0.320

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0011)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.099 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  43.520
     TOTAL RAINFALL   (mm)=  94.800
     RUNOFF COEFFICIENT   =   0.459

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.006 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  29.325
     TOTAL RAINFALL   (mm)=  94.800
     RUNOFF COEFFICIENT   =   0.309

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0012)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.094 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  37.967
     TOTAL RAINFALL   (mm)=  94.800
     RUNOFF COEFFICIENT   =   0.400
```

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0018)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n           =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=     105.23       147.25
                over (min)       20.00        25.00
     Storage Coeff.  (min)=      17.99 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      20.00        60.00
     Unit Hyd. peak  (cms)=       0.06         0.02
                                                               *TOTALS*
     PEAK FLOW       (cms)=       0.69         0.20           0.786 (iii)
     TIME TO PEAK    (hrs)=       6.25         6.92            6.25
     RUNOFF VOLUME    (mm)=      93.80        69.46           83.09
     TOTAL RAINFALL   (mm)=      94.80        94.80           94.80
     RUNOFF COEFFICIENT   =       0.99         0.73            0.88


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     0.19   0.026     6.08    36.56
      + ID2= 2 (  0011):     0.58   0.099     6.08    43.52
        ====================================================
        ID = 3 (  0022):     0.77   0.126     6.08    41.80

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     0.77   0.126     6.08    41.80
      + ID2= 2 (  0012):     0.69   0.094     6.08    37.97
        ====================================================
        ID = 1 (  0022):     1.46   0.220     6.08    39.99

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     1.46   0.220     6.08    39.99
      + ID2= 2 (  0018):     6.26   0.786     6.25    83.09
        ====================================================
        ID = 3 (  0022):     7.72   0.921     6.17    74.94

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     7.72   0.921     6.17    74.94
      + ID2= 2 (  0008):     0.07   0.006     6.17    29.33
        ====================================================
        ID = 1 (  0022):     7.79   0.927     6.17    74.53

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     7.79   0.927     6.17    74.53
      + ID2= 2 (  0009):     0.40   0.032     6.17    30.37
        ====================================================
        ID = 3 (  0022):     8.19   0.959     6.17    72.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185
```

```
     PEAK FLOW       (cms)=   0.099 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  43.520
     TOTAL RAINFALL   (mm)=  94.800
     RUNOFF COEFFICIENT   =   0.459

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0013)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.006 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  29.325
     TOTAL RAINFALL   (mm)=  94.800
     RUNOFF COEFFICIENT   =   0.309

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0014)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.032 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  30.373
     TOTAL RAINFALL   (mm)=  94.800
     RUNOFF COEFFICIENT   =   0.320

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0015)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.026 (i)
```

```
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  36.563
     TOTAL RAINFALL   (mm)=  94.800
     RUNOFF COEFFICIENT   =   0.386

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0017)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.094 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  37.967
     TOTAL RAINFALL   (mm)=  94.800
     RUNOFF COEFFICIENT   =   0.400

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0019)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n          =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=     105.23       147.25
                over (min)      20.00        25.00
     Storage Coeff.  (min)=      17.99 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      20.00        60.00
     Unit Hyd. peak  (cms)=       0.06         0.02
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.69         0.20         0.786 (iii)
     TIME TO PEAK    (hrs)=       6.25         6.92          6.25
     RUNOFF VOLUME    (mm)=      93.80        69.46         83.09
     TOTAL RAINFALL   (mm)=      94.80        94.80         94.80
     RUNOFF COEFFICIENT   =       0.99         0.73          0.88


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
```

```
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0013):     0.07   0.006     6.17    29.33
      + ID2= 2 (  0014):     0.40   0.032     6.17    30.37
        ===================================================
        ID = 3 (  0023):     0.47   0.038     6.17    30.22

     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):     0.47   0.038     6.17    30.22
      + ID2= 2 (  0015):     0.19   0.026     6.08    36.56
        ===================================================
        ID = 1 (  0023):     0.66   0.060     6.17    32.04

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     0.66   0.060     6.17    32.04
      + ID2= 2 (  0016):     0.58   0.099     6.08    43.52
        ===================================================
        ID = 3 (  0023):     1.24   0.159     6.08    37.41

     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):     1.24   0.159     6.08    37.41
      + ID2= 2 (  0017):     0.69   0.094     6.08    37.97
        ===================================================
        ID = 1 (  0023):     1.93   0.254     6.08    37.61

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

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--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     1.93   0.254     6.08    37.61
      + ID2= 2 (  0019):     6.26   0.786     6.25    83.09
        ===================================================
        ID = 3 (  0023):     8.19   0.959     6.17    72.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0024)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.7970      0.1600
                          0.3210     0.1300   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0023)      8.190      0.959      6.17      72.37
   OUTFLOW: ID= 1 (  0024)      8.190      0.615      6.58      72.36

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 64.05
                   TIME SHIFT OF PEAK FLOW        (min)= 25.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.1488

--------------------------------------------------------------------------------
************************************
** SIMULATION:100yr 24hr 5min SCS **
************************************

--------------------
|    READ STORM    |    Filename: C:\Users\m.orwin\AppD
|                  |              ata\Local\Temp\
|                  |              d5546b1a-54a6-497b-a8a5-5a1feca7b397\d0592b46
| Ptotal=115.20 mm |    Comments: 100yr 24hr 5min SCS
--------------------
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                 0.08    0.00 |  6.17    2.07 | 12.25   16.59 | 18.33    2.07
                 0.17    1.27 |  6.25    2.07 | 12.33   16.59 | 18.42    2.07
                 0.25    1.27 |  6.33    2.07 | 12.42   16.59 | 18.50    2.07
                 0.33    1.27 |  6.42    2.07 | 12.50   16.59 | 18.58    2.07
                 0.42    1.27 |  6.50    2.07 | 12.58   16.59 | 18.67    2.07
                 0.50    1.27 |  6.58    2.07 | 12.67    8.52 | 18.75    2.07
                 0.58    1.27 |  6.67    2.07 | 12.75    8.52 | 18.83    2.07
                 0.67    1.27 |  6.75    2.07 | 12.83    8.52 | 18.92    2.07
                 0.75    1.27 |  6.83    2.07 | 12.92    8.52 | 19.00    2.07
```

0.83	1.27	6.92	2.07	13.00	8.52	19.08	2.07
0.92	1.27	7.00	2.07	13.08	8.52	19.17	2.07
1.00	1.27	7.08	2.07	13.17	6.22	19.25	2.07
1.08	1.27	7.17	2.53	13.25	6.22	19.33	2.07
1.17	1.27	7.25	2.53	13.33	6.22	19.42	2.07
1.25	1.27	7.33	2.53	13.42	6.22	19.50	2.07
1.33	1.27	7.42	2.53	13.50	6.22	19.58	2.07
1.42	1.27	7.50	2.53	13.58	6.22	19.67	2.07
1.50	1.27	7.58	2.53	13.67	4.84	19.75	2.07
1.58	1.27	7.67	2.53	13.75	4.84	19.83	2.07
1.67	1.27	7.75	2.53	13.83	4.84	19.92	2.07
1.75	1.27	7.83	2.53	13.92	4.84	20.00	2.07
1.83	1.27	7.92	2.53	14.00	4.84	20.08	2.07
1.92	1.27	8.00	2.53	14.08	4.84	20.17	1.38
2.00	1.27	8.08	2.53	14.17	3.46	20.25	1.38
2.08	1.27	8.17	3.00	14.25	3.46	20.33	1.38
2.17	1.50	8.25	3.00	14.33	3.46	20.42	1.38
2.25	1.50	8.33	3.00	14.42	3.46	20.50	1.38
2.33	1.50	8.42	3.00	14.50	3.46	20.58	1.38
2.42	1.50	8.50	3.00	14.58	3.46	20.67	1.38
2.50	1.50	8.58	3.00	14.67	3.46	20.75	1.38
2.58	1.50	8.67	3.23	14.75	3.46	20.83	1.38
2.67	1.50	8.75	3.23	14.83	3.46	20.92	1.38
2.75	1.50	8.83	3.23	14.92	3.46	21.00	1.38
2.83	1.50	8.92	3.23	15.00	3.46	21.08	1.38
2.92	1.50	9.00	3.23	15.08	3.46	21.17	1.38
3.00	1.50	9.08	3.23	15.17	3.46	21.25	1.38
3.08	1.50	9.17	3.69	15.25	3.46	21.33	1.38
3.17	1.50	9.25	3.69	15.33	3.46	21.42	1.38
3.25	1.50	9.33	3.69	15.42	3.46	21.50	1.38
3.33	1.50	9.42	3.69	15.50	3.46	21.58	1.38
3.42	1.50	9.50	3.69	15.58	3.46	21.67	1.38
3.50	1.50	9.58	3.69	15.67	3.46	21.75	1.38
3.58	1.50	9.67	4.15	15.75	3.46	21.83	1.38
3.67	1.50	9.75	4.15	15.83	3.46	21.92	1.38
3.75	1.50	9.83	4.15	15.92	3.46	22.00	1.38
3.83	1.50	9.92	4.15	16.00	3.46	22.08	1.38
3.92	1.50	10.00	4.15	16.08	3.46	22.17	1.38
4.00	1.50	10.08	4.15	16.17	2.07	22.25	1.38
4.08	1.50	10.17	5.30	16.25	2.07	22.33	1.38
4.17	1.84	10.25	5.30	16.33	2.07	22.42	1.38
4.25	1.84	10.33	5.30	16.42	2.07	22.50	1.38
4.33	1.84	10.42	5.30	16.50	2.07	22.58	1.38
4.42	1.84	10.50	5.30	16.58	2.07	22.67	1.38
4.50	1.84	10.58	5.30	16.67	2.07	22.75	1.38
4.58	1.84	10.67	7.14	16.75	2.07	22.83	1.38
4.67	1.84	10.75	7.14	16.83	2.07	22.92	1.38
4.75	1.84	10.83	7.14	16.92	2.07	23.00	1.38
4.83	1.84	10.92	7.14	17.00	2.07	23.08	1.38
4.92	1.84	11.00	7.14	17.08	2.07	23.17	1.38
5.00	1.84	11.08	7.14	17.17	2.07	23.25	1.38
5.08	1.84	11.17	11.06	17.25	2.07	23.33	1.38
5.17	1.84	11.25	11.06	17.33	2.07	23.42	1.38
5.25	1.84	11.33	11.06	17.42	2.07	23.50	1.38
5.33	1.84	11.42	11.06	17.50	2.07	23.58	1.38
5.42	1.84	11.50	11.06	17.58	2.07	23.67	1.38
5.50	1.84	11.58	11.06	17.67	2.07	23.75	1.38
5.58	1.84	11.67	34.10	17.75	2.07	23.83	1.38
5.67	1.84	11.75	34.10	17.83	2.07	23.92	1.38
5.75	1.84	11.83	34.10	17.92	2.07	24.00	1.38
5.83	1.84	11.92	141.00	18.00	2.07	24.08	1.38
5.92	1.84	12.00	141.00	18.08	2.07		
6.00	1.84	12.08	141.00	18.17	2.07		
6.08	1.84	12.17	16.59	18.25	2.07		

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

--------------------
| CALIB            |
| NASHYD   (  0004)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.040 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  42.769
     TOTAL RAINFALL   (mm)= 115.200
     RUNOFF COEFFICIENT   =   0.371

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0005)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.032 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  50.459
     TOTAL RAINFALL   (mm)= 115.200
     RUNOFF COEFFICIENT   =   0.438

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0006)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
```

```
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.120 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  58.926
     TOTAL RAINFALL   (mm)= 115.200
     RUNOFF COEFFICIENT   =   0.512

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0007)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.115 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  52.176
     TOTAL RAINFALL   (mm)= 115.200
     RUNOFF COEFFICIENT   =   0.453

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   5.35   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.817

     PEAK FLOW       (cms)=   0.539 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  46.253
     TOTAL RAINFALL   (mm)= 115.200
     RUNOFF COEFFICIENT   =   0.402

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

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     5.35   0.539    12.17    46.25
      + ID2= 2 (  0004):     0.40   0.040    12.17    42.77
        ==================================================
        ID = 3 (  0020):     5.75   0.579    12.17    46.01

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     5.75   0.579    12.17    46.01
      + ID2= 2 (  0005):     0.19   0.032    12.08    50.46
        ==================================================
        ID = 1 (  0020):     5.94   0.605    12.17    46.15

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0020):     5.94   0.605    12.17    46.15
      + ID2= 2 (  0006):     0.58   0.120    12.08    58.93
        ==================================================
        ID = 3 (  0020):     6.52   0.697    12.17    47.29

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     6.52   0.697    12.17    47.29
      + ID2= 2 (  0007):     0.69   0.115    12.08    52.18
        ==================================================
        ID = 1 (  0020):     7.21   0.797    12.17    47.76

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   0.91   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

     Unit Hyd Qpeak  (cms)=   0.183
```

```
     PEAK FLOW       (cms)=   0.149 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  61.689
     TOTAL RAINFALL   (mm)= 115.200
     RUNOFF COEFFICIENT   =   0.535

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.008 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  41.433
     TOTAL RAINFALL   (mm)= 115.200
     RUNOFF COEFFICIENT   =   0.360

     (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 (  0002):     0.91   0.149    12.17    61.69
      + ID2= 2 (  0003):     0.07   0.008    12.17    41.43
        ====================================================
        ID = 3 (  0021):     0.98   0.157    12.17    60.24

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0010)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.032 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  50.459
     TOTAL RAINFALL   (mm)= 115.200
     RUNOFF COEFFICIENT   =   0.438

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0009)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.040 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  42.769
     TOTAL RAINFALL   (mm)= 115.200
     RUNOFF COEFFICIENT   =   0.371

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0011)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.120 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  58.926
     TOTAL RAINFALL   (mm)= 115.200
     RUNOFF COEFFICIENT   =   0.512

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.008 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  41.433
     TOTAL RAINFALL   (mm)= 115.200
     RUNOFF COEFFICIENT   =   0.360

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

```
-------------------------------------------------------------------------------
--------------------
| CALIB              |
| NASHYD   (  0012)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.115 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  52.176
     TOTAL RAINFALL   (mm)= 115.200
     RUNOFF COEFFICIENT   =   0.453

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

-------------------------------------------------------------------------------
--------------------
| CALIB              |
| STANDHYD (  0018)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n           =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=     141.00       170.62
                over (min)       15.00        20.00
     Storage Coeff.  (min)=      16.00 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      15.00        60.00
     Unit Hyd. peak  (cms)=       0.07         0.02
                                                           *TOTALS*
     PEAK FLOW       (cms)=       0.81         0.22          0.898 (iii)
     TIME TO PEAK    (hrs)=      12.17        12.92          12.17
     RUNOFF VOLUME    (mm)=     114.20        88.69         102.97
     TOTAL RAINFALL   (mm)=     115.20       115.20         115.20
     RUNOFF COEFFICIENT   =       0.99         0.77           0.89


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

```
--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     0.19   0.032    12.08    50.46
      + ID2= 2 (  0011):     0.58   0.120    12.08    58.93
        ====================================================
        ID = 3 (  0022):     0.77   0.152    12.08    56.84

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     0.77   0.152    12.08    56.84
      + ID2= 2 (  0012):     0.69   0.115    12.08    52.18
        ====================================================
        ID = 1 (  0022):     1.46   0.267    12.08    54.63

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     1.46   0.267    12.08    54.63
      + ID2= 2 (  0018):     6.26   0.898    12.17   102.97
        ====================================================
        ID = 3 (  0022):     7.72   1.117    12.17    93.83

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     7.72   1.117    12.17    93.83
      + ID2= 2 (  0008):     0.07   0.008    12.17    41.43
        ====================================================
        ID = 1 (  0022):     7.79   1.125    12.17    93.36

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
```

```
      ID1= 1 (  0022):     7.79   1.125    12.17    93.36
    + ID2= 2 (  0009):     0.40   0.040    12.17    42.77
      ====================================================
      ID = 3 (  0022):     8.19   1.164    12.17    90.89

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.120 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  58.926
     TOTAL RAINFALL   (mm)= 115.200
     RUNOFF COEFFICIENT   =   0.512

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0013)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.008 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  41.433
     TOTAL RAINFALL   (mm)= 115.200
     RUNOFF COEFFICIENT   =   0.360

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0014)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.040 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  42.769
     TOTAL RAINFALL   (mm)= 115.200
     RUNOFF COEFFICIENT   =   0.371

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0015)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.032 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  50.459
     TOTAL RAINFALL   (mm)= 115.200
     RUNOFF COEFFICIENT   =   0.438

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0017)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.115 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  52.176
     TOTAL RAINFALL   (mm)= 115.200
     RUNOFF COEFFICIENT   =   0.453

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0019)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      4.25         2.01
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.52         4.33
     Length            (m)=    330.00        30.00
     Mannings n           =     0.130        0.250
```

```
     Max.Eff.Inten.(mm/hr)=     141.00       170.62
                over (min)       15.00        20.00
     Storage Coeff.  (min)=      16.00 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      15.00        60.00
     Unit Hyd. peak  (cms)=       0.07         0.02
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.81         0.22          0.898 (iii)
     TIME TO PEAK    (hrs)=      12.17        12.92          12.17
     RUNOFF VOLUME    (mm)=     114.20        88.69         102.97
     TOTAL RAINFALL   (mm)=     115.20       115.20         115.20
     RUNOFF COEFFICIENT   =       0.99         0.77           0.89


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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


--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0013):     0.07   0.008    12.17    41.43
      + ID2= 2 (  0014):     0.40   0.040    12.17    42.77
        ====================================================
        ID = 3 (  0023):     0.47   0.047    12.17    42.57

     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):     0.47   0.047    12.17    42.57
      + ID2= 2 (  0015):     0.19   0.032    12.08    50.46
        ====================================================
        ID = 1 (  0023):     0.66   0.074    12.17    44.84

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     0.66   0.074    12.17    44.84
      + ID2= 2 (  0016):     0.58   0.120    12.08    58.93
        ====================================================
```

```
        ID = 3 (  0023):     1.24   0.194    12.08    51.43

     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):     1.24   0.194    12.08    51.43
      + ID2= 2 (  0017):     0.69   0.115    12.08    52.18
        ====================================================
        ID = 1 (  0023):     1.93   0.309    12.08    51.70

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     1.93   0.309    12.08    51.70
      + ID2= 2 (  0019):     6.26   0.898    12.17   102.97
        ====================================================
        ID = 3 (  0023):     8.19   1.164    12.17    90.89

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0024)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.7970      0.1600
                          0.3210     0.1300   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0023)      8.190      1.164     12.17      90.89
   OUTFLOW: ID= 1 (  0024)      8.190      0.695     12.42      90.88

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 59.69
                   TIME SHIFT OF PEAK FLOW         (min)= 15.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.1539

--------------------------------------------------------------------------------
***********************************
** SIMULATION:100yr 6hr 5min SCS **
***********************************

--------------------
|    READ STORM    |    Filename: C:\Users\m.orwin\AppD
```

```
|                  |             ata\Local\Temp\
|                  |             d5546b1a-54a6-497b-a8a5-5a1feca7b397\174114a3
| Ptotal= 76.80 mm |    Comments: 100yr 6hr 5min SCS
--------------------
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                 0.08    0.00 |  1.67    7.68 |  3.25   16.90 |  4.83    4.61
                 0.17    3.07 |  1.75    7.68 |  3.33   16.90 |  4.92    4.61
                 0.25    3.07 |  1.83    7.68 |  3.42   16.90 |  5.00    4.61
                 0.33    3.07 |  1.92    7.68 |  3.50   16.90 |  5.08    4.61
                 0.42    3.07 |  2.00    7.68 |  3.58   16.90 |  5.17    3.07
                 0.50    3.07 |  2.08    7.68 |  3.67    7.68 |  5.25    3.07
                 0.58    3.07 |  2.17    9.22 |  3.75    7.68 |  5.33    3.07
                 0.67    4.61 |  2.25    9.22 |  3.83    7.68 |  5.42    3.07
                 0.75    4.61 |  2.33    9.22 |  3.92    7.68 |  5.50    3.07
                 0.83    4.61 |  2.42    9.22 |  4.00    7.68 |  5.58    3.07
                 0.92    4.61 |  2.50    9.22 |  4.08    7.68 |  5.67    3.07
                 1.00    4.61 |  2.58    9.22 |  4.17    6.14 |  5.75    3.07
                 1.08    4.61 |  2.67   46.08 |  4.25    6.14 |  5.83    3.07
                 1.17    4.61 |  2.75   46.08 |  4.33    6.14 |  5.92    3.07
                 1.25    4.61 |  2.83   46.08 |  4.42    6.14 |  6.00    3.07
                 1.33    4.61 |  2.92  119.81 |  4.50    6.14 |  6.08    3.07
                 1.42    4.61 |  3.00  119.81 |  4.58    6.14 |
                 1.50    4.61 |  3.08  119.81 |  4.67    4.61 |
                 1.58    4.61 |  3.17   16.90 |  4.75    4.61 |

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

--------------------
| CALIB            |
| NASHYD   (  0004)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.025 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  20.602
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.268

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0005)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056
```

```
     PEAK FLOW       (cms)=   0.021 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  25.390
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.331

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0006)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.083 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  30.889
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.402

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0007)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.077 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  26.500
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.345

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   5.35   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.817
```

```
     PEAK FLOW       (cms)=   0.346 (i)
     TIME TO PEAK    (hrs)=   3.250
     RUNOFF VOLUME    (mm)=  22.616
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.294

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

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     5.35   0.346     3.25    22.62
      + ID2= 2 (  0004):     0.40   0.025     3.17    20.60
        =====================================================
        ID = 3 (  0020):     5.75   0.371     3.17    22.48

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     5.75   0.371     3.17    22.48
      + ID2= 2 (  0005):     0.19   0.021     3.08    25.39
        =====================================================
        ID = 1 (  0020):     5.94   0.389     3.17    22.57

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0020):     5.94   0.389     3.17    22.57
      + ID2= 2 (  0006):     0.58   0.083     3.08    30.89
        =====================================================
        ID = 3 (  0020):     6.52   0.454     3.17    23.31

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     6.52   0.454     3.17    23.31
      + ID2= 2 (  0007):     0.69   0.077     3.08    26.50
```

```
        =====================================================
        ID = 1 (  0020):     7.21   0.523     3.17    23.61

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   0.91   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

     Unit Hyd Qpeak  (cms)=   0.183

     PEAK FLOW       (cms)=   0.105 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  32.448
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.423

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.005 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  19.812
     TOTAL RAINFALL   (mm)=  76.800
     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 (  0002):     0.91   0.105     3.17    32.45
      + ID2= 2 (  0003):     0.07   0.005     3.17    19.81
        =====================================================
        ID = 3 (  0021):     0.98   0.110     3.17    31.55

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

```
| CALIB            |
| NASHYD   (  0010)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.021 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  25.390
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.331

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0009)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.025 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  20.602
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.268

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0011)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.083 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  30.889
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.402

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.005 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  19.812
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.258

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0012)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.077 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  26.500
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.345

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0018)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n          =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=     101.38       134.64
                over (min)      20.00        25.00
     Storage Coeff.  (min)=      18.26 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      20.00        60.00
     Unit Hyd. peak  (cms)=       0.06         0.02
                                                         *TOTALS*
     PEAK FLOW       (cms)=       0.66         0.18          0.737 (iii)
     TIME TO PEAK    (hrs)=       3.25         3.92           3.25
```

```
     RUNOFF VOLUME    (mm)=      75.80        52.87          65.71
     TOTAL RAINFALL   (mm)=      76.80        76.80          76.80
     RUNOFF COEFFICIENT   =       0.99         0.69           0.86


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     0.19   0.021     3.08    25.39
      + ID2= 2 (  0011):     0.58   0.083     3.08    30.89
        ===================================================
        ID = 3 (  0022):     0.77   0.104     3.08    29.53

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     0.77   0.104     3.08    29.53
      + ID2= 2 (  0012):     0.69   0.077     3.08    26.50
        ===================================================
        ID = 1 (  0022):     1.46   0.181     3.08    28.10

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     1.46   0.181     3.08    28.10
      + ID2= 2 (  0018):     6.26   0.737     3.25    65.71
        ===================================================
        ID = 3 (  0022):     7.72   0.846     3.17    58.59

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
```

```
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     7.72   0.846     3.17    58.59
      + ID2= 2 (  0008):     0.07   0.005     3.17    19.81
        ===================================================
        ID = 1 (  0022):     7.79   0.850     3.17    58.24

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     7.79   0.850     3.17    58.24
      + ID2= 2 (  0009):     0.40   0.025     3.17    20.60
        ===================================================
        ID = 3 (  0022):     8.19   0.876     3.17    56.41

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.083 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  30.889
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.402

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0013)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.005 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  19.812
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.258

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

```
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0014)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.025 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  20.602
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.268

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0015)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.021 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  25.390
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.331

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0017)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.077 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  26.500
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.345

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

```
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0019)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n           =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=     101.38       134.64
                over (min)       20.00        25.00
     Storage Coeff.  (min)=      18.26 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      20.00        60.00
     Unit Hyd. peak  (cms)=       0.06         0.02
                                                           *TOTALS*
     PEAK FLOW       (cms)=       0.66         0.18          0.737 (iii)
     TIME TO PEAK    (hrs)=       3.25         3.92           3.25
     RUNOFF VOLUME    (mm)=      75.80        52.87          65.71
     TOTAL RAINFALL   (mm)=      76.80        76.80          76.80
     RUNOFF COEFFICIENT   =       0.99         0.69           0.86


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0013):     0.07   0.005     3.17    19.81
      + ID2= 2 (  0014):     0.40   0.025     3.17    20.60
        ====================================================
        ID = 3 (  0023):     0.47   0.030     3.17    20.48

     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):     0.47   0.030     3.17    20.48
      + ID2= 2 (  0015):     0.19   0.021     3.08    25.39
```

```
        ====================================================
        ID = 1 (  0023):     0.66   0.048     3.17    21.90

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     0.66   0.048     3.17    21.90
      + ID2= 2 (  0016):     0.58   0.083     3.08    30.89
        ====================================================
        ID = 3 (  0023):     1.24   0.130     3.08    26.10

     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):     1.24   0.130     3.08    26.10
      + ID2= 2 (  0017):     0.69   0.077     3.08    26.50
        ====================================================
        ID = 1 (  0023):     1.93   0.207     3.08    26.24

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     1.93   0.207     3.08    26.24
      + ID2= 2 (  0019):     6.26   0.737     3.25    65.71
        ====================================================
        ID = 3 (  0023):     8.19   0.876     3.17    56.41

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0024)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.7970     0.1600
                          0.3210     0.1300   |   0.0000     0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0023)      8.190      0.876      3.17      56.41
   OUTFLOW: ID= 1 (  0024)      8.190      0.517      3.67      56.39

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 59.04
                  TIME SHIFT OF PEAK FLOW         (min)= 30.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1425

------------------------------------------------------------------------------
***********************************
** SIMULATION:10yr 12hr 5min SCS **
***********************************

--------------------
|    READ STORM    |    Filename: C:\Users\m.orwin\AppD
|                  |              ata\Local\Temp\
|                  |              d5546b1a-54a6-497b-a8a5-5a1feca7b397\f808367d
| Ptotal= 66.00 mm |    Comments: 10yr 12hr 5min SCS
--------------------
                  TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                  0.08    0.00 |  3.17    2.64 |  6.25   11.88 |  9.33    2.31
                  0.17    1.65 |  3.25    2.64 |  6.33   11.88 |  9.42    2.31
                  0.25    1.65 |  3.33    2.64 |  6.42   11.88 |  9.50    2.31
                  0.33    1.65 |  3.42    2.64 |  6.50   11.88 |  9.58    2.31
                  0.42    1.65 |  3.50    2.64 |  6.58   11.88 |  9.67    2.31
                  0.50    1.65 |  3.58    2.64 |  6.67    5.28 |  9.75    2.31
                  0.58    1.65 |  3.67    2.64 |  6.75    5.28 |  9.83    2.31
                  0.67    1.65 |  3.75    2.64 |  6.83    5.28 |  9.92    2.31
                  0.75    1.65 |  3.83    2.64 |  6.92    5.28 | 10.00    2.31
                  0.83    1.65 |  3.92    2.64 |  7.00    5.28 | 10.08    2.31
                  0.92    1.65 |  4.00    2.64 |  7.08    5.28 | 10.17    1.32
                  1.00    1.65 |  4.08    2.64 |  7.17    3.96 | 10.25    1.32
                  1.08    1.65 |  4.17    3.96 |  7.25    3.96 | 10.33    1.32
                  1.17    1.65 |  4.25    3.96 |  7.33    3.96 | 10.42    1.32
                  1.25    1.65 |  4.33    3.96 |  7.42    3.96 | 10.50    1.32
                  1.33    1.65 |  4.42    3.96 |  7.50    3.96 | 10.58    1.32
                  1.42    1.65 |  4.50    3.96 |  7.58    3.96 | 10.67    1.32
                  1.50    1.65 |  4.58    3.96 |  7.67    3.96 | 10.75    1.32
                  1.58    1.65 |  4.67    5.28 |  7.75    3.96 | 10.83    1.32
                  1.67    1.65 |  4.75    5.28 |  7.83    3.96 | 10.92    1.32
                  1.75    1.65 |  4.83    5.28 |  7.92    3.96 | 11.00    1.32
                  1.83    1.65 |  4.92    5.28 |  8.00    3.96 | 11.08    1.32
                  1.92    1.65 |  5.00    5.28 |  8.08    3.96 | 11.17    1.32
                  2.00    1.65 |  5.08    5.28 |  8.17    2.31 | 11.25    1.32
                  2.08    1.65 |  5.17    7.92 |  8.25    2.31 | 11.33    1.32
                  2.17    1.98 |  5.25    7.92 |  8.33    2.31 | 11.42    1.32
                  2.25    1.98 |  5.33    7.92 |  8.42    2.31 | 11.50    1.32
                  2.33    1.98 |  5.42    7.92 |  8.50    2.31 | 11.58    1.32
                  2.42    1.98 |  5.50    7.92 |  8.58    2.31 | 11.67    1.32
                  2.50    1.98 |  5.58    7.92 |  8.67    2.31 | 11.75    1.32
                  2.58    1.98 |  5.67   31.68 |  8.75    2.31 | 11.83    1.32
                  2.67    1.98 |  5.75   31.68 |  8.83    2.31 | 11.92    1.32
                  2.75    1.98 |  5.83   31.68 |  8.92    2.31 | 12.00    1.32
```

```
              2.83    1.98 |  5.92   87.12 |  9.00    2.31 | 12.08    1.32
              2.92    1.98 |  6.00   87.12 |  9.08    2.31 |
              3.00    1.98 |  6.08   87.12 |  9.17    2.31 |
              3.08    1.98 |  6.17   11.88 |  9.25    2.31 |

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

--------------------
| CALIB            |
| NASHYD   (  0004)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.016 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  15.383
     TOTAL RAINFALL   (mm)=  66.000
     RUNOFF COEFFICIENT   =   0.233

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0005)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.014 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  19.309
     TOTAL RAINFALL   (mm)=  66.000
     RUNOFF COEFFICIENT   =   0.293

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0006)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.054 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  23.881
     TOTAL RAINFALL   (mm)=  66.000
     RUNOFF COEFFICIENT   =   0.362

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0007)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.050 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  20.234
     TOTAL RAINFALL   (mm)=  66.000
     RUNOFF COEFFICIENT   =   0.307

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   5.35   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.817

     PEAK FLOW       (cms)=   0.222 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  16.981
     TOTAL RAINFALL   (mm)=  66.000
     RUNOFF COEFFICIENT   =   0.257

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

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     5.35   0.222     6.17    16.98
      + ID2= 2 (  0004):     0.40   0.016     6.17    15.38
        ==================================================
        ID = 3 (  0020):     5.75   0.238     6.17    16.87

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

```
--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     5.75   0.238     6.17    16.87
      + ID2= 2 (  0005):     0.19   0.014     6.08    19.31
        ====================================================
        ID = 1 (  0020):     5.94   0.249     6.17    16.95

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0020):     5.94   0.249     6.17    16.95
      + ID2= 2 (  0006):     0.58   0.054     6.08    23.88
        ====================================================
        ID = 3 (  0020):     6.52   0.292     6.17    17.56

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     6.52   0.292     6.17    17.56
      + ID2= 2 (  0007):     0.69   0.050     6.08    20.23
        ====================================================
        ID = 1 (  0020):     7.21   0.336     6.17    17.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   0.91   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

     Unit Hyd Qpeak  (cms)=   0.183

     PEAK FLOW       (cms)=   0.069 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  25.089
     TOTAL RAINFALL   (mm)=  66.000
     RUNOFF COEFFICIENT   =   0.380

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

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.003 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  14.749
     TOTAL RAINFALL   (mm)=  66.000
     RUNOFF COEFFICIENT   =   0.223

     (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 (  0002):     0.91   0.069     6.17    25.09
      + ID2= 2 (  0003):     0.07   0.003     6.17    14.75
        ====================================================
        ID = 3 (  0021):     0.98   0.072     6.17    24.35

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0010)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.014 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  19.309
     TOTAL RAINFALL   (mm)=  66.000
     RUNOFF COEFFICIENT   =   0.293

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0009)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23
```

```
     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.016 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  15.383
     TOTAL RAINFALL   (mm)=  66.000
     RUNOFF COEFFICIENT   =   0.233

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0011)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.054 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  23.881
     TOTAL RAINFALL   (mm)=  66.000
     RUNOFF COEFFICIENT   =   0.362

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0008)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.003 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  14.749
     TOTAL RAINFALL   (mm)=  66.000
     RUNOFF COEFFICIENT   =   0.223

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0012)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14
```

```
     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.050 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  20.234
     TOTAL RAINFALL   (mm)=  66.000
     RUNOFF COEFFICIENT   =   0.307

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| STANDHYD (  0018)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n           =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=      73.26        93.48
                over (min)       20.00        25.00
     Storage Coeff.  (min)=      20.79 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      20.00        60.00
     Unit Hyd. peak  (cms)=       0.05         0.02
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.45         0.12          0.510 (iii)
     TIME TO PEAK    (hrs)=       6.25         6.92           6.25
     RUNOFF VOLUME    (mm)=      65.00        43.16          55.38
     TOTAL RAINFALL   (mm)=      66.00        66.00          66.00
     RUNOFF COEFFICIENT   =       0.98         0.65           0.84


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     0.19   0.014     6.08    19.31
      + ID2= 2 (  0011):     0.58   0.054     6.08    23.88
        ====================================================
        ID = 3 (  0022):     0.77   0.068     6.08    22.75
```

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     0.77   0.068     6.08    22.75
      + ID2= 2 (  0012):     0.69   0.050     6.08    20.23
        ==================================================
        ID = 1 (  0022):     1.46   0.118     6.08    21.56

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     1.46   0.118     6.08    21.56
      + ID2= 2 (  0018):     6.26   0.510     6.25    55.38
        ==================================================
        ID = 3 (  0022):     7.72   0.575     6.25    48.99

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     7.72   0.575     6.25    48.99
      + ID2= 2 (  0008):     0.07   0.003     6.17    14.75
        ==================================================
        ID = 1 (  0022):     7.79   0.577     6.25    48.68

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     7.79   0.577     6.25    48.68
      + ID2= 2 (  0009):     0.40   0.016     6.17    15.38
        ==================================================
        ID = 3 (  0022):     8.19   0.593     6.17    47.05

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

```
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW      (cms)=   0.054 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  23.881
     TOTAL RAINFALL   (mm)=  66.000
     RUNOFF COEFFICIENT   =   0.362

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0013)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW      (cms)=   0.003 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  14.749
     TOTAL RAINFALL   (mm)=  66.000
     RUNOFF COEFFICIENT   =   0.223

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0014)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW      (cms)=   0.016 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  15.383
     TOTAL RAINFALL   (mm)=  66.000
     RUNOFF COEFFICIENT   =   0.233

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

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

```
| NASHYD   (  0015)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.014 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  19.309
     TOTAL RAINFALL   (mm)=  66.000
     RUNOFF COEFFICIENT   =   0.293

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0017)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.050 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  20.234
     TOTAL RAINFALL   (mm)=  66.000
     RUNOFF COEFFICIENT   =   0.307

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0019)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n          =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=      73.26        93.48
                over (min)       20.00        25.00
     Storage Coeff.  (min)=      20.79 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      20.00        60.00
     Unit Hyd. peak  (cms)=       0.05         0.02
                                                           *TOTALS*
     PEAK FLOW       (cms)=       0.45         0.12          0.510 (iii)
     TIME TO PEAK    (hrs)=       6.25         6.92           6.25
```

```
     RUNOFF VOLUME    (mm)=      65.00        43.16          55.38
     TOTAL RAINFALL   (mm)=      66.00        66.00          66.00
     RUNOFF COEFFICIENT   =       0.98         0.65           0.84


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0013):     0.07   0.003     6.17    14.75
      + ID2= 2 (  0014):     0.40   0.016     6.17    15.38
        ===================================================
        ID = 3 (  0023):     0.47   0.019     6.17    15.29

     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):     0.47   0.019     6.17    15.29
      + ID2= 2 (  0015):     0.19   0.014     6.08    19.31
        ===================================================
        ID = 1 (  0023):     0.66   0.031     6.17    16.45

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     0.66   0.031     6.17    16.45
      + ID2= 2 (  0016):     0.58   0.054     6.08    23.88
        ===================================================
        ID = 3 (  0023):     1.24   0.085     6.08    19.92

     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):     1.24   0.085     6.08    19.92
      + ID2= 2 (  0017):     0.69   0.050     6.08    20.23
        ===================================================
        ID = 1 (  0023):     1.93   0.134     6.08    20.03

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     1.93   0.134     6.08    20.03
      + ID2= 2 (  0019):     6.26   0.510     6.25    55.38
        ===================================================
        ID = 3 (  0023):     8.19   0.593     6.17    47.05

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0024)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.7970      0.1600
                          0.3210     0.1300   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0023)      8.190      0.593      6.17      47.05
   OUTFLOW: ID= 1 (  0024)      8.190      0.280      6.92      47.04

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 47.12
                   TIME SHIFT OF PEAK FLOW        (min)= 45.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.1133

------------------------------------------------------------------------------
***********************************
** SIMULATION:10yr 24hr 5min SCS **
***********************************

--------------------
|    READ STORM    |    Filename: C:\Users\m.orwin\AppD
|                  |              ata\Local\Temp\
|                  |              d5546b1a-54a6-497b-a8a5-5a1feca7b397\9dae4b2c
| Ptotal= 81.60 mm |    Comments: 10yr 24hr 5min SCS
--------------------
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                 0.08    0.00 |  6.17    1.47 | 12.25   11.75 | 18.33    1.47
                 0.17    0.90 |  6.25    1.47 | 12.33   11.75 | 18.42    1.47
                 0.25    0.90 |  6.33    1.47 | 12.42   11.75 | 18.50    1.47
                 0.33    0.90 |  6.42    1.47 | 12.50   11.75 | 18.58    1.47
                 0.42    0.90 |  6.50    1.47 | 12.58   11.75 | 18.67    1.47
                 0.50    0.90 |  6.58    1.47 | 12.67    6.04 | 18.75    1.47
                 0.58    0.90 |  6.67    1.47 | 12.75    6.04 | 18.83    1.47
                 0.67    0.90 |  6.75    1.47 | 12.83    6.04 | 18.92    1.47
                 0.75    0.90 |  6.83    1.47 | 12.92    6.04 | 19.00    1.47
                 0.83    0.90 |  6.92    1.47 | 13.00    6.04 | 19.08    1.47
                 0.92    0.90 |  7.00    1.47 | 13.08    6.04 | 19.17    1.47
                 1.00    0.90 |  7.08    1.47 | 13.17    4.41 | 19.25    1.47
                 1.08    0.90 |  7.17    1.80 | 13.25    4.41 | 19.33    1.47
                 1.17    0.90 |  7.25    1.80 | 13.33    4.41 | 19.42    1.47
                 1.25    0.90 |  7.33    1.80 | 13.42    4.41 | 19.50    1.47
                 1.33    0.90 |  7.42    1.80 | 13.50    4.41 | 19.58    1.47
                 1.42    0.90 |  7.50    1.80 | 13.58    4.41 | 19.67    1.47
                 1.50    0.90 |  7.58    1.80 | 13.67    3.43 | 19.75    1.47
                 1.58    0.90 |  7.67    1.80 | 13.75    3.43 | 19.83    1.47
                 1.67    0.90 |  7.75    1.80 | 13.83    3.43 | 19.92    1.47
                 1.75    0.90 |  7.83    1.80 | 13.92    3.43 | 20.00    1.47
                 1.83    0.90 |  7.92    1.80 | 14.00    3.43 | 20.08    1.47
                 1.92    0.90 |  8.00    1.80 | 14.08    3.43 | 20.17    0.98
                 2.00    0.90 |  8.08    1.80 | 14.17    2.45 | 20.25    0.98
                 2.08    0.90 |  8.17    2.12 | 14.25    2.45 | 20.33    0.98
                 2.17    1.06 |  8.25    2.12 | 14.33    2.45 | 20.42    0.98
                 2.25    1.06 |  8.33    2.12 | 14.42    2.45 | 20.50    0.98
                 2.33    1.06 |  8.42    2.12 | 14.50    2.45 | 20.58    0.98
                 2.42    1.06 |  8.50    2.12 | 14.58    2.45 | 20.67    0.98
                 2.50    1.06 |  8.58    2.12 | 14.67    2.45 | 20.75    0.98
                 2.58    1.06 |  8.67    2.28 | 14.75    2.45 | 20.83    0.98
                 2.67    1.06 |  8.75    2.28 | 14.83    2.45 | 20.92    0.98
                 2.75    1.06 |  8.83    2.28 | 14.92    2.45 | 21.00    0.98
                 2.83    1.06 |  8.92    2.28 | 15.00    2.45 | 21.08    0.98
                 2.92    1.06 |  9.00    2.28 | 15.08    2.45 | 21.17    0.98
                 3.00    1.06 |  9.08    2.28 | 15.17    2.45 | 21.25    0.98
                 3.08    1.06 |  9.17    2.61 | 15.25    2.45 | 21.33    0.98
                 3.17    1.06 |  9.25    2.61 | 15.33    2.45 | 21.42    0.98
                 3.25    1.06 |  9.33    2.61 | 15.42    2.45 | 21.50    0.98
                 3.33    1.06 |  9.42    2.61 | 15.50    2.45 | 21.58    0.98
                 3.42    1.06 |  9.50    2.61 | 15.58    2.45 | 21.67    0.98
                 3.50    1.06 |  9.58    2.61 | 15.67    2.45 | 21.75    0.98
                 3.58    1.06 |  9.67    2.94 | 15.75    2.45 | 21.83    0.98
                 3.67    1.06 |  9.75    2.94 | 15.83    2.45 | 21.92    0.98
                 3.75    1.06 |  9.83    2.94 | 15.92    2.45 | 22.00    0.98
                 3.83    1.06 |  9.92    2.94 | 16.00    2.45 | 22.08    0.98
                 3.92    1.06 | 10.00    2.94 | 16.08    2.45 | 22.17    0.98
                 4.00    1.06 | 10.08    2.94 | 16.17    1.47 | 22.25    0.98
                 4.08    1.06 | 10.17    3.75 | 16.25    1.47 | 22.33    0.98
                 4.17    1.31 | 10.25    3.75 | 16.33    1.47 | 22.42    0.98
                 4.25    1.31 | 10.33    3.75 | 16.42    1.47 | 22.50    0.98
                 4.33    1.31 | 10.42    3.75 | 16.50    1.47 | 22.58    0.98
                 4.42    1.31 | 10.50    3.75 | 16.58    1.47 | 22.67    0.98
                 4.50    1.31 | 10.58    3.75 | 16.67    1.47 | 22.75    0.98
```

```
             4.58    1.31 | 10.67    5.06 | 16.75    1.47 | 22.83    0.98
             4.67    1.31 | 10.75    5.06 | 16.83    1.47 | 22.92    0.98
             4.75    1.31 | 10.83    5.06 | 16.92    1.47 | 23.00    0.98
             4.83    1.31 | 10.92    5.06 | 17.00    1.47 | 23.08    0.98
             4.92    1.31 | 11.00    5.06 | 17.08    1.47 | 23.17    0.98
             5.00    1.31 | 11.08    5.06 | 17.17    1.47 | 23.25    0.98
             5.08    1.31 | 11.17    7.83 | 17.25    1.47 | 23.33    0.98
             5.17    1.31 | 11.25    7.83 | 17.33    1.47 | 23.42    0.98
             5.25    1.31 | 11.33    7.83 | 17.42    1.47 | 23.50    0.98
             5.33    1.31 | 11.42    7.83 | 17.50    1.47 | 23.58    0.98
             5.42    1.31 | 11.50    7.83 | 17.58    1.47 | 23.67    0.98
             5.50    1.31 | 11.58    7.83 | 17.67    1.47 | 23.75    0.98
             5.58    1.31 | 11.67   24.15 | 17.75    1.47 | 23.83    0.98
             5.67    1.31 | 11.75   24.15 | 17.83    1.47 | 23.92    0.98
             5.75    1.31 | 11.83   24.15 | 17.92    1.47 | 24.00    0.98
             5.83    1.31 | 11.92   99.88 | 18.00    1.47 | 24.08    0.98
             5.92    1.31 | 12.00   99.88 | 18.08    1.47 |
             6.00    1.31 | 12.08   99.88 | 18.17    1.47 |
             6.08    1.31 | 12.17   11.75 | 18.25    1.47 |

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

--------------------
| CALIB            |
| NASHYD   (  0004)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.021 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  23.086
     TOTAL RAINFALL   (mm)=  81.600
     RUNOFF COEFFICIENT   =   0.283

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0005)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.018 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  28.253
     TOTAL RAINFALL   (mm)=  81.600
     RUNOFF COEFFICIENT   =   0.346
```

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0006)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.069 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  34.151
     TOTAL RAINFALL   (mm)=  81.600
     RUNOFF COEFFICIENT   =   0.419

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0007)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.064 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  29.443
     TOTAL RAINFALL   (mm)=  81.600
     RUNOFF COEFFICIENT   =   0.361

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   5.35   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.817

     PEAK FLOW       (cms)=   0.288 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  25.286
     TOTAL RAINFALL   (mm)=  81.600
     RUNOFF COEFFICIENT   =   0.310
```

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

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     5.35   0.288    12.17    25.29
      + ID2= 2 (  0004):     0.40   0.021    12.17    23.09
        ===================================================
        ID = 3 (  0020):     5.75   0.309    12.17    25.13

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     5.75   0.309    12.17    25.13
      + ID2= 2 (  0005):     0.19   0.018    12.08    28.25
        ===================================================
        ID = 1 (  0020):     5.94   0.324    12.17    25.23

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0020):     5.94   0.324    12.17    25.23
      + ID2= 2 (  0006):     0.58   0.069    12.08    34.15
        ===================================================
        ID = 3 (  0020):     6.52   0.377    12.17    26.03

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     6.52   0.377    12.17    26.03
      + ID2= 2 (  0007):     0.69   0.064    12.08    29.44
        ===================================================
        ID = 1 (  0020):     7.21   0.434    12.17    26.35

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   0.91   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

     Unit Hyd Qpeak  (cms)=   0.183

     PEAK FLOW      (cms)=   0.086 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  35.866
     TOTAL RAINFALL   (mm)=  81.600
     RUNOFF COEFFICIENT   =   0.440

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW      (cms)=   0.004 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  22.229
     TOTAL RAINFALL   (mm)=  81.600
     RUNOFF COEFFICIENT   =   0.272

     (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 (  0002):     0.91   0.086    12.17    35.87
      + ID2= 2 (  0003):     0.07   0.004    12.17    22.23
        ===================================================
        ID = 3 (  0021):     0.98   0.090    12.17    34.89

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0010)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056
```

```
     PEAK FLOW       (cms)=   0.018 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  28.253
     TOTAL RAINFALL   (mm)=  81.600
     RUNOFF COEFFICIENT   =   0.346

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0009)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.021 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  23.086
     TOTAL RAINFALL   (mm)=  81.600
     RUNOFF COEFFICIENT   =   0.283

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0011)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.069 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  34.151
     TOTAL RAINFALL   (mm)=  81.600
     RUNOFF COEFFICIENT   =   0.419

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.004 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  22.229
     TOTAL RAINFALL   (mm)=  81.600
     RUNOFF COEFFICIENT   =   0.272

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0012)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.064 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  29.443
     TOTAL RAINFALL   (mm)=  81.600
     RUNOFF COEFFICIENT   =   0.361

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0018)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n          =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=      80.95       112.17
                over (min)      20.00        25.00
     Storage Coeff.  (min)=      19.98 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      20.00        60.00
     Unit Hyd. peak  (cms)=       0.06         0.02
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.49         0.14          0.560 (iii)
     TIME TO PEAK    (hrs)=      12.25        12.92          12.25
     RUNOFF VOLUME    (mm)=      80.60        57.25          70.32
     TOTAL RAINFALL   (mm)=      81.60        81.60          81.60
     RUNOFF COEFFICIENT   =       0.99         0.70           0.86


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
```

```
         CN*  =  85.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     0.19   0.018    12.08    28.25
      + ID2= 2 (  0011):     0.58   0.069    12.08    34.15
        ====================================================
        ID = 3 (  0022):     0.77   0.087    12.08    32.70

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     0.77   0.087    12.08    32.70
      + ID2= 2 (  0012):     0.69   0.064    12.08    29.44
        ====================================================
        ID = 1 (  0022):     1.46   0.151    12.08    31.16

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     1.46   0.151    12.08    31.16
      + ID2= 2 (  0018):     6.26   0.560    12.25    70.32
        ====================================================
        ID = 3 (  0022):     7.72   0.641    12.25    62.91

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     7.72   0.641    12.25    62.91
      + ID2= 2 (  0008):     0.07   0.004    12.17    22.23
        ====================================================
        ID = 1 (  0022):     7.79   0.644    12.25    62.55
```

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     7.79   0.644    12.25    62.55
      + ID2= 2 (  0009):     0.40   0.021    12.17    23.09
        ====================================================
        ID = 3 (  0022):     8.19   0.665    12.17    60.62

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW      (cms)=   0.069 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  34.151
     TOTAL RAINFALL   (mm)=  81.600
     RUNOFF COEFFICIENT   =   0.419

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0013)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW      (cms)=   0.004 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  22.229
     TOTAL RAINFALL   (mm)=  81.600
     RUNOFF COEFFICIENT   =   0.272

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0014)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
```

```
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.021 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  23.086
     TOTAL RAINFALL   (mm)=  81.600
     RUNOFF COEFFICIENT   =   0.283

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0015)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.018 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  28.253
     TOTAL RAINFALL   (mm)=  81.600
     RUNOFF COEFFICIENT   =   0.346

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0017)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.064 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  29.443
     TOTAL RAINFALL   (mm)=  81.600
     RUNOFF COEFFICIENT   =   0.361

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0019)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
```

```
                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      4.25         2.01
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.52         4.33
     Length            (m)=    330.00        30.00
     Mannings n          =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=     80.95       112.17
                over (min)      20.00        25.00
     Storage Coeff.  (min)=     19.98 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=     20.00        60.00
     Unit Hyd. peak  (cms)=      0.06         0.02
                                                          *TOTALS*
     PEAK FLOW       (cms)=      0.49         0.14          0.560 (iii)
     TIME TO PEAK    (hrs)=     12.25        12.92          12.25
     RUNOFF VOLUME    (mm)=     80.60        57.25          70.32
     TOTAL RAINFALL   (mm)=     81.60        81.60          81.60
     RUNOFF COEFFICIENT   =      0.99         0.70           0.86

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0013):     0.07   0.004    12.17    22.23
      + ID2= 2 (  0014):     0.40   0.021    12.17    23.09
        ==================================================
        ID = 3 (  0023):     0.47   0.025    12.17    22.96

     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):     0.47   0.025    12.17    22.96
      + ID2= 2 (  0015):     0.19   0.018    12.08    28.25
        ==================================================
        ID = 1 (  0023):     0.66   0.040    12.17    24.48

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

```
--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     0.66   0.040    12.17    24.48
      + ID2= 2 (  0016):     0.58   0.069    12.08    34.15
        ==================================================
        ID = 3 (  0023):     1.24   0.109    12.08    29.00

     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):     1.24   0.109    12.08    29.00
      + ID2= 2 (  0017):     0.69   0.064    12.08    29.44
        ==================================================
        ID = 1 (  0023):     1.93   0.173    12.08    29.16

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     1.93   0.173    12.08    29.16
      + ID2= 2 (  0019):     6.26   0.560    12.25    70.32
        ==================================================
        ID = 3 (  0023):     8.19   0.665    12.17    60.62

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0024)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.7970      0.1600
                          0.3210     0.1300   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0023)      8.190      0.665     12.17      60.62
   OUTFLOW: ID= 1 (  0024)      8.190      0.304     12.92      60.61

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 45.69
                   TIME SHIFT OF PEAK FLOW        (min)= 45.00
                   MAXIMUM  STORAGE   USED      (ha.m.)=  0.1232
```

```
--------------------------------------------------------------------------------
**********************************
** SIMULATION:10yr 6hr 5min SCS **
**********************************

--------------------
|    READ STORM    |    Filename: C:\Users\m.orwin\AppD
|                  |              ata\Local\Temp\
|                  |              d5546b1a-54a6-497b-a8a5-5a1feca7b397\ccbb5ea8
| Ptotal= 53.40 mm |    Comments: 10yr 6hr 5min SCS
--------------------
                  TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                  0.08    0.00 |  1.67    5.34 |  3.25   11.75 |  4.83    3.20
                  0.17    2.14 |  1.75    5.34 |  3.33   11.75 |  4.92    3.20
                  0.25    2.14 |  1.83    5.34 |  3.42   11.75 |  5.00    3.20
                  0.33    2.14 |  1.92    5.34 |  3.50   11.75 |  5.08    3.20
                  0.42    2.14 |  2.00    5.34 |  3.58   11.75 |  5.17    2.14
                  0.50    2.14 |  2.08    5.34 |  3.67    5.34 |  5.25    2.14
                  0.58    2.14 |  2.17    6.41 |  3.75    5.34 |  5.33    2.14
                  0.67    3.20 |  2.25    6.41 |  3.83    5.34 |  5.42    2.14
                  0.75    3.20 |  2.33    6.41 |  3.92    5.34 |  5.50    2.14
                  0.83    3.20 |  2.42    6.41 |  4.00    5.34 |  5.58    2.14
                  0.92    3.20 |  2.50    6.41 |  4.08    5.34 |  5.67    2.14
                  1.00    3.20 |  2.58    6.41 |  4.17    4.27 |  5.75    2.14
                  1.08    3.20 |  2.67   32.04 |  4.25    4.27 |  5.83    2.14
                  1.17    3.20 |  2.75   32.04 |  4.33    4.27 |  5.92    2.14
                  1.25    3.20 |  2.83   32.04 |  4.42    4.27 |  6.00    2.14
                  1.33    3.20 |  2.92   83.30 |  4.50    4.27 |  6.08    2.14
                  1.42    3.20 |  3.00   83.30 |  4.58    4.27 |
                  1.50    3.20 |  3.08   83.30 |  4.67    3.20 |
                  1.58    3.20 |  3.17   11.75 |  4.75    3.20 |

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

--------------------
| CALIB            |
| NASHYD   (  0004)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW      (cms)=   0.012 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  10.024
     TOTAL RAINFALL   (mm)=  53.400
     RUNOFF COEFFICIENT   =   0.188

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

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

```
--------------------
| CALIB              |
| NASHYD   (  0005)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.011 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  12.941
     TOTAL RAINFALL   (mm)=  53.400
     RUNOFF COEFFICIENT   =   0.242

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

--------------------------------------------------------------------------------
--------------------
| CALIB              |
| NASHYD   (  0006)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.044 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  16.404
     TOTAL RAINFALL   (mm)=  53.400
     RUNOFF COEFFICIENT   =   0.307

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

--------------------------------------------------------------------------------
--------------------
| CALIB              |
| NASHYD   (  0007)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.039 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  13.649
     TOTAL RAINFALL   (mm)=  53.400
     RUNOFF COEFFICIENT   =   0.256

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

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

```
| CALIB              |
| NASHYD   (  0001)|   Area    (ha)=   5.35   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.817

     PEAK FLOW       (cms)=   0.167 (i)
     TIME TO PEAK    (hrs)=   3.250
     RUNOFF VOLUME    (mm)=  11.151
     TOTAL RAINFALL   (mm)=  53.400
     RUNOFF COEFFICIENT   =   0.209

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

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     5.35   0.167     3.25    11.15
      + ID2= 2 (  0004):     0.40   0.012     3.17    10.02
        ====================================================
        ID = 3 (  0020):     5.75   0.179     3.25    11.07

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     5.75   0.179     3.25    11.07
      + ID2= 2 (  0005):     0.19   0.011     3.08    12.94
        ====================================================
        ID = 1 (  0020):     5.94   0.186     3.17    11.13

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0020):     5.94   0.186     3.17    11.13
      + ID2= 2 (  0006):     0.58   0.044     3.08    16.40
        ====================================================
        ID = 3 (  0020):     6.52   0.221     3.17    11.60

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

```
--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     6.52   0.221     3.17    11.60
      + ID2= 2 (  0007):     0.69   0.039     3.08    13.65
        ====================================================
        ID = 1 (  0020):     7.21   0.256     3.17    11.80

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   0.91   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

     Unit Hyd Qpeak  (cms)=   0.183

     PEAK FLOW       (cms)=   0.055 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  17.208
     TOTAL RAINFALL   (mm)=  53.400
     RUNOFF COEFFICIENT   =   0.322

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=   9.562
     TOTAL RAINFALL   (mm)=  53.400
     RUNOFF COEFFICIENT   =   0.179

     (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 (  0002):     0.91   0.055     3.17    17.21
      + ID2= 2 (  0003):     0.07   0.002     3.17     9.56
        ====================================================
        ID = 3 (  0021):     0.98   0.057     3.17    16.66

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0010)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.011 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  12.941
     TOTAL RAINFALL   (mm)=  53.400
     RUNOFF COEFFICIENT   =   0.242

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0009)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.012 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  10.024
     TOTAL RAINFALL   (mm)=  53.400
     RUNOFF COEFFICIENT   =   0.188

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0011)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.044 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  16.404
     TOTAL RAINFALL   (mm)=  53.400
```

```
     RUNOFF COEFFICIENT   =   0.307

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=   9.562
     TOTAL RAINFALL   (mm)=  53.400
     RUNOFF COEFFICIENT   =   0.179

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0012)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.039 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  13.649
     TOTAL RAINFALL   (mm)=  53.400
     RUNOFF COEFFICIENT   =   0.256

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0018)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n          =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=      70.49        83.68
```

```
              over (min)       20.00        30.00
     Storage Coeff.  (min)=      21.12 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      20.00        60.00
     Unit Hyd. peak  (cms)=       0.05         0.02
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.43         0.11          0.476 (iii)
     TIME TO PEAK    (hrs)=       3.25         3.92           3.25
     RUNOFF VOLUME    (mm)=      52.40        32.18          43.50
     TOTAL RAINFALL   (mm)=      53.40        53.40          53.40
     RUNOFF COEFFICIENT   =       0.98         0.60           0.81


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     0.19   0.011     3.08    12.94
      + ID2= 2 (  0011):     0.58   0.044     3.08    16.40
        ====================================================
        ID = 3 (  0022):     0.77   0.055     3.08    15.55

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     0.77   0.055     3.08    15.55
      + ID2= 2 (  0012):     0.69   0.039     3.08    13.65
        ====================================================
        ID = 1 (  0022):     1.46   0.094     3.08    14.65

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     1.46   0.094     3.08    14.65
      + ID2= 2 (  0018):     6.26   0.476     3.25    43.50
        ====================================================
        ID = 3 (  0022):     7.72   0.530     3.25    38.04
```

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     7.72   0.530     3.25    38.04
      + ID2= 2 (  0008):     0.07   0.002     3.17     9.56
        ==================================================
        ID = 1 (  0022):     7.79   0.532     3.25    37.79

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     7.79   0.532     3.25    37.79
      + ID2= 2 (  0009):     0.40   0.012     3.17    10.02
        ==================================================
        ID = 3 (  0022):     8.19   0.544     3.25    36.43

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.044 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  16.404
     TOTAL RAINFALL   (mm)=  53.400
     RUNOFF COEFFICIENT   =   0.307

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0013)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=   9.562
     TOTAL RAINFALL   (mm)=  53.400
     RUNOFF COEFFICIENT   =   0.179

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0014)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.012 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  10.024
     TOTAL RAINFALL   (mm)=  53.400
     RUNOFF COEFFICIENT   =   0.188

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0015)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.011 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  12.941
     TOTAL RAINFALL   (mm)=  53.400
     RUNOFF COEFFICIENT   =   0.242

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0017)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.039 (i)
```

```
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  13.649
     TOTAL RAINFALL   (mm)=  53.400
     RUNOFF COEFFICIENT   =   0.256

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0019)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n           =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=      70.49        83.68
                over (min)       20.00        30.00
     Storage Coeff.  (min)=      21.12 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      20.00        60.00
     Unit Hyd. peak  (cms)=       0.05         0.02
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.43         0.11          0.476 (iii)
     TIME TO PEAK    (hrs)=       3.25         3.92           3.25
     RUNOFF VOLUME    (mm)=      52.40        32.18          43.50
     TOTAL RAINFALL   (mm)=      53.40        53.40          53.40
     RUNOFF COEFFICIENT   =       0.98         0.60           0.81


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0013):     0.07   0.002     3.17     9.56
      + ID2= 2 (  0014):     0.40   0.012     3.17    10.02
        ==================================================
        ID = 3 (  0023):     0.47   0.014     3.17     9.95

     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):     0.47   0.014     3.17     9.95
      + ID2= 2 (  0015):     0.19   0.011     3.08    12.94
        ==================================================
        ID = 1 (  0023):     0.66   0.023     3.17    10.81

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     0.66   0.023     3.17    10.81
      + ID2= 2 (  0016):     0.58   0.044     3.08    16.40
        ==================================================
        ID = 3 (  0023):     1.24   0.067     3.08    13.43

     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):     1.24   0.067     3.08    13.43
      + ID2= 2 (  0017):     0.69   0.039     3.08    13.65
        ==================================================
        ID = 1 (  0023):     1.93   0.106     3.08    13.51

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     1.93   0.106     3.08    13.51
      + ID2= 2 (  0019):     6.26   0.476     3.25    43.50
        ==================================================
        ID = 3 (  0023):     8.19   0.544     3.25    36.43

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0024)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
```

```
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.7970     0.1600
                          0.3210     0.1300   |   0.0000     0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0023)      8.190      0.544      3.25      36.43
   OUTFLOW: ID= 1 (  0024)      8.190      0.252      4.00      36.42

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 46.44
                   TIME SHIFT OF PEAK FLOW         (min)= 45.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.1023

--------------------------------------------------------------------------------
***********************************
** SIMULATION:25yr 12hr 5min SCS **
***********************************

--------------------
|    READ STORM    |    Filename: C:\Users\m.orwin\AppD
|                  |              ata\Local\Temp\
|                  |              d5546b1a-54a6-497b-a8a5-5a1feca7b397\219f8a83
| Ptotal= 76.80 mm |    Comments: 25yr 12hr 5min SCS
--------------------
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                 0.08    0.00 |  3.17    3.07 |  6.25   13.82 |  9.33    2.69
                 0.17    1.92 |  3.25    3.07 |  6.33   13.82 |  9.42    2.69
                 0.25    1.92 |  3.33    3.07 |  6.42   13.82 |  9.50    2.69
                 0.33    1.92 |  3.42    3.07 |  6.50   13.82 |  9.58    2.69
                 0.42    1.92 |  3.50    3.07 |  6.58   13.82 |  9.67    2.69
                 0.50    1.92 |  3.58    3.07 |  6.67    6.14 |  9.75    2.69
                 0.58    1.92 |  3.67    3.07 |  6.75    6.14 |  9.83    2.69
                 0.67    1.92 |  3.75    3.07 |  6.83    6.14 |  9.92    2.69
                 0.75    1.92 |  3.83    3.07 |  6.92    6.14 | 10.00    2.69
                 0.83    1.92 |  3.92    3.07 |  7.00    6.14 | 10.08    2.69
                 0.92    1.92 |  4.00    3.07 |  7.08    6.14 | 10.17    1.54
                 1.00    1.92 |  4.08    3.07 |  7.17    4.61 | 10.25    1.54
                 1.08    1.92 |  4.17    4.61 |  7.25    4.61 | 10.33    1.54
                 1.17    1.92 |  4.25    4.61 |  7.33    4.61 | 10.42    1.54
                 1.25    1.92 |  4.33    4.61 |  7.42    4.61 | 10.50    1.54
                 1.33    1.92 |  4.42    4.61 |  7.50    4.61 | 10.58    1.54
                 1.42    1.92 |  4.50    4.61 |  7.58    4.61 | 10.67    1.54
                 1.50    1.92 |  4.58    4.61 |  7.67    4.61 | 10.75    1.54
                 1.58    1.92 |  4.67    6.14 |  7.75    4.61 | 10.83    1.54
                 1.67    1.92 |  4.75    6.14 |  7.83    4.61 | 10.92    1.54
                 1.75    1.92 |  4.83    6.14 |  7.92    4.61 | 11.00    1.54
                 1.83    1.92 |  4.92    6.14 |  8.00    4.61 | 11.08    1.54
                 1.92    1.92 |  5.00    6.14 |  8.08    4.61 | 11.17    1.54
                 2.00    1.92 |  5.08    6.14 |  8.17    2.69 | 11.25    1.54
                 2.08    1.92 |  5.17    9.22 |  8.25    2.69 | 11.33    1.54
                 2.17    2.30 |  5.25    9.22 |  8.33    2.69 | 11.42    1.54
                 2.25    2.30 |  5.33    9.22 |  8.42    2.69 | 11.50    1.54
                 2.33    2.30 |  5.42    9.22 |  8.50    2.69 | 11.58    1.54
                 2.42    2.30 |  5.50    9.22 |  8.58    2.69 | 11.67    1.54
                 2.50    2.30 |  5.58    9.22 |  8.67    2.69 | 11.75    1.54
                 2.58    2.30 |  5.67   36.86 |  8.75    2.69 | 11.83    1.54
                 2.67    2.30 |  5.75   36.86 |  8.83    2.69 | 11.92    1.54
                 2.75    2.30 |  5.83   36.86 |  8.92    2.69 | 12.00    1.54
                 2.83    2.30 |  5.92  101.38 |  9.00    2.69 | 12.08    1.54
                 2.92    2.30 |  6.00  101.38 |  9.08    2.69 |
                 3.00    2.30 |  6.08  101.38 |  9.17    2.69 |
                 3.08    2.30 |  6.17   13.82 |  9.25    2.69 |

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

--------------------
| CALIB            |
| NASHYD   (  0004)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW      (cms)=   0.022 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  20.602
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.268

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0005)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW      (cms)=   0.018 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  25.391
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.331

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0006)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
```

```
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.071 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  30.888
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.402

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

-------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0007)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.066 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  26.500
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.345

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

-------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0001)|   Area    (ha)=   5.35   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.817

     PEAK FLOW       (cms)=   0.299 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  22.617
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.294

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

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     5.35   0.299     6.17    22.62
      + ID2= 2 (  0004):     0.40   0.022     6.17    20.60
        ====================================================
        ID = 3 (  0020):     5.75   0.320     6.17    22.48

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     5.75   0.320     6.17    22.48
      + ID2= 2 (  0005):     0.19   0.018     6.08    25.39
        ====================================================
        ID = 1 (  0020):     5.94   0.335     6.17    22.57

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0020):     5.94   0.335     6.17    22.57
      + ID2= 2 (  0006):     0.58   0.071     6.08    30.89
        ====================================================
        ID = 3 (  0020):     6.52   0.390     6.17    23.31

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     6.52   0.390     6.17    23.31
      + ID2= 2 (  0007):     0.69   0.066     6.08    26.50
        ====================================================
        ID = 1 (  0020):     7.21   0.448     6.17    23.61

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0002)|   Area    (ha)=   0.91   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

     Unit Hyd Qpeak  (cms)=   0.183

     PEAK FLOW       (cms)=   0.089 (i)
```

```
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  32.448
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.423

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.004 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  19.812
     TOTAL RAINFALL   (mm)=  76.800
     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 (  0002):     0.91   0.089     6.17    32.45
      + ID2= 2 (  0003):     0.07   0.004     6.17    19.81
        ====================================================
        ID = 3 (  0021):     0.98   0.093     6.17    31.55

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0010)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.018 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  25.391
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.331

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

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0009)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.022 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  20.602
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.268

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0011)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.071 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  30.888
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.402

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.004 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  19.812
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.258

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

```
--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0012)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.066 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  26.500
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.345

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| STANDHYD (  0018)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n           =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=      85.25       113.54
                over (min)       20.00        25.00
     Storage Coeff.  (min)=      19.57 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      20.00        60.00
     Unit Hyd. peak  (cms)=       0.06         0.02
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.54         0.15          0.612 (iii)
     TIME TO PEAK    (hrs)=       6.25         6.92           6.25
     RUNOFF VOLUME    (mm)=      75.80        52.87          65.71
     TOTAL RAINFALL   (mm)=      76.80        76.80          76.80
     RUNOFF COEFFICIENT   =       0.99         0.69           0.86


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

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

```
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     0.19   0.018     6.08    25.39
      + ID2= 2 (  0011):     0.58   0.071     6.08    30.89
        ====================================================
        ID = 3 (  0022):     0.77   0.089     6.08    29.53

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     0.77   0.089     6.08    29.53
      + ID2= 2 (  0012):     0.69   0.066     6.08    26.50
        ====================================================
        ID = 1 (  0022):     1.46   0.154     6.08    28.10

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     1.46   0.154     6.08    28.10
      + ID2= 2 (  0018):     6.26   0.612     6.25    65.71
        ====================================================
        ID = 3 (  0022):     7.72   0.701     6.17    58.59

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     7.72   0.701     6.17    58.59
      + ID2= 2 (  0008):     0.07   0.004     6.17    19.81
        ====================================================
        ID = 1 (  0022):     7.79   0.705     6.17    58.24

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     7.79   0.705     6.17    58.24
```

```
    + ID2= 2 (  0009):     0.40   0.022     6.17    20.60
      ====================================================
      ID = 3 (  0022):     8.19   0.727     6.17    56.41

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.071 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  30.888
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.402

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0013)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.004 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  19.812
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.258

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0014)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.022 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  20.602
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.268

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0015)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.018 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  25.391
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.331

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0017)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.066 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  26.500
     TOTAL RAINFALL   (mm)=  76.800
     RUNOFF COEFFICIENT   =   0.345

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0019)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n          =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=      85.25       113.54
```

```
              over (min)       20.00        25.00
     Storage Coeff.  (min)=      19.57 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      20.00        60.00
     Unit Hyd. peak  (cms)=       0.06         0.02
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.54         0.15          0.612 (iii)
     TIME TO PEAK    (hrs)=       6.25         6.92           6.25
     RUNOFF VOLUME    (mm)=      75.80        52.87          65.71
     TOTAL RAINFALL   (mm)=      76.80        76.80          76.80
     RUNOFF COEFFICIENT   =       0.99         0.69           0.86


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0013):      0.07   0.004     6.17    19.81
     + ID2= 2 (  0014):      0.40   0.022     6.17    20.60
       ====================================================
       ID = 3 (  0023):      0.47   0.026     6.17    20.48

     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):      0.47   0.026     6.17    20.48
     + ID2= 2 (  0015):      0.19   0.018     6.08    25.39
       ====================================================
       ID = 1 (  0023):      0.66   0.041     6.17    21.90

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):      0.66   0.041     6.17    21.90
     + ID2= 2 (  0016):      0.58   0.071     6.08    30.89
       ====================================================
       ID = 3 (  0023):      1.24   0.111     6.08    26.10

     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):      1.24   0.111     6.08    26.10
     + ID2= 2 (  0017):      0.69   0.066     6.08    26.50
       ====================================================
       ID = 1 (  0023):      1.93   0.177     6.08    26.24

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):      1.93   0.177     6.08    26.24
     + ID2= 2 (  0019):      6.26   0.612     6.25    65.71
       ====================================================
       ID = 3 (  0023):      8.19   0.727     6.17    56.41

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0024)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.7970      0.1600
                          0.3210     0.1300   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0023)      8.190      0.727      6.17      56.41
   OUTFLOW: ID= 1 (  0024)      8.190      0.374      6.83      56.39

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 51.47
                   TIME SHIFT OF PEAK FLOW         (min)= 40.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.1334

--------------------------------------------------------------------------------
***********************************
** SIMULATION:25yr 24hr 5min SCS **
***********************************

--------------------
|    READ STORM    |    Filename: C:\Users\m.orwin\AppD
|                  |              ata\Local\Temp\
```

```
|                  |              d5546b1a-54a6-497b-a8a5-5a1feca7b397\f6442e92
| Ptotal= 96.00 mm |    Comments: 25yr 24hr 5min SCS
--------------------
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.08	0.00	6.17	1.73	12.25	13.82	18.33	1.73
0.17	1.06	6.25	1.73	12.33	13.82	18.42	1.73
0.25	1.06	6.33	1.73	12.42	13.82	18.50	1.73
0.33	1.06	6.42	1.73	12.50	13.82	18.58	1.73
0.42	1.06	6.50	1.73	12.58	13.82	18.67	1.73
0.50	1.06	6.58	1.73	12.67	7.10	18.75	1.73
0.58	1.06	6.67	1.73	12.75	7.10	18.83	1.73
0.67	1.06	6.75	1.73	12.83	7.10	18.92	1.73
0.75	1.06	6.83	1.73	12.92	7.10	19.00	1.73
0.83	1.06	6.92	1.73	13.00	7.10	19.08	1.73
0.92	1.06	7.00	1.73	13.08	7.10	19.17	1.73
1.00	1.06	7.08	1.73	13.17	5.18	19.25	1.73
1.08	1.06	7.17	2.11	13.25	5.18	19.33	1.73
1.17	1.06	7.25	2.11	13.33	5.18	19.42	1.73
1.25	1.06	7.33	2.11	13.42	5.18	19.50	1.73
1.33	1.06	7.42	2.11	13.50	5.18	19.58	1.73
1.42	1.06	7.50	2.11	13.58	5.18	19.67	1.73
1.50	1.06	7.58	2.11	13.67	4.03	19.75	1.73
1.58	1.06	7.67	2.11	13.75	4.03	19.83	1.73
1.67	1.06	7.75	2.11	13.83	4.03	19.92	1.73
1.75	1.06	7.83	2.11	13.92	4.03	20.00	1.73
1.83	1.06	7.92	2.11	14.00	4.03	20.08	1.73
1.92	1.06	8.00	2.11	14.08	4.03	20.17	1.15
2.00	1.06	8.08	2.11	14.17	2.88	20.25	1.15
2.08	1.06	8.17	2.50	14.25	2.88	20.33	1.15
2.17	1.25	8.25	2.50	14.33	2.88	20.42	1.15
2.25	1.25	8.33	2.50	14.42	2.88	20.50	1.15
2.33	1.25	8.42	2.50	14.50	2.88	20.58	1.15
2.42	1.25	8.50	2.50	14.58	2.88	20.67	1.15
2.50	1.25	8.58	2.50	14.67	2.88	20.75	1.15
2.58	1.25	8.67	2.69	14.75	2.88	20.83	1.15
2.67	1.25	8.75	2.69	14.83	2.88	20.92	1.15
2.75	1.25	8.83	2.69	14.92	2.88	21.00	1.15
2.83	1.25	8.92	2.69	15.00	2.88	21.08	1.15
2.92	1.25	9.00	2.69	15.08	2.88	21.17	1.15
3.00	1.25	9.08	2.69	15.17	2.88	21.25	1.15
3.08	1.25	9.17	3.07	15.25	2.88	21.33	1.15
3.17	1.25	9.25	3.07	15.33	2.88	21.42	1.15
3.25	1.25	9.33	3.07	15.42	2.88	21.50	1.15
3.33	1.25	9.42	3.07	15.50	2.88	21.58	1.15
3.42	1.25	9.50	3.07	15.58	2.88	21.67	1.15
3.50	1.25	9.58	3.07	15.67	2.88	21.75	1.15
3.58	1.25	9.67	3.46	15.75	2.88	21.83	1.15
3.67	1.25	9.75	3.46	15.83	2.88	21.92	1.15
3.75	1.25	9.83	3.46	15.92	2.88	22.00	1.15
3.83	1.25	9.92	3.46	16.00	2.88	22.08	1.15
3.92	1.25	10.00	3.46	16.08	2.88	22.17	1.15
4.00	1.25	10.08	3.46	16.17	1.73	22.25	1.15
4.08	1.25	10.17	4.42	16.25	1.73	22.33	1.15
4.17	1.54	10.25	4.42	16.33	1.73	22.42	1.15
4.25	1.54	10.33	4.42	16.42	1.73	22.50	1.15
4.33	1.54	10.42	4.42	16.50	1.73	22.58	1.15
4.42	1.54	10.50	4.42	16.58	1.73	22.67	1.15
4.50	1.54	10.58	4.42	16.67	1.73	22.75	1.15
4.58	1.54	10.67	5.95	16.75	1.73	22.83	1.15
4.67	1.54	10.75	5.95	16.83	1.73	22.92	1.15
4.75	1.54	10.83	5.95	16.92	1.73	23.00	1.15
4.83	1.54	10.92	5.95	17.00	1.73	23.08	1.15
4.92	1.54	11.00	5.95	17.08	1.73	23.17	1.15
5.00	1.54	11.08	5.95	17.17	1.73	23.25	1.15
5.08	1.54	11.17	9.22	17.25	1.73	23.33	1.15
5.17	1.54	11.25	9.22	17.33	1.73	23.42	1.15
5.25	1.54	11.33	9.22	17.42	1.73	23.50	1.15
5.33	1.54	11.42	9.22	17.50	1.73	23.58	1.15
5.42	1.54	11.50	9.22	17.58	1.73	23.67	1.15
5.50	1.54	11.58	9.22	17.67	1.73	23.75	1.15
5.58	1.54	11.67	28.42	17.75	1.73	23.83	1.15
5.67	1.54	11.75	28.42	17.83	1.73	23.92	1.15
5.75	1.54	11.83	28.42	17.92	1.73	24.00	1.15
5.83	1.54	11.92	117.50	18.00	1.73	24.08	1.15
5.92	1.54	12.00	117.50	18.08	1.73		
6.00	1.54	12.08	117.50	18.17	1.73		
6.08	1.54	12.17	13.82	18.25	1.73		

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

--------------------
| CALIB            |
| NASHYD   (  0004)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.028 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  31.066
     TOTAL RAINFALL   (mm)=  96.000
     RUNOFF COEFFICIENT   =   0.324

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

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--------------------
| CALIB            |
| NASHYD   (  0005)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13
```

```
    Unit Hyd Qpeak  (cms)=   0.056

    PEAK FLOW       (cms)=   0.024 (i)
    TIME TO PEAK    (hrs)=  12.083
    RUNOFF VOLUME    (mm)=  37.348
    TOTAL RAINFALL   (mm)=  96.000
    RUNOFF COEFFICIENT   =   0.389

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0006)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

    Unit Hyd Qpeak  (cms)=   0.185

    PEAK FLOW       (cms)=   0.090 (i)
    TIME TO PEAK    (hrs)=  12.083
    RUNOFF VOLUME    (mm)=  44.397
    TOTAL RAINFALL   (mm)=  96.000
    RUNOFF COEFFICIENT   =   0.462

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0007)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

    Unit Hyd Qpeak  (cms)=   0.188

    PEAK FLOW       (cms)=   0.085 (i)
    TIME TO PEAK    (hrs)=  12.083
    RUNOFF VOLUME    (mm)=  38.770
    TOTAL RAINFALL   (mm)=  96.000
    RUNOFF COEFFICIENT   =   0.404

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   5.35   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

    Unit Hyd Qpeak  (cms)=   0.817
```

```
    PEAK FLOW       (cms)=   0.390 (i)
    TIME TO PEAK    (hrs)=  12.167
    RUNOFF VOLUME    (mm)=  33.824
    TOTAL RAINFALL   (mm)=  96.000
    RUNOFF COEFFICIENT   =   0.352

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

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--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):     5.35   0.390    12.17    33.82
     + ID2= 2 (  0004):     0.40   0.028    12.17    31.07
       ===================================================
       ID = 3 (  0020):     5.75   0.418    12.17    33.63

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0020):     5.75   0.418    12.17    33.63
     + ID2= 2 (  0005):     0.19   0.024    12.08    37.35
       ===================================================
       ID = 1 (  0020):     5.94   0.438    12.17    33.75

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0020):     5.94   0.438    12.17    33.75
     + ID2= 2 (  0006):     0.58   0.090    12.08    44.40
       ===================================================
       ID = 3 (  0020):     6.52   0.507    12.17    34.70

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0020):     6.52   0.507    12.17    34.70
```

```
      + ID2= 2 (  0007):     0.69   0.085    12.08    38.77
        ==================================================
        ID = 1 (  0020):     7.21   0.582    12.17    35.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   0.91   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

     Unit Hyd Qpeak  (cms)=   0.183

     PEAK FLOW       (cms)=   0.113 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  46.571
     TOTAL RAINFALL   (mm)=  96.000
     RUNOFF COEFFICIENT   =   0.485

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.006 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  30.000
     TOTAL RAINFALL   (mm)=  96.000
     RUNOFF COEFFICIENT   =   0.313

     (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 (  0002):     0.91   0.113    12.17    46.57
      + ID2= 2 (  0003):     0.07   0.006    12.17    30.00
        ==================================================
        ID = 3 (  0021):     0.98   0.118    12.17    45.39

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

```
--------------------
| CALIB            |
| NASHYD   (  0010)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.024 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  37.348
     TOTAL RAINFALL   (mm)=  96.000
     RUNOFF COEFFICIENT   =   0.389

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0009)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.028 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  31.066
     TOTAL RAINFALL   (mm)=  96.000
     RUNOFF COEFFICIENT   =   0.324

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0011)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.090 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  44.397
     TOTAL RAINFALL   (mm)=  96.000
     RUNOFF COEFFICIENT   =   0.462

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

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

```
| CALIB             |
| NASHYD   (  0008)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.006 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  30.000
     TOTAL RAINFALL   (mm)=  96.000
     RUNOFF COEFFICIENT   =   0.313

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0012)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.085 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  38.770
     TOTAL RAINFALL   (mm)=  96.000
     RUNOFF COEFFICIENT   =   0.404

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| STANDHYD (  0018)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n          =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=      95.23       137.17
                over (min)       20.00        25.00
     Storage Coeff.  (min)=      18.72 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      20.00        60.00
     Unit Hyd. peak  (cms)=       0.06         0.02
                                                             *TOTALS*
     PEAK FLOW       (cms)=       0.60         0.17          0.681 (iii)
     TIME TO PEAK    (hrs)=      12.25        12.92          12.25
     RUNOFF VOLUME    (mm)=      95.00        70.58          84.25
     TOTAL RAINFALL   (mm)=      96.00        96.00          96.00
     RUNOFF COEFFICIENT   =       0.99         0.74           0.88

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     0.19   0.024    12.08    37.35
      + ID2= 2 (  0011):     0.58   0.090    12.08    44.40
        ===================================================
        ID = 3 (  0022):     0.77   0.114    12.08    42.66

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     0.77   0.114    12.08    42.66
      + ID2= 2 (  0012):     0.69   0.085    12.08    38.77
        ===================================================
        ID = 1 (  0022):     1.46   0.199    12.08    40.82

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     1.46   0.199    12.08    40.82
      + ID2= 2 (  0018):     6.26   0.681    12.25    84.25
        ===================================================
        ID = 3 (  0022):     7.72   0.792    12.17    76.04

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

--------------------
| ADD HYD  (  0022)|
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```
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     7.72   0.792    12.17    76.04
      + ID2= 2 (  0008):     0.07   0.006    12.17    30.00
        ===================================================
        ID = 1 (  0022):     7.79   0.798    12.17    75.62

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     7.79   0.798    12.17    75.62
      + ID2= 2 (  0009):     0.40   0.028    12.17    31.07
        ===================================================
        ID = 3 (  0022):     8.19   0.826    12.17    73.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.090 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  44.397
     TOTAL RAINFALL   (mm)=  96.000
     RUNOFF COEFFICIENT   =   0.462

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0013)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.006 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  30.000
     TOTAL RAINFALL   (mm)=  96.000
     RUNOFF COEFFICIENT   =   0.313
```

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0014)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.028 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  31.066
     TOTAL RAINFALL   (mm)=  96.000
     RUNOFF COEFFICIENT   =   0.324

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0015)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.024 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  37.348
     TOTAL RAINFALL   (mm)=  96.000
     RUNOFF COEFFICIENT   =   0.389

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0017)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.085 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  38.770
     TOTAL RAINFALL   (mm)=  96.000
     RUNOFF COEFFICIENT   =   0.404

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

```
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0019)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n           =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=      95.23       137.17
                over (min)       20.00        25.00
     Storage Coeff.  (min)=      18.72 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      20.00        60.00
     Unit Hyd. peak  (cms)=       0.06         0.02
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.60         0.17          0.681 (iii)
     TIME TO PEAK    (hrs)=      12.25        12.92          12.25
     RUNOFF VOLUME    (mm)=      95.00        70.58          84.25
     TOTAL RAINFALL   (mm)=      96.00        96.00          96.00
     RUNOFF COEFFICIENT   =       0.99         0.74           0.88


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0013):     0.07   0.006    12.17    30.00
      + ID2= 2 (  0014):     0.40   0.028    12.17    31.07
        ====================================================
        ID = 3 (  0023):     0.47   0.034    12.17    30.91

     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):     0.47   0.034    12.17    30.91
      + ID2= 2 (  0015):     0.19   0.024    12.08    37.35
        ====================================================
        ID = 1 (  0023):     0.66   0.054    12.17    32.76

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     0.66   0.054    12.17    32.76
      + ID2= 2 (  0016):     0.58   0.090    12.08    44.40
        ====================================================
        ID = 3 (  0023):     1.24   0.144    12.08    38.20

     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):     1.24   0.144    12.08    38.20
      + ID2= 2 (  0017):     0.69   0.085    12.08    38.77
        ====================================================
        ID = 1 (  0023):     1.93   0.229    12.08    38.41

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     1.93   0.229    12.08    38.41
      + ID2= 2 (  0019):     6.26   0.681    12.25    84.25
        ====================================================
        ID = 3 (  0023):     8.19   0.826    12.17    73.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0024)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.7970     0.1600
                          0.3210     0.1300   |   0.0000     0.0000

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

```
   INFLOW : ID= 2 (  0023)      8.190      0.826     12.17      73.45
   OUTFLOW: ID= 1 (  0024)      8.190      0.461     12.67      73.44

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 55.85
                   TIME SHIFT OF PEAK FLOW         (min)= 30.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.1389

--------------------------------------------------------------------------------
**********************************
** SIMULATION:25yr 6hr 5min SCS **
**********************************

--------------------
|    READ STORM    |    Filename: C:\Users\m.orwin\AppD
|                  |              ata\Local\Temp\
|                  |              d5546b1a-54a6-497b-a8a5-5a1feca7b397\703dde9e
| Ptotal= 63.00 mm |    Comments: 25yr 6hr 5min SCS
--------------------
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                 0.08    0.00 |  1.67    6.30 |  3.25   13.86 |  4.83    3.78
                 0.17    2.52 |  1.75    6.30 |  3.33   13.86 |  4.92    3.78
                 0.25    2.52 |  1.83    6.30 |  3.42   13.86 |  5.00    3.78
                 0.33    2.52 |  1.92    6.30 |  3.50   13.86 |  5.08    3.78
                 0.42    2.52 |  2.00    6.30 |  3.58   13.86 |  5.17    2.52
                 0.50    2.52 |  2.08    6.30 |  3.67    6.30 |  5.25    2.52
                 0.58    2.52 |  2.17    7.56 |  3.75    6.30 |  5.33    2.52
                 0.67    3.78 |  2.25    7.56 |  3.83    6.30 |  5.42    2.52
                 0.75    3.78 |  2.33    7.56 |  3.92    6.30 |  5.50    2.52
                 0.83    3.78 |  2.42    7.56 |  4.00    6.30 |  5.58    2.52
                 0.92    3.78 |  2.50    7.56 |  4.08    6.30 |  5.67    2.52
                 1.00    3.78 |  2.58    7.56 |  4.17    5.04 |  5.75    2.52
                 1.08    3.78 |  2.67   37.80 |  4.25    5.04 |  5.83    2.52
                 1.17    3.78 |  2.75   37.80 |  4.33    5.04 |  5.92    2.52
                 1.25    3.78 |  2.83   37.80 |  4.42    5.04 |  6.00    2.52
                 1.33    3.78 |  2.92   98.28 |  4.50    5.04 |  6.08    2.52
                 1.42    3.78 |  3.00   98.28 |  4.58    5.04 |
                 1.50    3.78 |  3.08   98.28 |  4.67    3.78 |
                 1.58    3.78 |  3.17   13.86 |  4.75    3.78 |

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

--------------------
| CALIB            |
| NASHYD   (  0004)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW      (cms)=   0.017 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  14.031
     TOTAL RAINFALL   (mm)=  63.000
     RUNOFF COEFFICIENT   =   0.223

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0005)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW      (cms)=   0.015 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  17.715
     TOTAL RAINFALL   (mm)=  63.000
     RUNOFF COEFFICIENT   =   0.281

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0006)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW      (cms)=   0.059 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  22.027
     TOTAL RAINFALL   (mm)=  63.000
     RUNOFF COEFFICIENT   =   0.350

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0007)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW      (cms)=   0.054 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  18.590
```

```
     TOTAL RAINFALL   (mm)=  63.000
     RUNOFF COEFFICIENT   =   0.295

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   5.35   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.817

     PEAK FLOW       (cms)=   0.235 (i)
     TIME TO PEAK    (hrs)=   3.250
     RUNOFF VOLUME    (mm)=  15.515
     TOTAL RAINFALL   (mm)=  63.000
     RUNOFF COEFFICIENT   =   0.246

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

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     5.35   0.235     3.25    15.51
      + ID2= 2 (  0004):     0.40   0.017     3.17    14.03
        ==================================================
        ID = 3 (  0020):     5.75   0.252     3.25    15.41

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     5.75   0.252     3.25    15.41
      + ID2= 2 (  0005):     0.19   0.015     3.08    17.72
        ==================================================
        ID = 1 (  0020):     5.94   0.263     3.17    15.49

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0020):     5.94   0.263     3.17    15.49
      + ID2= 2 (  0006):     0.58   0.059     3.08    22.03
        ==================================================
        ID = 3 (  0020):     6.52   0.310     3.17    16.07

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     6.52   0.310     3.17    16.07
      + ID2= 2 (  0007):     0.69   0.054     3.08    18.59
        ==================================================
        ID = 1 (  0020):     7.21   0.358     3.17    16.31

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   0.91   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

     Unit Hyd Qpeak  (cms)=   0.183

     PEAK FLOW       (cms)=   0.074 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  23.137
     TOTAL RAINFALL   (mm)=  63.000
     RUNOFF COEFFICIENT   =   0.367

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.003 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  13.440
     TOTAL RAINFALL   (mm)=  63.000
     RUNOFF COEFFICIENT   =   0.213

     (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 (  0002):     0.91   0.074     3.17    23.14
      + ID2= 2 (  0003):     0.07   0.003     3.17    13.44
        ====================================================
        ID = 3 (  0021):     0.98   0.078     3.17    22.44

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0010)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.015 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  17.715
     TOTAL RAINFALL   (mm)=  63.000
     RUNOFF COEFFICIENT   =   0.281

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0009)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.017 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  14.031
     TOTAL RAINFALL   (mm)=  63.000
     RUNOFF COEFFICIENT   =   0.223

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0011)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.059 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  22.027
     TOTAL RAINFALL   (mm)=  63.000
     RUNOFF COEFFICIENT   =   0.350

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.003 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  13.440
     TOTAL RAINFALL   (mm)=  63.000
     RUNOFF COEFFICIENT   =   0.213

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0012)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.054 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  18.590
     TOTAL RAINFALL   (mm)=  63.000
     RUNOFF COEFFICIENT   =   0.295

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0018)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
```

```
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n          =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=      83.16       104.39
                over (min)       20.00        25.00
     Storage Coeff.  (min)=      19.77 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      20.00        60.00
     Unit Hyd. peak  (cms)=       0.06         0.02
                                                            *TOTALS*
     PEAK FLOW       (cms)=       0.52         0.13          0.581 (iii)
     TIME TO PEAK    (hrs)=       3.25         3.92           3.25
     RUNOFF VOLUME    (mm)=      62.00        40.51          52.54
     TOTAL RAINFALL   (mm)=      63.00        63.00          63.00
     RUNOFF COEFFICIENT   =       0.98         0.64           0.83


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     0.19   0.015     3.08    17.72
      + ID2= 2 (  0011):     0.58   0.059     3.08    22.03
        ====================================================
        ID = 3 (  0022):     0.77   0.074     3.08    20.96

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     0.77   0.074     3.08    20.96
      + ID2= 2 (  0012):     0.69   0.054     3.08    18.59
        ====================================================
        ID = 1 (  0022):     1.46   0.128     3.08    19.84

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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```
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     1.46   0.128     3.08    19.84
      + ID2= 2 (  0018):     6.26   0.581     3.25    52.54
        ====================================================
        ID = 3 (  0022):     7.72   0.654     3.25    46.35

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     7.72   0.654     3.25    46.35
      + ID2= 2 (  0008):     0.07   0.003     3.17    13.44
        ====================================================
        ID = 1 (  0022):     7.79   0.657     3.25    46.06

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     7.79   0.657     3.25    46.06
      + ID2= 2 (  0009):     0.40   0.017     3.17    14.03
        ====================================================
        ID = 3 (  0022):     8.19   0.673     3.25    44.49

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.059 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  22.027
     TOTAL RAINFALL   (mm)=  63.000
     RUNOFF COEFFICIENT   =   0.350

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

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

```
| CALIB             |
| NASHYD   (  0013)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.003 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  13.440
     TOTAL RAINFALL   (mm)=  63.000
     RUNOFF COEFFICIENT   =   0.213

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0014)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.017 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  14.031
     TOTAL RAINFALL   (mm)=  63.000
     RUNOFF COEFFICIENT   =   0.223

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0015)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.015 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  17.715
     TOTAL RAINFALL   (mm)=  63.000
     RUNOFF COEFFICIENT   =   0.281

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

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

```
| NASHYD   (  0017)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.054 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  18.590
     TOTAL RAINFALL   (mm)=  63.000
     RUNOFF COEFFICIENT   =   0.295

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| STANDHYD (  0019)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n           =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=      83.16       104.39
                over (min)       20.00        25.00
     Storage Coeff.  (min)=      19.77 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      20.00        60.00
     Unit Hyd. peak  (cms)=       0.06         0.02
                                                            *TOTALS*
     PEAK FLOW       (cms)=       0.52         0.13          0.581 (iii)
     TIME TO PEAK    (hrs)=       3.25         3.92           3.25
     RUNOFF VOLUME    (mm)=      62.00        40.51          52.54
     TOTAL RAINFALL   (mm)=      63.00        63.00          63.00
     RUNOFF COEFFICIENT   =       0.98         0.64           0.83


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

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

```
       ID1= 1 (  0013):     0.07   0.003     3.17    13.44
     + ID2= 2 (  0014):     0.40   0.017     3.17    14.03
       ==================================================
       ID = 3 (  0023):     0.47   0.020     3.17    13.94

    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):     0.47   0.020     3.17    13.94
     + ID2= 2 (  0015):     0.19   0.015     3.08    17.72
       ==================================================
       ID = 1 (  0023):     0.66   0.033     3.17    15.03

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):     0.66   0.033     3.17    15.03
     + ID2= 2 (  0016):     0.58   0.059     3.08    22.03
       ==================================================
       ID = 3 (  0023):     1.24   0.091     3.08    18.30

    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):     1.24   0.091     3.08    18.30
     + ID2= 2 (  0017):     0.69   0.054     3.08    18.59
       ==================================================
       ID = 1 (  0023):     1.93   0.145     3.08    18.40

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):     1.93   0.145     3.08    18.40
     + ID2= 2 (  0019):     6.26   0.581     3.25    52.54
       ==================================================
       ID = 3 (  0023):     8.19   0.673     3.25    44.49

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0024)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.7970      0.1600
                          0.3210     0.1300   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0023)      8.190      0.673      3.25      44.49
   OUTFLOW: ID= 1 (  0024)      8.190      0.308      3.92      44.48

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 45.82
                  TIME SHIFT OF PEAK FLOW         (min)= 40.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1250

--------------------------------------------------------------------------------
**********************************
** SIMULATION:2yr 12hr 5min SCS **
**********************************

--------------------
|    READ STORM    |    Filename: C:\Users\m.orwin\AppD
|                  |              ata\Local\Temp\
|                  |              d5546b1a-54a6-497b-a8a5-5a1feca7b397\b9b99edc
| Ptotal= 43.20 mm |    Comments: 2yr 12hr 5min SCS
--------------------
                  TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                  0.08    0.00 |  3.17    1.73 |  6.25    7.78 |  9.33    1.51
                  0.17    1.08 |  3.25    1.73 |  6.33    7.78 |  9.42    1.51
                  0.25    1.08 |  3.33    1.73 |  6.42    7.78 |  9.50    1.51
                  0.33    1.08 |  3.42    1.73 |  6.50    7.78 |  9.58    1.51
                  0.42    1.08 |  3.50    1.73 |  6.58    7.78 |  9.67    1.51
                  0.50    1.08 |  3.58    1.73 |  6.67    3.46 |  9.75    1.51
                  0.58    1.08 |  3.67    1.73 |  6.75    3.46 |  9.83    1.51
                  0.67    1.08 |  3.75    1.73 |  6.83    3.46 |  9.92    1.51
                  0.75    1.08 |  3.83    1.73 |  6.92    3.46 | 10.00    1.51
                  0.83    1.08 |  3.92    1.73 |  7.00    3.46 | 10.08    1.51
                  0.92    1.08 |  4.00    1.73 |  7.08    3.46 | 10.17    0.86
                  1.00    1.08 |  4.08    1.73 |  7.17    2.59 | 10.25    0.86
                  1.08    1.08 |  4.17    2.59 |  7.25    2.59 | 10.33    0.86
                  1.17    1.08 |  4.25    2.59 |  7.33    2.59 | 10.42    0.86
                  1.25    1.08 |  4.33    2.59 |  7.42    2.59 | 10.50    0.86
                  1.33    1.08 |  4.42    2.59 |  7.50    2.59 | 10.58    0.86
                  1.42    1.08 |  4.50    2.59 |  7.58    2.59 | 10.67    0.86
                  1.50    1.08 |  4.58    2.59 |  7.67    2.59 | 10.75    0.86
                  1.58    1.08 |  4.67    3.46 |  7.75    2.59 | 10.83    0.86
```

```
                 1.67    1.08 |  4.75    3.46 |  7.83    2.59 | 10.92    0.86
                 1.75    1.08 |  4.83    3.46 |  7.92    2.59 | 11.00    0.86
                 1.83    1.08 |  4.92    3.46 |  8.00    2.59 | 11.08    0.86
                 1.92    1.08 |  5.00    3.46 |  8.08    2.59 | 11.17    0.86
                 2.00    1.08 |  5.08    3.46 |  8.17    1.51 | 11.25    0.86
                 2.08    1.08 |  5.17    5.18 |  8.25    1.51 | 11.33    0.86
                 2.17    1.30 |  5.25    5.18 |  8.33    1.51 | 11.42    0.86
                 2.25    1.30 |  5.33    5.18 |  8.42    1.51 | 11.50    0.86
                 2.33    1.30 |  5.42    5.18 |  8.50    1.51 | 11.58    0.86
                 2.42    1.30 |  5.50    5.18 |  8.58    1.51 | 11.67    0.86
                 2.50    1.30 |  5.58    5.18 |  8.67    1.51 | 11.75    0.86
                 2.58    1.30 |  5.67   20.74 |  8.75    1.51 | 11.83    0.86
                 2.67    1.30 |  5.75   20.74 |  8.83    1.51 | 11.92    0.86
                 2.75    1.30 |  5.83   20.74 |  8.92    1.51 | 12.00    0.86
                 2.83    1.30 |  5.92   57.02 |  9.00    1.51 | 12.08    0.86
                 2.92    1.30 |  6.00   57.02 |  9.08    1.51 |
                 3.00    1.30 |  6.08   57.02 |  9.17    1.51 |
                 3.08    1.30 |  6.17    7.78 |  9.25    1.51 |

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

--------------------
| CALIB            |
| NASHYD   (  0004)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.006 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=   6.360
     TOTAL RAINFALL   (mm)=  43.200
     RUNOFF COEFFICIENT   =   0.147

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0005)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.006 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=   8.481
     TOTAL RAINFALL   (mm)=  43.200
     RUNOFF COEFFICIENT   =   0.196

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0006)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.025 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  11.042
     TOTAL RAINFALL   (mm)=  43.200
     RUNOFF COEFFICIENT   =   0.256

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0007)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.022 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=   9.013
     TOTAL RAINFALL   (mm)=  43.200
     RUNOFF COEFFICIENT   =   0.209

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   5.35   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.817

     PEAK FLOW       (cms)=   0.090 (i)
     TIME TO PEAK    (hrs)=   6.250
     RUNOFF VOLUME    (mm)=   7.131
     TOTAL RAINFALL   (mm)=  43.200
     RUNOFF COEFFICIENT   =   0.165

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

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     5.35   0.090     6.25     7.13
      + ID2= 2 (  0004):     0.40   0.006     6.17     6.36
        ====================================================
        ID = 3 (  0020):     5.75   0.096     6.25     7.08

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     5.75   0.096     6.25     7.08
      + ID2= 2 (  0005):     0.19   0.006     6.08     8.48
        ====================================================
        ID = 1 (  0020):     5.94   0.100     6.17     7.12

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0020):     5.94   0.100     6.17     7.12
      + ID2= 2 (  0006):     0.58   0.025     6.08    11.04
        ====================================================
        ID = 3 (  0020):     6.52   0.120     6.17     7.47

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     6.52   0.120     6.17     7.47
      + ID2= 2 (  0007):     0.69   0.022     6.08     9.01
        ====================================================
        ID = 1 (  0020):     7.21   0.139     6.17     7.62

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   0.91   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

     Unit Hyd Qpeak  (cms)=   0.183

     PEAK FLOW       (cms)=   0.031 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  11.536
     TOTAL RAINFALL   (mm)=  43.200
     RUNOFF COEFFICIENT   =   0.267

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=   6.035
     TOTAL RAINFALL   (mm)=  43.200
     RUNOFF COEFFICIENT   =   0.140

     (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 (  0002):     0.91   0.031     6.17    11.54
      + ID2= 2 (  0003):     0.07   0.001     6.17     6.03
        ====================================================
        ID = 3 (  0021):     0.98   0.032     6.17    11.14

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0010)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056
```

```
     PEAK FLOW       (cms)=   0.006 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=   8.481
     TOTAL RAINFALL   (mm)=  43.200
     RUNOFF COEFFICIENT   =   0.196

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0009)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.006 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=   6.360
     TOTAL RAINFALL   (mm)=  43.200
     RUNOFF COEFFICIENT   =   0.147

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0011)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.025 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  11.042
     TOTAL RAINFALL   (mm)=  43.200
     RUNOFF COEFFICIENT   =   0.256

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.001 (i)
```

```
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=   6.035
     TOTAL RAINFALL   (mm)=  43.200
     RUNOFF COEFFICIENT   =   0.140

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0012)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.022 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=   9.013
     TOTAL RAINFALL   (mm)=  43.200
     RUNOFF COEFFICIENT   =   0.209

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0018)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n           =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=      42.51        52.34
                over (min)       25.00        35.00
     Storage Coeff.  (min)=      25.85 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      25.00        60.00
     Unit Hyd. peak  (cms)=       0.04         0.02
                                                           *TOTALS*
     PEAK FLOW       (cms)=       0.26         0.07          0.294 (iii)
     TIME TO PEAK    (hrs)=       6.33         6.92           6.33
     RUNOFF VOLUME    (mm)=      42.20        23.70          34.05
     TOTAL RAINFALL   (mm)=      43.20        43.20          43.20
     RUNOFF COEFFICIENT   =       0.98         0.55           0.79


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
```

```
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     0.19   0.006     6.08     8.48
      + ID2= 2 (  0011):     0.58   0.025     6.08    11.04
        ====================================================
        ID = 3 (  0022):     0.77   0.031     6.08    10.41

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     0.77   0.031     6.08    10.41
      + ID2= 2 (  0012):     0.69   0.022     6.08     9.01
        ====================================================
        ID = 1 (  0022):     1.46   0.053     6.08     9.75

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     1.46   0.053     6.08     9.75
      + ID2= 2 (  0018):     6.26   0.294     6.33    34.05
        ====================================================
        ID = 3 (  0022):     7.72   0.313     6.33    29.46

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     7.72   0.313     6.33    29.46
      + ID2= 2 (  0008):     0.07   0.001     6.17     6.03
        ====================================================
        ID = 1 (  0022):     7.79   0.314     6.33    29.25

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

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     7.79   0.314     6.33    29.25
      + ID2= 2 (  0009):     0.40   0.006     6.17     6.36
        ====================================================
        ID = 3 (  0022):     8.19   0.320     6.33    28.13

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.025 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  11.042
     TOTAL RAINFALL   (mm)=  43.200
     RUNOFF COEFFICIENT   =   0.256

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0013)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=   6.035
     TOTAL RAINFALL   (mm)=  43.200
     RUNOFF COEFFICIENT   =   0.140

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0014)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23
```

```
     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.006 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=   6.360
     TOTAL RAINFALL   (mm)=  43.200
     RUNOFF COEFFICIENT   =   0.147

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0015)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.006 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=   8.481
     TOTAL RAINFALL   (mm)=  43.200
     RUNOFF COEFFICIENT   =   0.196

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0017)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.022 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=   9.013
     TOTAL RAINFALL   (mm)=  43.200
     RUNOFF COEFFICIENT   =   0.209

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| STANDHYD (  0019)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
```

```
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n           =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=      42.51        52.34
                over (min)       25.00        35.00
     Storage Coeff.  (min)=      25.85 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      25.00        60.00
     Unit Hyd. peak  (cms)=       0.04         0.02
                                                            *TOTALS*
     PEAK FLOW       (cms)=       0.26         0.07          0.294 (iii)
     TIME TO PEAK    (hrs)=       6.33         6.92           6.33
     RUNOFF VOLUME    (mm)=      42.20        23.70          34.05
     TOTAL RAINFALL   (mm)=      43.20        43.20          43.20
     RUNOFF COEFFICIENT   =       0.98         0.55           0.79

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0013):     0.07   0.001     6.17     6.03
      + ID2= 2 (  0014):     0.40   0.006     6.17     6.36
        ===================================================
        ID = 3 (  0023):     0.47   0.008     6.17     6.31

     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):     0.47   0.008     6.17     6.31
      + ID2= 2 (  0015):     0.19   0.006     6.08     8.48
        ===================================================
        ID = 1 (  0023):     0.66   0.013     6.17     6.94

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

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

```
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):      0.66   0.013     6.17     6.94
     + ID2= 2 (  0016):      0.58   0.025     6.08    11.04
       ==================================================
       ID = 3 (  0023):      1.24   0.037     6.08     8.86

     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):      1.24   0.037     6.08     8.86
     + ID2= 2 (  0017):      0.69   0.022     6.08     9.01
       ==================================================
       ID = 1 (  0023):      1.93   0.059     6.08     8.91

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):      1.93   0.059     6.08     8.91
     + ID2= 2 (  0019):      6.26   0.294     6.33    34.05
       ==================================================
       ID = 3 (  0023):      8.19   0.320     6.33    28.13

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0024)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.7970      0.1600
                          0.3210     0.1300   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0023)      8.190      0.320      6.33      28.13
   OUTFLOW: ID= 1 (  0024)      8.190      0.167      7.08      28.12

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 52.17
                   TIME SHIFT OF PEAK FLOW         (min)= 45.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0676

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

```
**********************************
** SIMULATION:2yr 24hr 5min SCS **
**********************************

--------------------
|    READ STORM    |    Filename: C:\Users\m.orwin\AppD
|                  |              ata\Local\Temp\
|                  |              d5546b1a-54a6-497b-a8a5-5a1feca7b397\862fbbb9
| Ptotal= 52.80 mm |    Comments: 2yr 24hr 5min SCS
--------------------
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                 0.08    0.00 |  6.17    0.95 | 12.25    7.60 | 18.33    0.95
                 0.17    0.58 |  6.25    0.95 | 12.33    7.60 | 18.42    0.95
                 0.25    0.58 |  6.33    0.95 | 12.42    7.60 | 18.50    0.95
                 0.33    0.58 |  6.42    0.95 | 12.50    7.60 | 18.58    0.95
                 0.42    0.58 |  6.50    0.95 | 12.58    7.60 | 18.67    0.95
                 0.50    0.58 |  6.58    0.95 | 12.67    3.91 | 18.75    0.95
                 0.58    0.58 |  6.67    0.95 | 12.75    3.91 | 18.83    0.95
                 0.67    0.58 |  6.75    0.95 | 12.83    3.91 | 18.92    0.95
                 0.75    0.58 |  6.83    0.95 | 12.92    3.91 | 19.00    0.95
                 0.83    0.58 |  6.92    0.95 | 13.00    3.91 | 19.08    0.95
                 0.92    0.58 |  7.00    0.95 | 13.08    3.91 | 19.17    0.95
                 1.00    0.58 |  7.08    0.95 | 13.17    2.85 | 19.25    0.95
                 1.08    0.58 |  7.17    1.16 | 13.25    2.85 | 19.33    0.95
                 1.17    0.58 |  7.25    1.16 | 13.33    2.85 | 19.42    0.95
                 1.25    0.58 |  7.33    1.16 | 13.42    2.85 | 19.50    0.95
                 1.33    0.58 |  7.42    1.16 | 13.50    2.85 | 19.58    0.95
                 1.42    0.58 |  7.50    1.16 | 13.58    2.85 | 19.67    0.95
                 1.50    0.58 |  7.58    1.16 | 13.67    2.22 | 19.75    0.95
                 1.58    0.58 |  7.67    1.16 | 13.75    2.22 | 19.83    0.95
                 1.67    0.58 |  7.75    1.16 | 13.83    2.22 | 19.92    0.95
                 1.75    0.58 |  7.83    1.16 | 13.92    2.22 | 20.00    0.95
                 1.83    0.58 |  7.92    1.16 | 14.00    2.22 | 20.08    0.95
                 1.92    0.58 |  8.00    1.16 | 14.08    2.22 | 20.17    0.63
                 2.00    0.58 |  8.08    1.16 | 14.17    1.58 | 20.25    0.63
                 2.08    0.58 |  8.17    1.37 | 14.25    1.58 | 20.33    0.63
                 2.17    0.69 |  8.25    1.37 | 14.33    1.58 | 20.42    0.63
                 2.25    0.69 |  8.33    1.37 | 14.42    1.58 | 20.50    0.63
                 2.33    0.69 |  8.42    1.37 | 14.50    1.58 | 20.58    0.63
                 2.42    0.69 |  8.50    1.37 | 14.58    1.58 | 20.67    0.63
                 2.50    0.69 |  8.58    1.37 | 14.67    1.58 | 20.75    0.63
                 2.58    0.69 |  8.67    1.48 | 14.75    1.58 | 20.83    0.63
                 2.67    0.69 |  8.75    1.48 | 14.83    1.58 | 20.92    0.63
                 2.75    0.69 |  8.83    1.48 | 14.92    1.58 | 21.00    0.63
                 2.83    0.69 |  8.92    1.48 | 15.00    1.58 | 21.08    0.63
                 2.92    0.69 |  9.00    1.48 | 15.08    1.58 | 21.17    0.63
                 3.00    0.69 |  9.08    1.48 | 15.17    1.58 | 21.25    0.63
                 3.08    0.69 |  9.17    1.69 | 15.25    1.58 | 21.33    0.63
                 3.17    0.69 |  9.25    1.69 | 15.33    1.58 | 21.42    0.63
                 3.25    0.69 |  9.33    1.69 | 15.42    1.58 | 21.50    0.63
                 3.33    0.69 |  9.42    1.69 | 15.50    1.58 | 21.58    0.63
```

3.42	0.69	9.50	1.69	15.58	1.58	21.67	0.63
3.50	0.69	9.58	1.69	15.67	1.58	21.75	0.63
3.58	0.69	9.67	1.90	15.75	1.58	21.83	0.63
3.67	0.69	9.75	1.90	15.83	1.58	21.92	0.63
3.75	0.69	9.83	1.90	15.92	1.58	22.00	0.63
3.83	0.69	9.92	1.90	16.00	1.58	22.08	0.63
3.92	0.69	10.00	1.90	16.08	1.58	22.17	0.63
4.00	0.69	10.08	1.90	16.17	0.95	22.25	0.63
4.08	0.69	10.17	2.43	16.25	0.95	22.33	0.63
4.17	0.84	10.25	2.43	16.33	0.95	22.42	0.63
4.25	0.84	10.33	2.43	16.42	0.95	22.50	0.63
4.33	0.84	10.42	2.43	16.50	0.95	22.58	0.63
4.42	0.84	10.50	2.43	16.58	0.95	22.67	0.63
4.50	0.84	10.58	2.43	16.67	0.95	22.75	0.63
4.58	0.84	10.67	3.27	16.75	0.95	22.83	0.63
4.67	0.84	10.75	3.27	16.83	0.95	22.92	0.63
4.75	0.84	10.83	3.27	16.92	0.95	23.00	0.63
4.83	0.84	10.92	3.27	17.00	0.95	23.08	0.63
4.92	0.84	11.00	3.27	17.08	0.95	23.17	0.63
5.00	0.84	11.08	3.27	17.17	0.95	23.25	0.63
5.08	0.84	11.17	5.07	17.25	0.95	23.33	0.63
5.17	0.84	11.25	5.07	17.33	0.95	23.42	0.63
5.25	0.84	11.33	5.07	17.42	0.95	23.50	0.63
5.33	0.84	11.42	5.07	17.50	0.95	23.58	0.63
5.42	0.84	11.50	5.07	17.58	0.95	23.67	0.63
5.50	0.84	11.58	5.07	17.67	0.95	23.75	0.63
5.58	0.84	11.67	15.63	17.75	0.95	23.83	0.63
5.67	0.84	11.75	15.63	17.83	0.95	23.92	0.63
5.75	0.84	11.83	15.63	17.92	0.95	24.00	0.63
5.83	0.84	11.92	64.63	18.00	0.95	24.08	0.63
5.92	0.84	12.00	64.63	18.08	0.95		
6.00	0.84	12.08	64.63	18.17	0.95		
6.08	0.84	12.17	7.60	18.25	0.95		

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

--------------------
| CALIB            |
| NASHYD   (  0004)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.009 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=   9.790
     TOTAL RAINFALL   (mm)=  52.800
     RUNOFF COEFFICIENT   =   0.185

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

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0005)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.008 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  12.660
     TOTAL RAINFALL   (mm)=  52.800
     RUNOFF COEFFICIENT   =   0.240

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0006)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.032 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  16.070
     TOTAL RAINFALL   (mm)=  52.800
     RUNOFF COEFFICIENT   =   0.304

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0007)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.028 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  13.358
     TOTAL RAINFALL   (mm)=  52.800
     RUNOFF COEFFICIENT   =   0.253

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

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

```
--------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   5.35   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.817

     PEAK FLOW       (cms)=   0.119 (i)
     TIME TO PEAK    (hrs)=  12.250
     RUNOFF VOLUME    (mm)=  10.896
     TOTAL RAINFALL   (mm)=  52.800
     RUNOFF COEFFICIENT   =   0.206

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

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     5.35   0.119    12.25    10.90
      + ID2= 2 (  0004):     0.40   0.009    12.17     9.79
        ===================================================
        ID = 3 (  0020):     5.75   0.127    12.17    10.82

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     5.75   0.127    12.17    10.82
      + ID2= 2 (  0005):     0.19   0.008    12.08    12.66
        ===================================================
        ID = 1 (  0020):     5.94   0.134    12.17    10.88

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0020):     5.94   0.134    12.17    10.88
      + ID2= 2 (  0006):     0.58   0.032    12.08    16.07
        ===================================================
        ID = 3 (  0020):     6.52   0.159    12.17    11.34

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

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     6.52   0.159    12.17    11.34
      + ID2= 2 (  0007):     0.69   0.028    12.08    13.36
        ===================================================
        ID = 1 (  0020):     7.21   0.185    12.17    11.53

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   0.91   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

     Unit Hyd Qpeak  (cms)=   0.183

     PEAK FLOW       (cms)=   0.040 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  16.855
     TOTAL RAINFALL   (mm)=  52.800
     RUNOFF COEFFICIENT   =   0.319

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=   9.337
     TOTAL RAINFALL   (mm)=  52.800
     RUNOFF COEFFICIENT   =   0.177

     (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 (  0002):     0.91   0.040    12.17    16.85
      + ID2= 2 (  0003):     0.07   0.002    12.17     9.34
        ====================================================
        ID = 3 (  0021):     0.98   0.042    12.17    16.32

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0010)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.008 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  12.660
     TOTAL RAINFALL   (mm)=  52.800
     RUNOFF COEFFICIENT   =   0.240

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0009)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.009 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=   9.790
     TOTAL RAINFALL   (mm)=  52.800
     RUNOFF COEFFICIENT   =   0.185

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0011)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.032 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  16.070
```

```
     TOTAL RAINFALL   (mm)=  52.800
     RUNOFF COEFFICIENT   =   0.304

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=   9.337
     TOTAL RAINFALL   (mm)=  52.800
     RUNOFF COEFFICIENT   =   0.177

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0012)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.028 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  13.358
     TOTAL RAINFALL   (mm)=  52.800
     RUNOFF COEFFICIENT   =   0.253

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0018)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n          =      0.130        0.250
```

```
     Max.Eff.Inten.(mm/hr)=      45.03        63.12
                over (min)       25.00        30.00
     Storage Coeff.  (min)=      25.26 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      25.00        60.00
     Unit Hyd. peak  (cms)=       0.04         0.02
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.28         0.08         0.316 (iii)
     TIME TO PEAK    (hrs)=      12.33        12.92         12.33
     RUNOFF VOLUME    (mm)=      51.80        31.67         42.94
     TOTAL RAINFALL   (mm)=      52.80        52.80         52.80
     RUNOFF COEFFICIENT   =       0.98         0.60          0.81


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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


--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):      0.19   0.008    12.08    12.66
      + ID2= 2 (  0011):      0.58   0.032    12.08    16.07
        ====================================================
        ID = 3 (  0022):      0.77   0.040    12.08    15.23

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):      0.77   0.040    12.08    15.23
      + ID2= 2 (  0012):      0.69   0.028    12.08    13.36
        ====================================================
        ID = 1 (  0022):      1.46   0.068    12.08    14.34

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):      1.46   0.068    12.08    14.34
      + ID2= 2 (  0018):      6.26   0.316    12.33    42.94
        ====================================================
        ID = 3 (  0022):      7.72   0.340    12.33    37.53

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):      7.72   0.340    12.33    37.53
      + ID2= 2 (  0008):      0.07   0.002    12.17     9.34
        ====================================================
        ID = 1 (  0022):      7.79   0.341    12.33    37.28

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):      7.79   0.341    12.33    37.28
      + ID2= 2 (  0009):      0.40   0.009    12.17     9.79
        ====================================================
        ID = 3 (  0022):      8.19   0.348    12.33    35.94

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.032 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  16.070
     TOTAL RAINFALL   (mm)=  52.800
     RUNOFF COEFFICIENT   =   0.304

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0013)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015
```

```
     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=   9.337
     TOTAL RAINFALL   (mm)=  52.800
     RUNOFF COEFFICIENT   =   0.177

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

--------------------------------------------------------------------------------
--------------------
| CALIB              |
| NASHYD   (  0014)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.009 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=   9.790
     TOTAL RAINFALL   (mm)=  52.800
     RUNOFF COEFFICIENT   =   0.185

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

--------------------------------------------------------------------------------
--------------------
| CALIB              |
| NASHYD   (  0015)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.008 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  12.660
     TOTAL RAINFALL   (mm)=  52.800
     RUNOFF COEFFICIENT   =   0.240

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

--------------------------------------------------------------------------------
--------------------
| CALIB              |
| NASHYD   (  0017)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188
```

```
     PEAK FLOW       (cms)=   0.028 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  13.358
     TOTAL RAINFALL   (mm)=  52.800
     RUNOFF COEFFICIENT   =   0.253

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

--------------------------------------------------------------------------------
--------------------
| CALIB              |
| STANDHYD (  0019)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n          =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=      45.03        63.12
                over (min)      25.00        30.00
     Storage Coeff.  (min)=      25.26 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      25.00        60.00
     Unit Hyd. peak  (cms)=       0.04         0.02
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.28         0.08          0.316 (iii)
     TIME TO PEAK    (hrs)=      12.33        12.92          12.33
     RUNOFF VOLUME    (mm)=      51.80        31.67          42.94
     TOTAL RAINFALL   (mm)=      52.80        52.80          52.80
     RUNOFF COEFFICIENT   =       0.98         0.60           0.81


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0013):     0.07   0.002    12.17     9.34
      + ID2= 2 (  0014):     0.40   0.009    12.17     9.79
        ====================================================
        ID = 3 (  0023):     0.47   0.010    12.17     9.72

     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):     0.47   0.010    12.17     9.72
      + ID2= 2 (  0015):     0.19   0.008    12.08    12.66
        ==================================================
        ID = 1 (  0023):     0.66   0.017    12.17    10.57

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     0.66   0.017    12.17    10.57
      + ID2= 2 (  0016):     0.58   0.032    12.08    16.07
        ==================================================
        ID = 3 (  0023):     1.24   0.049    12.08    13.14

     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):     1.24   0.049    12.08    13.14
      + ID2= 2 (  0017):     0.69   0.028    12.08    13.36
        ==================================================
        ID = 1 (  0023):     1.93   0.077    12.08    13.22

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     1.93   0.077    12.08    13.22
      + ID2= 2 (  0019):     6.26   0.316    12.33    42.94
        ==================================================
        ID = 3 (  0023):     8.19   0.348    12.33    35.94

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0024)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
```

```
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.7970     0.1600
                          0.3210     0.1300   |   0.0000     0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0023)      8.190      0.348     12.33      35.94
   OUTFLOW: ID= 1 (  0024)      8.190      0.179     13.08      35.92

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 51.50
                   TIME SHIFT OF PEAK FLOW         (min)= 45.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0726

--------------------------------------------------------------------------------
*********************************
** SIMULATION:2yr 6hr 5min SCS **
*********************************

--------------------
|    READ STORM    |    Filename: C:\Users\m.orwin\AppD
|                  |              ata\Local\Temp\
|                  |              d5546b1a-54a6-497b-a8a5-5a1feca7b397\043d8f03
| Ptotal= 34.80 mm |    Comments: 2yr 6hr 5min SCS
--------------------
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                 0.08    0.00 |  1.67    3.48 |  3.25    7.66 |  4.83    2.09
                 0.17    1.39 |  1.75    3.48 |  3.33    7.66 |  4.92    2.09
                 0.25    1.39 |  1.83    3.48 |  3.42    7.66 |  5.00    2.09
                 0.33    1.39 |  1.92    3.48 |  3.50    7.66 |  5.08    2.09
                 0.42    1.39 |  2.00    3.48 |  3.58    7.66 |  5.17    1.39
                 0.50    1.39 |  2.08    3.48 |  3.67    3.48 |  5.25    1.39
                 0.58    1.39 |  2.17    4.18 |  3.75    3.48 |  5.33    1.39
                 0.67    2.09 |  2.25    4.18 |  3.83    3.48 |  5.42    1.39
                 0.75    2.09 |  2.33    4.18 |  3.92    3.48 |  5.50    1.39
                 0.83    2.09 |  2.42    4.18 |  4.00    3.48 |  5.58    1.39
                 0.92    2.09 |  2.50    4.18 |  4.08    3.48 |  5.67    1.39
                 1.00    2.09 |  2.58    4.18 |  4.17    2.78 |  5.75    1.39
                 1.08    2.09 |  2.67   20.88 |  4.25    2.78 |  5.83    1.39
                 1.17    2.09 |  2.75   20.88 |  4.33    2.78 |  5.92    1.39
                 1.25    2.09 |  2.83   20.88 |  4.42    2.78 |  6.00    1.39
                 1.33    2.09 |  2.92   54.29 |  4.50    2.78 |  6.08    1.39
                 1.42    2.09 |  3.00   54.29 |  4.58    2.78 |
                 1.50    2.09 |  3.08   54.29 |  4.67    2.09 |
                 1.58    2.09 |  3.17    7.66 |  4.75    2.09 |

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

--------------------
| CALIB            |
| NASHYD   (  0004)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
```

```
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.004 (i)
     TIME TO PEAK    (hrs)=   3.250
     RUNOFF VOLUME    (mm)=   3.870
     TOTAL RAINFALL   (mm)=  34.800
     RUNOFF COEFFICIENT   =   0.111

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0005)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.004 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=   5.368
     TOTAL RAINFALL   (mm)=  34.800
     RUNOFF COEFFICIENT   =   0.154

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0006)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.019 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=   7.206
     TOTAL RAINFALL   (mm)=  34.800
     RUNOFF COEFFICIENT   =   0.207

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0007)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.016 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=   5.760
     TOTAL RAINFALL   (mm)=  34.800
     RUNOFF COEFFICIENT   =   0.166

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   5.35   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.817

     PEAK FLOW       (cms)=   0.063 (i)
     TIME TO PEAK    (hrs)=   3.250
     RUNOFF VOLUME    (mm)=   4.376
     TOTAL RAINFALL   (mm)=  34.800
     RUNOFF COEFFICIENT   =   0.126

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

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     5.35   0.063     3.25     4.38
      + ID2= 2 (  0004):     0.40   0.004     3.25     3.87
        ====================================================
        ID = 3 (  0020):     5.75   0.067     3.25     4.34

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     5.75   0.067     3.25     4.34
      + ID2= 2 (  0005):     0.19   0.004     3.08     5.37
        ====================================================
        ID = 1 (  0020):     5.94   0.070     3.25     4.37
```

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0020):     5.94   0.070     3.25     4.37
      + ID2= 2 (  0006):     0.58   0.019     3.08     7.21
        ====================================================
        ID = 3 (  0020):     6.52   0.083     3.17     4.63

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     6.52   0.083     3.17     4.63
      + ID2= 2 (  0007):     0.69   0.016     3.08     5.76
        ====================================================
        ID = 1 (  0020):     7.21   0.098     3.17     4.73

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   0.91   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

     Unit Hyd Qpeak  (cms)=   0.183

     PEAK FLOW       (cms)=   0.023 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=   7.470
     TOTAL RAINFALL   (mm)=  34.800
     RUNOFF COEFFICIENT   =   0.215

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=   3.644
     TOTAL RAINFALL   (mm)=  34.800
     RUNOFF COEFFICIENT   =   0.105

     (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 (  0002):     0.91   0.023     3.17     7.47
      + ID2= 2 (  0003):     0.07   0.001     3.17     3.64
        ====================================================
        ID = 3 (  0021):     0.98   0.024     3.17     7.20

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0010)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.004 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=   5.368
     TOTAL RAINFALL   (mm)=  34.800
     RUNOFF COEFFICIENT   =   0.154

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0009)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.004 (i)
     TIME TO PEAK    (hrs)=   3.250
     RUNOFF VOLUME    (mm)=   3.870
     TOTAL RAINFALL   (mm)=  34.800
     RUNOFF COEFFICIENT   =   0.111

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

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0011)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.019 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=   7.206
     TOTAL RAINFALL   (mm)=  34.800
     RUNOFF COEFFICIENT   =   0.207

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=   3.644
     TOTAL RAINFALL   (mm)=  34.800
     RUNOFF COEFFICIENT   =   0.105

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0012)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.016 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=   5.760
     TOTAL RAINFALL   (mm)=  34.800
     RUNOFF COEFFICIENT   =   0.166

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

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0018)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n           =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=      40.92        45.31
                over (min)       25.00        35.00
     Storage Coeff.  (min)=      26.25 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      25.00        60.00
     Unit Hyd. peak  (cms)=       0.04         0.02
                                                           *TOTALS*
     PEAK FLOW       (cms)=       0.25         0.06          0.272 (iii)
     TIME TO PEAK    (hrs)=       3.33         4.00           3.33
     RUNOFF VOLUME    (mm)=      33.80        17.11          26.45
     TOTAL RAINFALL   (mm)=      34.80        34.80          34.80
     RUNOFF COEFFICIENT   =       0.97         0.49           0.76


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     0.19   0.004     3.08     5.37
      + ID2= 2 (  0011):     0.58   0.019     3.08     7.21
        ==================================================
        ID = 3 (  0022):     0.77   0.023     3.08     6.75

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     0.77   0.023     3.08     6.75
      + ID2= 2 (  0012):     0.69   0.016     3.08     5.76
```

```
        ====================================================
        ID = 1 (  0022):     1.46   0.040     3.08     6.28

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     1.46   0.040     3.08     6.28
      + ID2= 2 (  0018):     6.26   0.272     3.33    26.45
        ====================================================
        ID = 3 (  0022):     7.72   0.288     3.33    22.64

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     7.72   0.288     3.33    22.64
      + ID2= 2 (  0008):     0.07   0.001     3.17     3.64
        ====================================================
        ID = 1 (  0022):     7.79   0.289     3.33    22.47

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     7.79   0.289     3.33    22.47
      + ID2= 2 (  0009):     0.40   0.004     3.25     3.87
        ====================================================
        ID = 3 (  0022):     8.19   0.293     3.33    21.56

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.019 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=   7.206
```

```
     TOTAL RAINFALL   (mm)=  34.800
     RUNOFF COEFFICIENT   =   0.207

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0013)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=   3.644
     TOTAL RAINFALL   (mm)=  34.800
     RUNOFF COEFFICIENT   =   0.105

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0014)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.004 (i)
     TIME TO PEAK    (hrs)=   3.250
     RUNOFF VOLUME    (mm)=   3.870
     TOTAL RAINFALL   (mm)=  34.800
     RUNOFF COEFFICIENT   =   0.111

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0015)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.004 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=   5.368
     TOTAL RAINFALL   (mm)=  34.800
```

```
     RUNOFF COEFFICIENT   =   0.154

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0017)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.016 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=   5.760
     TOTAL RAINFALL   (mm)=  34.800
     RUNOFF COEFFICIENT   =   0.166

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0019)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n          =       0.130        0.250

     Max.Eff.Inten.(mm/hr)=      40.92        45.31
                over (min)       25.00        35.00
     Storage Coeff.  (min)=      26.25 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      25.00        60.00
     Unit Hyd. peak  (cms)=       0.04         0.02
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.25         0.06          0.272 (iii)
     TIME TO PEAK    (hrs)=       3.33         4.00           3.33
     RUNOFF VOLUME    (mm)=      33.80        17.11          26.45
     TOTAL RAINFALL   (mm)=      34.80        34.80          34.80
     RUNOFF COEFFICIENT   =       0.97         0.49           0.76


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0013):     0.07   0.001     3.17     3.64
      + ID2= 2 (  0014):     0.40   0.004     3.25     3.87
        ====================================================
        ID = 3 (  0023):     0.47   0.005     3.17     3.84

     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):     0.47   0.005     3.17     3.84
      + ID2= 2 (  0015):     0.19   0.004     3.08     5.37
        ====================================================
        ID = 1 (  0023):     0.66   0.009     3.17     4.28

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     0.66   0.009     3.17     4.28
      + ID2= 2 (  0016):     0.58   0.019     3.08     7.21
        ====================================================
        ID = 3 (  0023):     1.24   0.028     3.08     5.65

     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):     1.24   0.028     3.08     5.65
      + ID2= 2 (  0017):     0.69   0.016     3.08     5.76
        ====================================================
        ID = 1 (  0023):     1.93   0.044     3.08     5.69

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

```
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     1.93   0.044     3.08     5.69
      + ID2= 2 (  0019):     6.26   0.272     3.33    26.45
        ==================================================
        ID = 3 (  0023):     8.19   0.293     3.33    21.56

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0024)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.7970      0.1600
                          0.3210     0.1300   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0023)      8.190      0.293      3.33      21.56
   OUTFLOW: ID= 1 (  0024)      8.190      0.150      4.08      21.55

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 51.15
                   TIME SHIFT OF PEAK FLOW         (min)= 45.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0606

-------------------------------------------------------------------------------
***********************************
** SIMULATION:50yr 12hr 5min SCS **
***********************************

--------------------
|    READ STORM    |    Filename: C:\Users\m.orwin\AppD
|                  |              ata\Local\Temp\
|                  |              d5546b1a-54a6-497b-a8a5-5a1feca7b397\6a8fa9a2
| Ptotal= 86.40 mm |    Comments: 50yr 12hr 5min SCS
--------------------
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                 0.08    0.00 |  3.17    3.46 |  6.25   15.55 |  9.33    3.02
                 0.17    2.16 |  3.25    3.46 |  6.33   15.55 |  9.42    3.02
                 0.25    2.16 |  3.33    3.46 |  6.42   15.55 |  9.50    3.02
                 0.33    2.16 |  3.42    3.46 |  6.50   15.55 |  9.58    3.02
                 0.42    2.16 |  3.50    3.46 |  6.58   15.55 |  9.67    3.02
                 0.50    2.16 |  3.58    3.46 |  6.67    6.91 |  9.75    3.02
                 0.58    2.16 |  3.67    3.46 |  6.75    6.91 |  9.83    3.02
                 0.67    2.16 |  3.75    3.46 |  6.83    6.91 |  9.92    3.02
                 0.75    2.16 |  3.83    3.46 |  6.92    6.91 | 10.00    3.02
                 0.83    2.16 |  3.92    3.46 |  7.00    6.91 | 10.08    3.02
                 0.92    2.16 |  4.00    3.46 |  7.08    6.91 | 10.17    1.73
                 1.00    2.16 |  4.08    3.46 |  7.17    5.18 | 10.25    1.73
                 1.08    2.16 |  4.17    5.18 |  7.25    5.18 | 10.33    1.73
                 1.17    2.16 |  4.25    5.18 |  7.33    5.18 | 10.42    1.73
                 1.25    2.16 |  4.33    5.18 |  7.42    5.18 | 10.50    1.73
                 1.33    2.16 |  4.42    5.18 |  7.50    5.18 | 10.58    1.73
                 1.42    2.16 |  4.50    5.18 |  7.58    5.18 | 10.67    1.73
                 1.50    2.16 |  4.58    5.18 |  7.67    5.18 | 10.75    1.73
                 1.58    2.16 |  4.67    6.91 |  7.75    5.18 | 10.83    1.73
                 1.67    2.16 |  4.75    6.91 |  7.83    5.18 | 10.92    1.73
                 1.75    2.16 |  4.83    6.91 |  7.92    5.18 | 11.00    1.73
                 1.83    2.16 |  4.92    6.91 |  8.00    5.18 | 11.08    1.73
                 1.92    2.16 |  5.00    6.91 |  8.08    5.18 | 11.17    1.73
                 2.00    2.16 |  5.08    6.91 |  8.17    3.02 | 11.25    1.73
                 2.08    2.16 |  5.17   10.37 |  8.25    3.02 | 11.33    1.73
                 2.17    2.59 |  5.25   10.37 |  8.33    3.02 | 11.42    1.73
                 2.25    2.59 |  5.33   10.37 |  8.42    3.02 | 11.50    1.73
                 2.33    2.59 |  5.42   10.37 |  8.50    3.02 | 11.58    1.73
                 2.42    2.59 |  5.50   10.37 |  8.58    3.02 | 11.67    1.73
                 2.50    2.59 |  5.58   10.37 |  8.67    3.02 | 11.75    1.73
                 2.58    2.59 |  5.67   41.47 |  8.75    3.02 | 11.83    1.73
                 2.67    2.59 |  5.75   41.47 |  8.83    3.02 | 11.92    1.73
                 2.75    2.59 |  5.83   41.47 |  8.92    3.02 | 12.00    1.73
                 2.83    2.59 |  5.92  114.05 |  9.00    3.02 | 12.08    1.73
                 2.92    2.59 |  6.00  114.05 |  9.08    3.02 |
                 3.00    2.59 |  6.08  114.05 |  9.17    3.02 |
                 3.08    2.59 |  6.17   15.55 |  9.25    3.02 |

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

--------------------
| CALIB            |
| NASHYD   (  0004)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.027 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  25.661
     TOTAL RAINFALL   (mm)=  86.400
     RUNOFF COEFFICIENT   =   0.297

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0005)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056
```

```
    PEAK FLOW       (cms)=   0.022 (i)
    TIME TO PEAK    (hrs)=   6.083
    RUNOFF VOLUME    (mm)=  31.204
    TOTAL RAINFALL   (mm)=  86.400
    RUNOFF COEFFICIENT   =   0.361

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0006)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

    Unit Hyd Qpeak  (cms)=   0.185

    PEAK FLOW       (cms)=   0.086 (i)
    TIME TO PEAK    (hrs)=   6.083
    RUNOFF VOLUME    (mm)=  37.494
    TOTAL RAINFALL   (mm)=  86.400
    RUNOFF COEFFICIENT   =   0.434

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0007)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

    Unit Hyd Qpeak  (cms)=   0.188

    PEAK FLOW       (cms)=   0.081 (i)
    TIME TO PEAK    (hrs)=   6.083
    RUNOFF VOLUME    (mm)=  32.473
    TOTAL RAINFALL   (mm)=  86.400
    RUNOFF COEFFICIENT   =   0.376

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   5.35   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

    Unit Hyd Qpeak  (cms)=   0.817
```

```
    PEAK FLOW       (cms)=   0.373 (i)
    TIME TO PEAK    (hrs)=   6.167
    RUNOFF VOLUME    (mm)=  28.048
    TOTAL RAINFALL   (mm)=  86.400
    RUNOFF COEFFICIENT   =   0.325

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

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     5.35   0.373     6.17    28.05
      + ID2= 2 (  0004):     0.40   0.027     6.17    25.66
        ====================================================
        ID = 3 (  0020):     5.75   0.400     6.17    27.88

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     5.75   0.400     6.17    27.88
      + ID2= 2 (  0005):     0.19   0.022     6.08    31.20
        ====================================================
        ID = 1 (  0020):     5.94   0.419     6.17    27.99

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0020):     5.94   0.419     6.17    27.99
      + ID2= 2 (  0006):     0.58   0.086     6.08    37.49
        ====================================================
        ID = 3 (  0020):     6.52   0.485     6.17    28.83

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     6.52   0.485     6.17    28.83
      + ID2= 2 (  0007):     0.69   0.081     6.08    32.47
```

```
        ====================================================
        ID = 1 (  0020):     7.21   0.556     6.17    29.18

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   0.91   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

     Unit Hyd Qpeak  (cms)=   0.183

     PEAK FLOW       (cms)=   0.108 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  39.364
     TOTAL RAINFALL   (mm)=  86.400
     RUNOFF COEFFICIENT   =   0.456

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.005 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  24.735
     TOTAL RAINFALL   (mm)=  86.400
     RUNOFF COEFFICIENT   =   0.286

     (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 (  0002):     0.91   0.108     6.17    39.36
      + ID2= 2 (  0003):     0.07   0.005     6.17    24.73
        ====================================================
        ID = 3 (  0021):     0.98   0.114     6.17    38.32

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

```
| CALIB            |
| NASHYD   (  0010)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.022 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  31.204
     TOTAL RAINFALL   (mm)=  86.400
     RUNOFF COEFFICIENT   =   0.361

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0009)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.027 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  25.661
     TOTAL RAINFALL   (mm)=  86.400
     RUNOFF COEFFICIENT   =   0.297

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0011)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.086 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  37.494
     TOTAL RAINFALL   (mm)=  86.400
     RUNOFF COEFFICIENT   =   0.434

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

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

```
| NASHYD   (  0008)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.005 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  24.735
     TOTAL RAINFALL   (mm)=  86.400
     RUNOFF COEFFICIENT   =   0.286

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0012)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.081 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  32.473
     TOTAL RAINFALL   (mm)=  86.400
     RUNOFF COEFFICIENT   =   0.376

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0018)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n           =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=      95.90       131.49
                over (min)       20.00        25.00
     Storage Coeff.  (min)=      18.67 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      20.00        60.00
     Unit Hyd. peak  (cms)=       0.06         0.02
                                                           *TOTALS*
     PEAK FLOW       (cms)=       0.62         0.18          0.704 (iii)
     TIME TO PEAK    (hrs)=       6.25         6.92           6.25
     RUNOFF VOLUME    (mm)=      85.40        61.67          74.95
     TOTAL RAINFALL   (mm)=      86.40        86.40          86.40
     RUNOFF COEFFICIENT   =       0.99         0.71           0.87


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     0.19   0.022     6.08    31.20
      + ID2= 2 (  0011):     0.58   0.086     6.08    37.49
        ==================================================
        ID = 3 (  0022):     0.77   0.108     6.08    35.94

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     0.77   0.108     6.08    35.94
      + ID2= 2 (  0012):     0.69   0.081     6.08    32.47
        ==================================================
        ID = 1 (  0022):     1.46   0.188     6.08    34.30

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     1.46   0.188     6.08    34.30
      + ID2= 2 (  0018):     6.26   0.704     6.25    74.95
        ==================================================
        ID = 3 (  0022):     7.72   0.817     6.17    67.26

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
```

```
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     7.72   0.817     6.17    67.26
      + ID2= 2 (  0008):     0.07   0.005     6.17    24.73
        ====================================================
        ID = 1 (  0022):     7.79   0.822     6.17    66.88

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     7.79   0.822     6.17    66.88
      + ID2= 2 (  0009):     0.40   0.027     6.17    25.66
        ====================================================
        ID = 3 (  0022):     8.19   0.849     6.17    64.87

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.086 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  37.494
     TOTAL RAINFALL   (mm)=  86.400
     RUNOFF COEFFICIENT   =   0.434

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0013)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.005 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  24.735
     TOTAL RAINFALL   (mm)=  86.400
     RUNOFF COEFFICIENT   =   0.286

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

```
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0014)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.027 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  25.661
     TOTAL RAINFALL   (mm)=  86.400
     RUNOFF COEFFICIENT   =   0.297

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0015)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.022 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  31.204
     TOTAL RAINFALL   (mm)=  86.400
     RUNOFF COEFFICIENT   =   0.361

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0017)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.081 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  32.473
     TOTAL RAINFALL   (mm)=  86.400
     RUNOFF COEFFICIENT   =   0.376

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

```
------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0019)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n          =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=      95.90       131.49
                over (min)       20.00        25.00
     Storage Coeff.  (min)=      18.67 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      20.00        60.00
     Unit Hyd. peak  (cms)=       0.06         0.02
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.62         0.18          0.704 (iii)
     TIME TO PEAK    (hrs)=       6.25         6.92           6.25
     RUNOFF VOLUME    (mm)=      85.40        61.67          74.95
     TOTAL RAINFALL   (mm)=      86.40        86.40          86.40
     RUNOFF COEFFICIENT   =       0.99         0.71           0.87


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0013):     0.07   0.005     6.17    24.73
      + ID2= 2 (  0014):     0.40   0.027     6.17    25.66
        ====================================================
        ID = 3 (  0023):     0.47   0.032     6.17    25.52

     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):     0.47   0.032     6.17    25.52
      + ID2= 2 (  0015):     0.19   0.022     6.08    31.20
        ====================================================
        ID = 1 (  0023):     0.66   0.051     6.17    27.16

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     0.66   0.051     6.17    27.16
      + ID2= 2 (  0016):     0.58   0.086     6.08    37.49
        ====================================================
        ID = 3 (  0023):     1.24   0.136     6.08    31.99

     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):     1.24   0.136     6.08    31.99
      + ID2= 2 (  0017):     0.69   0.081     6.08    32.47
        ====================================================
        ID = 1 (  0023):     1.93   0.217     6.08    32.16

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     1.93   0.217     6.08    32.16
      + ID2= 2 (  0019):     6.26   0.704     6.25    74.95
        ====================================================
        ID = 3 (  0023):     8.19   0.849     6.17    64.87

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0024)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.7970     0.1600
                          0.3210     0.1300   |   0.0000     0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0023)     8.190      0.849      6.17      64.87
```

```
   OUTFLOW: ID= 1 (  0024)      8.190      0.505      6.67      64.86

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 59.52
                  TIME SHIFT OF PEAK FLOW         (min)= 30.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1418

--------------------------------------------------------------------------------
***********************************
** SIMULATION:50yr 24hr 5min SCS **
***********************************

--------------------
|    READ STORM    |    Filename: C:\Users\m.orwin\AppD
|                  |              ata\Local\Temp\
|                  |              d5546b1a-54a6-497b-a8a5-5a1feca7b397\90d0c80b
| Ptotal=105.60 mm |    Comments: 50yr 24hr 5min SCS
--------------------
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.08	0.00	6.17	1.90	12.25	15.21	18.33	1.90
0.17	1.16	6.25	1.90	12.33	15.21	18.42	1.90
0.25	1.16	6.33	1.90	12.42	15.21	18.50	1.90
0.33	1.16	6.42	1.90	12.50	15.21	18.58	1.90
0.42	1.16	6.50	1.90	12.58	15.21	18.67	1.90
0.50	1.16	6.58	1.90	12.67	7.81	18.75	1.90
0.58	1.16	6.67	1.90	12.75	7.81	18.83	1.90
0.67	1.16	6.75	1.90	12.83	7.81	18.92	1.90
0.75	1.16	6.83	1.90	12.92	7.81	19.00	1.90
0.83	1.16	6.92	1.90	13.00	7.81	19.08	1.90
0.92	1.16	7.00	1.90	13.08	7.81	19.17	1.90
1.00	1.16	7.08	1.90	13.17	5.70	19.25	1.90
1.08	1.16	7.17	2.32	13.25	5.70	19.33	1.90
1.17	1.16	7.25	2.32	13.33	5.70	19.42	1.90
1.25	1.16	7.33	2.32	13.42	5.70	19.50	1.90
1.33	1.16	7.42	2.32	13.50	5.70	19.58	1.90
1.42	1.16	7.50	2.32	13.58	5.70	19.67	1.90
1.50	1.16	7.58	2.32	13.67	4.44	19.75	1.90
1.58	1.16	7.67	2.32	13.75	4.44	19.83	1.90
1.67	1.16	7.75	2.32	13.83	4.44	19.92	1.90
1.75	1.16	7.83	2.32	13.92	4.44	20.00	1.90
1.83	1.16	7.92	2.32	14.00	4.44	20.08	1.90
1.92	1.16	8.00	2.32	14.08	4.44	20.17	1.27
2.00	1.16	8.08	2.32	14.17	3.17	20.25	1.27
2.08	1.16	8.17	2.75	14.25	3.17	20.33	1.27
2.17	1.37	8.25	2.75	14.33	3.17	20.42	1.27
2.25	1.37	8.33	2.75	14.42	3.17	20.50	1.27
2.33	1.37	8.42	2.75	14.50	3.17	20.58	1.27
2.42	1.37	8.50	2.75	14.58	3.17	20.67	1.27
2.50	1.37	8.58	2.75	14.67	3.17	20.75	1.27
2.58	1.37	8.67	2.96	14.75	3.17	20.83	1.27
2.67	1.37	8.75	2.96	14.83	3.17	20.92	1.27
2.75	1.37	8.83	2.96	14.92	3.17	21.00	1.27
2.83	1.37	8.92	2.96	15.00	3.17	21.08	1.27
2.92	1.37	9.00	2.96	15.08	3.17	21.17	1.27
3.00	1.37	9.08	2.96	15.17	3.17	21.25	1.27
3.08	1.37	9.17	3.38	15.25	3.17	21.33	1.27
3.17	1.37	9.25	3.38	15.33	3.17	21.42	1.27
3.25	1.37	9.33	3.38	15.42	3.17	21.50	1.27
3.33	1.37	9.42	3.38	15.50	3.17	21.58	1.27
3.42	1.37	9.50	3.38	15.58	3.17	21.67	1.27
3.50	1.37	9.58	3.38	15.67	3.17	21.75	1.27
3.58	1.37	9.67	3.80	15.75	3.17	21.83	1.27
3.67	1.37	9.75	3.80	15.83	3.17	21.92	1.27
3.75	1.37	9.83	3.80	15.92	3.17	22.00	1.27
3.83	1.37	9.92	3.80	16.00	3.17	22.08	1.27
3.92	1.37	10.00	3.80	16.08	3.17	22.17	1.27
4.00	1.37	10.08	3.80	16.17	1.90	22.25	1.27
4.08	1.37	10.17	4.86	16.25	1.90	22.33	1.27
4.17	1.69	10.25	4.86	16.33	1.90	22.42	1.27
4.25	1.69	10.33	4.86	16.42	1.90	22.50	1.27
4.33	1.69	10.42	4.86	16.50	1.90	22.58	1.27
4.42	1.69	10.50	4.86	16.58	1.90	22.67	1.27
4.50	1.69	10.58	4.86	16.67	1.90	22.75	1.27
4.58	1.69	10.67	6.55	16.75	1.90	22.83	1.27
4.67	1.69	10.75	6.55	16.83	1.90	22.92	1.27
4.75	1.69	10.83	6.55	16.92	1.90	23.00	1.27
4.83	1.69	10.92	6.55	17.00	1.90	23.08	1.27
4.92	1.69	11.00	6.55	17.08	1.90	23.17	1.27
5.00	1.69	11.08	6.55	17.17	1.90	23.25	1.27
5.08	1.69	11.17	10.14	17.25	1.90	23.33	1.27
5.17	1.69	11.25	10.14	17.33	1.90	23.42	1.27
5.25	1.69	11.33	10.14	17.42	1.90	23.50	1.27
5.33	1.69	11.42	10.14	17.50	1.90	23.58	1.27
5.42	1.69	11.50	10.14	17.58	1.90	23.67	1.27
5.50	1.69	11.58	10.14	17.67	1.90	23.75	1.27
5.58	1.69	11.67	31.26	17.75	1.90	23.83	1.27
5.67	1.69	11.75	31.26	17.83	1.90	23.92	1.27
5.75	1.69	11.83	31.26	17.92	1.90	24.00	1.27
5.83	1.69	11.92	129.25	18.00	1.90	24.08	1.27
5.92	1.69	12.00	129.25	18.08	1.90		
6.00	1.69	12.08	129.25	18.17	1.90		
6.08	1.69	12.17	15.21	18.25	1.90		

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

--------------------
| CALIB            |
| NASHYD   (  0004)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW      (cms)=   0.034 (i)
```

```
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  36.780
     TOTAL RAINFALL   (mm)= 105.600
     RUNOFF COEFFICIENT   =   0.348

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0005)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.028 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  43.777
     TOTAL RAINFALL   (mm)= 105.600
     RUNOFF COEFFICIENT   =   0.415

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0006)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.105 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  51.553
     TOTAL RAINFALL   (mm)= 105.600
     RUNOFF COEFFICIENT   =   0.488

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0007)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.100 (i)
     TIME TO PEAK    (hrs)=  12.083
```

```
     RUNOFF VOLUME    (mm)=  45.350
     TOTAL RAINFALL   (mm)= 105.600
     RUNOFF COEFFICIENT   =   0.429

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   5.35   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.817

     PEAK FLOW       (cms)=   0.463 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  39.904
     TOTAL RAINFALL   (mm)= 105.600
     RUNOFF COEFFICIENT   =   0.378

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

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     5.35   0.463    12.17    39.90
      + ID2= 2 (  0004):     0.40   0.034    12.17    36.78
        ====================================================
        ID = 3 (  0020):     5.75   0.497    12.17    39.69

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     5.75   0.497    12.17    39.69
      + ID2= 2 (  0005):     0.19   0.028    12.08    43.78
        ====================================================
        ID = 1 (  0020):     5.94   0.519    12.17    39.82

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
```

```
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0020):     5.94   0.519    12.17    39.82
      + ID2= 2 (  0006):     0.58   0.105    12.08    51.55
        ===================================================
        ID = 3 (  0020):     6.52   0.600    12.17    40.86

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     6.52   0.600    12.17    40.86
      + ID2= 2 (  0007):     0.69   0.100    12.08    45.35
        ===================================================
        ID = 1 (  0020):     7.21   0.687    12.17    41.29

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   0.91   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

     Unit Hyd Qpeak  (cms)=   0.183

     PEAK FLOW       (cms)=   0.131 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  54.026
     TOTAL RAINFALL   (mm)= 105.600
     RUNOFF COEFFICIENT   =   0.512

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.007 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  35.576
     TOTAL RAINFALL   (mm)= 105.600
     RUNOFF COEFFICIENT   =   0.337

     (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 (  0002):     0.91   0.131    12.17    54.03
      + ID2= 2 (  0003):     0.07   0.007    12.17    35.58
        ===================================================
        ID = 3 (  0021):     0.98   0.137    12.17    52.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0010)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.028 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  43.777
     TOTAL RAINFALL   (mm)= 105.600
     RUNOFF COEFFICIENT   =   0.415

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0009)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.034 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  36.780
     TOTAL RAINFALL   (mm)= 105.600
     RUNOFF COEFFICIENT   =   0.348

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0011)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
```

```
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.105 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  51.553
     TOTAL RAINFALL   (mm)= 105.600
     RUNOFF COEFFICIENT   =   0.488

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0008)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.007 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  35.576
     TOTAL RAINFALL   (mm)= 105.600
     RUNOFF COEFFICIENT   =   0.337

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0012)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.100 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  45.350
     TOTAL RAINFALL   (mm)= 105.600
     RUNOFF COEFFICIENT   =   0.429

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| STANDHYD (  0018)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
```

```
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n           =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=     104.76       153.89
                over (min)      20.00        25.00
     Storage Coeff.  (min)=      18.02 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      20.00        60.00
     Unit Hyd. peak  (cms)=       0.06         0.02
                                                         *TOTALS*
     PEAK FLOW       (cms)=       0.67         0.20          0.763 (iii)
     TIME TO PEAK    (hrs)=      12.25        12.92          12.25
     RUNOFF VOLUME    (mm)=     104.60        79.60          93.59
     TOTAL RAINFALL   (mm)=     105.60       105.60         105.60
     RUNOFF COEFFICIENT   =       0.99         0.75           0.89


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     0.19   0.028    12.08    43.78
      + ID2= 2 (  0011):     0.58   0.105    12.08    51.55
        =====================================================
        ID = 3 (  0022):     0.77   0.133    12.08    49.63

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     0.77   0.133    12.08    49.63
      + ID2= 2 (  0012):     0.69   0.100    12.08    45.35
        =====================================================
        ID = 1 (  0022):     1.46   0.233    12.08    47.61

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

```
--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     1.46   0.233    12.08    47.61
      + ID2= 2 (  0018):     6.26   0.763    12.25    93.59
        ====================================================
        ID = 3 (  0022):     7.72   0.897    12.17    84.90

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     7.72   0.897    12.17    84.90
      + ID2= 2 (  0008):     0.07   0.007    12.17    35.58
        ====================================================
        ID = 1 (  0022):     7.79   0.903    12.17    84.45

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     7.79   0.903    12.17    84.45
      + ID2= 2 (  0009):     0.40   0.034    12.17    36.78
        ====================================================
        ID = 3 (  0022):     8.19   0.937    12.17    82.13

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.105 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  51.553
     TOTAL RAINFALL   (mm)= 105.600
     RUNOFF COEFFICIENT   =   0.488

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

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```

```
--------------------
| CALIB            |
| NASHYD   (  0013)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.007 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  35.576
     TOTAL RAINFALL   (mm)= 105.600
     RUNOFF COEFFICIENT   =   0.337

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0014)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.034 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  36.780
     TOTAL RAINFALL   (mm)= 105.600
     RUNOFF COEFFICIENT   =   0.348

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0015)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.028 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  43.777
     TOTAL RAINFALL   (mm)= 105.600
     RUNOFF COEFFICIENT   =   0.415

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

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

```
| CALIB             |
| NASHYD   (  0017)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.100 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  45.350
     TOTAL RAINFALL   (mm)= 105.600
     RUNOFF COEFFICIENT   =   0.429

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| STANDHYD (  0019)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25        2.01
     Dep. Storage     (mm)=       1.00        1.50
     Average Slope     (%)=       1.52        4.33
     Length            (m)=     330.00       30.00
     Mannings n           =      0.130       0.250

     Max.Eff.Inten.(mm/hr)=     104.76      153.89
                over (min)       20.00       25.00
     Storage Coeff.  (min)=      18.02 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      20.00       60.00
     Unit Hyd. peak  (cms)=       0.06        0.02
                                                           *TOTALS*
     PEAK FLOW       (cms)=       0.67        0.20          0.763 (iii)
     TIME TO PEAK    (hrs)=      12.25       12.92          12.25
     RUNOFF VOLUME    (mm)=     104.60       79.60          93.59
     TOTAL RAINFALL   (mm)=     105.60      105.60         105.60
     RUNOFF COEFFICIENT   =       0.99        0.75           0.89


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

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

```
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0013):     0.07   0.007    12.17    35.58
      + ID2= 2 (  0014):     0.40   0.034    12.17    36.78
        ===============================================
        ID = 3 (  0023):     0.47   0.040    12.17    36.60

     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):     0.47   0.040    12.17    36.60
      + ID2= 2 (  0015):     0.19   0.028    12.08    43.78
        ===============================================
        ID = 1 (  0023):     0.66   0.063    12.17    38.67

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     0.66   0.063    12.17    38.67
      + ID2= 2 (  0016):     0.58   0.105    12.08    51.55
        ===============================================
        ID = 3 (  0023):     1.24   0.168    12.08    44.69

     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):     1.24   0.168    12.08    44.69
      + ID2= 2 (  0017):     0.69   0.100    12.08    45.35
        ===============================================
        ID = 1 (  0023):     1.93   0.268    12.08    44.93

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     1.93   0.268    12.08    44.93
      + ID2= 2 (  0019):     6.26   0.763    12.25    93.59
        ===============================================
```

```
       ID = 3 (  0023):     8.19   0.937    12.17    82.13

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0024)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.7970      0.1600
                          0.3210     0.1300   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0023)      8.190      0.937     12.17      82.13
   OUTFLOW: ID= 1 (  0024)      8.190      0.575     12.58      82.11

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 61.35
                   TIME SHIFT OF PEAK FLOW         (min)= 25.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.1461

--------------------------------------------------------------------------------
**********************************
** SIMULATION:50yr 6hr 5min SCS **
**********************************

--------------------
|    READ STORM    |    Filename: C:\Users\m.orwin\AppD
|                  |              ata\Local\Temp\
|                  |              d5546b1a-54a6-497b-a8a5-5a1feca7b397\187a93ab
| Ptotal= 69.60 mm |    Comments: 50yr 6hr 5min SCS
--------------------
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                 0.08    0.00 |  1.67    6.96 |  3.25   15.31 |  4.83    4.18
                 0.17    2.78 |  1.75    6.96 |  3.33   15.31 |  4.92    4.18
                 0.25    2.78 |  1.83    6.96 |  3.42   15.31 |  5.00    4.18
                 0.33    2.78 |  1.92    6.96 |  3.50   15.31 |  5.08    4.18
                 0.42    2.78 |  2.00    6.96 |  3.58   15.31 |  5.17    2.78
                 0.50    2.78 |  2.08    6.96 |  3.67    6.96 |  5.25    2.78
                 0.58    2.78 |  2.17    8.35 |  3.75    6.96 |  5.33    2.78
                 0.67    4.18 |  2.25    8.35 |  3.83    6.96 |  5.42    2.78
                 0.75    4.18 |  2.33    8.35 |  3.92    6.96 |  5.50    2.78
                 0.83    4.18 |  2.42    8.35 |  4.00    6.96 |  5.58    2.78
                 0.92    4.18 |  2.50    8.35 |  4.08    6.96 |  5.67    2.78
                 1.00    4.18 |  2.58    8.35 |  4.17    5.57 |  5.75    2.78
                 1.08    4.18 |  2.67   41.76 |  4.25    5.57 |  5.83    2.78
                 1.17    4.18 |  2.75   41.76 |  4.33    5.57 |  5.92    2.78
                 1.25    4.18 |  2.83   41.76 |  4.42    5.57 |  6.00    2.78
                 1.33    4.18 |  2.92  108.58 |  4.50    5.57 |  6.08    2.78
                 1.42    4.18 |  3.00  108.58 |  4.58    5.57 |
                 1.50    4.18 |  3.08  108.58 |  4.67    4.18 |
```

```
                 1.58    4.18 |  3.17   15.31 |  4.75    4.18 |

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

--------------------
| CALIB            |
| NASHYD   (  0004)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW      (cms)=   0.021 (i)
     TIME TO PEAK   (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  17.063
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.245

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0005)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW      (cms)=   0.018 (i)
     TIME TO PEAK   (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  21.276
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.306

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0006)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW      (cms)=   0.070 (i)
     TIME TO PEAK   (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  26.162
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.376
```

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0007)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.064 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  22.265
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.320

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   5.35   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.817

     PEAK FLOW       (cms)=   0.287 (i)
     TIME TO PEAK    (hrs)=   3.250
     RUNOFF VOLUME    (mm)=  18.799
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.270

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

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     5.35   0.287     3.25    18.80
      + ID2= 2 (  0004):     0.40   0.021     3.17    17.06
        ===================================================
        ID = 3 (  0020):     5.75   0.307     3.25    18.68

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     5.75   0.307     3.25    18.68
      + ID2= 2 (  0005):     0.19   0.018     3.08    21.28
        ===================================================
        ID = 1 (  0020):     5.94   0.321     3.17    18.76

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0020):     5.94   0.321     3.17    18.76
      + ID2= 2 (  0006):     0.58   0.070     3.08    26.16
        ===================================================
        ID = 3 (  0020):     6.52   0.377     3.17    19.42

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     6.52   0.377     3.17    19.42
      + ID2= 2 (  0007):     0.69   0.064     3.08    22.26
        ===================================================
        ID = 1 (  0020):     7.21   0.434     3.17    19.69

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   0.91   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

     Unit Hyd Qpeak  (cms)=   0.183

     PEAK FLOW       (cms)=   0.089 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  27.487
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.395

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

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

```
| NASHYD   (  0003)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.004 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  16.377
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.235

     (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 (  0002):     0.91   0.089     3.17    27.49
      + ID2= 2 (  0003):     0.07   0.004     3.17    16.38
        ====================================================
        ID = 3 (  0021):     0.98   0.093     3.17    26.69

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0010)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.018 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  21.276
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.306

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0009)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066
```

```
     PEAK FLOW       (cms)=   0.021 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  17.063
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.245

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0011)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.070 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  26.162
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.376

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.004 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  16.377
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.235

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0012)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.064 (i)
```

```
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  22.265
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.320

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0018)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n           =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=      91.87       118.80
                over (min)       20.00        25.00
     Storage Coeff.  (min)=      18.99 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      20.00        60.00
     Unit Hyd. peak  (cms)=       0.06         0.02
                                                           *TOTALS*
     PEAK FLOW       (cms)=       0.59         0.15          0.655 (iii)
     TIME TO PEAK    (hrs)=       3.25         3.92           3.25
     RUNOFF VOLUME    (mm)=      68.60        46.37          58.81
     TOTAL RAINFALL   (mm)=      69.60        69.60          69.60
     RUNOFF COEFFICIENT   =       0.99         0.67           0.85


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     0.19   0.018     3.08    21.28
      + ID2= 2 (  0011):     0.58   0.070     3.08    26.16
        ====================================================
        ID = 3 (  0022):     0.77   0.088     3.08    24.96

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     0.77   0.088     3.08    24.96
      + ID2= 2 (  0012):     0.69   0.064     3.08    22.26
        ====================================================
        ID = 1 (  0022):     1.46   0.153     3.08    23.68

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     1.46   0.153     3.08    23.68
      + ID2= 2 (  0018):     6.26   0.655     3.25    58.81
        ====================================================
        ID = 3 (  0022):     7.72   0.744     3.17    52.17

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     7.72   0.744     3.17    52.17
      + ID2= 2 (  0008):     0.07   0.004     3.17    16.38
        ====================================================
        ID = 1 (  0022):     7.79   0.748     3.17    51.85

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     7.79   0.748     3.17    51.85
      + ID2= 2 (  0009):     0.40   0.021     3.17    17.06
        ====================================================
        ID = 3 (  0022):     8.19   0.768     3.17    50.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
```

```
--------------------  U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.070 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  26.162
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.376

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0013)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------  U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.004 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  16.377
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.235

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0014)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------  U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.021 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  17.063
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.245

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0015)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------  U.H. Tp(hrs)=   0.13
```

```
     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.018 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  21.276
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.306

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0017)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------  U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.064 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  22.265
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.320

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0019)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      4.25         2.01
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.52         4.33
     Length            (m)=    330.00        30.00
     Mannings n           =     0.130        0.250

     Max.Eff.Inten.(mm/hr)=     91.87       118.80
                over (min)      20.00        25.00
     Storage Coeff.  (min)=     18.99 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=     20.00        60.00
     Unit Hyd. peak  (cms)=      0.06         0.02
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.59         0.15         0.655 (iii)
     TIME TO PEAK    (hrs)=      3.25         3.92          3.25
     RUNOFF VOLUME    (mm)=     68.60        46.37         58.81
     TOTAL RAINFALL   (mm)=     69.60        69.60         69.60
     RUNOFF COEFFICIENT   =      0.99         0.67          0.85
```

```
      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  85.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0013):     0.07   0.004     3.17    16.38
      + ID2= 2 (  0014):     0.40   0.021     3.17    17.06
        ====================================================
        ID = 3 (  0023):     0.47   0.025     3.17    16.96

     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):     0.47   0.025     3.17    16.96
      + ID2= 2 (  0015):     0.19   0.018     3.08    21.28
        ====================================================
        ID = 1 (  0023):     0.66   0.040     3.17    18.20

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     0.66   0.040     3.17    18.20
      + ID2= 2 (  0016):     0.58   0.070     3.08    26.16
        ====================================================
        ID = 3 (  0023):     1.24   0.109     3.08    21.93

     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):     1.24   0.109     3.08    21.93
      + ID2= 2 (  0017):     0.69   0.064     3.08    22.26
```

```
        ====================================================
        ID = 1 (  0023):     1.93   0.174     3.08    22.05

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     1.93   0.174     3.08    22.05
      + ID2= 2 (  0019):     6.26   0.655     3.25    58.81
        ====================================================
        ID = 3 (  0023):     8.19   0.768     3.17    50.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0024)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.7970      0.1600
                          0.3210     0.1300   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0023)      8.190      0.768      3.17      50.15
   OUTFLOW: ID= 1 (  0024)      8.190      0.407      3.75      50.14

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 52.97
                   TIME SHIFT OF PEAK FLOW        (min)= 35.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.1356

--------------------------------------------------------------------------------
**********************************
** SIMULATION:5yr 12hr 5min SCS **
**********************************

--------------------
|    READ STORM    |    Filename: C:\Users\m.orwin\AppD
|                  |              ata\Local\Temp\
|                  |              d5546b1a-54a6-497b-a8a5-5a1feca7b397\402813db
| Ptotal= 56.40 mm |    Comments: 5yr 12hr 5min SCS
--------------------
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                 0.08    0.00 |  3.17    2.26 |  6.25   10.15 |  9.33    1.97
                 0.17    1.41 |  3.25    2.26 |  6.33   10.15 |  9.42    1.97
                 0.25    1.41 |  3.33    2.26 |  6.42   10.15 |  9.50    1.97
                 0.33    1.41 |  3.42    2.26 |  6.50   10.15 |  9.58    1.97
                 0.42    1.41 |  3.50    2.26 |  6.58   10.15 |  9.67    1.97
```

0.50	1.41	3.58	2.26	6.67	4.51	9.75	1.97
0.58	1.41	3.67	2.26	6.75	4.51	9.83	1.97
0.67	1.41	3.75	2.26	6.83	4.51	9.92	1.97
0.75	1.41	3.83	2.26	6.92	4.51	10.00	1.97
0.83	1.41	3.92	2.26	7.00	4.51	10.08	1.97
0.92	1.41	4.00	2.26	7.08	4.51	10.17	1.13
1.00	1.41	4.08	2.26	7.17	3.38	10.25	1.13
1.08	1.41	4.17	3.38	7.25	3.38	10.33	1.13
1.17	1.41	4.25	3.38	7.33	3.38	10.42	1.13
1.25	1.41	4.33	3.38	7.42	3.38	10.50	1.13
1.33	1.41	4.42	3.38	7.50	3.38	10.58	1.13
1.42	1.41	4.50	3.38	7.58	3.38	10.67	1.13
1.50	1.41	4.58	3.38	7.67	3.38	10.75	1.13
1.58	1.41	4.67	4.51	7.75	3.38	10.83	1.13
1.67	1.41	4.75	4.51	7.83	3.38	10.92	1.13
1.75	1.41	4.83	4.51	7.92	3.38	11.00	1.13
1.83	1.41	4.92	4.51	8.00	3.38	11.08	1.13
1.92	1.41	5.00	4.51	8.08	3.38	11.17	1.13
2.00	1.41	5.08	4.51	8.17	1.97	11.25	1.13
2.08	1.41	5.17	6.77	8.25	1.97	11.33	1.13
2.17	1.69	5.25	6.77	8.33	1.97	11.42	1.13
2.25	1.69	5.33	6.77	8.42	1.97	11.50	1.13
2.33	1.69	5.42	6.77	8.50	1.97	11.58	1.13
2.42	1.69	5.50	6.77	8.58	1.97	11.67	1.13
2.50	1.69	5.58	6.77	8.67	1.97	11.75	1.13
2.58	1.69	5.67	27.07	8.75	1.97	11.83	1.13
2.67	1.69	5.75	27.07	8.83	1.97	11.92	1.13
2.75	1.69	5.83	27.07	8.92	1.97	12.00	1.13
2.83	1.69	5.92	74.45	9.00	1.97	12.08	1.13
2.92	1.69	6.00	74.45	9.08	1.97		
3.00	1.69	6.08	74.45	9.17	1.97		
3.08	1.69	6.17	10.15	9.25	1.97		

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

--------------------
| CALIB            |
| NASHYD   (  0004)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.011 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  11.221
     TOTAL RAINFALL   (mm)=  56.400
     RUNOFF COEFFICIENT   =   0.199

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

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

--------------------
| CALIB            |
| NASHYD   (  0005)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.010 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  14.377
     TOTAL RAINFALL   (mm)=  56.400
     RUNOFF COEFFICIENT   =   0.255

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0006)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.041 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  18.107
     TOTAL RAINFALL   (mm)=  56.400
     RUNOFF COEFFICIENT   =   0.321

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0007)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.037 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  15.138
     TOTAL RAINFALL   (mm)=  56.400
     RUNOFF COEFFICIENT   =   0.268

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

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

```
| CALIB             |
| NASHYD   (  0001)|   Area    (ha)=   5.35   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.817

     PEAK FLOW       (cms)=   0.160 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  12.459
     TOTAL RAINFALL   (mm)=  56.400
     RUNOFF COEFFICIENT   =   0.221

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

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     5.35   0.160     6.17    12.46
      + ID2= 2 (  0004):     0.40   0.011     6.17    11.22
        =====================================================
        ID = 3 (  0020):     5.75   0.172     6.17    12.37

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     5.75   0.172     6.17    12.37
      + ID2= 2 (  0005):     0.19   0.010     6.08    14.38
        =====================================================
        ID = 1 (  0020):     5.94   0.180     6.17    12.44

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0020):     5.94   0.180     6.17    12.44
      + ID2= 2 (  0006):     0.58   0.041     6.08    18.11
        =====================================================
        ID = 3 (  0020):     6.52   0.213     6.17    12.94

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

```
--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     6.52   0.213     6.17    12.94
      + ID2= 2 (  0007):     0.69   0.037     6.08    15.14
        =====================================================
        ID = 1 (  0020):     7.21   0.246     6.17    13.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0002)|   Area    (ha)=   0.91   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

     Unit Hyd Qpeak  (cms)=   0.183

     PEAK FLOW       (cms)=   0.052 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  19.005
     TOTAL RAINFALL   (mm)=  56.400
     RUNOFF COEFFICIENT   =   0.337

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0003)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  10.719
     TOTAL RAINFALL   (mm)=  56.400
     RUNOFF COEFFICIENT   =   0.190

     (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 (  0002):     0.91   0.052     6.17    19.01
```

```
 + ID2= 2 (  0003):     0.07   0.002     6.17    10.72
   ====================================================
   ID = 3 (  0021):     0.98   0.054     6.17    18.41

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0010)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.010 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  14.377
     TOTAL RAINFALL   (mm)=  56.400
     RUNOFF COEFFICIENT   =   0.255

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0009)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.011 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  11.221
     TOTAL RAINFALL   (mm)=  56.400
     RUNOFF COEFFICIENT   =   0.199

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0011)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.041 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  18.107
     TOTAL RAINFALL   (mm)=  56.400
```

```
     RUNOFF COEFFICIENT   =   0.321

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  10.719
     TOTAL RAINFALL   (mm)=  56.400
     RUNOFF COEFFICIENT   =   0.190

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0012)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.037 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  15.138
     TOTAL RAINFALL   (mm)=  56.400
     RUNOFF COEFFICIENT   =   0.268

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0018)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n          =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=      55.50        75.89
```

```
           over (min)       25.00        30.00
     Storage Coeff.  (min)=      23.24 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      25.00        60.00
     Unit Hyd. peak  (cms)=       0.05         0.02
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.35         0.10         0.407 (iii)
     TIME TO PEAK    (hrs)=       6.33         6.92          6.33
     RUNOFF VOLUME    (mm)=      55.40        34.76         46.31
     TOTAL RAINFALL   (mm)=      56.40        56.40         56.40
     RUNOFF COEFFICIENT   =       0.98         0.62          0.82


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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


--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     0.19   0.010     6.08    14.38
      + ID2= 2 (  0011):     0.58   0.041     6.08    18.11
        ====================================================
        ID = 3 (  0022):     0.77   0.051     6.08    17.19

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     0.77   0.051     6.08    17.19
      + ID2= 2 (  0012):     0.69   0.037     6.08    15.14
        ====================================================
        ID = 1 (  0022):     1.46   0.088     6.08    16.22

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     1.46   0.088     6.08    16.22
      + ID2= 2 (  0018):     6.26   0.407     6.33    46.31
        ====================================================
        ID = 3 (  0022):     7.72   0.439     6.33    40.62
```

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     7.72   0.439     6.33    40.62
      + ID2= 2 (  0008):     0.07   0.002     6.17    10.72
        ====================================================
        ID = 1 (  0022):     7.79   0.441     6.33    40.35

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     7.79   0.441     6.33    40.35
      + ID2= 2 (  0009):     0.40   0.011     6.17    11.22
        ====================================================
        ID = 3 (  0022):     8.19   0.450     6.33    38.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.041 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  18.107
     TOTAL RAINFALL   (mm)=  56.400
     RUNOFF COEFFICIENT   =   0.321

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0013)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015
```

```
     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  10.719
     TOTAL RAINFALL   (mm)=  56.400
     RUNOFF COEFFICIENT   =   0.190

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0014)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.011 (i)
     TIME TO PEAK    (hrs)=   6.167
     RUNOFF VOLUME    (mm)=  11.221
     TOTAL RAINFALL   (mm)=  56.400
     RUNOFF COEFFICIENT   =   0.199

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0015)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.010 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  14.377
     TOTAL RAINFALL   (mm)=  56.400
     RUNOFF COEFFICIENT   =   0.255

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0017)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.037 (i)
```

```
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  15.138
     TOTAL RAINFALL   (mm)=  56.400
     RUNOFF COEFFICIENT   =   0.268

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0019)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n          =       0.130        0.250

     Max.Eff.Inten.(mm/hr)=      55.50        75.89
                over (min)       25.00        30.00
     Storage Coeff.  (min)=      23.24 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      25.00        60.00
     Unit Hyd. peak  (cms)=       0.05         0.02
                                                            *TOTALS*
     PEAK FLOW       (cms)=       0.35         0.10          0.407 (iii)
     TIME TO PEAK    (hrs)=       6.33         6.92           6.33
     RUNOFF VOLUME    (mm)=      55.40        34.76          46.31
     TOTAL RAINFALL   (mm)=      56.40        56.40          56.40
     RUNOFF COEFFICIENT   =       0.98         0.62           0.82


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0013):     0.07   0.002     6.17    10.72
      + ID2= 2 (  0014):     0.40   0.011     6.17    11.22
        ====================================================
        ID = 3 (  0023):     0.47   0.014     6.17    11.15

     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):     0.47   0.014     6.17    11.15
      + ID2= 2 (  0015):     0.19   0.010     6.08    14.38
        ===================================================
        ID = 1 (  0023):     0.66   0.022     6.17    12.08

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     0.66   0.022     6.17    12.08
      + ID2= 2 (  0016):     0.58   0.041     6.08    18.11
        ===================================================
        ID = 3 (  0023):     1.24   0.063     6.08    14.90

     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):     1.24   0.063     6.08    14.90
      + ID2= 2 (  0017):     0.69   0.037     6.08    15.14
        ===================================================
        ID = 1 (  0023):     1.93   0.100     6.08    14.98

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     1.93   0.100     6.08    14.98
      + ID2= 2 (  0019):     6.26   0.407     6.33    46.31
        ===================================================
        ID = 3 (  0023):     8.19   0.450     6.33    38.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0024)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.7970      0.1600
                          0.3210     0.1300   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0023)      8.190      0.450      6.33      38.93
   OUTFLOW: ID= 1 (  0024)      8.190      0.231      7.00      38.92

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 51.42
                   TIME SHIFT OF PEAK FLOW         (min)= 40.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0939

-------------------------------------------------------------------------------
**********************************
** SIMULATION:5yr 24hr 5min SCS **
**********************************

--------------------
|    READ STORM    |    Filename: C:\Users\m.orwin\AppD
|                  |              ata\Local\Temp\
|                  |              d5546b1a-54a6-497b-a8a5-5a1feca7b397\0bf85659
| Ptotal= 69.60 mm |    Comments: 5yr 24hr 5min SCS
--------------------
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                 0.08    0.00 |  6.17    1.25 | 12.25   10.02 | 18.33    1.25
                 0.17    0.77 |  6.25    1.25 | 12.33   10.02 | 18.42    1.25
                 0.25    0.77 |  6.33    1.25 | 12.42   10.02 | 18.50    1.25
                 0.33    0.77 |  6.42    1.25 | 12.50   10.02 | 18.58    1.25
                 0.42    0.77 |  6.50    1.25 | 12.58   10.02 | 18.67    1.25
                 0.50    0.77 |  6.58    1.25 | 12.67    5.15 | 18.75    1.25
                 0.58    0.77 |  6.67    1.25 | 12.75    5.15 | 18.83    1.25
                 0.67    0.77 |  6.75    1.25 | 12.83    5.15 | 18.92    1.25
                 0.75    0.77 |  6.83    1.25 | 12.92    5.15 | 19.00    1.25
                 0.83    0.77 |  6.92    1.25 | 13.00    5.15 | 19.08    1.25
                 0.92    0.77 |  7.00    1.25 | 13.08    5.15 | 19.17    1.25
                 1.00    0.77 |  7.08    1.25 | 13.17    3.76 | 19.25    1.25
                 1.08    0.77 |  7.17    1.53 | 13.25    3.76 | 19.33    1.25
                 1.17    0.77 |  7.25    1.53 | 13.33    3.76 | 19.42    1.25
                 1.25    0.77 |  7.33    1.53 | 13.42    3.76 | 19.50    1.25
                 1.33    0.77 |  7.42    1.53 | 13.50    3.76 | 19.58    1.25
                 1.42    0.77 |  7.50    1.53 | 13.58    3.76 | 19.67    1.25
                 1.50    0.77 |  7.58    1.53 | 13.67    2.92 | 19.75    1.25
                 1.58    0.77 |  7.67    1.53 | 13.75    2.92 | 19.83    1.25
                 1.67    0.77 |  7.75    1.53 | 13.83    2.92 | 19.92    1.25
                 1.75    0.77 |  7.83    1.53 | 13.92    2.92 | 20.00    1.25
                 1.83    0.77 |  7.92    1.53 | 14.00    2.92 | 20.08    1.25
                 1.92    0.77 |  8.00    1.53 | 14.08    2.92 | 20.17    0.84
                 2.00    0.77 |  8.08    1.53 | 14.17    2.09 | 20.25    0.84
                 2.08    0.77 |  8.17    1.81 | 14.25    2.09 | 20.33    0.84
                 2.17    0.90 |  8.25    1.81 | 14.33    2.09 | 20.42    0.84
```

2.25	0.90	8.33	1.81	14.42	2.09	20.50	0.84
2.33	0.90	8.42	1.81	14.50	2.09	20.58	0.84
2.42	0.90	8.50	1.81	14.58	2.09	20.67	0.84
2.50	0.90	8.58	1.81	14.67	2.09	20.75	0.84
2.58	0.90	8.67	1.95	14.75	2.09	20.83	0.84
2.67	0.90	8.75	1.95	14.83	2.09	20.92	0.84
2.75	0.90	8.83	1.95	14.92	2.09	21.00	0.84
2.83	0.90	8.92	1.95	15.00	2.09	21.08	0.84
2.92	0.90	9.00	1.95	15.08	2.09	21.17	0.84
3.00	0.90	9.08	1.95	15.17	2.09	21.25	0.84
3.08	0.90	9.17	2.23	15.25	2.09	21.33	0.84
3.17	0.90	9.25	2.23	15.33	2.09	21.42	0.84
3.25	0.90	9.33	2.23	15.42	2.09	21.50	0.84
3.33	0.90	9.42	2.23	15.50	2.09	21.58	0.84
3.42	0.90	9.50	2.23	15.58	2.09	21.67	0.84
3.50	0.90	9.58	2.23	15.67	2.09	21.75	0.84
3.58	0.90	9.67	2.51	15.75	2.09	21.83	0.84
3.67	0.90	9.75	2.51	15.83	2.09	21.92	0.84
3.75	0.90	9.83	2.51	15.92	2.09	22.00	0.84
3.83	0.90	9.92	2.51	16.00	2.09	22.08	0.84
3.92	0.90	10.00	2.51	16.08	2.09	22.17	0.84
4.00	0.90	10.08	2.51	16.17	1.25	22.25	0.84
4.08	0.90	10.17	3.20	16.25	1.25	22.33	0.84
4.17	1.11	10.25	3.20	16.33	1.25	22.42	0.84
4.25	1.11	10.33	3.20	16.42	1.25	22.50	0.84
4.33	1.11	10.42	3.20	16.50	1.25	22.58	0.84
4.42	1.11	10.50	3.20	16.58	1.25	22.67	0.84
4.50	1.11	10.58	3.20	16.67	1.25	22.75	0.84
4.58	1.11	10.67	4.32	16.75	1.25	22.83	0.84
4.67	1.11	10.75	4.32	16.83	1.25	22.92	0.84
4.75	1.11	10.83	4.32	16.92	1.25	23.00	0.84
4.83	1.11	10.92	4.32	17.00	1.25	23.08	0.84
4.92	1.11	11.00	4.32	17.08	1.25	23.17	0.84
5.00	1.11	11.08	4.32	17.17	1.25	23.25	0.84
5.08	1.11	11.17	6.68	17.25	1.25	23.33	0.84
5.17	1.11	11.25	6.68	17.33	1.25	23.42	0.84
5.25	1.11	11.33	6.68	17.42	1.25	23.50	0.84
5.33	1.11	11.42	6.68	17.50	1.25	23.58	0.84
5.42	1.11	11.50	6.68	17.58	1.25	23.67	0.84
5.50	1.11	11.58	6.68	17.67	1.25	23.75	0.84
5.58	1.11	11.67	20.60	17.75	1.25	23.83	0.84
5.67	1.11	11.75	20.60	17.83	1.25	23.92	0.84
5.75	1.11	11.83	20.60	17.92	1.25	24.00	0.84
5.83	1.11	11.92	85.19	18.00	1.25	24.08	0.84
5.92	1.11	12.00	85.19	18.08	1.25		
6.00	1.11	12.08	85.19	18.17	1.25		
6.08	1.11	12.17	10.02	18.25	1.25		

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

--------------------
| CALIB            |
| NASHYD   (  0004)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW      (cms)=   0.015 (i)
     TIME TO PEAK   (hrs)=  12.167
     RUNOFF VOLUME   (mm)=  17.063
     TOTAL RAINFALL  (mm)=  69.600
     RUNOFF COEFFICIENT  =   0.245

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0005)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW      (cms)=   0.013 (i)
     TIME TO PEAK   (hrs)=  12.083
     RUNOFF VOLUME   (mm)=  21.277
     TOTAL RAINFALL  (mm)=  69.600
     RUNOFF COEFFICIENT  =   0.306

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0006)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW      (cms)=   0.053 (i)
     TIME TO PEAK   (hrs)=  12.083
     RUNOFF VOLUME   (mm)=  26.162
     TOTAL RAINFALL  (mm)=  69.600
     RUNOFF COEFFICIENT  =   0.376

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0007)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
```

```
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.048 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  22.265
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.320

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

--------------------------------------------------------------------------------
--------------------
| CALIB              |
| NASHYD   (  0001)|   Area    (ha)=   5.35   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.817

     PEAK FLOW       (cms)=   0.211 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  18.799
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.270

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

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     5.35   0.211    12.17    18.80
      + ID2= 2 (  0004):     0.40   0.015    12.17    17.06
        ====================================================
        ID = 3 (  0020):     5.75   0.227    12.17    18.68

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     5.75   0.227    12.17    18.68
      + ID2= 2 (  0005):     0.19   0.013    12.08    21.28
        ====================================================
        ID = 1 (  0020):     5.94   0.238    12.17    18.76

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0020):     5.94   0.238    12.17    18.76
      + ID2= 2 (  0006):     0.58   0.053    12.08    26.16
        ====================================================
        ID = 3 (  0020):     6.52   0.279    12.17    19.42

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     6.52   0.279    12.17    19.42
      + ID2= 2 (  0007):     0.69   0.048    12.08    22.26
        ====================================================
        ID = 1 (  0020):     7.21   0.321    12.17    19.69

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB              |
| NASHYD   (  0002)|   Area    (ha)=   0.91   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

     Unit Hyd Qpeak  (cms)=   0.183

     PEAK FLOW       (cms)=   0.066 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  27.487
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.395

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

--------------------------------------------------------------------------------
--------------------
| CALIB              |
| NASHYD   (  0003)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015
```

```
     PEAK FLOW       (cms)=   0.003 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  16.376
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.235

     (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 (  0002):     0.91   0.066    12.17    27.49
      + ID2= 2 (  0003):     0.07   0.003    12.17    16.38
        =====================================================
        ID = 3 (  0021):     0.98   0.069    12.17    26.69

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0010)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.013 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  21.277
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.306

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0009)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.015 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  17.063
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.245

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0011)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.053 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  26.162
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.376

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.003 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  16.376
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.235

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0012)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.048 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  22.265
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.320

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

```
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0018)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n          =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=      59.35        91.50
                over (min)       25.00        30.00
     Storage Coeff.  (min)=      22.62 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      25.00        60.00
     Unit Hyd. peak  (cms)=       0.05         0.02
                                                            *TOTALS*
     PEAK FLOW       (cms)=       0.38         0.11          0.443 (iii)
     TIME TO PEAK    (hrs)=      12.33        12.92          12.33
     RUNOFF VOLUME    (mm)=      68.60        46.37          58.81
     TOTAL RAINFALL   (mm)=      69.60        69.60          69.60
     RUNOFF COEFFICIENT   =       0.99         0.67           0.85


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     0.19   0.013    12.08    21.28
      + ID2= 2 (  0011):     0.58   0.053    12.08    26.16
        ====================================================
        ID = 3 (  0022):     0.77   0.066    12.08    24.96

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     0.77   0.066    12.08    24.96
      + ID2= 2 (  0012):     0.69   0.048    12.08    22.26
        ====================================================
        ID = 1 (  0022):     1.46   0.114    12.08    23.68

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     1.46   0.114    12.08    23.68
      + ID2= 2 (  0018):     6.26   0.443    12.33    58.81
        ====================================================
        ID = 3 (  0022):     7.72   0.482    12.33    52.17

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     7.72   0.482    12.33    52.17
      + ID2= 2 (  0008):     0.07   0.003    12.17    16.38
        ====================================================
        ID = 1 (  0022):     7.79   0.484    12.33    51.85

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     7.79   0.484    12.33    51.85
      + ID2= 2 (  0009):     0.40   0.015    12.17    17.06
        ====================================================
        ID = 3 (  0022):     8.19   0.496    12.33    50.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.053 (i)
     TIME TO PEAK    (hrs)=  12.083
```

```
     RUNOFF VOLUME    (mm)=  26.162
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.376

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0013)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.003 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  16.376
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.235

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0014)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.015 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  17.063
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.245

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0015)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.013 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  21.277
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.306

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0017)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.048 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  22.265
     TOTAL RAINFALL   (mm)=  69.600
     RUNOFF COEFFICIENT   =   0.320

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0019)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      4.25         2.01
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.52         4.33
     Length            (m)=    330.00        30.00
     Mannings n          =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=     59.35        91.50
                over (min)      25.00        30.00
     Storage Coeff.  (min)=     22.62 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=     25.00        60.00
     Unit Hyd. peak  (cms)=      0.05         0.02
                                                         *TOTALS*
     PEAK FLOW       (cms)=      0.38         0.11          0.443 (iii)
     TIME TO PEAK    (hrs)=     12.33        12.92          12.33
     RUNOFF VOLUME    (mm)=     68.60        46.37          58.81
     TOTAL RAINFALL   (mm)=     69.60        69.60          69.60
     RUNOFF COEFFICIENT   =      0.99         0.67           0.85


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
```

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

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0013):     0.07   0.003    12.17    16.38
      + ID2= 2 (  0014):     0.40   0.015    12.17    17.06
        ==================================================
        ID = 3 (  0023):     0.47   0.018    12.17    16.96

     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):     0.47   0.018    12.17    16.96
      + ID2= 2 (  0015):     0.19   0.013    12.08    21.28
        ==================================================
        ID = 1 (  0023):     0.66   0.029    12.17    18.20

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     0.66   0.029    12.17    18.20
      + ID2= 2 (  0016):     0.58   0.053    12.08    26.16
        ==================================================
        ID = 3 (  0023):     1.24   0.082    12.08    21.93

     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):     1.24   0.082    12.08    21.93
      + ID2= 2 (  0017):     0.69   0.048    12.08    22.26
        ==================================================
        ID = 1 (  0023):     1.93   0.130    12.08    22.05

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

```
--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     1.93   0.130    12.08    22.05
      + ID2= 2 (  0019):     6.26   0.443    12.33    58.81
        ==================================================
        ID = 3 (  0023):     8.19   0.496    12.33    50.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0024)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.7970      0.1600
                          0.3210     0.1300   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0023)      8.190      0.496     12.33      50.15
   OUTFLOW: ID= 1 (  0024)      8.190      0.251     13.00      50.14

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 50.61
                   TIME SHIFT OF PEAK FLOW         (min)= 40.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.1019

-------------------------------------------------------------------------------
*********************************
** SIMULATION:5yr 6hr 5min SCS **
*********************************

--------------------
|    READ STORM    |    Filename: C:\Users\m.orwin\AppD
|                  |              ata\Local\Temp\
|                  |              d5546b1a-54a6-497b-a8a5-5a1feca7b397\831e63dd
| Ptotal= 46.20 mm |    Comments: 5yr 6hr 5min SCS
--------------------
                   TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                    hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                   0.08    0.00 |  1.67    4.62 |  3.25   10.16 |  4.83    2.77
                   0.17    1.85 |  1.75    4.62 |  3.33   10.16 |  4.92    2.77
                   0.25    1.85 |  1.83    4.62 |  3.42   10.16 |  5.00    2.77
                   0.33    1.85 |  1.92    4.62 |  3.50   10.16 |  5.08    2.77
                   0.42    1.85 |  2.00    4.62 |  3.58   10.16 |  5.17    1.85
                   0.50    1.85 |  2.08    4.62 |  3.67    4.62 |  5.25    1.85
                   0.58    1.85 |  2.17    5.54 |  3.75    4.62 |  5.33    1.85
                   0.67    2.77 |  2.25    5.54 |  3.83    4.62 |  5.42    1.85
                   0.75    2.77 |  2.33    5.54 |  3.92    4.62 |  5.50    1.85
                   0.83    2.77 |  2.42    5.54 |  4.00    4.62 |  5.58    1.85
                   0.92    2.77 |  2.50    5.54 |  4.08    4.62 |  5.67    1.85
```

```
            1.00    2.77 |  2.58    5.54 |  4.17    3.70 |  5.75    1.85
            1.08    2.77 |  2.67   27.72 |  4.25    3.70 |  5.83    1.85
            1.17    2.77 |  2.75   27.72 |  4.33    3.70 |  5.92    1.85
            1.25    2.77 |  2.83   27.72 |  4.42    3.70 |  6.00    1.85
            1.33    2.77 |  2.92   72.07 |  4.50    3.70 |  6.08    1.85
            1.42    2.77 |  3.00   72.07 |  4.58    3.70 |
            1.50    2.77 |  3.08   72.07 |  4.67    2.77 |
            1.58    2.77 |  3.17   10.16 |  4.75    2.77 |

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

--------------------
| CALIB             |
| NASHYD   (  0004)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.009 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=   7.369
     TOTAL RAINFALL   (mm)=  46.200
     RUNOFF COEFFICIENT   =   0.159

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

-------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0005)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.008 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=   9.721
     TOTAL RAINFALL   (mm)=  46.200
     RUNOFF COEFFICIENT   =   0.210

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

-------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0006)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185
```

```
     PEAK FLOW       (cms)=   0.034 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  12.545
     TOTAL RAINFALL   (mm)=  46.200
     RUNOFF COEFFICIENT   =   0.272

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

-------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0007)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.029 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  10.304
     TOTAL RAINFALL   (mm)=  46.200
     RUNOFF COEFFICIENT   =   0.223

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

-------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0001)|   Area    (ha)=   5.35   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.817

     PEAK FLOW       (cms)=   0.122 (i)
     TIME TO PEAK    (hrs)=   3.250
     RUNOFF VOLUME    (mm)=   8.242
     TOTAL RAINFALL   (mm)=  46.200
     RUNOFF COEFFICIENT   =   0.178

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

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     5.35   0.122     3.25     8.24
      + ID2= 2 (  0004):     0.40   0.009     3.17     7.37
        ====================================================
```

```
       ID = 3 (  0020):     5.75   0.131     3.25     8.18

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0020):     5.75   0.131     3.25     8.18
     + ID2= 2 (  0005):     0.19   0.008     3.08     9.72
       ====================================================
       ID = 1 (  0020):     5.94   0.135     3.25     8.23

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0020):     5.94   0.135     3.25     8.23
     + ID2= 2 (  0006):     0.58   0.034     3.08    12.54
       ====================================================
       ID = 3 (  0020):     6.52   0.162     3.17     8.61

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0020):     6.52   0.162     3.17     8.61
     + ID2= 2 (  0007):     0.69   0.029     3.08    10.30
       ====================================================
       ID = 1 (  0020):     7.21   0.188     3.17     8.78

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   0.91   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

    Unit Hyd Qpeak  (cms)=   0.183

    PEAK FLOW       (cms)=   0.042 (i)
    TIME TO PEAK    (hrs)=   3.167
    RUNOFF VOLUME    (mm)=  13.128
    TOTAL RAINFALL   (mm)=  46.200
```

```
    RUNOFF COEFFICIENT   =   0.284

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

    Unit Hyd Qpeak  (cms)=   0.015

    PEAK FLOW       (cms)=   0.002 (i)
    TIME TO PEAK    (hrs)=   3.167
    RUNOFF VOLUME    (mm)=   7.004
    TOTAL RAINFALL   (mm)=  46.200
    RUNOFF COEFFICIENT   =   0.152

    (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 (  0002):     0.91   0.042     3.17    13.13
     + ID2= 2 (  0003):     0.07   0.002     3.17     7.00
       ====================================================
       ID = 3 (  0021):     0.98   0.043     3.17    12.69

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0010)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

    Unit Hyd Qpeak  (cms)=   0.056

    PEAK FLOW       (cms)=   0.008 (i)
    TIME TO PEAK    (hrs)=   3.083
    RUNOFF VOLUME    (mm)=   9.721
    TOTAL RAINFALL   (mm)=  46.200
    RUNOFF COEFFICIENT   =   0.210

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

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

```
| CALIB             |
| NASHYD   (  0009)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.009 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=   7.369
     TOTAL RAINFALL   (mm)=  46.200
     RUNOFF COEFFICIENT   =   0.159

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0011)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.034 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  12.545
     TOTAL RAINFALL   (mm)=  46.200
     RUNOFF COEFFICIENT   =   0.272

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0008)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=   7.004
     TOTAL RAINFALL   (mm)=  46.200
     RUNOFF COEFFICIENT   =   0.152

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0012)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.029 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  10.304
     TOTAL RAINFALL   (mm)=  46.200
     RUNOFF COEFFICIENT   =   0.223

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

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| STANDHYD (  0018)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n           =      0.130        0.250

     Max.Eff.Inten.(mm/hr)=      54.33        68.46
                over (min)       25.00        30.00
     Storage Coeff.  (min)=      23.44 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      25.00        60.00
     Unit Hyd. peak  (cms)=       0.05         0.02
                                                            *TOTALS*
     PEAK FLOW       (cms)=       0.34         0.09          0.385 (iii)
     TIME TO PEAK    (hrs)=       3.33         3.92           3.33
     RUNOFF VOLUME    (mm)=      45.20        26.15          36.81
     TOTAL RAINFALL   (mm)=      46.20        46.20          46.20
     RUNOFF COEFFICIENT   =       0.98         0.57           0.80


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
```

```
        ID1= 1 (  0010):     0.19   0.008     3.08     9.72
      + ID2= 2 (  0011):     0.58   0.034     3.08    12.54
        ====================================================
        ID = 3 (  0022):     0.77   0.042     3.08    11.85

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     0.77   0.042     3.08    11.85
      + ID2= 2 (  0012):     0.69   0.029     3.08    10.30
        ====================================================
        ID = 1 (  0022):     1.46   0.071     3.08    11.12

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     1.46   0.071     3.08    11.12
      + ID2= 2 (  0018):     6.26   0.385     3.33    36.81
        ====================================================
        ID = 3 (  0022):     7.72   0.413     3.33    31.95

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     7.72   0.413     3.33    31.95
      + ID2= 2 (  0008):     0.07   0.002     3.17     7.00
        ====================================================
        ID = 1 (  0022):     7.79   0.414     3.33    31.73

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     7.79   0.414     3.33    31.73
      + ID2= 2 (  0009):     0.40   0.009     3.17     7.37
        ====================================================
        ID = 3 (  0022):     8.19   0.421     3.33    30.54
```

```
     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW      (cms)=   0.034 (i)
     TIME TO PEAK   (hrs)=   3.083
     RUNOFF VOLUME   (mm)=  12.545
     TOTAL RAINFALL  (mm)=  46.200
     RUNOFF COEFFICIENT  =   0.272

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0013)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW      (cms)=   0.002 (i)
     TIME TO PEAK   (hrs)=   3.167
     RUNOFF VOLUME   (mm)=   7.004
     TOTAL RAINFALL  (mm)=  46.200
     RUNOFF COEFFICIENT  =   0.152

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0014)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW      (cms)=   0.009 (i)
     TIME TO PEAK   (hrs)=   3.167
     RUNOFF VOLUME   (mm)=   7.369
     TOTAL RAINFALL  (mm)=  46.200
     RUNOFF COEFFICIENT  =   0.159

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

```
 -------------------------------------------------------------------------------
 --------------------
 | CALIB              |
 | NASHYD   (  0015)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
 |ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
 --------------------   U.H. Tp(hrs)=   0.13

      Unit Hyd Qpeak  (cms)=   0.056

      PEAK FLOW       (cms)=   0.008 (i)
      TIME TO PEAK    (hrs)=   3.083
      RUNOFF VOLUME    (mm)=   9.721
      TOTAL RAINFALL   (mm)=  46.200
      RUNOFF COEFFICIENT   =   0.210

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

 -------------------------------------------------------------------------------
 --------------------
 | CALIB              |
 | NASHYD   (  0017)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
 |ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
 --------------------   U.H. Tp(hrs)=   0.14

      Unit Hyd Qpeak  (cms)=   0.188

      PEAK FLOW       (cms)=   0.029 (i)
      TIME TO PEAK    (hrs)=   3.083
      RUNOFF VOLUME    (mm)=  10.304
      TOTAL RAINFALL   (mm)=  46.200
      RUNOFF COEFFICIENT   =   0.223

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

 -------------------------------------------------------------------------------
 --------------------
 | CALIB              |
 | STANDHYD (  0019)|   Area    (ha)=   6.26
 |ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
 --------------------
                               IMPERVIOUS    PERVIOUS (i)
      Surface Area     (ha)=       4.25         2.01
      Dep. Storage     (mm)=       1.00         1.50
      Average Slope     (%)=       1.52         4.33
      Length            (m)=     330.00        30.00
      Mannings n          =      0.130        0.250

      Max.Eff.Inten.(mm/hr)=      54.33        68.46
                 over (min)       25.00        30.00
      Storage Coeff.  (min)=      23.44 (ii)   60.00 (ii)
      Unit Hyd. Tpeak (min)=      25.00        60.00
      Unit Hyd. peak  (cms)=       0.05         0.02
                                                           *TOTALS*
      PEAK FLOW       (cms)=       0.34         0.09         0.385 (iii)
      TIME TO PEAK    (hrs)=       3.33         3.92          3.33
      RUNOFF VOLUME    (mm)=      45.20        26.15         36.81
      TOTAL RAINFALL   (mm)=      46.20        46.20         46.20
      RUNOFF COEFFICIENT   =       0.98         0.57          0.80


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  85.0    Ia = Dep. Storage  (Above)
       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
            THAN THE STORAGE COEFFICIENT.
      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

 --------------------
 | ADD HYD  (  0023)|
 |   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
 --------------------        (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0013):     0.07   0.002     3.17     7.00
      + ID2= 2 (  0014):     0.40   0.009     3.17     7.37
        ====================================================
        ID = 3 (  0023):     0.47   0.010     3.17     7.31

      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):     0.47   0.010     3.17     7.31
      + ID2= 2 (  0015):     0.19   0.008     3.08     9.72
        ====================================================
        ID = 1 (  0023):     0.66   0.017     3.17     8.01

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

 --------------------
 | ADD HYD  (  0023)|
 |   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
 --------------------        (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     0.66   0.017     3.17     8.01
      + ID2= 2 (  0016):     0.58   0.034     3.08    12.54
        ====================================================
        ID = 3 (  0023):     1.24   0.050     3.08    10.13

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

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--------------------
| ADD HYD  (  0023)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0023):     1.24   0.050     3.08    10.13
      + ID2= 2 (  0017):     0.69   0.029     3.08    10.30
        ==================================================
        ID = 1 (  0023):     1.93   0.079     3.08    10.19

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     1.93   0.079     3.08    10.19
      + ID2= 2 (  0019):     6.26   0.385     3.33    36.81
        ==================================================
        ID = 3 (  0023):     8.19   0.421     3.33    30.54

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0024)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)    (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.7970      0.1600
                          0.3210     0.1300   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0023)      8.190      0.421      3.33      30.54
   OUTFLOW: ID= 1 (  0024)      8.190      0.212      4.08      30.53

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 50.34
                   TIME SHIFT OF PEAK FLOW        (min)= 45.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0860

--------------------------------------------------------------------------------
*****************************************
** SIMULATION:New Chicago Design Storm **
*****************************************
--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 405.000
| Ptotal= 24.91 mm |                          B=   3.000
--------------------                          C=   0.760
                        used in:   INTENSITY =  A / (t + B)^C

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

                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                 0.17    1.76 |  1.17   11.75 |  2.17    3.88 |  3.17    2.07
                 0.33    2.00 |  1.33   57.66 |  2.33    3.35 |  3.33    1.93
                 0.50    2.32 |  1.50   15.20 |  2.50    2.96 |  3.50    1.81
                 0.67    2.81 |  1.67    8.31 |  2.67    2.66 |  3.67    1.71
                 0.83    3.61 |  1.83    5.91 |  2.83    2.42 |  3.83    1.62
                 1.00    5.28 |  2.00    4.66 |  3.00    2.23 |  4.00    1.54

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0004)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

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

                          ---- TRANSFORMED HYETOGRAPH ----
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.083    1.76 | 1.083   11.75 | 2.083    3.88 |  3.08    2.07
                0.167    1.76 | 1.167   11.75 | 2.167    3.88 |  3.17    2.07
                0.250    2.00 | 1.250   57.66 | 2.250    3.35 |  3.25    1.93
                0.333    2.00 | 1.333   57.66 | 2.333    3.35 |  3.33    1.93
                0.417    2.32 | 1.417   15.20 | 2.417    2.96 |  3.42    1.81
                0.500    2.32 | 1.500   15.20 | 2.500    2.96 |  3.50    1.81
                0.583    2.81 | 1.583    8.31 | 2.583    2.66 |  3.58    1.71
                0.667    2.81 | 1.667    8.31 | 2.667    2.66 |  3.67    1.71
                0.750    3.61 | 1.750    5.91 | 2.750    2.42 |  3.75    1.62
                0.833    3.61 | 1.833    5.91 | 2.833    2.42 |  3.83    1.62
                0.917    5.28 | 1.917    4.66 | 2.917    2.23 |  3.92    1.54
                1.000    5.28 | 2.000    4.66 | 3.000    2.23 |  4.00    1.54

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   1.646
     TOTAL RAINFALL   (mm)=  24.906
     RUNOFF COEFFICIENT   =   0.066

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

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--------------------
| CALIB            |
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```
| NASHYD   (  0005)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

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


                            ---- TRANSFORMED HYETOGRAPH ----
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.083    1.76 | 1.083   11.75 | 2.083    3.88 |  3.08    2.07
                0.167    1.76 | 1.167   11.75 | 2.167    3.88 |  3.17    2.07
                0.250    2.00 | 1.250   57.66 | 2.250    3.35 |  3.25    1.93
                0.333    2.00 | 1.333   57.66 | 2.333    3.35 |  3.33    1.93
                0.417    2.32 | 1.417   15.20 | 2.417    2.96 |  3.42    1.81
                0.500    2.32 | 1.500   15.20 | 2.500    2.96 |  3.50    1.81
                0.583    2.81 | 1.583    8.31 | 2.583    2.66 |  3.58    1.71
                0.667    2.81 | 1.667    8.31 | 2.667    2.66 |  3.67    1.71
                0.750    3.61 | 1.750    5.91 | 2.750    2.42 |  3.75    1.62
                0.833    3.61 | 1.833    5.91 | 2.833    2.42 |  3.83    1.62
                0.917    5.28 | 1.917    4.66 | 2.917    2.23 |  3.92    1.54
                1.000    5.28 | 2.000    4.66 | 3.000    2.23 |  4.00    1.54

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=   2.480
     TOTAL RAINFALL   (mm)=  24.906
     RUNOFF COEFFICIENT   =   0.100

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0006)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

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


                            ---- TRANSFORMED HYETOGRAPH ----
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.083    1.76 | 1.083   11.75 | 2.083    3.88 |  3.08    2.07
                0.167    1.76 | 1.167   11.75 | 2.167    3.88 |  3.17    2.07
                0.250    2.00 | 1.250   57.66 | 2.250    3.35 |  3.25    1.93
                0.333    2.00 | 1.333   57.66 | 2.333    3.35 |  3.33    1.93
                0.417    2.32 | 1.417   15.20 | 2.417    2.96 |  3.42    1.81
                0.500    2.32 | 1.500   15.20 | 2.500    2.96 |  3.50    1.81
                0.583    2.81 | 1.583    8.31 | 2.583    2.66 |  3.58    1.71
                0.667    2.81 | 1.667    8.31 | 2.667    2.66 |  3.67    1.71
                0.750    3.61 | 1.750    5.91 | 2.750    2.42 |  3.75    1.62
                0.833    3.61 | 1.833    5.91 | 2.833    2.42 |  3.83    1.62
                0.917    5.28 | 1.917    4.66 | 2.917    2.23 |  3.92    1.54
                1.000    5.28 | 2.000    4.66 | 3.000    2.23 |  4.00    1.54

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.007 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=   3.529
     TOTAL RAINFALL   (mm)=  24.906
     RUNOFF COEFFICIENT   =   0.142

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0007)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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


                            ---- TRANSFORMED HYETOGRAPH ----
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.083    1.76 | 1.083   11.75 | 2.083    3.88 |  3.08    2.07
                0.167    1.76 | 1.167   11.75 | 2.167    3.88 |  3.17    2.07
                0.250    2.00 | 1.250   57.66 | 2.250    3.35 |  3.25    1.93
                0.333    2.00 | 1.333   57.66 | 2.333    3.35 |  3.33    1.93
                0.417    2.32 | 1.417   15.20 | 2.417    2.96 |  3.42    1.81
                0.500    2.32 | 1.500   15.20 | 2.500    2.96 |  3.50    1.81
                0.583    2.81 | 1.583    8.31 | 2.583    2.66 |  3.58    1.71
                0.667    2.81 | 1.667    8.31 | 2.667    2.66 |  3.67    1.71
                0.750    3.61 | 1.750    5.91 | 2.750    2.42 |  3.75    1.62
                0.833    3.61 | 1.833    5.91 | 2.833    2.42 |  3.83    1.62
                0.917    5.28 | 1.917    4.66 | 2.917    2.23 |  3.92    1.54
                1.000    5.28 | 2.000    4.66 | 3.000    2.23 |  4.00    1.54

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.005 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=   2.716
     TOTAL RAINFALL   (mm)=  24.906
     RUNOFF COEFFICIENT   =   0.109

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

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-------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0001)|   Area    (ha)=   5.35   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

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


                                  ---- TRANSFORMED HYETOGRAPH ----
                  TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                 0.083    1.76 | 1.083   11.75 | 2.083    3.88 |  3.08    2.07
                 0.167    1.76 | 1.167   11.75 | 2.167    3.88 |  3.17    2.07
                 0.250    2.00 | 1.250   57.66 | 2.250    3.35 |  3.25    1.93
                 0.333    2.00 | 1.333   57.66 | 2.333    3.35 |  3.33    1.93
                 0.417    2.32 | 1.417   15.20 | 2.417    2.96 |  3.42    1.81
                 0.500    2.32 | 1.500   15.20 | 2.500    2.96 |  3.50    1.81
                 0.583    2.81 | 1.583    8.31 | 2.583    2.66 |  3.58    1.71
                 0.667    2.81 | 1.667    8.31 | 2.667    2.66 |  3.67    1.71
                 0.750    3.61 | 1.750    5.91 | 2.750    2.42 |  3.75    1.62
                 0.833    3.61 | 1.833    5.91 | 2.833    2.42 |  3.83    1.62
                 0.917    5.28 | 1.917    4.66 | 2.917    2.23 |  3.92    1.54
                 1.000    5.28 | 2.000    4.66 | 3.000    2.23 |  4.00    1.54

     Unit Hyd Qpeak  (cms)=   0.817

     PEAK FLOW       (cms)=   0.020 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   1.889
     TOTAL RAINFALL   (mm)=  24.906
     RUNOFF COEFFICIENT   =   0.076

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

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     5.35   0.020     1.67     1.89
      + ID2= 2 (  0004):     0.40   0.001     1.67     1.65
        ====================================================
        ID = 3 (  0020):     5.75   0.021     1.67     1.87

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     5.75   0.021     1.67     1.87
      + ID2= 2 (  0005):     0.19   0.001     1.42     2.48
        ====================================================
        ID = 1 (  0020):     5.94   0.022     1.67     1.89

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0020):     5.94   0.022     1.67     1.89
      + ID2= 2 (  0006):     0.58   0.007     1.42     3.53
        ====================================================
        ID = 3 (  0020):     6.52   0.026     1.58     2.04

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     6.52   0.026     1.58     2.04
      + ID2= 2 (  0007):     0.69   0.005     1.42     2.72
        ====================================================
        ID = 1 (  0020):     7.21   0.031     1.58     2.10

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0002)|   Area    (ha)=   0.91   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

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


                                  ---- TRANSFORMED HYETOGRAPH ----
                  TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                 0.083    1.76 | 1.083   11.75 | 2.083    3.88 |  3.08    2.07
                 0.167    1.76 | 1.167   11.75 | 2.167    3.88 |  3.17    2.07
                 0.250    2.00 | 1.250   57.66 | 2.250    3.35 |  3.25    1.93
                 0.333    2.00 | 1.333   57.66 | 2.333    3.35 |  3.33    1.93
                 0.417    2.32 | 1.417   15.20 | 2.417    2.96 |  3.42    1.81
                 0.500    2.32 | 1.500   15.20 | 2.500    2.96 |  3.50    1.81
```

```
           0.583    2.81 | 1.583    8.31 | 2.583    2.66 |  3.58    1.71
           0.667    2.81 | 1.667    8.31 | 2.667    2.66 |  3.67    1.71
           0.750    3.61 | 1.750    5.91 | 2.750    2.42 |  3.75    1.62
           0.833    3.61 | 1.833    5.91 | 2.833    2.42 |  3.83    1.62
           0.917    5.28 | 1.917    4.66 | 2.917    2.23 |  3.92    1.54
           1.000    5.28 | 2.000    4.66 | 3.000    2.23 |  4.00    1.54

    Unit Hyd Qpeak  (cms)=   0.183

    PEAK FLOW       (cms)=   0.008 (i)
    TIME TO PEAK    (hrs)=   1.500
    RUNOFF VOLUME    (mm)=   3.576
    TOTAL RAINFALL   (mm)=  24.906
    RUNOFF COEFFICIENT   =   0.144

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

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


                            ---- TRANSFORMED HYETOGRAPH ----
            TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
             hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
           0.083    1.76 | 1.083   11.75 | 2.083    3.88 |  3.08    2.07
           0.167    1.76 | 1.167   11.75 | 2.167    3.88 |  3.17    2.07
           0.250    2.00 | 1.250   57.66 | 2.250    3.35 |  3.25    1.93
           0.333    2.00 | 1.333   57.66 | 2.333    3.35 |  3.33    1.93
           0.417    2.32 | 1.417   15.20 | 2.417    2.96 |  3.42    1.81
           0.500    2.32 | 1.500   15.20 | 2.500    2.96 |  3.50    1.81
           0.583    2.81 | 1.583    8.31 | 2.583    2.66 |  3.58    1.71
           0.667    2.81 | 1.667    8.31 | 2.667    2.66 |  3.67    1.71
           0.750    3.61 | 1.750    5.91 | 2.750    2.42 |  3.75    1.62
           0.833    3.61 | 1.833    5.91 | 2.833    2.42 |  3.83    1.62
           0.917    5.28 | 1.917    4.66 | 2.917    2.23 |  3.92    1.54
           1.000    5.28 | 2.000    4.66 | 3.000    2.23 |  4.00    1.54

    Unit Hyd Qpeak  (cms)=   0.015

    PEAK FLOW       (cms)=   0.000 (i)
    TIME TO PEAK    (hrs)=   1.583
    RUNOFF VOLUME    (mm)=   1.523
    TOTAL RAINFALL   (mm)=  24.906
    RUNOFF COEFFICIENT   =   0.061

    (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 (  0002):     0.91   0.008     1.50     3.58
      + ID2= 2 (  0003):     0.07   0.000     1.58     1.52
        ====================================================
        ID = 3 (  0021):     0.98   0.008     1.50     3.43

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0010)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

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


                            ---- TRANSFORMED HYETOGRAPH ----
            TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
             hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
           0.083    1.76 | 1.083   11.75 | 2.083    3.88 |  3.08    2.07
           0.167    1.76 | 1.167   11.75 | 2.167    3.88 |  3.17    2.07
           0.250    2.00 | 1.250   57.66 | 2.250    3.35 |  3.25    1.93
           0.333    2.00 | 1.333   57.66 | 2.333    3.35 |  3.33    1.93
           0.417    2.32 | 1.417   15.20 | 2.417    2.96 |  3.42    1.81
           0.500    2.32 | 1.500   15.20 | 2.500    2.96 |  3.50    1.81
           0.583    2.81 | 1.583    8.31 | 2.583    2.66 |  3.58    1.71
           0.667    2.81 | 1.667    8.31 | 2.667    2.66 |  3.67    1.71
           0.750    3.61 | 1.750    5.91 | 2.750    2.42 |  3.75    1.62
           0.833    3.61 | 1.833    5.91 | 2.833    2.42 |  3.83    1.62
           0.917    5.28 | 1.917    4.66 | 2.917    2.23 |  3.92    1.54
           1.000    5.28 | 2.000    4.66 | 3.000    2.23 |  4.00    1.54

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=   2.480
     TOTAL RAINFALL   (mm)=  24.906
     RUNOFF COEFFICIENT   =   0.100

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

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--------------------
| CALIB            |
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```
| NASHYD   (  0009)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

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


                             ---- TRANSFORMED HYETOGRAPH ----
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.083    1.76 | 1.083   11.75 | 2.083    3.88 |  3.08    2.07
                0.167    1.76 | 1.167   11.75 | 2.167    3.88 |  3.17    2.07
                0.250    2.00 | 1.250   57.66 | 2.250    3.35 |  3.25    1.93
                0.333    2.00 | 1.333   57.66 | 2.333    3.35 |  3.33    1.93
                0.417    2.32 | 1.417   15.20 | 2.417    2.96 |  3.42    1.81
                0.500    2.32 | 1.500   15.20 | 2.500    2.96 |  3.50    1.81
                0.583    2.81 | 1.583    8.31 | 2.583    2.66 |  3.58    1.71
                0.667    2.81 | 1.667    8.31 | 2.667    2.66 |  3.67    1.71
                0.750    3.61 | 1.750    5.91 | 2.750    2.42 |  3.75    1.62
                0.833    3.61 | 1.833    5.91 | 2.833    2.42 |  3.83    1.62
                0.917    5.28 | 1.917    4.66 | 2.917    2.23 |  3.92    1.54
                1.000    5.28 | 2.000    4.66 | 3.000    2.23 |  4.00    1.54

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   1.646
     TOTAL RAINFALL   (mm)=  24.906
     RUNOFF COEFFICIENT   =   0.066

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

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--------------------
| CALIB            |
| NASHYD   (  0011)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

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


                             ---- TRANSFORMED HYETOGRAPH ----
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.083    1.76 | 1.083   11.75 | 2.083    3.88 |  3.08    2.07
                0.167    1.76 | 1.167   11.75 | 2.167    3.88 |  3.17    2.07
                0.250    2.00 | 1.250   57.66 | 2.250    3.35 |  3.25    1.93
                0.333    2.00 | 1.333   57.66 | 2.333    3.35 |  3.33    1.93
                0.417    2.32 | 1.417   15.20 | 2.417    2.96 |  3.42    1.81
                0.500    2.32 | 1.500   15.20 | 2.500    2.96 |  3.50    1.81
                0.583    2.81 | 1.583    8.31 | 2.583    2.66 |  3.58    1.71
                0.667    2.81 | 1.667    8.31 | 2.667    2.66 |  3.67    1.71
                0.750    3.61 | 1.750    5.91 | 2.750    2.42 |  3.75    1.62
                0.833    3.61 | 1.833    5.91 | 2.833    2.42 |  3.83    1.62
                0.917    5.28 | 1.917    4.66 | 2.917    2.23 |  3.92    1.54
                1.000    5.28 | 2.000    4.66 | 3.000    2.23 |  4.00    1.54

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.007 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=   3.529
     TOTAL RAINFALL   (mm)=  24.906
     RUNOFF COEFFICIENT   =   0.142

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

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


                             ---- TRANSFORMED HYETOGRAPH ----
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.083    1.76 | 1.083   11.75 | 2.083    3.88 |  3.08    2.07
                0.167    1.76 | 1.167   11.75 | 2.167    3.88 |  3.17    2.07
                0.250    2.00 | 1.250   57.66 | 2.250    3.35 |  3.25    1.93
                0.333    2.00 | 1.333   57.66 | 2.333    3.35 |  3.33    1.93
                0.417    2.32 | 1.417   15.20 | 2.417    2.96 |  3.42    1.81
                0.500    2.32 | 1.500   15.20 | 2.500    2.96 |  3.50    1.81
                0.583    2.81 | 1.583    8.31 | 2.583    2.66 |  3.58    1.71
                0.667    2.81 | 1.667    8.31 | 2.667    2.66 |  3.67    1.71
                0.750    3.61 | 1.750    5.91 | 2.750    2.42 |  3.75    1.62
                0.833    3.61 | 1.833    5.91 | 2.833    2.42 |  3.83    1.62
                0.917    5.28 | 1.917    4.66 | 2.917    2.23 |  3.92    1.54
                1.000    5.28 | 2.000    4.66 | 3.000    2.23 |  4.00    1.54

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.000 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=   1.523
     TOTAL RAINFALL   (mm)=  24.906
     RUNOFF COEFFICIENT   =   0.061

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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--------------------
| CALIB            |
| NASHYD   (  0012)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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


                                 ---- TRANSFORMED HYETOGRAPH ----
                   TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                    hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                  0.083    1.76 | 1.083   11.75 | 2.083    3.88 |  3.08    2.07
                  0.167    1.76 | 1.167   11.75 | 2.167    3.88 |  3.17    2.07
                  0.250    2.00 | 1.250   57.66 | 2.250    3.35 |  3.25    1.93
                  0.333    2.00 | 1.333   57.66 | 2.333    3.35 |  3.33    1.93
                  0.417    2.32 | 1.417   15.20 | 2.417    2.96 |  3.42    1.81
                  0.500    2.32 | 1.500   15.20 | 2.500    2.96 |  3.50    1.81
                  0.583    2.81 | 1.583    8.31 | 2.583    2.66 |  3.58    1.71
                  0.667    2.81 | 1.667    8.31 | 2.667    2.66 |  3.67    1.71
                  0.750    3.61 | 1.750    5.91 | 2.750    2.42 |  3.75    1.62
                  0.833    3.61 | 1.833    5.91 | 2.833    2.42 |  3.83    1.62
                  0.917    5.28 | 1.917    4.66 | 2.917    2.23 |  3.92    1.54
                  1.000    5.28 | 2.000    4.66 | 3.000    2.23 |  4.00    1.54

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.005 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=   2.716
     TOTAL RAINFALL   (mm)=  24.906
     RUNOFF COEFFICIENT   =   0.109

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

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--------------------
| CALIB            |
| STANDHYD (  0018)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n          =      0.130        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.
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```
                                 ---- TRANSFORMED HYETOGRAPH ----
                   TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                    hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                  0.083    1.76 | 1.083   11.75 | 2.083    3.88 |  3.08    2.07
                  0.167    1.76 | 1.167   11.75 | 2.167    3.88 |  3.17    2.07
                  0.250    2.00 | 1.250   57.66 | 2.250    3.35 |  3.25    1.93
                  0.333    2.00 | 1.333   57.66 | 2.333    3.35 |  3.33    1.93
                  0.417    2.32 | 1.417   15.20 | 2.417    2.96 |  3.42    1.81
                  0.500    2.32 | 1.500   15.20 | 2.500    2.96 |  3.50    1.81
                  0.583    2.81 | 1.583    8.31 | 2.583    2.66 |  3.58    1.71
                  0.667    2.81 | 1.667    8.31 | 2.667    2.66 |  3.67    1.71
                  0.750    3.61 | 1.750    5.91 | 2.750    2.42 |  3.75    1.62
                  0.833    3.61 | 1.833    5.91 | 2.833    2.42 |  3.83    1.62
                  0.917    5.28 | 1.917    4.66 | 2.917    2.23 |  3.92    1.54
                  1.000    5.28 | 2.000    4.66 | 3.000    2.23 |  4.00    1.54

     Max.Eff.Inten.(mm/hr)=      28.20        28.88
                over (min)       30.00        40.00
     Storage Coeff.  (min)=      30.46 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      30.00        60.00
     Unit Hyd. peak  (cms)=       0.04         0.02
                                                           *TOTALS*
     PEAK FLOW       (cms)=       0.17         0.03          0.188 (iii)
     TIME TO PEAK    (hrs)=       1.75         2.33           1.75
     RUNOFF VOLUME    (mm)=      23.91        10.03          17.80
     TOTAL RAINFALL   (mm)=      24.91        24.91          24.91
     RUNOFF COEFFICIENT   =       0.96         0.40           0.71


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     0.19   0.001     1.42     2.48
      + ID2= 2 (  0011):     0.58   0.007     1.42     3.53
        ====================================================
        ID = 3 (  0022):     0.77   0.008     1.42     3.27

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

--------------------
| ADD HYD  (  0022)|
```

```
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     0.77   0.008     1.42     3.27
      + ID2= 2 (  0012):     0.69   0.005     1.42     2.72
        ====================================================
        ID = 1 (  0022):     1.46   0.014     1.42     3.01

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     1.46   0.014     1.42     3.01
      + ID2= 2 (  0018):     6.26   0.188     1.75    17.80
        ====================================================
        ID = 3 (  0022):     7.72   0.195     1.75    15.00

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

--------------------
| ADD HYD  (  0022)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0022):     7.72   0.195     1.75    15.00
      + ID2= 2 (  0008):     0.07   0.000     1.58     1.52
        ====================================================
        ID = 1 (  0022):     7.79   0.195     1.75    14.88

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

--------------------
| ADD HYD  (  0022)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0022):     7.79   0.195     1.75    14.88
      + ID2= 2 (  0009):     0.40   0.001     1.67     1.65
        ====================================================
        ID = 3 (  0022):     8.19   0.196     1.75    14.23

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   0.58   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.12

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

```
                          ---- TRANSFORMED HYETOGRAPH ----
              TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
               hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
             0.083    1.76 | 1.083   11.75 | 2.083    3.88 |  3.08    2.07
             0.167    1.76 | 1.167   11.75 | 2.167    3.88 |  3.17    2.07
             0.250    2.00 | 1.250   57.66 | 2.250    3.35 |  3.25    1.93
             0.333    2.00 | 1.333   57.66 | 2.333    3.35 |  3.33    1.93
             0.417    2.32 | 1.417   15.20 | 2.417    2.96 |  3.42    1.81
             0.500    2.32 | 1.500   15.20 | 2.500    2.96 |  3.50    1.81
             0.583    2.81 | 1.583    8.31 | 2.583    2.66 |  3.58    1.71
             0.667    2.81 | 1.667    8.31 | 2.667    2.66 |  3.67    1.71
             0.750    3.61 | 1.750    5.91 | 2.750    2.42 |  3.75    1.62
             0.833    3.61 | 1.833    5.91 | 2.833    2.42 |  3.83    1.62
             0.917    5.28 | 1.917    4.66 | 2.917    2.23 |  3.92    1.54
             1.000    5.28 | 2.000    4.66 | 3.000    2.23 |  4.00    1.54

     Unit Hyd Qpeak  (cms)=   0.185

     PEAK FLOW       (cms)=   0.007 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=   3.529
     TOTAL RAINFALL   (mm)=  24.906
     RUNOFF COEFFICIENT   =   0.142

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0013)|   Area    (ha)=   0.07   Curve Number   (CN)= 60.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

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


                          ---- TRANSFORMED HYETOGRAPH ----
              TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
               hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
             0.083    1.76 | 1.083   11.75 | 2.083    3.88 |  3.08    2.07
             0.167    1.76 | 1.167   11.75 | 2.167    3.88 |  3.17    2.07
             0.250    2.00 | 1.250   57.66 | 2.250    3.35 |  3.25    1.93
             0.333    2.00 | 1.333   57.66 | 2.333    3.35 |  3.33    1.93
             0.417    2.32 | 1.417   15.20 | 2.417    2.96 |  3.42    1.81
             0.500    2.32 | 1.500   15.20 | 2.500    2.96 |  3.50    1.81
             0.583    2.81 | 1.583    8.31 | 2.583    2.66 |  3.58    1.71
             0.667    2.81 | 1.667    8.31 | 2.667    2.66 |  3.67    1.71
             0.750    3.61 | 1.750    5.91 | 2.750    2.42 |  3.75    1.62
             0.833    3.61 | 1.833    5.91 | 2.833    2.42 |  3.83    1.62
             0.917    5.28 | 1.917    4.66 | 2.917    2.23 |  3.92    1.54
```

```
             1.000    5.28 | 2.000    4.66 | 3.000    2.23 |  4.00    1.54

     Unit Hyd Qpeak  (cms)=   0.015

     PEAK FLOW       (cms)=   0.000 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=   1.523
     TOTAL RAINFALL   (mm)=  24.906
     RUNOFF COEFFICIENT   =   0.061

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

-------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0014)|   Area    (ha)=   0.40   Curve Number   (CN)= 61.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

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


                        ---- TRANSFORMED HYETOGRAPH ----
              TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
               hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
             0.083    1.76 | 1.083   11.75 | 2.083    3.88 |  3.08    2.07
             0.167    1.76 | 1.167   11.75 | 2.167    3.88 |  3.17    2.07
             0.250    2.00 | 1.250   57.66 | 2.250    3.35 |  3.25    1.93
             0.333    2.00 | 1.333   57.66 | 2.333    3.35 |  3.33    1.93
             0.417    2.32 | 1.417   15.20 | 2.417    2.96 |  3.42    1.81
             0.500    2.32 | 1.500   15.20 | 2.500    2.96 |  3.50    1.81
             0.583    2.81 | 1.583    8.31 | 2.583    2.66 |  3.58    1.71
             0.667    2.81 | 1.667    8.31 | 2.667    2.66 |  3.67    1.71
             0.750    3.61 | 1.750    5.91 | 2.750    2.42 |  3.75    1.62
             0.833    3.61 | 1.833    5.91 | 2.833    2.42 |  3.83    1.62
             0.917    5.28 | 1.917    4.66 | 2.917    2.23 |  3.92    1.54
             1.000    5.28 | 2.000    4.66 | 3.000    2.23 |  4.00    1.54

     Unit Hyd Qpeak  (cms)=   0.066

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   1.646
     TOTAL RAINFALL   (mm)=  24.906
     RUNOFF COEFFICIENT   =   0.066

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

-------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0015)|   Area    (ha)=   0.19   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

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


                        ---- TRANSFORMED HYETOGRAPH ----
              TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
               hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
             0.083    1.76 | 1.083   11.75 | 2.083    3.88 |  3.08    2.07
             0.167    1.76 | 1.167   11.75 | 2.167    3.88 |  3.17    2.07
             0.250    2.00 | 1.250   57.66 | 2.250    3.35 |  3.25    1.93
             0.333    2.00 | 1.333   57.66 | 2.333    3.35 |  3.33    1.93
             0.417    2.32 | 1.417   15.20 | 2.417    2.96 |  3.42    1.81
             0.500    2.32 | 1.500   15.20 | 2.500    2.96 |  3.50    1.81
             0.583    2.81 | 1.583    8.31 | 2.583    2.66 |  3.58    1.71
             0.667    2.81 | 1.667    8.31 | 2.667    2.66 |  3.67    1.71
             0.750    3.61 | 1.750    5.91 | 2.750    2.42 |  3.75    1.62
             0.833    3.61 | 1.833    5.91 | 2.833    2.42 |  3.83    1.62
             0.917    5.28 | 1.917    4.66 | 2.917    2.23 |  3.92    1.54
             1.000    5.28 | 2.000    4.66 | 3.000    2.23 |  4.00    1.54

     Unit Hyd Qpeak  (cms)=   0.056

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=   2.480
     TOTAL RAINFALL   (mm)=  24.906
     RUNOFF COEFFICIENT   =   0.100

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

-------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0017)|   Area    (ha)=   0.69   Curve Number   (CN)= 68.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14

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


                        ---- TRANSFORMED HYETOGRAPH ----
              TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
               hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
             0.083    1.76 | 1.083   11.75 | 2.083    3.88 |  3.08    2.07
             0.167    1.76 | 1.167   11.75 | 2.167    3.88 |  3.17    2.07
             0.250    2.00 | 1.250   57.66 | 2.250    3.35 |  3.25    1.93
             0.333    2.00 | 1.333   57.66 | 2.333    3.35 |  3.33    1.93
             0.417    2.32 | 1.417   15.20 | 2.417    2.96 |  3.42    1.81
             0.500    2.32 | 1.500   15.20 | 2.500    2.96 |  3.50    1.81
             0.583    2.81 | 1.583    8.31 | 2.583    2.66 |  3.58    1.71
```

```
          0.667    2.81 | 1.667    8.31 | 2.667    2.66 |  3.67    1.71
          0.750    3.61 | 1.750    5.91 | 2.750    2.42 |  3.75    1.62
          0.833    3.61 | 1.833    5.91 | 2.833    2.42 |  3.83    1.62
          0.917    5.28 | 1.917    4.66 | 2.917    2.23 |  3.92    1.54
          1.000    5.28 | 2.000    4.66 | 3.000    2.23 |  4.00    1.54

     Unit Hyd Qpeak  (cms)=   0.188

     PEAK FLOW       (cms)=   0.005 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=   2.716
     TOTAL RAINFALL   (mm)=  24.906
     RUNOFF COEFFICIENT   =   0.109

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

------------------------------------------------------------------------------
--------------------
| CALIB              |
| STANDHYD (  0019)|   Area    (ha)=   6.26
|ID= 1 DT= 5.0 min |   Total Imp(%)=  67.90   Dir. Conn.(%)=  56.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.25         2.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.52         4.33
     Length            (m)=     330.00        30.00
     Mannings n          =      0.130        0.250

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


                              ---- TRANSFORMED HYETOGRAPH ----
            TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
             hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
          0.083    1.76 | 1.083   11.75 | 2.083    3.88 |  3.08    2.07
          0.167    1.76 | 1.167   11.75 | 2.167    3.88 |  3.17    2.07
          0.250    2.00 | 1.250   57.66 | 2.250    3.35 |  3.25    1.93
          0.333    2.00 | 1.333   57.66 | 2.333    3.35 |  3.33    1.93
          0.417    2.32 | 1.417   15.20 | 2.417    2.96 |  3.42    1.81
          0.500    2.32 | 1.500   15.20 | 2.500    2.96 |  3.50    1.81
          0.583    2.81 | 1.583    8.31 | 2.583    2.66 |  3.58    1.71
          0.667    2.81 | 1.667    8.31 | 2.667    2.66 |  3.67    1.71
          0.750    3.61 | 1.750    5.91 | 2.750    2.42 |  3.75    1.62
          0.833    3.61 | 1.833    5.91 | 2.833    2.42 |  3.83    1.62
          0.917    5.28 | 1.917    4.66 | 2.917    2.23 |  3.92    1.54
          1.000    5.28 | 2.000    4.66 | 3.000    2.23 |  4.00    1.54

     Max.Eff.Inten.(mm/hr)=      28.20        28.88
               over (min)       30.00        40.00
     Storage Coeff.  (min)=      30.46 (ii)   60.00 (ii)
     Unit Hyd. Tpeak (min)=      30.00        60.00
```

```
     Unit Hyd. peak  (cms)=       0.04         0.02
                                                           *TOTALS*
     PEAK FLOW       (cms)=       0.17         0.03          0.188 (iii)
     TIME TO PEAK    (hrs)=       1.75         2.33           1.75
     RUNOFF VOLUME    (mm)=      23.91        10.03          17.80
     TOTAL RAINFALL   (mm)=      24.91        24.91          24.91
     RUNOFF COEFFICIENT   =       0.96         0.40           0.71


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0013):     0.07   0.000     1.58     1.52
      + ID2= 2 (  0014):     0.40   0.001     1.67     1.65
        ====================================================
        ID = 3 (  0023):     0.47   0.002     1.67     1.63

     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):     0.47   0.002     1.67     1.63
      + ID2= 2 (  0015):     0.19   0.001     1.42     2.48
        ====================================================
        ID = 1 (  0023):     0.66   0.003     1.50     1.87

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     0.66   0.003     1.50     1.87
      + ID2= 2 (  0016):     0.58   0.007     1.42     3.53
        ====================================================
        ID = 3 (  0023):     1.24   0.009     1.42     2.65

     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):     1.24   0.009     1.42     2.65
      + ID2= 2 (  0017):     0.69   0.005     1.42     2.72
        ====================================================
        ID = 1 (  0023):     1.93   0.015     1.42     2.67

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

--------------------
| ADD HYD  (  0023)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0023):     1.93   0.015     1.42     2.67
      + ID2= 2 (  0019):     6.26   0.188     1.75    17.80
        ====================================================
        ID = 3 (  0023):     8.19   0.196     1.75    14.23

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0024)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.7970      0.1600
                          0.3210     0.1300   |   0.0000      0.0000

                             AREA     QPEAK     TPEAK       R.V.
                             (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0023)      8.190      0.196      1.75      14.23
   OUTFLOW: ID= 1 (  0024)      8.190      0.100      2.58      14.22

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 51.14
                   TIME SHIFT OF PEAK FLOW         (min)= 50.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0407

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

APPENDIX E
STORMWATER MANAGEMENT FACILITY CALCULATIONS

CCO-22-0957 - WINTERGREEN SUBDIVISION - STORMWATER MANAGEMENT POND CLEANOUT FREQUENCY

Catchment Imperviousness	**Annual Loading (kg/ha)**	**Wet Density (kg/m^3)**	**Annual Loading (m^3/ha)**
35%	770	1,230	0.6
55%	2,300	1,230	1.9
70%	3,495	1,230	2.8
85%	4,680	1,230	3.8

Requirements		**Pond 1**	**Units**
Catchment Imperviousness	=	54.6%	
Sediment Loading Per 1-Year	=	1.9	m^3/ha
Total Area to Pond	=	8.190	ha
Yearly Sediment to Pond	=	15.3	m^3
Initial Removal Efficiency	=	80%	
Yearly Accumulation in Pond	=	12.3	m^3
Required Quality Volume	=	*190.3*	m^3/ha
Required Permanent Pool Volume [(203.9 - 80 Extended Detention) x Total Area]	=	903.4	m^3
Permanent Pool Volume Provided	**=**	**1,560.0**	**m^3**
Required Quality Volume @ 5% less Efficient	=	*180.8*	m^3/ha
Required Permanent Pool Volume @ 5% less Efficient [(193.7 - 80 Extended Detention) x Total Area]	=	825.4	m^3
Total Sediment Accumlation Allowed Before Removal Required (Provided - Max Allowed 5% Reduction)	=	734.6	m^3
Total Approximate Number of Years Before Sediment Removal is Required	**=**	**60**	**years**

CCO-22-0957 - WINTERGREEN SUBDIVISION - STORMWATER MANAGEMENT POND FOREBAY AND PERMANENT POOL STORAGE VOLUME

1. Forebay Storage Volumes

A conservative estimate for forebay volume is equal to or greater than ten (10) years of sediment accumulation.
The conservative estimate for minimum forebay volume based on ten (10) times the sediment accumulation is 123 m3.

2. Permanent Pool Storage Volumes

Total Permanent Pool Volume Required = 1,559 m^3
Total Permanent Pool Volume Provided = 1,560 m^3

Therefore, the permanent pool volume provided is greater than the required volume.

3. Settling Length

Distance = $\frac{rQ_p}{V_s}$ Equation 4.5 : Settling Length, MECP SMPDM, March 2003

Length-to-Width Ratio --->	$r =$	2	(recommended)
Peak Flow Rate --->	$Q_p =$	0.196 m^3/s	(quality storm outflow --- 25mm Chicago storm event)
Settling Velocity --->	$V_s =$	0.0003 m/s	(recommended)

Distance = 36 m **Settling Length (based on settling particles of approx. 0.15mm diameter)**

4. Dispersion Length

Distance = $\frac{(8Q)}{dV_f}$ Equation 4.6 : Dispersion Length, MECP SMPDM March 2003

Inlet Flow Rate --->	$Q =$	0.496 m^3/s	(5 year Post)
Depth of Permanent Pool --->	$d =$	1.85 m	(in Forebay)
Settling Velocity --->	$V_f =$	0.5 m/s	(recommended)

Distance = 4 m **Length of dispersion (based on pipe full flow capacity)**

The forebay should be 36 m long to settle particles and for pipe full flow dispersion.
The forebay length provided in the proposed pond design is 40 m long for particle settlement and dispersion.
Therefore, the forebay length meets the minimum requirements for particle settlement and dispersion

5. Forebay Width

Width = $\frac{Dist.}{8}$ Equation 4.7 : Minimum Forebay Bottom Width

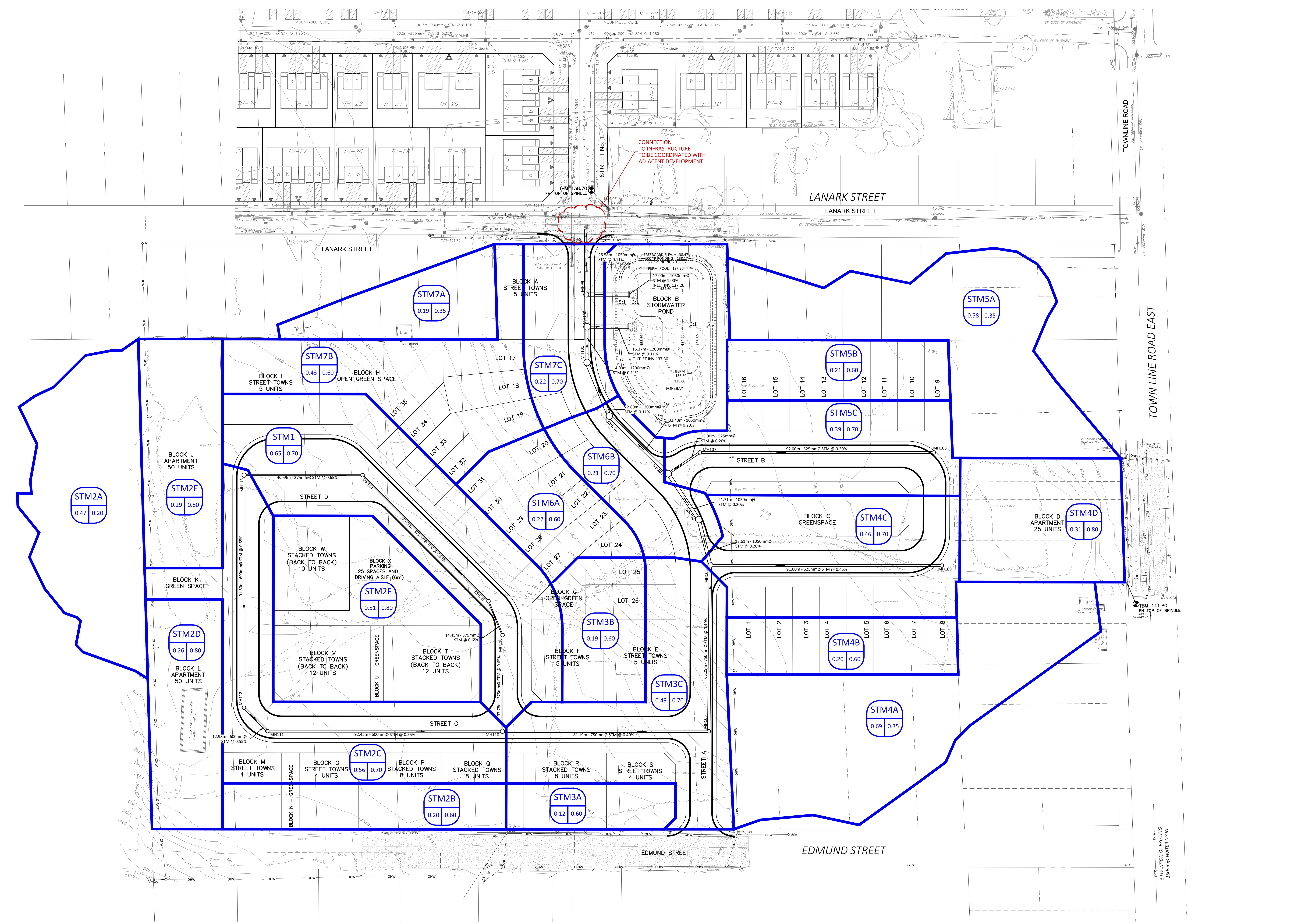
Width = $\frac{36}{8}$ = 5 m

The forebay deep zone should be at least 5 m wide.
The forebay deep zone width provided in the proposed pond design is 5 m wide.
Therefore, the forebay deep zone provided meets the minimum requirements for bottom width.

APPENDIX F

STORM SEWER DESIGN SHEET AND DRAINAGE PLAN

MCINTOSH PERRY



LOCATION MAP
N.T.S.

LEGEND

AREA I.D.
STM1
1.00 | 0.50
AREA SIZE (HECTARES)
RUNOFF COEFFICIENT

FOR REVIEW ONLY
NOT FOR CONSTRUCTION

SCALE 1 : 750
0 25 50 75 Metres

No.	Revision/Issue	Date
0	ISSUED FOR REVIEW	SEPT.08.2023

Check and verify all dimensions before proceeding with the work

Do not scale drawings

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North:

Stamp:

Client:
WINTERGREEN RIDGE LTD.

Project:
400 LANARK STREET
WINTERGREEN RIDGE SUBDIVISION
CARLETON PLACE ONTARIO

Drawing Title:
CONCEPTUAL STORM SERVICING PLAN

Scale: 1:750
Project Number: CCO-22-0957
Drawn by:
Checked By:
Drawing Number: STM
Designed By:

STORM SEWER DESIGN SHEET

McINTOSH PERRY

PROJECT: Wintergreen Ridge Subdivision
LOCATION: Carleton Place
CLIENT: Wintergreen Ridge Ltd.

LOCATION				CONTRIBUTING AREA (ha)								RATIONAL DESIGN FLOW											SEWER DATA								
				VACANT	EX RY	PR RY	FY	APT	POND																						
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	31	32
STREET	AREA ID	FROM MH	TO MH	C-VALUE						INDIV AC	CUMUL AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm)			SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr)	
				0.20	0.35	0.60	0.70	0.80	1.00																DIA	W	H			(L/s)	(%)
	STM1	MH113	MH110				0.65			0.46	0.46	10.00	2.18	12.18	104.19	122.14	178.56	131.79				131.79	147.47	169.00	375			0.65	1.293	15.67	10.63%
	STM2	MH113	MH110	0.47		0.20	0.56	1.06		1.45	1.45	10.00	2.02	12.02	104.19	122.14	178.56	421.16				421.16	475.05	197.00	600			0.55	1.628	53.89	11.34%
	STM3	MH110	MH105			0.31	0.49			0.53	2.44	12.18	1.52	12.18	93.94	110.07	160.83	636.72				636.72	734.54	147.00	750			0.40	1.611	97.82	13.32%
	STM4	MH109	MH105		0.69	0.20	0.46	0.31		0.93	0.93	10.00	1.13	11.13	104.19	122.14	178.56	269.82				269.82	300.97	91.00	525			0.45	1.347	31.15	10.35%
	STM5	MH108	MH103		0.58	0.21	0.39			0.60	0.60	10.00	1.99	11.99	104.19	122.14	178.56	174.37				174.37	200.65	107.00	525			0.20	0.898	26.27	13.09%
	STM6	MH105	MH102			0.22	0.21			0.28	4.25	12.18	0.85	13.03	93.94	110.07	160.83	1,110.08				1,110.08	1,274.02	73.00	1050			0.20	1.425	163.94	12.87%
	STM7	MH103	POND		0.19	0.43	0.22			0.48	4.73	13.03	0.79	13.82	90.51	106.03	154.90	1,189.89				1,189.89	1,348.97	55.00	1200			0.11	1.155	159.08	11.79%

Definitions:
Q = 2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (ha)
i = Rainfall intensity in millimeters per hour (mm/hr)
[i = 998.071 / (TC+6.053)^0.814] 5 YEAR
[i = 1174.184 / (TC+6.014)^0.816] 10 YEAR
[i = 1735.688 / (TC+6.014)^0.820] 100 YEAR

Notes:
1. Mannings coefficient (n) = 0.013

Designed: SH

Checked: PK

Project No.: CCO-22-0957

No.	Revision	Date
1.	ISSUED FOR REVIEW	Sept.08.2023

Sheet No: 1 of 1

FUNCTIONAL SERVICING REPORT
400 LANARK SUBDIVISION

Project No.: CCO-22-0957

Prepared for:

Wintergreen Ridge Ltd

Prepared by:

McIntosh Perry Consulting Engineers Ltd.
115 Walgreen Road
Carp, ON K0A 1L0

September 15th, 2023

McINTOSH PERRY

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APPENDICES

1.0 PROJECT DESCRIPTION

1.1 Purpose

McIntosh Perry (MP) has been retained by Wintergreen Ridge Ltd. to prepare this Servicing Report in support of the Plan of Subdivision process and stormwater management report for the proposed 400 Lanark Subdivision, located in the Town of Carleton Place, Ontario.

The main purpose of this report is to present a servicing design for the development in accordance with the recommendations and guidelines provided by the Town of Carleton Place, the Mississippi Valley Conservation Authority (MVCA), and the Ministry of the Environment, Conservation and Parks (MECP). This report will address the water, sanitary and storm sewer servicing for the development, ensuring that existing and available services will adequately service the proposed development.

This report should be read in conjunction with the following drawings:

- CCO-22-0957 – General Plan of Services
- CCO-22-0957 – Conceptual Grading Plan
- CCO-22-0957 – Conceptual Storm Servicing Plan
- CCO-22-0957 – Conceptual Sanitary Servicing Plan

1.2 Site Description

The property is located in the Town of Carleton Place, Ontario. It is described as Part of Lot 1, Concession 7 in the geographic Township of Ramsay. The site is bounded by Lanark Street to the Northeast, Edmund Street to the Southwest, Town Line Road East to the Southeast, and undeveloped lands to the Northwest. The development area for the proposed works is approximately 8.19ha.

See Site Location Plan in Appendix 'A' for more details.

The existing site is currently undeveloped. Proposed Watermain, Sanitary, and Storm stubs are planned to be extended from proposed Carleton / Lanark Development across Lanark Street Northeast of this site.

The proposed development consists of thirty-five (35) single family units, ninety (90) townhouse units and one hundred-twenty-five (125) apartment units. There will be two site accesses for the development the first is from Lanark Street to the North East and the second is from Edmund Street to the South West both will be connected through a future roadway that offers a through connection between the two (2) access points.

2.0 BACKROUND STUDIES

Background studies that have been completed for the proposed site include As-built drawings, a topographical survey, a geotechnical report and a Phase I Environmental Site Assessment (ESA) prepared in support of Draft Approval.

As-built drawings of existing services and roads as well as the proposed adjacent development were reviewed in order to determine accurate servicing and stormwater management schemes for the site.

A topographic survey of the site was completed by McIntosh Perry Surveying Inc (MPSI).

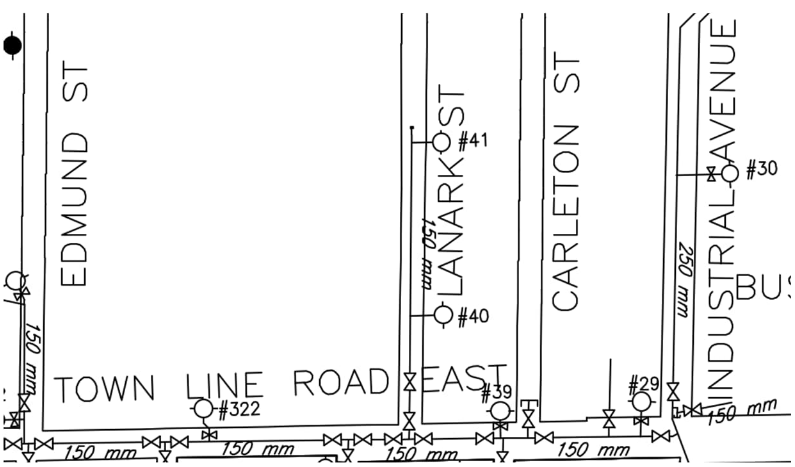
The following reports have previously been completed and are available under separate cover:

- Geotechnical Investigation – Kollaard Associates Engineers (Oct. 2014).
- Plan of Survey with Topography – McIntosh Perry Surveying Inc. (Nov. 2022).
- Industrial Avenue Sewage Pumping Station – McIntosh Perry Consulting Engineers Ltd. (Nov. 2015).
- Carleton / Lanark Inversness Servicing Report – Robinson Consultants Inc. (Dec. 2022).
- Phase I Environmental Site Assessment – Watter Environmental Group (June. 2021).
- Scope Environmental Impact Statement and Tree Preservation Plan – McIntosh Perry Consulting Engineers Ltd. (August. 2023)

3.0 WATERMAIN

3.1 Existing Water Servicing Conditions

This site is surrounding by three (3) streets of Lanark Street, Edmund Street, and Town Line Road East. Each street has a 150mm diameter Watermain. Lanark Street terminates approximately 210m North of Town Line Road East where there is a future proposed 203mm diameter watermain with the Carleton / Lanark Subdivision. Edmund Streets watermain terminates approximately 80m North of Town Line Road East. As part of the future Carleton / Lanark Development there is a proposed 203mm diameter watermain stub for the connection of this site, which is connected to a 250mm diameter watermain on Industrial Avenue.



3.2 Proposed Water Servicing

The proposed water distribution system will consist of 200mm diameter watermain piping and the applicable appurtenances to provide water for domestic consumption and fire protection. Five new fire hydrants are proposed to provide fire protection for the development. Water supply for each single-family home and townhome will be provided by individual water service connections to the proposed municipal watermain. A future connection to the municipal main will be provided to service the proposed apartments. Curb stops will be installed on all water services at the property line, away from driveways and any aboveground utilities. The watermain is designed to have a minimum of 2.4m cover.

3.3 Water Servicing Design Criteria

The design parameters that were used to establish water consumption and fire flow demands are summarized Table 1 below.

Table 1: Summary of Water Supply Design Criteria

Design Parameter	Value
Population Density – Single-family Home	3.4 persons/unit
Population Density – Townhome or Terrace Flat	2.7 persons/unit
Population Density – Average Apartment	1.8 persons/unit
Estimated Population Range (Full Development)	500-1000 person
Average Day Demands – Residential	280 L/person/day
Maximum Day Factor – Residential (MECP Table 3-1)	2.75 x Average Day Demands
Peak Hour Factor – Residential (MECP Table 3-1)	4.13 x Average Day Demands
Maximum Allowable Operating Pressure	551.6 kPa (80 psi)
Minimum Allowable Operating Pressure	275.8 kPa (40 psi)

3.4 Estimated Water Demands

Table 2 below summarizes the anticipated domestic water demands for all units (single family home, townhomes and apartments) under average day, maximum day and peak hour conditions.

Table 2: Total Water Demand Summary

Water Demand Conditions	Water Demands (L/sec)
Average Day	2.27
Max Day	6.24
Peak Hour	9.37

3.5 Fire Flow Requirements

Water for fire protection will be available by utilizing the proposed fire hydrants located along the proposed roadways. The required fire flows for all proposed buildings were calculated based on typical values as established by the Fire Underwriters Survey 2020 (FUS). Fire flow calculations were also completed based on the Ontario Building Code (OBC) method for determining required fire flows, however the FUS method was used as it resulted in more conservative requirements. Detailed calculations for both methods are provided in Appendix C. The design parameters that were used to establish Required Fire Flows (RFF) are summarized in Table 1 below.

Table 3: Fire Flow Design Parameters

Design Parameter	Single Family	Townhome	Apartment
Type of Construction	Wood Frame	Wood Frame	Wood Frame
Maximum Effective Floor Area (2-Storey c/w Basement >50% Below Grade)	400m^2	1,070m^2	4,500 m^2
Occupancy Type	-15% Limited Combustible (Residential)	-15% Limited Combustible (Residential)	-15% Limited Combustible (Residential)
Sprinkler Protection System	None Provided	None Provided	Automatic sprinkler conforms to NFPA 13
Maximum Increase from Exposures	44%	32%	15%
Maximum Required Fire Flow	150 L/sec	200 L/sec (167 L/sec CAP)	250 L/sec

The maximum allowable footprints based on zoning setbacks were used to determine the RFFs for the single family and townhouse units. As per the City of Ottawa's Technical Bulletin ISTB-2018-02, the required fire flows for single and townhomes can be capped at 167 L/sec as there is more then 10m of spatial separation between the backs of adjacent units and the footprint of the townhome blocks are less than 600m^2. Detailed calculations of the RFFs necessary for each building is provided in Appendix C. The estimated required fire flows (RFFs) based on the FUS Method ranges from 150 L/sec for single family homes, 167 L/sec L/sec for townhomes blocks. Fire flow requirements for the proposed future apartment block will be determined prior to construction to ensure sufficient flows are available.

3.6 Boundary Conditions

Hydraulic Grade Line (HGL) boundary conditions were estimated for design purposes based on the hydraulic water model of the Town's water distribution system prepared by J.L. Richards & Associates (JLR) dated March 11, 2021, for the Town of Carleton Place.

A separate water model was prepared to specifically analyze the 400 Lanark development using the JLR water model results at the following three junctions.

Table 4: Boundary Conditions and Pressures Summary

Demand Scenario	Edmund Street Junction J-972	Lanark Street Junction J-191	Industrial Avenue via Carleton / Lanark Subdivision Junction J-262
Approximate Ground Elevation	146.00m	137.50m	137.00m
Average Day (Maximum HGL)	182.03m	182.02m	182.01m
Peak Hour (Minimum HGL)	180.02m	180.04m	179.97m

For the purposes of design, the provided Peak Hour HGL was reduced by 15 meters of head (~21 psi) as a safety factor while simulating the Maximum Day plus Fire Flow scenario for the development, equating to approximately 45-50 psi of pressure within the main at the boundary conditions.

3.7 Modelling Scenarios

A total of three (3) scenarios were analyzed. The performance of the proposed water distribution system within the development was analyzed under each scenario. The following summarizes the modelling scenarios that were analyzed.

Scenario 1: Average Day Demands (w/ Maximum HGL)

Scenario 2: Peak Hour Demands (w/ Minimum HGL)

Scenario 3: Max Day Plus Fire Flow (w/ Reduced Minimum HGL)

Scenario details for each model can be found in Appendix C.

3.1 Water Modeling Results

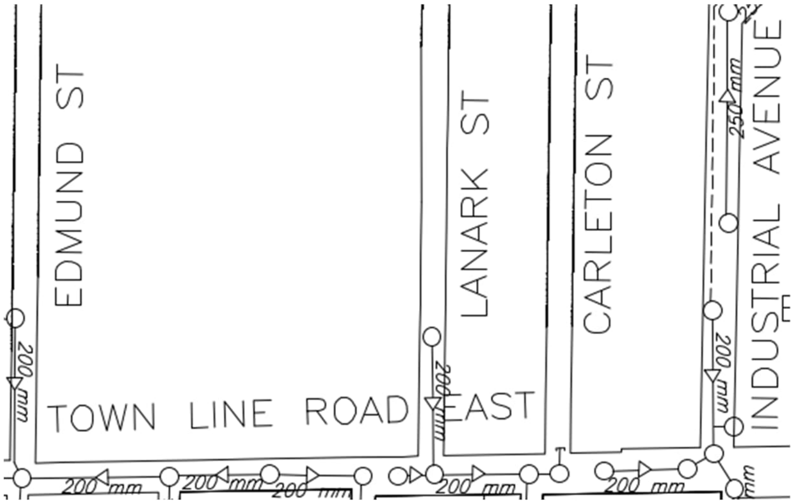
The calculated range of working pressures will be confirmed during detailed design once the structures and layout have been finalized. The calculated range of working pressures anticipated within the development under average day conditions were between 55 psi and 60 psi, and under peak hour conditions were between 50 psi and 57 psi. This meets the minimum 40psi pressure requirement as stated by the MECP guidelines. No pressure reducing measures are required as operating pressures are within 40 psi and 80 psi.

Under Maximum Day plus Fire Flow conditions the available fire flows are adequate compared to the required fire flows (RFF) based on a water distribution system with two (2) proposed connections to existing adjacent watermains. Additional measures for upsizing watermain are required to attain the RRF. Detailed design demand calculations and additional connections will be explore as part of the detailed design to determine if the RFF will be reduced. Current calculations are conservative upon the finalization of the proposed structures size, location, and construction material. As part of the proposed design a 250mm watermain is required under the main line through the development as well as the loop to the North-West where the proposed apartments are located. The remaining watermain are to have a proposed size of 200mm, with the apartment building to the South-East connecting directly to Townline Road.

4.0 SANITARY SEWER

4.1 Existing Sanitary Sewer

There is an existing 200mm diameter sanitary sewer located on Lanark Street, Edmund Street, and Town Line Road East. The servicing report completed by the Carleton / Lanark Subdivision determined that the sewers that are services from the existing sanitary services along Town Line Road East are of substandard installation. As a result this site shall not be serviced by any of the existing sanitary sewers along Lanark Street, Edmund Street, or Town Line Road East. As part of the future proposed Carleton / Lanark development there will be a 200mm diameter sanitary stub for this site to use for sanitary servicing.



4.2 Proposed Sanitary Sewer

New 200mm diameter gravity sanitary sewers are proposed to service this development and connect to the future proposed 200mm diameter stub as part of the Carleton / Lanark Development which is to be serviced using the existing 200mm diameter sanitary sewer along Industrial Avenue.

The peak design flows for the proposed residential units were calculated using criteria from the *City of Ottawa – Sewer Design Guidelines, October 2012*. The proposed site development area (8.19ha) will generate a flow of 8.83 L/s.

The proposed gravity sanitary sewers will be installed throughout the subject property with a minimum full flow target velocity (cleansing velocity) of 0.6 m/s and a full flow velocity of not more than 3.0 m/s. This may not be feasible on every length of pipe. This issue has been dealt with by increasing the slopes of the sanitary sewers. Design parameters for the site include an infiltration rate of 0.33 l/s/ha.

The proposed sanitary main will be connected to sanitary stub from the future proposed Carleton / Lanark Development to the Northeast of the property under the proposed road connection to Lanark Street. It is anticipated that there will be no issues with capacity constraints within the existing 200mm sanitary main within the downstream external sanitary sewer.

See *Onsite Sanitary Sewer Design Sheets* in Appendix D of this report for more details.

4.2.1 *Adequacy Assessment*

The purpose of this assessment is to confirm the existing sanitary infrastructure can adequately convey flows from the 400 Lanark Subdivision. Please see Figure 1 below for a visual of the contributing property parcels included in this assessment. The population breakdown has also been included in Table 5 in Section 4.2.1 below.

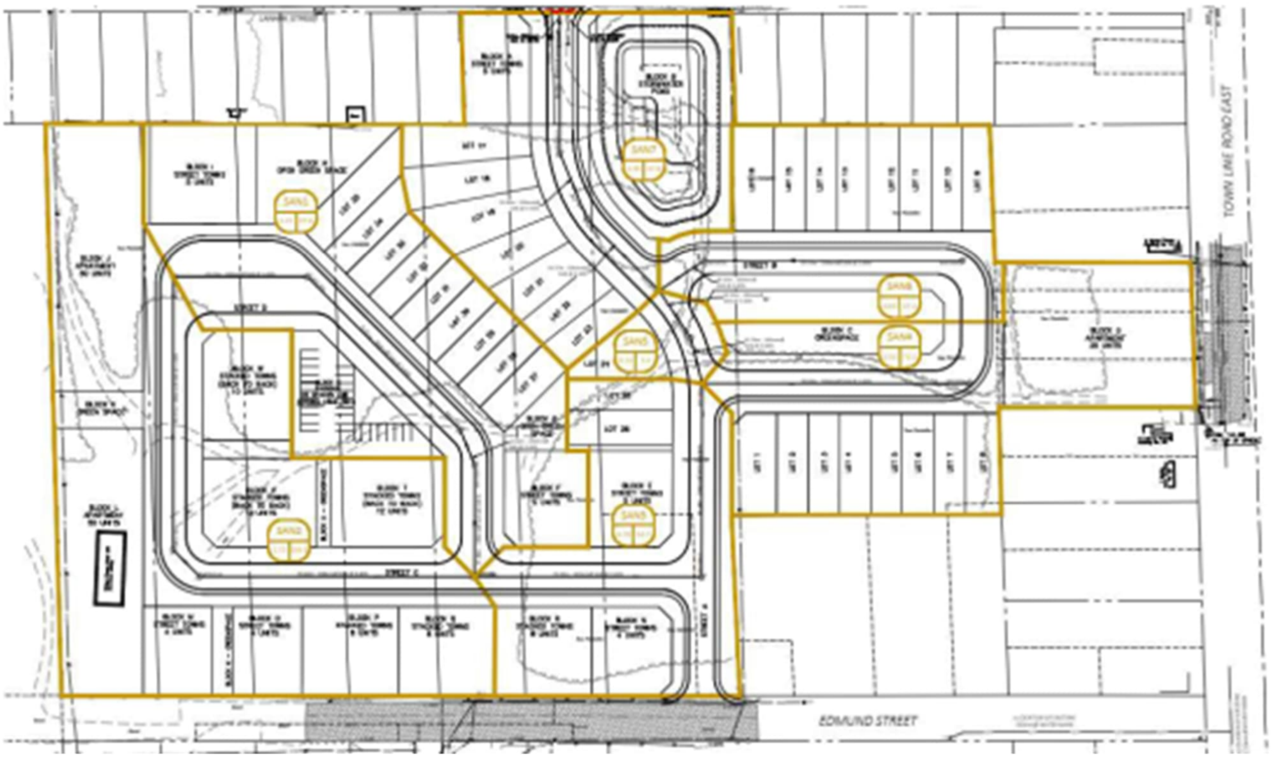


Figure 1 - Sanitary Drainage Areas

See onsite *Sanitary Sewer Design Sheet – Assessment 1* in Appendix D of this report for more details.

Populations for the areas have been further broken down in the Tables below:

Table 5: Population by Unit Type

Area ID	Area (ha)	Unit Types					Resulting Population
		SF	SD	TH	APT	APT (1-Bd)	
SAN1	1.21	9	-	10	-	-	58
SAN2	1.72	-	-	58	100	-	337
SAN3	0.70	2	-	17	0	-	53
SAN4	0.92	8	-	-	25	-	73
SAN5	0.10	1	-	-	-	-	3
SAN6	0.65	8	-	-	-	-	27
SAN7	0.95	7	-	5	-	-	37
Total							588

Table 6: Population by Area

Area ID	Area (ha)	Resulting Population
SAN1	1.21	58
SAN2	1.72	337
SAN3	0.70	53
SAN4	0.92	73
SAN5	0.10	3
SAN6	0.65	27
SAN7	0.95	37
Total from Site		588

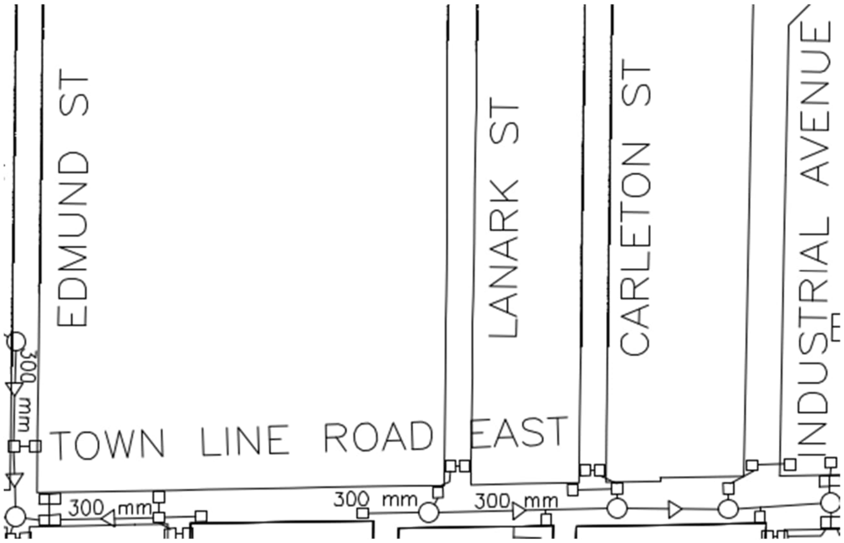
Notes:

- **Residential contributing areas only shown where unit type breakdown is not available or number of units is unknown.*
- *Design Populations for the table above are based on the following (taken from the City of Ottawa Sewer Design Guidelines):*
    - *Residential*
        - *SF – 3.4 p/p/u*
        - *TH/SD – 2.7 p/p/u*
        - *APT – 1.8 p/p/u*
        - *APT (1bd) – 1.4 p/p/u*
        - *Area Weighted – 60 p/p/ha*

5.0 STORM SEWER

5.1 Existing Storm Sewers

The subject property is currently undeveloped and without storm services. There is an existing storm network within the adjacent future proposed Carleton / Lanark Subdivision with a 900mm diameter storm stub for connection from this site. There is a new stormwater management facility is proposed to capture runoff from the proposed works. This system will outlet to the stub from the adjacent development that outlets to Industrial Avenue. On the roads adjacent to the development there is a 300mm diameter system on Town Line Road East and a 300mm diameter system along Edmund Street which terminated at a manhole at the Carambeck Community Centre approximately 130m North of Town Line Road East.



5.2 Proposed Storm Sewers

Please refer to the stormwater management report for the detailed discussion on the proposed storm sewer system. A preliminary storm sewer design sheet was created using the rational method, which allows for the proper sizing of the storm pipes within the development. Drainage area information, along with respective pipe slopes and other necessary information was utilized to evaluate the performance of the storm sewer network. The time of concentration calculated for the storm sewer system is based on a 15-minute inlet time.

The preliminary storm sewer design sheet identifies the 5-year flow that is conveyed through each pipe section of the storm sewer network. The peak flow and peak velocity are the maximum results based on gravity flow. Included in the sheet is the full flow capacity of the pipe and the associated full flow velocity, when the pipe is under gravity flow condition. The peak flow was checked against the full flow capacity to ensure that each storm sewer pipe can convey the 5-year flow unrestricted.

See Storm Sewer Design Sheet in Appendix 'E' of this report for more details.

A preliminary review of the updated HGL results indicates that, though there are increases, the increased elevations remain below the USF elevations. Additional analysis will be required to confirm this during the detailed design stage.

6.0 INSPECTION AND MAINTENANCE CONSIDERATIONS

Inspection and maintenance of SWM facilities is crucial to ensure the ongoing performance and effectiveness of such facilities throughout its lifecycle. It should be noted that a proper functional SWM plan can prevent future ponding, erosion and sedimentation from occurring and can significantly improve the quality of runoff leaving the site.

To ensure the SWM facilities function properly, routine inspection is required. Inspections will determine whether maintenance is required to any parts of the facilities. Inspections on site shall be completed a minimum of bi-annually, once following the spring freshet and once in the fall prior to freeze up (October).

After routine inspections are done for the facilities, a series of maintenance requirements will potentially need to be completed. Based on the type of work the maintenance activity can be categorized into Routine/Non-routine maintenance. The following tables illustrates some general maintenance activities and their frequency for considerations.

Table 7: General Maintenance Activities

Task	Required Equipment	Objective	Frequency
Grass cutting	Lawn mowers	To provide unobstructive conveyance pathways and to improve the aesthetic of the site	Routine – once per month or as required
Weed removal	Weed trimmers	To remove unwanted and invasive species of plants which could impede the conveyance and storage capacity of SWM facilities	Routine – once per month or as required
Trash removal	Gloves, garbage bags and garbage picker	To provide unobstructed drainage pathways and to minimize the clogging of outfall structures	Routine – once per month or as required
Grading of roadways and repair to erosion. Small scale - rills, ruts, isolated potholes. Large scale - eroded roadway, irregular cross-fall etc.	Small scale – Rakes, tamper, granular materials Large Scale – Grader, granular materials	To minimize the sediment transport, to avoid clogging of catchbasins and to mitigate erosion	Non-Routine – As required based on the condition of the roadway or conveyance system
Removal of sediments Small scale – at Catchbasins, Manholes structures and Conduits	Vacuum trucks, Shovel, wheelbarrow and/or similar equipment for transportation of materials	To maintain the capacity of the storm sewer system and to minimize the sediment transport	Non-Routine – Once the sediment a depth of 0.15m in the sumps or as required based on field inspection
Removal of sediments Large scale – SWM pond	Heavy machinery and transportation equipment	To maintain the quality control objective and to minimize sediment transport off site.	Non-Routine – Please refer to Appendix F

A site specific SWM inspection and maintenance manual in accordance with MCEP guidelines is recommended during the detailed design stage of the development to provide guidance on inspection and to provide detailed maintenance breakdown for the proposed SWM facilities at the site.

7.0 EROSION AND SEDIMENT CONTROL

During construction, when the soils are exposed, there is a greater chance for the sediment to be transported to the downstream areas even for a small rainfall event. Temporary Erosion and Sediment Control measures are recommended to minimize the sediment transport during the initial stages of the development. Following ESC measures are found to be suitable for the proposed development.

Silt Fence

Based on the nature of development, light duty silt fences are recommended as per OPSD 219.110. The silt fence should be installed before commencing any construction and should be inspected after every storm event. In the event that the silt fence is damaged or accumulated a significant amount of sediment, the affected portion should be replaced or cleaned for proper function.

Catchbasin Inlet Control Devices

Catchbasin inlet control structures include a filter which treats the runoff before it reaches the SWM facility. Filters must be inspected regularly and cleaned/replaced whenever necessary to ensure continuous treatment. The Catchbasin filters can be removed once the final layer of asphalt has been paved or the vegetation has been established to minimize the sediment transport.

Before construction begins, temporary silt fence will need to be installed as noted on the *Erosion and Sediment Control Plan*. Inlet sediment control devices complete with crushed stone filter should be installed at all specified locations. It is crucial that these controls be maintained throughout construction and inspection of sediment and erosion control will be facilitated by the Contractor or Contract Administration staff throughout the construction period.

The Contractor, at their discretion or at the instruction of the Town, MVCA or the Contract Administrator shall increase the quantity of sediment and erosion controls on-site to ensure that the site is operating as intended and no additional sediment finds its way into the storm sewer network on site. The silt fence shall be inspected weekly and after rainfall events. Care shall be taken to properly remove sediment as required.

As each lot is developed, proper sediment and erosion controls will need to be installed and maintained. Grass shall be established as soon as possible, and excess fill shall be removed or leveled promptly. All manholes, catchbasins and other drainage structures shall be covered in inlet sediment control device when installed.

8.0 RECOMMENDATION

Based on the information presented in this report, the preliminary assessment determined the proposed site can achieve adequate capacity for water, waste water, and storm servicing to accommodate the proposed development.

This report is submitted in support of the proposed Plan of Subdivision. We respectfully request the details of this report be approved.

Regards,

McIntosh Perry Consulting Engineers Ltd.

Josh Smith, P.Eng.
Project Manager | Land Development
McIntosh Perry Consulting Engineers
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E: j.smith@mcintoshperry.com

9.0 STATEMENT OF LIMITATIONS

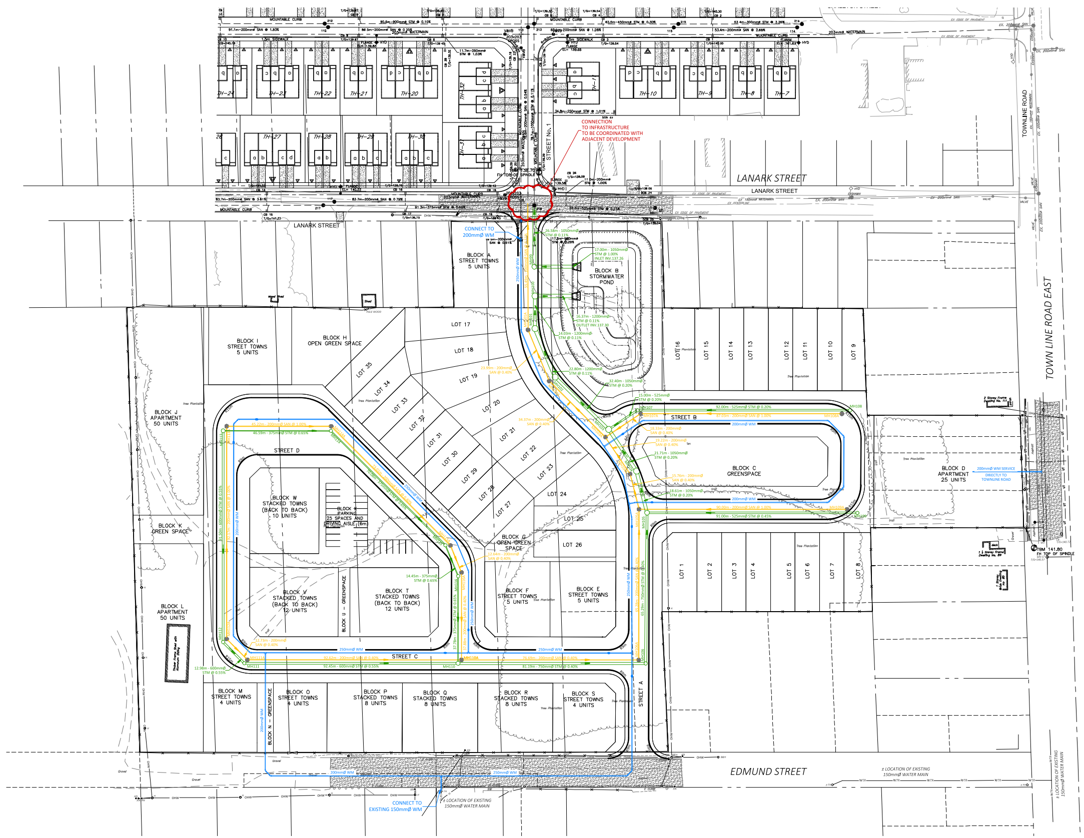
This report was produced for the exclusive use of Wintergreen Ridge Ltd. The purpose of the report is to assess the existing servicing and provide recommendations and designs for the post-construction scenario that are in compliance with the guidelines and standards from the Ministry of the Environment, Conservation and Parks, Town of Carleton Place and local approval agencies. McIntosh Perry reviewed the site information and background documents listed in Section 2.0 of this report. While the previous data was reviewed by McIntosh Perry and site visits were performed, no field verification/measures of any information were conducted.

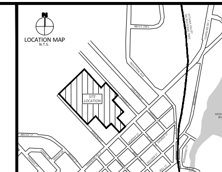
Any use of this review by a third party, or any reliance on decisions made based on it, without a reliance report is the responsibility of such third parties. McIntosh Perry accepts no responsibility for damages, if any, suffered by any third party as a result of decisions or actions made based on this review.

The findings, conclusions and/or recommendations of this report are only valid as of the date of this report. No assurance is made regarding any changes in conditions subsequent to this date. If additional information is discovered or becomes available at a future date, McIntosh Perry should be requested to re-evaluate the conclusions presented in this report, and provide amendments, if required.

APPENDIX A
SERVICING AND GRADING PLAN

McINTOSH PERRY





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NOT FOR CONSTRUCTION

SCALE 1 : 750
0 25 50 75 Metres

No.	Revision/Issue	Date
0	ISSUED FOR REVIEW	SEPT.14.2023

Check and verify all dimensions before proceeding with the work. Do not scale drawings

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North:

Stamp:

Client:
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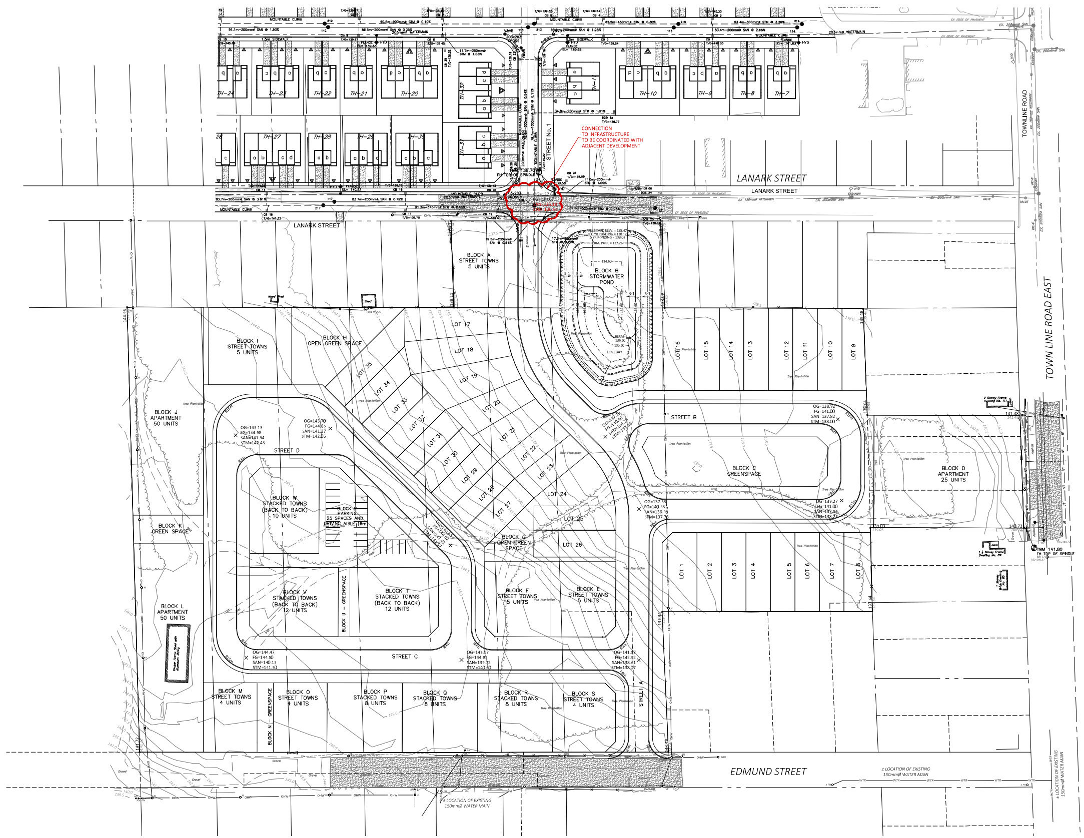
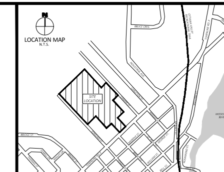
Project:
400 LANARK STREET
WINTERGREEN RIDGE SUBDIVISION
CARLETON PLACE ONTARIO

Drawing Title:
PRELIMINARY PLAN OF SERVICES

Scale: 1:750
Project Number: CCO-22-0957
Drawn by:
Checked By:
Designed By:
Drawing Number: SRV





SCALE 1 : 750

0 25 50 75 Metres

No.	Revision/Issue	Date
0	ISSUED FOR REVIEW	SEPT 14 2023

Check and verify all dimensions before proceeding with the work

Do not scale drawings

McINTOSH PERRY

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Tel: 613-267-6524 Fax: 613-267-7992

www.mcintoshperry.com

North:

Stamp:

Client:

WINTERGREEN RIDGE LTD.

Project:

400 LANARK STREET

WINTERGREEN RIDGE SUBDIVISION

CARLETON PLACE ONTARIO

Drawing Title:

PRELIMINARY GRADING PLAN

Scale: 1:750

Project Number: CCO-22-0957

Drawn by:

Checked By:

Drawing Number: GRD

Designed By:

APPENDIX B
PRE-CONSULTATION NOTES

Pre-Consultation Meeting Notes
Virtual zoom meeting – October 13, 2022
Prepared By: Julie Stewart

In Attendance
Mike Sullivan – President, LandPro Planning Solutions
Marko Maric – Planner, LandPro Planning Solutions
Derek Crupi - owner
Joshua Smith – McIntosh Perry
Niki Dwyer – Director of Development Services, Town of Carleton Place
Joanne Henderson - Manager of Recreation and Culture, Town of Carleton Place
Diane Reid – Planner, MVCA
Terry McCann – Director of Public Works, County of Lanark
Julie Stewart – County Planner, County of Lanark

A pre-consultation meeting was held in 2021. The agents have requested a subsequent pre-consultation meeting to review revised concept plan.

Townline Road

Townline Road is a County Road and therefore the Director of Public Works for the County of Lanark will review and provide comment on the Traffic Study. The study should address intersections, requirements for turning lanes, road widenings, entrances, any modifications, etc.

The County had been contacted by an engineering firm in regards to a Traffic Study for the proposed Inverness development at Lanark and Carleton Street. Recommended that the agents for the proposed McGuire development reach out to Inverness to coordinate studies.

The County will also review and comment on the stormwater management report and plans.

Any proposed entrance to the apartment building off of Townline Road will also need to approvals from Lanark County Public Works Department.

The Town will also be involved in the review and comment of the TIS.

Town Planning comments – Niki Dwyer

Council is not favourable on five (5) blocks of townhouses. Want some variation of the number of units consecutively. Recommended that the blocks provide a mix of types of units.

Parking – the Town does not favour surface parking. If there is surface parking it should be away from the street.

Consultant and owner noted there is an opportunity for at grade parking.

Niki supports the open space at the entrance to the development and requested that consideration be given to carry the open space "corridor" through to Lanark Street, to provide harmony.

Recommended that the consultants connect with Inverness in regards to their proposed plans for Lanark and Carleton Street development.

Noted that a portion of Edmund Street is closed.

Recommended that a market analysis for condominiums versus rental apartments be provided.

Affordable Housing – a minimum of 20% will be required to be provided.
Discussion on overall density

- Proposed density is high
- May be reduced when the townhouse blocks are redesigned

MVCA
Diane Reid – advised no Natural Heritage or Natural Hazards on site. MVCA involvement will be limited to storm water management review.

Diane did ask where the outlet would be proposed.

Joshua noted may be at Lanark Street or onto Townline Road.

APPENDIX C
WATERMAIN CALCULATIONS

WATER DEMAND CALCULATIONS

PROJECT: Coleman Central Subdivision - Phase 2
LOCATION: Carleton Place
CLIENT: Cavanagh Construction Ltd.

McINTOSH PERRY

LOCATION		INDIVIDUAL						FLOW									
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
STREET	JUNCTION	UNIT TYPES				AREA	POPULATION	PEAKING FACTORS		AVERAGE DAY FLOW Q(a)		MAX DAY FLOW Q(max)		PEAK HOURLY FLOW Q(h)		FIRE FLOW (FUS)	
		SF	SD	TH	APT	(ha)		MAX DAY	PEAK HOUR	(L/s)	(L/min)	(L/s)	(L/min)	(L/s)	(L/min)	(L/s)	(L/min)
400 Lanark																	
	J-1	2		5			20.3	2.75	4.13	0.08	4.93	0.23	13.57	0.34	20.38	250.00	15,000
	J-2	8					27.2	2.75	4.13	0.11	6.61	0.30	18.18	0.46	27.30	250.00	15,000
	J-3	6					20.4	2.75	4.13	0.08	4.96	0.23	13.64	0.34	20.48	250.00	15,000
	J-4			22			59.4	2.75	4.13	0.24	14.44	0.66	39.70	0.99	59.63	250.00	15,000
	J-5	6		28			96.0	2.75	4.13	0.39	23.33	1.07	64.17	1.61	96.37	250.00	15,000
	J-6	3		5	50		113.7	2.75	4.13	0.46	27.64	1.27	76.00	1.90	114.13	250.00	15,000
	J-7			20	50		144.0	2.75	4.13	0.58	35.00	1.60	96.25	2.41	144.55	250.00	15,000
	J-8	5			25		62.0	2.75	4.13	0.25	15.07	0.69	41.44	1.04	62.24	250.00	15,000
	J-9	5					17.0	2.75	4.13	0.07	4.13	0.19	11.36	0.28	17.06	250.00	15,000
TOTALS		35	0	80	125	0	560.0			2.27	136.11	6.24	374.31	9.37	562.14		

Design Parameters:

Single Family	3.4	p/p/u
TH/SD	2.7	p/p/u
Average Apartment	1.8	p/p/u

Notes:

1. Domestic Flow: 350 L/(cap·day)

Q (a) = Average Daily Flow
Q (max) = Maximum Daily Flow — Q (max) = Q(a) * Peaking Factor
Q (h) = Peak Hour Flow — Q (h) = Q(a) * Peaking Factor
Q (min) = Night Minimum Hour Flow — Q (min) = Q(a) * Peaking Factor

Designed: LG

Checked:

Project No.: CCO-22-0957

REFERENCE: CITY OF OTTAWA - WATER DISTRIBUTION GUIDELINES, JULY 2010
MOE - DESIGN GUIDELINES FOR DRINKING-WATER SYSTEMS 2008

McINTOSH PERRY

Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

Building No. / Type: Single Family

An estimate of the Fire Flow required for a given fire area may be estimated by:

RFF = 220 x C x √A Where:

F = Required fire flow in liters per minute

C = Coefficient related to the type of construction.

A = The total floor area in square meters (including all storey's, but excluding basements at least 50 percent below grade) in the building being considered.

A. Determine the Construction Coefficient (C)

Choose the construction type and coefficient to be used in the required fire flow formula:

C =	1.5	**Type V** Wood Frame Construction
=	0.8	**Type IV-A** Mass Timber Construction
=	0.9	**Type IV-B** Mass Timber Construction
=	1.0	**Type IV-C** Mass Timber Construction
=	1.5	**Type IV-D** Mass Timber Construction
=	1.0	**Type III** Ordinary Construction
=	0.8	**Type II** Noncombustible Construction
=	0.6	**Type I** Fire Resistive Construction

Input: C = Type V Wood Frame Construction = 1.5

B. Determine Total Effective Floor Area (A)

Input building floor areas:

Floor No.		Area (m^2)	% Used	Area Used (m^2)	Total (m^2)
2	=	**200**	100%	200	
1	=	**200**	100%	200	**400**
B1	=	**200**	0%	0	
		Input:			

C. Determine Required Fire Flow

RFF	=	**220 x C x √A**	=	6600 L/min
			=	**7000 L/min** *(Rounded to nearest 1,000 L/min)*

D. Determine Increase or Decrease Based on Occupancy Contents Adjustment Factor

Choose the combusitbility of building contents:

Option		Input:	Factor	Fire Flow Change	Adjusted RFF
Non-Combustible	-25%				
Limited Combustible	-15%				
Combustible	0%	**Limited Combustible**	**-15%**	**-1050 L/min**	**5950 L/min**
Free Burning	15%				
Rapid Burning	25%				

McINTOSH PERRY

Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

Building No. / Type: **Single Family**

E. Determine the Decrease for Automatic Sprinkler Protection, if Applicable

Choose the sprinkler options that apply:

Option		Applicable?	Factor	Fire Flow Change	Adjusted RFF
Automatic sprinkler conforms to NFPA 13	-30%	No	0%	0 L/min	5950 L/min
Standard water supply for system and Fire Department hose line	-10%	No	0%	0 L/min	5950 L/min
Fully supervised system	-10%	No	0%	0 L/min	5950 L/min

F. Determine the Total Increase for Exposures

Choose separation distance and wall lengths:

Subject Side	Separation Distance (m)	Exposed Wall Type	Wall Length (m)	No. of Storeys	Length-Height Factor	Charge (%) (See FUS-Table 6)	Total Charge (%)	Fire Flow Change (L/min)	Adjusted RFF (L/min)
North	4.5	Type V	18	2	36	11%	44%	2618	8568
South	4.5	Type V	18	2	36	11%			
East	10.3	Type V	12	2	24	11%			
West	36.5	Type V	12	2	24	11%			
			Input:						

G. Determine the Total Required Fire Flow

Total Required Fire Flow, Rounded to the Nearest 1,000 L/min =	9000 L/min
Total Required Fire Flow (L/sec) =	150 L/sec
Does the 10,000 L/min (167 L/sec) RFF limit apply, based on "TECHNICAL BULLITEN ISTB-2018-02"? =	No

Resultant Total Required Fire Flow (L/sec) =	**150 L/sec**

MCINTOSH PERRY

Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

Building No. / Type: Townhome

An estimate of the Fire Flow required for a given fire area may be estimated by:

RFF = 220 x C x √A Where:

F = Required fire flow in liters per minute

C = Coefficient related to the type of construction.

A = The total floor area in square meters (including all storey's, but excluding basements at least 50 percent below grade) in the building being considered.

A. Determine the Construction Coefficient (C)

Choose the construction type and coefficient to be used in the required fire flow formula:

C =	1.5	**Type V** Wood Frame Construction
=	0.8	**Type IV-A** Mass Timber Construction
=	0.9	**Type IV-B** Mass Timber Construction
=	1.0	**Type IV-C** Mass Timber Construction
=	1.5	**Type IV-D** Mass Timber Construction
=	1.0	**Type III** Ordinary Construction
=	0.8	**Type II** Noncombustible Construction
=	0.6	**Type I** Fire Resistive Construction

Input: C = Type V Wood Frame Construction = 1.5

B. Determine Total Effective Floor Area (A)

Input building floor areas:

Floor No.		Area (m^2)	% Used	Area Used (m^2)	Total (m^2)
2	=	**535**	100%	535	
1	=	**535**	100%	535	**1070**
B1	=	**535**	0%	0	
		Input:			

C. Determine Required Fire Flow

RFF	=	**220 x C x √A**	=	10795 L/min
			=	**11000 L/min** *(Rounded to nearest 1,000 L/min)*

D. Determine Increase or Decrease Based on Occupancy Contents Adjustment Factor

Choose the combusitbility of building contents:

Option		Input:	Factor	Fire Flow Change	Adjusted RFF
Non-Combustible	-25%				
Limited Combustible	-15%	**Limited Combustible**	**-15%**	**-1650 L/min**	**9350 L/min**
Combustible	0%				
Free Burning	15%				
Rapid Burning	25%				

McINTOSH PERRY

Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

Building No. / Type: **Townhome**

E. Determine the Decrease for Automatic Sprinkler Protection, if Applicable

Choose the sprinkler options that apply:

Option		Applicable?	Factor	Fire Flow Change	Adjusted RFF
Automatic sprinkler conforms to NFPA 13	-30%	No	0%	0 L/min	9350 L/min
Standard water supply for system and Fire Department hose line	-10%	No	0%	0 L/min	9350 L/min
Fully supervised system	-10%	No	0%	0 L/min	9350 L/min

F. Determine the Total Increase for Exposures

Choose separation distance and wall lengths:

Subject Side	Separation Distance (m)	Exposed Wall Type	Wall Length (m)	No. of Storeys	Length-Height Factor	Charge (%) (See FUS-Table 6)	Total Charge (%)	Fire Flow Change (L/min)	Adjusted RFF (L/min)
North East	9	Type V	21	2	42	16%	32%	2992	12342
Sout West	22	Type V	21	2	42	4%			
North West	15	Type V	26	2	52	12%			
South East	32	Type V	11	2	22	0%			
			Input:						

G. Determine the Total Required Fire Flow

Total Required Fire Flow, Rounded to the Nearest 1,000 L/min =	12000 L/min
Total Required Fire Flow (L/sec) =	200 L/sec
Does the 10,000 L/min (167 L/sec) RFF limit apply, based on "TECHNICAL BULLITEN ISTB-2018-02"? =	No

Resultant Total Required Fire Flow (L/sec) =	**200 L/sec**

McINTOSH PERRY

Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

Building No. / Type: Townhome

An estimate of the Fire Flow required for a given fire area may be estimated by:

RFF = 220 x C x √A Where:

F = Required fire flow in liters per minute

C = Coefficient related to the type of construction.

A = The total floor area in square meters (including all storey's, but excluding basements at least 50 percent below grade) in the building being considered.

A. Determine the Construction Coefficient (C)

Choose the construction type and coefficient to be used in the required fire flow formula:

C = 1.5	**Type V** Wood Frame Construction
= 0.8	**Type IV-A** Mass Timber Construction
= 0.9	**Type IV-B** Mass Timber Construction
= 1.0	**Type IV-C** Mass Timber Construction
= 1.5	**Type IV-D** Mass Timber Construction
= 1.0	**Type III** Ordinary Construction
= 0.8	**Type II** Noncombustible Construction
= 0.6	**Type I** Fire Resistive Construction

Input: C = Type V Wood Frame Construction = 1.5

B. Determine Total Effective Floor Area (A)

Input building floor areas:

Floor No.		Area (m^2)	% Used	Area Used (m^2)	Total (m^2)
2	=	**1500**	100%	1500	**4500**
2	=	**1500**	100%	1500	
1	=	**1500**	100%	1500	
B1	=	**1500**	0%	0	
		Input:			

C. Determine Required Fire Flow

RFF	=	**220 x C x √A**	=	22137 L/min
			=	**22000 L/min** *(Rounded to nearest 1,000 L/min)*

D. Determine Increase or Decrease Based on Occupancy Contents Adjustment Factor

Choose the combusitbility of building contents:

Option		Input:	Factor	Fire Flow Change	Adjusted RFF
Non-Combustible	-25%				
Limited Combustible	-15%				
Combustible	0%	**Limited Combustible**	**-15%**	**-3300 L/min**	**18700 L/min**
Free Burning	15%				
Rapid Burning	25%				

McINTOSH PERRY

Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

Building No. / Type: **Townhome**

E. Determine the Decrease for Automatic Sprinkler Protection, if Applicable

Choose the sprinkler options that apply:

Option		Applicable?	Factor	Fire Flow Change	Adjusted RFF
Automatic sprinkler conforms to NFPA 13	-30%	Yes	-30%	-5610 L/min	13090 L/min
Standard water supply for system and Fire Department hose line	-10%	No	0%	0 L/min	13090 L/min
Fully supervised system	-10%	No	0%	0 L/min	13090 L/min

F. Determine the Total Increase for Exposures

Choose separation distance and wall lengths:

Subject Side	Separation Distance (m)	Exposed Wall Type	Wall Length (m)	No. of Storeys	Length-Height Factor	Charge (%) (See FUS-Table 6)	Total Charge (%)	Fire Flow Change (L/min)	Adjusted RFF (L/min)
North East	30	Type V	21	3	63	0%			
Sout West	0	Type V	0	0	0	0%	15%	1964	15054
North West	0	Type V	0	0	0	0%			
South East	6	Type V	12	2	24	15%			
			Input:						

G. Determine the Total Required Fire Flow

Total Required Fire Flow, Rounded to the Nearest 1,000 L/min =	15000 L/min
Total Required Fire Flow (L/sec) =	250 L/sec
Does the 10,000 L/min (167 L/sec) RFF limit apply, based on "TECHNICAL BULLITEN ISTB-2018-02"? =	No

Resultant Total Required Fire Flow (L/sec) =	**250 L/sec**

400 Lanark Water Model

Average Day Demands

Junction Table - Time: 0.00 hours

ID	Label	Elevation (m)	Zone	Demand Collection	Demand (L/s)	Hydraulic Grade (m)	Pressure (psi)
35	J-1	140.54	<None>	<Collection: 1 item>	0.08	183.14	60
37	J-2	140.50	<None>	<Collection: 1 item>	0.11	183.07	60
39	J-3	140.68	<None>	<Collection: 1 item>	0.08	183.05	60
41	J-4	142.92	<None>	<Collection: 1 item>	0.24	182.97	57
43	J-5	144.95	<None>	<Collection: 1 item>	0.39	182.95	54
45	J-6	144.85	<None>	<Collection: 1 item>	0.46	182.94	54
47	J-7	144.50	<None>	<Collection: 1 item>	0.58	182.94	55
50	J-8	141.00	<None>	<Collection: 1 item>	0.25	183.06	60
52	J-9	140.95	<None>	<Collection: 1 item>	0.07	183.06	60
55	J-10	144.32	<None>	<Collection: 0 items>	0.00	182.95	55
69	J-11	143.32	<None>	<Collection: 0 items>	0.00	182.86	56
93	J-19	143.32	<None>	<Collection: 0 items>	0.00	182.90	260
95	J-20	144.56	<None>	<Collection: 0 items>	0.00	182.94	54

Reservoir Table - Time: 0.00 hours

ID	Label	Elevation (m)	Zone	Flow (Out net) (L/s)	Hydraulic Grade (m)

400 Lanark Water Model

Average Day Demands

Reservoir Table - Time: 0.00 hours

ID	Label	Elevation (m)	Zone	Flow (Out net) (L/s)	Hydraulic Grade (m)
34	R-1 (ExJ5)	183.20	<None>	22.02	183.20
73	R-2 (J-135)	182.03	<None>	-19.76	182.03

400 Lanark Water Model

Peak Hour Demands

Junction Table - Time: 0.00 hours

ID	Label	Elevation (m)	Zone	Demand Collection	Demand (L/s)	Hydraulic Grade (m)	Pressure (psi)
35	J-1	140.54	<None>	<Collection: 1 item>	0.34	180.60	57
37	J-2	140.50	<None>	<Collection: 1 item>	1.90	180.52	57
39	J-3	140.68	<None>	<Collection: 1 item>	0.34	180.50	57
41	J-4	142.92	<None>	<Collection: 1 item>	0.99	180.45	53
43	J-5	144.95	<None>	<Collection: 1 item>	1.61	180.43	50
45	J-6	144.85	<None>	<Collection: 1 item>	1.90	180.42	50
47	J-7	144.50	<None>	<Collection: 1 item>	2.41	180.42	51
50	J-8	141.00	<None>	<Collection: 1 item>	1.04	180.51	56
52	J-9	140.95	<None>	<Collection: 1 item>	0.28	180.51	56
55	J-10	144.32	<None>	<Collection: 0 items>	0.00	180.43	51
69	J-11	143.32	<None>	<Collection: 0 items>	0.00	180.41	53
93	J-19	143.32	<None>	<Collection: 0 items>	0.00	180.42	256
95	J-20	144.56	<None>	<Collection: 0 items>	0.00	180.42	51

Reservoir Table - Time: 0.00 hours

ID	Label	Elevation (m)	Zone	Flow (Out net) (L/s)	Hydraulic Grade (m)

400 Lanark Water Model

Peak Hour Demands

Reservoir Table - Time: 0.00 hours

ID	Label	Elevation (m)	Zone	Flow (Out net) (L/s)	Hydraulic Grade (m)
34	R-1 (ExJ5)	180.66	<None>	22.78	180.66
73	R-2 (J-135)	180.02	<None>	-11.97	180.02

400 Lanark Water Model

Max Day + Fire Flow, Reduced HGL (Min. 167L/sec)

Fire Flow Results Table - Time: 0.00 hours

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow Status	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)
J-1	<None>	True	1	0.00	350.00
J-2	<None>	True	1	0.00	350.00
J-3	<None>	True	1	0.00	350.00
J-4	<None>	True	1	0.00	350.00
J-5	<None>	True	1	0.00	295.67
J-6	<None>	True	1	0.00	260.18
J-7	<None>	True	1	0.00	268.13
J-8	<None>	True	1	0.00	260.80
J-9	<None>	False	6	0.00	242.97
J-10	<None>	True	1	0.00	323.49
J-11	<None>	True	1	0.00	327.13
J-19	<None>	True	1	0.00	307.38
J-20	<None>	True	1	0.00	276.47

Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual) (psi)	Pressure (Zone Lower Limit) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Junction w/ Minimum Pressure (Zone)
250.23	350.23	0	47	0	41	J-5
250.30	350.30	0	36	0	32	J-5
250.23	350.23	0	33	0	28	J-5
250.66	350.66	0	23	0	20	J-5
251.07	296.74	0	20	0	21	J-6
251.27	261.45	0	20	0	25	J-7
251.60	269.73	0	20	0	23	J-20
250.69	261.49	0	20	0	22	J-9
250.19	243.16	0	20	0	27	J-8
250.00	323.49	0	20	0	25	J-5
250.00	327.13	0	20	0	24	J-10
250.00	307.38	0	216	0	20	J-20
250.00	276.47	0	20	0	21	J-7

Pressure (System Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)	Is Fire Flow Run Balanced?
0	41	J-5	True
0	32	J-5	True
0	28	J-5	True
0	20	J-5	True
0	21	J-6	True
0	25	J-7	True
0	23	J-20	True
0	22	J-9	True
0	27	J-8	True

400 Lanark Water Model

Max Day + Fire Flow, Reduced HGL (Min. 167L/sec)

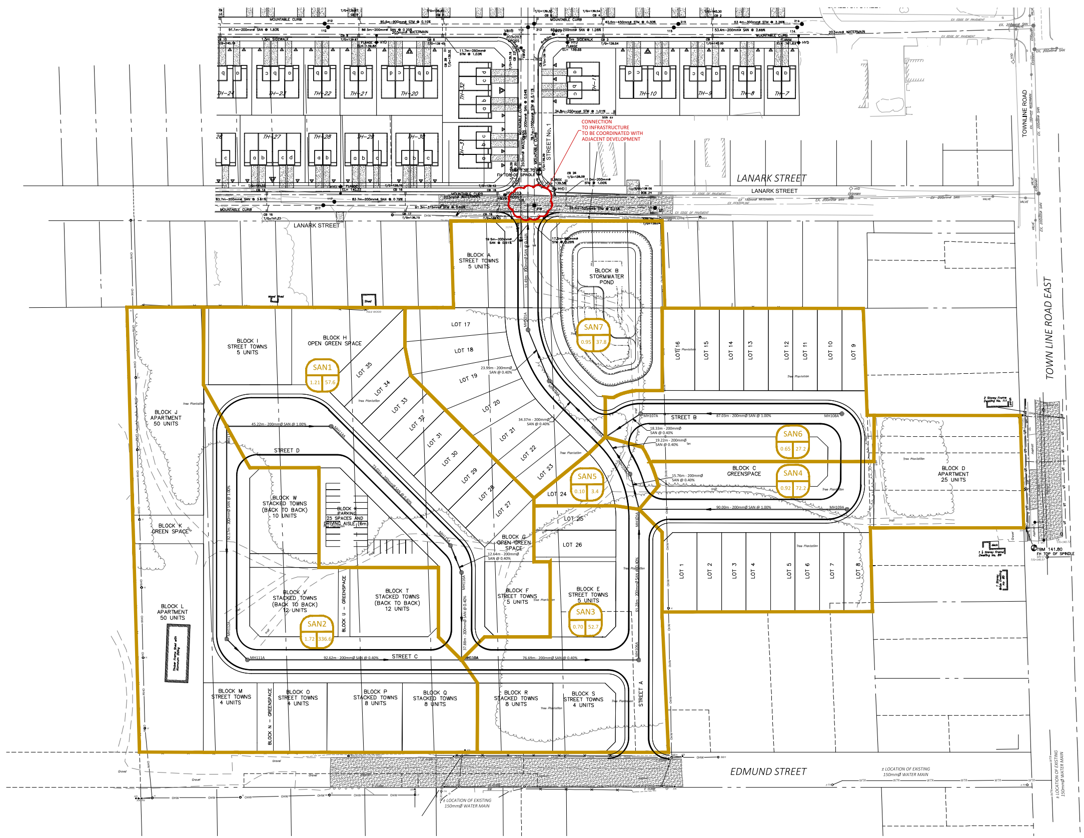
Fire Flow Results Table - Time: 0.00 hours

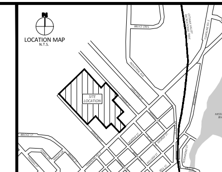
Pressure (System Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)	Is Fire Flow Run Balanced?
0	25	J-5	True
0	24	J-10	True
0	20	J-20	True
0	21	J-7	True

Reservoir Table - Time: 0.00 hours

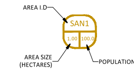
ID	Label	Elevation (m)	Zone	Flow (Out net) (L/s)	Hydraulic Grade (m)
34	R-1 (ExJ5)	180.66	<None>	19.01	180.66
73	R-2 (J-135)	180.02	<None>	-12.77	180.02

APPENDIX D
SANITARY CALCULATIONS





LEGEND



FOR REVIEW ONLY
NOT FOR CONSTRUCTION

SCALE 1 : 750
0 25 50 75 Metres

No.	Revision/Issue	Date
0	ISSUED FOR REVIEW	SEPT.14.2023

Check and verify all dimensions before proceeding with the work

Do not scale drawings

McINTOSH PERRY
3240 Drummond Cons 5A, R.R. #7, Perth, ON K7H 3C9
Tel: 613-267-6524 Fax: 613-267-7992
www.mcintoshperry.com

North:

Stamp:

Client:
WINTERGREEN RIDGE LTD.

Project:
400 LANARK STREET
WINTERGREEN RIDGE SUBDIVISION
CARLETON PLACE ONTARIO

Drawing Title:
PRELIMINARY SANITARY SERVICING PLAN

Scale: 1:750

Drawn by:

Checked By:

Designed By:

Project Number: CCO-22-0957

Drawing Number: SAN

SANITARY SEWER DESIGN SHEET

MCINTOSH PERRY

PROJECT: Wintergreen Ridge Subdivision
LOCATION: Carleton Place
CLIENT: Wintergreen Ridge Ltd.

LOCATION				RESIDENTIAL										ICI AREAS							INFILTRATION ALLOWANCE			FLOW	SEWER DATA					
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	31	32
				UNIT TYPES					AREA	POPULATION			PEAK	AREA (ha)						PEAK	AREA (ha)		FLOW	DESIGN	CAPACITY	LENGTH	DIA	SLOPE	AVAILABLE	
													FLOW	INSTITUTIONAL		COMMERCIAL		INDUSTRIAL		FLOW				FLOW					CAPACITY	
STREET	AREA ID	FROM MH	TO MH	SF	SD	TH	APT	1BD APT	(ha)	IND	CUM	PEAK FACTOR	(L/s)	IND	CUM	IND	CUM	IND	CUM	(L/s)	IND	CUM	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	L/s	(%)
	SAN1	113A	110A	9	0	10	0	0	1.21	57.6	57.6	3.64	0.68			0.00	0.00			0.00	1.21	1.21	0.40	1.08	21.64	165.00	200	0.40	20.56	95.01
	SAN2	113A	110A	0	0	58	100	0	1.72	336.6	336.6	3.45	3.76			0.00	0.00			0.00	1.72	1.72	0.57	4.33	21.64	190.00	200	0.40	17.31	80.01
	SAN3	110A	105A	2	0	17	0	0	0.70	52.7	446.9	3.40	4.92			0.00	0.00			0.00	0.70	3.63	1.20	6.12	21.64	142.00	200	0.40	15.52	71.72
	SAN4	109A	105A	8	0	0	25	0	0.92	72.2	72.2	3.62	0.85			0.00	0.00			0.00	0.92	0.92	0.30	1.15	34.22	90.00	200	1.00	33.07	96.64
	SAN5	105A	103A	1	0	0	0	0	0.10	3.4	522.5	3.37	5.71			0.00	0.00			0.00	0.10	4.65	1.54	7.24	21.64	36.00	200	0.40	14.40	66.52
	SAN6	108A	103A	8	0	0	0	0	0.65	27.2	27.2	3.69	0.33			0.00	0.00			0.00	0.65	0.65	0.21	0.54	34.22	87.00	200	1.00	33.68	98.42
	SAN7	103A	MH-EX1A	7	0	5	0	0	0.95	37.3	587.0	3.35	6.37			0.00	0.00			0.00	0.95	6.26	2.06	8.44	21.64	114.00	200	0.40	13.20	61.01

Design Parameters:

Residential		ICI Areas			Peak Factor
SF	3.4				
TH/SD	2.7	INST	28,000	L/Ha/day	1.5
APT	1.8	COM	28,000	L/Ha/day	1.5
1BD APT	1.4	IND	35,000	L/Ha/day	1.5
Other	60				

Notes:
1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 280 L/day
3. Infiltration allowance: 0.33 L/s/Ha
4. Residential Peaking Factor:
   Harmon Formula = 1+(14/(4+P^0.5)*1)
   where P = population in thousands

Designed: SH

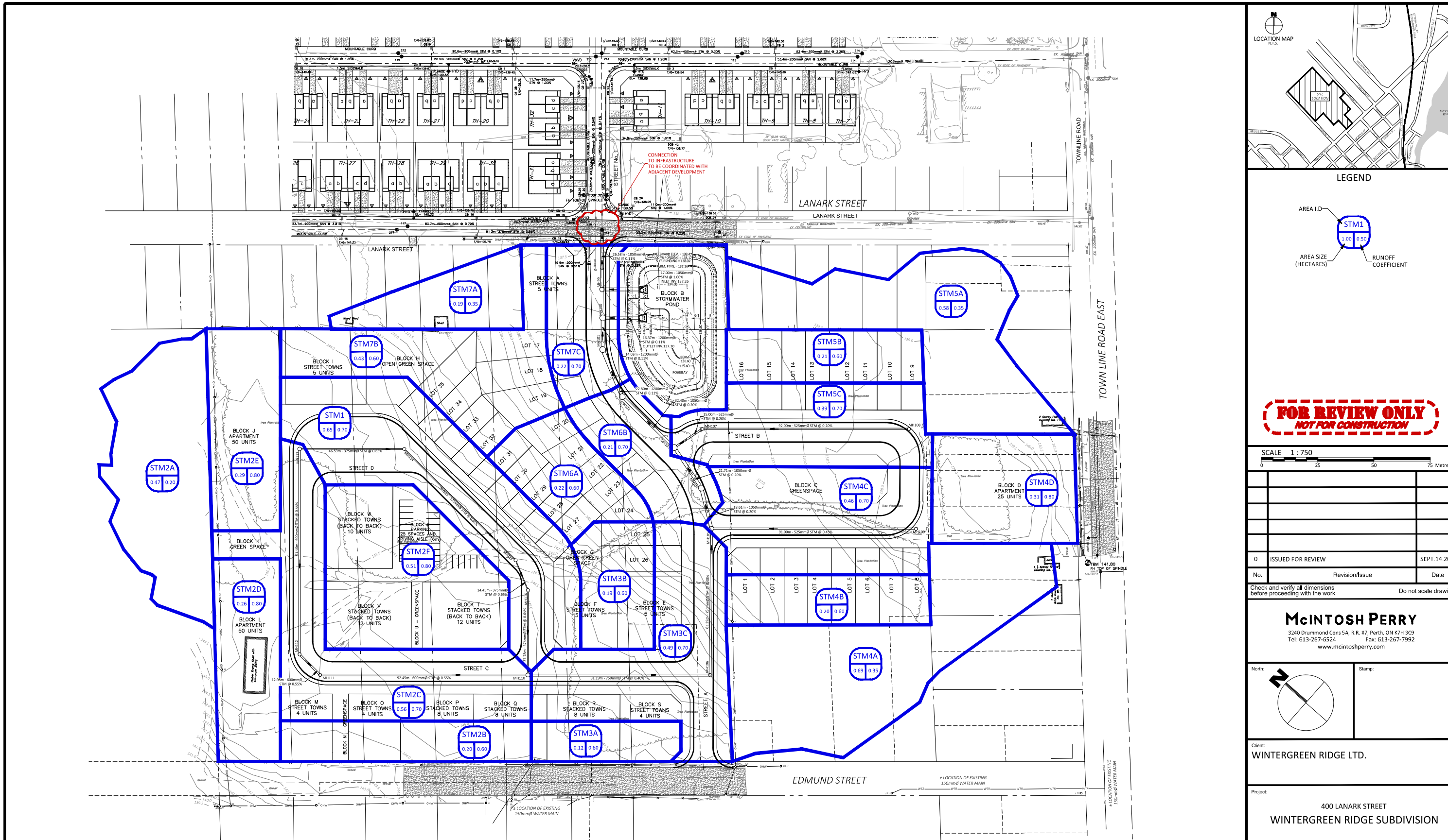
Checked: PK

Project No.: CCO-22-0957

No.	Revision	Date
1	Issued For Review	Sept.11.2023

Sheet No: 1 of 1

APPENDIX E
POST-DEVELOPMENT DRAINAGE PLAN



FOR REVIEW ONLY
NOT FOR CONSTRUCTION

SCALE 1 : 750

0 25 50 75 Metres

No.	Revision/Issue	Date
0	ISSUED FOR REVIEW	SEPT 14 2023

Check and verify all dimensions before proceeding with the work

Do not scale drawings

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North:

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WINTERGREEN RIDGE LTD.

Project:
400 LANARK STREET
WINTERGREEN RIDGE SUBDIVISION

CARLETON PLACE ONTARIO

Drawing Title:
PRELIMINARY STORM SERVICING PLAN

Scale: 1:750

Project Number: CCO-22-0957

Drawn by:

Checked By:

Designed By:

Drawing Number: STM

APPENDIX F
STORM CALCULATIONS

STORM SEWER DESIGN SHEET

McINTOSH PERRY

PROJECT: Wintergreen Ridge Subdivision
LOCATION: Carleton Place
CLIENT: Wintergreen Ridge Ltd.

LOCATION				CONTRIBUTING AREA (ha)								RATIONAL DESIGN FLOW		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
				VACANT	EX RY	PR RY	FY	APT	POND					
STREET	AREA ID	FROM MH	TO MH	C-VALUE 0.20	0.35	0.60	0.70	0.80	1.00	INDIV AC	CUMUL AC	INLET (min)	TIME IN PIPE	TOTAL (min)
	STM1	MH113	MH110				0.65			0.46	0.46	10.00	2.18	12.18
	STM2	MH113	MH110	0.47		0.20	0.56	1.06		1.45	1.45	10.00	2.02	12.02
	STM3	MH110	MH105			0.31	0.49			0.53	2.44	12.18	1.52	12.18
	STM4	MH109	MH105		0.69	0.20	0.46	0.31		0.93	0.93	10.00	1.13	11.13
	STM5	MH108	MH103		0.58	0.21	0.39			0.60	0.60	10.00	1.99	11.99
	STM6	MH105	MH102			0.22	0.21			0.28	4.25	12.18	0.85	13.03
	STM7	MH103	POND		0.19	0.43	0.22			0.48	4.73	13.03	0.79	13.82

	RATIONAL DESIGN FLOW								SEWER DATA								
2	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
AREA ID	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	W	H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr) (L/s)	(%)
STM1	104.19	122.14	178.56	131.79				131.79	147.47	169.00	375			0.65	1.293	15.67	10.63%
STM2	104.19	122.14	178.56	421.16				421.16	475.05	197.00	600			0.55	1.628	53.89	11.34%
STM3	93.94	110.07	160.83	636.72				636.72	734.54	147.00	750			0.40	1.611	97.82	13.32%
STM4	104.19	122.14	178.56	269.82				269.82	300.97	91.00	525			0.45	1.347	31.15	10.35%
STM5	104.19	122.14	178.56	174.37				174.37	200.65	107.00	525			0.20	0.898	26.27	13.09%
STM6	93.94	110.07	160.83	1,110.08				1,110.08	1,274.02	73.00	1050			0.20	1.425	163.94	12.87%
STM7	90.51	106.03	154.90	1,189.89				1,189.89	1,348.97	55.00	1200			0.11	1.155	159.08	11.79%

Definitions:
Q = 2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (ha)
i = Rainfall intensity in millimeters per hour (mm/hr)
[i = 998.071 / (TC+6.053)^0.814] 5 YEAR
[i = 1174.184 / (TC+6.014)^0.816] 10 YEAR
[i = 1735.688 / (TC+6.014)^0.820] 100 YEAR

Notes:
1. Mannings coefficient (n) = 0.013

Designed: SH
Checked: PK
Project No.: CCO-22-0957

No.	Revision	Date
1.	ISSUED FOR REVIEW	Sept.11.2023

Sheet No: 1 of 1

27FA2023P-186

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT.	PLAN 27R-12109 RECEIVED AND DEPOSITED
DATE May 10, 2023	DATE July 17, 2023
John Gauthier JOHN GAUTHIER, O.L.S.	K. Egg REPRESENTATIVE FOR THE LAND REGISTRAR FOR THE LAND TITLES DIVISION OF LANARK (No. 27)

SCHEDULE

PART	LOT	R.P.	P.I.N.	AREA (ha.)
1	All of 17, 20, 23, 26, 29, 32 And Pt of 4 & 12	787	All of 05303-0286(LT)	6.2604
	All of 89, 90, 91, 92, 93 & 94	3469		

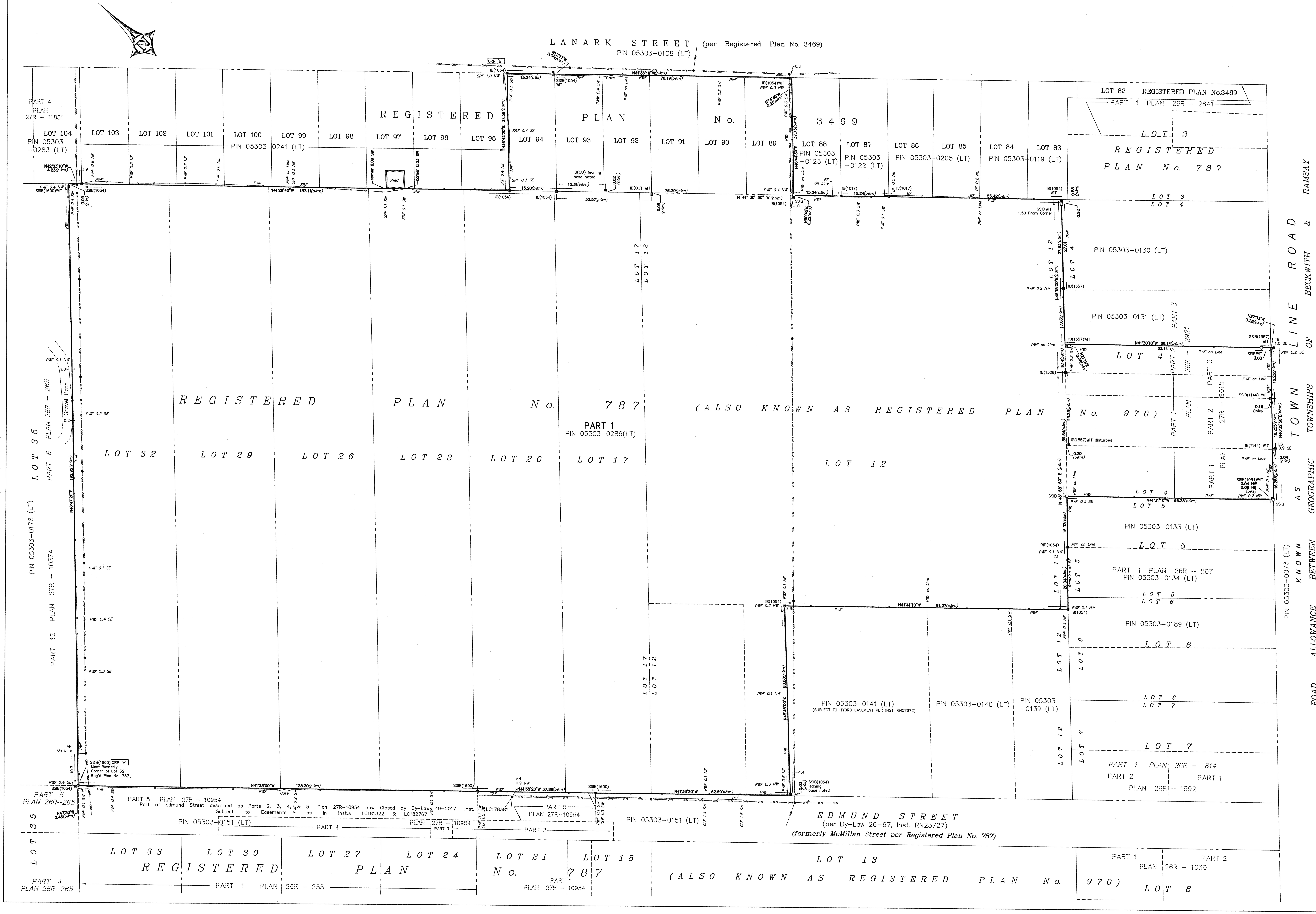
PLAN OF SURVEY OF LOTS 17, 20, 23, 26, 29 & 32 AND PART OF LOTS 4 & 12 REGISTERED PLAN No. 787 (ALSO KNOWN AS REGISTERED PLAN 970) & LOTS 89, 90, 91, 92, 93 & 94 REGISTERED PLAN No. 3469 FORMERLY IN THE GEOGRAPHIC TOWNSHIP OF RAMSAY TOWN OF CARLETON PLACE COUNTY OF LANARK

McINTOSH PERRY SURVEYING INC

SCALE 1 : 400

0 10 20 30 40 Metres

THE INTENDED PLOT SIZE OF THIS PLAN IS 1219mm IN WIDTH BY 762mm IN HEIGHT WHEN PLOTTED AT A SCALE OF 1 : 400.



METRIC :

DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

NOTE: AREA SHOWN ON THIS PLAN IN HECTARES CAN BE CONVERTED TO ACRES BY MULTIPLYING BY 2.47105.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 30TH DAY OF NOVEMBER, 2022.

DECEMBER 14, 2022
DATE

John Gauthier
JOHN GAUTHIER
ONTARIO LAND SURVEYOR

THIS PLAN OF SURVEY RELATES TO AOLS PLAN SUBMISSION FORM NUMBER V-35832.

LEGEND AND NOTES

□	DENOTES	MONUMENT PLANTED
■	DENOTES	MONUMENT FOUND
IB	DENOTES	IRON BAR
SIB	DENOTES	STANDARD IRON BAR
SSIB	DENOTES	SHORT STANDARD IRON BAR
RPL	DENOTES	ROCK PLUG
RIB	DENOTES	ROUND IRON BAR
(m)	DENOTES	MEASURED
(s)	DENOTES	SET
(p)	DENOTES	PLAN OF SURVEY WITH TOPOGRAPHY BY McINTOSH PERRY SURVEYING INC., DATED JUNE 22, 2022.
(1017)	DENOTES	CALLON DIETZ INCORPORATED
(1054)	DENOTES	G.W. BRACKEN, OLS
(1144)	DENOTES	ROGERS & PARKER INC.
(1326)	DENOTES	W.R. TAGGART, OLS
(1557)	DENOTES	SURY, ROWE & KASPRZAK LTD.
(1600)	DENOTES	G.A. SMITH SURVEYING LTD.
(OU)	DENOTES	ORIGIN UNKNOWN
WIT	DENOTES	WITNESS
AN	DENOTES	ANCHOR
LS	DENOTES	LIGHT STANDARD
TB	DENOTES	TERMINAL BOX
N,S,E,W	DENOTES	NORTH, SOUTH, EAST, WEST
-OHW-	DENOTES	OVERHEAD WIRES
BF	DENOTES	BOARD FENCE
CLF	DENOTES	CHAIN LINK FENCE
PWF	DENOTES	POST AND WIRE FENCE
SRF	DENOTES	SNAKE RAIL FENCE
R.P.	DENOTES	REGISTERED PLAN
ORP	DENOTES	OBSERVED REFERENCE POINT

SHORT STANDARD IRON BARS HAVE BEEN PLANTED IN LIEU OF STANDARD IRON BARS WHERE REQUIRED DUE TO LACK OF OVERBURDEN OR TO AVOID SUBSURFACE UTILITIES OR OTHER OBSTRUCTIONS.

DISTANCES SHOWN ON THIS PLAN ARE GROUND DISTANCES AND CAN BE CONVERTED TO GRID DISTANCES BY MULTIPLYING BY A COMBINED SCALE FACTOR OF 0.999683.

BEARINGS SHOWN ON THIS PLAN ARE UTM GRID BEARINGS, DERIVED FROM OBSERVED REFERENCE POINTS A AND B, SHOWN HEREON, BY REAL TIME NETWORK (RTN) OBSERVATIONS, AND ARE REFERRED TO THE CENTRAL MERIDIAN OF UTM ZONE 18, (75° 00' WEST LONGITUDE) NAD83 (CSRS) (2010.0)

OBSERVED REFERENCE POINTS (ORP's) DERIVED FROM GPS OBSERVATIONS USING REAL TIME NETWORK (RTN) SERVICE. UTM ZONE 18, NAD83 (CSRS) (2010.0)

COORDINATES TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10

POINT ID	NORTHING	EASTING
ORP 'A'	4999959.70	409421.30
ORP 'B'	5000011.72	409682.84

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN

JOB No. 22-4710	DRAWING: 22-4710 R-PLAN
THIS PLAN WAS PREPARED FOR: WINTERGREEN RIDGE LTD.	

McINTOSH PERRY
SURVEYING INC.
3240 Drummond Con. 5A, R.R. #7, Perth, ON K7H 3C9
Tel: 613-267-6524 Fax: 613-267-7992
www.mcintoshperry.com

CHECKED: JG	CAD: DL

Properties

PIN	05303 - 0124 LT
Description	LT 93 PL 3469 LANARK N RAMSAY ; TOWN OF CARLETON PLACE
Address	CARLETON PLACE
PIN	05303 - 0125 LT
Description	LT 94 PL 3469 LANARK N RAMSAY ; TOWN OF CARLETON PLACE
Address	CARLETON PLACE
PIN	05303 - 0142 LT
Description	PT LT 12 PL 787 LANARK N RAMSAY AKA PL 970 AS IN RN33358; TOWN OF CARLETON PLACE
Address	CARLETON PLACE
PIN	05303 - 0143 LT
Description	PT LT 12 PL 787 LANARK N RAMSAY AKA PL 970 AS IN RN30997 EXCEPT RS196301; LT 89 PL 3469 LANARK N RAMSAY; LT 90 PL 3469 LANARK N RAMSAY; LT 91 PL 3469 LANARK N RAMSAY; LT 92 PL 3469 LANARK N RAMSAY ; TOWN OF CARLETON PLACE
Address	CARLETON PLACE
PIN	05303 - 0144 LT
Description	PT LT 12 PL 787 LANARK N RAMSAY AS IN RN30997 LYING W OF E LIMIT OF RS196301; CARLETON PLACE
Address	351 EDMUND STREET CARLETON PLACE
PIN	05303 - 0145 LT
Description	LT 17 PL 787 LANARK N RAMSAY; CARLETON PLACE
Address	CARLETON PLACE
PIN	05303 - 0146 LT
Description	LT 20 PL 787 LANARK N RAMSAY; CARLETON PLACE
Address	CARLETON PLACE
PIN	05303 - 0147 LT
Description	LT 23 PL 787 LANARK N RAMSAY; CARLETON PLACE
Address	CARLETON PLACE
PIN	05303 - 0148 LT
Description	LT 26 PL 787 LANARK N RAMSAY; CARLETON PLACE
Address	CARLETON PLACE
PIN	05303 - 0149 LT
Description	LT 29 PL 787 LANARK N RAMSAY; CARLETON PLACE
Address	CARLETON PLACE
PIN	05303 - 0150 LT
Description	LT 32 PL 787 AKA PL 970 LANARK N RAMSAY; TOWN OF CARLETON PLACE
Address	CARLETON PLACE
PIN	05303 - 0192 LT
Description	PART LOT 4 PL 787 LANARK N RAMSAY AKA PL 970 PART 1 27R8015; TOWN OF CARLETON PLACE
Address	CARLETON PLACE
PIN	05303 - 0193 LT
Description	PT LT 4 PL 787 LANARK N RAMSAY AKA PL 970 PT 2, 27R8015;; TOWN OF CARLETON PLACE
Address	CARLETON PLACE
PIN	05303 - 0194 LT
Description	PT LT 4 PL 787 LANARK N RAMSAY AKA PL 970 PT 3, 27R8015; TOWN OF CARLETON PLACE
Address	CARLETON PLACE

Applicant(s)

Name	WINTERGREEN RIDGE LTD.
Address for Service	39 Wheatland Avenue, Ottawa, Ontario K2M 2L2

A person or persons with authority to bind the corporation has/have consented to the registration of this document.

This document is not authorized under Power of Attorney by this party.

Statements

The registered owner applies to consolidate the selected PINs and the proposed description for the parcels to be consolidated is See Schedules.

Signed By

Alessandro Giuseppe Pagliarello	2401-160 Elgin Street Ottawa K2P 2P7	acting for Applicant(s)	Signed	2022 08 18

Tel 613-238-6321

Fax 613-233-4553

I have the authority to sign and register the document on behalf of the Applicant(s).

Submitted By

KELLY SANTINI LLP	2401-160 Elgin Street Ottawa K2P 2P7	2022 08 18

Tel 613-238-6321

Fax 613-233-4553

Fees/Taxes/Payment

Statutory Registration Fee	$66.30
Total Paid	$66.30

File Number

Applicant Client File Number : MAT95426

SCHEDULE

LEGAL DESCRIPTIONS OF PARCELS TO BE CONSOLIDATED

FIRSTLY LT 93 PL 3469 LANARK N RAMSAY ; TOWN OF CARLETON PLACE;

SECONDLY LT 94 PL 3469 LANARK N RAMSAY ; TOWN OF CARLETON PLACE;

THIRDLY PT LT 12 PL 787 LANARK N RAMSAY AKA PL 970 AS IN RN33358; TOWN OF CARLETON PLACE;

FOURTHLY PT LT 12 PL 787 LANARK N RAMSAY AKA PL 970 AS IN RN30997 EXCEPT RS196301; LT 89 PL 3469 LANARK N RAMSAY; LT 90 PL 3469 LANARK N RAMSAY; LT 91 PL3469 LANARK N RAMSAY; LT 92 PL 3469 LANARK N RAMSAY ; TOWN OF CARLETON PLACE;

FIFTHLY PT LT 12 PL 787 LANARK N RAMSAY AS IN RN30997 LYING W OF E LIMIT OF RS196301; CARLETON PLACE;

SIXTHLY LT 17 PL 787 LANARK N RAMSAY; CARLETON PLACE;

SEVENTHLY LT 20 PL 787 LANARK N RAMSAY; CARLETON PLACE;

EIGHTHLY LT 23 PL 787 LANARK N RAMSAY; CARLETON PLACE;

NINTHLY LT 26 PL 787 LANARK N RAMSAY; CARLETON PLACE;

TENTHLY LT 29 PL 787 LANARK N RAMSAY; CARLETON PLACE;

ELEVENTHLY LT 32 PL 787 AKA PL 970 LANARK N RAMSAY; TOWN OF CARLETON PLACE;

TWELFTHLY PART LOT 4 PL 787 LANARK N RAMSAY AKA PL 970 PART 1 27R8015; TOWN OF CARLETON PLACE;

THIRTEENTHLY PT LT 4 PL 787 LANARK N RAMSAY AKA PL 970 PT 2, 27R8015;; TOWN OF CARLETON PLACE;

FOURTEENTHLY PT LT 4 PL 787 LANARK N RAMSAY AKA PL 970 PT 3, 27R8015; TOWN OF CARLETON PLACE.

Pre-Consultation Meeting Notes
Virtual zoom meeting – October 13, 2022
Prepared By: Julie Stewart

In Attendance
Mike Sullivan – President, LandPro Planning Solutions
Marko Maric – Planner, LandPro Planning Solutions
Derek Crupi - owner
Joshua Smith – McIntosh Perry
Niki Dwyer – Director of Development Services, Town of Carleton Place
Joanne Henderson - Manager of Recreation and Culture, Town of Carleton Place
Diane Reid – Planner, MVCA
Terry McCann – Director of Public Works, County of Lanark
Julie Stewart – County Planner, County of Lanark

A pre-consultation meeting was held in 2021. The agents have requested a subsequent pre-consultation meeting to review revised concept plan.

Townline Road

Townline Road is a County Road and therefore the Director of Public Works for the County of Lanark will review and provide comment on the Traffic Study. The study should address intersections, requirements for turning lanes, road widenings, entrances, any modifications, etc.

The County had been contacted by an engineering firm in regards to a Traffic Study for the proposed Inverness development at Lanark and Carleton Street. Recommended that the agents for the proposed McGuire development reach out to Inverness to coordinate studies.

The County will also review and comment on the stormwater management report and plans.

Any proposed entrance to the apartment building off of Townline Road will also need to approvals from Lanark County Public Works Department.

The Town will also be involved in the review and comment of the TIS.

Town Planning comments – Niki Dwyer

Council is not favourable on five (5) blocks of townhouses. Want some variation of the number of units consecutively. Recommended that the blocks provide a mix of types of units.

Parking – the Town does not favour surface parking. If there is surface parking it should be away from the street.

Consultant and owner noted there is an opportunity for at grade parking.

Niki supports the open space at the entrance to the development and requested that consideration be given to carry the open space "corridor" through to Lanark Street, to provide harmony.

Recommended that the consultants connect with Inverness in regards to their proposed plans for Lanark and Carleton Street development.

Noted that a portion of Edmund Street is closed.

Recommended that a market analysis for condominiums versus rental apartments be provided.

Affordable Housing – a minimum of 20% will be required to be provided.
Discussion on overall density

- Proposed density is high
- May be reduced when the townhouse blocks are redesigned

MVCA
Diane Reid – advised no Natural Heritage or Natural Hazards on site. MVCA involvement will be limited to storm water management review.

Diane did ask where the outlet would be proposed.

Joshua noted may be at Lanark Street or onto Townline Road.