vallee

Consulting Engineers,
Architects & Planners

October 11, 2022

Norfolk County
Planning Department
185 Robinson Street – Suite 200
Simcoe, ON N3Y 5L6

Attention: **Tricia Givens, M.Sc.(Pl), MCIP, RPP**

Reference: **Official Plan and Zoning Bylaw Amendment**
Cottonwood Condominiums, Waterford
Our Project #21-173

Dear Tricia,

Enclosed please find the necessary documents to complete an Official Plan and Zoning By-law amendment for the subject property, including:

- Signed Norfolk County Development Application for 260 West Church Street, dated October 6, 2022;
- Signed Norfolk County Development Application for Block D in Draft Plan of Subdivision 28TPL2016124, dated October 6, 2022;
- Cheque Payable to Norfolk County in the amount of $9,020.00 (Official Plan and Zoning Amendments Combined – Major);
- Planning Justification Report, G. Douglas Vallee Limited, dated August 9, 2022;
  - Appendix A – Concept Site Plan;
  - Appendix B – Provincial Policy Statement 2020 – Policy Compliance;
  - Appendix C – Norfolk County Official Plan – Policy Compliance.
- Proposed Building Elevations & Floor Plans;
- Functional Servicing Report, G. Douglas Vallee Limited dated August 9, 2022;
- D-6 Compatibility & Noise Assessment Study (prepared by CCS Engineering Inc. dated August 2022);
- Traffic Impact Study (prepared by Paradigm Transportation Solutions Limited, dated August 2022).

As noted in the Planning Justification Report, this application seeks the following amendments:

- Official Plan Amendment: Change the designation of a portion of the Parcel from Industrial to Urban Residential.

- Zoning Bylaw Amendment: Required to permit the following
  - Change the Zoning of the entire parcel to Urban Residential Type 4 (R4) to permit the construction of group townhouses;
  - Apply the definition of "LOT" to the entire condominium block;
  - Deem the condominium road as a private road NOT an open improved street;
  - Define the "FRONT LOT LINE" as the "LOT LINE" abutting Vanrooy Trail.

A redline application was submitted to Norfolk County on March 30, 2022 to have Block D in Draft Plan of Subdivision 28TPL2016124 removed from the draft plan. We are confident this application has been processed by County staff.

We recognize that a road closure application is required in order to officially close and convey a portion of the McCool Street road allowance in Waterford - this application is forthcoming. We kindly request to have the Official Plan and Zoning Bylaw Amendment application processed and considered while the final requirements are gathered for the road closure application.

Should you require additional information, please contact the me at 519-426-6270.

Yours truly,

Scott Puillandre, CD, MSc
Planner
G. DOUGLAS VALLEE LIMITED
Consulting Engineers, Architects & Planners
H:\Projects\2021\21-173 Cottonwood Condos\Agency\OPA-ZBA\Submission\Cover Letter.docx

Planning Department Development Application Form

Complete Application

A complete development application consists of the following:

1. A properly completed and signed application form (signature must be original in planners file);
2. Supporting information adequate to illustrate your proposal as indicated in **Section H** of this application form (plans are required in paper copy and digital PDF format);
3. Written authorization from the registered owner of the subject lands where the applicant is not the owner as per Section N; and,
4. Cash, debit or cheque payable to Norfolk County in the amount set out in the user fees By-Law.

The above information is required to ensure that your application is given full consideration. An incomplete or improperly prepared application will not be accepted and may result in delays during the processing of the application. This application must be typed or printed in ink and completed in full.

Pre-Submission Consultation "Pre-consultation":

A pre-consultation meeting with staff is required for all applications; however, minor applications may be exempted depending on the nature of the proposal, with approval from the Director of Planning or delegate. The purpose of a pre-consultation meeting is to provide the applicant with an opportunity to present the proposed application, discuss potential issues, and for the County and Agency staff to identify the required information and materials to be submitted with the application in order for it to be considered complete. The applicant has the opportunity to make revisions to the application prior to submission, without the additional costs of recirculation fees. It may be necessary to seek the assistance of independent professional help (for example, a planning consultant or engineer) for complex applications. If a pre-consultation meeting has been held to discuss your development, please **include a copy of the Pre-consultation minutes with your application** as part of the submission package. It should be noted **that pre-consultation minutes are valid for one year after the meeting date**.

Development Application Process

Once an application has been deemed complete by a planner, it will be circulated to public agencies and County departments for review and comments. Notice of the application is also provided to adjacent land owners. The comments received assist the planner with the review and recommendation/approval of your application. The time involved in processing an application varies depending upon its complexity and its

acceptability to the other agencies and is subject to statutory *Planning Act* decision timeframes.

An additional fee will be required if a review by the Long Point Region Conservation Authority or by the Grand River Conservation Authority is deemed necessary by planning staff and/or by the Authority. A separate cheque payable to the Long Point Region Conservation Authority or the Grand River Conservation Authority is required in accordance with their fee schedule at the same time your application is submitted.

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If the application is withdrawn prior to the circulation to commenting agencies, the entire original fee will be refunded. If withdrawn after the circulation to agencies, half the original fee will be refunded. If your drawings are required to be recirculated there will be an additional fee. Also, please note that if your engineering drawings require more than three reviews due to revisions by the owner or failure to revise your engineering drawings as requested, an additional fee will be charged. No refund is available after the public meeting and/or after approval of application.

Notification Sign Requirements

For the purpose of public notification and in order for staff to locate your lands for appropriate applications (zoning, subdivision, condominium or official plan) you will be given a sign to indicate the intent and purpose of your development application. It is your responsibility to:

1. Post one sign per frontage in a conspicuous location on the subject lands;
2. Ensure one sign is posted at the front of the subject lands at least three feet above ground level, not on a tree;
3. Notify the Planner when the sign is in place in order to avoid processing delays; and
4. Maintain the sign until the development application is finalized and thereafter removed.

Contact Us

For additional information or assistance in completing this application, please contact a planner at 519-426-5870 or 519-875-4485 extension 1842 or planning@norfolkcounty.ca. Please submit the completed application and fees to the attention of the Planning Department at 185 Robinson Street, Suite 200, Simcoe, ON N3Y 5L6.

For Office Use Only:

File Number		Public Notice Sign	
Related File Number		Application Fee	
Pre-consultation Meeting		Conservation Authority Fee	
Application Submitted		Well & Septic Info Provided	
Complete Application		Planner	

Check the type of planning application(s) you are submitting.

- [x] Official Plan Amendment
- [x] Zoning By-Law Amendment
- [ ] Temporary Use By-law
- [ ] Draft Plan of Subdivision/Vacant Land Condominium
- [ ] Condominium Exemption
- [ ] Site Plan Application
- [ ] Extension of a Temporary Use By-law
- [ ] Part Lot Control
- [ ] Cash-in-Lieu of Parking
- [ ] Renewable Energy Project or Radio Communication Tower

Please summarize the desired end result of this application (for example: a special zoning provision on the subject lands to include additional use(s), changing the zone and/or official plan designation of the subject lands, creating a certain number of lots, or similar)

Official Plan Amendment to change designation of a portion of the parcel from Industrial to Urban Residential
Zoning Bylaw Amendment to change the zoning of the entire parcel to Urban Residential Type 4 (R4) and
to apply a site specific provision to apply the definition of a "LOT" to the entire condominium block and
to deem the condominium road as a private road NOT an open improved street and to define the "FRONT LOT LINE"

Property Assessment Roll Number: 33503002600

A. Applicant Information

Name of Owner Paul R. Laevens & Darlene M. Laevens

It is the responsibility of the owner or applicant to notify the planner of any changes in ownership within 30 days of such a change.

Address 260 Church Street West

Town and Postal Code Waterford, ON N0E1Y0

Phone Number

Cell Number (519)732-8520

Email paulrlaevens@gmail.com

Name of Applicant AUCOIN-DIXON DEVELOPMENTS INC.

Address 75 BRANT AVE

Town and Postal Code BRANTFORD, ON, N3T 3H2

Phone Number 519-755-6252

Cell Number 519-754-9942

Email paulaucoin@hotmail.ca

Name of Agent G. Douglas Vallee Limited

Address 2 Talbot Street North

Town and Postal Code Simcoe Ontario N3Y 3W4

Phone Number 519-426-6270

Cell Number

Email scottpuillandre@gdvallee.ca

Please specify to whom all communications should be sent. Unless otherwise directed, all correspondence and notices in respect of this application will be forwarded to both owner and agent noted above.

☐ Owner ■ Agent ☐ Applicant

Names and addresses of any holder of any mortgagees, charges or other encumbrances on the subject lands: None

B. Location, Legal Description and Property Information

1. Legal Description (include Geographic Township, Concession Number, Lot Number, Block Number and Urban Area or Hamlet):

   WAT PLAN 97B PT LOTS 2 TO 9

   Municipal Civic Address: 260 West Church St

   Present Official Plan Designation(s): Urban Residential and Industrial

   Present Zoning: MG

2. Is there a special provision or site specific zone on the subject lands?

   ☐ Yes ■ No If yes, please specify corresponding number:

3. Present use of the subject lands:
   Residential

4. Please describe **all existing** buildings or structures on the subject lands and whether they are to be retained, demolished or removed. If retaining the buildings or structures, please describe the type of buildings or structures, and illustrate the setback, in metric units, from front, rear and side lot lines, ground floor area, gross floor area, lot coverage, number of storeys, width, length, and height on your attached sketch which must be included with your application:
   Single Detached dwelling and accessory buildings

5. If an addition to an existing building is being proposed, please explain what it will be used for (for example: bedroom, kitchen, or bathroom). If new fixtures are proposed, please describe.
   NA

6. Please describe **all proposed** buildings or structures/additions on the subject lands. Describe the type of buildings or structures/additions, and illustrate the setback, in metric units, from front, rear and side lot lines, ground floor area, gross floor area, lot coverage, number of storeys, width, length, and height on your attached sketch which must be included with your application:
   Group townhouses - see concept plan provided by G. Douglas Vallee

7. Are any existing buildings on the subject lands designated under the *Ontario Heritage Act* as being architecturally and/or historically significant? Yes ☐ No ■

   If yes, identify and provide details of the building:

8. If known, the length of time the existing uses have continued on the subject lands:
   Decades
9. Existing use of abutting properties:
   Residential and Industrial
10. Are there any easements or restrictive covenants affecting the subject lands?

    ☐ Yes ■ No If yes, describe the easement or restrictive covenant and its effect:

C. Purpose of Development Application

Note: Please complete all that apply.

1. Please explain what you propose to do on the subject lands/premises which makes this development application necessary:
   Condominium Development in the form of Group Townhouses
2. Please explain why it is not possible to comply with the provision(s) of the Zoning By-law/and or Official Plan:
   Current designation and official plan do not permit this form of development
3. Does the requested amendment alter all or any part of the boundary of an area of settlement in the municipality or implement a new area of settlement in the municipality? ☐ Yes ■ No If yes, describe its effect:
4. Does the requested amendment remove the subject land from an area of employment? ☐ Yes ■ No If yes, describe its effect:

5. Does the requested amendment alter, replace, or delete a policy of the Official Plan? ☐ Yes ☒ No If yes, identify the policy, and also include a proposed text of the policy amendment (if additional space is required, please attach a separate sheet):

_____

_____

_____

6. Description of land intended to be severed in metric units:

Frontage: _____

Depth: _____

Width: _____

Lot Area: _____

Present Use: _____

Proposed Use: _____

Proposed final lot size (if boundary adjustment): _____

If a boundary adjustment, identify the assessment roll number and property owner of the lands to which the parcel will be added: _____

_____

Description of land intended to be retained in metric units:

Frontage: _____

Depth: _____

Width: _____

Lot Area: _____

Present Use: _____

Proposed Use: _____

Buildings on retained land: _____

7. Description of proposed right-of-way/easement:

Frontage: _____

Depth: _____

Width: _____

Area: _____

Proposed use: _____

8. Name of person(s), if known, to whom lands or interest in lands to be transferred, leased or charged (if known):

_____

9. **Site Information**	**Zoning**	**Proposed**
Please indicate unit of measurement, for example: m, m^2 or %		
Lot frontage	3m0m	35.2m
Lot depth	NA	NA
Lot width	NA	NA
Lot area	195m2	20209m2
Lot coverage	NA	NA
Front yard	6m	>6m and 6.9m
Rear yard	Through Lot	NA
Left Interior side yard	3m	3m
Right Interior side yard	3m	3m
Exterior side yard (corner lot)	NA	NA
Landscaped open space	50%	>50%
Entrance access width	7.5m	7.5m
Exit access width	7.5m	7.5m
Size of fencing or screening	NA	NA
Type of fencing	NA	NA

10. Building Size

Number of storeys	NA	1 Storey
Building height	11m	< 11m
Total ground floor area	NA	136m2
Total gross floor area	NA	136m2
Total useable floor area	NA	136m2

11. Off Street Parking and Loading Facilities

Number of off street parking spaces	60	120
Number of visitor parking spaces	10	13
Number of accessible parking spaces	1	1
Number of off street loading facilities	NA	NA

12. Residential (if applicable)

Number of buildings existing: Single detached dwelling and accessory buildings

Number of buildings proposed: 30 dwelling units

Is this a conversion or addition to an existing building? ☐ Yes ■ No

If yes, describe: _____

Type	Number of Units	Floor Area per Unit in m2
Single Detached		
Semi-Detached		
Duplex		
Triplex		
Four-plex		
Street Townhouse	30	136m2
Stacked Townhouse		
Apartment - Bachelor		
Apartment - One bedroom		
Apartment - Two bedroom		
Apartment - Three bedroom		

Other facilities provided (for example: play facilities, underground parking, games room, or swimming pool):

13. Commercial/Industrial Uses (if applicable)

Number of buildings existing: _____

Number of buildings proposed: _____

Is this a conversion or addition to an existing building? ☐ Yes ■ No

If yes, describe:

_____

Indicate the gross floor area by the type of use (for example: office, retail, or storage):

_____

_____

_____

Seating Capacity (for assembly halls or similar): _____

Total number of fixed seats: _____

Describe the type of business(es) proposed: _____

Total number of staff proposed initially: _____

Total number of staff proposed in five years: _____

Maximum number of staff on the largest shift: _____

Is open storage required: ☐ Yes ☐ No

Is a residential use proposed as part of, or accessory to commercial/industrial use?

☐ Yes ☒ No If yes please describe:

_____

_____

14. Institutional (if applicable)

Describe the type of use proposed: _____

Seating capacity (if applicable): _____

Number of beds (if applicable): _____

Total number of staff proposed initially: _____

Total number of staff proposed in five years: _____

Maximum number of staff on the largest shift: _____

Indicate the gross floor area by the type of use (for example: office, retail, or storage):

_____

_____

_____

15. Describe Recreational or Other Use(s) (if applicable)

_____

_____

_____

_____

_____

D. Previous Use of the Property

1. Has there been an industrial or commercial use on the subject lands or adjacent lands? ■ Yes ☐ No ☐ Unknown
   If yes, specify the uses (for example: gas station or petroleum storage):
   Alpha Vico company claims to be a school furniture manufacturer
2. Is there reason to believe the subject lands may have been contaminated by former uses on the site or adjacent sites? ☐ Yes ■ No ☐ Unknown
3. Provide the information you used to determine the answers to the above questions:
4. If you answered yes to any of the above questions in Section D, a previous use inventory showing all known former uses of the subject lands, or if appropriate, the adjacent lands, is needed. Is the previous use inventory attached? ☐ Yes ■ No

E. Provincial Policy

1. Is the requested amendment consistent with the provincial policy statements issued under subsection 3(1) of the *Planning Act, R.S.O. 1990, c. P. 13*? ■ Yes ☐ No

   If no, please explain:
2. It is owner's responsibility to be aware of and comply with all relevant federal or provincial legislation, municipal by-laws or other agency approvals, including the Endangered Species Act, 2007. Have the subject lands been screened to ensure that development or site alteration will not have any impact on the habitat for endangered or threatened species further to the provincial policy statement subsection 2.1.7? ■ Yes ☐ No

   If no, please explain:

3. Have the subject lands been screened to ensure that development or site alteration will not have any impact on source water protection? ☐ Yes ■ No

   If no, please explain:
   Not requested by municipality

   Note: If in an area of source water Wellhead Protection Area (WHPA) A, B or C please attach relevant information and approved mitigation measures from the Risk Manager Official.

4. Are any of the following uses or features on the subject lands or within 500 metres of the subject lands, unless otherwise specified? Please check boxes, if applicable.

   Livestock facility or stockyard (submit MDS Calculation with application)
   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Wooded area
   ☐ On the subject lands or ■ within 500 meters – distance 200m

   Municipal Landfill
   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Sewage treatment plant or waste stabilization plant
   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Provincially significant wetland (class 1, 2 or 3) or other environmental feature
   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Floodplain
   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Rehabilitated mine site
   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Non-operating mine site within one kilometre
   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Active mine site within one kilometre
   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Industrial or commercial use (specify the use(s))
   ☐ On the subject lands or ■ within 500 meters – distance Adjacent

   Active railway line
   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Seasonal wetness of lands
   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Erosion
   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Abandoned gas wells
   ☐ On the subject lands or ☐ within 500 meters – distance _____

F. Servicing and Access

1. Indicate what services are available or proposed:

Water Supply

- ■ Municipal piped water
- ☐ Individual wells
- ☐ Communal wells
- ☐ Other (describe below)

Sewage Treatment

- ■ Municipal sewers
- ☐ Septic tank and tile bed in good working order
- ☐ Communal system
- ☐ Other (describe below)

Storm Drainage

- ■ Storm sewers
- ☐ Other (describe below)
- ☐ Open ditches

2. Existing or proposed access to subject lands:

- ■ Municipal road
- ☐ Unopened road
- ☐ Provincial highway
- ☐ Other (describe below)

Name of road/street: West Church St and Vanroy Trail

G. Other Information

1. Does the application involve a local business? ☐ Yes ■ No
   If yes, how many people are employed on the subject lands?

2. Is there any other information that you think may be useful in the review of this application? If so, explain below or attach on a separate page.

H. Supporting Material to be submitted by Applicant

In order for your application to be considered complete, **folded** hard copies (number of paper copies as directed by the planner) and an **electronic version (PDF) of the properly named site plan drawings, additional plans, studies and reports** will be required, including but not limited to the following details:

1. Concept/Layout Plan
2. All measurements in metric
3. Key map
4. Scale, legend and north arrow
5. Legal description and municipal address
6. Development name
7. Drawing title, number, original date and revision dates
8. Owner's name, address and telephone number
9. Engineer's name, address and telephone number
10. Professional engineer's stamp
11. Existing and proposed easements and right of ways
12. Zoning compliance table – required versus proposed
13. Parking space totals – required and proposed
14. All entrances to parking areas marked with directional arrows
15. Loading spaces, facilities and routes (for commercial developments)
16. All dimensions of the subject lands
17. Dimensions and setbacks of all buildings and structures
18. Location and setbacks of septic system and well from all existing and proposed lot lines, and all existing and proposed structures
19. Gross, ground and useable floor area
20. Lot coverage
21. Floor area ratio
22. Building entrances, building type, height, grades and extent of overhangs
23. Names, dimensions and location of adjacent streets including daylighting triangles
24. Driveways, curbs, drop curbs, pavement markings, widths, radii and traffic directional signs
25. All exterior stairways and ramps with dimensions and setbacks
26. Retaining walls including materials proposed
27. Fire access and routes
28. Location, dimensions and number of parking spaces (including visitor and accessible) and drive aisles
29. Location of mechanical room, and other building services (e.g. A/C, HRV)
30. Refuse disposal and storage areas including any related screening (if indoors, need notation on site plan)
31. Winter snow storage location

32. Landscape areas with dimensions
33. Natural features, watercourses and trees
34. Fire hydrants and utilities location
35. Fencing, screening and buffering – size, type and location
36. All hard surface materials
37. Light standards and wall mounted lights (plus a note on the site plan that all outdoor lighting is to be dark sky compliant)
38. Business signs (make sure they are not in sight lines)
39. Sidewalks and walkways with dimensions
40. Pedestrian access routes into site and around site
41. Bicycle parking
42. Architectural elevations of all building sides
43. All other requirements as per the pre-consultation meeting

In addition, the following additional plans, studies and reports, including but not limited to, **may** also be required as part of the complete application submission:

☐ Zoning Deficiency Form

☐ On-Site Sewage Disposal System Evaluation Form (to verify location and condition)

☐ Architectural Plan

☐ Buildings Elevation Plan

☐ Cut and Fill Plan

☐ Erosion and Sediment Control Plan

☐ Grading and Drainage Control Plan (around perimeter and within site) (existing and proposed)

☐ Landscape Plan

☐ Photometric (Lighting) Plan

☐ Plan and Profile Drawings

☐ Site Servicing Plan

☐ Storm water Management Plan

☐ Street Sign and Traffic Plan

☐ Street Tree Planting Plan

☐ Tree Preservation Plan

☐ Archaeological Assessment

☐ Environmental Impact Study

☐ Functional Servicing Report

☐ Geotechnical Study / Hydrogeological Review

☐ Minimum Distance Separation Schedule

☐ Noise or Vibration Study

☐ Record of Site Condition

☐ Storm water Management Report

☐ Traffic Impact Study – please contact the Planner to verify the scope required

Site Plan applications will require the following supporting materials:

1. Two (2) complete sets of the site plan drawings folded to 8½ x 11 and an electronic version in PDF format
2. Letter requesting that the Holding be removed (if applicable)
3. A cost estimate prepared by the applicant's engineer
4. An estimate for Parkland dedication by a certified land appraiser
5. Property Identification Number (PIN) printout

Standard condominium exemptions will require the following supporting materials:

☐ Plan of standard condominium (2 paper copies and 1 electronic copy)

☐ Draft condominium declaration

☐ Property Identification Number (PIN) printout

Your development approval might also be dependent on Ministry of Environment and Climate Change, Ministry of Transportation or other relevant federal or provincial legislation, municipal by-laws or other agency approvals.

All final plans must include the owner's signature as well as the engineer's signature and seal.

I. Development Agreements

A development agreement may be required prior to approval for site plan, subdivision and condominium applications. Should this be necessary for your development, you will be contacted by the agreement administrator with further details of the requirements including but not limited to insurance coverage, professional liability for your engineer, additional fees and securities.

J. Transfers, Easements and Postponement of Interest

The owner acknowledges and agrees that if required it is their solicitor's responsibility on behalf of the owner for the registration of all transfer(s) of land to the County, and/or transfer(s) of easement in favour of the County and/or utilities. Also, the owner further acknowledges and agrees that it is their solicitor's responsibility on behalf of the owner for the registration of postponements of any charges in favour of the County.

K. Permission to Enter Subject Lands

Permission is hereby granted to Norfolk County officers, employees or agents, to enter the premises subject to this application for the purposes of making inspections associated with this application, during normal and reasonable working hours.

L. Freedom of Information

For the purposes of the *Municipal Freedom of Information and Protection of Privacy Act*, I authorize and consent to the use by or the disclosure to any person or public body any information that is collected under the authority of the *Planning Act, R.S.O. 1990, c. P. 13* for the purposes of processing this application.

X Paul R. Laevens Darlene Laevens — Aug 21 2022

Owner/Applicant Signature — Date

M. Owner's Authorization

If the applicant/agent is not the registered owner of the lands that is the subject of this application, the owner(s) must complete the authorization set out below.

I/We Paul R. Laevens & Darlene M. Laevens am/are the registered owner(s) of the lands that is the subject of this application.

I/We authorize G. Douglas Vallee Limited to make this application on my/our behalf and to provide any of my/our personal information necessary for the processing of this application. Moreover, this shall be your good and sufficient authorization for so doing.

X _____ — Aug 21 2022

Owner — Date

X Darlene Laevens — Aug 21 2022

Owner — Date

N. Declaration

I, Paul R. Laevens & Darlene M. Laevens of Waterford, ON

solemnly declare that:

all of the above statements and the statements contained in all of the exhibits transmitted herewith are true and I make this solemn declaration conscientiously believing it to be true and knowing that it is of the same force and effect as if made under oath and by virtue of *The Canada Evidence Act.*

Declared before me
at: Norfolk County

In Town of Simcoe

This 6th day of October

A.D., 2022

A Commissioner, etc.

SCOTT CONNELL PUILLANDRE,
a Commissioner, etc., Province of Ontario,
for G. Douglas Vallee Limited.
Expires August 19, 2025.

Paul Laevens Darlene Laevens

Owner/Applicant Signature

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If the application is withdrawn prior to the circulation to commenting agencies, the entire original fee will be refunded. If withdrawn after the circulation to agencies, half the original fee will be refunded. If your drawings are required to be recirculated there will be an additional fee. Also, please note that if your engineering drawings require more than three reviews due to revisions by the owner or failure to revise your engineering drawings as requested, an additional fee will be charged. No refund is available after the public meeting and/or after approval of application.

Notification Sign Requirements

For the purpose of public notification and in order for staff to locate your lands for appropriate applications (zoning, subdivision, condominium or official plan) you will be given a sign to indicate the intent and purpose of your development application. It is your responsibility to:

1. Post one sign per frontage in a conspicuous location on the subject lands;
2. Ensure one sign is posted at the front of the subject lands at least three feet above ground level, not on a tree;
3. Notify the Planner when the sign is in place in order to avoid processing delays; and
4. Maintain the sign until the development application is finalized and thereafter removed.

Contact Us

For additional information or assistance in completing this application, please contact a planner at 519-426-5870 or 519-875-4485 extension 1842 or planning@norfolkcounty.ca. Please submit the completed application and fees to the attention of the Planning Department at 185 Robinson Street, Suite 200, Simcoe, ON N3Y 5L6.

For Office Use Only:

File Number	_____	Public Notice Sign	_____
Related File Number	_____	Application Fee	_____
Pre-consultation Meeting	_____	Conservation Authority Fee	_____
Application Submitted	_____	Well & Septic Info Provided	_____
Complete Application	_____	Planner	_____

Check the type of planning application(s) you are submitting.

- ☐ Official Plan Amendment
- ☐ Zoning By-Law Amendment
- ☐ Temporary Use By-law
- ☐ Draft Plan of Subdivision/Vacant Land Condominium
- ☐ Condominium Exemption
- ☐ Site Plan Application
- ☐ Extension of a Temporary Use By-law
- ☐ Part Lot Control
- ☐ Cash-in-Lieu of Parking
- ☐ Renewable Energy Project or Radio Communication Tower

Please summarize the desired end result of this application (for example: a special zoning provision on the subject lands to include additional use(s), changing the zone and/or official plan designation of the subject lands, creating a certain number of lots, or similar)

_____
_____
_____
_____
_____
_____
_____

Property Assessment Roll Number: _____

A. Applicant Information

Name of Owner Aucoin Dixon Developments Inc

It is the responsibility of the owner or applicant to notify the planner of any changes in ownership within 30 days of such a change.

Address 75 Brant Ave

Town and Postal Code Brantford, ON, N3T 3H2

Phone Number 519-753-9495

Cell Number 519-754-9942

Email paulaucoin@hotmail.ca

Name of Applicant

Address

Town and Postal Code

Phone Number

Cell Number

Email

Name of Agent G. Douglas Vallee Limited

Address 2 Talbot Street North

Town and Postal Code Simcoe Ontario N3Y 3W4

Phone Number 519-426-6270

Cell Number

Email scottpuillandre@gdvallee.ca

Please specify to whom all communications should be sent. Unless otherwise directed, all correspondence and notices in respect of this application will be forwarded to both owner and agent noted above.

☐ Owner ■ Agent ☐ Applicant

Names and addresses of any holder of any mortgagees, charges or other encumbrances on the subject lands:

Royal Bank of Canada

95 Lynden Rd, Brantford, ON, N3R 7J9

B. Location, Legal Description and Property Information

1. Legal Description (include Geographic Township, Concession Number, Lot Number, Block Number and Urban Area or Hamlet):

   _____

   _____

   Municipal Civic Address: _____

   Present Official Plan Designation(s): _____

   Present Zoning: _____

2. Is there a special provision or site specific zone on the subject lands?

   ☐ Yes ☐ No If yes, please specify corresponding number:

   _____

3. Present use of the subject lands:

   _____

   _____

4. Please describe **all existing** buildings or structures on the subject lands and whether they are to be retained, demolished or removed. If retaining the buildings or structures, please describe the type of buildings or structures, and illustrate the setback, in metric units, from front, rear and side lot lines, ground floor area, gross floor area, lot coverage, number of storeys, width, length, and height on your attached sketch which must be included with your application:

   _____

   _____

   _____

5. If an addition to an existing building is being proposed, please explain what it will be used for (for example: bedroom, kitchen, or bathroom). If new fixtures are proposed, please describe.

   _____

   _____

   _____

6. Please describe **all proposed** buildings or structures/additions on the subject lands. Describe the type of buildings or structures/additions, and illustrate the setback, in metric units, from front, rear and side lot lines, ground floor area, gross floor area, lot coverage, number of storeys, width, length, and height on your attached sketch which must be included with your application:

   _____

   _____

   _____

7. Are any existing buildings on the subject lands designated under the *Ontario Heritage Act* as being architecturally and/or historically significant? Yes ☐ No ☐

   If yes, identify and provide details of the building:

   _____

   _____

8. If known, the length of time the existing uses have continued on the subject lands:

   _____

9. Existing use of abutting properties:

   _____

10. Are there any easements or restrictive covenants affecting the subject lands?

    ☐ Yes ☐ No If yes, describe the easement or restrictive covenant and its effect:

    _____

C. Purpose of Development Application

Note: Please complete all that apply.

1. Please explain what you propose to do on the subject lands/premises which makes this development application necessary:

   _____

   _____

   _____

   _____

2. Please explain why it is not possible to comply with the provision(s) of the Zoning By-law/and or Official Plan:

   _____

   _____

   _____

3. Does the requested amendment alter all or any part of the boundary of an area of settlement in the municipality or implement a new area of settlement in the municipality? ☐ Yes ☐ No If yes, describe its effect:

   _____

   _____

   _____

4. Does the requested amendment remove the subject land from an area of employment? ☐ Yes ☐ No If yes, describe its effect:

   _____

   _____

   _____

5. Does the requested amendment alter, replace, or delete a policy of the Official Plan? ☐ Yes ☐ No If yes, identify the policy, and also include a proposed text of the policy amendment (if additional space is required, please attach a separate sheet):

   _____

   _____

   _____

6. Description of land intended to be severed in metric units:
   Frontage: _____
   Depth: _____
   Width: _____
   Lot Area: _____
   Present Use: _____
   Proposed Use: _____
   Proposed final lot size (if boundary adjustment): _____
   If a boundary adjustment, identify the assessment roll number and property owner of the lands to which the parcel will be added: _____

   _____

   Description of land intended to be retained in metric units:
   Frontage: _____
   Depth: _____
   Width: _____
   Lot Area: _____
   Present Use: _____
   Proposed Use: _____
   Buildings on retained land: _____
7. Description of proposed right-of-way/easement:
   Frontage: _____
   Depth: _____
   Width: _____
   Area: _____
   Proposed use: _____
8. Name of person(s), if known, to whom lands or interest in lands to be transferred, leased or charged (if known):

   _____

9. **Site Information**	**Zoning**	**Proposed**
Please indicate unit of measurement, for example: m, m^2 or %		
Lot frontage	_____	_____
Lot depth	_____	_____
Lot width	_____	_____
Lot area	_____	_____
Lot coverage	_____	_____
Front yard	_____	_____
Rear yard	_____	_____
Left Interior side yard	_____	_____
Right Interior side yard	_____	_____
Exterior side yard (corner lot)	_____	_____
Landscaped open space	_____	_____
Entrance access width	_____	_____
Exit access width	_____	_____
Size of fencing or screening	_____	_____
Type of fencing	_____	_____

10. Building Size

Number of storeys	_____	_____
Building height	_____	_____
Total ground floor area	_____	_____
Total gross floor area	_____	_____
Total useable floor area	_____	_____

11. Off Street Parking and Loading Facilities

Number of off street parking spaces	_____	_____
Number of visitor parking spaces	_____	_____
Number of accessible parking spaces	_____	_____
Number of off street loading facilities	_____	_____

12. Residential (if applicable)

Number of buildings existing: _____

Number of buildings proposed: _____

Is this a conversion or addition to an existing building? ☐ Yes ☐ No

If yes, describe: _____

Type	**Number of Units**	**Floor Area per Unit in m2**
Single Detached	_____	_____
Semi-Detached	_____	_____
Duplex	_____	_____
Triplex	_____	_____
Four-plex	_____	_____
Street Townhouse	_____	_____
Stacked Townhouse	_____	_____
Apartment - Bachelor	_____	_____
Apartment - One bedroom	_____	_____
Apartment - Two bedroom	_____	_____
Apartment - Three bedroom	_____	_____

Other facilities provided (for example: play facilities, underground parking, games room, or swimming pool):

13. Commercial/Industrial Uses (if applicable)

Number of buildings existing: _____

Number of buildings proposed: _____

Is this a conversion or addition to an existing building? ☐ Yes ☐ No

If yes, describe:

_____

Indicate the gross floor area by the type of use (for example: office, retail, or storage):

_____

_____

_____

Seating Capacity (for assembly halls or similar): _____

Total number of fixed seats: _____

Describe the type of business(es) proposed: _____

Total number of staff proposed initially: _____

Total number of staff proposed in five years: _____

Maximum number of staff on the largest shift: _____

Is open storage required: ☐ Yes ☐ No

Is a residential use proposed as part of, or accessory to commercial/industrial use?

☐ Yes ☐ No If yes please describe:

_____

_____

14. Institutional (if applicable)

Describe the type of use proposed: _____

Seating capacity (if applicable): _____

Number of beds (if applicable): _____

Total number of staff proposed initially: _____

Total number of staff proposed in five years: _____

Maximum number of staff on the largest shift: _____

Indicate the gross floor area by the type of use (for example: office, retail, or storage):

_____

_____

_____

15. Describe Recreational or Other Use(s) (if applicable)

_____

_____

_____

_____

_____

D. Previous Use of the Property

1. Has there been an industrial or commercial use on the subject lands or adjacent lands? ☐ Yes ☐ No ☐ Unknown
   If yes, specify the uses (for example: gas station or petroleum storage):

   _____

   _____
2. Is there reason to believe the subject lands may have been contaminated by former uses on the site or adjacent sites?☐ Yes ☐ No ☐ Unknown
3. Provide the information you used to determine the answers to the above questions:

   _____

   _____

   _____
4. If you answered yes to any of the above questions in Section D, a previous use inventory showing all known former uses of the subject lands, or if appropriate, the adjacent lands, is needed. Is the previous use inventory attached? ☐ Yes ☐ No

E. Provincial Policy

1. Is the requested amendment consistent with the provincial policy statements issued under subsection 3(1) of the *Planning Act, R.S.O. 1990, c. P. 13*? ☐ Yes ☐ No

   If no, please explain:

   _____

   _____

   _____
2. It is owner's responsibility to be aware of and comply with all relevant federal or provincial legislation, municipal by-laws or other agency approvals, including the Endangered Species Act, 2007. Have the subject lands been screened to ensure that development or site alteration will not have any impact on the habitat for endangered or threatened species further to the provincial policy statement subsection 2.1.7? ☐ Yes ☐ No

   If no, please explain:

   _____

   _____

   _____

3. Have the subject lands been screened to ensure that development or site alteration will not have any impact on source water protection? ☐ Yes ☐ No

   If no, please explain:

   _____

   _____

   Note: If in an area of source water Wellhead Protection Area (WHPA) A, B or C please attach relevant information and approved mitigation measures from the Risk Manager Official.

4. Are any of the following uses or features on the subject lands or within 500 metres of the subject lands, unless otherwise specified? Please check boxes, if applicable.

   Livestock facility or stockyard (submit MDS Calculation with application)

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Wooded area

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Municipal Landfill

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Sewage treatment plant or waste stabilization plant

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Provincially significant wetland (class 1, 2 or 3) or other environmental feature

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Floodplain

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Rehabilitated mine site

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Non-operating mine site within one kilometre

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Active mine site within one kilometre

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Industrial or commercial use (specify the use(s))

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Active railway line

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Seasonal wetness of lands

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Erosion

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Abandoned gas wells

   ☐ On the subject lands or ☐ within 500 meters – distance _____

F. Servicing and Access

1. Indicate what services are available or proposed:
   Water Supply
   - ☐ Municipal piped water
   - ☐ Communal wells
   - ☐ Individual wells
   - ☐ Other (describe below)

   _____

   Sewage Treatment
   - ☐ Municipal sewers
   - ☐ Communal system
   - ☐ Septic tank and tile bed in good working order
   - ☐ Other (describe below)

   _____

   Storm Drainage
   - ☐ Storm sewers
   - ☐ Open ditches
   - ☐ Other (describe below)

   _____

2. Existing or proposed access to subject lands:
   - ☐ Municipal road
   - ☐ Provincial highway
   - ☐ Unopened road
   - ☐ Other (describe below)

   Name of road/street: _____

G. Other Information

1. Does the application involve a local business? ☐ Yes ☐ No
   If yes, how many people are employed on the subject lands?
   _____
2. Is there any other information that you think may be useful in the review of this application? If so, explain below or attach on a separate page.
   _____
   _____
   _____
   _____

H. Supporting Material to be submitted by Applicant

In order for your application to be considered complete, **folded** hard copies (number of paper copies as directed by the planner) and an **electronic version (PDF) of the properly named site plan drawings, additional plans, studies and reports** will be required, including but not limited to the following details:

1. Concept/Layout Plan
2. All measurements in metric
3. Key map
4. Scale, legend and north arrow
5. Legal description and municipal address
6. Development name
7. Drawing title, number, original date and revision dates
8. Owner's name, address and telephone number
9. Engineer's name, address and telephone number
10. Professional engineer's stamp
11. Existing and proposed easements and right of ways
12. Zoning compliance table – required versus proposed
13. Parking space totals – required and proposed
14. All entrances to parking areas marked with directional arrows
15. Loading spaces, facilities and routes (for commercial developments)
16. All dimensions of the subject lands
17. Dimensions and setbacks of all buildings and structures
18. Location and setbacks of septic system and well from all existing and proposed lot lines, and all existing and proposed structures
19. Gross, ground and useable floor area
20. Lot coverage
21. Floor area ratio
22. Building entrances, building type, height, grades and extent of overhangs
23. Names, dimensions and location of adjacent streets including daylighting triangles
24. Driveways, curbs, drop curbs, pavement markings, widths, radii and traffic directional signs
25. All exterior stairways and ramps with dimensions and setbacks
26. Retaining walls including materials proposed
27. Fire access and routes
28. Location, dimensions and number of parking spaces (including visitor and accessible) and drive aisles
29. Location of mechanical room, and other building services (e.g. A/C, HRV)
30. Refuse disposal and storage areas including any related screening (if indoors, need notation on site plan)
31. Winter snow storage location

32. Landscape areas with dimensions
33. Natural features, watercourses and trees
34. Fire hydrants and utilities location
35. Fencing, screening and buffering – size, type and location
36. All hard surface materials
37. Light standards and wall mounted lights (plus a note on the site plan that all outdoor lighting is to be dark sky compliant)
38. Business signs (make sure they are not in sight lines)
39. Sidewalks and walkways with dimensions
40. Pedestrian access routes into site and around site
41. Bicycle parking
42. Architectural elevations of all building sides
43. All other requirements as per the pre-consultation meeting

In addition, the following additional plans, studies and reports, including but not limited to, **may** also be required as part of the complete application submission:

☐ Zoning Deficiency Form

☐ On-Site Sewage Disposal System Evaluation Form (to verify location and condition)

☐ Architectural Plan

☐ Buildings Elevation Plan

☐ Cut and Fill Plan

☐ Erosion and Sediment Control Plan

☐ Grading and Drainage Control Plan (around perimeter and within site) (existing and proposed)

☐ Landscape Plan

☐ Photometric (Lighting) Plan

☐ Plan and Profile Drawings

☐ Site Servicing Plan

☐ Storm water Management Plan

☐ Street Sign and Traffic Plan

☐ Street Tree Planting Plan

☐ Tree Preservation Plan

☐ Archaeological Assessment

☐ Environmental Impact Study

☐ Functional Servicing Report

☐ Geotechnical Study / Hydrogeological Review

☐ Minimum Distance Separation Schedule

☐ Noise or Vibration Study

☐ Record of Site Condition

☐ Storm water Management Report

☐ Traffic Impact Study – please contact the Planner to verify the scope required

Site Plan applications will require the following supporting materials:

1. Two (2) complete sets of the site plan drawings folded to 8½ x 11 and an electronic version in PDF format
2. Letter requesting that the Holding be removed (if applicable)
3. A cost estimate prepared by the applicant's engineer
4. An estimate for Parkland dedication by a certified land appraiser
5. Property Identification Number (PIN) printout

Standard condominium exemptions will require the following supporting materials:

☐ Plan of standard condominium (2 paper copies and 1 electronic copy)

☐ Draft condominium declaration

☐ Property Identification Number (PIN) printout

Your development approval might also be dependent on Ministry of Environment and Climate Change, Ministry of Transportation or other relevant federal or provincial legislation, municipal by-laws or other agency approvals.

All final plans must include the owner's signature as well as the engineer's signature and seal.

I. Development Agreements

A development agreement may be required prior to approval for site plan, subdivision and condominium applications. Should this be necessary for your development, you will be contacted by the agreement administrator with further details of the requirements including but not limited to insurance coverage, professional liability for your engineer, additional fees and securities.

J. Transfers, Easements and Postponement of Interest

The owner acknowledges and agrees that if required it is their solicitor's responsibility on behalf of the owner for the registration of all transfer(s) of land to the County, and/or transfer(s) of easement in favour of the County and/or utilities. Also, the owner further acknowledges and agrees that it is their solicitor's responsibility on behalf of the owner for the registration of postponements of any charges in favour of the County.

K. Permission to Enter Subject Lands

Permission is hereby granted to Norfolk County officers, employees or agents, to enter the premises subject to this application for the purposes of making inspections associated with this application, during normal and reasonable working hours.

L. Freedom of Information

For the purposes of the *Municipal Freedom of Information and Protection of Privacy Act*, I authorize and consent to the use by or the disclosure to any person or public body any information that is collected under the authority of the *Planning Act, R.S.O. 1990, c. P. 13* for the purposes of processing this application.

Paul Aucoin — 09/30/22

Owner/Applicant Signature — Date

M. Owner's Authorization

If the applicant/agent is not the registered owner of the lands that is the subject of this application, the owner(s) must complete the authorization set out below.

I/We Paul Aucoin am/are the registered owner(s) of the lands that is the subject of this application.

I/We authorize G. Douglas Vallee Limited to make this application on my/our behalf and to provide any of my/our personal information necessary for the processing of this application. Moreover, this shall be your good and sufficient authorization for so doing.

Paul Aucoin — 09/30/22

Owner — Date

_____ — _____

Owner — Date

N. Declaration

I, Paul Aucoin of Waterford

solemnly declare that:

all of the above statements and the statements contained in all of the exhibits transmitted herewith are true and I make this solemn declaration conscientiously believing it to be true and knowing that it is of the same force and effect as if made under oath and by virtue of *The Canada Evidence Act.*

Declared before me at:

Norfolk County

In Town of Simcoe

This 6th day of October

A.D., 2022

A Commissioner, etc.

Owner/Applicant Signature

SCOTT CONNELL PUILLANDRE,
a Commissioner, etc., Province of Ontario,
for G. Douglas Vallee Limited.
Expires August 19, 2025.

003201

AUCOIN-DIXON DEVELOPMENTS INC.
75 BRANT AVE
BRANTFORD ON
N3T3H2

ROYAL BANK OF CANADA
LYNDEN ROAD BRANCH
95 LYNDEN RD
BRANTFORD ON N3R 7J9

DATE 2022 10 03
Y Y Y Y M M D D

PAY ******Nine Thousand Twenty and 00/100 $ **9,020.00

TO THE ORDER OF Norfolk County

AUCOIN-DIXON DEVELOPMENTS INC.

PER _____

MEMO Cottonwood Condos Official Plan & Zoning Bylaw Amendment Ap

⑈003201⑈ ⑆01312⑈003⑆ 10⑈9942⑈ 21

SECURITY FEATURES INCLUDED – SEE REVERSE
CONTIENT DES CARACTÉRISTIQUES DE SÉCURITÉ – VOIR À L'ENDOS
S1067

AUCOIN-DIXON DEVELOPMENTS INC.

003201

Norfolk County 2022-10-03

9,020.00

RBC 1019942 Cottonwood Condos Official Plan & Zoning Byla 9,020.00

Cottonwood Condominium – Waterford
Planning Justification Report

G. Douglas Vallee Limited on behalf of
Aucoin-Dixon Developments Inc.
Application for Official Plan & Zoning Bylaw Amendment

OCTOBER 11

G. Douglas Vallee Limited
Authored by: Scott Puillandre, CD, MSc
Reviewed by: Eldon Darbyson, BES, MCIP, RPP

vallee
Consulting Engineers, Architects & Planners

Table of Contents

vallee
Consulting Engineers, Architects & Planners

1.0 Introduction

G. Douglas Vallee Limited has been retained by Aucoin-Dixon Development Inc., to make applications for an Official Plan and Zoning Bylaw Amendment to permit a residential condominium on the subject lands. The lands are located at the intersection of McCool Street and West Church Street, within the urban settlement area of Waterford, Norfolk County. The proposed condominium would include a combination of parcels including the following:

- A portion of the lands known municipally as 260 West Church Street – Roll# 33503002600;
- A portion of the unopened municipal road allowance of McCool Street; and
- Block D in Draft Plan of Subdivision 28TPL2016124. A redline application was submitted to Norfolk County on March 30, 2022 to have this parcel removed from the draft plan.

As shown on Schedule B-18 of the Norfolk County Official Plan, the proposed assembled parcel has a split official plan designation with the north half identified as Industrial and the southerly half as Urban Residential. The zoning of the parcel, is General Industrial and Urban Residential Type 4 (R4-H) as shown on Schedule A-16 of the Norfolk County Zoning Bylaw.

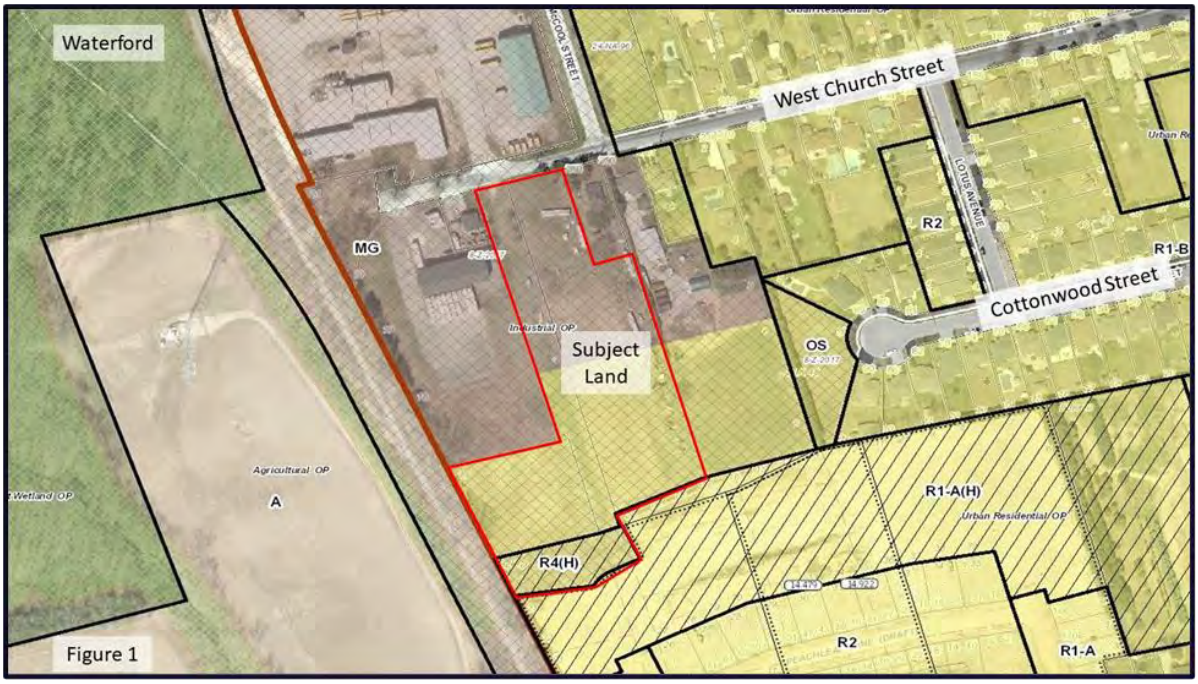
Appendix A provides a detailed site plan for the proposed development which would include group townhouse units. The concept design includes an on-site stormwater management pond along with amenities such as a pedestrian linkage between West Church Street and the new Cedar Park subdivision and bicycle racks to encourage active transportation. It is important to note that each unit in the proposed development would provide 4 parking spaces per dwelling (2 car garage / 2 car driveway) in order to reduce the potential of parking issues.

An official plan and zoning bylaw amendment is required to apply the appropriate designation and zone categories to permit this form of residential dwellings and provisions consistent with the Norfolk County official plan and zoning bylaw.

This application:

- Provides a compatible form of residential dwelling types.
- Is consistent with the Provincial Policy Statement;
- Maintains the general intent and purpose of the Norfolk County Official Plan;
- Proposes an increased density and housing options for the residents of Waterford;
- Can be appropriately serviced by municipal infrastructure including water and sanitary services;
- Is supported by the necessary technical and servicing studies;
- Represents good planning.

Figure 1.1 – Subject Lands



2.0 The Application

A pre-consultation meeting for this development was held on December 8, 2021 in order for Norfolk County and other agencies to comment on the proposed development. The purpose of this planning justification report is to provide planning support and a high-level overview of the requirements identified during the pre-consultation meeting to Norfolk County staff and Council when considering the applications for an Official Plan and Zoning Bylaw amendment on the subject lands. The proposed amendments are seeking the following:

- Official Plan Amendment: Change the lands currently designated from Industrial to Urban Residential.

- Zoning Bylaw Amendment: Required to permit the following
    - Change the Zoning of the entire parcel to Urban Residential Type 4 (R4) to permit the construction of group townhouses;
    - Apply the definition of “LOT” to the entire condominium block;
    - Deem the condominium road as a private road NOT an open improved street;
    - Define the “FRONT LOT LINE” as the “LOT LINE” abutting Vanrooy Trail;
    - Recognize the existing single detached dwelling and its future lot characteristics, with site specific zone provisions to facilitate a future severance of the dwelling lot from the condominium lot.

The development concept consists of the following:

Residential	Type & # of dwellings
Group Townhouses	1 storey x 30
Total	**30 dwellings**

Table 2.1: Zoning By-law Amendments

	Existing	Proposed
Zone	Residential Type 4 “R4-(H)” General Industrial “MG” Zone	Residential Type 4 “R4” Zone
Permitted Uses	**General Industrial (MG) Zone** a) ambulance service b) animal hospital c) auction centre d) bus terminal e) call centre f) Cannabis Production and Processing, subject to General Provisions 3.21 [25- Z-2018] g) construction shop h) contractor’s yard i) crematorium j) fire hall k) food processing, excluding abattoir l) general material manufacturing m) graphics and design n) industrial supply o) material processing, excluding asphalt plant, cement works and concrete batching p) merchandise service shop q) office, industrial, accessory to a permitted use r) personal and health services for employees, accessory to an industry on the same lot s) research and development facility t) retail sales accessory to an industry on the same lot u) storage v) taxi terminal w) telecommunications and data processing x) trade school y) transportation z) vehicle services and repair, including automobile body shop and industrial garage aa) wholesale outlet.	**Urban Residential Type 4 (R4) Zone** To permit group townhouses

3.0 Site description

The lands are 2.02 hectares in area located within the community Waterford with frontage / road access along West Church Steet to the north and Vanrooy Trail to the south through the Cedar Park subdivision. The lands are within the defined settlement area of Waterford and consist of an assembly of parcels including:

- A portion of the lands known municipally as 260 West Church Street – Roll# 33503002600;
- A portion of the unopened municipal road allowance of McCool Street; and
- Block D in Draft Plan of Subdivision 28TPL2016124. A redline application was submitted to Norfolk County on March 30, 2022 to have this parcel removed from the draft plan.

The topography of the lands is mainly flat with sporadic vegetation and no identifiable water features. There is an existing single detached dwelling with various accessory buildings located at 260 West Church Street.

4.0 Surrounding Uses

- North: North of West Church Street is a former Norfolk Co-op site with a storage silo system that was serviced from the former LE and N (Lake Erie and Northern Railway) and CPR railway system that was discontinued in 1975 and officially abandoned in the early 1990's. The property currently appears to have two commercial operations, and some storage activities. The commercial operations are a school bus transportation company and a telecommunication and utility infrastructure construction company. This site may be re-developed as a residential land use.

- East: The adjoining lands located immediately to the east are designated and zoned for industrial purposes. However, a site visit would appear to show they are both used for residential purposes. The predominate land use to the east is residential in the form of single and semi-detached dwellings across Washington Street consists of established low density residential development in the form of single-detached dwellings.

- South: The lands located to the south are a new developed residential subdivision know as Cedar Park. This subdivision has a mix of single and semi-detached dwellings. This land use to the south will have a similar built form as the proposed condominium.

- West: The adjoining lands located immediately to the west are designated and zoned for industrial purposes. One parcel is used to operate a business in the form of a school furniture manufacturing company, while the other appears to be used for residential purposes.

- The surrounding lands uses are discussed in detail at Reference C.

5.0 Supporting Studies

Studies identified through a pre-consultation meeting with Norfolk County, have been completed and are submitted in support of the proposed development. These studies are included as references and are summarized as follows:

- Functional Servicing Report, prepared by G. Douglas Vallee Limited dated August, 2022.
- Traffic Impact Study, prepared by Paradigm Transportation Solutions Ltd, dated August 2022.
- D-6 Compatibility Study prepared by CCS Engineering Limited, dated August, 2022.

Appendices to this report include the following:

- Appendix A – Conceptual Site Plan – with elevations / floor plans
- Appendix B – Provincial Policy Statement 2020 Policy Compliance
- Appendix C – Norfolk County Official Plan Policy Compliance

This application includes the information and material required under Section 22 'Request for Amendment' and Section 34 (10.1) 'Zoning' of the Planning Act as part of a complete application.

6.0 Planning Review

6.1 Planning Act

Section 2	Lists matters of provincial interest to have regard to.
Section 3	Requires that, in exercising any authority that affects a planning matter, planning authorities "shall be consistent with the policy statements" issued under the Act and "shall conform with the provincial plans that are in effect on that date, or shall not conflict with them, as the case may be".
Section 22	Allows amendments to the Official Plan.
Section 34	Allows amendments to the Zoning By-law.
Section 41	Allows for site plan agreements.
Section 51	Allows for the creation of plans of Condominium. An exemption from draft plan of condominium is a process administered by the County. An exemption application would occur in the future after site plan approval.

6.1.1 Matters of Provincial Interest

Section 2 of the Planning Act establishes matters of provincial interest. The Minister, the council of a municipality, a local board, a planning board and the Tribunal, in carrying out their responsibilities under this Act, shall have regard to, among other matters, matters of provincial interest. These matters are reviewed in the table below:

Matter	Comment	Complies
(a) the protection of ecological systems, including natural areas, features and functions;	The proposed development is located in an established urban area. There are no impacts on any natural areas.	✓
(b) the protection of the agricultural resources of the Province;	The proposed development is located in an established urban area. There are no impacts on agricultural resources.	✓
(c) the conservation and management of natural resources and the mineral resource base;	The proposed development is located in an established urban area. In accordance with Schedule J-1 of the official plan the proposed development is not within an area of identified Natural Resources.	✓
(d) the conservation of features of significant architectural, cultural, historical, archaeological or scientific interest;	The proposed development is located in an established urban area on vacant land. The application has been reviewed by the municipality and an archaeological	✓

	assessment is not required as part of the application.	
(e) the supply, efficient use and conservation of energy and water;	As new construction, energy efficient dwellings will be built as required under the Ontario Building Code.	✓
(f) the adequate provision and efficient use of communication, transportation, sewage and water services and waste management systems;	The development will utilize existing municipal infrastructure in the area.	✓
(g) the minimization of waste;	N/A	✓
(h) the orderly development of safe and healthy communities; (h.1) the accessibility for persons with disabilities to all facilities, services and matters to which this Act applies;	This development is taking place within an area of established and new residential development. This application would result in the redevelopment of used vacant land within the urban This development will require the construction of accessible parking spaces and contain pedestrian connections through the development to increase accessibility in the area.	✓
(i) the adequate provision and distribution of educational, health, social, cultural and recreational facilities;	This policy is mainly a requirement of the municipality. However, applicable agencies will be circulated to ensure adequate provision of these requirements.	✓
(j) the adequate provision of a full range of housing, including affordable housing;	This application will result in an increase of housing options to local residents. Group town houses are not readily available, are encouraged in Norfolk County and generally sell at a more attainable price point than a single detached dwelling.	✓
(k) the adequate provision of employment opportunities;	This policy is not applicable in this instance.	✓
(l) the protection of the financial and economic well-being of the Province and its municipalities;	This development would provide increased tax revenue to the local and provincial governments.	✓
(m) the co-ordination of planning activities of public bodies;	The applications will be circulated to all applicable public bodies and agencies for comments as determined by Norfolk County.	✓
(n) the resolution of planning conflicts involving public and private interests;	This will be achieved through the planning approvals process.	✓
(o) the protection of public health and safety;	The subject lands are not located within an area of natural hazard and will provide safe and available housing options within Norfolk County.	✓

(p) the appropriate location of growth and development;	The subject lands are located within an urban area with access to existing municipal services.	✓
(q) the promotion of development that is designed to be sustainable, to support public transit and to be oriented to pedestrians;	This development is located immediately adjacent to the Trans Canada Trail as shown on Schedule I-5 of the Official Plan. The location will help encourage active transportation.	✓
(r) the promotion of built form that, (i) is well-designed, (ii) encourages a sense of place, and (iii) provides for public spaces that are of high quality, safe, accessible, attractive and vibrant;	These lands are located among existing residential lands uses. This development would result in the redevelopment of an underutilized parcel of industrial lands for residential purposes.	✓
(s) the mitigation of greenhouse gas emissions and adaptation to a changing climate.	This development will encourage active transportation and will be constructed to meet Ontario Building Code standards.	✓

6.2 Provincial Policy Statement 2020

The PPS provides policy direction for appropriate land use planning and development patterns to achieve healthy, livable, and resilient communities that will protect resources of provincial interest, public health and safety, the quality of the natural and built environment, and will facilitate economic growth.

The subject lands are within a Settlement Area as defined by the Provincial Policy Statement, 2020 (PPS). It is recognized that rural settlement areas are critical to the long-term economic property of communities across the province. The PPS requires settlement areas to be the focus of growth and development through the efficient use of land while encouraging a mix of densities and land uses.

Full details describing the applicable Provincial policies and how the application is consistent with the PPS are included in Appendix B. The policy analysis of the PPS demonstrates that the proposed development:

a) Represents an infill development and encourages a more compact use of land;
b) Provides a variety of housing forms within an urban settlement area;
c) Encourages active transportation;
d) Takes advantage of existing municipal infrastructure; and
e) Helps contribute to a healthy, livable, and safe community.

6.2.1 Summary of PPS Review

The proposed Official Plan and Zoning Bylaw Amendment is seeking to establish the necessary zoning provisions and lot configuration to facilitate the construction of group townhouses within the municipally serviced settlement area of Waterford. The proposed infill development represents a more compact and efficient use of an underdeveloped area with access to full municipal services. This application will provide the citizens of Norfolk County with additional housing options which are not readily available, are desirable and encouraged by policy.

As the necessary studies have been completed to satisfy Section 1.2.6.2 of the PPS, approval of this application will not further hamper the protection and long-term viability of the existing industrial lands.

A decision by Council to approve the Official Plan and Zoning By-law amendment will be consistent with PPS, 2020. Full details describing the applicable Provincial policies and how the application is consistent with the PPS are included in Appendix B.

6.3 Norfolk County Official Plan (NCOP)

The subject lands are designated Industrial and Urban Residential in accordance with Schedule B-18 of the NCOP. It is proposed to change the Industrial designation to Urban Residential. The details of compliance with the Official Plan are demonstrated in Appendix C.

Several sections of the Official Plan apply when considering amendments to the Official Plan and Zoning Bylaw and are discussed in detail under Appendix C. From a high level, details of the Official Plan policies are captured by the overarching Goals and Objectives. Section 2.2 of the Official Plan sets out six “Goals and Objectives” to which the following five are applicable to the proposed residential development:

- Protecting and Enhancing the Natural Environment;
- Maintaining and Enhancing the Rural and Small-Town Character;
- Maintaining a High Quality of Life;
- Upgrading and Expanding Infrastructure; and
- A Well Governed, Well Planned and Sustainable County.

The proposed official plan and zoning bylaw amendment achieves the ‘Goals and Objectives’ of the Official Plan as demonstrated in Appendix C.

It is important to note that Section 7.13 of the Official Plan explicitly encourages the conversion of these types of older industrial / underutilized sites to more compatible uses as they are poorly situated to attract industrial investment. The proposed development will implement the policies of the official plan by providing a compact form of additional housing choices and compatible character to the existing mix of residential development in the area. This will result in an efficient use of land by providing increased housing options and levels of affordability. The lands are subject to site plan control to ensure County development standards are achieved.

The lands are near a network of sidewalks to provide easy access to the local services in the downtown area. Additionally, the development is immediately adjacent to a designated cycling route identified on Schedule I-3 “Active Transportation” of the Official Plan. The County Official Plan supports the development of vacant and underutilized lands supporting the location of the development in close proximity to active transportation and potential active transportation networks.

Norfolk County’s existing infrastructure will be reviewed by Norfolk County’s consultant (RV Anderson Associates) in consideration of the connections proposed to service this development and in light of a Functional Servicing Report prepared by G. Douglas Vallee Limited. The proposed infrastructure will be designed and constructed in accordance with Norfolk County’s requirements, and will be subject to Norfolk County’s approval through the site plan process.

The lands are near existing residential, commercial and institutional uses including the Waterford District High School, several places of worship, parks and a retail center. Through the site plan process,

appropriate landscaping, buffering and the recommendations (as applicable) from the D-6 Compatibility Assessment completed by CCS Engineering Inc. will be considered to improve compatibility with the adjacent uses.

6.3.1 Summary of Official Plan review

The proposed Official Plan and Zoning bylaw amendment meets the policies of the Official Plan. As shown in Appendix C, the proposed development meets the requirements of a medium density development as per Section 7.7.2 b) through the implementation of appropriate and compatible forms of housing. As an infill development, this application will help Norfolk County achieve its minimum 25 percent target of annual residential development through infill, intensification and redevelopment within the existing urban areas with full municipal services.

The land use compatibility with adjacent industrial land uses has been addressed through an expert study. The development concept represents an appropriate land use considering the size of the property, proximity to existing residential and commercial uses, availability of servicing, and the provision of buffering and landscaping. Accordingly, the proposed applications meet the intent and purpose of the Official Plan and represent good planning.

Any necessary mitigation measures will be implemented during the site plan approval process (buffering, privacy fences, etc.). The development concept represents an appropriate redevelopment of underutilized lands within the urban area of Waterford. As outlined above, Section 7.13 of the Official Plan directs the conversion of these lands to more compatible uses as they are poorly situated among sensitive land uses to attract industrial investment.

A decision of Council to approve the proposed amendment from Industrial to Urban Residential is considered appropriate as it implements the policy direction of the Norfolk County Official Plan.

6.4 Norfolk County Zoning Bylaw

The zoning of the parcel, is General Industrial and Urban Residential Type 4 (R4-H) as shown on Schedule A-16 of the Norfolk County Zoning Bylaw. As outlined above, the proposed zoning bylaw amendment is required for the following reasons:

- Change the Zoning of the entire parcel to Urban Residential Type 4 (R4) to permit the construction of group townhouses;
- Apply the definition of “LOT” to the entire condominium block;
- Identify the condominium road as a private road (an alternative to an open improved street); and
- Recognize the existing single detached dwelling and implement site specific zone provisions.

The proposed amendment would implement the necessary zoning provisions to permit residential development in the form of group townhouse dwellings. As shown on Appendix A, the proposed development will comply with all requirements of the respective R4 zone. Table 6.4.1 and 6.4.2 below, respectively provide a comprehensive zoning review of the R4 zone and the requested site-specific provisions. It is important to note that the provisions requested in Table 6.4.2 are requested to provide clarity to the interpretation of definitions and how the development will be interpreted at the condominium stage. A parking assessment for the proposed development has been provided in Table 6.4.3.

6.4.1 – R4 Zoning Bylaw Review – Proposed

Provision	Required	Provided/Proposed	Comment
Permitted Uses	a) group townhouse b) stacked townhouse c) street townhouse d) semi-detached, duplex, tri-plex and four-plex dwellings provided they are located on the same lot with, and in accordance with the Zone provisions of, group townhouse e) home occupation f) accessory residential dwelling unit, subject to Subsection 3.2.3.[7-Z-2020]	Amendment: • Group townhouses • Single Detached Dwelling	Required to permit Group Townhouses and to recognize the Single Detached Dwelling
minimum lot area: i) attached garage ii) corner lot	i) 195m^2 ii) 195m^2	20,200 +/- m^2	The Condominium Block shall be deemed the 'Lot' • 30 units x 195m2 = 5850m2 Intent of Zoning provisions met
minimum lot frontage: i) interior lot ii) corner lot	i) 30m ii) 30m	35m	The Condominium Block shall be deemed the 'Lot' Zoning provisions met
minimum front yard:	6.0m	Min 6.0m	The Condominium Block shall be deemed the 'Lot' Each unit includes: • 6 m from front of dwelling to private road • Over 8 metres from rear of dwelling to yard property line. Intent of Zoning provisions met

minimum exterior side yard: **i) with a 6m front yard**	6.0m	N/A	The Condominium Block shall be deemed the 'Lot' The closest dwelling exterior side is a minimum of 6m. Intent of Zoning provision met.
minimum interior side yard:	1.2m	Min 1.2m	Complies
minimum rear yard: i) attached garage	7.5m	N/A **Note:** From a site plan perspective, not less than 7.5m of rear yard space is provided for each unit.	Through lot – no rear yard Not less than 6 metres achieved on either front. Over 8 metres of rear yard for each unit provided. Intent of Zoning provisions met.
maximum building height:	11.0m	Max 11.0m	Zoning provisions met
Proposed Single Detached Dwelling on Retained Lot		Frontage: 15m Front Yard: 7.5m Side Yard 1.2m Rear Yard: 7.5m Existing accessory building: recognize existing setbacks It is proposed to include a special provision Section 3.2.1 (e) and (g) to recognize the existing structure.	The recognition of the site-specific zone provisions for the single detached dwelling will facilitate a severance of the lot which is required prior to a site plan agreement approval. The existing accessory structure is on or near the easterly lot line.

Please see Appendix A1 for a detail of the proposed lot which contains the existing single detached dwelling and accessory structure. This appendix helps demonstrate the existing conditions of the property and how the proposed zoning will allow for this lot to continue its residential function after a successful severance application.

6.4.2 – Site Specific Zoning Provisions for Cottonwood Condominium

Section	Required	Provided
2.88	"LOT" shall mean a parcel of land which can be legally conveyed. Where two (2) adjoining lots are in common ownership and a main building straddles the lots, the two (2) lots are deemed to be one (1) lot for the purposes of establishing interior side yards.	In lieu of Section 2.88 the definition of a LOT shall not apply to the individual condominium units. The LOT shall be defined as the parcel of land consisting of entire condominium block. The Norfolk County Zoning By-law provisions regarding the definition of a LOT are unclear in its application to a condominium development. The inclusion of this provision will clearly define the LOT and corresponding yard provisions. It will enhance the ability to interpret and apply the zoning by-law at the Site Plan approvals stage.
2.93.1 d)	In the case of a through lot, the nearer street line to the main building.	In lieu of Section 2.93.1 d) the FRONT LOT LINE shall be the southerly LOT LINE abutting Vanrooy Trail. The inclusion of this provision will clearly define the FRONT LOT LINE and corresponding yard provisions. It will enhance the ability to interpret and apply the zoning by-law at the Site Plan approvals stage.
3.11.2	For the purposes of this Subsection, a private condominium road servicing a condominium development shall be deemed to be an open, constructed and year-round improved street.	In lieu of Section 3.11.2, the private condominium road shall be deemed a private road NOT an opened improved street. The Norfolk County Zoning By-law provisions regarding a street are unclear in its application to a condominium development. The entire condominium block has frontage on an open and year-round improved street. The inclusion of this provision will clearly identify the condominium road as a private road. Yard setbacks required under the zoning bylaw will be applied to the condominium block and NOT the individual condominium units. This will enhance the ability to interpret and apply the zoning by-law at the Site Plan approvals stage.

		Note: The design of the group townhouse condominium was based on the setbacks of the R4 zone provisions.

6.4.3 –Parking Assessment

Provision	Requirements	Required	Provided
4.9 a) single detached, semi-detached, duplex, tri-plex, four-plex, townhouse dwellings and vacation home [8-Z-2017]	2 parking spaces for each dwelling unit 30 group townhouses (2 car garage & 2 car driveway)	60	30 x 3 = 90 2 in garage and 1 in driveway
4.9 f) All apartment dwellings; and duplex dwellings, tri-plex dwellings, four-plex dwellings, townhouse dwellings or single detached or semi-detached dwellings as part of a condominium development or when they abut a private road [27-Z-2020].	1 visitor space for every 3 dwelling units: 30 units / 3	10	13
4.3.3Minimum Number and Type of Accessible Parking Spaces As per section 4.9 f) - 19 required visitor parking spaces Number of Parking Spaces: 1 – 25 Type A Accessible Space (Van): 1 Type B Accessible Space: 0	1 to be included as part of the total required visitor parking	1	1 included as part of the total required visitor parking
Total		**70**	**103 spaces****

** ***(33 more than required by Norfolk Zoning Bylaw)***

As shown in the Table 6.4.3 above, the on-site parking far exceeds the minimum requirement of the zoning bylaw. This increased parking will help eliminate the potential for on-street parking.

6.4.4 – Summary of Zoning Bylaw Review

As shown in the above sections the proposed official plan and zoning bylaw amendment will implement the necessary zoning provisions to facilitate a condominium development in the form of group townhouses. All required zoning provision under the respective section of the zoning by-law have been satisfied. As outlined in Table 6.4.2, site-specific provisions have been required in order to provide clarity of a 'Lot' as it relates to corresponding zoning provision in light of a future private condominium.

The site design provides sufficient parking which is well in excess of the minimum requirement under the by-law. This increased parking will help mitigate against the potential of on-site and illegal parking while simultaneously facilitating traffic flows in the area.

In this instance, a decision by Council to approve the proposed Official Plan and Zoning Bylaw Amendment is considered appropriate.

7.0 Land Use Compatibility

As shown on Figure 1.1, the subject lands are located on the westerly edge of the urban area of Waterford and surrounded by a predominantly low and medium density residential development. The surrounding residential lands consist mainly of one and two-storey singled and semi-detached dwellings.

As shown on Appendix A, the development will provide housing in the form of group townhouses. The proposed form of housing is similar in nature to the existing development in the area. The individual townhouse units have been provided with similar setbacks from adjacent property lines and will be required to meet the respective R4 height restrictions. The compatible setbacks and the limited massing of the townhouse blocks (max 6 units per block) ensures the proposed condominium is compatible with the existing residential land uses in the area.

The proposed condominium represents a medium density development which will provide much needed additional housing options to the residents of Norfolk. The proposed mixed density development provides a housing form that is similar and compatible with the existing built form in the area.

The D-6 Compatibility Assessment prepared by CCS Engineering Inc. was conducted in accordance with the “Compatibility between Industrial Facilities and Sensitive Land Uses”, published by the Ontario Ministry of the Environment Conservation and Parks (MOECP) as Guideline D-6 (D-6 Guideline). The proposed development is outside the recommended 20m separation distance (from source to proposed dwelling) for a Class I light industrial or commercial operation, this is in compliance with the Guideline D-6 – Land Use Compatibility recommendations. It is recommended that the condominiums be designed with the provision for adding central air conditioning to allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment, Conservation, and Parks (MOECP).

The proposed development is not anticipated to be adversely impacted by noise, odour or dust from the neighbouring light industrial or commercial operations identified to the west and north. The proposed development does not further inhibit nearby industrial uses beyond what has been established currently.

The existing single detached dwelling is provided with increased setbacks and is a compatible form of development with the proposed group townhouse condominium.

8.0 Traffic Impact Study

A Traffic Impact Study (TIS) was completed by Paradigm Transportation Solutions Limited dated August 2022. The TIS includes an analysis of peak AM and PM hours of existing traffic conditions; a description of the proposed development; traffic forecasts for the development opening year (2024), five years after development opening (2029), ten years after development opening (2034); and an assessment of traffic impacts with recommendations, as appropriate, to accommodate the proposed development.

The study area intersections included; West Church Street and Washington Street and the proposed site driveway access. Analysis of existing traffic conditions was conducted in December 2021, in accordance with the following:

- Intersection of West Church Street and Washington Street
    - AM Peak Hours (8:30 – 9:30am)
    - PM Peak Hours (4:15 – 5:15pm)

Despite the impacts of COVID-19, traffic was generally back to normal from late last year. Traffic studies were undertaken even during Covid-19 restrictions, with adjustments made based on past counts where necessary. Paradigm Transportation Solutions Limited was retained in April of 2022 to conduct the traffic impact study. Paradigm has confirmed the counts for this project accurately reflect current traffic conditions.

The study considered the impacts on current traffic and forecasted traffic conditions, and concluded that the study area intersections are forecasted to operate within acceptable levels of service under existing and future time horizons out to 2034. Based on the study findings, Paradigm Transportation Solutions Limited recommends the subject development be considered for approval.

9.0 Servicing

A Functional Servicing Report was completed by G. Douglas Vallee Limited, dated August 2022. The following is a brief overview taken from that report.

9.1 Sanitary

The proposed development will be serviced by a sanitary sewer that connects to the existing 200mm sanitary sewer along “Street A” in the Cedar Pak II Subdivision. A peak sanitary design flow of approximately 2.40 L/s is anticipated from the proposed development. The Cedar Park II Subdivision sanitary system has adequate capacity to support the additional flow. Modelling from Norfolk County’s consultant is required to confirm capacity in the sanitary system further downstream.

9.2 Water

The existing 200mm watermain along “Street A” in the Cedar Pak II Subdivision shall serve as the water supply for the proposed development. The domestic maximum day demand and peak hourly demand were found to be 92.14 m^3/day (1.07 L/s) and 6.83 m^3/hour (1.90 L/s), respectively. Under the Ontario Building Code (OBC) and Fire Underwriters Survey (Part 2), the estimated required fire flow for the proposed development were found to be 90 L/s and 133L/s respectively. The watermain hydraulic assessment of the Cedar Park II Subdivision completed by R.V Anderson dated April 9, 2019 estimates that the available fire flow in the watermain along “Street A” ranges from 127 L/s to 138 L/s. Therefore, the available municipal watermain is anticipated to provide sufficient flow to service the development.

9.3 Storm Water

As part of the Cedar Park II Subdivision, a 525mm storm sewer was installed to the property line along “Street A” to provide a storm connection for future development. It is proposed the Cottonwood Condominiums will utilize this connection as an outlet for stormwater runoff. During the design of the Cedar Park II Subdivision storm sewers and stormwater management facility, a portion of the

Cottonwood development site was included within the stormwater drainage areas. However, additional area has been added to the catchment area. Therefore, an on-site stormwater management facility will be utilized to reduce post-development peak flows during all storm events up to and including the 100-year storm event.

Minor storm events (2-year and 5-year) will be conveyed to the proposed SWM storage facility at the south end of the subject property through a storm sewer network and major storm events will flow overland. Runoff released from the storage facility will be directed to the 525mm storm sewer connection, and conveyed to Cedar Park II SWM Facility via the Cedar Park II storm sewer network, where it will ultimately discharge to the Waterford South Municipal Drain (WSMD) via the Thompson Road storm sewer.

Under all storm events up to and including the 100-year storm event, peak flows to the Thompson Road storm sewer are controlled to less than or equal to the allowable peak flow rates. Quality control will be analyzed during the detailed design stage.

10.0 Conclusion

The proposed Official Plan and Zoning By-law Amendments are consistent with the policies of the PPS and the Norfolk County Official Plan. The proposed development will provide a compact form of development while maintaining compatibility with the surrounding residential land uses. As a parcel with access to full municipal services, this development will provide much needed housing options for the residents of Norfolk County.

The D-6 Compatibility Assessment completed by CCS Engineering Inc. demonstrates that there will be no negative impacts on the industrial lands or the proposed development. Recommendations from this assessment will be implemented during the construction phase to further mitigate the potential of future land use conflicts. Through the site plan control process, appropriate buffering and other mitigation measures can be implemented to help ensure compatibility with the neighbouring lands.

The analysis of this application is supportive. The proposed application is consistent with Provincial and County planning policies. Accordingly, it is our opinion that the applications:

- ✓ model good planning;
- ✓ facilitate a development with the most appropriate land use; and
- ✓ ensure efficiency and compatibility with the surrounding land uses.

As such it is requested that Staff and Council consider a favourable recommendation and decision to amend the Official Plan and Zoning By-law to permit a group townhouse condominium development subject to site specific provisions and to recognize the existing single detached dwelling lot subject to a future severance application.

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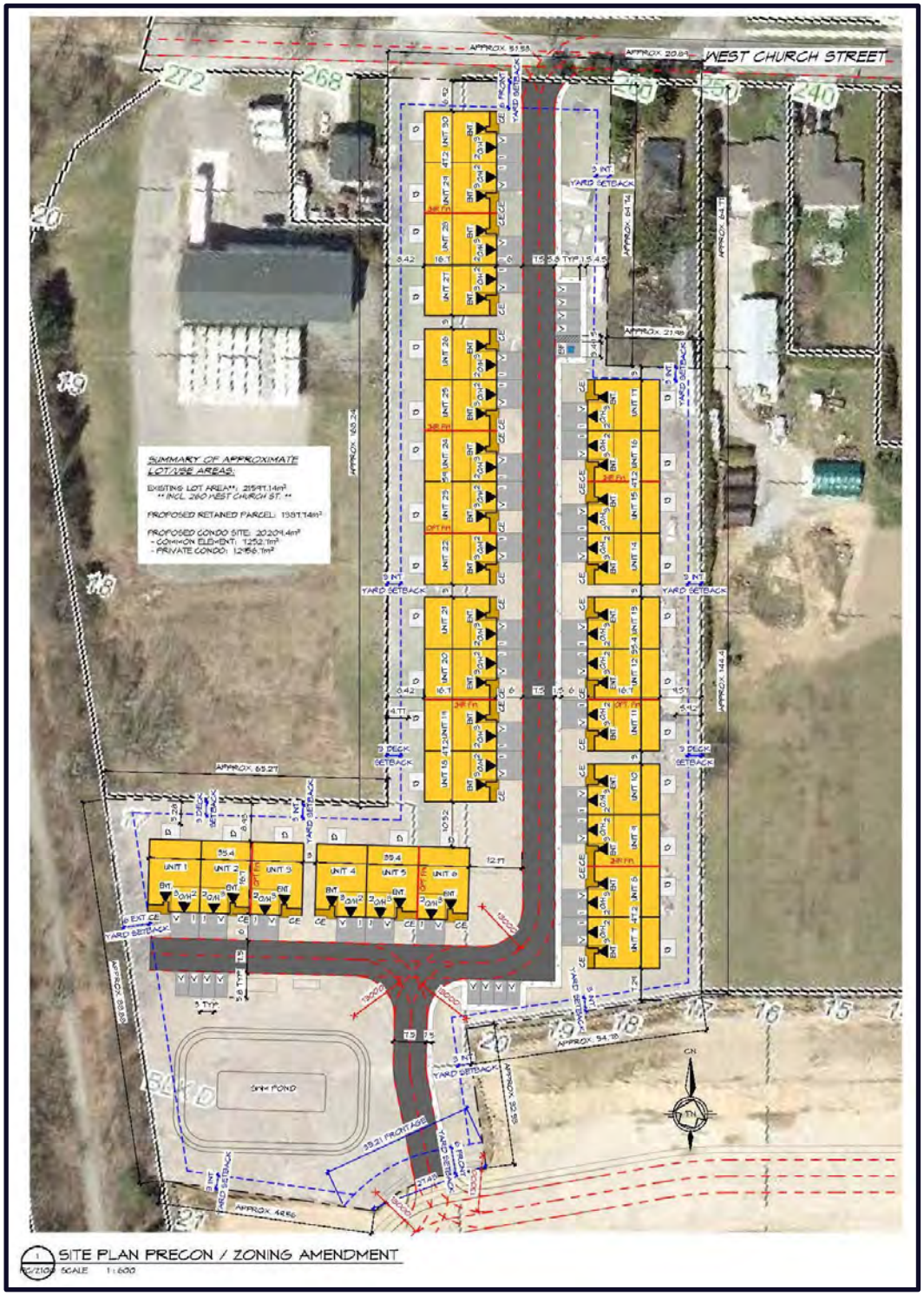
List of Appendices

Appendix A – Concept Site Plan – with elevations / floor plans
Appendix B – Provincial Policy Statement 2020 Policy Compliance
Appendix C – Norfolk County Official Plan Policy Compliance

List of References

A. Function Servicing Report, prepare by G. Douglas Vallee Limited, dated August,2022
B. Traffic Impact Study, prepared by Paradigm Transportation Solutions Limited, dated August 2022
C. D-6 Noise and Vibration Study prepared by CCS Engineering Limited, dated August, 2022

Appendix A – Proposed Plan of Condominium



Appendix A1 – Proposed Severance of Existing Single Detached Dwelling and Accessory Structure

Appendix B – Provincial Policy Statement 2020 Policy Compliance

This appendix demonstrates how the proposed application is consistent with those applicable policies of the Provincial Policy Statement 2020.

Section	Policy	Comments	Complies
1.1	Managing and Directing Land Use to Achieve Efficient and Resilient Development and Land Use Patterns Policy 1.1.1 outlines that healthy, liveable, and safe communities are sustained by:		✓
	a) promoting efficient development and land use patterns which sustain the financial well-being of the Province and municipalities over the long term;	a) This development adds a compact and efficiently designed form of residential development in an under-utilized area in Waterford.	
	b) accommodating an appropriate affordable and market-based range and mix of residential types (including single-detached, additional residential units, multi-unit housing, affordable housing and housing for older persons), employment (including industrial and commercial), institutional (including places of worship, cemeteries and long-term care homes), recreation, park and open space, and other uses to meet long-term needs;	b) A mix of dwelling unit types is proposed which considers market housing attainability.	
	c) avoiding development and land use patterns which may cause environmental or public health and safety concerns;	c) The necessary studies have been completed to ensure the proposed development does not cause public health and safety concerns.	
	d) avoiding development and land use patterns that would prevent the efficient expansion of settlement areas in those areas	d) N/A	

	which are adjacent or close to settlement areas; e) promoting the integration of land use planning, growth management, transit-supportive development, intensification and infrastructure planning to achieve cost-effective development patterns, optimization of transit investments, and standards to minimize land consumption and servicing costs; f) improving accessibility for persons with disabilities and older persons by addressing land use barriers which restrict their full participation in society; g) ensuring that necessary infrastructure and public service facilities are or will be available to meet current and projected needs; h) promoting development and land use patterns that conserve biodiversity; and; i) preparing for the regional and local impacts of a changing climate.	e) The proposed development is seeking residential intensification of underutilized lands within the urban area of Waterford. Should additional transit options become available in Waterford, the subject lands are generally located near existing transit services. f) The development will contain a sidewalk network and accessible parking spaces to help ensure accessibility. g) Infrastructure and various services exist in the area. Capacity does exist within these services to support the development. h) N/A i) As new construction, these dwelling units will be required to adhere to Ontario Building Code which helps implement this policy.	
1.1.3.1	States that settlement areas shall be the focus of growth and development.	The subject lands are within the urban settlement area of Waterford.	✓
1.1.3.2	States that land use patterns within settlement areas shall be based on densities and a mix of land uses which: a) efficiently use land and resources;	a) This compact development represents a redevelopment of	✓

		underutilized land within an urban area.	
	b) are appropriate for, and efficiently use, the infrastructure and public service facilities which are planned or available, and avoid the need for their unjustified and/or uneconomical expansion;	b) Municipal services are available to this development with no requirement for extension	
	c) minimize negative impacts to air quality and climate change, and promote energy efficiency;	c) Modern construction methods will be required under the Ontario Building Code	
	d) prepare for the impacts of a changing climate;	d) Modern construction methods will be required under the Ontario Building Code	
	e) support active transportation;	e) The location of the development provides easy access to a number of current and proposed trail options in accordance with Schedule I-5 of the official plan.	
	f) are transit-supportive, where transit is planned, exists or may be developed; and	f) This development is well situated for consideration of future transit stops.	
	g) are freight-supportive.	g) N/A	
	Land use patterns within settlement areas shall also be based on a range of uses and opportunities for intensification and redevelopment in accordance with the criteria in policy 1.1.3.3, where this can be accommodated.	This development will add a compact and efficient housing on underutilized lands within the urban area of Waterford.	✓
1.1.3.3	Planning authorities shall identify appropriate locations and promote opportunities for transit-supportive development, accommodating a significant supply and range of housing options through	This policy encourages the proposed development which represents intensification and redevelopment of vacant and underutilized land through the provision of a range of housing	✓

	intensification and redevelopment where this can be accommodated taking into account existing building stock or areas, including brownfield sites, and the availability of suitable existing or planned infrastructure and public service facilities required to accommodate projected needs.	options that can be serviced with existing municipal infrastructure.	
1.1.3.4	Appropriate development standards should be promoted which facilitate intensification, redevelopment and compact form, while avoiding or mitigating risks to public health and safety.	The development intensifies the area in a compact form and is not located within an area of natural hazards.	✓
1.1.3.5	Planning authorities shall establish and implement minimum targets for intensification and redevelopment within built-up areas, based on local conditions. However, where provincial targets are established through provincial plans, the provincial target shall represent the minimum target for affected areas.	The County Official Plan indicates that the County shall target that a minimum 25 percent of its annual residential growth be accommodated through infill, intensification and redevelopment within the existing built-up areas in the Urban Areas with full municipal services.	✓
1.2.6	**Land Use Compatibility** Major facilities and sensitive land uses shall be planned and developed to avoid, or if avoidance is not possible, minimize and mitigate any potential adverse effects from odour, noise and other contaminants, minimize risk to public health and safety, and to ensure the long-term operational and economic viability of major facilities in accordance with provincial guidelines, standards and procedures. A sensitive land use means buildings, amenity areas, or outdoor spaces where routine or normal activities	As shown through the D-6 Compatibility Assessment completed by CCS Engineering Inc., there are no existing facilities (industrial or commercial) that are expected to adversely impact the proposed development with noise, dust or odour emissions. There are existing dwellings in the immediate area that limit any potential industrial expansion or changes on the lands that are zoned industrial. Anything that occurs on the industrial lands must meet air limits at their	✓

	occurring at reasonably expected times would experience one or more adverse effects from contaminant discharges generated by a nearby major facility. Sensitive land uses may be a part of the natural or built environment. Examples may include, but are not limited to: residences, day care centres, and educational and health facilities. A major facility means facilities which may require separation from sensitive land uses, including but not limited to airports, manufacturing uses, transportation infrastructure and corridors, rail facilities, marine facilities, sewage treatment facilities, waste management systems, oil and gas pipelines, industries, energy generation facilities and transmission systems, and resource extraction activities.	property lines and noise limits at neighbouring houses and recreational areas that are already there and existing.	
1.4	Housing Planning authorities to provide for an appropriate range and mix of housing types and densities.	This development adds to the range and mix of housing types and densities in the area.	✓
1.4.3	Planning authorities to provide for an appropriate range and mix of housing options and densities to meet projected market-based and affordable housing needs of current and future residents of the regional market area by: b) permitting and facilitating: 1. all housing options required to meet the social, health, economic	b) The development adds to the housing options in the area to help meet the current and future needs of Norfolk Residents.	✓

	and well-being requirements of current and future residents, including special needs requirements and needs arising from demographic changes and employment opportunities; and 2. all types of residential intensification, including additional residential units, and redevelopment in accordance with policy 1.1.3.3;		
	c) directing the development of new housing towards locations where appropriate levels of infrastructure and public service facilities are or will be available to support current and projected needs;	c) This development represents residential intensification where public facilities are already available.	
	d) promoting densities for new housing which efficiently use land, resources, infrastructure and public service facilities, and support the use of active transportation and transit in areas where it exists or is to be developed;	d) The proposed development will achieve 14.8 uph to ensure efficient use of the land. The urban area of Waterford contains existing infrastructure public services facilities.	
	e) requiring transit-supportive development and prioritizing intensification, including potential air rights development, in proximity to transit, including corridors and stations; and	e) N/A	
	f) establishing development standards for residential intensification, redevelopment	f) The development is an appropriate density for the size of	

	and new residential development which minimize the cost of housing and facilitate compact form, while maintaining appropriate levels of public health and safety.	the lands near sidewalks and existing and future trails.	

Summary

The proposed development will facilitate the construction of a 30-dwelling unit development on underutilized lands within the County's Settlement Area. The proposed Official Plan and zoning amendments and future plan of condominium will help add to the range of housing in the area. The form of development contributes the County's existing residential building supply, improves the mix of land uses in the area, adds to the diversity unit configurations available, and will appeal to individuals with various needs and financial abilities. The lands have access to existing municipal infrastructure and will not cause any environmental or public health and safety concerns as the necessary studies have been completed to implement mitigation from adjacent industrial land uses.

1.5 Public Spaces, Recreation, Parks, Trails and Open Space

Section 1.5 addresses healthy communities and the provision of public spaces, recreation, parks, trails and open space. The lands are too small to provide viable parkland. Therefore, 5% of the value of the lands will be paid to the County in lieu of parkland dedication in accordance with County policies. It will facilitate active transportation and community connectivity due to the proximity of local businesses and services and fosters social interaction through existing recreation in the area. More specifically, the development is near public parks and adjacent to the Trans Canada Trail identified on Schedule I of the Official Plan.

1.6 Infrastructure and Public Service Facilities

Policy 1.6 discusses the efficient use of infrastructure, utilities and green infrastructure. The subject lands will take advantage of existing infrastructure and coordinate the installation of utilities. Green infrastructure in the form of street trees will be required by the County. The lands will contain permeable surfaces in the form of sodded boulevards open space areas unoccupied by buildings, structures and driveways. The proposed application will include an increased naturalized area for storm water management purpose to help control effects on downstream facilities.

1.8 Energy Conservation, Air Quality and Climate Change

Policy 1.8.1 states that planning authorities shall support energy conservation and efficiency, improved air quality, reduced greenhouse gas emissions, and preparing for the impacts of a changing climate through land use and development patterns which:

b) promote the use of active transportation and transit in and between residential, employment (including commercial and industrial) and institutional uses and other areas;
e) encourage transit-supportive development and intensification to improve the mix of employment and housing uses to shorten commute journeys and decrease transportation congestion;

The proposed development is in a location that encourages active transportation such as walking and cycling. The lands are in close proximity to various commercial and institutional uses which provide employment opportunities to the future residents of the development.

3.0 Protecting Public Health and Safety

Policy 3.0 discusses natural and human-made hazardous lands, where development is prohibited or permitted subject to conditions addressing flooding and erosion.

As shown through the D-6 Compatibility Assessment completed by CCS Engineering Inc., there are no existing facilities (industrial or commercial) that are expected to adversely impact the proposed development with noise, dust or odour emissions. Any future proposed industrial facility will already have to take into consideration these provincial guidelines and standards due to existing residential land uses in the immediate area. The proposed development does not further inhibit industrial uses beyond what has been established currently.

Appendix C – Norfolk County Official Plan Policy Compliance

Norfolk County Official Plan – Policy Compliance Table

This appendix demonstrates how the proposed application is consistent with those applicable policies of the Norfolk County Official Plan.

Section	Policy	Comments	Complies
2.2	**Goals and Objectives** This section of the Official Plan sets out six "Goals and Objectives" to which the following five are applicable to the proposed residential development: • Strong and Diversified Economy; • Maintaining and Enhancing the Rural and Small-Town Character; • Maintaining a High Quality of Life; • Upgrading and Expanding Infrastructure; and • A Well Governed, Well Planned and Sustainable County.	The proposed Official Plan and Zoning Bylaw Amendment maintains the general purpose and intent of the Official Plan's Goals and Objectives by providing compact and efficient residential infill development within the serviced urban area of Waterford. The location of the development will provide its residents with easy access to commercial and social services located in the local shopping centre and downtown area. The proposed development will provide residents with access to much needed housing options to live and work in Norfolk County. Through the site plan processes, adherence to the County's high quality design criteria will ensure this development maintains and enriches the rural and small-town character. The housing options provided in this development will achieve a density of 14.8 uph to ensure efficient use of land while maintaining compatibility with surrounding residential land uses. The location of this development will provide its residents with easy access to Thompson Road and Old Highway 24 in order to access employment opportunity across Norfolk County.	✓

5.3	**Housing** The provision of housing is an essential part of planning in Norfolk County. The County shall ensure that a full range of housing types are provided to meet the anticipated demand and demographic change.	The proposed application is consistent with the policies of this section of the official plan. This residential development will provide much need additional housing forms. The proposed application provides a housing form not readily available in Norfolk County.	✓
	5.3 e) Under this section the County shall encourage innovative and appropriate housing development that exhibits design and adaptability characteristics, and may represent non-traditional additions to the County's housing stock.	e) This section of the Official Plan requires the County to consider innovative and appropriate housing options. As shown on the concept site plan, the design of this development will provide townhouses which are not readily available in Norfolk County.	
	5.3 g) Further the County shall encourage that housing be considered when opportunities for redevelopment become available. This includes the redevelopment of existing single-use and underutilized areas with full municipal services, such as shopping plazas, business and employment sites and older commercial and residential areas, especially where the land is in close proximity to human services. Special attention shall be given to the design of buildings, the landscaping treatment and features of the site to ensure that the proposed redevelopment is physically compatible with the adjacent uses.	g) This development is strongly encouraged by this section of the official plan. The proposed application is seeking redevelopment of underutilized lands. The purposed development would see the redevelopment of this site in a compact and efficient manner. As shown through the D-6 compatibility study there are no negative impacts on the proposed development or surrounding land uses. Through the site plan process, buffering and landscaping will be provided on site to further mitigate any potential impacts. The innovate site design has incorporated pedestrian connections through the site along with bike racks to encourage active transportation.	

	5.3.1 Residential Intensification b) The County shall target that a minimum 25 percent of its annual residential growth be accommodated through infill, intensification and redevelopment within the existing built-up areas in the Urban Areas with full municipal services. The boundary of the Built-Up areas of Simcoe, Port Dover, Delhi, Waterford and Port Rowan are indicated on Schedule "B" to this Plan and delineates the extent of existing development at the time of the approval of the Official Plan Amendment implementing the Five-Year Review of the Official Plan. Development within the Built-Up Area boundary will be considered as infill development and development situated between the Built-Up Area boundary and the boundary of the Urban Area will be considered as greenfield development. d) On lands designated Urban Residential and located outside of the Built-Up areas of Simcoe, Port Dover, Delhi, Waterford and Port Rowan, the minimum overall density of residential development shall be 15 units per hectare of developable land area. Developable land shall not include Hazard Lands, Provincially Significant Wetlands and Significant Natural Areas. e) Under this section the County shall encourage innovative and appropriate housing development that exhibits design and adaptability characteristics, and may represent non-traditional additions to the County's housing stock.	b) This would be considered as intensification as per policy 5.3.1 and contribute to the County's minimum 25 percent target of its annual residential development through infill, intensification and redevelopment within the existing built-up areas in the Urban Areas with full municipal services. d) The proposed development achieves an overall density of 14.8 uph, which maintains the intent of this policy. e) This section of the Official Plan requires the County to consider innovative and appropriate housing options. As shown on the concept site plan, the design of this development will provide a form of housing not readily available in Norfolk County.	✓

	f) The County shall consider applications for infill development, intensification and redevelopment of sites and buildings through intensification based on the following criteria:		✓
	i. the development proposal is within an Urban Area, and is appropriately located in the context of the residential intensification study;	i. The proposed development is located within the urban area of Waterford and appropriately located within a residential area.	
	ii. the existing water and sanitary sewer services can accommodate the additional development;	ii. A functional servicing report has been completed to show the local water and sanitary sewers can accommodate the development. During the site plan approval phase, modelling will be complete to ensure the necessary capacity exist within the water treatment and wastewater treatment facilities to support the development.	
	iii. the road network can accommodate the traffic generated;	iii. A traffic impact study was completed and determined the road network can accommodate the anticipated traffic demands.	
	iv. the proposed development is compatible with the existing development and physical character of the adjacent properties and surrounding neighbourhood; and	iv. The proposed condominium is seeking to establish group townhouses which are compatible with the existing development and physical character of the adjacent properties / surrounding neighbourhood.	
	v. the proposed development is consistent with the policies of the appropriate Land Use Designation associated with the land	v. As outlined in the Planning Justification the proposed development is consistent with the policies of the appropriate Land Use Designation associated with the land.	

5.4	**Community Design** The following shall be the policy of the County:		✓
	a) Through implementation of this Plan, the County shall seek to maintain and improve the physical design characteristics of the Urban Areas in the context of new and existing development and stress a generally high quality of settlement design throughout the County.	a) This development will be subject to the site plan control process which will ensure high quality design.	
	b) Through the review of development applications, including plans of subdivision, site plans and other development proposals, the County:		
	i. shall ensure that new development is designed in keeping with the traditional character of the Urban Areas, in a manner that both preserves the traditional image of the Urban Areas and enhances the sense of place within the County while maintaining the community image of existing settlement areas;	i. The proposed development will achieve 14.8 uph to ensure efficient use of the land while providing a density that maintains an overall small-town characteristic which is generally comprised of single and semi-detached dwellings. This characteristic is further enhanced with future additional units within the Cedar Park subdivision.	✓
	ii. shall promote efficient and cost-effective development design patterns that minimize land consumption;	ii. McCool Street is proposed to be closed and conveyed to the developer to facilitate an efficient condominium layout and density.	
	iii. shall promote the improvement of the physical character, appearance and safety of	iii. The development is subject to site plan control which will address the gateway areas to and from the development onto Vanrooy Trail and West Church	

	streetscapes, civic spaces, and parks;	Street such as appropriate landscaping features that do not interfere with site lines.	✓
	iv. shall encourage tree retention and tree replacement;	iv. A tree planting plan can be provided during the site plan process.	
	v. shall ensure that design is sympathetic to the heritage character of an area, including the area's cultural heritage resources;	v. The surrounding residential lands are a mix of established and new residential development. Given the proposed form of housing is similar to the existing housing in the area this policy will be achieved. No cultural heritage dwellings have been identified in close proximity to the subject lands.	
	vi. shall strongly encourage design that considers and, wherever possible, continues existing and traditional street patterns and neighbourhood structure; and	vi. As shown on Appendix A, the proposed development will implement the requirements of this policy. The design of the condominium considers the R4 Zone standards to ensure traditional neighbourhood structure is maintained.	
	vii. may require, at the County's sole discretion, that proponents submit design guidelines with development applications, establishing how the policies of this Section have been considered and addressed. Such guidelines may also be required to address related issues of residential streetscaping, landscaping, setbacks,	vii. This requirement will be met during the site plan application process.	

	sidewalks, signage, garage placement, and architectural treatment		
	c) Adequate measures shall be taken to ensure that the permitted uses have no adverse effects on adjacent land uses. Adequate buffering shall be provided between any uses where land use conflicts might be expected, and such buffering may include provisions for grass strips and appropriate planting of trees and shrubs, berms or fence screening, and other means as appropriate. Modifications to building orientation may also be appropriate buffering measures, but not in replacement of appropriate plantings.	c) This requirement will be met during the site plan application process. The land use compatibility assessment supports the proposed uses adjacent to the existing industrial use. Recommendations to improve potential compatibility issues are included in the compatibility assessment.	
	d) Development design that establishes reverse lotting on Provincial Highways and County Roads will not be permitted. Development design that requires features such as noise attenuation or privacy fencing will be discouraged. Wherever possible, new development will be oriented toward streets or parks.	d) As shown on the site plan, no reverse lotting is proposed for any dwelling units on this development.	
6.4	**Urban Areas** This section of the Official Plan identifies the six Urban Areas of Norfolk County – Delhi, Courtland, Port Dove, Port Rowan, Simcoe, and Waterford – as the focal points for growth and development activity.	The proposed application is within the urban boundary of Waterford and will help Norfolk County meet its growth targets.	✓
6.5.4	The County will support and promote the continued development of		

	Waterford as an important urban community and agricultural support centre in the County. The following shall be the policy of the County: a) Waterford is the closest Urban Area to Highway No. 403. The County shall encourage employment growth and development in the Urban Area. b) Many of the historic residences in the Waterford Urban Area are of cultural heritage value or interest. The County will encourage the maintenance, rehabilitation, and adaptive reuse of the historic residences. c) Trail linkage opportunities exist in the Waterford Urban Area due to the presence of abandoned rail corridors and other linear open space features. The County will encourage the development of trails integrating Waterford with other areas of the County.	This development is located within the urban area of Waterford and does not offend these policies. A link to the trail to the west will be provided.	✓
7.7	**Urban Residential Designation** The Urban Residential Designation applies to the Urban Areas of the County. The Urban Areas are expected to continue to accommodate attractive neighbourhoods which will provide for a variety of residential forms. A variety of housing types are needed to meet the needs of a diverse population.	The proposed development will provide a form of housing not readily available in Norfolk County.	✓

	Under Permitted uses: 7.7.1 b) Medium density residential uses shall be permitted including triplex dwellings, fourplex dwellings, row or block townhouse dwellings, converted dwellings containing more than two dwelling units, walk-up apartments and similar medium profile residential buildings. Land Use Policies 7.7.2 b) Triplex, fourplex, townhouses, and other medium density housing forms, shall generally have a net density of between 15 and 30 uph, save and except for in the Courtland Urban Area where private servicing limitations shall determine the density of development. New medium density residential development and other uses that are similar in terms of profile, shall meet the following criteria: i. the density, height and character of the development shall have regard to adjacent uses; ii. the height and massing of the buildings at the edge of the medium density residential development shall have regard to the height and massing of the buildings in any adjacent low density residential area and may be subject to additional setbacks,	The policies of section 7.7.2b) require development to <u>generally</u> have a net density of between 15 and 30uph. The proposed development provides and overall density of 14.8 uph, in the form of group townhouse dwellings. The requested R4 zone category will facilitate the townhouses and implement the policies of Section 7.7.2b). As a proposed medium density condominium, subject to Section 9.6.5 Site Plan Control, the development will adhere to Norfolk County's design criteria to ensure all requirements of this section are satisfied. This will include the necessary studies and modeling to ensure service capacity exists and appropriate buffering and landscaping is implemented. i. The proposed forms of housing are similar to the existing residential uses in the area along Cottonwood Street and Lotus Avenue. The proposed R4 zone has a maximum height provision of 11m. This height provision is the same as the surrounding zones and not out of character for the area. ii. The proposed maximum height for the R4 zones are the same as the surrounding residential lands. All through the condominium block is considered the lot, the site has been designed so each condominium unit achieves the required zoning setbacks (front	✓

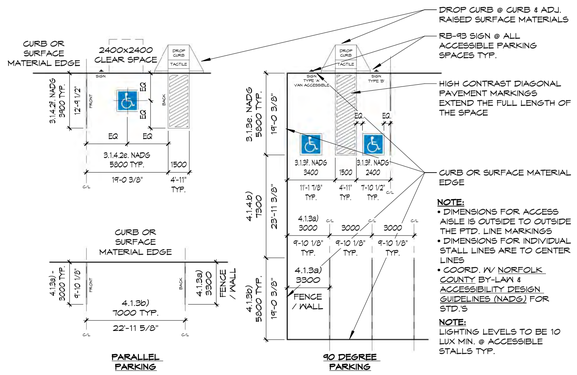
	or landscaping to provide an appropriate buffer;	yard / rear yard / side yards) to help further reduce potential compatibility issues.	
	iii. the development will be encouraged to have direct access to an arterial or collector road, where possible and appropriate;	iii. In accordance with Schedule E-5, West Church Street is classified as a collector road. The proposed development has direct access to West Church Street.	
	iv. the watermains and sanitary sewers shall be capable of accommodating the development, or the proponent shall commit to extending services at no cost to the County, save and except for in the Courtland Urban Area, where private septic systems shall be permitted;	iv. A functional servicing report has been completed by G. Douglas Vallee and the necessary modelling will be completed during the site plan process.	
	v. the development is adequately serviced by parks and school facilities;	v. At this time, Norfolk County will not accept a parkland dedication as part of this development. Cash-in-lieu will be provided to ensure Norfolk County can provide parkland as required. The local school board will be circulated as part of the development approvals process.	✓
	vi. in developments incorporating walk-up apartments, block townhouse dwellings and medium-profile residential buildings, on-site recreational facilities or amenities such as playground equipment may be required;	vi. This requirement can be considered during the site plan application processes. The current site design incorporates bike racks and benches and is located adjacent to the Trans Canada Trail.	

	vii. the development shall be designed and landscaped, and buffering shall be provided to ensure that the visual impact of the development on adjacent uses is minimized;	vii. This requirement can be considered during the plan of subdivision and site plan application processes.	
7.13	**Industrial Designation** The Industrial Designation applies to older industrial sites that are under-utilized and poorly situated to attract new industrial investment. Generally, areas designated as Industrial are located near to residential areas and their intensive use for industrial purposes may conflict with neighbouring sensitive uses. The conversion of lands designated as Industrial to other uses more compatible with the neighbourhood context in which the lands are situated is encouraged.	The proposed development is strongly encouraged by this section of the official plan. The subject lands are underutilized industrial lands located in close proximity to existing residential lands. The proposed official Plan and Zoning Bylaw Amendment would see the conversation of these lands to a compatible residential land use.	✓
8.8	**Noise, Vibration, Odour and Light Emissions** Noise, vibration, odour and other contaminants resulting from industrial activity can impact adjacent land uses, and the residents, businesses and visitors of Norfolk County. Managing noise, vibration and odour levels in the County is important to ensuring the health and well-being of the County, and in managing appropriate relationships between sensitive land uses, land uses that emit noise, vibration and/or odour, and certain elements of the transportation network.	A D-6 Compatibly Assessment was completed by CCS Engineering Inc. to determine if noise, odour, vibration or dust emissions from surrounding sources might adversely impact the proposed townhouse development sensitive land uses. As shown through the D-6 Compatibility Assessment completed by CCS Engineering Inc., there are no existing facilities (industrial) that are expected to adversely impact the proposed development with noise, dust or odour emissions. The study recommends that the condominium units be designed with the provision for adding central air conditioning to allow windows and exterior doors to remain closed,	✓

		thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment, Conservation, and Parks (MOECP). These recommendations will be incorporated into the development at the site plan stage to further mitigate any potential for future land use conflicts.	
8.9.1	**Services in Urban Areas** 8.9.1 c) All development in the Urban Areas shall be fully serviced by municipal piped water supply and waste water treatment systems, save and except for circumstances outlined in Section 8.9.1 f) (Services in Urban Areas). Notwithstanding this, appropriate development shall be permitted in the Courtland Urban Area on the basis of a municipal water system and private waste water disposal systems. e) Infilling of vacant areas within the Urban Areas which are already provided with full municipal services is encouraged, and shall be a criterion when evaluating proposed plans of subdivision and consents, with respect to the extension of services, utilities or the associated construction.	As demonstrated by the Functional Servicing Report prepared by G. Douglas Vallee Limited, adequate capacity exists within the water and sanitary mains within the Cedar Park Subdivision to service the development. As infill site within the urban area of Waterford, this development is encouraged by the policies of this section.	✓
9.6	Development Control 9.6.1 c) The County shall consider the following criteria when reviewing applications to amend this Plan: i) the manner in which the proposed amendment conforms to prevailing Provincial policy and regulations;	The proposed application is for an Official Plan and Zoning Bylaw amendment in order to facilitate a medium density multi-unit condominium which will provide	✓

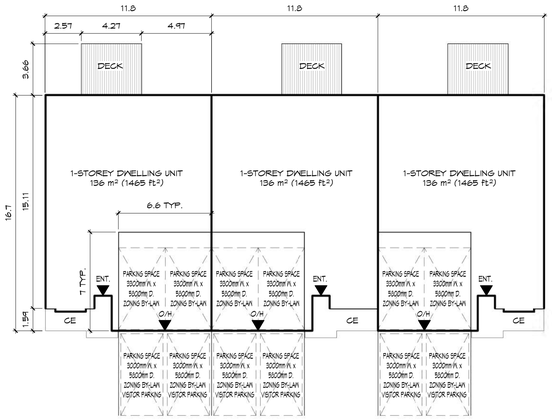
	ii) the manner in which the proposed amendment conforms to the Strategic Plan prepared in support on this Plan; iii) the manner in which the proposed amendment conforms to the Goals and Objectives, and policies of this Plan; iv) the impacts of the proposed amendment on the provision of and demand for municipal services, infrastructure and facilities; v) the adequacy of the proposed servicing solution with respect to the servicing policies of this Plan; vi) the impact of the proposed amendment on surrounding land uses, the transportation system, municipal services and community amenities and services; vii) the impact of the proposed amendment on the community structure and nature of the Urban Areas and/or Hamlet Areas; viii) the impact of the proposed amendment on cultural heritage resources and/or Natural Heritage Features; ix) the impact on agricultural uses and land; x) the impact of the proposed amendment on the financial sustainability of the County; and xi) any other information determined by the County, in	increased housing options to the area. The development will be located on an assembled parcel consisting of existing lots of record within the Urban Settlement area of Waterford and will have access to adequate municipal water and sanitary services. The necessary studies and modeling have been completed to ensure there are no adverse impacts on surrounding land uses the necessary capacity exists within the municipal services to accommodate this development. This type of development will provide the citizens of Norfolk with increased housing options and is supported and encouraged by provincial and county land use planning policies.	

	consultation with the appropriate, agencies, to be relevant and applicable.		
9.10.5	Parkland Dedication The County shall secure the maximum benefit of the Planning Act with respect to land dedication for park development and shall strive to meet the policies of Section 7.5.1 (Parks) of this Plan relating to park development. g) The County may accept cash-in-lieu of the land dedication to be paid into a special account and used as specified in the Planning Act. Council will consider cash-in-lieu of parkland dedication under the following circumstances: a. where the required land dedication fails to provide an area of suitable shape, size or location for development as public parkland; b. where the required dedication of land would render the remainder of the site unsuitable or impractical for development; and/or c. where it is preferable to have consolidated parkland of a substantial size servicing a wide area d. The County may establish a flat rate for cash-in-lieu payments for parkland dedications from new residential, commercial and industrial lots created by consent.	At the pre-consultation meeting, it was indicated that Norfolk County will not accept a parkland dedication as part of this development. As part of the approval process, cash-in-lieu of parkland will be provided in accordance with the applicable policies and bylaws.	✓



2 PC/Z100 SCALE 1 : 200

PARKING STALL GUIDELINES - NORFOLK COUNTY

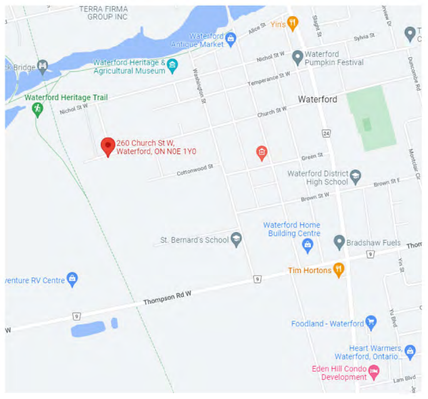


3 PC/Z100 SCALE 1 : 200

TYPICAL UNIT LAYOUT

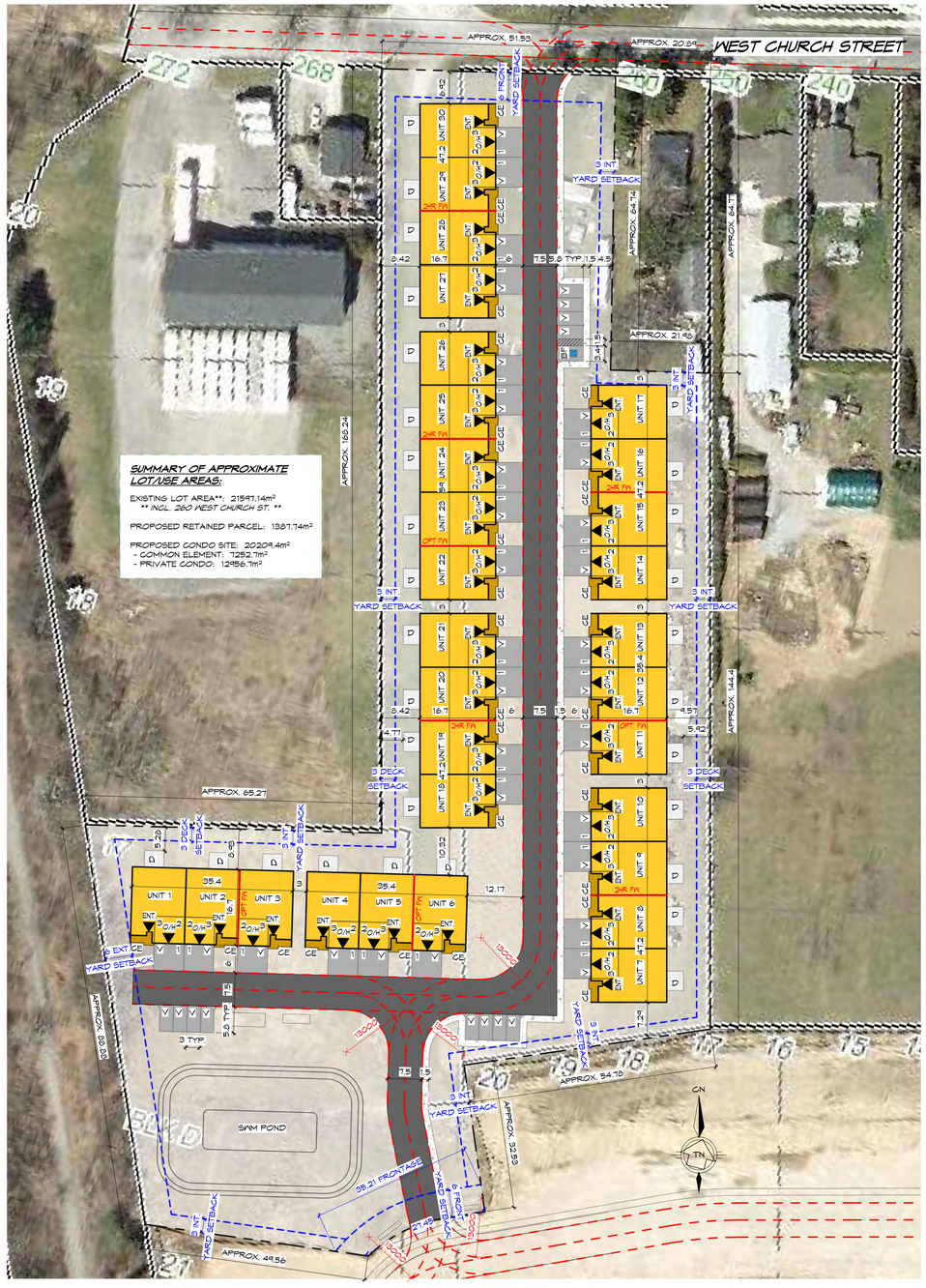
4 PC/Z100 SCALE 1 : 300

PROPOSED RETAINED PARCEL



KEY MAP
SCALE 1 : 100

SITE MAP
SCALE 1 : 100



1 PC/Z100 SCALE 1 : 600

SITE PLAN PRECON / ZONING AMENDMENT

SITE STATISTIC & ZONING REQ.'S

PROPERTY LEGAL DESCRIPTION:

PLAN 37R-*, PART *, ROLL # 33503002600
IN THE TOWN OF WATERFORD, IN THE DISTRICT OF NORFOLK COUNTY

ZONING:

IN ACCORDANCE TO THE TOWN OF WATERFORD, ZONING BY-LAW 1-Z-2014 NORFOLK COUNTY - JANUARY-2021-CONSOLIDATION

PROVISION	LAND USE: EXISTING
5.4 5.4.1 SPECIAL PROVISIONS 3.2.1 (e) 3.2.1 (g)	URBAN RESIDENTIAL TYPE 4 ZONE (R4) PERMITTED USES In an R4 Zone, no land, building or structure shall be used except in accordance with the following uses: a) group townhouse g) dwelling, single detached Existing accessory structure(s) to existing residential use(s) are permitted within 1.2m of an interior lot line within a rear yard. Existing accessory structure(s) to existing residential use(s) are permitted to occupy up to 125 m² useable floor area.

PROVISION	SETBACKS (m - METERS):	REQ'D (a) Street Townhouse	REQ'D (a) Group Townhouse Stacked Townhouse	PROVIDED (m)
5.4.2a)	MIN. LOT AREA: i) ATTACHED GARAGE ii) CORNER LOT	156m² 264m²	195m² 195m²	20,209m² N/A
5.4.2b)	MIN. LOT FRONTAGE: i) INTERIOR LOT ii) CORNER LOT	6.5 11	30 30	35.2 N/A
5.4.2c)	MIN. FRONT YARD: i) ATTACHED GARAGE ii) DETACHED GARAGE OR REAR YARD PARKING	6 1.5	6 1.5	8.9 N/A
5.4.2d)	MIN. EXTERIOR SIDE YARD: i) W/ A 6m FRONT YARD ii) W/ A 1.5m FRONT YARD	6 1.5	6 1.5	6 N/A
5.4.2e)	MIN. INTERIOR SIDE YARD	1.2	3	3
5.4.2f)	MIN. REAR YARD: i) ATTACHED GARAGE	7.5	7.5	N/A
5.4.2g)	MIN. SEPARATION BETWEEN TOWNHOUSE DWELLINGS	2	2	3
5.4.2h)	MAX. BLDG. HEIGHT	11 [8-Z-2017]	11 [8-Z-2017]	TBD [8-Z-2017]
5.4.3	MIN. MUTUAL SIDE LOT LINE	1.2	1.2	N/A
5.4.4	MAX. UNITS IN A TOWNHOUSE DWELLING	8 UNITS	8 UNITS	5 UNITS

COORD. W/ ZONING BY-LAW FOR ALL OTHER ZONING REQ.'S

PARKING REQ.'D: RESIDENTIAL

PROVISION	NUMBER OF PARKING SPACES	REQUIRED	PROVIDED
4.9a)	TOWNHOUSE DWELLINGS [8-Z-2017]: 2 SPACES / DWELLING UNIT 2 SPACES x 30 DWELLING UNITS = 60	60 SPACE(S)	60 RESID SPACE(S) PLUS 30 ADDITIONAL SPACES

PARKING REQ.'D RESIDENTIAL - VISITOR:

4.9f)	VISITOR PARKING: 1 SPACE / 5 DWELLING UNITS 1 SPACE x (30 / 5) = 10	10 SPACE(S)	5 SPACES IN COMMON ELEMENT PLUS 30 SPACES IN PRIVATE DRIVEWAYS

PARKING REQ.'D TOTAL:

	TOTAL	70 SPACE(S)	103 SPACE(S)

PARKING REQ.'D - BARRIER FREE: (PART OF REQ.'D VISITOR PARKING)

4.3.3	BARRIER FREE PARKING REQ.'D: 1.2% (VISITOR) PARKING SPACES =		
	TYPE 'A' (3.4m WIDE) PLUS 1.5m AISLE	1 SPACE(S)	1 SPACE(S)
	TYPE 'B' (2.4m WIDE) PLUS 1.5m AISLE	N/A	N/A

PARKING AREA REGULATIONS

4.1 4.1.3a) 4.1.3b)	PARKING SPACE DIMENSIONS WIDTH OF PARKING SPACE: FOR VEHICLES PARKED SIDE BY SIDE FOR VEHICLES PARKED WITH WALL OR FENCE ADJ. DEPTH OF PARKING SPACE: FOR 90 DEGREE PARKING FOR PARALLEL PARKING	 3 MIN. 3.3 MIN. 5.8 MIN. 7 MIN.	 3 3.3 5.8 7
4.1.4 4.1.4b)	PARKING AISLE REQ.'S TWO-WAY TRAFFIC	7.3 MIN.	7.3 MIN.

SITE PLAN LEGEND

- ENTRANCE / EXIT DOOR
- ENT. MAIN ENTRANCE / EXIT DOOR
- O/H ENTRANCE / EXIT DOOR (OVERHEAD DOOR W/ OPERATOR)
- PROPERTY LINE
- SETBACKS
- FIRE / WASTE/RECYCLING PICK-UP ROUTE (7.5m WIDE / 13m CENTER RADIUS)
- CE COVERED ENTRANCE
- D DECK / UNENCLOSED PORCH
- PAINTED GRAPHICS ON ASPHALT / CONC.: (COORD. W/ THE CITY / TOWN HAVING JURISDICTION GUIDELINES)
- • WHEELCHAIR SIGN ON ASPHALT / CONC. (WHITE & BLUE COLOUR)
- BF V # • VEHICULAR STALL MARKINGS (YELLOW COLOUR)
  BF - BARRIER-FREE PARKING
  V - VISITOR
  # - PARKING SPACE COUNT / DWELLING UNIT
- • DIAGONAL MARKINGS

HATCH IDENTIFICATION LEGEND

- CONC. SIDEWALK / PAD / CROSSWALK / SIDEWALK / LANEWAY / STAIRS / ETC.
- AREA OF ASPHALT
- AREA OF PARKING
- 1-STOREY RESIDENTIAL DWELLING (VEHICULAR - x2 GARAGE, x2 DRIVEWAY) (11800mm W x 16700mm D)
- COVERED ENTRANCE AREA

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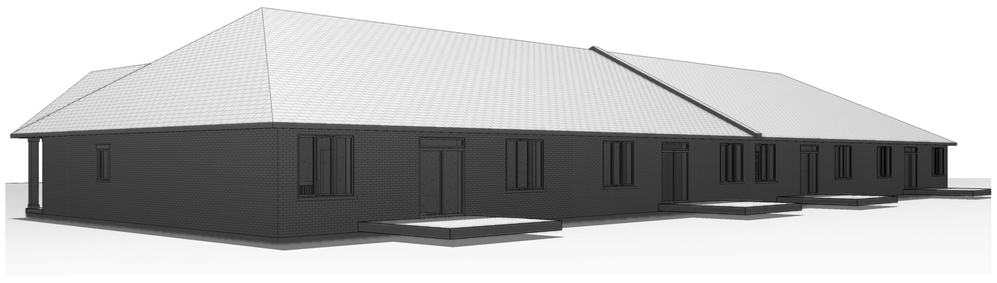
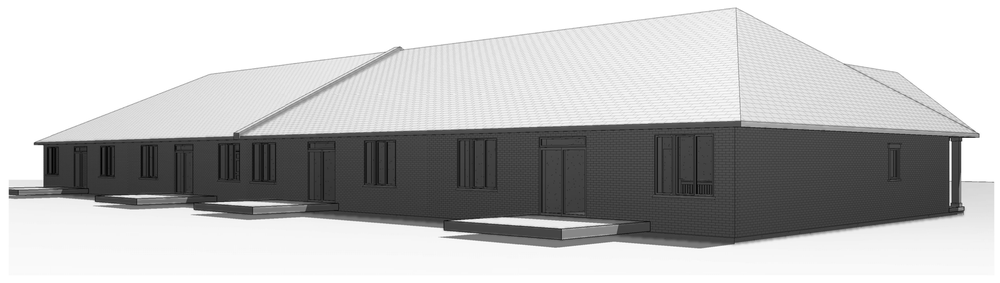
Project Title
COTTONWOOD CONDOMINIUMS
WATERFORD, ONTARIO
N0E 1Y0

PROJECT No.
21-173

Drawing Title
SITE PLAN PRE-CON / ZONING AMENDMENT

Drawing No.
PC/Z100





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Project Title

COTTONWOOD CONDOMINIUMS

WATERFORD, ONTARIO
N0E 1Y0

PROJECT No.
21-173

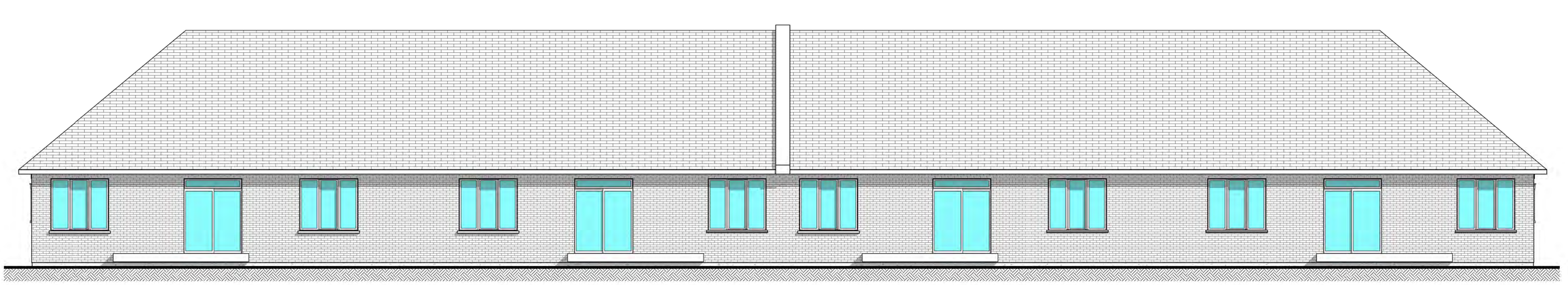
Drawing Title

COVER SHEET

Drawing No.

A000

1 P100 TYPICAL FRONT ELEVATION
SCALE 1 : 60



2 P100 TYPICAL REAR ELEVATION
SCALE 1 : 60

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Project Title

COTTONWOOD CONDOMINIUMS

WATERFORD, ONTARIO
N0E 1Y0

PROJECT No.
21-173

Drawing Title

ELEVATION

Drawing No.

P100

1 / P200 LEVEL 1 PLAN PRESENTATION
SCALE 1 : 60

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Project Title
COTTONWOOD CONDOMINIUMS
WATERFORD, ONTARIO
N0E 1Y0

PROJECT No.
21-173

Drawing Title
PRESENTATION PLANS

Drawing No.
P200

vallee
Consulting Engineers, Architects & Planners

August 9, 2022

Aucoin-Dixon Developments Inc.
75 Brant Avenue
Brantford, ON
N3T 3H2

Attention: **Mr. Paul Aucoin**

Reference: **Functional Servicing Report**
Cottonwood Condominiums
Waterford, Norfolk County
Our Project # 21-173

Introduction

This Functional Servicing Report has been prepared on behalf of Aucoin-Dixon Developments Inc. in support of the zoning by-law amendment required for the construction of a 30-unit condominium development located in Waterford - Norfolk County. This report presents the conceptual functional serving for the proposed development, including sanitary servicing, storm servicing and domestic and fire water servicing. The indicated designs are conceptual and may be altered prior to final design approvals in order to improve efficiency and produce cost savings.

Background

The proposed 2.02 ha development site is situated on the western edge of Waterford. Currently, the subject property is vacant land and is bounded by residential lands to the east & the south, D&R Towing and the LE & N Trail to the west, and West Church Street to the north. The proposed development will be an extension of the existing Cedar Park II Subdivision, located at the south end of the subject site. Refer to Figure 1 in Appendix A for the site location.

Land Use and Design Assumptions

The subject property is currently zoned as “General Industrial Zone (MG)” and a small portion is zoned as “Urban Residential Type 4 (R4)”. The proposed development will be zoned entirely as “Urban Residential Type 4 Zone (R4)”, and will consist of the following construction:

- 30 – 2-storey residential dwelling units;
- Storm and sanitary infrastructure to support proposed construction;
- Stormwater management facility;
- Curbs, sidewalks, swales and other miscellaneous items to support proposed construction.

Sanitary Servicing

Record drawings from Vallee Project No. 17-027- Cedar Park II Subdivision indicate a 200mm PVC diameter gravity sewer installed along “Street A”, located south of the proposed Cottonwood development. As part of the Cedar Park II Subdivision, a sanitary manhole will be installed on the subject site’s south property line for future development. Refer to drawing 17-027 SAN – Sanitary Drainage Areas, located in Appendix B. It is proposed that sanitary flows from the proposed development will discharge to this sanitary sewer system.

Sanitary design flows were calculated using the Norfolk County Design Criteria. Table 1 presents the flow information for the proposed development. In summary, the proposed development is anticipated to generate an additional sanitary flow of approximately 2.40 L/s to the sanitary sewer within the Cedar Park Subdivision.

Table 1
Sanitary Design Flow Information

Total Number of Units	30
Population Density (persons/units)	2.75
Per Capita Flow (L/person/day)	450
Peak Extraneous Flow (L/sec/hectare)	0.28
Development Area (ha)	2.02
Infiltration Flow (L/s)	0.56
Sewage Flow (L/s)	0.43
Peak Design Flow (L/s)	2.40

As part of the Cedar Park II Subdivision (Vallee Project No. 17-027), a sanitary drainage area plan and sanitary design sheet were created for the sanitary sewer system which discharges to the sanitary main along Charles Street, shown in Appendix B. This sanitary design sheet has been updated to include the proposed 30-unit condominium development, as shown on the revised sanitary design sheet in Appendix B. Based on the calculations completed, it can be concluded that the sanitary sewer within the existing Cedar Park II Subdivision has adequate capacity to support the proposed development.

To confirm the calculations presented, it is recommended that sanitary hydraulic modelling be completed by the Norfolk County consultant to determine if the existing County infrastructure provides adequate capacity to accommodate the estimated sanitary design flow from the proposed development.

Stormwater Management

Under existing conditions, the subject site is composed of open grassed area. The majority of runoff from the site drains overland in a south easterly direction the Cedar Park II Subdivision, and a small portion drains overland to the west towards the LE & N Trail. As part of the Cedar Park II Subdivision (Vallee Project No. 17-027), a 525mm storm sewer was installed to the property line along “Street A” to provide a storm connection for future development. It is proposed the Cottonwood Condominiums will utilize this connection as an outlet for stormwater runoff.

During the design of the Cedar Park II Subdivision storm sewers and stormwater management facility, a portion of the Cottonwood development site was included within the stormwater drainage areas. However, additional area has been added to the catchment area, therefore an on-site stormwater management facility is proposed to reduce post-development peak flows during all storm events up to and including the 100-year storm event. Minor storm events (2-year and 5-year) will be conveyed to the proposed SWM storage facility at the south end of the subject property through a storm sewer network and major storm events will flow overland. Runoff released from the storage facility will be directed to the 525mm storm sewer connection, and conveyed to Cedar Park II SWM Facility via the Cedar Park II storm sewer network, where it will ultimately discharge to the Waterford South Municipal Drain (WSMD) via the Thompson Road storm sewer.

As part of the Cedar Park II Subdivision (Vallee Project No. 17-027), a storm drainage area plan and storm design sheet were created for the Cedar Park II storm sewer system and the Thompson Road storm sewer, shown in Appendix C. The maximum allowable flow rate from the proposed Cottonwood SWM facility is 0.155 m^3/s, based on the capacity of the Cedar Park II storm sewers. The maximum allowable flow rate from the existing Cedar Park II SWM Facility is 0.192 m^3/s, based on the capacity of the Thompson Road storm sewer. Refer to the revised storm sewer design sheet in Appendix C. In addition, the storage capacity of the existing Cedar Park II SWM Facility must not exceeded, and the pre-development flow rates to the WSMD determined as park of the Cedar Park II SWM design must not been exceeded for all storm events up to and including the 100-year storm event.

Visual OTTHYMO was utilized to simulate the proposed post-development condition for the Cottonwood Condominium site and determine the storage volume and orifice control required to meet the quantity control objectives. Using a storage volume of 600 m^3 and a 150mm control orifice, the total post-development design flows from the subject site can be controlled to meet the aforementioned quantity control targets. Table 2 presents the proposed post-development peak flow rates to the Cedar Park II storm sewer system and the Thompson Road storm sewer during the 100-year storm event. As shown below, the proposed flow rates to the receiving storm sewers are less than the maximum allowable flow rates.

Table 2
100-Year Post-Development Flow Rates to Storm Sewers

	Maximum Allowable (cms)	Proposed (cms)
Cedar Park II Storm Sewer System	0.155	0.052
Thompson Road Storm Sewer System	0.192	0.179

Table 3 presents the approximate utilized storage volumes and elevations in the Cedar Park II SWM Facility under current conditions and with the proposed Cottonwood development. An emergency overflow is provided at an elevation of 241.40m, therefore the ponding elevation in the proposed condition must not exceed 241.40m. As shown below, the proposed Cottonwood SWM Facility provides adequate storage to ensure that the maximum storage depth in the Cedar Park II SWM Facility is not exceeded.

Table 3 Post-Development – Cedar Park II SWM Facility Performance				
Event	Current Condition (Cedar Park II)		Proposed Condition (Cedar Park II with Cottonwood)	
	Storage Volume (m^3)	Storage Elevation (m)	Storage Volume (m^3)	Storage Elevation (m)
2-year	1083	240.80	1116	240.82
5-year	1416	240.93	1458	240.96
10-year	1649	241.03	1700	241.06
25-year	1939	241.13	1987	241.18
50-year	2180	241.25	2192	241.26
100-year	2551	241.40	2539	241.40

Lastly, Table 4 presents the total peak post-development flow rates to the WSMD under the predevelopment condition (prior to construction of the Cedar Park II Subdivision), the current condition and the proposed condition, Cedar Park II with the Cottonwood development.

Table 4 Post-Development – Flows to WSMD			
Event	Pre-Dev to WSMD (prior to Cedar Park II) (cms)	Post-Dev to WSMD (Cedar Park II) (cms)	Post-Dev to WSMD (Cedar Park II with Cottonwood) (cms)
2-year	0.025	0.27	0.026
5-year	0.061	0.047	0.050
10-year	0.101	0.074	0.076
25-year	0.153	0.031	0.130
50-year	0.223	0.185	0.184
100-year	0.315	0.267	0.267

Under the proposed condition, the peak post-development flow rates to the WSMD are controlled to less than the pre-development flow rates for all storm events, with the exception of the 2-year storm event. However, the proposed 2-year post-development flow rates has been reduced when compared to the current flow rate from the Cedar Park II SWM Facility. All supporting calculations can be found in Appendix C. During the detailed design stage, further low-impact development infiltration practices will be analyzed to reduce the required storage volume.

Stormwater quality control for the site will be analyzed during the detailed design stage. At that time, multiple quality control solutions will be investigated, such as low-impact development (LID) treatment and oil grit separators (OGS), and the most practical solution that meets the municipal design criteria will be proposed.

Water Servicing

Record drawings from Vallee Project No. 17-027- Cedar Park II Subdivision indicate a 200mm PVC diameter watermain will be installed along "Street A", within the Cedar Park II Subdivision. An analysis of the hydraulic modelling is required to be conducted by the County consultants to determine the water servicing capacity and constraints on the existing water system to ensure adequate system flows and pressure for the aforementioned domestic and fire demands. Norfolk County's design criteria stipulates the following requirements for system pressures, and the system shall be designed to meet the greater of either of the following requirements;

- Fire flow conditions– not less than 140 kPa
- Normal operating conditions – not less than 280 kPa

Domestic Water Demand

The following summarizes the domestic water flow information for the proposed development. Refer to Appendix D for complete details.

- Total Number of Units: 30
- Population Density: 2.75 persons per unit
- Population: 83 people
- Average Daily Water Demand (per person) 0.450 m^3/person/day
- Average Daily Water Demand: 37.35 m^3/day (0.43 L/s)
- Maximum Day Demand Factor: 2.25
- Maximum Day Demand: 84.04 m^3/day (0.97 L/s)
- Peak Hourly Demand Factor (Residential) 4.00
- Peak Hourly Demand 6.23 m^3/hour (1.73 L/s)

Fire Water Service

According to the County GIS online mapping and record drawings from Vallee Project No. 17-027, there are two existing fire hydrants located within proximity to the proposed development. One is located at the west end of West Church Street, and the second will be located on the south side of "Street A" in the Cedar Park II Subdivision. However, these hydrants do not provide substantial coverage of the proposed development. Consequently, two fire hydrants will be installed on the subject property to service the proposed development.

Typically, available fire flow during the maximum day demand is the critical criteria when evaluating a watermain distribution system's ability to service a residential subdivision. The estimated fire flow requirement for the development has been determined using both the recommendations of the Fire Underwriters Survey – 1999 (FUS) and the Ontario Building Code (OBC) method. Using the FUS recommendations and the OBC fire flow calculation procedure, the minimum required fire flow was determined to be 133 L/s and 90 L/s, respectively. It should be noted that the FUS method is generally conservative. As such, the required flow for proposed development is estimated to be 90 L/s. Supporting calculations for both methods are detailed in Appendix D.

The watermain hydraulic assessment of the Cedar Park II Subdivision completed by R.V Anderson dated April 9, 2019 estimates that the available fire flow in the watermain along “Street A” ranges from 127 L/s to 138 L/s. Refer to Figure C-2 within the report in Appendix D. Therefore, the available municipal watermain is anticipated to provide sufficient flow to service the development.

Conclusions and Recommendations

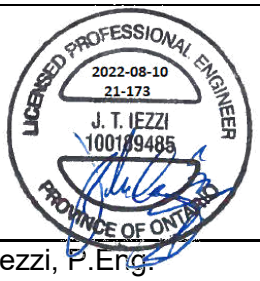
The functional servicing design for the proposed development can be summarized as follows:

- The proposed development will be serviced by a sanitary sewer that connects to the 200mm sanitary sewer along “Street A” within the Cedar Park II Subdivision.
- A peak sanitary design flow of approximately 2.40 L/s is anticipated from the proposed development.
- An analysis of the existing sanitary sewer network within the Cedar Park II Subdivision indicates that there is sufficient capacity to support the sanitary flows from the proposed development.
- Overland flow during major storm events, and internal storm sewers during minor storm events will convey stormwater to the proposed SWM facility, ultimately releasing to the 525mm diameter storm sewer along “Street A” within the Cedar Park II Subdivision via a storm sewer.
- Under all storm events, peak flows associated with the post-development site are controlled to less than the allowable peak flow rates based on existing storm sewer capacity, and the storage capacity of the Cedar Park II SWM Facility is not exceeded.
- Quality control will be analyzed during the detailed design stage.
- The 150mm watermain along “Street A” within the Cedar Park II Subdivision shall serve as the water supply for the proposed development.
- The domestic maximum day demand and peak hourly demand were found to be 84.04 m^3/day (0.97 L/s) and 6.23 m^3/hour (1.73 L/s), respectively.
- The required fire flow demand for the proposed development was found to be 90 L/s, which is within the estimated range of available fire flow (127 L/s to 138 L/s).

It is recommended that this report be provided to the Norfolk County and the Long Point Region Conservation Authority in support of the application for zoning by-law amendment of the proposed development.

We trust that this information is complete and sufficient for submission. Should you have any questions or require further information please do not hesitate to contact us

Respectfully submitted,



Natalie Biesinger, E.I.T.
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Appendix A
– 21-137 FIG1 – Site Location

Appendix B
– 17-027 SAN – Sanitary Drainage Areas
– Sanitary Design Flows
– Revised Sanitary Sewer Design Sheet

Appendix C
– 17-027 STM – Storm Drainage Areas
– 17-027 STM – Stormwater Management Report
– 21-173 FIG2 – SWM Drainage Area
– SWM Calculations
– Revised Storm Sewer Design Sheet
– Visual OTTHYMO Output Files

Appendix D
– Domestic Water Demand Calculations
– 21-173 FIG 3 - Fire Distances
– FUS Fire Flow Calculations
– OBC Fire Flow Calculations
– Cedar Park II Subdivision Watermain Assessment

APPENDIX A

21-137 FIG1 – Site Location

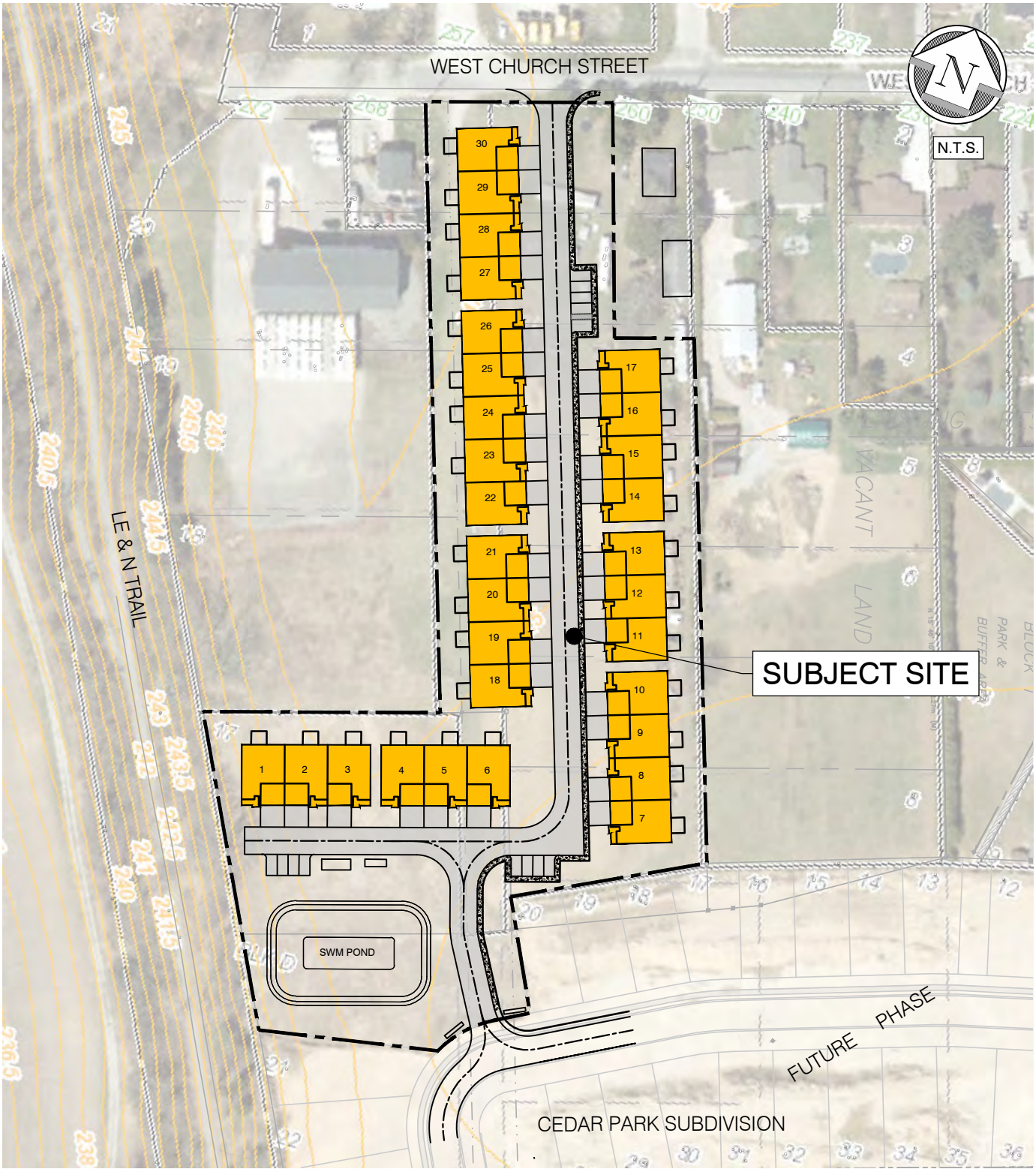

FIG 1 - SITE LOCATION

APPENDIX B

17-027 SAN – Sanitary Drainage Areas
Sanitary Design Flows
Revised Sanitary Sewer Design Sheet

SANITARY SEWER DESIGN SHEET

Pipe Material: PVC
N: 0.013

Project: Cedar Park Extension - Phase 1
Project No. 17-027

Date: Nov 19.2018
Designed by: RCS
Checked by: TGS
Sheet of: 1 of 1

Area	Location Street	From MH	To MH	Areas with Ex. or Prop.Units Ha	Units	Pop.	Fut. Res Areas Ha	Pop	Total Pop	Total Area ha	M=Peak Factor	Flow Q(i) L/s	Q(s) L/s	Q(d) L/s	Material	Sewer Design Size mm	Length m	N	Slope %	Cap (Full) L/s	Full V m/s	Cap %	Actual V m/s
SA2	Street A	26	25	1.18	19	52			52	1.18	4.31	0.33	1.17	1.50	PVC	200	59.9	0.013	0.75%	28.4	0.90	5.3	0.35
SA3	Street A	25	24	0.58	9	25			77	1.76	4.27	0.49	1.71	2.21	PVC	200	65.6	0.013	0.55%	24.3	0.77	9.1	0.38
SA4	Street A	24	23	0.7	10	28			105	2.46	4.24	0.69	2.31	3.00	PVC	200	71.2	0.013	0.55%	24.3	0.77	12.3	0.43
SA5	Street A	23	22	0.12	1	3			107	2.58	4.24	0.72	2.37	3.09	PVC	200	14.4	0.013	0.50%	23.2	0.74	13.3	0.43
SA6	Street A	22	21	0.11	1	3			110	2.69	4.23	0.75	2.42	3.18	PVC	200	12.7	0.013	0.50%	23.2	0.74	13.7	0.43
SA7	Street A	21	CAP	0.4	5	14			124	3.09	4.22	0.87	2.72	3.58	PVC	200	53.6	0.013	0.50%	23.2	0.74	15.5	0.46
	Street A	CAP	20	0	0	0			124	3.09	4.22	0.87	2.72	3.58	PVC	200	16.2	0.013	0.50%	23.2	0.74	15.5	0.46
SA1	Street A	16	15	0.08	1	3			3	0.08	4.45	0.02	0.06	0.09	PVC	200	10.9	0.013	0.80%	29.3	0.93	0.3	0.10
SA12	Street A	15	CAP	0.41	5	14			17	0.49	4.39	0.14	0.38	0.51	PVC	200	51.6	0.013	0.80%	29.3	0.93	1.8	0.23
	Street A	CAP	17	0	0	0			17	0.49	4.39	0.14	0.38	0.51	PVC	200	15.2	0.013	0.80%	29.3	0.93	1.8	0.23
SA13	Street A	14	17	0.32	4	11			11	0.32	4.41	0.09	0.25	0.34	PVC	200	50.4	0.013	0.70%	27.4	0.87	1.2	0.17
SA8	Street B	17	18	0.52	11	30			58	1.33	4.30	0.37	1.29	1.67	PVC	200	69	0.013	0.40%	20.7	0.66	8.0	0.30
SA9	Street B	18	19	0.7	17	47			105	2.03	4.24	0.57	2.31	2.88	PVC	200	88.3	0.013	0.40%	20.7	0.66	13.9	0.38
SA10	Street B	19	20	0.47	10	28			132	2.50	4.21	0.70	2.89	3.59	PVC	200	61.8	0.013	0.40%	20.7	0.66	17.3	0.43
SA11	Street A	20	3	0.44	4	11			267	6.03	4.10	1.69	5.70	7.38	PVC	200	99.8	0.013	0.40%	19.7	0.66	37.5	0.59
SA14	Street A	14	13	0.39	4	11			11	0.39	4.41	0.11	0.25	0.36	PVC	200	35.3	0.013	0.70%	27.4	0.87	1.3	0.18
SA15	Street A	13	12	0.42	5	14			25	0.81	4.37	0.23	0.56	0.79	PVC	200	43.5	0.013	0.60%	25.4	0.81	3.1	0.24
SA16	Street A	12	11	0.25	2	6			30	1.06	4.35	0.30	0.69	0.98	PVC	200	15	0.013	0.50%	23.2	0.74	4.2	0.26
	Street A	11	10	0	0	0			30	1.06	4.35	0.30	0.69	0.98	PVC	200	14.9	0.013	0.40%	20.7	0.66	4.7	0.24
SA17	Street A	10	7	0.34	4	11			41	1.40	4.33	0.39	0.93	1.32	PVC	200	78.5	0.013	0.40%	20.7	0.66	6.4	0.28
SA18	CHARLES	9	8	1.08	7	19			19	1.08	4.38	0.30	0.44	0.74	PVC	200	30.9	0.013	0.70%	27.4	0.87	2.7	0.25
SA19	CHARLES	8	7	0.16	2	6			25	1.24	4.37	0.35	0.56	0.91	PVC	200	35	0.013	0.50%	23.2	0.74	3.9	0.25
SA20	CHARLES	7	6	0.23	3	8			74	2.87	4.28	0.60	1.65	2.46	PVC	200	35.5	0.013	0.40%	20.7	0.66	11.8	0.36
SA21	CHARLES	6	5	0.24	3	8			83	3.11	4.27	0.87	1.83	2.70	PVC	200	14.6	0.013	0.40%	20.7	0.66	13.0	0.38
	CHARLES	5	4	0	0	0			83	3.11	4.27	0.87	1.83	2.70	PVC	200	13.6	0.013	0.40%	20.7	0.66	13.0	0.38
SA22	CHARLES	4	3	0.82	5	14	0.27	15	111	4.20	4.23	1.18	2.45	3.62	PVC	200	72	0.013	0.40%	20.7	0.66	17.5	0.43
SA23	CHARLES	3	2	0.55	1	3			381	10.78	4.03	3.02	7.99	11.01	PVC	200	59.2	0.013	0.50%	23.2	0.74	47.5	0.72
SA24	CHARLES	2	1	0.72	2	6			386	11.50	4.03	3.22	8.10	11.32	PVC	200	59.2	0.013	0.40%	20.7	0.66	54.6	0.64

Design Information:
Q(s) = Sewage Flow = P q M / 86.4
Q(i) = Infiltration Flow = I A
Q(d) = Peak Design Flow = Q(s) + Q(i)
Future Pipes

q = Per Capita Flow= 450 L/cap d
I = Peak Extraneous Flow = 0.28 L/s/ha
Population Density 55 persons /ha
Population Density 2.75 persons /unit

REV. No.	DATE	REVISION
0	JAN 11 2018	FIRST SUBMISSION TO COUNTY
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6	MAR 14, 2022	AS RECORDED

SCALE:
HORIZONTAL : 1 : 1000
10 30 50

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T. G. SMITH
4/13/2022
17027
PROVINCE OF ONTARIO

Project Title
CEDAR PARK II
PHASE I
WATERFORD - NORFOLK COUNTY

Drawing Title
SANITARY DRAINAGE AREAS

Designed by :	Drawn By :
KM/TGS	KM/RCS
Checked by : TGS	Date Started :
Drawing Scale : 1:1000	Drawing No. SAN
Project No. 17-027	

DATE LAST PLOTTED :

vallee
Consulting Engineers, Architects & Planners

Subject:	Cottonwood Condo's		
Date:	8/9/2022	By:	N.B.N
Project #:	21-173	Page	1

Norfolk County Design Criteria Section 9.2 - Sanitary Sewage Flow

9.2.01 Tributary Population

Residential Development:	2.75	persons/unit
Units:	30	Units
Number of Persons:	83	persons
Site Area	2.0	ha

9.2.02 Sewage Flow

Residential Development:	0.45	m^3/person/day
Average Sewage Flow:	0.43	L/s

9.2.03 Peak Sanitary Flow Factor

Residential Peaking Factor Formula:

M = 1 + (14/(4+ [14 / { 4 + P^(0.5)}])

P =	0.083
M =	4

9.2.04 Infiltration Allowance

Infiltration Allowance:	0.28	L/s/ha
Infiltration Allowance:	0.56	L/s

9.2.05 Design Flow

Design Flow:

Design Flow = (Average Sewage Flow * Peak Sanitary Flow Factor) + Infil. Allowance

Design Flow =	2.40	L/s

REVISED SANITARY SEWER DESIGN SHEET

Pipe Material: PVC
N: 0.013

Project: Cottonwood Condominiums
Project No. 21-173

Date: 9-Aug-22
Designed by: NLB
Checked by: JI
Sheet of : 1 of 1

Location				Areas with Ex. or Prop.Units			Fut. Res Areas					Flow			Sewer Design							
Area	Street	From MH	To MH	Ha	Units	Pop.	Ha	Pop	Total Pop	Total Area ha	M=Peak Factor	Q(i) L/s	Q(s) L/s	Q(d) L/s	Material	Size mm	Length m	N	Slope %	Cap (Full) L/s	Full V m/s	Cap %	Actual V m/s
SA2	Street A	26	25	2.51	37	102			102	2.51	4.24	0.70	2.25	2.95	PVC	200	59.9	0.013	0.75%	28.4	0.90	10.4	0.35
SA3	Street A	25	24	0.58	9	25			127	3.09	4.21	0.87	2.78	3.64	PVC	200	65.6	0.013	0.55%	24.3	0.77	15.0	0.38
SA4	Street A	24	23	0.7	10	28			154	3.79	4.19	1.06	3.36	4.42	PVC	200	71.2	0.013	0.55%	24.3	0.77	18.2	0.43
SA5	Street A	23	22	0.12	1	3			157	3.91	4.18	1.09	3.42	4.51	PVC	200	14.4	0.013	0.50%	23.2	0.74	19.5	0.43
SA6	Street A	22	21	0.11	1	3			160	4.02	4.18	1.13	3.47	4.60	PVC	200	12.7	0.013	0.50%	23.2	0.74	19.8	0.43
SA7	Street A	21	CAP	0.4	5	14			173	4.42	4.17	1.24	3.76	5.00	PVC	200	53.6	0.013	0.50%	23.2	0.74	21.6	0.46
	Street A	CAP	20	0	0	0			173	4.42	4.17	1.24	3.76	5.00	PVC	200	16.2	0.013	0.50%	23.2	0.74	21.6	0.46
SA1	Street A	16	15	0.08	1	3			3	0.08	4.45	0.02	0.06	0.09	PVC	200	10.9	0.013	0.80%	29.3	0.93	0.3	0.10
SA12	Street A	15	CAP	0.41	5	14			17	0.49	4.39	0.14	0.38	0.51	PVC	200	51.6	0.013	0.80%	29.3	0.93	1.8	0.23
	Street A	CAP	17	0	0	0			17	0.49	4.39	0.14	0.38	0.51	PVC	200	15.2	0.013	0.80%	29.3	0.93	1.8	0.23
SA13	Street A	14	17	0.32	4	11			11	0.32	4.41	0.09	0.25	0.34	PVC	200	50.4	0.013	0.70%	27.4	0.87	1.2	0.17
SA8	Street B	17	18	0.52	11	30			58	1.33	4.30	0.37	1.29	1.67	PVC	200	69	0.013	0.40%	20.7	0.66	8.0	0.30
SA9	Street B	18	19	0.7	17	47			105	2.03	4.24	0.57	2.31	2.88	PVC	200	88.3	0.013	0.40%	20.7	0.66	13.9	0.38
SA10	Street B	19	20	0.47	10	28			132	2.50	4.21	0.70	2.89	3.59	PVC	200	61.8	0.013	0.40%	20.7	0.66	17.3	0.43
SA11	Street A	20	3	0.44	4	11			316	7.36	4.07	2.06	6.70	8.76	PVC	200	99.8	0.013	0.40%	19.7	0.66	44.5	0.59
SA14	Street A	14	13	0.39	4	11			11	0.39	4.41	0.11	0.25	0.36	PVC	200	35.3	0.013	0.70%	27.4	0.87	1.3	0.18
SA15	Street A	13	12	0.42	5	14			25	0.81	4.37	0.23	0.56	0.79	PVC	200	43.5	0.013	0.60%	25.4	0.81	3.1	0.24
SA16	Street A	12	11	0.25	2	6			30	1.06	4.35	0.30	0.69	0.98	PVC	200	15	0.013	0.50%	23.2	0.74	4.2	0.26
	Street A	11	10	0	0	0			30	1.06	4.35	0.30	0.69	0.98	PVC	200	14.9	0.013	0.40%	20.7	0.66	4.7	0.24
SA17	Street A	10	7	0.34	4	11			41	1.40	4.33	0.39	0.93	1.32	PVC	200	78.5	0.013	0.40%	20.7	0.66	6.4	0.28
SA18	CHARLES	9	8	1.08	7	19			19	1.08	4.38	0.30	0.44	0.74	PVC	200	30.9	0.013	0.70%	27.4	0.87	2.7	0.25
SA19	CHARLES	8	7	0.16	2	6			25	1.24	4.37	0.35	0.56	0.91	PVC	200	35	0.013	0.50%	23.2	0.74	3.9	0.25
SA20	CHARLES	7	6	0.23	3	8			74	2.87	4.28	0.80	1.65	2.46	PVC	200	35.5	0.013	0.40%	20.7	0.66	11.8	0.36
SA21	CHARLES	6	5	0.24	3	8			83	3.11	4.27	0.87	1.83	2.70	PVC	200	14.6	0.013	0.40%	20.7	0.66	13.0	0.38
	CHARLES	5	4	0	0	0			83	3.11	4.27	0.87	1.83	2.70	PVC	200	13.6	0.013	0.40%	20.7	0.66	13.0	0.38
SA22	CHARLES	4	3	0.82	5	14	0.27	15	111	4.20	4.23	1.18	2.45	3.62	PVC	200	72	0.013	0.40%	20.7	0.66	17.5	0.43
SA23	CHARLES	3	2	0.55	1	3			430	12.11	4.01	3.39	8.98	12.37	PVC	200	59.2	0.013	0.50%	23.2	0.74	53.3	0.72
SA24	CHARLES	2	1	0.72	2	6			436	12.83	4.00	3.59	9.08	12.68	PVC	200	59.2	0.013	0.40%	20.7	0.66	61.1	0.64

Design Information:
Q(s) = Sewage Flow = P q M / 86.4
Q(i) = Infiltration Flow = I A
Q(d) = Peak Design Flow = Q(s) + Q(i)

q = Per Capita Flow=	450	L/cap d
I = Peak Extraneous Flow =	0.28	L/s/ha
Population Density	55	persons /ha
Population Density	2.75	persons /unit

Future Pipes

NOTE: Area SA2 was orignally 1.18 ha with 19 units
Area SA2 has been modified to be 2.51 ha (1.18 ha + 1.33 ha) and 37 units (7 lots in Cedar Park II + 30 new units)

APPENDIX C

17-027 STM – Storm Drainage Areas
17-027 STM – Stormwater Management Report
21-173 FIG2 – SWM Drainage Area
SWM Calculations
Revised Storm Sewer Design Sheet
Visual OTTHYMO Output Files

LEGEND

ST1 — STORM DRAINAGE AREA NUMBER
0.99 | 0.45 — RUN–OFF COEFFICIENT
AREA (ha)

OVERLAND FLOW (MAJOR)
STORM SEWER FLOW (MINOR)
STMH5 — PROPOSED STORM MANHOLE
PROPOSED SINGLE CATCH BASIN
PROPOSED DOUBLE CATCH BASIN
PROPOSED SINGLE CATCH BASIN MH
PROPOSED DOUBLE CATCH BASIN MH
STORM DRAINAGE BOUNDARY

STORM SEWER DESIGN SHEET

Storm 5-year — Date Jan. 03 2019
A= 583.017 B= 3.01 C= 0.703
Pipe Material PVC<=450, Concrete >450 — Project 17-027 Cedar Park II — Designed by KM
n 0.013 — Checked by TGS
Town/County Waterford — Sheet of : 1 of 1

Location			Area			Individual	Cumulative	Time of	Rainfall	Flow	Sewer Design						
Area	From	To	Ha	Ha	Ha	R*A	R*A	Concentration	mm/hr	2.78*I*A*R	Size	Slope	Capacity (Full)	Vel (Full)	Length	Time	Cap
			0.45	0.60	0.75			min	mm/hr	L/s	mm	%	L/s	m/s	m	min	%
ST1	CBMH3	STMH16	0.00	0.00	0.00	0.36	0.36	10.00	96.03	96.1	375	0.80%	156.02	1.42	44.0	0.52	61%
ST4a	STMH16	STMH15	0.00	0.00	0.68	0.51	0.87	10.52	93.44	226.0	525	0.60%	333.12	1.54	15.9	0.17	68%
	STMH15	STMH14	0.00	0.00	0.00	0.00	0.87	10.69	92.61	224.0	525	0.60%	333.12	1.54	10.5	0.11	67%
ST4	STMH14	ST-CAP	0.59	0.00	0.00	0.27	1.14	10.80	92.07	290.6	600	0.50%	434.17	1.54	51.9	0.56	67%
	TEMP CB	STMH13	0.00	0.00	0.00	0.00	1.14	11.37	89.52	282.6	600	0.50%	434.17	1.54	14.1	0.15	65%
ST2	STMH22	STMH21	0.48	0.00	0.00	0.22	0.22	10.00	96.03	57.7	300	0.45%	64.87	0.92	10.1	0.18	89%
	STMH21	STMH20	0.00	0.00	0.00	0.00	0.22	10.18	95.09	57.1	300	0.45%	64.87	0.92	11.3	0.21	88%
ST3	STMH20	ST-CAP	0.68	0.00	0.00	0.31	0.52	10.39	94.06	136.5	450	0.45%	191.26	1.20	51.7	0.72	71%
	TEMP CB	STMH19	0.00	0.00	0.00	0.00	0.52	11.11	90.68	131.6	450	0.45%	191.26	1.20	14.7	0.20	69%
ST8	STMH19	STMH18	0.00	0.51	0.00	0.31	0.83	11.31	89.77	206.6	525	0.50%	304.10	1.40	59.1	0.70	68%
ST7	STMH18	STMH17	0.00	0.48	0.00	0.29	1.12	12.01	86.80	269.3	600	0.40%	388.33	1.37	88.6	1.08	69%
	STMH17	CBMH1	0.00	0.00	0.00	0.00	1.12	13.09	82.69	256.5	600	0.45%	411.89	1.46	55.3	0.63	62%
ST6	CBMH1	STMH13	0.00	0.66	0.00	0.40	1.51	13.72	80.47	338.3	600	0.45%	411.89	1.46	17.1	0.20	82%
ST5	STMH13	STMH12	0.33	0.00	0.00	0.15	2.80	13.91	79.82	620.4	750	0.45%	746.81	1.69	53.2	0.52	83%
	STMH12	STMH11	0.00	0.00	0.00	0.00	2.80	14.44	78.12	607.2	750	0.45%	746.81	1.69	34.2	0.34	81%
ST9	STMH11	STMH10	0.66	0.00	0.00	0.30	3.09	14.78	77.08	662.8	750	0.45%	746.81	1.69	45.0	0.44	89%
	STMH10	DCBMH1	0.00	0.00	0.00	0.00	3.09	15.22	75.76	651.4	750	0.45%	746.81	1.69	14.9	0.15	87%
ST12	DCBMH2	STMH9	0.37	0.00	0.00	0.17	0.17	10.00	96.03	44.5	375	0.40%	110.89	1.00	12.8	0.21	40%
ST12a	STMH9	STMH8	0.44	0.00	0.00	0.20	0.36	10.21	94.94	96.2	375	0.40%	110.89	1.00	68.8	1.14	87%
	STMH8	STMH7	0.00	0.00	0.00	0.00	0.36	11.35	88.57	90.8	375	0.40%	110.89	1.00	15.1	0.25	82%
	STMH7	STMH6	0.00	0.00	0.00	0.00	0.36	11.61	88.49	89.7	375	0.40%	110.89	1.00	16.5	0.27	81%
	STMH6	STMH3	0.00	0.00	0.00	0.00	0.36	11.88	87.34	88.5	375	0.40%	110.89	1.00	37.6	0.62	80%
ST13	STMH5	STMH4	0.36	0.00	0.00	0.16	0.16	10.00	96.03	43.2	300	0.45%	64.87	0.92	20.4	0.37	67%
	STMH4	STMH3	0.00	0.00	0.00	0.00	0.16	10.37	94.15	42.4	300	0.45%	64.87	0.92	31.5	0.57	65%
ST11	STMH3	STMH2	0.43	0.00	0.00	0.19	0.72	12.50	84.85	169.8	525	0.35%	254.43	1.18	78.7	1.12	67%
	STMH2	DCBMH1	0.00	0.00	0.00	0.00	0.72	13.62	80.81	161.7	525	0.37%	261.60	1.21	16.0	0.22	62%
ST10	DCBMH1	OUTLET	0.98	0.00	0.00	0.44	4.25	15.37	75.33	890.9	825	0.50%	1015.01	1.90	28.4	0.23	88%
SWM Facility Outlet - Thompson Road																	
	CBMH23	STMH24								181.0	450	11.01%	946.02	5.95	24.5	0.07	19%
	STMH24	STMH25								181.0	450	6.72%	739.08	4.65	54.0	0.19	24%
	STMH25	STMH26	Design flow for thiese pipes is based on peak discharge from SWM facility of 0.181 cms or 181 L/s. Reference SWM report dated January 2018, 100yr post development scenario, page 27 of model output.							181.0	450	3.26%	514.77	3.24	21.3	0.11	35%
	STMH26	STMH27								181.0	450	0.50%	201.60	1.27	95.5	1.26	90%
	STMH27	STMH28								181.0	450	0.50%	201.60	1.27	99.0	1.30	90%
	STMH28	STMH29								181.0	450	0.50%	201.60	1.27	99.0	1.30	90%
	STMH29	STMH30								181.0	450	0.50%	201.60	1.27	99.0	1.30	90%
	STMH30	Outlet	Add capacity of ex 750mm culvert being replaced at 833L/s							1014.0	900	0.87%	1688.55	2.65	19.6	0.12	60%

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SCALE:
HORIZONTAL : 1 : 1000

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Stamp
LICENSED PROFESSIONAL ENGINEER
T. G. SMITH
4/13/2022
17027
PROVINCE OF ONTARIO

Project Title
CEDAR PARK II
PHASE I
WATERFORD - NORFOLK COUNTY

Drawing Title
STORM DRAINAGE AREAS

Designed by :	Drawn By :
KM/TGS	KM/RCS
Checked by :	Date Started :
TGS	
Drawing Scale :	Drawing No.
1:1000	STM
Project No.	
17-027	

DATE LAST PLOTTED :

vallee

Consulting Engineers, Architects & Planners

January 3, 2018

ROI Group (Spadafora) Inc.
75 Brant Ave
Brantford ON N3T 3H2

Attention: **Mr. Mark Dixon**

Dear Sir:

Reference: **Storm Water Management Report**
Cedar Park II
Waterford – Norfolk County
Our File 17-027

1.0 Introduction

This Storm Water Management Report has been prepared in support of the detailed design for the Cedar Park II subdivision in Waterford. It is the intention to submit this report to the Norfolk County and the Long Point Region Conservation Authority for review and approval of the proposed Draft Plan of Subdivision.

The proposed Cedar Park II is a single family residential development located at the western edge of Waterford. The site is generally bordered by Thompson Road to the south, the Waterford Heritage Trail (WHT) to the west and the existing portion of the Cedar Park subdivision to the north. This report will outline a functional SWM plan for the proposed development. It is not intended to outline a final design but rather that the site can be serviced with respect to SWM.

The development covers approximately 11.33 ha and is proposed to be comprised of 77 single family lots, 19 (38 units) semidetached lots. The overall layout is shown by Figure 1.

The Visual Otthymo computer model has been used to simulate the sub watershed under pre and post development conditions. The simulations were conducted using the 4-hour Chicago Distribution design storm of the 2-year, 5-year, 10-year, 25-year, 50-year and 100-year storm events.

2.0 Pre-Development

Typically, it is requirement for development sites to reduce or control the post development runoff from the site to levels that do not exceed pre-development conditions. This is achieved by directing the majority of runoff to a retention area or areas. The release from these areas is controlled by means of orifice plates and/or weirs. It is anticipated that this will be the case for this development and the functional SWM plan developed will be based on this requirement.

Based on the existing contours the site can currently be divided into three (3) pre development catchment areas as shown on Figure 2. These areas can generally be described as:

- Pre South: Approximately 3.75 ha of the southern portion of the site.
- Pre North East: Approximately 4.45 ha of the north eastern portion of the site.
- Pre North West: Approximately 3.13 ha of the north western portion of the site.
- Total site area 11.33 ha

Figure 3 shows an aerial photo of the development and its surrounding area. The pre-development catchment areas noted above are also shown along with current drainage patterns associated with each of these areas. All of these areas ultimately drain to the area referred to as the Waterford Ponds. Each route to the Waterford Ponds can be described as follows:

- Pre South: This area drains in a southerly direction to a culvert that passes under the Waterford Heritage Trail where it then follows an existing water course across commercial and residential properties fronting Thompson Road. The water course eventually connects with the Waterford South Municipal Drain and discharges to the Waterford Ponds.
- Pre North East: This area drains in a south easterly direction to Charles Street and then overland through the property of St Bernard's School and ultimately to the same culvert under the Waterford Heritage Trail as Pre South.
- Pre North West: This area drains to the west over the Waterford Heritage Trail and continues in a westerly direction to the Waterford Ponds.

The existing contours on Figure 3 also confirm that there are not external drainage areas that drain to the site of Cedar Park 2 and therefore only the development area needs to be considered for the sizing of the proposed storm water management facility.

The Visual Otthymo computer model was used to simulate pre-development conditions for each of these areas. The model uses a modified SCS procedure to estimate losses that occur naturally during a rainfall event such as evaporation and infiltration. For the areas with rural runoff characteristics, Table 1 summarizes the background information and input parameters for the computer model with complete notes included with this report as Appendix A.

Table 1
Visual Otthymo Model Input – Pre Development

Parameter	Pre South	Pre North East	Pre North West
Area (ha)	3.75	4.45	3.13
Soil Type	Wilsonville – gravelly sandy till, sandy textures over gravelly sandy till rapid to well drainage		
Hydrologic Soil Group	A		
SCS Curve Number	Pastures and other unimproved land - 58		
Initial Abstraction	16.5 mm ($IA/S_{0.05}$ = 0.05, with $S_{0.05}$ = 1.33 * $S_{0.20}$^1.15 in inches and $S_{0.20}$ = 1000/CN-10 in inches)		

Longest Flow Path (m)	191	268	127
Average Slope (%)	6.8	2.0	2.3
Runoff Coeff	0.2	0.2	0.2
Time to Peak (hrs)	0.21	0.38	0.25

Table 2 summarizes the pre-development peak runoff for each drainage area as well as the combined flows, as applicable, based on the pre-development drainage patterns identified above.

Table 2
Peak Pre-Development Runoff (cms)

Event	Pre South (To WSMD via Culvert under WHT)	Pre North East (To WSMD via Charles St and overland)	Pre North West	Pre- Dev Peak (all areas) (cms)	Pre To WSMD (Pre South + Pre North East)
2-year	0.014	0.013	0.011	0.036	0.025
5-year	0.031	0.033	0.026	0.088	0.061
10-year	0.041	0.056	0.044	0.145	0.101
25-year	0.077	0.080	0.068	0.219	0.153
50-year	0.111	0.134	0.100	0.322	0.223
100-year	0.156	0.188	0.140	0.452	0.315

3.0 Post-Development

Drainage Areas

Post development, the drainage patterns will be provided by the major overland flow routes along the proposed roadways and the minor system provided by the proposed storm sewers. The intent of both systems is to maximize the drainage area contributing runoff to the proposed SWM facility for the development.

The post development drainage areas used for this analysis match the drainage areas used for the storm sewer system design and are shown on Figure 4. Also shown on this drawing is the flow direction for the minor (ie storm sewer) system. All storm sewers will direct runoff to the proposed SWM facility. In addition the major overland flow route resulting from the proposed road profiles is also shown. This route will direct runoff during the major storm events to the proposed SWM facility for all areas with the exception of Areas ST12 and ST12A. Due to the existing elevations of Charles Street and existing homes in this area, it is not possible to direct the major overland route for this small area to the proposed SWM facility. This area is a small portion of the pre-development area Pre North East and will continue to direct runoff to the Charles Street during major storm events as it does in the existing conditions.

Post development, impervious land areas will be introduced to areas A1 through A12 with differing degrees. For the areas within the development the following assumptions have been made with respect to impervious surfaces introduced post development.

- Assumed roof and driveway area per town single family unit $230m^2$
- Municipal Road (includes sidewalk one side) $11m^2/m$
  (Road area considered directly connected to storm sewers)

Table 3 summarizes the anticipated impervious land areas for post development areas ST1 through to ST17. The calculations are appended as part of Appendix B.

Table 3
Post Development Impervious Areas

Area	Total Area (ha)	Impervious Area		Directly Connected	
		(ha)	(as % of Total)	(ha)	(as % of Total)
ST1	0.8	0.38	48	0.10	13
ST2	0.48	0.24	50	0.07	14
ST3	0.67	0.28	42	0.12	18
ST4	0.59	0.28	47	0.09	16
ST4a	0.68	0.41	60	0.13	19
ST5	0.33	0.20	60	0.08	25
ST6	0.61	0.38	62	0.09	14
ST7	0.52	0.37	71	0.07	14
ST8	0.51	0.34	66	0.08	16
ST9	0.66	0.24	36	0.07	10
ST10	0.86	0.34	39	0.13	15
ST11	0.65	0.20	30	0.07	11
ST12	0.49	0.13	26	0.08	17
ST12a	0.25	0.12	49	0.08	31
ST13	0.41	0.19	45	0.07	17
ST14	1.74	0.13	7	0.00	0
ST15	0.71	0.05	6	0.00	0
ST16	0.09	0.00	0	0.00	0
ST17	0.31	0.13	41	0.00	0

Post development areas with estimated impervious areas less than 20% of the total area are typically drainage areas with less than 20% impervious land area are modeled as rural basins. Therefore, this will be the case for areas ST14, ST15 and ST16 within the post development model.

Discharge to Storage Relationship

In order for the computer model to determine the storage volume required the relationship between the storage volume of the pond and the discharge must be defined and is referred to as the pond-rating curve. This rating curve is determined by calculating volume of the proposed pond facility up to a proposed contour elevation and then calculating the expected discharge from the facility based on the water level at this contour elevation and the proposed outlet control configuration.

Generally orifices or weirs can control discharge from SWM facilities. Each of these control methods can be used by the singular control or they can be used in combination depending on the discharge characteristics desired. For this facility both an orifice and weir are proposed will be used to control with the following equations used to estimate discharge

1. Orifice
   - o $Q = C * A * \sqrt{2 * g * h}$

     where: Q = Discharge in cms
     C = constant, 0.63
     A = orifice area in m^2
     g = gravitational constant, 9.81 m/s^2
     h = height above orifice, m

2. Weir
   - o $Q = 1.67 * w * h^{3/2}$

     where: Q = Discharge in cms
     w = width of the weir, m
     h = height above weir, m

For this facility a 100mm orifice at elevation 240.00 and a 0.2m wide weir at elevation 240.80 will be used for flow control. The complete rating curve is appended to this report as part of Appendix B.

Post Development Model

The post development model developed for this report as included as Appendix B. Table 4 summarizes the post development results for the storm events analyzed.

Table 4 Post Development – SWM Facility Performance					
Event	**Pre- Dev Peak (all areas) (cms)**	**Pre-Dev Peak to WSMD (cms)**	**Post Dev Peak to WSMD (all areas) (cms)**	**Approximate Storage Elevation (m)**	**Storage Provided (ha*m)**
2-year	0.036	0.025	0.027	240.80	0.1083
5-year	0.088	0.061	0.047	240.93	0.1416
10-year	0.145	0.101	0.074	241.03	0.1649
25-year	0.219	0.153	0.131	241.13	0.1939
50-year	0.322	0.223	0.185	241.25	0.2180
100-year	0.452	0.315	0.267	241.40	0.2551

For all storm events the peak post development discharge has been controlled to less than the estimated peak pre development runoff for the entire development site. Furthermore, the post development peak discharge to the WSMD has been controlled to less than the pre development peak runoff to the WSMD.

As was noted previously, the major overland flow route from post development area A11 will continue to direct runoff to Charles Street. Table 6 summarizes the estimated post development peak runoff from the development site that will continue to use this major overland flow route. Also shown is the estimated pre development peak runoff to Charles Street.

Table 5 Peak Runoff Contribution To Major Overland Flow Route Along Charles Street		
Event	**Pre- Development (cms) Pre North East**	**Post Development (cms) Areas ST12 and ST12a**
2-year	0.013	0.000
5-year	0.033	0.000
10-year	0.056	0.010
25-year	0.080	0.040
50-year	0.134	0.060
100-year	0.188	0.110

For all storm events the anticipated post development peak runoff from the development site to the major overland flow route along Charles Street has been reduced significantly from the estimated pre development. The anticipated flow of 0.000 cms during the 2-year and 5-year events is expected as the minor flow for all areas is being conveyed by the storm sewer system to the proposed SWM facility for the development.

4.0 Proposed SWM Facility

The Ministry of the Environment's document titled **Stormwater Management Practices Planning and Design Manual** (March 2003) was used in conjunction with requirements for Norfolk County to determine the design for the conceptual SWM facility for Cedar Park II subdivision. The following summarizes the design guidelines presented by the manual along with the corresponding value for the proposed facility. The complete calculations are provided as Appendix C.

a) Storage Sizing: Table 3.2 of the MOE design manual provides which required levels of storage volume are dependent on the percent impervious ratios for the land area to provide normal protection. For a wet pond facility based on 45% impervious area of the contributing area to the facility, the required volume of storage is 100 m^3/ha of contributing area. Of this storage 40 m^3/ha is dedicated as extended storage and the remaining 60 m^3/ha for permanent pool volume. For the contributing area of 9.22 ha this results in extended storage of 369 m^3 required versus the 1,083 m^3 provided during the quality storm. The required permanent pool volume required 553 m3 and compares to the 619 provided. (forebay volume calculations are included with the pond rating curve in Appendix B).
b) Detention Time: During the quality storm the design manual indicates a 24 hr detention time as a minimum requirement for wet pond facilities. For the proposed facility the runoff stored during the quality storm (2-year event) the drawdown time is estimated to be approximately 37 hours (drawdown times are included with the pond rating curve in Appendix B).
c) Minimum Orifice Size: A minimum orifice of 75mm is recommended for wet pond facilities and compares to the 100mm provided by this facility.
d) Active Storage Depth: The MOE guideline recommends a maximum active storage depth of 2.0m. The active storage depth ranges between 0.80m and 1.40m depending on the storm event.
e) Side Slopes: Average side slopes are recommended to be at 4(h):1(v) or flatter. The exposed side slopes of the proposed facility are proposed to be 5(h):1(v).
f) Forebay Settling Length: The design manual outlines the calculation of the required length for the forebay to allow a certain size of particle to settle. The calculation is based on the peak flow rate from the pond during the quality storm, the length to width ratio of the forebay and settling velocity of the particle size (0.0003 m/s). The resulting length is 11.3m and compares to the approximately 28m provided depending on the pond inlet.
g) Forebay Dispersion Length: The design manual also outlines a calculation to determine the length of forebay required to slow a discharge. This calculation is based on the inlet flow rate during the quality storm (2-year), the depth of the permanent pool in the forebay and the desired velocity in the forebay (0.5 m/s). This results in a target forebay length of 6.4m and compares to the approximately 28m provided.
h) Sediment Accumulation: Based on the anticipated sediment loading rates outlined by Table 6.3

of the MOE guidelines, the estimated sediment accumulation can be determined based on the impervious land area within the catchment area along with the target removal efficiency of the proposed facility. For the estimated 45% impervious land of the contributing area (9.22ha), sediment accumulation is estimated to be approximately 80m^3 over a 10-year period. This compares to the forebay volume of 619 m^3 which require approximately 77years of sediment accumulation to completely fill.

i) Length to Width: The overall pond is approximately 72m measured at the quality storm event level(2-year storm). At the widest point the pond is approximately 21m wide resulting in a length to width ration of 3.4:1 which compares to the MOE minimum criteria of 3:1.

5.0 Outlet Capacity

The proposed outlet for the SWM facility outlined by this report is the Waterford South Municipal Drain as this ultimately provided the outlet for the pre-development site. There are three options for the location of this outlet as follows:

1. Use the existing outlet which is generally described as the existing culvert under the WHT and follow the existing water course to the WSMD.
2. Connect to the WSMD on the south side of Thompson Road.
3. Provide a storm sewer along Thompson Road and connect to the WSMD downstream of the WSMD SWM facility.

Existing Outlet

During preliminary discussion with Norfolk County, it was generally agreed that maintaining the existing drainage patterns would be problematic. The watercourse downstream of the existing culvert under the WHT is not well defined and is also routed through a series of culverts as it crosses commercial and residential properties. The system overall is very shallow and would be difficult to lower to provide sufficient capacity and maintain use of the existing properties. This is not considered a viable outlet.

WSMH – South Side of Thompson Road

The WSMD was only designed to provide an outlet for the storm sewer systems generally in the southern end of Waterford. It was not intended to nor is it physically possible, due to topography, for this drain to collect runoff during major storms. If the proposed facility for this development was connected to the WSMD, it would need to discharge to the WSMD during major storm events. This would increase the total volume of water to the WSMD SWM facility significantly. This increased volume of water would be consistent regardless of the rate from the proposed facility for which the development was controlled.

The inlet pipe for the WSMD SWM facility follows the south side of Thompson Road to the WHT where it turns to the south and discharges into the WMD SWM facility. The intention would be to connect to this system as the outlet for the proposed SWM facility of this development. This would be dependent on sufficient capacity within the WSMD at this location to accept the flow from this development. We have reviewed the design report (VALLEE 1996) in this regard and note the following:

- The design flows for the system is 3.25 m^3/s
- The design capacity for the pipe at the potential connection location is 3.31 m^3/s (1500mm dia @ 0.22%)

There is limited to no surplus capacity in the WSMD to accept increased flows from the Cedar Park SWM facility during major storm events beyond the design event for the WSMD. Therefore, this also is not a viable outlet for the proposed development.

WSMD – Downstream of WSMD SWM Facility

This option would involve the construction of a storm sewer along the south side of Thompson Road west of the WHT. The new storm sewer would discharge to the WSMD downstream of its SWM facility and therefore avoid the volumetric issue identified above. There are two (2) options available with respect to the connection to the WSMD as follows:

1. Upgrade road culvert to provide additional capacity for the increased flow from the new storm sewer.
2. Twin the road crossing with existing CSP serving the outlet from the WSMD SWM facility and a new crossing as part of the outlet from the Cedar Park II SWM facility.

The maximum peak discharge from the proposed facility occurs during the 100-yr event and is estimated at 0.181 cms by the post development model. This compares to the limiting capacity of the proposed outlet of 0.192 cms of the 450mm diameter at 0.5% (95% full capacity).

6.0 Emergency Overflow

As part of the outlet structure for the proposed SWM facility, a 2.0m square precast concrete catch basin structure has been placed with its top corresponding to the anticipated water level of the proposed SWM facility during the 100-year storm event (241.40). In the event that a storm event in excess of the 100-year storm occurs or the primary outlet is blocked, discharge from the facility will begin to occur over the top of this structure prior to overflowing the top of bank surrounding the SWM facility.

A secondary overflow system has also been provided in the very unlikely event that the dedicated 450mm outlet system is blocked in some way and the pond becomes 100% full at approximately elevation 242.00. For this dedicated overflow system to be needed would require any combination of the following:

- Both the 100mm orifice and 200mm weir blocked.
- Top of 2.0m by 2.0m outlet structure blocked.
- 450mm dedicated outlet sewer blocked.
- Storm event in excess of the 100 yr event.
- A combination of major storm events over short duration.

This secondary overflow system consists of:

- Two (2) precast ditch inlet catch basin structures with 4:1 sloped grate; leading edge at elevation 241.78 and back edge at elevation 242.00.
- 450mm storm sewer that outlets to the existing water course that serves as the existing outlet for the pre-development areas Pre South and Pre-North East and ultimately flowing under the WHT through an existing culvert.

7.0 Proposed SWM Facility Summary

The following summarizes the proposed SWM Facility, shown on drawings 17-027-10 and 17-027-11, for the Cedar Park II subdivision in Waterford.

- A wet pond facility with a permanent pool elevation in the sediment forebay of 240.00, pond bottom of elevation in the sediment forebay of 239.00 and top of slope 242.00.
- Permanent pool depth of 1.0m.
- A 300mm thick clay/silt liner to elevation 242.00. Material to have a permeability in the order of 10^{-5} to 10^{-7} cm/s.
- Total storage volume provided for the 100-year storm event is 2,515 m^3.
- Discharge from the proposed facility controlled by a 100mm diameter orifice at elevation 240.00 and 0.2m wide weir with invert elevation of 240.80.
- Outlet for the proposed facility provided by a new 450mm storm sewer along Thompson Road discharging to the WSMD downstream of the outlet of the WSMD pond.
- Emergency overflow flow provided by catch basin structure with top of concrete elevation placed at the approximate 100-year storage level (241.40).
- Secondary Overflow system provided by
    - Two (2) precast ditch inlet catch basin structures with 4:1 sloped grates; leading edge at elevation 241.78 and back edge at elevation 242.00
    - 450mm storm sewer that outlets to the existing water course that serves as the existing outlet for the pre-development areas Pre South and Pre-North East and ultimately flowing under the WHT through an existing culvert

8.0 Erosion and Sediment Control

During construction, the contractor is required to protect the work site and all adjacent lands from sediment and erosion regardless of the source to the satisfaction of all applicable parties. The measures installed by the contractor are to remain in place until such time as there is no further threat of damage.

9.0 Low Level Lot Controls (Best Management Practices)

With the development of any property there is an introduction of impervious land area by the construction of buildings, roadways, driveways and parking lots. In the Waterford area the native soil has excellent infiltration characteristics that can be impeded by the construction of these impervious areas. Therefore, with developments it is desired to take steps to encourage infiltration over the remaining pervious land areas. For the Cedar Park II subdivision, the individual lots are not serviced with storm sewer services. Therefore, roof leaders and sump discharges must discharge to the ground and there by encouraging infiltration of the surface runoff.

In addition, soak away pits are to be provided as detailed on drawing 17-027-12 for Lots 36-39 and Lots 1-11 and the future lots north of Lot 36. The pits are needed to collect runoff from the rear yard of each lot as match elevations to lands outside the development are too low to allow for collection of the runoff by the proposed storm sewer system. The soak away pits will collect the runoff from the respective lots and prevent it from flowing onto adjacent lands. As the contributing areas of each lot are relatively small and the runoff will be relatively clean (ie from roofs and rear yards), each soakway pit has been sized for the runoff volume for the 100-yr event. Table 6 summarizes the volumetric calculation based on a porosity of the soak away pit of 0.40.

Table 6 Soak Away Volumetric Calculations					
Lot	**Contributing Area m2**	**Runoff from VO (100 yr) mm**	**Volume m3**	**Soak Away End Area m2**	**Length of Soak Away Required m**
Area ST17					
Future	96	35.97	3.5	4	2.2
Future	256		9.2		5.8
Future	256		9.2		5.8
Future	256		9.2		5.8
Future	296		10.6		6.7
36	405		14.6		9.1
37	405		14.6		9.1
38	405		14.6		9.1
39	564		20.3		12.7
Area ST14					
1	420	17.19	7.2	4	4.5
2	315		5.4		3.4
3	315		5.4		3.4
4	315		5.4		3.4
5	315		5.4		3.4
6	315		5.4		3.4
7	430.5		7.4		4.6
8	1180.5		20.3		12.7
9	1887.5		32.4		20.3
10	1625		27.9		17.5
11	1826.5		31.4		19.6

11.0 Conclusions and Recommendations

It is concluded that:

1. Post development flows from the development site have been controlled to less than pre development and also less than currently discharges to the WSMD.
2. The proposed storm water pond has sufficient capacity and meets the design guidelines outlined by the MOE's document titled **Stormwater Management Practices Planning and Design Manual** (March 2003) for normal protection and requirements Norfolk County.
3. An outlet storm sewer can be provided along Thompson Road from the proposed facility with sufficient capacity to convey the discharge from the proposed facility.

It is recommended that this report be provided to the Norfolk County and the Long Point Region Conservation Authority in support of the detailed design for the proposed development.

Should you have any questions or require further information please do not hesitate to call. Thank you.

Yours truly,

T. Gregory Smith, P.Eng.
G. DOUGLAS VALLEE LIMITED
Consulting Engineers, Architects and Planners

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Appendix A: Pre-Development Model

vallee
Consulting Engineers, Architects & Planners

Subject: Cedar Park Extension
Date: Mar-16 By: TGS
Project #: 13054 Page

Pre North East

tc calc for upstream drainage area

tc = 3.26*(1.1-C)*L^(0.5)/S^0.333 (airport formula)

L as above	268 m
S as above but as percent	2.00 %
C, rational Runoff Coefficient (Pre dev)	0.2

tc = 38 min 0.64 hrs

tp = 0.6 *tc tp = 0.38 hrs

PRE South

tc calc for upstream drainage area

tc = 3.26*(1.1-C)*L^(0.5)/S^0.333 (airport formula)

L as above	191 m
S as above but as percent	6.80 %
C, rational Runoff Coefficient (Pre dev)	0.2

tc = 21 min 0.36 hrs

tp = 0.6 *tc tp = 0.21 hrs

Pre North West

tc calc for upstream drainage area

tc = 3.26*(1.1-C)*L^(0.5)/S^0.333 (airport formula)

L as above	127 m
S as above but as percent	2.30 %
C, rational Runoff Coefficient (Pre dev)	0.2

tc = 25 min 0.42 hrs

tp = 0.6 *tc tp = 0.25 hrs

CHART C2-2 - HYDROLOGIC SOIL GROUPS FOR GENERAL SOIL TYPES

Sands, sandy loams, and gravels	
- overlying sand, gravel or limestone bedrock, very well drained	A
- ditto, imperfectly drained	AB
- Shallow, overlying precambrian bedrock or clay subsoil	B
Coarse loams	
- overlying sand, gravel or limestone, well drained	AB
- shallow, overlying precambrian bedrock or clay subsoil	B
Medium textured loams	
- shallow, overlying limestone bedrock	B
- overlying medium textured subsoil	BC
Silt loams, some loams	
- with good internal drainage	BC
- with slow internal drainage and good external drainage	C
Clays, clay loams, silty clay loams	
- with good internal drainage	C
- with imperfect or poor external drainage	C
- with slow internal drainage and good external drainage	D

Note: Soils are classified on the basis of bare soil having maximum swelling at the end of a long storm whose rainfall exceeds infiltration into soil. Classifications shown are subject to modification as experience dictates.

Classifications are based on S.C.S. definitions (9) modified to suit Ontario conditions.


Waterford
Waterford Pond
MAR
MAN MADE
Conservation Area
Gravel Pits
Auto Wreckers
Shopping Centre
Cemetery
Park
Reservoir
Dam
Town Limits
Greenhouses
Kilns
Dugouts
Tertiary Mill
LAKE ERIE AND NORTHERN
MICHIGAN CENTRAL
WIL1 D
FOX1 B
WAT1 c
CWQ1 B
BRT1 B
BRT4 c>B
STD8 d>B
NDE3 B>B
SLI1 B
BRR5 B>B
GP
STD1 c
STD5 DD
WIL1 E
STD2 B>B
TVK1 B
TUC4 BB
BRT1 c
BRT1 D
GNY1 B
WIL3 D
BAY1 B
OKL1 B
TUC1 B
BRT1 D
WIL5 cB
WIL3 C
SLI1 B
CWO1 B
BRT1 BD
BRT1 DB
TUC3 B>C
STD1 B
WIL5 DD
NDE1 B
ALU1 B
BRT1 c
FOX4 B>B
VSS2 B>C
WIL1 F
BFO3 B
BOO1 D
BOO3 BB
BVY2 B
FOX1 cB
BAY1 B
BOO1 B
PED2 c
BAY4 B>B
FOX9 DE
NDE1 B
BOX1 dB
WIL13 B>B
FOX1 C
BVY6 B>B
STD2 c>B
TVK5 B>B
CWO1 BB
WAT1 d>B
WAT2 e>B
SLI10 B>B
NDE2 B>c
WAT1 dE
STD9 C>B
HMP1 B
PED2 d>c
OKL2 B>B
BOO1 C
BOO3 cB
FOX4 c>B
OKL2 BB
OKL4
STD1
WUS3
TUC1 B
BRR B>
WAT1

DRAINAGE COMPONENTS No. 1	No. 2
Variable	Rapid
Very poor	Variable
Very poor	Rapid
Very poor	Rapid to well
Variable	Rapid
Variable	Rapid to well
Very poor	
Rapid to well	
Variable	

MAP UNIT SYMBOL	MAP UNIT COMPONENTS No. 1	No. 2	PARENT MATERIAL COMPONENTS No. 1	No. 2	DRAINAGE COMPONENTS No. 1	No. 2
WIL - Wilsonville						
WIL 1	WIL	None	Mainly gravelly sandy till		Rapid to well	
WIL 3	WIL.C	None	15-40 cm sandy textures over gravelly sandy till		Rapid to well	
WIL 5	WIL	WIL.C	see WIL 1	see WIL 3	Rapid to well	Rapid to well
WIL 9	WIL.L	WIL	15-40 cm loamy textures over gravelly sandy till	see WIL 1	Rapid to well	Rapid to well
WIL 10	WIL.L	BRT	see WIL 9	see BRT 1	Rapid to well	Well
WIL 11	WIL.C	WIL	see WIL 3	see WIL 1	Rapid to well	Rapid to well
WIL 12	WIL.C	STD	see WIL 3	see STD 1	Rapid to well	Rapid to well
WIL 13	WIL.C	NDE	see WIL 3	see NDE 1	Rapid to well	Imperfect
WIL 14	WIL.C	OKL	see WIL 3	see OKL 1	Rapid to well	Imperfect
WSH - Walsher						
WSH 1	WSH	None	40-100 cm sandy textures over lacustrine silt loam		Well	
WUS - Wauseon						
WUS 1	WUS	None	40-100 cm sandy textures over lacustrine silty clay		Poor	
WUS 3	WUS.P	None	15-40 cm organic materials over lacustrine silty clay		Very poor	
WUS 4	WUS	BRR	see WUS 1	see BRR 1	Poor	Imperfect
WUS 6	WUS	TLD.C	see WUS 1	see TLD 2	Poor	Poor
WUS 9	WUS	SLI	see WUS 1	see SLI 1	Poor	Poor
WUS 10	WUS	TUC.C	see WUS 1	15-40 cm sandy textures over lacustrine silt loam	Poor	Imperfect

als, and drainages. This informa-

pproximate proportions, and the

mponents in the map unit. The component refers to the No. 2 omponent has been mapped in

ons, the slope symbols appear ortions, a "greater than" symbol ient that occupies at least 80%

mbols B, c, C, d, D, e, E, f, F, heet.

derstand that many soil bound- to several hectares, of uniden- ristics to a depth of about 100

CHART C2-8 - SOIL/LAND USE CURVE NUMBERS

Land Use	Hydrologic Soil Group						
	A	AB	B	BC	C	CD	D
Fallow (special cases only)	77	82	86	89	91	93	94
Crop and other improved land	66*	70	74	78	82	84	86
Pasture & other unimproved land	58*	62*	65	71	76	79	81
Woodlots and forest	50*	54*	58	65	71	74	77
Impervious areas (paved)		98					
Bare rock draining directly to stream		98					
Bare rock draining indirectly to stream		70					
Water surfaces		100	(use in special cases only)				

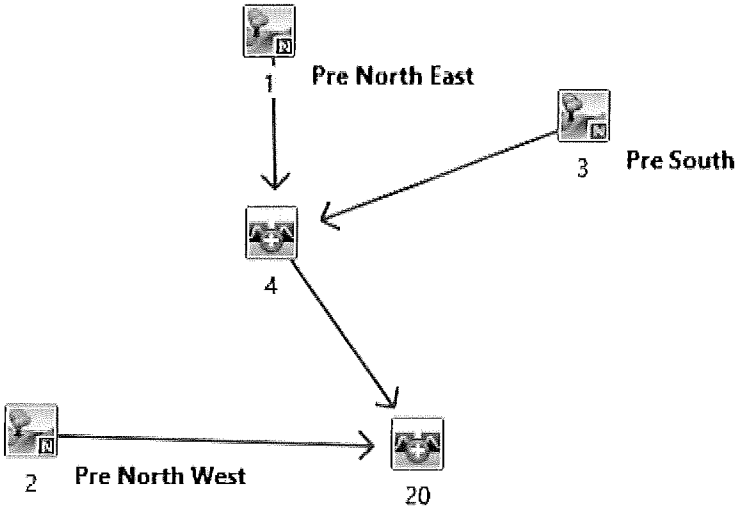
Notes

1. Figures are based on average antecedent moisture condition (AMC II) except those marked *, which are initially wet (AMC III) or an intermediate condition. For definition of AMC's see Chart C2-10.
2. Table is not applicable to frozen soils or to periods in which snowmelt contributes to runoff.
3. For detailed values in urban areas see Table 2.2 of ref. 14.
4. Source: SCS Handbook of Hydrology, Chapter 9 (9), with modifications.

CHART C2-9 - PERCENT IMPERVIOUSNESS OF URBAN AREAS

Urban Land Use	% Imperviousness
Business - Commercial	40 - 90
Industrial - Light	45 - 65
Industrial - Heavy	50 - 70
Residential - Low density	20 - 30
Residential - Medium density	25 - 35
Residential - High density	30 - 40

Source: SCS Handbook of Hydrology, Chapter 15 (9)


1
Pre North East
3
Pre South
4
2
Pre North West
20

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================================================================================
==================

       V    V   I    SSSSS  U   U    A    L              (v 5.1.2003)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\VO2\voin.dat
  Output  filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f8\8e849ff1-e5cd-4a56-86d5-8b2d6f73202b\scenari
  Summary filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f8\8e849ff1-e5cd-4a56-86d5-8b2d6f73202b\scenari


DATE: 01/03/2019                          TIME: 03:46:31

USER:


COMMENTS: _____

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  ***********************************************
  ** SIMULATION : Run 01                       **
  ***********************************************


-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              be8a6531-6b4d-4fdd-9d49-2b493bb98ea8\e36b58d1
| Ptotal= 39.38 mm |    Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.25 |  1.17    8.94 |  2.17    8.15 |  3.17    4.39
               0.33    3.56 |  1.33   16.92 |  2.33    7.01 |  3.33    4.11
               0.50    3.96 |  1.50   78.82 |  2.50    6.20 |  3.50    3.89
               0.67    4.52 |  1.67   21.89 |  2.67    5.59 |  3.67    3.68
               0.83    5.31 |  1.83   13.00 |  2.83    5.11 |  3.83    3.51
               1.00    6.55 |  2.00    9.88 |  3.00    4.72 |  4.00    3.35

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

-------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   4.45   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.38

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.014 (i)
     TIME TO PEAK    (hrs)=   2.333
     RUNOFF VOLUME    (mm)=   2.526
     TOTAL RAINFALL   (mm)=  39.385
     RUNOFF COEFFICIENT   =   0.064

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

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-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              be8a6531-6b4d-4fdd-9d49-2b493bb98ea8\e36b58d1
| Ptotal= 39.38 mm |    Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.25 |  1.17    8.94 |  2.17    8.15 |  3.17    4.39
               0.33    3.56 |  1.33   16.92 |  2.33    7.01 |  3.33    4.11
               0.50    3.96 |  1.50   78.82 |  2.50    6.20 |  3.50    3.89
               0.67    4.52 |  1.67   21.89 |  2.67    5.59 |  3.67    3.68
               0.83    5.31 |  1.83   13.00 |  2.83    5.11 |  3.83    3.51
               1.00    6.55 |  2.00    9.88 |  3.00    4.72 |  4.00    3.35

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

-------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   3.75   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.21

     Unit Hyd Qpeak  (cms)=   0.682

     PEAK FLOW       (cms)=   0.013 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=   2.477
     TOTAL RAINFALL   (mm)=  39.385
     RUNOFF COEFFICIENT   =   0.063

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

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-------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):     4.45   0.014    2.33     2.53
     + ID2= 2 (  0003):     3.75   0.013    1.83     2.48
       ================================================
       ID = 3 (  0004):     8.20   0.025    2.17     2.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              be8a6531-6b4d-4fdd-9d49-2b493bb98ea8\e36b58d1
| Ptotal= 39.38 mm |    Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.25 |  1.17    8.94 |  2.17    8.15 |  3.17    4.39
               0.33    3.56 |  1.33   16.92 |  2.33    7.01 |  3.33    4.11
               0.50    3.96 |  1.50   78.82 |  2.50    6.20 |  3.50    3.89
               0.67    4.52 |  1.67   21.89 |  2.67    5.59 |  3.67    3.68
               0.83    5.31 |  1.83   13.00 |  2.83    5.11 |  3.83    3.51
               1.00    6.55 |  2.00    9.88 |  3.00    4.72 |  4.00    3.35

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

-------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   3.13   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.478

     PEAK FLOW       (cms)=   0.011 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=   2.503
     TOTAL RAINFALL   (mm)=  39.385
     RUNOFF COEFFICIENT   =   0.064

     (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 (  0002):     3.13   0.011    2.00     2.50
     + ID2= 2 (  0004):     8.20   0.025    2.17     2.50
       ================================================
       ID = 3 (  0020):    11.33   0.036    2.00     2.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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       V    V   I    SSSSS  U   U    A    L              (v 5.1.2003)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\VO2\voin.dat
  Output  filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f8\64c73fd3-7593-4778-afa6-2d9bdc37c64d\scenari
  Summary filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f8\64c73fd3-7593-4778-afa6-2d9bdc37c64d\scenari


DATE: 01/03/2019                          TIME: 03:46:31

USER:


COMMENTS: _____

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  ***********************************************
  ** SIMULATION : Run 02                       **
  ***********************************************


-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              be8a6531-6b4d-4fdd-9d49-2b493bb98ea8\10dc2817
| Ptotal= 48.48 mm |    Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.53 |  1.17   10.19 |  2.17    9.15 |  3.17    4.55
               0.33    3.66 |  1.33   21.62 |  2.33    7.70 |  3.33    4.22
               0.50    4.04 |  1.50  112.37 |  2.50    6.68 |  3.50    3.96
               0.67    4.67 |  1.67   27.76 |  2.67    5.94 |  3.67    3.73
               0.83    5.61 |  1.83   15.75 |  2.83    5.39 |  3.83    3.53
               1.00    7.11 |  2.00   11.43 |  3.00    4.93 |  4.00    3.35

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-------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   4.45   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.38

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.031 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=   4.725
     TOTAL RAINFALL   (mm)=  48.478
     RUNOFF COEFFICIENT   =   0.097

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

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-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              be8a6531-6b4d-4fdd-9d49-2b493bb98ea8\10dc2817
| Ptotal= 48.48 mm |    Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.53 |  1.17   10.19 |  2.17    9.15 |  3.17    4.55
               0.33    3.66 |  1.33   21.62 |  2.33    7.70 |  3.33    4.22
               0.50    4.04 |  1.50  112.37 |  2.50    6.68 |  3.50    3.96
               0.67    4.67 |  1.67   27.76 |  2.67    5.94 |  3.67    3.73
               0.83    5.61 |  1.83   15.75 |  2.83    5.39 |  3.83    3.53
               1.00    7.11 |  2.00   11.43 |  3.00    4.93 |  4.00    3.35

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

-------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   3.75   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.21

     Unit Hyd Qpeak  (cms)=   0.682

     PEAK FLOW       (cms)=   0.033 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   4.633
     TOTAL RAINFALL   (mm)=  48.478
     RUNOFF COEFFICIENT   =   0.096

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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-------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):     4.45   0.031     2.00     4.73
     + ID2= 2 (  0003):     3.75   0.033     1.67     4.63
       ================================================
       ID = 3 (  0004):     8.20   0.061     1.83     4.68

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              be8a6531-6b4d-4fdd-9d49-2b493bb98ea8\10dc2817
| Ptotal= 48.48 mm |    Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.53 |  1.17   10.19 |  2.17    9.15 |  3.17    4.55
               0.33    3.66 |  1.33   21.62 |  2.33    7.70 |  3.33    4.22
               0.50    4.04 |  1.50  112.37 |  2.50    6.68 |  3.50    3.96
               0.67    4.67 |  1.67   27.76 |  2.67    5.94 |  3.67    3.73
               0.83    5.61 |  1.83   15.75 |  2.83    5.39 |  3.83    3.53
               1.00    7.11 |  2.00   11.43 |  3.00    4.93 |  4.00    3.35

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

-------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   3.13   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.478

     PEAK FLOW       (cms)=   0.026 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=   4.682
     TOTAL RAINFALL   (mm)=  48.478
     RUNOFF COEFFICIENT   =   0.097

     (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 (  0002):     3.13   0.026     1.83     4.68
     + ID2= 2 (  0004):     8.20   0.061     1.83     4.68
       ================================================
       ID = 3 (  0020):    11.33   0.088     1.83     4.68

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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       V    V   I    SSSSS  U   U    A    L             (v 5.1.2003)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\VO2\voin.dat
  Output  filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f8\18941e4c-0d61-4572-aa74-fd006a3e8704\scenari
  Summary filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f8\18941e4c-0d61-4572-aa74-fd006a3e8704\scenari


DATE: 01/03/2019                          TIME: 03:46:30

USER:


COMMENTS: _____


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  **********************************************
  ** SIMULATION : Run 03                      **
  **********************************************


-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              be8a6531-6b4d-4fdd-9d49-2b493bb98ea8\57bf828e
| Ptotal= 56.08 mm |    Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.58 |  1.17   11.51 |  2.17   10.31 |  3.17    5.05
               0.33    3.99 |  1.33   25.32 |  2.33    8.66 |  3.33    4.70
               0.50    4.50 |  1.50  133.60 |  2.50    7.52 |  3.50    4.39
               0.67    5.21 |  1.67   32.00 |  2.67    6.65 |  3.67    4.14
               0.83    6.27 |  1.83   19.73 |  2.83    5.38 |  3.83    3.91
               1.00    8.00 |  2.00   12.95 |  3.00    5.49 |  4.00    3.63

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

-------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   4.45   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.38

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.051 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=   6.994
     TOTAL RAINFALL   (mm)=  56.083
     RUNOFF COEFFICIENT   =   0.125

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

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

-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              be8a6531-6b4d-4fdd-9d49-2b493bb98ea8\57bf828e
| Ptotal= 56.08 mm |    Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.58 |  1.17   11.51 |  2.17   10.31 |  3.17    5.05
               0.33    3.99 |  1.33   25.32 |  2.33    8.66 |  3.33    4.70
               0.50    4.50 |  1.50  133.60 |  2.50    7.52 |  3.50    4.39
               0.67    5.21 |  1.67   32.00 |  2.67    6.65 |  3.67    4.14
               0.83    6.27 |  1.83   19.73 |  2.83    5.38 |  3.83    3.91
               1.00    8.00 |  2.00   12.95 |  3.00    5.49 |  4.00    3.63

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

-------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   3.75   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.21

     Unit Hyd Qpeak  (cms)=   0.682

     PEAK FLOW       (cms)=   0.056 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   6.857
     TOTAL RAINFALL   (mm)=  56.083
     RUNOFF COEFFICIENT   =   0.122

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

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-------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):     4.45   0.051     2.00     6.99
     + ID2= 2 (  0003):     3.75   0.056     1.67     6.86
       ================================================
       ID = 3 (  0004):     8.20   0.101     1.83     6.93

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              be8a6531-6b4d-4fdd-9d49-2b493bb98ea8\57bf828e
| Ptotal= 56.08 mm |    Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.58 |  1.17   11.51 |  2.17   10.31 |  3.17    5.05
               0.33    3.99 |  1.33   25.32 |  2.33    8.66 |  3.33    4.70
               0.50    4.50 |  1.50  133.60 |  2.50    7.52 |  3.50    4.39
               0.67    5.21 |  1.67   32.00 |  2.67    6.65 |  3.67    4.14
               0.83    6.27 |  1.83   19.73 |  2.83    5.38 |  3.83    3.91
               1.00    8.00 |  2.00   12.95 |  3.00    5.49 |  4.00    3.63

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

-------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   3.13   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.478

     PEAK FLOW       (cms)=   0.044 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=   6.929
     TOTAL RAINFALL   (mm)=  56.083
     RUNOFF COEFFICIENT   =   0.124

     (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 (  0002):     3.13   0.044     1.83     6.93
     + ID2= 2 (  0004):     8.20   0.101     1.83     6.93
       ================================================
       ID = 3 (  0020):    11.33   0.145     1.83     6.93

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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================================================================================
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       V    V   I    SSSSS  U   U    A    L             (v 5.1.2003)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\VO2\voin.dat
  Output  filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f8\4e2f61ca-403b-4907-a19f-94c0ed34696f\scenari
  Summary filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f8\4e2f61ca-403b-4907-a19f-94c0ed34696f\scenari


DATE: 01/03/2019                          TIME: 03:46:30

USER:


COMMENTS: _____


--------------------------------------------------------------------------------
-------------------
  **********************************************
  ** SIMULATION : Run 04                      **
  **********************************************


-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              be8a6531-6b4d-4fdd-9d49-2b493bb98ea8\9207a5aa
| Ptotal= 66.02 mm |    Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
```

```
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   13.67 |  2.17   12.32 |  3.17    6.27
                0.33    4.98 |  1.33   27.69 |  2.33   10.44 |  3.33    5.00
                0.50    5.61 |  1.50  158.85 |  2.50    9.14 |  3.50    5.84
                0.67    6.45 |  1.67   35.08 |  2.67    8.15 |  3.67    5.18
                0.83    7.70 |  1.83   20.60 |  2.83    7.39 |  3.83    4.90
                1.00    9.70 |  2.00   15.24 |  3.00    6.78 |  4.00    4.65

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

-------------------
| CALIB           |
| NASHYD   (  0001)|  Area    (ha)=   4.45   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |  Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
-------------------  U.H. Tp(hrs)=   0.38

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.077 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  10.481
     TOTAL RAINFALL   (mm)=  66.023
     RUNOFF COEFFICIENT   =   0.159

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

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

-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              be8a6531-6b4d-4fdd-9d49-2b493bb98ea8\9207a5aa
| Ptotal= 66.02 mm |    Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   13.67 |  2.17   12.32 |  3.17    6.27
                0.33    4.98 |  1.33   27.69 |  2.33   10.44 |  3.33    5.00
                0.50    5.61 |  1.50  158.85 |  2.50    9.14 |  3.50    5.84
                0.67    6.45 |  1.67   35.08 |  2.67    8.15 |  3.67    5.18
                0.83    7.70 |  1.83   20.60 |  2.83    7.39 |  3.83    4.90
                1.00    9.70 |  2.00   15.24 |  3.00    6.78 |  4.00    4.65

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

-------------------
| CALIB           |
| NASHYD   (  0003)|  Area    (ha)=   3.75   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |  Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
-------------------  U.H. Tp(hrs)=   0.21

     Unit Hyd Qpeak  (cms)=   0.682

     PEAK FLOW       (cms)=   0.090 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  10.276
     TOTAL RAINFALL   (mm)=  66.023
     RUNOFF COEFFICIENT   =   0.156

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

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

-------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):     4.45   0.077     2.00    10.48
     + ID2= 2 (  0003):     3.75   0.090     1.67    10.28
       ================================================
       ID = 3 (  0004):     8.20   0.153     1.83    10.39

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              be8a6531-6b4d-4fdd-9d49-2b493bb98ea8\9207a5aa
| Ptotal= 66.02 mm |    Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   13.67 |  2.17   12.32 |  3.17    6.27
                0.33    4.98 |  1.33   27.69 |  2.33   10.44 |  3.33    5.00
                0.50    5.61 |  1.50  158.85 |  2.50    9.14 |  3.50    5.84
                0.67    6.45 |  1.67   35.08 |  2.67    8.15 |  3.67    5.18
                0.83    7.70 |  1.83   20.60 |  2.83    7.39 |  3.83    4.90
                1.00    9.70 |  2.00   15.24 |  3.00    6.78 |  4.00    4.65

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

-------------------
| CALIB           |
| NASHYD   (  0002)|  Area    (ha)=   3.13   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |  Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
-------------------  U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.478

     PEAK FLOW       (cms)=   0.068 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  10.385
     TOTAL RAINFALL   (mm)=  66.023
     RUNOFF COEFFICIENT   =   0.157

     (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 (  0002):     3.13   0.068     1.67    10.38
     + ID2= 2 (  0004):     8.20   0.153     1.83    10.39
       ================================================
       ID = 3 (  0020):    11.33   0.219     1.83    10.39

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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       V    V   I    SSSSS  U   U    A    L             (v 5.1.2003)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

       OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M M M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  D E T A I L E D   O U T P U T *****
```

```
  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\VO2\voin.dat
  Output  filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f8\204ff7c7-b780-47ff-a783-455ba9fe3586\scenari
  Summary filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f8\204ff7c7-b780-47ff-a783-455ba9fe3586\scenari


DATE: 01/03/2019                          TIME: 03:46:30

USER:


COMMENTS: _____

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  ************************************************
  ** SIMULATION : Run 05                        **
  ************************************************


-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              be8a6531-6b4d-4fdd-9d49-2b493bb98ea8\51b849c0
| Ptotal= 72.96 mm |    Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.99 |  1.17   14.27 |  2.17   12.62 |  3.17    5.79
                0.33    4.45 |  1.33   33.90 |  2.33   10.39 |  3.33    5.33
                0.50    5.08 |  1.50  186.56 |  2.50    8.89 |  3.50    4.98
                0.67    5.97 |  1.67   44.81 |  2.67    7.80 |  3.67    4.65
                0.83    7.29 |  1.83   23.44 |  2.83    6.96 |  3.83    4.37
                1.00    9.53 |  2.00   16.26 |  3.00    6.30 |  4.00    4.14

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

-------------------
| CALIB           |
| NASHYD   (  0001)|  Area    (ha)=   4.45   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |  Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
-------------------  U.H. Tp(hrs)=   0.38

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.111 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  13.230
     TOTAL RAINFALL   (mm)=  72.962
     RUNOFF COEFFICIENT   =   0.181

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

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

-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              be8a6531-6b4d-4fdd-9d49-2b493bb98ea8\51b849c0
| Ptotal= 72.96 mm |    Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.99 |  1.17   14.27 |  2.17   12.62 |  3.17    5.79
                0.33    4.45 |  1.33   33.90 |  2.33   10.39 |  3.33    5.33
                0.50    5.08 |  1.50  186.56 |  2.50    8.89 |  3.50    4.98
                0.67    5.97 |  1.67   44.81 |  2.67    7.80 |  3.67    4.65
                0.83    7.29 |  1.83   23.44 |  2.83    6.96 |  3.83    4.37
                1.00    9.53 |  2.00   16.26 |  3.00    6.30 |  4.00    4.14

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

-------------------
| CALIB           |
| NASHYD   (  0003)|  Area    (ha)=   3.75   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |  Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
-------------------  U.H. Tp(hrs)=   0.21

     Unit Hyd Qpeak  (cms)=   0.682

     PEAK FLOW       (cms)=   0.134 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  12.972
     TOTAL RAINFALL   (mm)=  72.962
     RUNOFF COEFFICIENT   =   0.178

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

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

-------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):     4.45   0.111     1.83    13.23
     + ID2= 2 (  0003):     3.75   0.134     1.67    12.97
       ================================================
       ID = 3 (  0004):     8.20   0.223     1.83    13.11

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              be8a6531-6b4d-4fdd-9d49-2b493bb98ea8\51b849c0
| Ptotal= 72.96 mm |    Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.99 |  1.17   14.27 |  2.17   12.62 |  3.17    5.79
                0.33    4.45 |  1.33   33.90 |  2.33   10.39 |  3.33    5.33
                0.50    5.08 |  1.50  186.56 |  2.50    8.89 |  3.50    4.98
                0.67    5.97 |  1.67   44.81 |  2.67    7.80 |  3.67    4.65
                0.83    7.29 |  1.83   23.44 |  2.83    6.96 |  3.83    4.37
                1.00    9.53 |  2.00   16.26 |  3.00    6.30 |  4.00    4.14

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

-------------------
| CALIB           |
| NASHYD   (  0002)|  Area    (ha)=   3.13   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |  Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
-------------------  U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.478

     PEAK FLOW       (cms)=   0.100 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  13.109
     TOTAL RAINFALL   (mm)=  72.962
     RUNOFF COEFFICIENT   =   0.180

     (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 (  0002):     3.13   0.100     1.67    13.11
     + ID2= 2 (  0004):     8.20   0.223     1.83    13.11
       ================================================
       ID = 3 (  0020):    11.33   0.322     1.67    13.11

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
================================================================================
==================

       V    V   I    SSSSS  U   U    A    L              (v 5.1.2003)
       V    V   I    SS     U   U   A A   L
        V  V    I      SS   U   U  AAAAA  L
        V  V    I       SS  U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\VO2\voin.dat
  Output  filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f8\fd675b7f-07f0-4195-add9-4b9e531b5ad0\scenari
  Summary filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f8\fd675b7f-07f0-4195-add9-4b9e531b5ad0\scenari


DATE: 01/03/2019                          TIME: 03:46:31

USER:


COMMENTS: _____

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--------------------
  ***********************************************
  ** SIMULATION : Run 06                       **
  ***********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              be8a6531-6b4d-4fdd-9d49-2b493bb98ea8\c02acabe
| Ptotal= 83.90 mm |    Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   16.86 |  2.17   14.83 |  3.17    6.60
                0.33    5.05 |  1.33   41.07 |  2.33   12.12 |  3.33    6.10
                0.50    5.82 |  1.50  205.92 |  2.50   10.31 |  3.50    5.66
                0.67    6.83 |  1.67   54.56 |  2.67    9.02 |  3.67    5.28
                0.83    8.41 |  1.83   29.17 |  2.83    8.03 |  3.83    4.98
                1.00   11.07 |  2.00   19.28 |  3.00    7.24 |  4.00    4.70

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

--------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   4.45   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.38

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.156 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  18.033
     TOTAL RAINFALL   (mm)=  83.902
     RUNOFF COEFFICIENT   =   0.215

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

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

--------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              be8a6531-6b4d-4fdd-9d49-2b493bb98ea8\c02acabe
| Ptotal= 83.90 mm |    Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   16.86 |  2.17   14.83 |  3.17    6.60
                0.33    5.05 |  1.33   41.07 |  2.33   12.12 |  3.33    6.10
                0.50    5.82 |  1.50  205.92 |  2.50   10.31 |  3.50    5.66
                0.67    6.83 |  1.67   54.56 |  2.67    9.02 |  3.67    5.28
                0.83    8.41 |  1.83   29.17 |  2.83    8.03 |  3.83    4.98
                1.00   11.07 |  2.00   19.28 |  3.00    7.24 |  4.00    4.70

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

--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   3.75   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.21

     Unit Hyd Qpeak  (cms)=   0.682

     PEAK FLOW       (cms)=   0.188 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  17.682
     TOTAL RAINFALL   (mm)=  83.902
     RUNOFF COEFFICIENT   =   0.211

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

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

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):     4.45   0.156     1.83    18.03
     + ID2= 2 (  0003):     3.75   0.188     1.67    17.68
       ================================================
       ID = 3 (  0004):     8.20   0.314     1.83    17.87

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              be8a6531-6b4d-4fdd-9d49-2b493bb98ea8\c02acabe
| Ptotal= 83.90 mm |    Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   16.86 |  2.17   14.83 |  3.17    6.60
                0.33    5.05 |  1.33   41.07 |  2.33   12.12 |  3.33    6.10
                0.50    5.82 |  1.50  205.92 |  2.50   10.31 |  3.50    5.66
                0.67    6.83 |  1.67   54.56 |  2.67    9.02 |  3.67    5.28
                0.83    8.41 |  1.83   29.17 |  2.83    8.03 |  3.83    4.98
                1.00   11.07 |  2.00   19.28 |  3.00    7.24 |  4.00    4.70

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

--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=   3.13   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.478

     PEAK FLOW       (cms)=   0.140 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  17.868
     TOTAL RAINFALL   (mm)=  83.902
     RUNOFF COEFFICIENT   =   0.213

     (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 (  0002):     3.13   0.140     1.67    17.87
     + ID2= 2 (  0004):     8.20   0.314     1.83    17.87
       ================================================
       ID = 3 (  0020):    11.33   0.452     1.67    17.87

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

 FINISH
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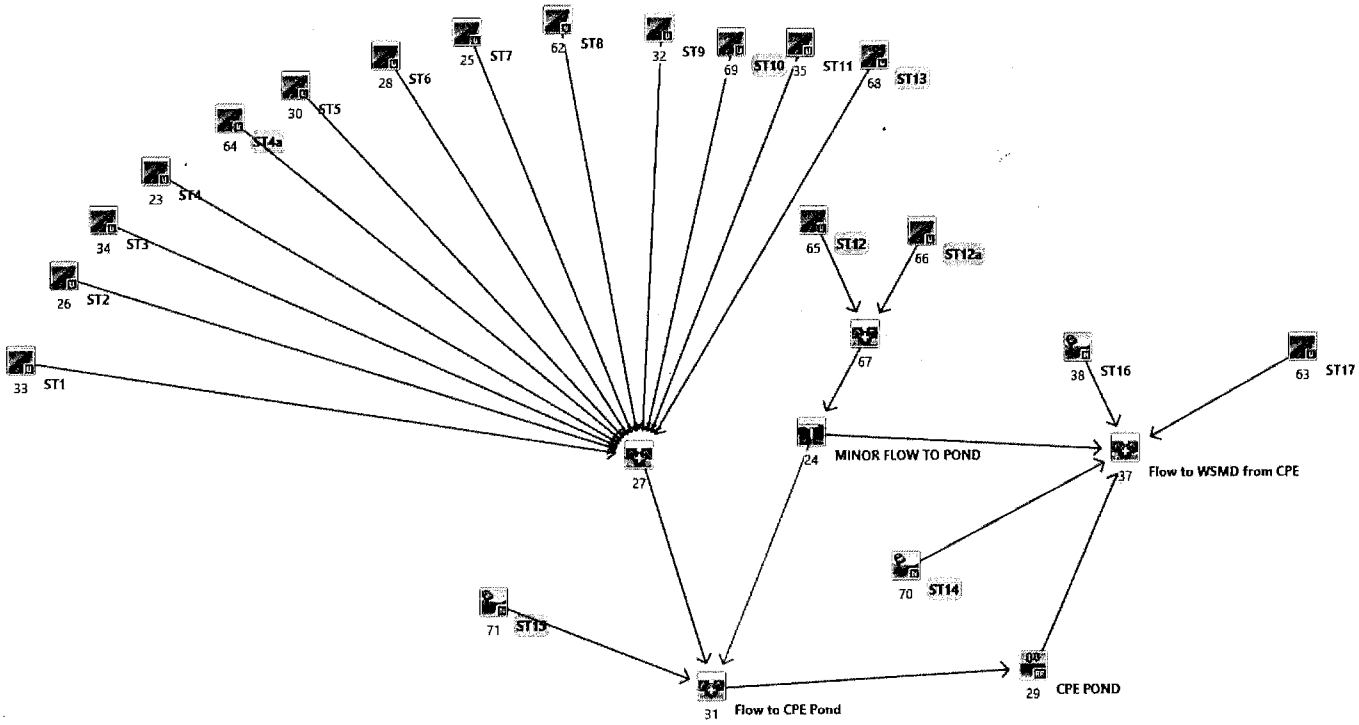
==================
```

Appendix B: Post Development Model


33 ST1
26 ST2
34 ST3
23 ST4
64 ST4a
30 ST5
28 ST6
25 ST7
62 ST8
32 ST9
69 ST10
35 ST11
68 ST13
65 ST12
66 ST12a
67
27
24 MINOR FLOW TO POND
38 ST16
63 ST17
37 Flow to WSMD from CPE
70 ST14
71 ST15
31 Flow to CPE Pond
29 CPE POND

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

       V    V   I    SSSSS  U   U    A    L              (v 5.1.2003)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\VO2\voin.dat
  Output  filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f8\754286ca-aebd-422c-a09d-166c5db145c6\scenari
  Summary filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f8\754286ca-aebd-422c-a09d-166c5db145c6\scenari


DATE: 01/05/2019                          TIME: 10:33:09

USER:


COMMENTS: _____


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  **********************************************
  ** SIMULATION : Run 01                       **
  **********************************************


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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\fd561058
| Ptotal= 39.38 mm |    Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.25 |  1.17    8.94 |  2.17    8.15 |  3.17    4.39
                0.33    3.56 |  1.33   16.92 |  2.33    7.01 |  3.33    4.11
                0.50    3.96 |  1.50   78.82 |  2.50    6.20 |  3.50    3.89
                0.67    4.52 |  1.67   21.89 |  2.67    5.59 |  3.67    3.68
                0.83    5.31 |  1.83   13.00 |  2.83    5.11 |  3.83    3.51
                1.00    6.55 |  2.00    9.88 |  3.00    4.72 |  4.00    3.35

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

-------------------
| CALIB            |
| NASHYD   (  0038)|   Area    (ha)=   0.09   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.15

     Unit Hyd Qpeak  (cms)=   0.023

     PEAK FLOW       (cms)=   0.000 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=   2.352
     TOTAL RAINFALL   (mm)=  39.385
     RUNOFF COEFFICIENT   =   0.060

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

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-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\fd561058
| Ptotal= 39.38 mm |    Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.25 |  1.17    8.94 |  2.17    8.15 |  3.17    4.39
                0.33    3.56 |  1.33   16.92 |  2.33    7.01 |  3.33    4.11
                0.50    3.96 |  1.50   78.82 |  2.50    6.20 |  3.50    3.89
                0.67    4.52 |  1.67   21.89 |  2.67    5.59 |  3.67    3.68
                0.83    5.31 |  1.83   13.00 |  2.83    5.11 |  3.83    3.51
                1.00    6.55 |  2.00    9.88 |  3.00    4.72 |  4.00    3.35

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

-------------------
| CALIB            |
| NASHYD   (  0070)|   Area    (ha)=   1.74   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.399

     PEAK FLOW       (cms)=   0.006 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=   2.407
     TOTAL RAINFALL   (mm)=  39.385
     RUNOFF COEFFICIENT   =   0.061

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

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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\fd561058
| Ptotal= 39.38 mm |    Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.25 |  1.17    8.94 |  2.17    8.15 |  3.17    4.39
                0.33    3.56 |  1.33   16.92 |  2.33    7.01 |  3.33    4.11
                0.50    3.96 |  1.50   78.82 |  2.50    6.20 |  3.50    3.89
                0.67    4.52 |  1.67   21.89 |  2.67    5.59 |  3.67    3.68
                0.83    5.31 |  1.83   13.00 |  2.83    5.11 |  3.83    3.51
                1.00    6.55 |  2.00    9.88 |  3.00    4.72 |  4.00    3.35

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-------------------
| CALIB            |
| NASHYD   (  0071)|   Area    (ha)=   0.71   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.163

     PEAK FLOW       (cms)=   0.009 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=   5.149
     TOTAL RAINFALL   (mm)=  39.385

     RUNOFF COEFFICIENT   =   0.131

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

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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\fd561058
| Ptotal= 39.38 mm |    Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.25 |  1.17    8.94 |  2.17    8.15 |  3.17    4.39
                0.33    3.56 |  1.33   16.92 |  2.33    7.01 |  3.33    4.11
                0.50    3.96 |  1.50   78.82 |  2.50    6.20 |  3.50    3.89
                0.67    4.52 |  1.67   21.89 |  2.67    5.59 |  3.67    3.68
                0.83    5.31 |  1.83   13.00 |  2.83    5.11 |  3.83    3.51
                1.00    6.55 |  2.00    9.88 |  3.00    4.72 |  4.00    3.35

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-------------------
| CALIB            |
| STANDHYD (  0023)|   Area    (ha)=   0.59
|ID= 1 DT=10.0 min |   Total Imp(%)=  47.00   Dir. Conn.(%)=  16.00
-------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.28         0.31
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      62.72        40.00
     Mannings n             =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82        18.18
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       2.12 (ii)   16.08 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.01         0.026 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      38.58         9.56         14.19
     TOTAL RAINFALL   (mm)=      39.38        39.38         39.38
     RUNOFF COEFFICIENT   =       0.98         0.24          0.36

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  58.0     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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-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\fd561058
| Ptotal= 39.38 mm |    Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.25 |  1.17    8.94 |  2.17    8.15 |  3.17    4.39
                0.33    3.56 |  1.33   16.92 |  2.33    7.01 |  3.33    4.11
                0.50    3.96 |  1.50   78.82 |  2.50    6.20 |  3.50    3.89
                0.67    4.52 |  1.67   21.89 |  2.67    5.59 |  3.67    3.68
                0.83    5.31 |  1.83   13.00 |  2.83    5.11 |  3.83    3.51
                1.00    6.55 |  2.00    9.88 |  3.00    4.72 |  4.00    3.35

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

-------------------
| CALIB            |
| STANDHYD (  0025)|   Area    (ha)=   0.52
|ID= 1 DT=10.0 min |   Total Imp(%)=  71.00   Dir. Conn.(%)=  14.00
-------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.37         0.15
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      58.88        40.00
     Mannings n             =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82        80.66
               over (min)        10.00        10.00
     Storage Coeff.  (min)=       2.04 (ii)    9.74 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.02         0.039 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=      38.58        14.98         18.28
     TOTAL RAINFALL   (mm)=      39.38        39.38         39.38
     RUNOFF COEFFICIENT   =       0.98         0.38          0.46

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  58.0     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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-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\fd561058
| Ptotal= 39.38 mm |    Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.25 |  1.17    8.94 |  2.17    8.15 |  3.17    4.39
                0.33    3.56 |  1.33   16.92 |  2.33    7.01 |  3.33    4.11
                0.50    3.96 |  1.50   78.82 |  2.50    6.20 |  3.50    3.89
                0.67    4.52 |  1.67   21.89 |  2.67    5.59 |  3.67    3.68
                0.83    5.31 |  1.83   13.00 |  2.83    5.11 |  3.83    3.51
                1.00    6.55 |  2.00    9.88 |  3.00    4.72 |  4.00    3.35

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-------------------
| CALIB            |
| STANDHYD (  0026)|   Area    (ha)=   0.48
|ID= 1 DT=10.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  14.00
-------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.24
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      56.57        40.00
     Mannings n             =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82        21.15
               over (min)        10.00        20.00
```

```
     Storage Coeff.  (min)=       2.00 (ii)   15.13 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.07
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.01          0.020 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      38.59        10.20         14.16
     TOTAL RAINFALL   (mm)=      39.38        39.38         39.38
     RUNOFF COEFFICIENT   =       0.98         0.26          0.36

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  58.0    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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-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\fd561058
| Ptotal= 39.38 mm |    Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.25 |  1.17    8.94 |'  2.17    8.15 |  3.17    4.39
                0.33    3.56 |  1.33   16.92 |'  2.33    7.01 |  3.33    4.11
                0.50    3.96 |  1.50   78.82 |'  2.50    6.20 |  3.50    3.89
                0.67    4.52 |  1.67   21.89 |'  2.67    5.59 |  3.67    3.68
                0.83    5.31 |  1.83   13.00 |'  2.83    5.11 |  3.83    3.51
                1.00    6.55 |  2.00    9.88 |'  3.00    4.72 |  4.00    3.35

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-------------------
| CALIB            |
| STANDHYD (  0028)|   Area    (ha)=   0.61
|ID= 1 DT=10.0 min |   Total Imp(%)=  62.00   Dir. Conn.(%)=  14.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.38         0.23
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      63.77        40.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82        49.97
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       2.15 (ii)   11.46 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.02          0.028 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      38.58        12.50         16.14
     TOTAL RAINFALL   (mm)=      39.38        39.38         39.38
     RUNOFF COEFFICIENT   =       0.98         0.32          0.41

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  58.0    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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-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\fd561058
| Ptotal= 39.38 mm |    Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.25 |  1.17    8.94 |'  2.17    8.15 |  3.17    4.39
                0.33    3.56 |  1.33   16.92 |'  2.33    7.01 |  3.33    4.11
                0.50    3.96 |  1.50   78.82 |'  2.50    6.20 |  3.50    3.89
                0.67    4.52 |  1.67   21.89 |'  2.67    5.59 |  3.67    3.68
                0.83    5.31 |  1.83   13.00 |'  2.83    5.11 |  3.83    3.51
                1.00    6.55 |  2.00    9.88 |'  3.00    4.72 |  4.00    3.35

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-------------------
| CALIB            |
| STANDHYD (  0030)|   Area    (ha)=   0.33
|ID= 1 DT=10.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  25.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.20         0.13
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      46.90        40.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82        24.77
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       1.78 (ii)   14.12 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.07
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.01          0.021 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      38.58        10.89         17.80
     TOTAL RAINFALL   (mm)=      39.38        39.38         39.38
     RUNOFF COEFFICIENT   =       0.98         0.28          0.45

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  58.0    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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-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\fd561058
| Ptotal= 39.38 mm |    Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.25 |  1.17    8.94 |'  2.17    8.15 |  3.17    4.39
                0.33    3.56 |  1.33   16.92 |'  2.33    7.01 |  3.33    4.11
                0.50    3.96 |  1.50   78.82 |'  2.50    6.20 |  3.50    3.89
                0.67    4.52 |  1.67   21.89 |'  2.67    5.59 |  3.67    3.68
                0.83    5.31 |  1.83   13.00 |'  2.83    5.11 |  3.83    3.51
                1.00    6.55 |  2.00    9.88 |'  3.00    4.72 |  4.00    3.35

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-------------------
| CALIB            |
| STANDHYD (  0034)|   Area    (ha)=   0.66
|ID= 1 DT=10.0 min |   Total Imp(%)=  36.00   Dir. Conn.(%)=  10.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.42
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      66.33        40.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82        14.53
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       2.20 (ii)   17.46 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.06
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.01          0.020 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      38.58         8.68         11.66
     TOTAL RAINFALL   (mm)=      39.38        39.38         39.38
     RUNOFF COEFFICIENT   =       0.98         0.22          0.30

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  58.0    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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-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\fd561058
| Ptotal= 39.38 mm |    Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.25 |  1.17    8.94 |'  2.17    8.15 |  3.17    4.39
                0.33    3.56 |  1.33   16.92 |'  2.33    7.01 |  3.33    4.11
                0.50    3.96 |  1.50   78.82 |'  2.50    6.20 |  3.50    3.89
                0.67    4.52 |  1.67   21.89 |'  2.67    5.59 |  3.67    3.68
                0.83    5.31 |  1.83   13.00 |'  2.83    5.11 |  3.83    3.51
                1.00    6.55 |  2.00    9.88 |'  3.00    4.72 |  4.00    3.35

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-------------------
| CALIB            |
| STANDHYD (  0033)|   Area    (ha)=   0.80
|ID= 1 DT=10.0 min |   Total Imp(%)=  48.00   Dir. Conn.(%)=  13.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.38         0.42
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      73.03        40.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82        20.10
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       2.33 (ii)   15.74 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.06
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.02          0.031 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      38.58         9.98         13.69
     TOTAL RAINFALL   (mm)=      39.38        39.38         39.38
     RUNOFF COEFFICIENT   =       0.98         0.25          0.35

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\fd561058
| Ptotal= 39.38 mm |    Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.25 |  1.17    8.94 |'  2.17    8.15 |  3.17    4.39
                0.33    3.56 |  1.33   16.92 |'  2.33    7.01 |  3.33    4.11
                0.50    3.96 |  1.50   78.82 |'  2.50    6.20 |  3.50    3.89
                0.67    4.52 |  1.67   21.89 |'  2.67    5.59 |  3.67    3.68
                0.83    5.31 |  1.83   13.00 |'  2.83    5.11 |  3.83    3.51
                1.00    6.55 |  2.00    9.88 |'  3.00    4.72 |  4.00    3.35

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-------------------
| CALIB            |
| STANDHYD (  0034)|   Area    (ha)=   0.67
|ID= 1 DT=10.0 min |   Total Imp(%)=  42.00   Dir. Conn.(%)=  18.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.28         0.39
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      66.83        40.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82        14.68
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       2.21 (ii)   17.41 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.06
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.01          0.031 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      38.58         8.72         14.08
     TOTAL RAINFALL   (mm)=      39.38        39.38         39.38
     RUNOFF COEFFICIENT   =       0.98         0.22          0.36

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\fd561058
| Ptotal= 39.38 mm |    Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.25 |  1.17    8.94 |  2.17    8.15 |  3.17    4.39
                0.33    3.56 |  1.33   16.92 |  2.33    7.01 |  3.33    4.11
                0.50    3.96 |  1.50   78.82 |  2.50    6.20 |  3.50    3.89
                0.67    4.52 |  1.67   21.89 |  2.67    5.59 |  3.67    3.68
                0.83    5.31 |  1.83   13.00 |  2.83    5.11 |  3.83    3.51
                1.00    6.55 |  2.00    9.88 |  3.00    4.72 |  4.00    3.35

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-------------------
| CALIB           |
| STANDHYD (  0035)|   Area    (ha)=   0.65
|ID= 1 DT=10.0 min |   Total Imp(%)=  30.00   Dir. Conn.(%)=  11.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.19         0.45
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      65.83        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82        12.01
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       2.19 (ii)   18.66 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.06
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.01          0.020 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67           1.50
     RUNOFF VOLUME    (mm)=      38.58         7.98          11.33
     TOTAL RAINFALL   (mm)=      39.38        39.38          39.38
     RUNOFF COEFFICIENT   =       0.98         0.20           0.29

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0     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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\fd561058
| Ptotal= 39.38 mm |    Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.25 |  1.17    8.94 |  2.17    8.15 |  3.17    4.39
                0.33    3.56 |  1.33   16.92 |  2.33    7.01 |  3.33    4.11
                0.50    3.96 |  1.50   78.82 |  2.50    6.20 |  3.50    3.89
                0.67    4.52 |  1.67   21.89 |  2.67    5.59 |  3.67    3.68
                0.83    5.31 |  1.83   13.00 |  2.83    5.11 |  3.83    3.51
                1.00    6.55 |  2.00    9.88 |  3.00    4.72 |  4.00    3.35

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-------------------
| CALIB           |
| STANDHYD (  0062)|   Area    (ha)=   0.51
|ID= 1 DT=10.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  16.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.17
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      58.31        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82        58.48
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       2.03 (ii)   10.78 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.02          0.026 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67           1.50
     RUNOFF VOLUME    (mm)=      38.38        13.28          17.29
     TOTAL RAINFALL   (mm)=      39.38        39.38          39.38
     RUNOFF COEFFICIENT   =       0.97         0.34           0.44

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0     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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\fd561058
| Ptotal= 39.38 mm |    Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.25 |  1.17    8.94 |  2.17    8.15 |  3.17    4.39
                0.33    3.56 |  1.33   16.92 |  2.33    7.01 |  3.33    4.11
                0.50    3.96 |  1.50   78.82 |  2.50    6.20 |  3.50    3.89
                0.67    4.52 |  1.67   21.89 |  2.67    5.59 |  3.67    3.68
                0.83    5.31 |  1.83   13.00 |  2.83    5.11 |  3.83    3.51
                1.00    6.55 |  2.00    9.88 |  3.00    4.72 |  4.00    3.35

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-------------------
| CALIB           |
| STANDHYD (  0064)|   Area    (ha)=   0.68
|ID= 1 DT=10.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  19.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.41         0.27
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      67.33        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82        28.47
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       2.22 (ii)   13.88 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.07
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.02          0.036 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67           1.50
     RUNOFF VOLUME    (mm)=      38.38        11.53          16.63
     TOTAL RAINFALL   (mm)=      39.38        39.38          39.38
     RUNOFF COEFFICIENT   =       0.97         0.29           0.42

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0     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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-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\fd561058
| Ptotal= 39.38 mm |    Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.25 |  1.17    8.94 |  2.17    8.15 |  3.17    4.39
                0.33    3.56 |  1.33   16.92 |  2.33    7.01 |  3.33    4.11
                0.50    3.96 |  1.50   78.82 |  2.50    6.20 |  3.50    3.89
                0.67    4.52 |  1.67   21.89 |  2.67    5.59 |  3.67    3.68
                0.83    5.31 |  1.83   13.00 |  2.83    5.11 |  3.83    3.51
                1.00    6.55 |  2.00    9.88 |  3.00    4.72 |  4.00    3.35

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-------------------
| CALIB           |
| STANDHYD (  0068)|   Area    (ha)=   0.41
|ID= 1 DT=10.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  17.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.18         0.23
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      52.28        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82        16.59
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       1.90 (ii)   16.38 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.06
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.01          0.019 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67           1.50
     RUNOFF VOLUME    (mm)=      38.38         9.20          14.13
     TOTAL RAINFALL   (mm)=      39.38        39.38          39.38
     RUNOFF COEFFICIENT   =       0.97         0.23           0.36

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0     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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-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\fd561058
| Ptotal= 39.38 mm |    Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.25 |  1.17    8.94 |  2.17    8.15 |  3.17    4.39
                0.33    3.56 |  1.33   16.92 |  2.33    7.01 |  3.33    4.11
                0.50    3.96 |  1.50   78.82 |  2.50    6.20 |  3.50    3.89
                0.67    4.52 |  1.67   21.89 |  2.67    5.59 |  3.67    3.68
                0.83    5.31 |  1.83   13.00 |  2.83    5.11 |  3.83    3.51
                1.00    6.55 |  2.00    9.88 |  3.00    4.72 |  4.00    3.35

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-------------------
| CALIB           |
| STANDHYD (  0069)|   Area    (ha)=   0.86
|ID= 1 DT=10.0 min |   Total Imp(%)=  39.00   Dir. Conn.(%)=  15.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.52
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      75.72        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82        14.29
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       2.38 (ii)   17.75 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.06
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.01          0.035 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67           1.50
     RUNOFF VOLUME    (mm)=      38.39         8.62          13.07
     TOTAL RAINFALL   (mm)=      39.38        39.38          39.38
     RUNOFF COEFFICIENT   =       0.97         0.22           0.33

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0     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  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):     0.59   0.026     1.50     14.19
     + ID2= 2 (  0025):     0.52   0.039     1.50     18.28
       ========================================================
       ID = 3 (  0027):     1.11   0.065     1.50     16.11

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     1.11   0.065     1.50     16.11
     + ID2= 2 (  0026):     0.48   0.020     1.50     14.16
       ========================================================
       ID = 1 (  0027):     1.59   0.084     1.50     15.52
```

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     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     1.59   0.084     1.50    15.52
     + ID2= 2 (  0028):     0.61   0.028     1.50    16.14
       ================================================
       ID = 3 (  0027):     2.20   0.112     1.50    15.69

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     2.20   0.112     1.50    15.69
     + ID2= 2 (  0030):     0.33   0.021     1.50    17.80
       ================================================
       ID = 1 (  0027):     2.53   0.133     1.50    15.96

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     2.53   0.133     1.50    15.96
     + ID2= 2 (  0032):     0.66   0.020     1.50    11.66
       ================================================
       ID = 3 (  0027):     3.19   0.153     1.50    15.07

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     3.19   0.153     1.50    15.07
     + ID2= 2 (  0033):     0.80   0.031     1.50    13.69
       ================================================
       ID = 1 (  0027):     3.99   0.184     1.50    14.80

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     3.99   0.184     1.50    14.80
     + ID2= 2 (  0034):     0.67   0.031     1.50    14.08
       ================================================
       ID = 3 (  0027):     4.66   0.215     1.50    14.69

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     4.66   0.215     1.50    14.69
     + ID2= 2 (  0035):     0.65   0.020     1.50    11.33
       ================================================
       ID = 1 (  0027):     5.31   0.235     1.50    14.28

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     5.31   0.235     1.50    14.28
     + ID2= 2 (  0062):     0.51   0.026     1.50    17.29
       ================================================
       ID = 3 (  0027):     5.82   0.261     1.50    14.55

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     5.82   0.261     1.50    14.55
     + ID2= 2 (  0064):     0.68   0.036     1.50    16.63
       ================================================
       ID = 1 (  0027):     6.50   0.297     1.50    14.76

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     6.50   0.297     1.50    14.76
     + ID2= 2 (  0068):     0.41   0.019     1.50    14.13
       ================================================
       ID = 3 (  0027):     6.91   0.316     1.50    14.73

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     6.91   0.316     1.50    14.73
     + ID2= 2 (  0069):     0.86   0.035     1.50    13.07
       ================================================
       ID = 1 (  0027):     7.77   0.351     1.50    14.54

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\fd561058
| Ptotal= 39.38 mm |    Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.25 |  1.17    8.94 |  2.17    8.15 |  3.17    4.39
               0.33    3.56 |  1.33   16.92 |  2.33    7.01 |  3.33    4.11
               0.50    3.96 |  1.50   78.82 |  2.50    6.20 |  3.50    3.89
               0.67    4.52 |  1.67   21.89 |  2.67    5.59 |  3.67    3.68
               0.83    5.31 |  1.83   13.00 |  2.83    5.11 |  3.83    3.51
               1.00    6.55 |  2.00    9.88 |  3.00    4.72 |  4.00    3.35

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

------------------
| CALIB            |
| STANDHYD (  0065)|   Area    (ha)=   0.49
|ID= 1 DT=10.0 min |   Total Imp(%)=  26.00   Dir. Conn.(%)=  17.00
------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.13         0.36
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      57.15        40.00
     Mannings n          =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82         9.44
               over (min)        10.00        30.00
     Storage Coeff.  (min)=       2.01 (ii)   20.15 (ii)
     Unit Hyd. Tpeak (min)=      10.00        30.00
     Unit Hyd. peak  (cms)=       0.17         0.05
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.01          0.020 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.83           1.50
     RUNOFF VOLUME    (mm)=      38.38         7.17          12.45
     TOTAL RAINFALL   (mm)=      39.38        39.38          39.38
     RUNOFF COEFFICIENT   =       0.97         0.18           0.32

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  58.0     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.

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

------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\fd561058
| Ptotal= 39.38 mm |    Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.25 |  1.17    8.94 |  2.17    8.15 |  3.17    4.39
               0.33    3.56 |  1.33   16.92 |  2.33    7.01 |  3.33    4.11
               0.50    3.96 |  1.50   78.82 |  2.50    6.20 |  3.50    3.89
               0.67    4.52 |  1.67   21.89 |  2.67    5.59 |  3.67    3.68
               0.83    5.31 |  1.83   13.00 |  2.83    5.11 |  3.83    3.51
               1.00    6.55 |  2.00    9.88 |  3.00    4.72 |  4.00    3.35

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

------------------
| CALIB            |
| STANDHYD (  0066)|   Area    (ha)=   0.25
|ID= 1 DT=10.0 min |   Total Imp(%)=  49.00   Dir. Conn.(%)=  31.00
------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.12         0.13
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      40.82        40.00
     Mannings n          =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82        13.51
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       1.64 (ii)   17.36 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.00          0.018 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67           1.50
     RUNOFF VOLUME    (mm)=      38.39         8.41          17.65
     TOTAL RAINFALL   (mm)=      39.38        39.38          39.38
     RUNOFF COEFFICIENT   =       0.97         0.21           0.45

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  58.0     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  (  0067)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0065):     0.49   0.020     1.50    12.45
     + ID2= 2 (  0066):     0.25   0.018     1.50    17.65
       ================================================
       ID = 3 (  0067):     0.74   0.038     1.50    14.20

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

------------------
| DUHYD    (  0024)|
| Inlet Cap.= 0.057|
| #of Inlets=   1  |
| Total(cms)=  0.1 |      AREA     QPEAK     TPEAK    R.V.
------------------       (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   0.74      0.04      1.50   14.20
     ================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00    0.00
     MINOR SYS.(ID= 3):   0.74      0.04      1.50   14.20

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

------------------
| ADD HYD  (  0031)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0024):     0.74   0.038     1.50    14.20
     + ID2= 2 (  0027):     7.77   0.351     1.50    14.54
       ================================================
       ID = 3 (  0031):     8.51   0.389     1.50    14.51

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

------------------
| ADD HYD  (  0031)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0031):     8.51   0.389     1.50    14.51
     + ID2= 2 (  0071):     0.71   0.009     1.50     5.15
       ================================================
       ID = 1 (  0031):     9.22   0.398     1.50    13.79
```

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

------------------------------------------------------------------------------
-------------------
| RESERVOIR(  0029)|
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.1080     0.2030
                         0.0085     0.0227   |   0.1807     0.2551
                         0.0130     0.0491   |   0.2663     0.3117
                         0.0163     0.0772   |   0.3630     0.3731
                         0.0190     0.1119   |   0.4697     0.4393
                         0.0512     0.1553   |   0.0000     0.0000

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0031)     9.220     0.398      1.50      13.79
   OUTFLOW: ID= 1 (  0029)     9.220     0.019      4.25      13.28

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  4.71
                  TIME SHIFT OF PEAK FLOW         (min)=165.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1083

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

-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\fd561058
| Ptotal= 39.38 mm |    Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.25 |  1.17    8.94 |  2.17    8.15 |  3.17    4.39
               0.33    3.56 |  1.33   16.92 |  2.33    7.01 |  3.33    4.11
               0.50    3.96 |  1.50   78.82 |  2.50    6.20 |  3.50    3.89
               0.67    4.52 |  1.67   21.89 |  2.67    5.59 |  3.67    3.68
               0.83    5.31 |  1.83   13.00 |  2.83    5.11 |  3.83    3.51
               1.00    6.55 |  2.00    9.88 |  3.00    4.72 |  4.00    3.35

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

-------------------
| CALIB            |
| STANDHYD (  0063)|   Area    (ha)=   0.31
|ID= 1 DT=10.0 min |   Total Imp(%)=  41.00   Dir. Conn.(%)=   0.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.13         0.18
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      45.46        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82        20.59
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       1.75 (ii)   15.03 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.07
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.00         0.01          0.007 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.67
     RUNOFF VOLUME    (mm)=      38.38        10.08         10.05
     TOTAL RAINFALL   (mm)=      39.38        39.38         39.38
     RUNOFF COEFFICIENT   =       0.97         0.26          0.26

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  58.0    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  (  0037)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH   0024 <ID= 1> IS DRY.
*** W A R N I N G :  HYDROGRAPH   0037 = HYDROGRAPH 0029
       ID1= 1 (  0024):     0.00   0.000     0.00     0.00
     + ID2= 2 (  0029):     9.22   0.019     4.25    13.28
       ==========================================================
       ID = 3 (  0037):     9.22   0.019     4.25    13.28

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0037)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0037):     9.22   0.019     4.25    13.28
     + ID2= 2 (  0038):     0.09   0.000     1.83     2.35
       ==========================================================
       ID = 1 (  0037):     9.31   0.019     4.05    13.17

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0037)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0037):     9.31   0.019     4.05    13.17
     + ID2= 2 (  0063):     0.31   0.007     1.67    10.05
       ==========================================================
       ID = 3 (  0037):     9.62   0.020     1.83    13.07

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0037)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0037):     9.62   0.020     1.83    13.07
     + ID2= 2 (  0070):     1.74   0.006     1.83     2.41
       ==========================================================
       ID = 1 (  0037):    11.36   0.027     1.83    11.44

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
================================================================================
==================

       V    V   I    SSSSS  U   U    A    L              (v 5.1.2003)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

       OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\VO2\voin.dat
  Output  filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f8\91bf6bc0-fe51-45b4-afc8-c024478adfca\scenari
  Summary filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f8\91bf6bc0-fe51-45b4-afc8-c024478adfca\scenari


DATE: 01/05/2019                          TIME: 10:33:09

USER:


COMMENTS: _____

------------------------------------------------------------------------------
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  ************************************************
  ** SIMULATION : Run 02                        **
  ************************************************


-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\432754d6
| Ptotal= 48.48 mm |    Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.53 |  1.17   10.19 |  2.17    9.15 |  3.17    4.55
               0.33    3.66 |  1.33   21.62 |  2.33    7.70 |  3.33    4.22
               0.50    4.04 |  1.50  112.37 |  2.50    6.68 |  3.50    3.96
               0.67    4.67 |  1.67   27.76 |  2.67    5.94 |  3.67    3.73
               0.83    5.61 |  1.83   15.75 |  2.83    5.39 |  3.83    3.53
               1.00    7.11 |  2.00   11.43 |  3.00    4.93 |  4.00    3.35

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

-------------------
| CALIB            |
| NASHYD   (  0038)|   Area    (ha)=   0.09   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.15

     Unit Hyd Qpeak  (cms)=   0.023

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   4.401
     TOTAL RAINFALL   (mm)=  48.478
     RUNOFF COEFFICIENT   =   0.091

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

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

-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\432754d6
| Ptotal= 48.48 mm |    Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.53 |  1.17   10.19 |  2.17    9.15 |  3.17    4.55
               0.33    3.66 |  1.33   21.62 |  2.33    7.70 |  3.33    4.22
               0.50    4.04 |  1.50  112.37 |  2.50    6.68 |  3.50    3.96
               0.67    4.67 |  1.67   27.76 |  2.67    5.94 |  3.67    3.73
               0.83    5.61 |  1.83   15.75 |  2.83    5.39 |  3.83    3.53
               1.00    7.11 |  2.00   11.43 |  3.00    4.93 |  4.00    3.35

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

-------------------
| CALIB            |
| NASHYD   (  0070)|   Area    (ha)=   1.74   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.399

     PEAK FLOW       (cms)=   0.017 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   4.503
     TOTAL RAINFALL   (mm)=  48.478
     RUNOFF COEFFICIENT   =   0.093

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

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

-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\432754d6
| Ptotal= 48.48 mm |    Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.53 |  1.17   10.19 |  2.17    9.15 |  3.17    4.55
               0.33    3.66 |  1.33   21.62 |  2.33    7.70 |  3.33    4.22
               0.50    4.04 |  1.50  112.37 |  2.50    6.68 |  3.50    3.96
               0.67    4.67 |  1.67   27.76 |  2.67    5.94 |  3.67    3.73
               0.83    5.61 |  1.83   15.75 |  2.83    5.39 |  3.83    3.53
               1.00    7.11 |  2.00   11.43 |  3.00    4.93 |  4.00    3.35

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

-------------------
| CALIB            |
| NASHYD   (  0071)|   Area    (ha)=   0.71   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.163

     PEAK FLOW       (cms)=   0.017 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=   7.903
     TOTAL RAINFALL   (mm)=  48.478
     RUNOFF COEFFICIENT   =   0.163

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

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

-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\432754d6
```

| Ptotal= 48.48 mm | Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.17	3.53	1.17	10.19	2.17	9.15	3.17	4.55
0.33	3.66	1.33	21.62	2.33	7.70	3.33	4.22
0.50	4.04	1.50	112.37	2.50	6.68	3.50	3.96
0.67	4.67	1.67	27.76	2.67	5.94	3.67	3.73
0.83	5.61	1.83	15.75	2.83	5.39	3.83	3.53
1.00	7.11	2.00	11.43	3.00	4.93	4.00	3.35

| CALIB | STANDHYD (0023) | Area (ha)= 0.59 | ID= 1 DT=10.0 min | Total Imp(%)= 47.00 Dir. Conn.(%)= 16.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.28	0.31
Dep. Storage (mm)=	0.80	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	62.72	40.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	112.37	44.94
over (min)	10.00	20.00
Storage Coeff. (min)=	1.84 (ii)	11.56 (ii)
Unit Hyd. Tpeak (min)=	10.00	20.00
Unit Hyd. peak (cms)=	0.17	0.08

	TOTALS
PEAK FLOW (cms)=	0.03 0.02 0.040 (iii)
TIME TO PEAK (hrs)=	1.50 1.67 1.50
RUNOFF VOLUME (mm)=	47.68 13.81 19.22
TOTAL RAINFALL (mm)=	48.48 48.48 48.48
RUNOFF COEFFICIENT =	0.98 0.28 0.40

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 58.0 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.

| READ STORM | Filename: C:\Users\Greg\AppData\Local\Temp\838a855b-29b4-4b71-a467-7100b13d0872\432754d6
| Ptotal= 48.48 mm | Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.17	3.53	1.17	10.19	2.17	9.15	3.17	4.55
0.33	3.66	1.33	21.62	2.33	7.70	3.33	4.22
0.50	4.04	1.50	112.37	2.50	6.68	3.50	3.96
0.67	4.67	1.67	27.76	2.67	5.94	3.67	3.73
0.83	5.61	1.83	15.75	2.83	5.39	3.83	3.53
1.00	7.11	2.00	11.43	3.00	4.93	4.00	3.35

| CALIB | STANDHYD (0025) | Area (ha)= 0.52 | ID= 1 DT=10.0 min | Total Imp(%)= 71.00 Dir. Conn.(%)= 14.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.37	0.15
Dep. Storage (mm)=	0.80	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	58.88	40.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	112.37	134.97
over (min)	10.00	10.00
Storage Coeff. (min)=	1.77 (ii)	8.03 (ii)
Unit Hyd. Tpeak (min)=	10.00	10.00
Unit Hyd. peak (cms)=	0.17	0.12

	TOTALS
PEAK FLOW (cms)=	0.02 0.04 0.064 (iii)
TIME TO PEAK (hrs)=	1.50 1.50 1.50
RUNOFF VOLUME (mm)=	47.68 20.92 24.66
TOTAL RAINFALL (mm)=	48.48 48.48 48.48
RUNOFF COEFFICIENT =	0.98 0.43 0.51

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 58.0 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.

| READ STORM | Filename: C:\Users\Greg\AppData\Local\Temp\838a855b-29b4-4b71-a467-7100b13d0872\432754d6
| Ptotal= 48.48 mm | Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.17	3.53	1.17	10.19	2.17	9.15	3.17	4.55
0.33	3.66	1.33	21.62	2.33	7.70	3.33	4.22
0.50	4.04	1.50	112.37	2.50	6.68	3.50	3.96
0.67	4.67	1.67	27.76	2.67	5.94	3.67	3.73
0.83	5.61	1.83	15.75	2.83	5.39	3.83	3.53
1.00	7.11	2.00	11.43	3.00	4.93	4.00	3.35

| CALIB | STANDHYD (0026) | Area (ha)= 0.48 | ID= 1 DT=10.0 min | Total Imp(%)= 50.00 Dir. Conn.(%)= 14.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.24	0.24
Dep. Storage (mm)=	0.80	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	56.57	40.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	112.37	52.16
over (min)	10.00	20.00
Storage Coeff. (min)=	1.73 (ii)	10.89 (ii)
Unit Hyd. Tpeak (min)=	10.00	20.00
Unit Hyd. peak (cms)=	0.17	0.08

	TOTALS
PEAK FLOW (cms)=	0.02 0.02 0.031 (iii)
TIME TO PEAK (hrs)=	1.50 1.67 1.50
RUNOFF VOLUME (mm)=	47.68 14.66 19.28
TOTAL RAINFALL (mm)=	48.48 48.48 48.48
RUNOFF COEFFICIENT =	0.98 0.30 0.40

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 58.0 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.

| READ STORM | Filename: C:\Users\Greg\AppData\Local\Temp\838a855b-29b4-4b71-a467-7100b13d0872\432754d6
| Ptotal= 48.48 mm | Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.17	3.53	1.17	10.19	2.17	9.15	3.17	4.55
0.33	3.66	1.33	21.62	2.33	7.70	3.33	4.22
0.50	4.04	1.50	112.37	2.50	6.68	3.50	3.96
0.67	4.67	1.67	27.76	2.67	5.94	3.67	3.73
0.83	5.61	1.83	15.75	2.83	5.39	3.83	3.53
1.00	7.11	2.00	11.43	3.00	4.93	4.00	3.35

| CALIB | STANDHYD (0028) | Area (ha)= 0.61 | ID= 1 DT=10.0 min | Total Imp(%)= 62.00 Dir. Conn.(%)= 14.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.38	0.23
Dep. Storage (mm)=	0.80	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	63.77	40.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	112.37	85.00
over (min)	10.00	10.00
Storage Coeff. (min)=	1.86 (ii)	9.39 (ii)
Unit Hyd. Tpeak (min)=	10.00	10.00
Unit Hyd. peak (cms)=	0.17	0.11

	TOTALS
PEAK FLOW (cms)=	0.03 0.04 0.064 (iii)
TIME TO PEAK (hrs)=	1.50 1.50 1.50
RUNOFF VOLUME (mm)=	47.68 17.71 21.90
TOTAL RAINFALL (mm)=	48.48 48.48 48.48
RUNOFF COEFFICIENT =	0.98 0.37 0.45

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 58.0 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.

| READ STORM | Filename: C:\Users\Greg\AppData\Local\Temp\838a855b-29b4-4b71-a467-7100b13d0872\432754d6
| Ptotal= 48.48 mm | Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.17	3.53	1.17	10.19	2.17	9.15	3.17	4.55
0.33	3.66	1.33	21.62	2.33	7.70	3.33	4.22
0.50	4.04	1.50	112.37	2.50	6.68	3.50	3.96
0.67	4.67	1.67	27.76	2.67	5.94	3.67	3.73
0.83	5.61	1.83	15.75	2.83	5.39	3.83	3.53
1.00	7.11	2.00	11.43	3.00	4.93	4.00	3.35

| CALIB | STANDHYD (0030) | Area (ha)= 0.33 | ID= 1 DT=10.0 min | Total Imp(%)= 60.00 Dir. Conn.(%)= 25.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.20	0.13
Dep. Storage (mm)=	0.80	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	46.90	40.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	112.37	60.94
over (min)	10.00	20.00
Storage Coeff. (min)=	1.55 (ii)	10.15 (ii)
Unit Hyd. Tpeak (min)=	10.00	20.00
Unit Hyd. peak (cms)=	0.17	0.08

	TOTALS
PEAK FLOW (cms)=	0.03 0.01 0.032 (iii)
TIME TO PEAK (hrs)=	1.50 1.67 1.50
RUNOFF VOLUME (mm)=	47.68 15.59 23.60
TOTAL RAINFALL (mm)=	48.48 48.48 48.48
RUNOFF COEFFICIENT =	0.98 0.32 0.49

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 58.0 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.

| READ STORM | Filename: C:\Users\Greg\AppData\Local\Temp\838a855b-29b4-4b71-a467-7100b13d0872\432754d6
| Ptotal= 48.48 mm | Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.17	3.53	1.17	10.19	2.17	9.15	3.17	4.55
0.33	3.66	1.33	21.62	2.33	7.70	3.33	4.22
0.50	4.04	1.50	112.37	2.50	6.68	3.50	3.96
0.67	4.67	1.67	27.76	2.67	5.94	3.67	3.73
0.83	5.61	1.83	15.75	2.83	5.39	3.83	3.53
1.00	7.11	2.00	11.43	3.00	4.93	4.00	3.35

| CALIB | STANDHYD (0032) | Area (ha)= 0.66 | ID= 1 DT=10.0 min | Total Imp(%)= 36.00 Dir. Conn.(%)= 10.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.24	0.42
Dep. Storage (mm)=	0.80	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	66.33	40.00

```
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37        24.63
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       1.91 (ii)   14.27 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.07
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.02          0.031 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      47.68        12.61         16.11
     TOTAL RAINFALL   (mm)=      48.48        48.48         48.48
     RUNOFF COEFFICIENT   =       0.98         0.26          0.33

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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| Ptotal= 48.48 mm |    Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.53 |  1.17   10.19 |  2.17    9.15 |  3.17    4.55
                0.33    3.66 |  1.33   21.62 |  2.33    7.70 |  3.33    4.22
                0.50    4.04 |  1.50  112.37 |  2.50    6.68 |  3.50    3.96
                0.67    4.67 |  1.67   27.76 |  2.67    5.94 |  3.67    3.73
                0.83    5.61 |  1.83   15.75 |  2.83    5.39 |  3.83    3.53
                1.00    7.11 |  2.00   11.43 |  3.00    4.93 |  4.00    3.35

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| CALIB            |
| STANDHYD (  0033)|   Area    (ha)=   0.80
|ID= 1 DT=10.0 min |   Total Imp(%)=  48.00   Dir. Conn.(%)=  13.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.38         0.42
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      73.03        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37        49.61
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       2.02 (ii)   11.36 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.03          0.048 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      47.68        14.37         18.69
     TOTAL RAINFALL   (mm)=      48.48        48.48         48.48
     RUNOFF COEFFICIENT   =       0.98         0.30          0.39

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
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| Ptotal= 48.48 mm |    Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.53 |  1.17   10.19 |  2.17    9.15 |  3.17    4.55
                0.33    3.66 |  1.33   21.62 |  2.33    7.70 |  3.33    4.22
                0.50    4.04 |  1.50  112.37 |  2.50    6.68 |  3.50    3.96
                0.67    4.67 |  1.67   27.76 |  2.67    5.94 |  3.67    3.73
                0.83    5.61 |  1.83   15.75 |  2.83    5.39 |  3.83    3.53
                1.00    7.11 |  2.00   11.43 |  3.00    4.93 |  4.00    3.35

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| CALIB            |
| STANDHYD (  0034)|   Area    (ha)=   0.67
|ID= 1 DT=10.0 min |   Total Imp(%)=  42.00   Dir. Conn.(%)=  18.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.28         0.39
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      66.83        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37        24.87
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       1.91 (ii)   14.23 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.07
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.02          0.047 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      47.68        12.67         18.96
     TOTAL RAINFALL   (mm)=      48.48        48.48         48.48
     RUNOFF COEFFICIENT   =       0.98         0.26          0.39

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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| Ptotal= 48.48 mm |    Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO
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                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.53 |  1.17   10.19 |  2.17    9.15 |  3.17    4.55
                0.33    3.66 |  1.33   21.62 |  2.33    7.70 |  3.33    4.22
                0.50    4.04 |  1.50  112.37 |  2.50    6.68 |  3.50    3.96
                0.67    4.67 |  1.67   27.76 |  2.67    5.94 |  3.67    3.73
                0.83    5.61 |  1.83   15.75 |  2.83    5.39 |  3.83    3.53
                1.00    7.11 |  2.00   11.43 |  3.00    4.93 |  4.00    3.35

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| CALIB            |
| STANDHYD (  0035)|   Area    (ha)=   0.65
|ID= 1 DT=10.0 min |   Total Imp(%)=  30.00   Dir. Conn.(%)=  11.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.19         0.45
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      65.83        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37        20.46
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       1.90 (ii)   15.21 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.07
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.02          0.031 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      47.68        11.65         15.60
     TOTAL RAINFALL   (mm)=      48.48        48.48         48.48
     RUNOFF COEFFICIENT   =       0.98         0.24          0.32

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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| Ptotal= 48.48 mm |    Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO
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                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.53 |  1.17   10.19 |  2.17    9.15 |  3.17    4.55
                0.33    3.66 |  1.33   21.62 |  2.33    7.70 |  3.33    4.22
                0.50    4.04 |  1.50  112.37 |  2.50    6.68 |  3.50    3.96
                0.67    4.67 |  1.67   27.76 |  2.67    5.94 |  3.67    3.73
                0.83    5.61 |  1.83   15.75 |  2.83    5.39 |  3.83    3.53
                1.00    7.11 |  2.00   11.43 |  3.00    4.93 |  4.00    3.35

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| CALIB            |
| STANDHYD (  0062)|   Area    (ha)=   0.51
|ID= 1 DT=10.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  16.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.17
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      58.31        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37        98.97
               over (min)        10.00        10.00
     Storage Coeff.  (min)=       1.76 (ii)    8.85 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.03          0.059 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=      47.48        18.73         23.32
     TOTAL RAINFALL   (mm)=      48.48        48.48         48.48
     RUNOFF COEFFICIENT   =       0.98         0.39          0.48

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\432754d6
| Ptotal= 48.48 mm |    Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.53 |  1.17   10.19 |  2.17    9.15 |  3.17    4.55
                0.33    3.66 |  1.33   21.62 |  2.33    7.70 |  3.33    4.22
                0.50    4.04 |  1.50  112.37 |  2.50    6.68 |  3.50    3.96
                0.67    4.67 |  1.67   27.76 |  2.67    5.94 |  3.67    3.73
                0.83    5.61 |  1.83   15.75 |  2.83    5.39 |  3.83    3.53
                1.00    7.11 |  2.00   11.43 |  3.00    4.93 |  4.00    3.35

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

--------------------
| CALIB            |
| STANDHYD (  0064)|   Area    (ha)=   0.68
|ID= 1 DT=10.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  19.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.41         0.27
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      67.33        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37        69.90
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       1.92 (ii)   10.07 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.03          0.055 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      47.48        16.45         22.34
     TOTAL RAINFALL   (mm)=      48.48        48.48         48.48
     RUNOFF COEFFICIENT   =       0.98         0.34          0.46

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\432754d6
| Ptotal= 48.48 mm |    Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.53 |  1.17   10.19 |  2.17    9.15 |  3.17    4.55
                0.33    3.66 |  1.33   21.62 |  2.33    7.70 |  3.33    4.22
                0.50    4.04 |  1.50  112.37 |  2.50    6.68 |  3.50    3.96
                0.67    4.67 |  1.67   27.76 |  2.67    5.94 |  3.67    3.73
                0.83    5.61 |  1.83   15.75 |  2.83    5.39 |  3.83    3.53
                1.00    7.11 |  2.00   11.43 |  3.00    4.93 |  4.00    3.35

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

-------------------
| CALIB            |
| STANDHYD (  0068)|   Area    (ha)=   0.41
|ID= 1 DT=10.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  17.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.18         0.23
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      52.28        40.00
     Mannings n             =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37        28.01
               over (min)       10.00        20.00
     Storage Coeff.  (min)=      1.65 (ii)   13.39 (ii)
     Unit Hyd. Tpeak (min)=     10.00        20.00
     Unit Hyd. peak  (cms)=      0.17         0.07
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.02         0.01          0.028 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=     47.48        13.31         19.10
     TOTAL RAINFALL   (mm)=     48.48        48.48         48.48
     RUNOFF COEFFICIENT   =      0.98         0.27          0.39

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  58.0    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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-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\432754d6
| Ptotal= 48.48 mm |    Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.53 |  1.17   10.19 |  2.17    9.15 |  3.17    4.55
                0.33    3.66 |  1.33   21.62 |  2.33    7.70 |  3.33    4.22
                0.50    4.04 |  1.50  112.37 |  2.50    6.68 |  3.50    3.96
                0.67    4.67 |  1.67   27.76 |  2.67    5.94 |  3.67    3.73
                0.83    5.61 |  1.83   15.75 |  2.83    5.39 |  3.83    3.53
                1.00    7.11 |  2.00   11.43 |  3.00    4.93 |  4.00    3.35

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-------------------
| CALIB            |
| STANDHYD (  0069)|   Area    (ha)=   0.86
|ID= 1 DT=10.0 min |   Total Imp(%)=  39.00   Dir. Conn.(%)=  15.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.52
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      75.72        40.00
     Mannings n             =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37        24.22
               over (min)       10.00        20.00
     Storage Coeff.  (min)=      2.06 (ii)   14.51 (ii)
     Unit Hyd. Tpeak (min)=     10.00        20.00
     Unit Hyd. peak  (cms)=      0.17         0.07
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.04         0.03          0.052 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=     47.48        12.52         17.76
     TOTAL RAINFALL   (mm)=     48.48        48.48         48.48
     RUNOFF COEFFICIENT   =      0.98         0.26          0.37

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  58.0    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  (  0027)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):     0.59   0.040     1.50    19.22
     + ID2= 2 (  0025):     0.52   0.064     1.50    24.66
       ================================================
       ID = 3 (  0027):     1.11   0.104     1.50    21.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     1.11   0.104     1.50    21.77
     + ID2= 2 (  0026):     0.48   0.031     1.50    19.28
       ================================================
       ID = 1 (  0027):     1.59   0.135     1.50    21.02

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     1.59   0.135     1.50    21.02
     + ID2= 2 (  0028):     0.61   0.064     1.50    21.90
       ================================================
       ID = 3 (  0027):     2.20   0.198     1.50    21.26

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     2.20   0.198     1.50    21.26
     + ID2= 2 (  0030):     0.33   0.032     1.50    23.60
       ================================================
       ID = 1 (  0027):     2.53   0.231     1.50    21.57

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     2.53   0.231     1.50    21.57
     + ID2= 2 (  0032):     0.66   0.031     1.50    16.11
       ================================================
       ID = 3 (  0027):     3.19   0.261     1.50    20.44

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     3.19   0.261     1.50    20.44
     + ID2= 2 (  0033):     0.80   0.048     1.50    18.69
       ================================================
       ID = 1 (  0027):     3.99   0.309     1.50    20.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     3.99   0.309     1.50    20.09
     + ID2= 2 (  0034):     0.67   0.047     1.50    18.96
       ================================================
       ID = 3 (  0027):     4.66   0.356     1.50    19.92

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     4.66   0.356     1.50    19.92
     + ID2= 2 (  0035):     0.65   0.031     1.50    15.60
       ================================================
       ID = 1 (  0027):     5.31   0.387     1.50    19.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     5.31   0.387     1.50    19.40
     + ID2= 2 (  0062):     0.51   0.059     1.50    23.32
       ================================================
       ID = 3 (  0027):     5.82   0.446     1.50    19.74

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     5.82   0.446     1.50    19.74
     + ID2= 2 (  0064):     0.68   0.055     1.50    22.34
       ================================================
       ID = 1 (  0027):     6.50   0.502     1.50    20.01

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     6.50   0.502     1.50    20.01
     + ID2= 2 (  0068):     0.41   0.028     1.50    19.10
       ================================================
       ID = 3 (  0027):     6.91   0.530     1.50    19.96

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     6.91   0.530     1.50    19.96
     + ID2= 2 (  0069):     0.86   0.052     1.50    17.76
       ================================================
       ID = 1 (  0027):     7.77   0.582     1.50    19.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\432754d6
| Ptotal= 48.48 mm |    Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.53 |  1.17   10.19 |  2.17    9.15 |  3.17    4.55
                0.33    3.66 |  1.33   21.62 |  2.33    7.70 |  3.33    4.22
                0.50    4.04 |  1.50  112.37 |  2.50    6.68 |  3.50    3.96
                0.67    4.67 |  1.67   27.76 |  2.67    5.94 |  3.67    3.73
                0.83    5.61 |  1.83   15.75 |  2.83    5.39 |  3.83    3.53
                1.00    7.11 |  2.00   11.43 |  3.00    4.93 |  4.00    3.35

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| CALIB            |
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```
| STANDHYD (  0065)|   Area    (ha)=   0.49
|ID= 1 DT=10.0 min |   Total Imp(%)=  26.00   Dir. Conn.(%)=  17.00
-------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.13         0.36
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      57.15        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37        16.18
               over (min)       10.00        20.00
     Storage Coeff.  (min)=      1.74 (ii)   16.37 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.06
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.01          0.031 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      47.48        10.53         16.79
     TOTAL RAINFALL   (mm)=      48.48        48.48         48.48
     RUNOFF COEFFICIENT   =       0.98         0.22          0.35

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\432754d6
| Ptotal= 48.48 mm |    Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.53 |  1.17   10.19 |  2.17    9.15 |  3.17    4.55
                0.33    3.66 |  1.33   21.62 |  2.33    7.70 |  3.33    4.22
                0.50    4.04 |  1.50  112.37 |  2.50    6.68 |  3.50    3.96
                0.67    4.67 |  1.67   27.76 |  2.67    5.94 |  3.67    3.73
                0.83    5.61 |  1.83   15.75 |  2.83    5.39 |  3.83    3.53
                1.00    7.11 |  2.00   11.43 |  3.00    4.93 |  4.00    3.35

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-------------------
| CALIB             |
| STANDHYD (  0066)|   Area    (ha)=   0.25
|ID= 1 DT=10.0 min |   Total Imp(%)=  49.00   Dir. Conn.(%)=  31.00
-------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.12         0.13
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      40.82        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37        22.94
               over (min)       10.00        20.00
     Storage Coeff.  (min)=      1.42 (ii)   14.14 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.07
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.01          0.027 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      47.48        12.24         23.13
     TOTAL RAINFALL   (mm)=      48.48        48.48         48.48
     RUNOFF COEFFICIENT   =       0.98         0.25          0.48

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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  (  0067)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0065):     0.49   0.031     1.50    16.79
     + ID2= 2 (  0066):     0.25   0.027     1.50    23.13
       ================================================
       ID = 3 (  0067):     0.74   0.058     1.50    18.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| DUHYD    (  0024)|
| Inlet Cap.= 0.057|
| #of Inlets=     1|
| Total(cms)=   0.1|      AREA     QPEAK     TPEAK    R.V.
-------------------      (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   0.74      0.06      1.50   18.93
     ================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      1.50   18.93
     MINOR SYS.(ID= 3):   0.74      0.06      1.50   18.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD  (  0031)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0024):     0.74   0.057     1.50    18.93
     + ID2= 2 (  0027):     7.77   0.582     1.50    19.71
       ================================================
       ID = 3 (  0031):     8.51   0.639     1.50    19.65

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD  (  0031)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0031):     8.51   0.639     1.50    19.65
     + ID2= 2 (  0071):     0.71   0.017     1.50     7.90
       ================================================
       ID = 1 (  0031):     9.22   0.656     1.50    18.74

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| RESERVOIR(  0029)|
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000    |   0.1080     0.2030
                         0.0085     0.0227    |   0.1807     0.2551
                         0.0130     0.0491    |   0.2663     0.3117
                         0.0163     0.0772    |   0.3630     0.3731
                         0.0190     0.1119    |   0.4697     0.4393
                         0.0512     0.1553    |   0.0000     0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0031)      9.216     0.656      1.50      18.74
   OUTFLOW: ID= 1 (  0029)      9.216     0.041      4.07      17.95

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=  6.25
                    TIME SHIFT OF PEAK FLOW         (min)=154.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.1416

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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\432754d6
| Ptotal= 48.48 mm |    Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.53 |  1.17   10.19 |  2.17    9.15 |  3.17    4.55
                0.33    3.66 |  1.33   21.62 |  2.33    7.70 |  3.33    4.22
                0.50    4.04 |  1.50  112.37 |  2.50    6.68 |  3.50    3.96
                0.67    4.67 |  1.67   27.76 |  2.67    5.94 |  3.67    3.73
                0.83    5.61 |  1.83   15.75 |  2.83    5.39 |  3.83    3.53
                1.00    7.11 |  2.00   11.43 |  3.00    4.93 |  4.00    3.35

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

-------------------
| CALIB             |
| STANDHYD (  0063)|   Area    (ha)=   0.31
|ID= 1 DT=10.0 min |   Total Imp(%)=  41.00   Dir. Conn.(%)=   0.00
-------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.13         0.18
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      45.46        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37        50.79
               over (min)       10.00        20.00
     Storage Coeff.  (min)=      1.52 (ii)   10.77 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.00         0.01          0.015 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.67
     RUNOFF VOLUME    (mm)=      47.48        14.51         14.49
     TOTAL RAINFALL   (mm)=      48.48        48.48         48.48
     RUNOFF COEFFICIENT   =       0.98         0.30          0.30

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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  (  0037)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0024):     0.00   0.001     1.50    18.93
     + ID2= 2 (  0029):     9.22   0.041     4.07    17.95
       ================================================
       ID = 3 (  0037):     9.22   0.041     4.07    17.95

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0037)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0037):     9.22   0.041     4.07    17.95
     + ID2= 2 (  0038):     0.09   0.001     1.67     4.40
       ================================================
       ID = 1 (  0037):     9.31   0.041     4.05    17.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0037)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0037):     9.31   0.041     4.05    17.82
     + ID2= 2 (  0063):     0.31   0.015     1.67    14.49
       ================================================
       ID = 3 (  0037):     9.62   0.043     4.00    17.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0037)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0037):     9.62   0.043     4.00    17.71
     + ID2= 2 (  0070):     1.74   0.017     1.67     4.50
       ================================================
       ID = 1 (  0037):    11.36   0.047     1.67    15.69

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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================================================================================
==================

       V    V   I    SSSSS  U   U    A    L              (v 5.1.2003)
       V    V   I    SS     U   U   A A   L
        V  V    I      SS   U   U  AAAAA  L
        V  V    I     SS    U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\VO2\voin.dat
```

```
  Output  filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f9\cec7ce50-29aa-4592-b2f1-6bf32e96f3d9\scenari
  Summary filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f8\cec7ce50-29aa-4592-b2f1-6bf32e96f3d9\scenari

DATE: 01/05/2019                          TIME: 10:33:09

USER:


COMMENTS: _____

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  **************************************************
  ** SIMULATION : Run 03                           **
  **************************************************


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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\5a9247c8
| Ptotal= 56.08 mm |    Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT
--------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.58 |  1.17   11.51 |  2.17   10.31 |  3.17    5.05
               0.33    3.99 |  1.33   25.32 |  2.33    8.66 |  3.33    4.70
               0.50    4.50 |  1.50  133.60 |  2.50    7.52 |  3.50    4.39
               0.67    5.21 |  1.67   32.00 |  2.67    6.65 |  3.67    4.14
               0.83    6.27 |  1.83   19.73 |  2.83    5.38 |  3.83    3.91
               1.00    8.00 |  2.00   12.95 |  3.00    5.49 |  4.00    3.63

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

--------------------
| CALIB            |
| NASHYD   (  0038)|   Area    (ha)=   0.09   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.15

     Unit Hyd Qpeak  (cms)=   0.023

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   6.514
     TOTAL RAINFALL   (mm)=  56.083
     RUNOFF COEFFICIENT   =   0.116

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

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--------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\5a9247c8
| Ptotal= 56.08 mm |    Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT
--------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.58 |  1.17   11.51 |  2.17   10.31 |  3.17    5.05
               0.33    3.99 |  1.33   25.32 |  2.33    8.66 |  3.33    4.70
               0.50    4.50 |  1.50  133.60 |  2.50    7.52 |  3.50    4.39
               0.67    5.21 |  1.67   32.00 |  2.67    6.65 |  3.67    4.14
               0.83    6.27 |  1.83   19.73 |  2.83    5.38 |  3.83    3.91
               1.00    8.00 |  2.00   12.95 |  3.00    5.49 |  4.00    3.63

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

--------------------
| CALIB            |
| NASHYD   (  0070)|   Area    (ha)=   1.74   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.399

     PEAK FLOW       (cms)=   0.028 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   6.665
     TOTAL RAINFALL   (mm)=  56.083
     RUNOFF COEFFICIENT   =   0.119

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

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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\5a9247c8
| Ptotal= 56.08 mm |    Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT
--------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.58 |  1.17   11.51 |  2.17   10.31 |  3.17    5.05
               0.33    3.99 |  1.33   25.32 |  2.33    8.66 |  3.33    4.70
               0.50    4.50 |  1.50  133.60 |  2.50    7.52 |  3.50    4.39
               0.67    5.21 |  1.67   32.00 |  2.67    6.65 |  3.67    4.14
               0.83    6.27 |  1.83   19.73 |  2.83    5.38 |  3.83    3.91
               1.00    8.00 |  2.00   12.95 |  3.00    5.49 |  4.00    3.63

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--------------------
| CALIB            |
| NASHYD   (  0071)|   Area    (ha)=   0.71   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.163

     PEAK FLOW       (cms)=   0.024 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  10.556
     TOTAL RAINFALL   (mm)=  56.083
     RUNOFF COEFFICIENT   =   0.188

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

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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\5a9247c8
| Ptotal= 56.08 mm |    Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT
--------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.58 |  1.17   11.51 |  2.17   10.31 |  3.17    5.05
               0.33    3.99 |  1.33   25.32 |  2.33    8.66 |  3.33    4.70
               0.50    4.50 |  1.50  133.60 |  2.50    7.52 |  3.50    4.39
               0.67    5.21 |  1.67   32.00 |  2.67    6.65 |  3.67    4.14
               0.83    6.27 |  1.83   19.73 |  2.83    5.38 |  3.83    3.91
               1.00    8.00 |  2.00   12.95 |  3.00    5.49 |  4.00    3.63

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--------------------
| CALIB            |
| STANDHYD (  0023)|   Area    (ha)=   0.59
|ID= 1 DT=10.0 min |   Total Imp(%)=  47.00   Dir. Conn.(%)=  16.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.28         0.31
     Dep. Storage     (mm)=      0.80         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     62.72        40.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    133.60        60.21
               over (min)       10.00        20.00
     Storage Coeff.  (min)=      1.72 (ii)   10.37 (ii)
     Unit Hyd. Tpeak (min)=     10.00        20.00
     Unit Hyd. peak  (cms)=      0.17         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.03         0.03         0.050 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=     55.28        17.76         23.76
     TOTAL RAINFALL   (mm)=     56.08        56.08         56.08
     RUNOFF COEFFICIENT   =      0.99         0.32          0.42

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  58.0    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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--------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\5a9247c8
| Ptotal= 56.08 mm |    Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT
--------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.58 |  1.17   11.51 |  2.17   10.31 |  3.17    5.05
               0.33    3.99 |  1.33   25.32 |  2.33    8.66 |  3.33    4.70
               0.50    4.50 |  1.50  133.60 |  2.50    7.52 |  3.50    4.39
               0.67    5.21 |  1.67   32.00 |  2.67    6.65 |  3.67    4.14
               0.83    6.27 |  1.83   19.73 |  2.83    5.38 |  3.83    3.91
               1.00    8.00 |  2.00   12.95 |  3.00    5.49 |  4.00    3.63

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

--------------------
| CALIB            |
| STANDHYD (  0025)|   Area    (ha)=   0.52
|ID= 1 DT=10.0 min |   Total Imp(%)=  71.00   Dir. Conn.(%)=  14.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.37         0.15
     Dep. Storage     (mm)=      0.80         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     58.88        40.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    133.60       176.58
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.66 (ii)    7.28 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.03         0.06         0.084 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     55.28        26.27         30.32
     TOTAL RAINFALL   (mm)=     56.08        56.08         56.08
     RUNOFF COEFFICIENT   =      0.99         0.47          0.54

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  58.0    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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--------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\5a9247c8
| Ptotal= 56.08 mm |    Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT
--------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.58 |  1.17   11.51 |  2.17   10.31 |  3.17    5.05
               0.33    3.99 |  1.33   25.32 |  2.33    8.66 |  3.33    4.70
               0.50    4.50 |  1.50  133.60 |  2.50    7.52 |  3.50    4.39
               0.67    5.21 |  1.67   32.00 |  2.67    6.65 |  3.67    4.14
               0.83    6.27 |  1.83   19.73 |  2.83    5.38 |  3.83    3.91
               1.00    8.00 |  2.00   12.95 |  3.00    5.49 |  4.00    3.63

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

--------------------
| CALIB            |
| STANDHYD (  0026)|   Area    (ha)=   0.48
|ID= 1 DT=10.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  14.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.24         0.24
     Dep. Storage     (mm)=      0.80         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     56.57        40.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    133.60        69.68
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.62 (ii)    9.77 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.02         0.03         0.056 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     55.28        18.80         23.90
     TOTAL RAINFALL   (mm)=     56.08        56.08         56.08
     RUNOFF COEFFICIENT   =      0.99         0.34          0.43

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  58.0    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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--------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\5a9247c8
| Ptotal= 56.08 mm |    Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.58 |  1.17   11.51 |  2.17   10.31 |  3.17    5.05
                0.33    3.99 |  1.33   25.32 |  2.33    8.66 |  3.33    4.70
                0.50    4.50 |  1.50  133.60 |  2.50    7.52 |  3.50    4.39
                0.67    5.21 |  1.67   32.00 |  2.67    6.65 |  3.67    4.14
                0.83    6.27 |  1.83   19.73 |  2.83    5.38 |  3.83    3.91
                1.00    8.00 |  2.00   12.95 |  3.00    5.49 |  4.00    3.63

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--------------------
| CALIB            |
| STANDHYD (  0028)|   Area    (ha)=   0.61
|ID= 1 DT=10.0 min |   Total Imp(%)=  62.00   Dir. Conn.(%)=  14.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.38         0.23
     Dep. Storage     (mm)=      0.80         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     63.77        40.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=    133.60       112.41
               over (min)      10.00        10.00
     Storage Coeff.  (min)=     1.74 (ii)    8.47 (ii)
     Unit Hyd. Tpeak (min)=    10.00        10.00
     Unit Hyd. peak  (cms)=     0.17         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=     0.03         0.05          0.083 (iii)
     TIME TO PEAK    (hrs)=     1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=    55.28        22.47         27.06
     TOTAL RAINFALL   (mm)=    56.08        56.08         56.08
     RUNOFF COEFFICIENT   =     0.99         0.40          0.48

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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.

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

--------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\5a9247c8
| Ptotal= 56.08 mm |    Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.58 |  1.17   11.51 |  2.17   10.31 |  3.17    5.05
                0.33    3.99 |  1.33   25.32 |  2.33    8.66 |  3.33    4.70
                0.50    4.50 |  1.50  133.60 |  2.50    7.52 |  3.50    4.39
                0.67    5.21 |  1.67   32.00 |  2.67    6.65 |  3.67    4.14
                0.83    6.27 |  1.83   19.73 |  2.83    5.38 |  3.83    3.91
                1.00    8.00 |  2.00   12.95 |  3.00    5.49 |  4.00    3.63

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--------------------
| CALIB            |
| STANDHYD (  0030)|   Area    (ha)=   0.33
|ID= 1 DT=10.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  25.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.20         0.13
     Dep. Storage     (mm)=      0.80         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     46.90        40.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=    133.60        81.15
               over (min)      10.00        10.00
     Storage Coeff.  (min)=     1.44 (ii)    9.12 (ii)
     Unit Hyd. Tpeak (min)=    10.00        10.00
     Unit Hyd. peak  (cms)=     0.17         0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=     0.03         0.02          0.051 (iii)
     TIME TO PEAK    (hrs)=     1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=    55.28        19.93         28.75
     TOTAL RAINFALL   (mm)=    56.08        56.08         56.08
     RUNOFF COEFFICIENT   =     0.99         0.36          0.51

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\5a9247c8
| Ptotal= 56.08 mm |    Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.58 |  1.17   11.51 |  2.17   10.31 |  3.17    5.05
                0.33    3.99 |  1.33   25.32 |  2.33    8.66 |  3.33    4.70
                0.50    4.50 |  1.50  133.60 |  2.50    7.52 |  3.50    4.39
                0.67    5.21 |  1.67   32.00 |  2.67    6.65 |  3.67    4.14
                0.83    6.27 |  1.83   19.73 |  2.83    5.38 |  3.83    3.91
                1.00    8.00 |  2.00   12.95 |  3.00    5.49 |  4.00    3.63

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--------------------
| CALIB            |
| STANDHYD (  0032)|   Area    (ha)=   0.66
|ID= 1 DT=10.0 min |   Total Imp(%)=  36.00   Dir. Conn.(%)=  10.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.24         0.42
     Dep. Storage     (mm)=      0.80         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     66.33        40.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=    133.60        48.49
               over (min)      10.00        20.00
     Storage Coeff.  (min)=     1.78 (ii)   11.21 (ii)
     Unit Hyd. Tpeak (min)=    10.00        20.00
     Unit Hyd. peak  (cms)=     0.17         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=     0.02         0.03          0.040 (iii)
     TIME TO PEAK    (hrs)=     1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=    55.28        16.29         20.18
     TOTAL RAINFALL   (mm)=    56.08        56.08         56.08
     RUNOFF COEFFICIENT   =     0.99         0.29          0.36

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\5a9247c8
| Ptotal= 56.08 mm |    Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.58 |  1.17   11.51 |  2.17   10.31 |  3.17    5.05
                0.33    3.99 |  1.33   25.32 |  2.33    8.66 |  3.33    4.70
                0.50    4.50 |  1.50  133.60 |  2.50    7.52 |  3.50    4.39
                0.67    5.21 |  1.67   32.00 |  2.67    6.65 |  3.67    4.14
                0.83    6.27 |  1.83   19.73 |  2.83    5.38 |  3.83    3.91
                1.00    8.00 |  2.00   12.95 |  3.00    5.49 |  4.00    3.63

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--------------------
| CALIB            |
| STANDHYD (  0033)|   Area    (ha)=   0.80
|ID= 1 DT=10.0 min |   Total Imp(%)=  48.00   Dir. Conn.(%)=  13.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.38         0.42
     Dep. Storage     (mm)=      0.80         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     73.03        40.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=    133.60        66.34
               over (min)      10.00        20.00
     Storage Coeff.  (min)=     1.08 (ii)   10.20 (ii)
     Unit Hyd. Tpeak (min)=    10.00        20.00
     Unit Hyd. peak  (cms)=     0.17         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=     0.04         0.04          0.060 (iii)
     TIME TO PEAK    (hrs)=     1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=    55.28        18.44         23.23
     TOTAL RAINFALL   (mm)=    56.08        56.08         56.08
     RUNOFF COEFFICIENT   =     0.99         0.33          0.41

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\5a9247c8
| Ptotal= 56.08 mm |    Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.58 |  1.17   11.51 |  2.17   10.31 |  3.17    5.05
                0.33    3.99 |  1.33   25.32 |  2.33    8.66 |  3.33    4.70
                0.50    4.50 |  1.50  133.60 |  2.50    7.52 |  3.50    4.39
                0.67    5.21 |  1.67   32.00 |  2.67    6.65 |  3.67    4.14
                0.83    6.27 |  1.83   19.73 |  2.83    5.38 |  3.83    3.91
                1.00    8.00 |  2.00   12.95 |  3.00    5.49 |  4.00    3.63

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--------------------
| CALIB            |
| STANDHYD (  0034)|   Area    (ha)=   0.67
|ID= 1 DT=10.0 min |   Total Imp(%)=  42.00   Dir. Conn.(%)=  18.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.28         0.39
     Dep. Storage     (mm)=      0.80         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     66.83        40.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=    133.60        48.96
               over (min)      10.00        20.00
     Storage Coeff.  (min)=     1.79 (ii)   11.18 (ii)
     Unit Hyd. Tpeak (min)=    10.00        20.00
     Unit Hyd. peak  (cms)=     0.17         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=     0.04         0.03          0.059 (iii)
     TIME TO PEAK    (hrs)=     1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=    55.28        16.35         23.35
     TOTAL RAINFALL   (mm)=    56.08        56.08         56.08
     RUNOFF COEFFICIENT   =     0.99         0.29          0.42

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\5a9247c8
| Ptotal= 56.08 mm |    Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.58 |  1.17   11.51 |  2.17   10.31 |  3.17    5.05
                0.33    3.99 |  1.33   25.32 |  2.33    8.66 |  3.33    4.70
                0.50    4.50 |  1.50  133.60 |  2.50    7.52 |  3.50    4.39
                0.67    5.21 |  1.67   32.00 |  2.67    6.65 |  3.67    4.14
                0.83    6.27 |  1.83   19.73 |  2.83    5.38 |  3.83    3.91
                1.00    8.00 |  2.00   12.95 |  3.00    5.49 |  4.00    3.63

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--------------------
| CALIB            |
| STANDHYD (  0035)|   Area    (ha)=   0.65
|ID= 1 DT=10.0 min |   Total Imp(%)=  30.00   Dir. Conn.(%)=  11.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
```

```
     Surface Area     (ha)=       0.19         0.45
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      65.83        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     133.60        27.32
               over (min)       10.00        20.00
     Storage Coeff.  (min)=       1.77 (ii)   13.63 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.07
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.03          0.039 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      55.28        15.10         19.51
     TOTAL RAINFALL   (mm)=      56.08        56.08         56.08
     RUNOFF COEFFICIENT   =       0.99         0.27          0.35

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\5a9247c8
| Ptotal= 56.08 mm |    Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.58 |  1.17   11.51 |  2.17   10.31 |  3.17    5.05
                0.33    3.99 |  1.33   25.32 |  2.33    8.66 |  3.33    4.70
                0.50    4.50 |  1.50  133.60 |  2.50    7.52 |  3.50    4.39
                0.67    5.21 |  1.67   32.00 |  2.67    6.65 |  3.67    4.14
                0.83    6.27 |  1.83   19.73 |  2.83    5.38 |  3.83    3.91
                1.00    8.00 |  2.00   12.95 |  3.00    5.49 |  4.00    3.63

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-------------------
| CALIB            |
| STANDHYD (  0062)|   Area    (ha)=   0.51
|ID= 1 DT=10.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  16.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.17
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      58.31        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     133.60       130.43
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.65 (ii)    7.99 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.05          0.076 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=      55.08        23.69         28.70
     TOTAL RAINFALL   (mm)=      56.08        56.08         56.08
     RUNOFF COEFFICIENT   =       0.98         0.42          0.51

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\5a9247c8
| Ptotal= 56.08 mm |    Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.58 |  1.17   11.51 |  2.17   10.31 |  3.17    5.05
                0.33    3.99 |  1.33   25.32 |  2.33    8.66 |  3.33    4.70
                0.50    4.50 |  1.50  133.60 |  2.50    7.52 |  3.50    4.39
                0.67    5.21 |  1.67   32.00 |  2.67    6.65 |  3.67    4.14
                0.83    6.27 |  1.83   19.73 |  2.83    5.38 |  3.83    3.91
                1.00    8.00 |  2.00   12.95 |  3.00    5.49 |  4.00    3.63

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-------------------
| CALIB            |
| STANDHYD (  0064)|   Area    (ha)=   0.68
|ID= 1 DT=10.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  19.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.41         0.27
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      67.33        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     133.60        92.82
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.79 (ii)    9.07 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.05         0.05          0.096 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=      55.08        20.95         27.43
     TOTAL RAINFALL   (mm)=      56.08        56.08         56.08
     RUNOFF COEFFICIENT   =       0.98         0.37          0.49

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\5a9247c8
| Ptotal= 56.08 mm |    Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.58 |  1.17   11.51 |  2.17   10.31 |  3.17    5.05
                0.33    3.99 |  1.33   25.32 |  2.33    8.66 |  3.33    4.70
                0.50    4.50 |  1.50  133.60 |  2.50    7.52 |  3.50    4.39
                0.67    5.21 |  1.67   32.00 |  2.67    6.65 |  3.67    4.14
                0.83    6.27 |  1.83   19.73 |  2.83    5.38 |  3.83    3.91
                1.00    8.00 |  2.00   12.95 |  3.00    5.49 |  4.00    3.63

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-------------------
| CALIB            |
| STANDHYD (  0068)|   Area    (ha)=   0.41
|ID= 1 DT=10.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  17.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.18         0.23
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      52.28        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     133.60        55.12
               over (min)       10.00        20.00
     Storage Coeff.  (min)=       1.54 (ii)   10.50 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.02          0.036 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      55.08        17.15         23.58
     TOTAL RAINFALL   (mm)=      56.08        56.08         56.08
     RUNOFF COEFFICIENT   =       0.98         0.31          0.42

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\5a9247c8
| Ptotal= 56.08 mm |    Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.58 |  1.17   11.51 |  2.17   10.31 |  3.17    5.05
                0.33    3.99 |  1.33   25.32 |  2.33    8.66 |  3.33    4.70
                0.50    4.50 |  1.50  133.60 |  2.50    7.52 |  3.50    4.39
                0.67    5.21 |  1.67   32.00 |  2.67    6.65 |  3.67    4.14
                0.83    6.27 |  1.83   19.73 |  2.83    5.38 |  3.83    3.91
                1.00    8.00 |  2.00   12.95 |  3.00    5.49 |  4.00    3.63

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-------------------
| CALIB            |
| STANDHYD (  0069)|   Area    (ha)=   0.86
|ID= 1 DT=10.0 min |   Total Imp(%)=  39.00   Dir. Conn.(%)=  15.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.52
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      75.72        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     133.60        47.69
               over (min)       10.00        20.00
     Storage Coeff.  (min)=       1.93 (ii)   11.42 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.05         0.04          0.066 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      55.08        16.18         22.00
     TOTAL RAINFALL   (mm)=      56.08        56.08         56.08
     RUNOFF COEFFICIENT   =       0.98         0.29          0.39

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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  (  0027)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):     0.59   0.050     1.50    23.76
     + ID2= 2 (  0025):     0.52   0.084     1.50    30.32
       ================================================
       ID = 3 (  0027):     1.11   0.133     1.50    26.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     1.11   0.133     1.50    26.83
     + ID2= 2 (  0026):     0.48   0.056     1.50    23.90
       ================================================
       ID = 1 (  0027):     1.59   0.189     1.50    25.95

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     1.59   0.189     1.50    25.95
     + ID2= 2 (  0028):     0.61   0.083     1.50    27.06
       ================================================
       ID = 3 (  0027):     2.20   0.273     1.50    26.25

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     2.20   0.273     1.50    26.25
```

```
     + ID2= 2 (  0030):     0.33   0.051     1.50    28.75
       ================================================
       ID = 1 (  0027):     2.53   0.324     1.50    26.58

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0027)|
|  1 +  2 =  3     |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     2.53   0.324     1.50    26.58
     + ID2= 2 (  0032):     0.66   0.040     1.50    20.18
       ================================================
       ID = 3 (  0027):     3.19   0.364     1.50    25.26

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0027)|
|  3 +  2 =  1     |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     3.19   0.364     1.50    25.26
     + ID2= 2 (  0033):     0.80   0.060     1.50    23.23
       ================================================
       ID = 1 (  0027):     3.99   0.424     1.50    24.85

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0027)|
|  1 +  2 =  3     |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     3.99   0.424     1.50    24.85
     + ID2= 2 (  0034):     0.67   0.059     1.50    23.35
       ================================================
       ID = 3 (  0027):     4.66   0.483     1.50    24.63

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0027)|
|  3 +  2 =  1     |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     4.66   0.483     1.50    24.63
     + ID2= 2 (  0035):     0.65   0.039     1.50    19.51
       ================================================
       ID = 1 (  0027):     5.31   0.522     1.50    24.01

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0027)|
|  1 +  2 =  3     |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     5.31   0.522     1.50    24.01
     + ID2= 2 (  0062):     0.51   0.076     1.50    28.70
       ================================================
       ID = 3 (  0027):     5.82   0.598     1.50    24.42

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0027)|
|  3 +  2 =  1     |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     5.82   0.598     1.50    24.42
     + ID2= 2 (  0064):     0.68   0.096     1.50    27.43
       ================================================
       ID = 1 (  0027):     6.50   0.695     1.50    24.73

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0027)|
|  1 +  2 =  3     |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     6.50   0.695     1.50    24.73
     + ID2= 2 (  0068):     0.41   0.036     1.50    23.58
       ================================================
       ID = 3 (  0027):     6.91   0.730     1.50    24.66

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0027)|
|  3 +  2 =  1     |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     6.91   0.730     1.50    24.66
     + ID2= 2 (  0069):     0.86   0.066     1.50    22.00
       ================================================
       ID = 1 (  0027):     7.77   0.796     1.50    24.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\5a9247c8
| Ptotal= 56.08 mm |    Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.58 |  1.17   11.51 |  2.17   10.31 |  3.17    5.05
               0.33    3.99 |  1.33   25.32 |  2.33    8.66 |  3.33    4.70
               0.50    4.50 |  1.50  133.60 |  2.50    7.52 |  3.50    4.39
               0.67    5.21 |  1.67   32.00 |  2.67    6.65 |  3.67    4.14
               0.83    6.27 |  1.83   19.73 |  2.83    5.38 |  3.83    3.91
               1.00    8.00 |  2.00   12.95 |  3.00    5.49 |  4.00    3.63

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

-------------------
| CALIB            |
| STANDHYD (  0065)|   Area    (ha)=   0.49
|ID= 1 DT=10.0 min |   Total Imp(%)=  26.00   Dir. Conn.(%)=  17.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.13          0.36
     Dep. Storage     (mm)=      1.00          1.50
     Average Slope     (%)=      1.00          2.00
     Length            (m)=     57.15         40.00
     Mannings n           =     0.013         0.250

     Max.Eff.Inten.(mm/hr)=    133.60         21.71
               over (min)      10.00         20.00
     Storage Coeff.  (min)=      1.63 (ii)   14.63 (ii)
     Unit Hyd. Tpeak (min)=     10.00         20.00
     Unit Hyd. peak  (cms)=      0.17          0.07
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.03          0.02          0.038 (iii)
     TIME TO PEAK    (hrs)=      1.50          1.67           1.50
     RUNOFF VOLUME    (mm)=     55.08         13.70          20.71
     TOTAL RAINFALL   (mm)=     56.08         56.08          56.08
     RUNOFF COEFFICIENT   =      0.98          0.24           0.37

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  58.0     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.

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

-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\5a9247c8
| Ptotal= 56.08 mm |    Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.58 |  1.17   11.51 |  2.17   10.31 |  3.17    5.05
               0.33    3.99 |  1.33   25.32 |  2.33    8.66 |  3.33    4.70
               0.50    4.50 |  1.50  133.60 |  2.50    7.52 |  3.50    4.39
               0.67    5.21 |  1.67   32.00 |  2.67    6.65 |  3.67    4.14
               0.83    6.27 |  1.83   19.73 |  2.83    5.38 |  3.83    3.91
               1.00    8.00 |  2.00   12.95 |  3.00    5.49 |  4.00    3.63

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

-------------------
| CALIB            |
| STANDHYD (  0066)|   Area    (ha)=   0.25
|ID= 1 DT=10.0 min |   Total Imp(%)=  49.00   Dir. Conn.(%)=  31.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.12          0.13
     Dep. Storage     (mm)=      1.00          1.50
     Average Slope     (%)=      1.00          2.00
     Length            (m)=     40.82         40.00
     Mannings n           =     0.013         0.250

     Max.Eff.Inten.(mm/hr)=    133.60         45.18
               over (min)      10.00         20.00
     Storage Coeff.  (min)=      1.33 (ii)   11.03 (ii)
     Unit Hyd. Tpeak (min)=     10.00         20.00
     Unit Hyd. peak  (cms)=      0.17          0.08
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.03          0.01          0.033 (iii)
     TIME TO PEAK    (hrs)=      1.50          1.67           1.50
     RUNOFF VOLUME    (mm)=     55.08         15.83          27.98
     TOTAL RAINFALL   (mm)=     56.08         56.08          56.08
     RUNOFF COEFFICIENT   =      0.98          0.28           0.50

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  58.0     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  (  0067)|
|  1 +  2 =  3     |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0065):     0.49   0.038     1.50    20.71
     + ID2= 2 (  0066):     0.25   0.033     1.50    27.98
       ================================================
       ID = 3 (  0067):     0.74   0.072     1.50    23.17

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| DUHYD    (  0024)|
| Inlet Cap.= 0.057|
| #of Inlets=   1|
| Total(cms)=  0.1|      AREA     QPEAK     TPEAK    R.V.
-------------------          (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   0.74      0.07      1.50   23.17
     ================================================
     MAJOR SYS.(ID= 2):   0.04      0.01      1.50   23.17
     MINOR SYS.(ID= 3):   0.70      0.06      1.50   23.17

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0031)|
|  1 +  2 =  3     |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0024):     0.70   0.057     1.50    23.17
     + ID2= 2 (  0027):     7.77   0.796     1.50    24.37
       ================================================
       ID = 3 (  0031):     8.47   0.853     1.50    24.27

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0031)|
|  3 +  2 =  1     |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0031):     8.47   0.853     1.50    24.27
     + ID2= 2 (  0071):     0.71   0.024     1.50    10.56
       ================================================
       ID = 1 (  0031):     9.18   0.877     1.50    23.21

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| RESERVOIR(  0029)|
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |  0.1080     0.2030
                         0.0085     0.0227   |  0.1807     0.2551
                         0.0130     0.0491   |  0.2663     0.3117
                         0.0163     0.0772   |  0.3630     0.3731
                         0.0190     0.1119   |  0.4697     0.4393
                         0.0512     0.1553   |  0.0000     0.0000

                              AREA     QPEAK     TPEAK      R.V.
                              (ha)     (cms)     (hrs)      (mm)
   INFLOW : ID= 2 (  0031)     9.182     0.877      1.50     23.21
   OUTFLOW: ID= 1 (  0029)     9.182     0.063      3.83     22.28

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.14
```

```
                TIME SHIFT OF PEAK FLOW        (min)=140.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.1649

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

-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\5a9247c8
| Ptotal= 56.08 mm |    Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    3.58 |  1.17   11.51 |  2.17   10.31 |  3.17    5.05
               0.33    3.99 |  1.33   25.32 |  2.33    8.66 |  3.33    4.70
               0.50    4.50 |  1.50  133.60 |  2.50    7.52 |  3.50    4.39
               0.67    5.21 |  1.67   32.00 |  2.67    6.65 |  3.67    4.14
               0.83    6.27 |  1.83   19.73 |  2.83    5.38 |  3.83    3.91
               1.00    8.00 |  2.00   12.95 |  3.00    5.49 |  4.00    3.63

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

-------------------
| CALIB            |
| STANDHYD (  0063)|   Area    (ha)=   0.31
|ID= 1 DT=10.0 min |   Total Imp(%)=  41.00   Dir. Conn.(%)=   0.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.13         0.18
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      45.46        40.00
     Mannings n             =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     133.60        67.89
                over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.42 (ii)    9.66 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.00         0.02          0.023 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      55.08        18.61          18.59
     TOTAL RAINFALL   (mm)=      56.08        56.08          56.08
     RUNOFF COEFFICIENT   =       0.98         0.33           0.33

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  58.0     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  (  0037)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0024):     0.04   0.015     1.50    23.17
     + ID2= 2 (  0029):     9.18   0.063     3.83    22.28
       ================================================
       ID = 3 (  0037):     9.22   0.063     3.83    22.28

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0037)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0037):     9.22   0.063     3.83    22.28
     + ID2= 2 (  0038):     0.09   0.001     1.67     6.51
       ================================================
       ID = 1 (  0037):     9.31   0.063     3.82    22.13

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0037)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0037):     9.31   0.063     3.82    22.13
     + ID2= 2 (  0063):     0.31   0.023     1.50    18.59
       ================================================
       ID = 3 (  0037):     9.62   0.065     3.75    22.01

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0037)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0037):     9.62   0.065     3.75    22.01
     + ID2= 2 (  0070):     1.74   0.028     1.67     6.66
       ================================================
       ID = 1 (  0037):    11.36   0.074     1.50    19.66

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

 FINISH
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==================

       V    V   I    SSSSS  U   U    A    L              (v 5.1.2003)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\VO2\voin.dat
  Output  filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f8\1e8cda6e-7081-41c1-bae5-c5bf5be1484a\scenari
  Summary filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f8\1e8cda6e-7081-41c1-bae5-c5bf5be1484a\scenari

DATE: 01/05/2019                          TIME: 10:33:08

USER:


COMMENTS: _____

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  ************************************************
  ** SIMULATION : Run 04                        **
  ************************************************


-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\817e5206
| Ptotal= 66.02 mm |    Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    4.50 |  1.17   13.67 |  2.17   12.32 |  3.17    6.27
               0.33    4.98 |  1.33   27.69 |  2.33   10.44 |  3.33    5.00
               0.50    5.61 |  1.50  158.85 |  2.50    9.14 |  3.50    5.84
               0.67    6.45 |  1.67   35.08 |  2.67    8.15 |  3.67    5.18
               0.83    7.70 |  1.83   20.60 |  2.83    7.39 |  3.83    4.90
               1.00    9.70 |  2.00   15.24 |  3.00    6.78 |  4.00    4.65

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

-------------------
| CALIB            |
| NASHYD   (  0038)|   Area    (ha)=   0.09   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.15

     Unit Hyd Qpeak  (cms)=   0.023

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=   9.762
     TOTAL RAINFALL   (mm)=  66.023
     RUNOFF COEFFICIENT   =   0.148

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

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

-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\817e5206
| Ptotal= 66.02 mm |    Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    4.50 |  1.17   13.67 |  2.17   12.32 |  3.17    6.27
               0.33    4.98 |  1.33   27.69 |  2.33   10.44 |  3.33    5.00
               0.50    5.61 |  1.50  158.85 |  2.50    9.14 |  3.50    5.84
               0.67    6.45 |  1.67   35.08 |  2.67    8.15 |  3.67    5.18
               0.83    7.70 |  1.83   20.60 |  2.83    7.39 |  3.83    4.90
               1.00    9.70 |  2.00   15.24 |  3.00    6.78 |  4.00    4.65

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

-------------------
| CALIB            |
| NASHYD   (  0070)|   Area    (ha)=   1.74   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.399

     PEAK FLOW       (cms)=   0.044 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   9.988
     TOTAL RAINFALL   (mm)=  66.023
     RUNOFF COEFFICIENT   =   0.151

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

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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\817e5206
| Ptotal= 66.02 mm |    Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    4.50 |  1.17   13.67 |  2.17   12.32 |  3.17    6.27
               0.33    4.98 |  1.33   27.69 |  2.33   10.44 |  3.33    5.00
               0.50    5.61 |  1.50  158.85 |  2.50    9.14 |  3.50    5.84
               0.67    6.45 |  1.67   35.08 |  2.67    8.15 |  3.67    5.18
               0.83    7.70 |  1.83   20.60 |  2.83    7.39 |  3.83    4.90
               1.00    9.70 |  2.00   15.24 |  3.00    6.78 |  4.00    4.65

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-------------------
| CALIB            |
| NASHYD   (  0071)|   Area    (ha)=   0.71   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.163

     PEAK FLOW       (cms)=   0.034 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  14.453
     TOTAL RAINFALL   (mm)=  66.023
     RUNOFF COEFFICIENT   =   0.219

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

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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\817e5206
| Ptotal= 66.02 mm |    Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    4.50 |  1.17   13.67 |  2.17   12.32 |  3.17    6.27
               0.33    4.98 |  1.33   27.69 |  2.33   10.44 |  3.33    5.00
               0.50    5.61 |  1.50  158.85 |  2.50    9.14 |  3.50    5.84
               0.67    6.45 |  1.67   35.08 |  2.67    8.15 |  3.67    5.18
               0.83    7.70 |  1.83   20.60 |  2.83    7.39 |  3.83    4.90
               1.00    9.70 |  2.00   15.24 |  3.00    6.78 |  4.00    4.65

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-------------------
| CALIB            |
| STANDHYD (  0023)|   Area    (ha)=   0.59
|ID= 1 DT=10.0 min |   Total Imp(%)=  47.00   Dir. Conn.(%)=  16.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
```

```
     Surface Area     (ha)=       0.28         0.31
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      62.72        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85        81.47
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.60 (ii)    9.27 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.04         0.05          0.090 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=     65.22        23.38          30.07
     TOTAL RAINFALL   (mm)=     66.02        66.02          66.02
     RUNOFF COEFFICIENT   =      0.99         0.35           0.46

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\817e5206
| Ptotal= 66.02 mm |    Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   13.67 |'  2.17   12.32 |  3.17    6.27
                0.33    4.98 |  1.33   27.69 |'  2.33   10.44 |  3.33    5.00
                0.50    5.61 |  1.50  158.85 |'  2.50    9.14 |  3.50    5.84
                0.67    6.45 |  1.67   35.08 |'  2.67    8.15 |  3.67    5.18
                0.83    7.70 |  1.83   20.60 |'  2.83    7.39 |  3.83    4.90
                1.00    9.70 |  2.00   15.24 |'  3.00    6.78 |  4.00    4.65

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-------------------
| CALIB            |
| STANDHYD (  0025)|   Area    (ha)=   0.52
|ID= 1 DT=10.0 min |   Total Imp(%)=  71.00   Dir. Conn.(%)=  14.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.37         0.15
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      58.88        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85       232.42
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.54 (ii)    6.58 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.03         0.08          0.110 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=     65.22        33.66          38.07
     TOTAL RAINFALL   (mm)=     66.02        66.02          66.02
     RUNOFF COEFFICIENT   =      0.99         0.51           0.58

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\817e5206
| Ptotal= 66.02 mm |    Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   13.67 |'  2.17   12.32 |  3.17    6.27
                0.33    4.98 |  1.33   27.69 |'  2.33   10.44 |  3.33    5.00
                0.50    5.61 |  1.50  158.85 |'  2.50    9.14 |  3.50    5.84
                0.67    6.45 |  1.67   35.08 |'  2.67    8.15 |  3.67    5.18
                0.83    7.70 |  1.83   20.60 |'  2.83    7.39 |  3.83    4.90
                1.00    9.70 |  2.00   15.24 |'  3.00    6.78 |  4.00    4.65

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-------------------
| CALIB            |
| STANDHYD (  0026)|   Area    (ha)=   0.48
|ID= 1 DT=10.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  14.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.24
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      56.57        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85        93.97
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.51 (ii)    8.74 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.03         0.04          0.074 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=     65.22        24.67          30.34
     TOTAL RAINFALL   (mm)=     66.02        66.02          66.02
     RUNOFF COEFFICIENT   =      0.99         0.37           0.46

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\817e5206
| Ptotal= 66.02 mm |    Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   13.67 |'  2.17   12.32 |  3.17    6.27
                0.33    4.98 |  1.33   27.69 |'  2.33   10.44 |  3.33    5.00
                0.50    5.61 |  1.50  158.85 |'  2.50    9.14 |  3.50    5.84
                0.67    6.45 |  1.67   35.08 |'  2.67    8.15 |  3.67    5.18
                0.83    7.70 |  1.83   20.60 |'  2.83    7.39 |  3.83    4.90
                1.00    9.70 |  2.00   15.24 |'  3.00    6.78 |  4.00    4.65

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-------------------
| CALIB            |
| STANDHYD (  0028)|   Area    (ha)=   0.61
|ID= 1 DT=10.0 min |   Total Imp(%)=  62.00   Dir. Conn.(%)=  14.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.38         0.23
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      63.77        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85       149.79
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.62 (ii)    7.63 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.04         0.07          0.110 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=     65.22        29.13          34.17
     TOTAL RAINFALL   (mm)=     66.02        66.02          66.02
     RUNOFF COEFFICIENT   =      0.99         0.44           0.52

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\817e5206
| Ptotal= 66.02 mm |    Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   13.67 |'  2.17   12.32 |  3.17    6.27
                0.33    4.98 |  1.33   27.69 |'  2.33   10.44 |  3.33    5.00
                0.50    5.61 |  1.50  158.85 |'  2.50    9.14 |  3.50    5.84
                0.67    6.45 |  1.67   35.08 |'  2.67    8.15 |  3.67    5.18
                0.83    7.70 |  1.83   20.60 |'  2.83    7.39 |  3.83    4.90
                1.00    9.70 |  2.00   15.24 |'  3.00    6.78 |  4.00    4.65

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-------------------
| CALIB            |
| STANDHYD (  0030)|   Area    (ha)=   0.33
|ID= 1 DT=10.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  25.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.20         0.13
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      46.90        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85       109.04
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.35 (ii)    8.17 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.04         0.03          0.065 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=     65.22        26.05          35.83
     TOTAL RAINFALL   (mm)=     66.02        66.02          66.02
     RUNOFF COEFFICIENT   =      0.99         0.39           0.54

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\817e5206
| Ptotal= 66.02 mm |    Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   13.67 |'  2.17   12.32 |  3.17    6.27
                0.33    4.98 |  1.33   27.69 |'  2.33   10.44 |  3.33    5.00
                0.50    5.61 |  1.50  158.85 |'  2.50    9.14 |  3.50    5.84
                0.67    6.45 |  1.67   35.08 |'  2.67    8.15 |  3.67    5.18
                0.83    7.70 |  1.83   20.60 |'  2.83    7.39 |  3.83    4.90
                1.00    9.70 |  2.00   15.24 |'  3.00    6.78 |  4.00    4.65

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-------------------
| CALIB            |
| STANDHYD (  0032)|   Area    (ha)=   0.66
|ID= 1 DT=10.0 min |   Total Imp(%)=  36.00   Dir. Conn.(%)=  10.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.42
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      66.33        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85        65.93
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.66 (ii)   10.00 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.03         0.05          0.080 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=     65.22        21.55          25.91
     TOTAL RAINFALL   (mm)=     66.02        66.02          66.02
     RUNOFF COEFFICIENT   =      0.99         0.33           0.39

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
```

```
         CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\817e5206
| Ptotal= 66.02 mm |    Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   13.67 |  2.17   12.32 |  3.17    6.27
                0.33    4.98 |  1.33   27.69 |  2.33   10.44 |  3.33    5.00
                0.50    5.61 |  1.50  158.85 |  2.50    9.14 |  3.50    5.84
                0.67    6.45 |  1.67   35.08 |  2.67    8.15 |  3.67    5.18
                0.83    7.70 |  1.83   20.60 |  2.83    7.39 |  3.83    4.90
                1.00    9.70 |  2.00   15.24 |  3.00    6.78 |  4.00    4.65

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-------------------
| CALIB            |
| STANDHYD (  0033)|   Area    (ha)=   0.80
|ID= 1 DT=10.0 min |   Total Imp(%)=  48.00   Dir. Conn.(%)=  13.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.38         0.42
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      73.03        40.00
     Mannings n             =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85        89.56
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.76 (ii)    9.13 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.05         0.07          0.117 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     65.22        24.23         29.55
     TOTAL RAINFALL   (mm)=     66.02        66.02         66.02
     RUNOFF COEFFICIENT   =      0.99         0.37          0.45

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\817e5206
| Ptotal= 66.02 mm |    Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   13.67 |  2.17   12.32 |  3.17    6.27
                0.33    4.98 |  1.33   27.69 |  2.33   10.44 |  3.33    5.00
                0.50    5.61 |  1.50  158.85 |  2.50    9.14 |  3.50    5.84
                0.67    6.45 |  1.67   35.08 |  2.67    8.15 |  3.67    5.18
                0.83    7.70 |  1.83   20.60 |  2.83    7.39 |  3.83    4.90
                1.00    9.70 |  2.00   15.24 |  3.00    6.78 |  4.00    4.65

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| CALIB            |
| STANDHYD (  0034)|   Area    (ha)=   0.67
|ID= 1 DT=10.0 min |   Total Imp(%)=  42.00   Dir. Conn.(%)=  18.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.28         0.39
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      66.83        40.00
     Mannings n             =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85        66.56
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.67 (ii)    9.97 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.05         0.05          0.100 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     65.22        21.63         29.47
     TOTAL RAINFALL   (mm)=     66.02        66.02         66.02
     RUNOFF COEFFICIENT   =      0.99         0.33          0.45

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\817e5206
| Ptotal= 66.02 mm |    Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   13.67 |  2.17   12.32 |  3.17    6.27
                0.33    4.98 |  1.33   27.69 |  2.33   10.44 |  3.33    5.00
                0.50    5.61 |  1.50  158.85 |  2.50    9.14 |  3.50    5.84
                0.67    6.45 |  1.67   35.08 |  2.67    8.15 |  3.67    5.18
                0.83    7.70 |  1.83   20.60 |  2.83    7.39 |  3.83    4.90
                1.00    9.70 |  2.00   15.24 |  3.00    6.78 |  4.00    4.65

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-------------------
| CALIB            |
| STANDHYD (  0035)|   Area    (ha)=   0.65
|ID= 1 DT=10.0 min |   Total Imp(%)=  30.00   Dir. Conn.(%)=  11.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.19         0.45
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      65.83        40.00
     Mannings n             =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85        55.01
               over (min)       10.00        20.00
     Storage Coeff.  (min)=      1.65 (ii)    10.62 (ii)
     Unit Hyd. Tpeak (min)=     10.00        20.00
     Unit Hyd. peak  (cms)=      0.17         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.03         0.04          0.051 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=     65.22        20.07         25.03
     TOTAL RAINFALL   (mm)=     66.02        66.02         66.02
     RUNOFF COEFFICIENT   =      0.99         0.30          0.38

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\817e5206
| Ptotal= 66.02 mm |    Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   13.67 |  2.17   12.32 |  3.17    6.27
                0.33    4.98 |  1.33   27.69 |  2.33   10.44 |  3.33    5.00
                0.50    5.61 |  1.50  158.85 |  2.50    9.14 |  3.50    5.84
                0.67    6.45 |  1.67   35.08 |  2.67    8.15 |  3.67    5.18
                0.83    7.70 |  1.83   20.60 |  2.83    7.39 |  3.83    4.90
                1.00    9.70 |  2.00   15.24 |  3.00    6.78 |  4.00    4.65

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-------------------
| CALIB            |
| STANDHYD (  0062)|   Area    (ha)=   0.51
|ID= 1 DT=10.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  16.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.17
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      58.31        40.00
     Mannings n             =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85       173.12
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.54 (ii)    7.20 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.04         0.06          0.100 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     65.02        30.60         36.09
     TOTAL RAINFALL   (mm)=     66.02        66.02         66.02
     RUNOFF COEFFICIENT   =      0.98         0.46          0.55

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\817e5206
| Ptotal= 66.02 mm |    Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   13.67 |  2.17   12.32 |  3.17    6.27
                0.33    4.98 |  1.33   27.69 |  2.33   10.44 |  3.33    5.00
                0.50    5.61 |  1.50  158.85 |  2.50    9.14 |  3.50    5.84
                0.67    6.45 |  1.67   35.08 |  2.67    8.15 |  3.67    5.18
                0.83    7.70 |  1.83   20.60 |  2.83    7.39 |  3.83    4.90
                1.00    9.70 |  2.00   15.24 |  3.00    6.78 |  4.00    4.65

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-------------------
| CALIB            |
| STANDHYD (  0064)|   Area    (ha)=   0.68
|ID= 1 DT=10.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  19.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.41         0.27
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      67.33        40.00
     Mannings n             =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85       124.30
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.67 (ii)    8.14 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.06         0.07          0.125 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     65.02        27.30         34.46
     TOTAL RAINFALL   (mm)=     66.02        66.02         66.02
     RUNOFF COEFFICIENT   =      0.98         0.41          0.52

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\817e5206
| Ptotal= 66.02 mm |    Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   13.67 |  2.17   12.32 |  3.17    6.27
                0.33    4.98 |  1.33   27.69 |  2.33   10.44 |  3.33    5.00
                0.50    5.61 |  1.50  158.85 |  2.50    9.14 |  3.50    5.84
                0.67    6.45 |  1.67   35.08 |  2.67    8.15 |  3.67    5.18
                0.83    7.70 |  1.83   20.60 |  2.83    7.39 |  3.83    4.90
                1.00    9.70 |  2.00   15.24 |  3.00    6.78 |  4.00    4.65
```

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--------------------
| CALIB            |
| STANDHYD (  0068)|   Area    (ha)=   0.41
|ID= 1 DT=10.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  17.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.18         0.23
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     52.28        40.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=    158.85        74.73
               over (min)      10.00        10.00
     Storage Coeff.  (min)=     1.44 (ii)    9.37 (ii)
     Unit Hyd. Tpeak (min)=    10.00        10.00
     Unit Hyd. peak  (cms)=     0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=     0.03         0.03        0.062 (iii)
     TIME TO PEAK    (hrs)=     1.50         1.50         1.50
     RUNOFF VOLUME    (mm)=    66.02        22.62        29.82
     TOTAL RAINFALL   (mm)=    66.02        66.02        66.02
     RUNOFF COEFFICIENT   =     0.98         0.34         0.45

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\817e5206
| Ptotal= 66.02 mm |   Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   13.67 |  2.17   12.32 |  3.17    6.27
                0.33    4.98 |  1.33   27.69 |  2.33   10.44 |  3.33    5.00
                0.50    5.61 |  1.50  158.85 |  2.50    9.14 |  3.50    5.84
                0.67    6.45 |  1.67   35.08 |  2.67    8.15 |  3.67    5.18
                0.83    7.70 |  1.83   20.60 |  2.83    7.39 |  3.83    4.90
                1.00    9.70 |  2.00   15.24 |  3.00    6.78 |  4.00    4.65

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--------------------
| CALIB            |
| STANDHYD (  0069)|   Area    (ha)=   0.86
|ID= 1 DT=10.0 min |   Total Imp(%)=  39.00   Dir. Conn.(%)=  15.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.34         0.52
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     75.72        40.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=    158.85        64.86
               over (min)      10.00        20.00
     Storage Coeff.  (min)=     1.80 (ii)   10.19 (ii)
     Unit Hyd. Tpeak (min)=    10.00        20.00
     Unit Hyd. peak  (cms)=     0.17         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=     0.06         0.05        0.083 (iii)
     TIME TO PEAK    (hrs)=     1.50         1.67         1.50
     RUNOFF VOLUME    (mm)=    65.02        21.42        27.95
     TOTAL RAINFALL   (mm)=    66.02        66.02        66.02
     RUNOFF COEFFICIENT   =     0.98         0.32         0.42

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  58.0    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  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):     0.50   0.090     1.50     30.07
     + ID2= 2 (  0025):     0.52   0.110     1.50     38.07
       ====================================================
       ID = 3 (  0027):     1.11   0.200     1.50     33.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     1.11   0.200     1.50     33.82
     + ID2= 2 (  0026):     0.48   0.074     1.50     30.34
       ====================================================
       ID = 1 (  0027):     1.59   0.273     1.50     32.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     1.59   0.273     1.50     32.77
     + ID2= 2 (  0028):     0.61   0.110     1.50     34.17
       ====================================================
       ID = 3 (  0027):     2.20   0.383     1.50     33.16

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     2.20   0.383     1.50     33.16
     + ID2= 2 (  0030):     0.33   0.065     1.50     35.83
       ====================================================
       ID = 1 (  0027):     2.53   0.449     1.50     33.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     2.53   0.449     1.50     33.50
     + ID2= 2 (  0032):     0.66   0.080     1.50     25.91
       ====================================================
       ID = 3 (  0027):     3.19   0.528     1.50     31.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     3.19   0.528     1.50     31.93
     + ID2= 2 (  0033):     0.80   0.117     1.50     29.55
       ====================================================
       ID = 1 (  0027):     3.99   0.645     1.50     31.46

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     3.99   0.645     1.50     31.46
     + ID2= 2 (  0034):     0.67   0.100     1.50     29.47
       ====================================================
       ID = 3 (  0027):     4.66   0.745     1.50     31.17

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     4.66   0.745     1.50     31.17
     + ID2= 2 (  0035):     0.65   0.051     1.50     25.03
       ====================================================
       ID = 1 (  0027):     5.31   0.796     1.50     30.42

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     5.31   0.796     1.50     30.42
     + ID2= 2 (  0062):     0.51   0.100     1.50     36.09
       ====================================================
       ID = 3 (  0027):     5.82   0.896     1.50     30.91

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     5.82   0.896     1.50     30.91
     + ID2= 2 (  0064):     0.68   0.125     1.50     34.46
       ====================================================
       ID = 1 (  0027):     6.50   1.021     1.50     31.29

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     6.50   1.021     1.50     31.29
     + ID2= 2 (  0068):     0.41   0.062     1.50     29.82
       ====================================================
       ID = 3 (  0027):     6.91   1.084     1.50     31.20

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     6.91   1.084     1.50     31.20
     + ID2= 2 (  0069):     0.86   0.083     1.50     27.95
       ====================================================
       ID = 1 (  0027):     7.77   1.167     1.50     30.84

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\817e5206
| Ptotal= 66.02 mm |   Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   13.67 |  2.17   12.32 |  3.17    6.27
                0.33    4.98 |  1.33   27.69 |  2.33   10.44 |  3.33    5.00
                0.50    5.61 |  1.50  158.85 |  2.50    9.14 |  3.50    5.84
                0.67    6.45 |  1.67   35.08 |  2.67    8.15 |  3.67    5.18
                0.83    7.70 |  1.83   20.60 |  2.83    7.39 |  3.83    4.90
                1.00    9.70 |  2.00   15.24 |  3.00    6.78 |  4.00    4.65

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--------------------
| CALIB            |
| STANDHYD (  0065)|   Area    (ha)=   0.49
|ID= 1 DT=10.0 min |   Total Imp(%)=  26.00   Dir. Conn.(%)=  17.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.13         0.36
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     57.15        40.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=    158.85        43.77
               over (min)      10.00        20.00
     Storage Coeff.  (min)=     1.52 (ii)   11.34 (ii)
     Unit Hyd. Tpeak (min)=    10.00        20.00
     Unit Hyd. peak  (cms)=     0.17         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=     0.04         0.02        0.049 (iii)
     TIME TO PEAK    (hrs)=     1.50         1.67         1.50
     RUNOFF VOLUME    (mm)=    65.02        18.30        26.23
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     TOTAL RAINFALL   (mm)=      66.02        66.02          66.02
     RUNOFF COEFFICIENT   =       0.98         0.28           0.40

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* =  58.0     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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\817e5206
| Ptotal= 66.02 mm |    Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   13.67 |  2.17   12.32 |  3.17    6.27
                0.33    4.98 |  1.33   27.69 |  2.33   10.44 |  3.33    5.00
                0.50    5.61 |  1.50  158.85 |  2.50    9.14 |  3.50    5.84
                0.67    6.45 |  1.67   35.08 |  2.67    8.15 |  3.67    5.18
                0.83    7.70 |  1.83   20.60 |  2.83    7.39 |  3.83    4.90
                1.00    9.70 |  2.00   15.24 |  3.00    6.78 |  4.00    4.65

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

--------------------
| CALIB            |
| STANDHYD (  0066)|   Area    (ha)=   0.25
|ID= 1 DT=10.0 min |   Total Imp(%)=  49.00   Dir. Conn.(%)=  31.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.12         0.13
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      40.82        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85        61.52
               over (min)        10.00        10.00
     Storage Coeff.  (min)=       1.24 (ii)    9.81 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.01          0.049 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      65.02        20.98          34.61
     TOTAL RAINFALL   (mm)=      66.02        66.02          66.02
     RUNOFF COEFFICIENT   =       0.98         0.32           0.52

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* =  58.0     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  (  0067)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0065):     0.49   0.049     1.50    26.23
     + ID2= 2 (  0066):     0.25   0.049     1.50    34.61
       ==================================================
       ID = 3 (  0067):     0.74   0.097     1.50    29.06

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| DUHYD    (  0024)|
| Inlet Cap.= 0.057|
| #of Inlets=    1|
| Total(cms)=  0.1|      AREA     QPEAK     TPEAK    R.V.
--------------------      (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   0.74      0.10      1.50   29.06
     ==================================================
     MAJOR SYS.(ID= 2):   0.08      0.04      1.50   29.06
     MINOR SYS.(ID= 3):   0.66      0.06      1.50   29.06

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD  (  0031)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0024):     0.66   0.057     1.50    29.06
     + ID2= 2 (  0027):     7.77   1.167     1.50    30.84
       ==================================================
       ID = 3 (  0031):     8.43   1.224     1.50    30.70

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD  (  0031)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0031):     8.43   1.224     1.50    30.70
     + ID2= 2 (  0071):     0.71   0.034     1.50    14.45
       ==================================================
       ID = 1 (  0031):     9.14   1.259     1.50    29.44

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| RESERVOIR(  0029)|
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000    |   0.1080     0.2030
                         0.0085     0.0227    |   0.1807     0.2551
                         0.0130     0.0491    |   0.2663     0.3117
                         0.0163     0.0772    |   0.3630     0.3731
                         0.0190     0.1119    |   0.4697     0.4393
                         0.0512     0.1553    |   0.0000     0.0000

                              AREA     QPEAK     TPEAK      R.V.
                              (ha)     (cms)     (hrs)      (mm)
   INFLOW : ID= 2 (  0031)     9.137     1.259     1.50      29.44
   OUTFLOW: ID= 1 (  0029)     9.137     0.097     3.25      28.38

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.72
                  TIME SHIFT OF PEAK FLOW         (min)=105.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1939

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

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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\817e5206
| Ptotal= 66.02 mm |    Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   13.67 |  2.17   12.32 |  3.17    6.27
                0.33    4.98 |  1.33   27.69 |  2.33   10.44 |  3.33    5.00
                0.50    5.61 |  1.50  158.85 |  2.50    9.14 |  3.50    5.84
                0.67    6.45 |  1.67   35.08 |  2.67    8.15 |  3.67    5.18
                0.83    7.70 |  1.83   20.60 |  2.83    7.39 |  3.83    4.90
                1.00    9.70 |  2.00   15.24 |  3.00    6.78 |  4.00    4.65

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

--------------------
| CALIB            |
| STANDHYD (  0063)|   Area    (ha)=   0.31
|ID= 1 DT=10.0 min |   Total Imp(%)=  41.00   Dir. Conn.(%)=   0.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.13         0.18
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      45.46        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85        91.60
               over (min)        10.00        10.00
     Storage Coeff.  (min)=       1.32 (ii)    8.63 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.00         0.03          0.033 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      65.02        24.43          24.41
     TOTAL RAINFALL   (mm)=      66.02        66.02          66.02
     RUNOFF COEFFICIENT   =       0.98         0.37           0.37

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* =  58.0     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  (  0037)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0024):     0.08   0.040     1.50    29.06
     + ID2= 2 (  0029):     9.14   0.097     3.25    28.38
       ==================================================
       ID = 3 (  0037):     9.22   0.097     3.25    28.38

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD  (  0037)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0037):     9.22   0.097     3.25    28.38
     + ID2= 2 (  0038):     0.09   0.002     1.50     9.76
       ==================================================
       ID = 1 (  0037):     9.31   0.098     3.23    28.20

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD  (  0037)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0037):     9.31   0.098     3.23    28.20
     + ID2= 2 (  0063):     0.31   0.033     1.50    24.41
       ==================================================
       ID = 3 (  0037):     9.62   0.101     3.17    28.08

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD  (  0037)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0037):     9.62   0.101     3.17    28.08
     + ID2= 2 (  0070):     1.74   0.044     1.67     9.99
       ==================================================
       ID = 1 (  0037):    11.36   0.131     1.50    25.31

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
================================================================================
==================

      V    V   I    SSSSS  U   U    A    L              (v 5.1.2003)
      V    V   I    SS     U   U   A A   L
       V  V    I     SS    U   U  AAAAA  L
       V  V    I      SS   U   U  A   A  L
        VV     I    SSSSS  UUUUU  A   A  LLLLL

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

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                    *****  D E T A I L E D   O U T P U T *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\VO2\voin.dat
  Output  filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f8\36a9ff03-5b0a-473d-b10e-17f691784387\scenari
   Summary filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f8\36a9ff03-5b0a-473d-b10e-17f691784387\scenari


DATE: 01/05/2019                          TIME: 10:33:09

USER:


COMMENTS: _____

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  **********************************************
  ** SIMULATION : Run 05                      **
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  ********************************************

--------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\67b5ebc9
| Ptotal= 72.96 mm |    Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.99 |  1.17   14.27 |  2.17   12.62 |  3.17    5.79
                0.33    4.45 |  1.33   33.90 |  2.33   10.39 |  3.33    5.33
                0.50    5.08 |  1.50  186.56 |  2.50    8.89 |  3.50    4.98
                0.67    5.97 |  1.67   44.81 |  2.67    7.80 |  3.67    4.65
                0.83    7.29 |  1.83   23.44 |  2.83    6.96 |  3.83    4.37
                1.00    9.53 |  2.00   16.26 |  3.00    6.30 |  4.00    4.14

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

--------------------
| CALIB            |
| NASHYD   (  0038)|   Area    (ha)=   0.09   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.15

     Unit Hyd Qpeak  (cms)=   0.023

     PEAK FLOW       (cms)=   0.003 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  12.324
     TOTAL RAINFALL   (mm)=  72.962
     RUNOFF COEFFICIENT   =   0.169

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

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--------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\67b5ebc9
| Ptotal= 72.96 mm |    Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.99 |  1.17   14.27 |  2.17   12.62 |  3.17    5.79
                0.33    4.45 |  1.33   33.90 |  2.33   10.39 |  3.33    5.33
                0.50    5.08 |  1.50  186.56 |  2.50    8.89 |  3.50    4.98
                0.67    5.97 |  1.67   44.81 |  2.67    7.80 |  3.67    4.65
                0.83    7.29 |  1.83   23.44 |  2.83    6.96 |  3.83    4.37
                1.00    9.53 |  2.00   16.26 |  3.00    6.30 |  4.00    4.14

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

--------------------
| CALIB            |
| NASHYD   (  0070)|   Area    (ha)=   1.74   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.399

     PEAK FLOW       (cms)=   0.065 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  12.608
     TOTAL RAINFALL   (mm)=  72.962
     RUNOFF COEFFICIENT   =   0.173

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

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--------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\67b5ebc9
| Ptotal= 72.96 mm |    Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.99 |  1.17   14.27 |  2.17   12.62 |  3.17    5.79
                0.33    4.45 |  1.33   33.90 |  2.33   10.39 |  3.33    5.33
                0.50    5.08 |  1.50  186.56 |  2.50    8.89 |  3.50    4.98
                0.67    5.97 |  1.67   44.81 |  2.67    7.80 |  3.67    4.65
                0.83    7.29 |  1.83   23.44 |  2.83    6.96 |  3.83    4.37
                1.00    9.53 |  2.00   16.26 |  3.00    6.30 |  4.00    4.14

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

--------------------
| CALIB            |
| NASHYD   (  0071)|   Area    (ha)=   0.71   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.163

     PEAK FLOW       (cms)=   0.045 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  17.433
     TOTAL RAINFALL   (mm)=  72.962
     RUNOFF COEFFICIENT   =   0.239

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

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

--------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\67b5ebc9
| Ptotal= 72.96 mm |    Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.99 |  1.17   14.27 |  2.17   12.62 |  3.17    5.79
                0.33    4.45 |  1.33   33.90 |  2.33   10.39 |  3.33    5.33
                0.50    5.08 |  1.50  186.56 |  2.50    8.89 |  3.50    4.98
                0.67    5.97 |  1.67   44.81 |  2.67    7.80 |  3.67    4.65
                0.83    7.29 |  1.83   23.44 |  2.83    6.96 |  3.83    4.37
                1.00    9.53 |  2.00   16.26 |  3.00    6.30 |  4.00    4.14

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

--------------------
| CALIB            |
| STANDHYD (  0023)|   Area    (ha)=   0.59
|ID= 1 DT=10.0 min |   Total Imp(%)=  47.00   Dir. Conn.(%)=  16.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.28         0.31
     Dep. Storage     (mm)=      0.80         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     62.72        40.00
     Mannings n             =   0.013        0.250

     Max.Eff.Inten.(mm/hr)=    186.56       103.35
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.50 (ii)    8.47 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.05         0.06          0.113 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=     72.16        27.58          34.71
     TOTAL RAINFALL   (mm)=     72.96        72.96          72.96
     RUNOFF COEFFICIENT   =      0.99         0.38           0.48

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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--------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\67b5ebc9
| Ptotal= 72.96 mm |    Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.99 |  1.17   14.27 |  2.17   12.62 |  3.17    5.79
                0.33    4.45 |  1.33   33.90 |  2.33   10.39 |  3.33    5.33
                0.50    5.08 |  1.50  186.56 |  2.50    8.89 |  3.50    4.98
                0.67    5.97 |  1.67   44.81 |  2.67    7.80 |  3.67    4.65
                0.83    7.29 |  1.83   23.44 |  2.83    6.96 |  3.83    4.37
                1.00    9.53 |  2.00   16.26 |  3.00    6.30 |  4.00    4.14

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

--------------------
| CALIB            |
| STANDHYD (  0025)|   Area    (ha)=   0.52
|ID= 1 DT=10.0 min |   Total Imp(%)=  71.00   Dir. Conn.(%)=  14.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.37         0.15
     Dep. Storage     (mm)=      0.80         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     58.88        40.00
     Mannings n             =   0.013        0.250

     Max.Eff.Inten.(mm/hr)=    186.56       289.37
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.45 (ii)    6.06 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.14
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.04         0.10          0.138 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=     72.16        39.04          43.67
     TOTAL RAINFALL   (mm)=     72.96        72.96          72.96
     RUNOFF COEFFICIENT   =      0.99         0.54           0.60

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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.

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

--------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\67b5ebc9
| Ptotal= 72.96 mm |    Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.99 |  1.17   14.27 |  2.17   12.62 |  3.17    5.79
                0.33    4.45 |  1.33   33.90 |  2.33   10.39 |  3.33    5.33
                0.50    5.08 |  1.50  186.56 |  2.50    8.89 |  3.50    4.98
                0.67    5.97 |  1.67   44.81 |  2.67    7.80 |  3.67    4.65
                0.83    7.29 |  1.83   23.44 |  2.83    6.96 |  3.83    4.37
                1.00    9.53 |  2.00   16.26 |  3.00    6.30 |  4.00    4.14

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| CALIB            |
| STANDHYD (  0026)|   Area    (ha)=   0.48
|ID= 1 DT=10.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  14.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.24         0.24
     Dep. Storage     (mm)=      0.80         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     56.57        40.00
     Mannings n             =   0.013        0.250

     Max.Eff.Inten.(mm/hr)=    186.56       118.94
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.41 (ii)    8.00 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.03         0.06          0.093 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=     72.16        29.03          35.05
     TOTAL RAINFALL   (mm)=     72.96        72.96          72.96
     RUNOFF COEFFICIENT   =      0.99         0.40           0.48

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\67b5ebc9
| Ptotal= 72.96 mm |    Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.99 |  1.17   14.27 |  2.17   12.62 |  3.17    5.79
                0.33    4.45 |  1.33   33.90 |  2.33   10.39 |  3.33    5.33
                0.50    5.08 |  1.50  186.56 |  2.50    8.89 |  3.50    4.98
                0.67    5.97 |  1.67   44.81 |  2.67    7.80 |  3.67    4.65
                0.83    7.29 |  1.83   23.44 |  2.83    6.96 |  3.83    4.37
                1.00    9.53 |  2.00   16.26 |  3.00    6.30 |  4.00    4.14

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| CALIB            |
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| STANDHYD (  0028)|   Area    (ha)=   0.61
|ID= 1 DT=10.0 min |   Total Imp(%)=  62.00   Dir. Conn.(%)=  14.00
-------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.38         0.23
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      63.77        40.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56       188.06
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.52 (ii)    7.00 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.09          0.138 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      72.16        34.04          39.37
     TOTAL RAINFALL   (mm)=      72.96        72.96          72.96
     RUNOFF COEFFICIENT   =       0.99         0.47           0.54

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\67b5ebc9
| Ptotal= 72.96 mm |    Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.99 |  1.17   14.27 |  2.17   12.62 |  3.17    5.79
                0.33    4.45 |  1.33   33.90 |  2.33   10.39 |  3.33    5.33
                0.50    5.08 |  1.50  186.56 |  2.50    8.89 |  3.50    4.98
                0.67    5.97 |  1.67   44.81 |  2.67    7.80 |  3.67    4.65
                0.83    7.29 |  1.83   23.44 |  2.83    6.96 |  3.83    4.37
                1.00    9.53 |  2.00   16.26 |  3.00    6.30 |  4.00    4.14

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-------------------
| CALIB            |
| STANDHYD (  0030)|   Area    (ha)=   0.33
|ID= 1 DT=10.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  25.00
-------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.20         0.13
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      46.90        40.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56       137.67
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.26 (ii)    7.47 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.04          0.081 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      72.16        30.58          40.97
     TOTAL RAINFALL   (mm)=      72.96        72.96          72.96
     RUNOFF COEFFICIENT   =       0.99         0.42           0.56

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\67b5ebc9
| Ptotal= 72.96 mm |    Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.99 |  1.17   14.27 |  2.17   12.62 |  3.17    5.79
                0.33    4.45 |  1.33   33.90 |  2.33   10.39 |  3.33    5.33
                0.50    5.08 |  1.50  186.56 |  2.50    8.89 |  3.50    4.98
                0.67    5.97 |  1.67   44.81 |  2.67    7.80 |  3.67    4.65
                0.83    7.29 |  1.83   23.44 |  2.83    6.96 |  3.83    4.37
                1.00    9.53 |  2.00   16.26 |  3.00    6.30 |  4.00    4.14

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-------------------
| CALIB            |
| STANDHYD (  0032)|   Area    (ha)=   0.66
|ID= 1 DT=10.0 min |   Total Imp(%)=  36.00   Dir. Conn.(%)=  10.00
-------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.42
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      66.33        40.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56       83.91
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.56 (ii)    9.13 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.07          0.102 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      72.16        25.50          30.16
     TOTAL RAINFALL   (mm)=      72.96        72.96          72.96
     RUNOFF COEFFICIENT   =       0.99         0.35           0.41

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\67b5ebc9
| Ptotal= 72.96 mm |    Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.99 |  1.17   14.27 |  2.17   12.62 |  3.17    5.79
                0.33    4.45 |  1.33   33.90 |  2.33   10.39 |  3.33    5.33
                0.50    5.08 |  1.50  186.56 |  2.50    8.89 |  3.50    4.98
                0.67    5.97 |  1.67   44.81 |  2.67    7.80 |  3.67    4.65
                0.83    7.29 |  1.83   23.44 |  2.83    6.96 |  3.83    4.37
                1.00    9.53 |  2.00   16.26 |  3.00    6.30 |  4.00    4.14

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-------------------
| CALIB            |
| STANDHYD (  0033)|   Area    (ha)=   0.80
|ID= 1 DT=10.0 min |   Total Imp(%)=  48.00   Dir. Conn.(%)=  13.00
-------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.38         0.42
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      73.03        40.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56       113.44
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.65 (ii)    8.36 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.05         0.09          0.148 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      72.16        28.53          34.20
     TOTAL RAINFALL   (mm)=      72.96        72.96          72.96
     RUNOFF COEFFICIENT   =       0.99         0.39           0.47

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\67b5ebc9
| Ptotal= 72.96 mm |    Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.99 |  1.17   14.27 |  2.17   12.62 |  3.17    5.79
                0.33    4.45 |  1.33   33.90 |  2.33   10.39 |  3.33    5.33
                0.50    5.08 |  1.50  186.56 |  2.50    8.89 |  3.50    4.98
                0.67    5.97 |  1.67   44.81 |  2.67    7.80 |  3.67    4.65
                0.83    7.29 |  1.83   23.44 |  2.83    6.96 |  3.83    4.37
                1.00    9.53 |  2.00   16.26 |  3.00    6.30 |  4.00    4.14

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-------------------
| CALIB            |
| STANDHYD (  0034)|   Area    (ha)=   0.67
|ID= 1 DT=10.0 min |   Total Imp(%)=  42.00   Dir. Conn.(%)=  18.00
-------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.28         0.39
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      66.83        40.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56       84.70
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.56 (ii)    9.11 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.06         0.06          0.125 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      72.16        25.59          33.97
     TOTAL RAINFALL   (mm)=      72.96        72.96          72.96
     RUNOFF COEFFICIENT   =       0.99         0.35           0.47

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\67b5ebc9
| Ptotal= 72.96 mm |    Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.99 |  1.17   14.27 |  2.17   12.62 |  3.17    5.79
                0.33    4.45 |  1.33   33.90 |  2.33   10.39 |  3.33    5.33
                0.50    5.08 |  1.50  186.56 |  2.50    8.89 |  3.50    4.98
                0.67    5.97 |  1.67   44.81 |  2.67    7.80 |  3.67    4.65
                0.83    7.29 |  1.83   23.44 |  2.83    6.96 |  3.83    4.37
                1.00    9.53 |  2.00   16.26 |  3.00    6.30 |  4.00    4.14

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-------------------
| CALIB            |
| STANDHYD (  0035)|   Area    (ha)=   0.65
|ID= 1 DT=10.0 min |   Total Imp(%)=  30.00   Dir. Conn.(%)=  11.00
-------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.19         0.45
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      65.83        40.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56       70.20
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.55 (ii)    9.68 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.06          0.096 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      72.16        23.81          29.12
     TOTAL RAINFALL   (mm)=      72.96        72.96          72.96
     RUNOFF COEFFICIENT   =       0.99         0.33           0.40

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\67b5ebc9
| Ptotal= 72.96 mm |    Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.99 |  1.17   14.27 |  2.17   12.62 |  3.17    5.79
                0.33    4.45 |  1.33   33.90 |  2.33   10.39 |  3.33    5.33
                0.50    5.08 |  1.50  186.56 |  2.50    8.89 |  3.50    4.98
                0.67    5.97 |  1.67   44.81 |  2.67    7.80 |  3.67    4.65
                0.83    7.29 |  1.83   23.44 |  2.83    6.96 |  3.83    4.37
                1.00    9.53 |  2.00   16.26 |  3.00    6.30 |  4.00    4.14

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| CALIB            |
| STANDHYD (  0062)|   Area    (ha)=   0.51
|ID= 1 DT=10.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  16.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.17
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      58.31        40.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56       216.78
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.44 (ii)    6.62 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.04         0.08          0.125 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=     71.96        35.66          41.46
     TOTAL RAINFALL   (mm)=     72.96        72.96          72.96
     RUNOFF COEFFICIENT   =      0.99         0.49           0.57

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\67b5ebc9
| Ptotal= 72.96 mm |    Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.99 |  1.17   14.27 |  2.17   12.62 |  3.17    5.79
                0.33    4.45 |  1.33   33.90 |  2.33   10.39 |  3.33    5.33
                0.50    5.08 |  1.50  186.56 |  2.50    8.89 |  3.50    4.98
                0.67    5.97 |  1.67   44.81 |  2.67    7.80 |  3.67    4.65
                0.83    7.29 |  1.83   23.44 |  2.83    6.96 |  3.83    4.37
                1.00    9.53 |  2.00   16.26 |  3.00    6.30 |  4.00    4.14

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-------------------
| CALIB            |
| STANDHYD (  0064)|   Area    (ha)=   0.68
|ID= 1 DT=10.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  19.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.41         0.27
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      67.33        40.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56       156.58
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.57 (ii)    7.47 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.07         0.09          0.156 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=     71.96        31.99          39.57
     TOTAL RAINFALL   (mm)=     72.96        72.96          72.96
     RUNOFF COEFFICIENT   =      0.99         0.44           0.54

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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.

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

-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\67b5ebc9
| Ptotal= 72.96 mm |    Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.99 |  1.17   14.27 |  2.17   12.62 |  3.17    5.79
                0.33    4.45 |  1.33   33.90 |  2.33   10.39 |  3.33    5.33
                0.50    5.08 |  1.50  186.56 |  2.50    8.89 |  3.50    4.98
                0.67    5.97 |  1.67   44.81 |  2.67    7.80 |  3.67    4.65
                0.83    7.29 |  1.83   23.44 |  2.83    6.96 |  3.83    4.37
                1.00    9.53 |  2.00   16.26 |  3.00    6.30 |  4.00    4.14

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

-------------------
| CALIB            |
| STANDHYD (  0068)|   Area    (ha)=   0.41
|ID= 1 DT=10.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  17.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.18         0.23
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      52.28        40.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56        94.94
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.35 (ii)    8.56 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.04         0.04          0.078 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=     71.96        26.72          34.39
     TOTAL RAINFALL   (mm)=     72.96        72.96          72.96
     RUNOFF COEFFICIENT   =      0.99         0.37           0.47

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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.

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

-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\67b5ebc9
| Ptotal= 72.96 mm |    Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.99 |  1.17   14.27 |  2.17   12.62 |  3.17    5.79
                0.33    4.45 |  1.33   33.90 |  2.33   10.39 |  3.33    5.33
                0.50    5.08 |  1.50  186.56 |  2.50    8.89 |  3.50    4.98
                0.67    5.97 |  1.67   44.81 |  2.67    7.80 |  3.67    4.65
                0.83    7.29 |  1.83   23.44 |  2.83    6.96 |  3.83    4.37
                1.00    9.53 |  2.00   16.26 |  3.00    6.30 |  4.00    4.14

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

-------------------
| CALIB            |
| STANDHYD (  0069)|   Area    (ha)=   0.86
|ID= 1 DT=10.0 min |   Total Imp(%)=  39.00   Dir. Conn.(%)=  15.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.52
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      75.72        40.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56        82.57
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.68 (ii)    9.30 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.07         0.08          0.148 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=     71.96        25.35          32.33
     TOTAL RAINFALL   (mm)=     72.96        72.96          72.96
     RUNOFF COEFFICIENT   =      0.99         0.35           0.44

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):     0.59   0.113     1.50    34.71
     + ID2= 2 (  0025):     0.52   0.138     1.50    43.67
       ==================================================
       ID = 3 (  0027):     1.11   0.250     1.50    38.91

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     1.11   0.250     1.50    38.91
     + ID2= 2 (  0026):     0.48   0.093     1.50    35.05
       ==================================================
       ID = 1 (  0027):     1.59   0.343     1.50    37.74

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     1.59   0.343     1.50    37.74
     + ID2= 2 (  0028):     0.61   0.138     1.50    39.37
       ==================================================
       ID = 3 (  0027):     2.20   0.481     1.50    38.19

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     2.20   0.481     1.50    38.19
     + ID2= 2 (  0030):     0.33   0.081     1.50    40.97
       ==================================================
       ID = 1 (  0027):     2.53   0.562     1.50    38.56

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     2.53   0.562     1.50    38.56
     + ID2= 2 (  0032):     0.66   0.102     1.50    30.16
       ==================================================
       ID = 3 (  0027):     3.19   0.664     1.50    36.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     3.19   0.664     1.50    36.82
     + ID2= 2 (  0033):     0.80   0.148     1.50    34.20
       ================================================
       ID = 1 (  0027):     3.99   0.812     1.50    36.29

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     3.99   0.812     1.50    36.29
     + ID2= 2 (  0034):     0.67   0.125     1.50    33.97
       ================================================
       ID = 3 (  0027):     4.66   0.937     1.50    35.96

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     4.66   0.937     1.50    35.96
     + ID2= 2 (  0035):     0.65   0.096     1.50    29.12
       ================================================
       ID = 1 (  0027):     5.31   1.033     1.50    35.12

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     5.31   1.033     1.50    35.12
     + ID2= 2 (  0062):     0.51   0.125     1.50    41.46
       ================================================
       ID = 3 (  0027):     5.82   1.158     1.50    35.68

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     5.82   1.158     1.50    35.68
     + ID2= 2 (  0064):     0.68   0.156     1.50    39.57
       ================================================
       ID = 1 (  0027):     6.50   1.314     1.50    36.09

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     6.50   1.314     1.50    36.09
     + ID2= 2 (  0068):     0.41   0.078     1.50    34.39
       ================================================
       ID = 3 (  0027):     6.91   1.393     1.50    35.98

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     6.91   1.393     1.50    35.98
     + ID2= 2 (  0069):     0.86   0.148     1.50    32.33
       ================================================
       ID = 1 (  0027):     7.77   1.541     1.50    35.58

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\67b5ebc9
| Ptotal= 72.96 mm |    Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.99 |  1.17   14.27 |  2.17   12.62 |  3.17    5.79
                0.33    4.45 |  1.33   33.90 |  2.33   10.39 |  3.33    5.33
                0.50    5.08 |  1.50  186.56 |  2.50    8.89 |  3.50    4.98
                0.67    5.97 |  1.67   44.81 |  2.67    7.80 |  3.67    4.65
                0.83    7.29 |  1.83   23.44 |  2.83    6.96 |  3.83    4.37
                1.00    9.53 |  2.00   16.26 |  3.00    6.30 |  4.00    4.14

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

------------------
| CALIB            |
| STANDHYD (  0065)|   Area    (ha)=   0.49
|ID= 1 DT=10.0 min |   Total Imp(%)=  26.00   Dir. Conn.(%)=  17.00
------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.13         0.36
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      57.15        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56        56.04
               over (min)       10.00        20.00
     Storage Coeff.  (min)=       1.42 (ii)  10.32 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.03          0.059 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67           1.50
     RUNOFF VOLUME    (mm)=      71.96        21.77          30.30
     TOTAL RAINFALL   (mm)=      72.96        72.96          72.96
     RUNOFF COEFFICIENT   =       0.99         0.30           0.42

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  58.0    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.

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

------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\67b5ebc9
| Ptotal= 72.96 mm |    Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.99 |  1.17   14.27 |  2.17   12.62 |  3.17    5.79
                0.33    4.45 |  1.33   33.90 |  2.33   10.39 |  3.33    5.33
                0.50    5.08 |  1.50  186.56 |  2.50    8.89 |  3.50    4.98
                0.67    5.97 |  1.67   44.81 |  2.67    7.80 |  3.67    4.65
                0.83    7.29 |  1.83   23.44 |  2.83    6.96 |  3.83    4.37
                1.00    9.53 |  2.00   16.26 |  3.00    6.30 |  4.00    4.14

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

------------------
| CALIB            |
| STANDHYD (  0066)|   Area    (ha)=   0.25
|ID= 1 DT=10.0 min |   Total Imp(%)=  49.00   Dir. Conn.(%)=  31.00
------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.12         0.13
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      40.82        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56        78.39
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.16 (ii)   8.94 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.02          0.059 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      71.96        24.84          39.44
     TOTAL RAINFALL   (mm)=      72.96        72.96          72.96
     RUNOFF COEFFICIENT   =       0.99         0.34           0.54

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  58.0    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  (  0067)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0065):     0.49   0.059     1.50    30.30
     + ID2= 2 (  0066):     0.25   0.059     1.50    39.44
       ================================================
       ID = 3 (  0067):     0.74   0.118     1.50    33.39

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

------------------
| DUHYD    (  0024)|
| Inlet Cap.= 0.057|
| #of Inlets=    1|
| Total(cms)=  0.1|      AREA     QPEAK     TPEAK    R.V.
-------------------      (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   0.74      0.12      1.50   33.39
     ================================================
     MAJOR SYS.(ID= 2):   0.12      0.06      1.50   33.39
     MINOR SYS.(ID= 3):   0.62      0.06      1.50   33.39

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

------------------
| ADD HYD  (  0031)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0024):     0.62   0.057     1.50    33.39
     + ID2= 2 (  0027):     7.77   1.541     1.50    35.58
       ================================================
       ID = 3 (  0031):     8.39   1.598     1.50    35.42

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

------------------
| ADD HYD  (  0031)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0031):     8.39   1.598     1.50    35.42
     + ID2= 2 (  0071):     0.71   0.045     1.50    17.43
       ================================================
       ID = 1 (  0031):     9.10   1.643     1.50    34.02

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

------------------
| RESERVOIR(  0029)|
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.1080     0.2030
                          0.0085     0.0227   |   0.1807     0.2551
                          0.0130     0.0491   |   0.2663     0.3117
                          0.0163     0.0772   |   0.3630     0.3731
                          0.0190     0.1119   |   0.4697     0.4393
                          0.0512     0.1553   |   0.0000     0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0031)      9.095     1.643      1.50      34.02
   OUTFLOW: ID= 1 (  0029)      9.095     0.129      2.75      32.90

                PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.85
                TIME SHIFT OF PEAK FLOW         (min)= 75.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.2180

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------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\67b5ebc9
| Ptotal= 72.96 mm |    Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.99 |  1.17   14.27 |  2.17   12.62 |  3.17    5.79
                0.33    4.45 |  1.33   33.90 |  2.33   10.39 |  3.33    5.33
                0.50    5.08 |  1.50  186.56 |  2.50    8.89 |  3.50    4.98
                0.67    5.97 |  1.67   44.81 |  2.67    7.80 |  3.67    4.65
                0.83    7.29 |  1.83   23.44 |  2.83    6.96 |  3.83    4.37
                1.00    9.53 |  2.00   16.26 |  3.00    6.30 |  4.00    4.14
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-------------------
| CALIB           |
| STANDHYD (  0063)|   Area    (ha)=   0.31
|ID= 1 DT=10.0 min |   Total Imp(%)=  41.00   Dir. Conn.(%)=   0.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.13         0.18
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     45.46        40.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=    186.56       115.99
           over (min)          10.00        10.00
     Storage Coeff.  (min)=     1.24 (ii)    7.89 (ii)
     Unit Hyd. Tpeak (min)=    10.00        10.00
     Unit Hyd. peak  (cms)=     0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=     0.00         0.04       0.043 (iii)
     TIME TO PEAK    (hrs)=     1.50         1.50        1.50
     RUNOFF VOLUME    (mm)=    71.96        28.77       28.75
     TOTAL RAINFALL   (mm)=    72.96        72.96       72.96
     RUNOFF COEFFICIENT   =     0.99         0.39        0.39

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  58.0    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  (  0037)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0024):     0.12   0.061    1.50    33.39
     + ID2= 2 (  0029):     9.10   0.129    2.75    32.90
       ====================================================
       ID = 3 (  0037):     9.22   0.129    2.75    32.91

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0037)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0037):     9.22   0.129    2.75    32.91
     + ID2= 2 (  0038):     0.09   0.003    1.50    12.32
       ====================================================
       ID = 1 (  0037):     9.31   0.130    2.73    32.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0037)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0037):     9.31   0.130    2.73    32.71
     + ID2= 2 (  0063):     0.31   0.043    1.50    28.75
       ====================================================
       ID = 3 (  0037):     9.62   0.134    2.65    32.58

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0037)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0037):     9.62   0.134    2.65    32.58
     + ID2= 2 (  0070):     1.74   0.065    1.67    12.61
       ====================================================
       ID = 1 (  0037):    11.36   0.185    1.50    29.52

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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================================================================================
==================


       V    V   I    SSSSS  U   U    A    L              (v 5.1.2003)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I       SS  U   U  A   A  L
         VV     I    SSSSS  UUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\VO2\voin.dat
  Output  filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f8\8e89fb65-26b5-4fca-b495-0fa80ff2ba97\scenari
  Summary filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861-
e38dc4dfd2f8\8e89fb65-26b5-4fca-b495-0fa80ff2ba97\scenari


DATE: 01/05/2019                          TIME: 10:33:09

USER:


COMMENTS: _____

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  **********************************************
  ** SIMULATION : Run 06                      **
  **********************************************


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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\d57abe18
| Ptotal= 83.90 mm |    Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    4.50 |  1.17   16.86 |  2.17   14.83 |  3.17    6.60
               0.33    5.05 |  1.33   41.07 |  2.33   12.12 |  3.33    6.10
               0.50    5.82 |  1.50  205.92 |  2.50   10.31 |  3.50    5.66
               0.67    6.83 |  1.67   54.56 |  2.67    9.02 |  3.67    5.28
               0.83    8.41 |  1.83   29.17 |  2.83    8.03 |  3.83    4.98
               1.00   11.07 |  2.00   19.28 |  3.00    7.24 |  4.00    4.70

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

-------------------
| CALIB           |
| NASHYD   (  0038)|   Area    (ha)=   0.09   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.15

     Unit Hyd Qpeak  (cms)=   0.023

     PEAK FLOW       (cms)=   0.005 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  16.799
     TOTAL RAINFALL   (mm)=  83.902
     RUNOFF COEFFICIENT   =   0.200

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

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-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\d57abe18
| Ptotal= 83.90 mm |    Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    4.50 |  1.17   16.86 |  2.17   14.83 |  3.17    6.60
               0.33    5.05 |  1.33   41.07 |  2.33   12.12 |  3.33    6.10
               0.50    5.82 |  1.50  205.92 |  2.50   10.31 |  3.50    5.66
               0.67    6.83 |  1.67   54.56 |  2.67    9.02 |  3.67    5.28
               0.83    8.41 |  1.83   29.17 |  2.83    8.03 |  3.83    4.98
               1.00   11.07 |  2.00   19.28 |  3.00    7.24 |  4.00    4.70

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

-------------------
| CALIB           |
| NASHYD   (  0070)|   Area    (ha)=   1.74   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.399

     PEAK FLOW       (cms)=   0.092 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  17.185
     TOTAL RAINFALL   (mm)=  83.902
     RUNOFF COEFFICIENT   =   0.205

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

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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\d57abe18
| Ptotal= 83.90 mm |    Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    4.50 |  1.17   16.86 |  2.17   14.83 |  3.17    6.60
               0.33    5.05 |  1.33   41.07 |  2.33   12.12 |  3.33    6.10
               0.50    5.82 |  1.50  205.92 |  2.50   10.31 |  3.50    5.66
               0.67    6.83 |  1.67   54.56 |  2.67    9.02 |  3.67    5.28
               0.83    8.41 |  1.83   29.17 |  2.83    8.03 |  3.83    4.98
               1.00   11.07 |  2.00   19.28 |  3.00    7.24 |  4.00    4.70

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

-------------------
| CALIB           |
| NASHYD   (  0071)|   Area    (ha)=   0.71   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.163

     PEAK FLOW       (cms)=   0.056 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  22.519
     TOTAL RAINFALL   (mm)=  83.902
     RUNOFF COEFFICIENT   =   0.268

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

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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\d57abe18
| Ptotal= 83.90 mm |    Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    4.50 |  1.17   16.86 |  2.17   14.83 |  3.17    6.60
               0.33    5.05 |  1.33   41.07 |  2.33   12.12 |  3.33    6.10
               0.50    5.82 |  1.50  205.92 |  2.50   10.31 |  3.50    5.66
               0.67    6.83 |  1.67   54.56 |  2.67    9.02 |  3.67    5.28
               0.83    8.41 |  1.83   29.17 |  2.83    8.03 |  3.83    4.98
               1.00   11.07 |  2.00   19.28 |  3.00    7.24 |  4.00    4.70

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-------------------
| CALIB           |
| STANDHYD (  0023)|   Area    (ha)=   0.59
|ID= 1 DT=10.0 min |   Total Imp(%)=  47.00   Dir. Conn.(%)=  16.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.28         0.31
     Dep. Storage     (mm)=      0.80         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     62.72        40.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=    205.92       125.35
           over (min)          10.00        10.00
     Storage Coeff.  (min)=     1.45 (ii)    7.89 (ii)
     Unit Hyd. Tpeak (min)=    10.00        10.00
     Unit Hyd. peak  (cms)=     0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=     0.05         0.08        0.134 (iii)
     TIME TO PEAK    (hrs)=     1.50         1.50         1.50
     RUNOFF VOLUME    (mm)=    83.10        34.58        42.33
     TOTAL RAINFALL   (mm)=    83.90        83.90        83.90
     RUNOFF COEFFICIENT   =     0.99         0.41         0.50

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  58.0    Ia = Dep. Storage  (Above)
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```
     (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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\d57abe18
| Ptotal= 83.90 mm |    Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    4.50 |  1.17   16.86 |  2.17   14.83 |  3.17    6.60
               0.33    5.05 |  1.33   41.07 |  2.33   12.12 |  3.33    6.10
               0.50    5.82 |  1.50  205.92 |  2.50   10.31 |  3.50    5.66
               0.67    6.83 |  1.67   54.56 |  2.67    9.02 |  3.67    5.28
               0.83    8.41 |  1.83   29.17 |  2.83    8.03 |  3.83    4.98
               1.00   11.07 |  2.00   19.28 |  3.00    7.24 |  4.00    4.70

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

-------------------
| CALIB            |
| STANDHYD (  0025)|   Area    (ha)=   0.52
|ID= 1 DT=10.0 min |   Total Imp(%)=  71.00   Dir. Conn.(%)=  14.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.37         0.15
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      58.88        40.00
     Mannings n             =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       343.21
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.39 (ii)    5.70 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.04         0.12          0.163 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     83.10        47.83         52.76
     TOTAL RAINFALL   (mm)=     83.90        83.90         83.90
     RUNOFF COEFFICIENT   =      0.99         0.57          0.63

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  58.0     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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\d57abe18
| Ptotal= 83.90 mm |    Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    4.50 |  1.17   16.86 |  2.17   14.83 |  3.17    6.60
               0.33    5.05 |  1.33   41.07 |  2.33   12.12 |  3.33    6.10
               0.50    5.82 |  1.50  205.92 |  2.50   10.31 |  3.50    5.66
               0.67    6.83 |  1.67   54.56 |  2.67    9.02 |  3.67    5.28
               0.83    8.41 |  1.83   29.17 |  2.83    8.03 |  3.83    4.98
               1.00   11.07 |  2.00   19.28 |  3.00    7.24 |  4.00    4.70

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

-------------------
| CALIB            |
| STANDHYD (  0026)|   Area    (ha)=   0.48
|ID= 1 DT=10.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  14.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.24
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      56.57        40.00
     Mannings n             =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       143.86
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.36 (ii)    7.46 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.04         0.07          0.111 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     83.10        36.29         42.83
     TOTAL RAINFALL   (mm)=     83.90        83.90         83.90
     RUNOFF COEFFICIENT   =      0.99         0.43          0.51

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  58.0     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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\d57abe18
| Ptotal= 83.90 mm |    Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    4.50 |  1.17   16.86 |  2.17   14.83 |  3.17    6.60
               0.33    5.05 |  1.33   41.07 |  2.33   12.12 |  3.33    6.10
               0.50    5.82 |  1.50  205.92 |  2.50   10.31 |  3.50    5.66
               0.67    6.83 |  1.67   54.56 |  2.67    9.02 |  3.67    5.28
               0.83    8.41 |  1.83   29.17 |  2.83    8.03 |  3.83    4.98
               1.00   11.07 |  2.00   19.28 |  3.00    7.24 |  4.00    4.70

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

-------------------
| CALIB            |
| STANDHYD (  0028)|   Area    (ha)=   0.61
|ID= 1 DT=10.0 min |   Total Imp(%)=  62.00   Dir. Conn.(%)=  14.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.38         0.23
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      63.77        40.00
     Mannings n             =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       225.29
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.46 (ii)    6.56 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.05         0.12          0.165 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=      83.10        42.12         47.85
     TOTAL RAINFALL   (mm)=      83.90        83.90         83.90
     RUNOFF COEFFICIENT   =       0.99         0.50          0.57

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  58.0     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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-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\d57abe18
| Ptotal= 83.90 mm |    Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    4.50 |  1.17   16.86 |  2.17   14.83 |  3.17    6.60
               0.33    5.05 |  1.33   41.07 |  2.33   12.12 |  3.33    6.10
               0.50    5.82 |  1.50  205.92 |  2.50   10.31 |  3.50    5.66
               0.67    6.83 |  1.67   54.56 |  2.67    9.02 |  3.67    5.28
               0.83    8.41 |  1.83   29.17 |  2.83    8.03 |  3.83    4.98
               1.00   11.07 |  2.00   19.28 |  3.00    7.24 |  4.00    4.70

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

-------------------
| CALIB            |
| STANDHYD (  0030)|   Area    (ha)=   0.33
|ID= 1 DT=10.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  25.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.20         0.13
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      46.90        40.00
     Mannings n             =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       166.02
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.21 (ii)    6.98 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.05         0.05          0.095 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     83.10        38.11         49.35
     TOTAL RAINFALL   (mm)=     83.90        83.90         83.90
     RUNOFF COEFFICIENT   =      0.99         0.45          0.59

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  58.0     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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-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\d57abe18
| Ptotal= 83.90 mm |    Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    4.50 |  1.17   16.86 |  2.17   14.83 |  3.17    6.60
               0.33    5.05 |  1.33   41.07 |  2.33   12.12 |  3.33    6.10
               0.50    5.82 |  1.50  205.92 |  2.50   10.31 |  3.50    5.66
               0.67    6.83 |  1.67   54.56 |  2.67    9.02 |  3.67    5.28
               0.83    8.41 |  1.83   29.17 |  2.83    8.03 |  3.83    4.98
               1.00   11.07 |  2.00   19.28 |  3.00    7.24 |  4.00    4.70

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-------------------
| CALIB            |
| STANDHYD (  0032)|   Area    (ha)=   0.66
|ID= 1 DT=10.0 min |   Total Imp(%)=  36.00   Dir. Conn.(%)=  10.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.42
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      66.33        40.00
     Mannings n             =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       102.17
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.50 (ii)    8.49 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.04         0.09          0.123 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     83.10        32.12         37.21
     TOTAL RAINFALL   (mm)=     83.90        83.90         83.90
     RUNOFF COEFFICIENT   =      0.99         0.38          0.44

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  58.0     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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\d57abe18
| Ptotal= 83.90 mm |    Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    4.50 |  1.17   16.86 |  2.17   14.83 |  3.17    6.60
               0.33    5.05 |  1.33   41.07 |  2.33   12.12 |  3.33    6.10
               0.50    5.82 |  1.50  205.92 |  2.50   10.31 |  3.50    5.66
               0.67    6.83 |  1.67   54.56 |  2.67    9.02 |  3.67    5.28
               0.83    8.41 |  1.83   29.17 |  2.83    8.03 |  3.83    4.98
               1.00   11.07 |  2.00   19.28 |  3.00    7.24 |  4.00    4.70

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--------------------
| CALIB            |
| STANDHYD (  0033)|   Area    (ha)=   0.80
|ID= 1 DT=10.0 min |   Total Imp(%)=  48.00   Dir. Conn.(%)=  13.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.38         0.42
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      73.03        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       137.34
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.58 (ii)    7.80 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.06         0.12          0.177 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      83.10        35.71          41.87
     TOTAL RAINFALL   (mm)=      83.90        83.90          83.90
     RUNOFF COEFFICIENT   =       0.99         0.43           0.50

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\d57abe18
| Ptotal= 83.90 mm |    Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
--------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    4.50 |  1.17   16.86 |  2.17   14.83 |  3.17    6.60
               0.33    5.05 |  1.33   41.07 |  2.33   12.12 |  3.33    6.10
               0.50    5.82 |  1.50  205.92 |  2.50   10.31 |  3.50    5.66
               0.67    6.83 |  1.67   54.56 |  2.67    9.02 |  3.67    5.28
               0.83    8.41 |  1.83   29.17 |  2.83    8.03 |  3.83    4.98
               1.00   11.07 |  2.00   19.28 |  3.00    7.24 |  4.00    4.70

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--------------------
| CALIB            |
| STANDHYD (  0034)|   Area    (ha)=   0.67
|ID= 1 DT=10.0 min |   Total Imp(%)=  42.00   Dir. Conn.(%)=  18.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.28         0.39
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      66.83        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       103.12
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.50 (ii)    8.47 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.07         0.08          0.148 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      83.10        32.23          41.38
     TOTAL RAINFALL   (mm)=      83.90        83.90          83.90
     RUNOFF COEFFICIENT   =       0.99         0.38           0.49

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\d57abe18
| Ptotal= 83.90 mm |    Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
--------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    4.50 |  1.17   16.86 |  2.17   14.83 |  3.17    6.60
               0.33    5.05 |  1.33   41.07 |  2.33   12.12 |  3.33    6.10
               0.50    5.82 |  1.50  205.92 |  2.50   10.31 |  3.50    5.66
               0.67    6.83 |  1.67   54.56 |  2.67    9.02 |  3.67    5.28
               0.83    8.41 |  1.83   29.17 |  2.83    8.03 |  3.83    4.98
               1.00   11.07 |  2.00   19.28 |  3.00    7.24 |  4.00    4.70

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--------------------
| CALIB            |
| STANDHYD (  0035)|   Area    (ha)=   0.65
|ID= 1 DT=10.0 min |   Total Imp(%)=  30.00   Dir. Conn.(%)=  11.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.19         0.45
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      65.83        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92        85.76
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.49 (ii)    8.99 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.08          0.116 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      83.10        30.09          35.92
     TOTAL RAINFALL   (mm)=      83.90        83.90          83.90
     RUNOFF COEFFICIENT   =       0.99         0.36           0.43

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\d57abe18
| Ptotal= 83.90 mm |    Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
--------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    4.50 |  1.17   16.86 |  2.17   14.83 |  3.17    6.60
               0.33    5.05 |  1.33   41.07 |  2.33   12.12 |  3.33    6.10
               0.50    5.82 |  1.50  205.92 |  2.50   10.31 |  3.50    5.66
               0.67    6.83 |  1.67   54.56 |  2.67    9.02 |  3.67    5.28
               0.83    8.41 |  1.83   29.17 |  2.83    8.03 |  3.83    4.98
               1.00   11.07 |  2.00   19.28 |  3.00    7.24 |  4.00    4.70

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--------------------
| CALIB            |
| STANDHYD (  0062)|   Area    (ha)=   0.51
|ID= 1 DT=10.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  16.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.17
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      58.31        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       258.85
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.38 (ii)    6.21 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.05         0.10          0.149 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      82.90        43.98          50.20
     TOTAL RAINFALL   (mm)=      83.90        83.90          83.90
     RUNOFF COEFFICIENT   =       0.99         0.52           0.60

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\d57abe18
| Ptotal= 83.90 mm |    Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
--------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    4.50 |  1.17   16.86 |  2.17   14.83 |  3.17    6.60
               0.33    5.05 |  1.33   41.07 |  2.33   12.12 |  3.33    6.10
               0.50    5.82 |  1.50  205.92 |  2.50   10.31 |  3.50    5.66
               0.67    6.83 |  1.67   54.56 |  2.67    9.02 |  3.67    5.28
               0.83    8.41 |  1.83   29.17 |  2.83    8.03 |  3.83    4.98
               1.00   11.07 |  2.00   19.28 |  3.00    7.24 |  4.00    4.70

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--------------------
| CALIB            |
| STANDHYD (  0064)|   Area    (ha)=   0.68
|ID= 1 DT=10.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  19.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.41         0.27
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      67.33        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       188.32
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.51 (ii)    6.99 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.07         0.11          0.185 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      82.90        39.75          47.94
     TOTAL RAINFALL   (mm)=      83.90        83.90          83.90
     RUNOFF COEFFICIENT   =       0.99         0.47           0.57

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  58.0    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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|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\d57abe18
| Ptotal= 83.90 mm |    Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
--------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    4.50 |  1.17   16.86 |  2.17   14.83 |  3.17    6.60
               0.33    5.05 |  1.33   41.07 |  2.33   12.12 |  3.33    6.10
               0.50    5.82 |  1.50  205.92 |  2.50   10.31 |  3.50    5.66
               0.67    6.83 |  1.67   54.56 |  2.67    9.02 |  3.67    5.28
               0.83    8.41 |  1.83   29.17 |  2.83    8.03 |  3.83    4.98
               1.00   11.07 |  2.00   19.28 |  3.00    7.24 |  4.00    4.70

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--------------------
| CALIB            |
| STANDHYD (  0068)|   Area    (ha)=   0.41
|ID= 1 DT=10.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  17.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.18         0.23
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      52.28        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       115.33
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.30 (ii)    7.96 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.05          0.093 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      82.90        33.56          41.94
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     TOTAL RAINFALL   (mm)=      83.90        83.90          83.90
     RUNOFF COEFFICIENT   =       0.99         0.40           0.50

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  58.0     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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-------------------
|     READ STORM    |     Filename: C:\Users\Greg\AppD
|                   |               ata\Local\Temp\
|                   |               838a855b-29b4-4b71-a467-7100b13d0872\d57abe18
| Ptotal= 83.90 mm |    Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   16.86 |  2.17   14.83 |  3.17    6.60
                0.33    5.05 |  1.33   41.07 |  2.33   12.12 |  3.33    6.10
                0.50    5.82 |  1.50  205.92 |  2.50   10.31 |  3.50    5.66
                0.67    6.83 |  1.67   54.56 |  2.67    9.02 |  3.67    5.28
                0.83    8.41 |  1.83   29.17 |  2.83    8.03 |  3.83    4.98
                1.00   11.07 |  2.00   19.28 |  3.00    7.24 |  4.00    4.70

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-------------------
| CALIB             |
| STANDHYD (  0069)|   Area    (ha)=   0.86
|ID= 1 DT=10.0 min |   Total Imp(%)=  39.00   Dir. Conn.(%)=  15.00
-------------------
                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.52
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      75.72        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       100.57
           over (min)          10.00        10.00
     Storage Coeff.  (min)=     1.62 (ii)    8.66 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.07         0.10        0.177 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50         1.50
     RUNOFF VOLUME    (mm)=     82.90        31.93        39.57
     TOTAL RAINFALL   (mm)=     83.90        83.90        83.90
     RUNOFF COEFFICIENT   =      0.99         0.38         0.47

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  58.0     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  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):     0.59   0.134     1.50    42.33
     + ID2= 2 (  0025):     0.52   0.163     1.50    52.76
       ==========================================================
       ID = 3 (  0027):     1.11   0.297     1.50    47.22

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     1.11   0.297     1.50    47.22
     + ID2= 2 (  0026):     0.48   0.111     1.50    42.83
       ==========================================================
       ID = 1 (  0027):     1.59   0.408     1.50    45.89

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     1.59   0.408     1.50    45.89
     + ID2= 2 (  0028):     0.61   0.165     1.50    47.85
       ==========================================================
       ID = 3 (  0027):     2.20   0.573     1.50    46.43

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     2.20   0.573     1.50    46.43
     + ID2= 2 (  0030):     0.33   0.095     1.50    49.35
       ==========================================================
       ID = 1 (  0027):     2.53   0.668     1.50    46.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     2.53   0.668     1.50    46.82
     + ID2= 2 (  0032):     0.66   0.123     1.50    37.21
       ==========================================================
       ID = 3 (  0027):     3.19   0.791     1.50    44.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     3.19   0.791     1.50    44.83
     + ID2= 2 (  0033):     0.80   0.177     1.50    41.87
       ==========================================================
       ID = 1 (  0027):     3.99   0.969     1.50    44.23

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     3.99   0.969     1.50    44.23
     + ID2= 2 (  0034):     0.67   0.148     1.50    41.38
       ==========================================================
       ID = 3 (  0027):     4.66   1.117     1.50    43.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     4.66   1.117     1.50    43.82
     + ID2= 2 (  0035):     0.65   0.116     1.50    35.92
       ==========================================================
       ID = 1 (  0027):     5.31   1.233     1.50    42.86

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     5.31   1.233     1.50    42.86
     + ID2= 2 (  0062):     0.51   0.149     1.50    50.20
       ==========================================================
       ID = 3 (  0027):     5.82   1.382     1.50    43.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     5.82   1.382     1.50    43.50
     + ID2= 2 (  0064):     0.68   0.185     1.50    47.94
       ==========================================================
       ID = 1 (  0027):     6.50   1.566     1.50    43.96

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     6.50   1.566     1.50    43.96
     + ID2= 2 (  0068):     0.41   0.093     1.50    41.94
       ==========================================================
       ID = 3 (  0027):     6.91   1.659     1.50    43.84

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     6.91   1.659     1.50    43.84
     + ID2= 2 (  0069):     0.86   0.177     1.50    39.57
       ==========================================================
       ID = 1 (  0027):     7.77   1.837     1.50    43.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
|     READ STORM    |     Filename: C:\Users\Greg\AppD
|                   |               ata\Local\Temp\
|                   |               838a855b-29b4-4b71-a467-7100b13d0872\d57abe18
| Ptotal= 83.90 mm |    Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   16.86 |  2.17   14.83 |  3.17    6.60
                0.33    5.05 |  1.33   41.07 |  2.33   12.12 |  3.33    6.10
                0.50    5.82 |  1.50  205.92 |  2.50   10.31 |  3.50    5.66
                0.67    6.83 |  1.67   54.56 |  2.67    9.02 |  3.67    5.28
                0.83    8.41 |  1.83   29.17 |  2.83    8.03 |  3.83    4.98
                1.00   11.07 |  2.00   19.28 |  3.00    7.24 |  4.00    4.70

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

-------------------
| CALIB             |
| STANDHYD (  0065)|   Area    (ha)=   0.49
|ID= 1 DT=10.0 min |   Total Imp(%)=  26.00   Dir. Conn.(%)=  17.00
-------------------
                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.13         0.36
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      57.15        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92        68.72
           over (min)          10.00        10.00
     Storage Coeff.  (min)=      1.37 (ii)    9.57 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.05         0.05        0.094 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50         1.50
     RUNOFF VOLUME    (mm)=     82.90        27.65        37.03
     TOTAL RAINFALL   (mm)=     83.90        83.90        83.90
     RUNOFF COEFFICIENT   =      0.99         0.33         0.44

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  58.0     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.

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

-------------------
|     READ STORM    |     Filename: C:\Users\Greg\AppD
|                   |               ata\Local\Temp\
|                   |               838a855b-29b4-4b71-a467-7100b13d0872\d57abe18
| Ptotal= 83.90 mm |    Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.50 |  1.17   16.86 |  2.17   14.83 |  3.17    6.60
```

```
               0.33    5.05 |  1.33   41.07 |  2.33   12.12 |  3.33    6.10
               0.50    5.82 |  1.50  205.92 |  2.50   10.31 |  3.50    5.66
               0.67    6.83 |  1.67   54.56 |  2.67    9.02 |  3.67    5.28
               0.83    8.41 |  1.83   29.17 |  2.83    8.03 |  3.83    4.98
               1.00   11.07 |  2.00   19.28 |  3.00    7.24 |  4.00    4.70

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

-------------------
| CALIB           |
| STANDHYD (  0066)|   Area    (ha)=   0.25
|ID= 1 DT=10.0 min |   Total Imp(%)=  49.00   Dir. Conn.(%)=  31.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.12         0.13
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      40.82        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92        95.57
                over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.12 (ii)    8.30 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.02          0.069 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      82.90        31.34          47.31
     TOTAL RAINFALL   (mm)=      83.90        83.90          83.90
     RUNOFF COEFFICIENT   =       0.99         0.37           0.56

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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  (  0067)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0065):     0.49   0.094     1.50    37.03
     + ID2= 2 (  0066):     0.25   0.069     1.50    47.31
       ==================================================
       ID = 3 (  0067):     0.74   0.163     1.50    40.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| DUHYD    (  0024)|
| Inlet Cap.= 0.057|
| #of Inlets=     1|
| Total(cms)=   0.1|      AREA     QPEAK     TPEAK    R.V.
-------------------      (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   0.74      0.16      1.50   40.50
     ==================================================
     MAJOR SYS.(ID= 2):   0.18      0.11      1.50   40.50
     MINOR SYS.(ID= 3):   0.56      0.06      1.50   40.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0031)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0024):     0.56   0.057     1.50    40.50
     + ID2= 2 (  0027):     7.77   1.837     1.50    43.37
       ==================================================
       ID = 3 (  0031):     8.33   1.894     1.50    43.18

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0031)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0031):     8.33   1.894     1.50    43.18
     + ID2= 2 (  0071):     0.71   0.056     1.50    22.52
       ==================================================
       ID = 1 (  0031):     9.04   1.950     1.50    41.56

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  0029)|
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |      OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.1080     0.2030
                          0.0085     0.0227   |   0.1807     0.2551
                          0.0130     0.0491   |   0.2663     0.3117
                          0.0163     0.0772   |   0.3630     0.3731
                          0.0190     0.1119   |   0.4697     0.4393
                          0.0512     0.1553   |   0.0000     0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0031)     9.038     1.950      1.50      41.56
   OUTFLOW: ID= 1 (  0029)     9.038     0.181      2.55      40.35

                PEAK   FLOW   REDUCTION [Qout/Qin](%)=  9.27
                TIME SHIFT OF PEAK FLOW       (min)= 63.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.2551

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-------------------
|    READ STORM    |    Filename: C:\Users\Greg\AppD
|                  |              ata\Local\Temp\
|                  |              838a855b-29b4-4b71-a467-7100b13d0872\d57abe18
| Ptotal= 83.90 mm |    Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.17    4.50 |  1.17   16.86 |  2.17   14.83 |  3.17    6.60
               0.33    5.05 |  1.33   41.07 |  2.33   12.12 |  3.33    6.10
               0.50    5.82 |  1.50  205.92 |  2.50   10.31 |  3.50    5.66
               0.67    6.83 |  1.67   54.56 |  2.67    9.02 |  3.67    5.28
               0.83    8.41 |  1.83   29.17 |  2.83    8.03 |  3.83    4.98
               1.00   11.07 |  2.00   19.28 |  3.00    7.24 |  4.00    4.70

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

-------------------
| CALIB           |
| STANDHYD (  0063)|   Area    (ha)=   0.31
|ID= 1 DT=10.0 min |   Total Imp(%)=  41.00   Dir. Conn.(%)=   0.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.13         0.18
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      45.46        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       140.36
                over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.19 (ii)    7.36 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.00         0.05          0.054 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      82.90        35.98          35.97
     TOTAL RAINFALL   (mm)=      83.90        83.90          83.90
     RUNOFF COEFFICIENT   =       0.99         0.43           0.43

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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  (  0037)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0024):     0.18   0.106     1.50    40.50
     + ID2= 2 (  0029):     9.04   0.181     2.55    40.35
       ==================================================
       ID = 3 (  0037):     9.22   0.181     2.55    40.36

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0037)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0037):     9.22   0.181     2.55    40.36
     + ID2= 2 (  0038):     0.09   0.005     1.50    16.80
       ==================================================
       ID = 1 (  0037):     9.31   0.182     2.55    40.13

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0037)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0037):     9.31   0.182     2.55    40.13
     + ID2= 2 (  0063):     0.31   0.054     1.50    35.97
       ==================================================
       ID = 3 (  0037):     9.62   0.188     2.47    39.99

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0037)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0037):     9.62   0.188     2.47    39.99
     + ID2= 2 (  0070):     1.74   0.092     1.67    17.19
       ==================================================
       ID = 1 (  0037):    11.36   0.267     1.50    36.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
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Appendix C: Misc Pond Calculations

vallee
Consulting Engineers, Architects & Planners

Subject: Cedar Park Extendsion
Date: Jan-18 By: TGS
Project #: 17-027 Page

Pond Sizing Calculations

1) Storage Sizing Table 3.2

Imp	Stor (m3/ha)	
35	90	
55	110	
45	100	100 m3/ha
Less 40 m3/ha ext. detention		40
Perm pool		60 m3/ha

Contributing Area 9.22 ha

Ext. Det 369 m3
Perm Pool Required 553

2) Forebay Design: Settling

Equation 4.5 Dist= sqrt(r*Qp/Vs)

Dist = forebay length
r = length to width of forebay
Qp = peak flow rate from pond during quality storm
Vs= target settling velocity, recommended at 0.0003 m/s

Given	r=	2	Target 2:1
	Qp =	0.019	SYMHYMO RESULTS 2-year event
	Vs=	0.0003	
	Dist=	11.3	

3) Forebary Design: Dispersion Length

Equation 4.6 Dist = 8*Q/(d*Vf)

Dist = forebay length
Q= inlet flow rate for quality storm
d= depth of perm pool
Vf = desired velocity in forebay (<0.5m/s)

Given	Q=	0.398	SYMHYMO results to pond for 2-year event
	d=	1	
	Vf=	0.5	
	dist=	6.4	

4) Forebay Design: Bottom Width

Equation 4.7 Width=Dist/8

Given Dist= 28

width= 3.5

5) Forebay Design: Cleanout Frequency

Table 6.3 of SWM Planning and Design Manual

35%	Impervious	0.6 m3/ha, annual sediment loading
55%	Impervious	1.9 m3/ha, annual sediment loading

Reference Calculation of Impervious areas spreadsheet for this development==> 39% impervious
Therefore extrapolate

45% 1.25 m3/ha

Total site area, including external contributing area 9.22 ha

Sediment Accummulation	11.525	m3/year
Target Removal eff. For normal protection	70%	
Anticipate Accumulation	8.0675	m3/year
Clean Frequency	10	year
Total Anticipated Accumulation	80.675	m3
Maximum No of years	77	years

Outlet Capacity

Mannings r	0.013	
Diameter	0.45	m
Slope	0.50%	
Hydraulic F	0.1125	m
C/S Area	0.159043	m2
V	1.27	m/s
Q	0.202	cms
=	202	L/s

Q95= 191.52 L/s

Ratio 0.002814

vallee
Consulting Engineers, Architects & Planners

Subject: Cedar Park Extension
Date: Jan-19 By: TGS
Project #: 17027 Page

Permanent Pool Volume

Contour	A1	A2	At	Incr V	Volume	
239.00	48	228	276	0		
239.20	81	268	349	62	62	
239.40	171	395	566	92	154	
239.60	222	462	684	125	279	
239.80	288	553	841	153	432	
240.00	368	665	1033	187	619	Compares to 586m3 by Civil 3D

Rating Curve

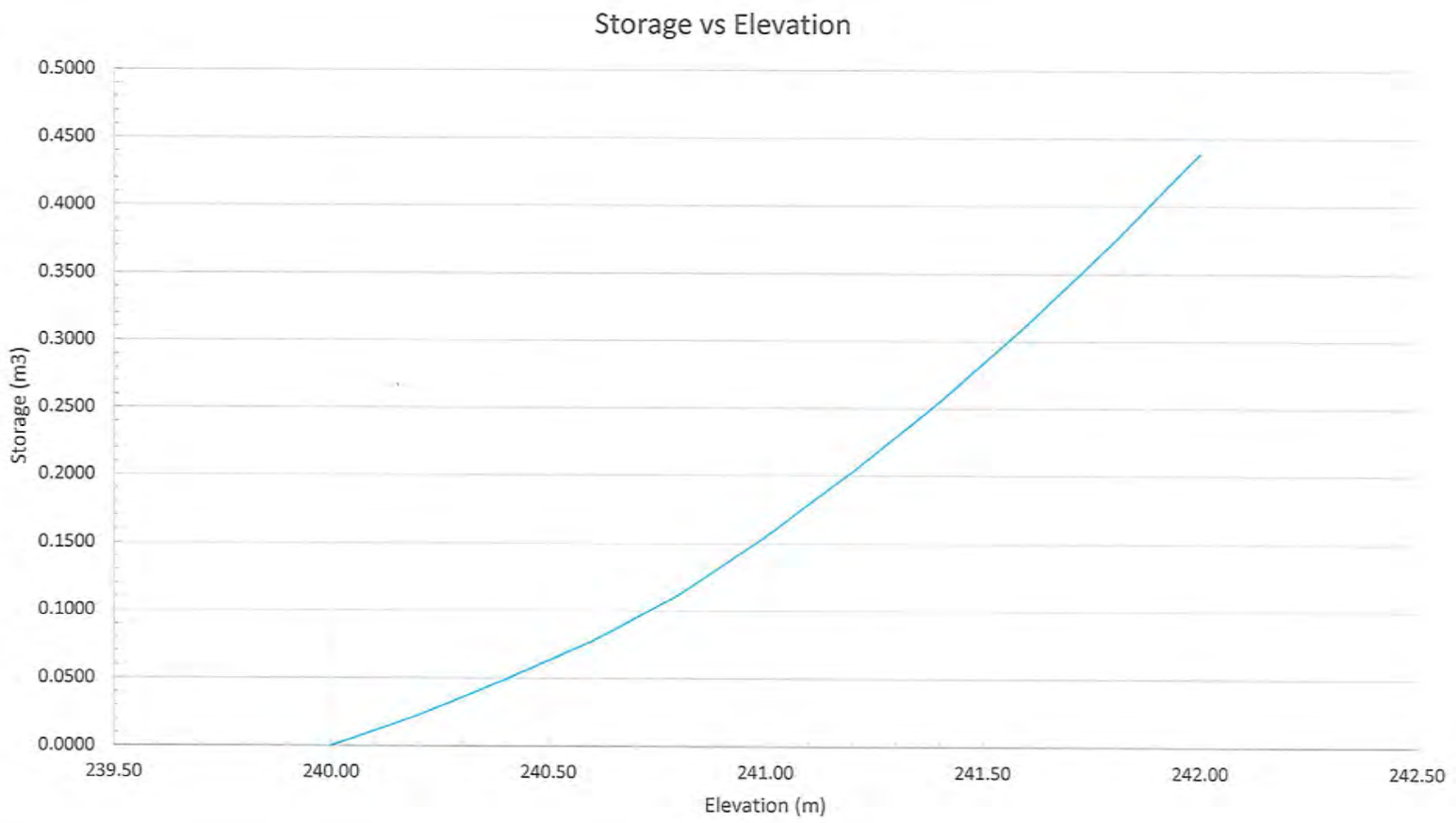
Diam	100	0.2 mm
CL Elev	240.05	240.80 m
Area	0.007854	

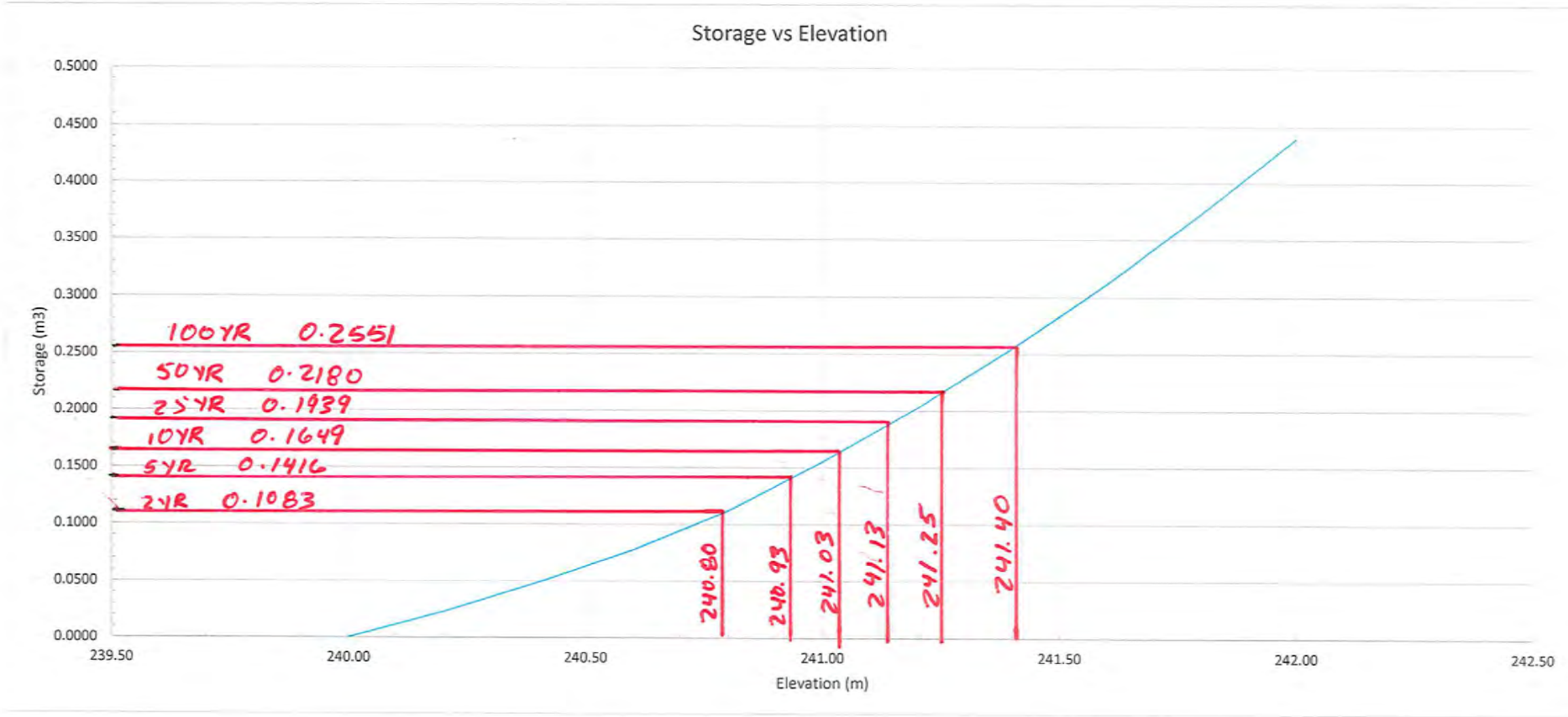
Contour	A1 m2	A2 m2	At m2	Incr V m3	m3	Volume (ha*m)	Orf. Q cms	Weir Q cms	Tot Q cms	Drawdown hr	Tot Drw. hr
240.00	368	665	1033	0	0	0	0.0000		0.0000	0.000000	0
240.20	1232		1232	226	226	0.02265	0.0085		0.0085	14.824162	14.82416
240.40	1410		1410	264	491	0.04907	0.0130		0.0130	6.841310	21.66547
240.60	1404		1404	281	772	0.07721	0.0163		0.0163	5.350166	27.01564
240.80	2063		2063	347	1119	0.11188	0.0190	0.0000	0.0190	5.466523	32.48216
241.00	2277		2277	434	1553	0.15528	0.0214	0.0299	0.0512	3.433825	35.91599
241.20	2494		2494	477	2030	0.20299	0.0235	0.0845	0.1080	1.664554	37.58054
241.40	2717		2717	521	2551	0.25510	0.0255	0.1552	0.1807	1.002793	38.58333
241.60	2947		2947	566	3117	0.31174	0.0273	0.2390	0.2663	0.703997	39.28733
241.80	3185		3185	613	3731	0.37306	0.0290	0.3340	0.3630	0.541367	39.82870
242.00	3435		3435	662	4393	0.43926	0.0306	0.4391	0.4697	0.441694	40.27039

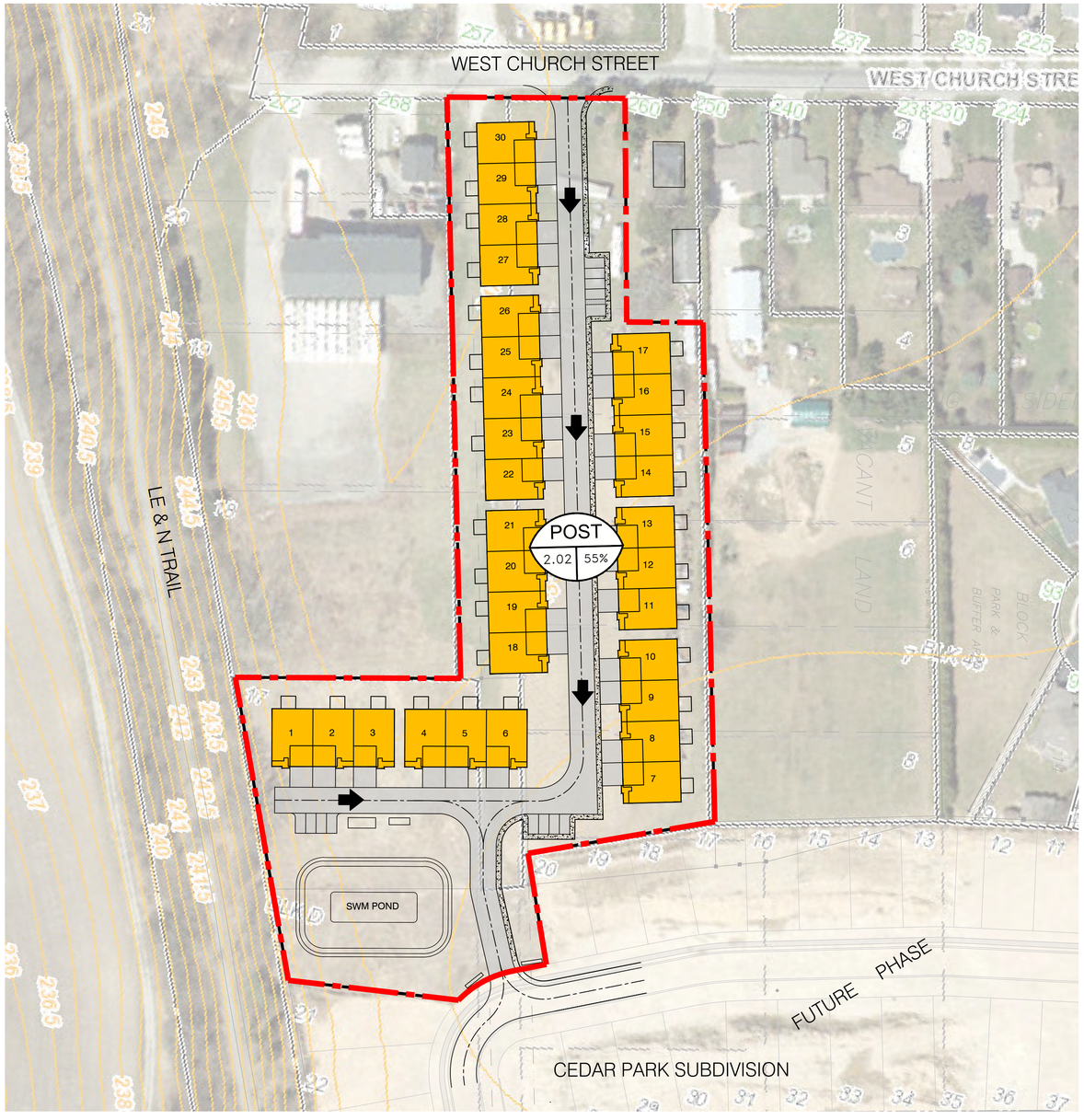
4393 compares to 4439 by Civil 3D

vallee
Consulting Engineers, Architects & Planners

Subject: Cedar Park Extension
Date: Jan-19 By: TGS
Project #: 17027 Page




Storage vs Elevation
Storage (m3)
0.5000
0.4500
0.4000
0.3500
0.3000
0.2500
0.2000
0.1500
0.1000
0.0500
0.0000
239.50
240.00
240.50
241.00
241.50
242.00
242.50
Elevation (m)
100YR 0.2551
50YR 0.2180
25YR 0.1939
10YR 0.1649
5YR 0.1416
2YR 0.1083
240.80
240.93
241.03
241.13
241.25
241.40



LEGEND

- OVERLAND FLOW (MAJOR)
- PROPERTY/CATCHMENT BOUNDARY
- SWM — SWM DRAINAGE AREA
  - 0.99 — AREA (ha)
  - 35.0% — TOTAL IMPERVIOUS PERCENTAGE (%)

REV. No.	DATE	REVISION

SCALE:
7.5 22.5 37.5
HORIZONTAL : 1 : 750

vallee
Consulting Engineers, Architects & Planners
G. DOUGLAS VALLEE LIMITED
2 TALBOT STREET NORTH
SIMCOE, ONTARIO N3Y 3W4
(519) 426-6270

Stamp

Project Title
CEDAR PARK
CONDOS
WATERFORD - NORFOLK COUNTY

Drawing Title
SWM DRAINAGE AREA

Designed by : NLB	Drawn By : NLB
Checked by : JI	Date Started : JUNE 3, 2022
Drawing Scale : 1:750	Drawing No. FIG2
Project No. 21-173	

DATE LAST PLOTTED :

vallee
Consulting Engineers, Architects & Planners

Subject:	Catchment Parameters		
Date:	6/1/2022	By:	NLB
Project #:	21-173	Page	1

Post-Development Catchment Parameters

Impervious Area Description	Footprint (m2)	Quantity	Impervious Area (ha)
3 Unit Block	602	3	0.181
4 Unit Block	808	4	0.323
5 Unit Block	1003	1	0.100
Rear Deck/Patio	16	30	0.048
Driveways	40	30	0.120
Roads, Sidewalk & Parking	3320	1	0.332
Total Impervious (ha)			1.10
Directly Connected Impervious (ha)			0.45

Drainage Area	Area (ha)	Imperv. Area (ha)	Directly Connected Imperv. (ha)	TIMP (%)	XIMP (%)
	(1)	(2)	(3)	(2)/(1)	(3)/(1)
Total	2.02	1.10	0.45	55%	22%

Soil Parameters

Soil Type	A - gravelly sandy till, sandy textures over gravelly sandy till	
CN (-)	58	
Ia	16.5	mm

Pre-Development Flow Rates to WSMD
(From 17-027 Cedar Park II SWM Repor)

Design Storm	Q (m3/s)
2	0.025
5	0.061
10	0.101
25	0.153
50	0.223
100	0.315

Target Flows (Based on Cedar Park II and Thompson Road Stom Sewer Capacity

Max Allowable Flow Rate from Cottonwood Pond	0.160	m3/s
Max Allowable Rate from Cedar Park II Pond	0.192	m3/s

Target Volume (Based on Cedar Park II SWM Facility Capacity)

Max Allowable Storage Volume in Cedar Park II SWM Facility	2551	m3
Max Allowable Storage Depth in Cedar Park II SWM Facility	241.40	m

Proposed Cottonwood SWM Facility

Pond Parameters

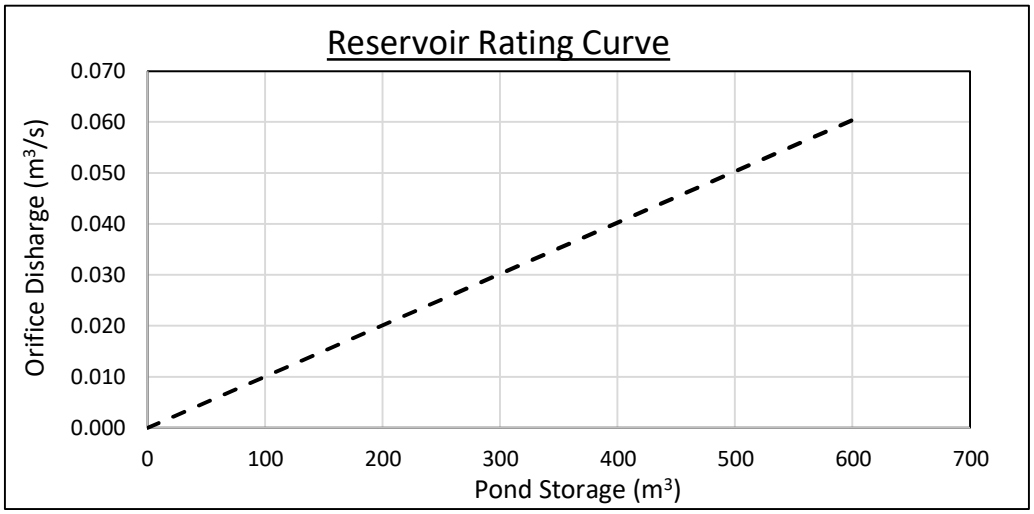
Bottom of Pond Elev. (m)	0.00
Target Flow Rate (m3/s)	0.160
Active Storage Depth (m)	1.5
Required Volume (m3)	600

Orifice Parameters

	Diameter	0.150	m
Orifice #1	Area	0.0177	m2
	Elevation	0.00	m

Stage-Storage-Discharge

Description	Elevation (m)	Ponding Depth (m)	Pond Volume (m3)	Total Volume (ha.m)	Total Q (m3/s)
Bottom of Pond/Orifice #1	0.00	0.0	0.00	0.0000	0.000
Top of Active Storage	1.50	1.5	600.00	0.0600	0.060



Pre to Post-Development Flow Rates to WSMD

Return Period	Q (m3/s)				Check
	Pre	Total Post from Original Cedar Park II - 17-027	Total Post from Cedar Park II including Cottonwood	Net (Pre to Post with Cottonwood)	
2	0.025	0.027	0.026	-0.001	✗
5	0.061	0.047	0.050	0.011	✓
10	0.101	0.074	0.076	0.025	✓
25	0.153	0.131	0.130	0.023	✓
50	0.223	0.185	0.184	0.039	✓
100	0.315	0.267	0.267	0.048	✓

100-YR Flow Rate from Cottonwood Pond (m3/s)

Target	0.160	m3/s	
Actual Provided	0.052	m3/s	✓

100-YR Flow Rate from Cedar Park II Pond (m3/s)

Target	0.192	m3/s	
Actual Provided	0.179	m3/s	✓

Required Storage for Cottonwood Pond

Provided	600	m3
Utilized (100-YR Event)	521	m3

Stage-Storage (Cedar Park II Pond)

Description	Elevation (m)	Ponding Depth (m)	Total Volume (m3)
Bottom of Pond	240.00	0.0	0.0
	240.20	0.2	226.0
	240.40	0.4	491.0
	240.60	0.6	772.0
	240.80	0.8	119.0
	241.00	1.0	1553.0
	241.20	1.2	2030.0
Emergency Overflow #1	241.40	1.4	2551.0
	241.60	1.6	3117.0
Emergency Overflow #2	241.80	1.8	3731.0
Top of Pond	242.00	2.0	4393.0

Approximate Pond Stages from OTTHYMO Model (Cedar Park II Pond)

Return Period	Utilized Storage (m3)	Ponding Depth (m)	Elev. (m)	
2	1116	0.82	240.82	
5	1458	0.96	240.96	
10	1700	1.06	241.06	
25	1987	1.18	241.18	
50	2192	1.26	241.26	
100	2539	1.40	241.40	< 241.40m = O.K.

REVISED STORM SEWER DESIGN SHEET - MAXIMUM ALLOWABLE FLOWS

Storm 5-year
A= 583.017 B= 3.01
Pipe Material PVC<=450, Concrete >450
n 0.013

C= 0.703

Project 17-027 Cedar Park II
Town/County Waterford

Date June 7 2022
Designed by NLB
Checked by JI
Sheet of : 1 of 1

Location			Area			Individual	Cumulative	Time of	Rainfall	Flow	Sewer Design						
Area	From	To	Ha	Ha	Ha	R*A	R*A	Concentration	mm/hr	2.78*I*A*R	Size	Slope	Capacity (Full)	Vel (Full)	Length	Time	Cap
			0.45	0.60	0.75			min	mm/hr	L/s	mm	%	L/s	m/s	m	min	%
ST1	CBMH3	STMH16	0.80	0.00	0.00	0.36	0.36	10.00	96.03	96.1	375	0.80%	156.82	1.42	44.0	0.52	✓ 61%
COTTONWOOD	STMH16	STMH15								155.0	525	0.60%	333.12	1.54	15.9	0.17	✓ 47%
	STMH15	STMH14	0.00	0.00	0.00	0.00	0.36	10.52	93.44	248.5	525	0.60%	333.12	1.54	10.5	0.11	✓ 75%
ST4	STMH14	ST-CAP	0.59	0.00	0.00	0.27	0.63	10.63	92.89	316.5	600	0.50%	434.17	1.54	51.9	0.56	✓ 73%
	TEMP CB	STMH13	0.00	0.00	0.00	0.00	0.63	11.19	90.28	312.0	600	0.50%	434.17	1.54	14.1	0.15	✓ 72%
ST2	STMH22	STMH21	0.48	0.00	0.00	0.22	0.22	10.00	96.03	57.7	300	0.45%	64.87	0.92	10.1	0.18	✓ 89%
	STMH21	STMH20	0.00	0.00	0.00	0.00	0.22	10.18	95.09	57.1	300	0.45%	64.87	0.92	11.3	0.21	✓ 88%
ST3	STMH20	ST-CAP	0.68	0.00	0.00	0.31	0.52	10.39	94.06	136.5	450	0.45%	191.26	1.20	51.7	0.72	✓ 71%
	TEMP CB	STMH19	0.00	0.00	0.00	0.00	0.52	11.11	90.68	131.6	450	0.45%	191.26	1.20	14.7	0.20	✓ 69%
ST8	STMH19	STMH18	0.00	0.51	0.00	0.31	0.83	11.31	89.77	206.6	525	0.50%	304.10	1.40	59.1	0.70	✓ 68%
ST7	STMH18	STMH17	0.00	0.48	0.00	0.29	1.12	12.01	86.80	269.3	600	0.40%	388.33	1.37	88.6	1.08	✓ 69%
	STMH17	CBMH1	0.00	0.00	0.00	0.00	1.12	13.09	82.69	256.5	600	0.45%	411.89	1.46	55.3	0.63	✓ 62%
ST6	CBMH1	STMH13	0.00	0.66	0.00	0.40	1.51	13.72	80.47	338.3	600	0.45%	411.89	1.46	17.1	0.20	✓ 82%
ST5	STMH13	STMH12	0.33	0.00	0.00	0.15	2.29	13.91	79.82	662.3	750	0.45%	746.81	1.69	53.2	0.52	✓ 89%
	STMH12	STMH11	0.00	0.00	0.00	0.00	2.29	14.44	78.12	651.5	750	0.45%	746.81	1.69	34.2	0.34	✓ 87%
ST9	STMH11	STMH10	0.66	0.00	0.00	0.30	2.58	14.78	77.08	708.5	750	0.45%	746.81	1.69	45.0	0.44	✓ 95%
	STMH10	DCBMH1	0.00	0.00	0.00	0.00	2.58	15.22	75.76	699.0	750	0.45%	746.81	1.69	14.9	0.15	✓ 94%
ST12	DCBMH2	STMH9	0.37	0.00	0.00	0.17	0.17	10.00	96.03	44.5	375	0.40%	110.89	1.00	12.8	0.21	✓ 40%
ST12a	STMH9	STMH8	0.44	0.00	0.00	0.20	0.36	10.21	94.94	96.2	375	0.40%	110.89	1.00	68.8	1.14	✓ 87%
	STMH8	STMH7	0.00	0.00	0.00	0.00	0.36	11.35	89.57	90.8	375	0.40%	110.89	1.00	15.1	0.25	✓ 82%
	STMH7	STMH6	0.00	0.00	0.00	0.00	0.36	11.61	88.49	89.7	375	0.40%	110.89	1.00	16.5	0.27	✓ 81%
	STMH6	STMH3	0.00	0.00	0.00	0.00	0.36	11.88	87.34	88.5	375	0.40%	110.89	1.00	37.6	0.62	✓ 80%
ST13	STMH5	STMH4	0.36	0.00	0.00	0.16	0.16	10.00	96.03	43.2	300	0.45%	64.87	0.92	20.4	0.37	✓ 67%
	STMH4	STMH3	0.00	0.00	0.00	0.00	0.16	10.37	94.15	42.4	300	0.45%	64.87	0.92	31.5	0.57	✓ 65%
ST11	STMH3	STMH2	0.43	0.00	0.00	0.19	0.72	12.50	84.85	169.8	525	0.35%	254.43	1.18	78.7	1.12	✓ 67%
	STMH2	DCBMH1	0.00	0.00	0.00	0.00	0.72	13.62	80.81	161.7	525	0.37%	261.60	1.21	16.0	0.22	✓ 62%
ST10	DCBMH1	OUTLET	0.98	0.00	0.00	0.44	3.74	15.37	75.33	939.1	825	0.50%	1015.01	1.90	26.4	0.23	✓ 93%
SWM Facility Outlet - Thompson Road																	
	CBMH23	STMH24								192.0	450	11.01%	946.02	5.95	24.5	0.07	✓ 20%
	STMH24	STMH25								192.0	450	6.72%	739.08	4.65	54.0	0.19	✓ 26%
	STMH25	STMH26								192.0	450	3.26%	514.77	3.24	21.3	0.11	✓ 37%
	STMH26	STMH27	Design flow for these pipes is based on peak discharge from the Cedar Park SWM facility of 0.192 cms or 192 L/s during the 100-year storm event. Original Design was 181 L/s.							192.0	450	0.50%	201.60	1.27	95.5	1.26	! 95%
	STMH27	STMH28								192.0	450	0.50%	201.60	1.27	99.0	1.30	! 95%
	STMH28	STMH29								192.0	450	0.50%	201.60	1.27	99.0	1.30	! 95%
	STMH29	STMH30								192.0	450	0.50%	201.60	1.27	99.0	1.30	! 95%
	STMH30	Outlet	Add capacity of ex 750mm culvert being replaced at 833L/s							1025.0	900	0.87%	1688.55	2.65	19.6	0.12	✓ 61%

LEGEND

- future pipes
- Maximum allowable flow from the 21-173 Cottonwood SWM facility during the 100-year storm event 0.155 cms or 155 L/s.
- Maximum allowable flow from the Cedar Park SWM facility during the 100-year storm event is 0.192 cms or 192 L/s.

REVISED STORM SEWER DESIGN SHEET - ACTUAL FLOWS

Storm 5-year
A= 583.017 B= 3.01
Pipe Material PVC<=450, Concrete >450
n 0.013

C= 0.703

Project 17-027 Cedar Park II
Town/County Waterford

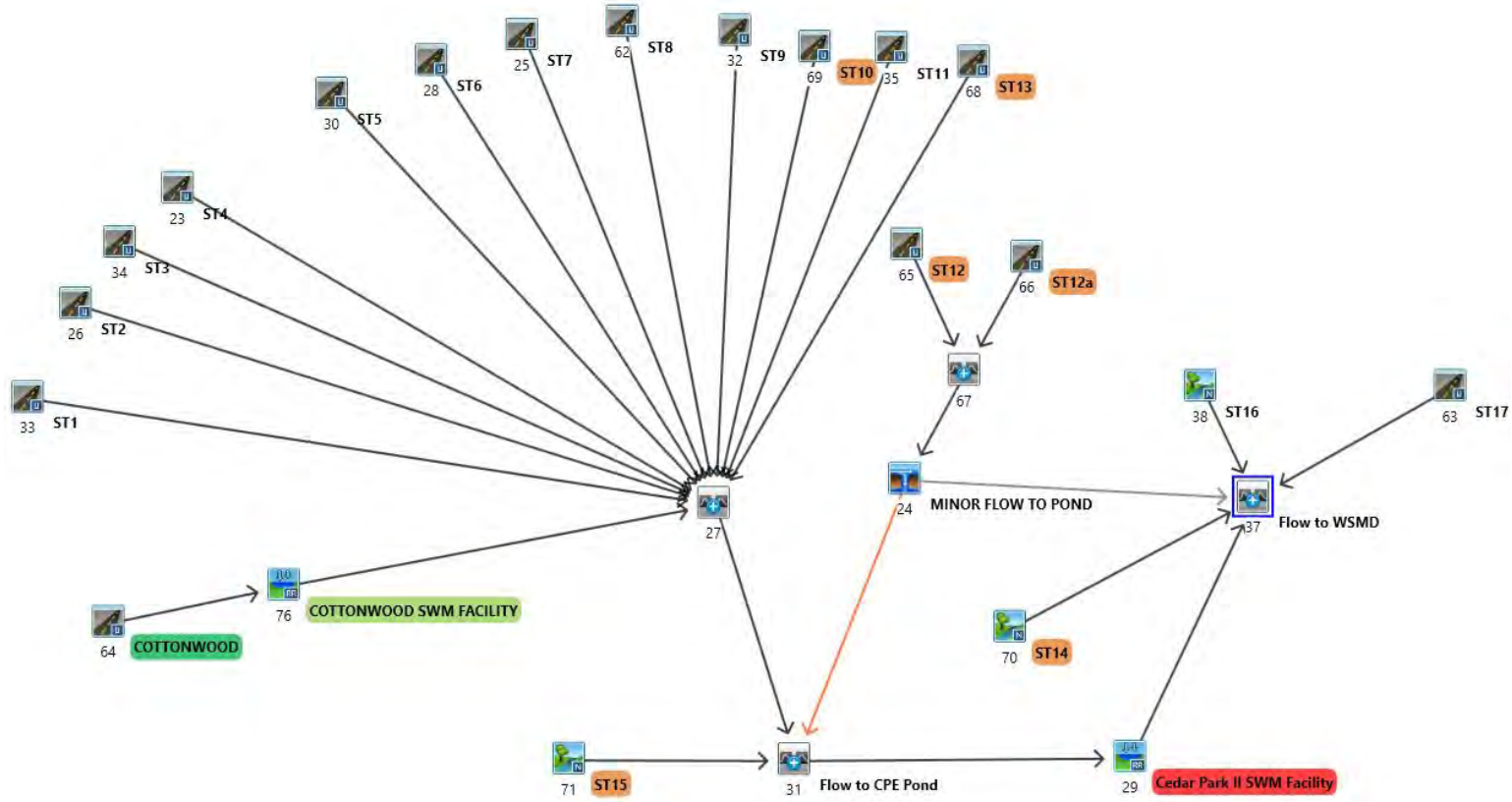
Date June 7 2022
Designed by NLB
Checked by JI
Sheet of : 1 of 1

Location			Area			Individual	Cumulative	Time of	Rainfall	Flow	Sewer Design						
Area	From	To	Ha	Ha	Ha	R*A	R*A	Concentration	mm/hr	2.78*I*A*R	Size	Slope	Capacity (Full)	Vel (Full)	Length	Time	Cap
			0.45	0.60	0.75			min	mm/hr	L/s	mm	%	L/s	m/s	m	min	%
ST1	CBMH3	STMH16	0.80	0.00	0.00	0.36	0.36	10.00	96.03	96.1	375	0.80%	156.82	1.42	44.0	0.52	61%
COTTONWOOD	STMH16	STMH15								52.0	525	0.60%	333.12	1.54	15.9	0.17	16%
	STMH15	STMH14	0.00	0.00	0.00	0.00	0.36	10.52	93.44	145.5	525	0.60%	333.12	1.54	10.5	0.11	44%
ST4	STMH14	ST-CAP	0.59	0.00	0.00	0.27	0.63	10.63	92.89	213.5	600	0.50%	434.17	1.54	51.9	0.56	49%
	TEMP CB	STMH13	0.00	0.00	0.00	0.00	0.63	11.19	90.28	209.0	600	0.50%	434.17	1.54	14.1	0.15	48%
ST2	STMH22	STMH21	0.48	0.00	0.00	0.22	0.22	10.00	96.03	57.7	300	0.45%	64.87	0.92	10.1	0.18	89%
	STMH21	STMH20	0.00	0.00	0.00	0.00	0.22	10.18	95.09	57.1	300	0.45%	64.87	0.92	11.3	0.21	88%
ST3	STMH20	ST-CAP	0.68	0.00	0.00	0.31	0.52	10.39	94.06	136.5	450	0.45%	191.26	1.20	51.7	0.72	71%
	TEMP CB	STMH19	0.00	0.00	0.00	0.00	0.52	11.11	90.68	131.6	450	0.45%	191.26	1.20	14.7	0.20	69%
ST8	STMH19	STMH18	0.00	0.51	0.00	0.31	0.83	11.31	89.77	206.6	525	0.50%	304.10	1.40	59.1	0.70	68%
ST7	STMH18	STMH17	0.00	0.48	0.00	0.29	1.12	12.01	86.80	269.3	600	0.40%	388.33	1.37	88.6	1.08	69%
	STMH17	CBMH1	0.00	0.00	0.00	0.00	1.12	13.09	82.69	256.5	600	0.45%	411.89	1.46	55.3	0.63	62%
ST6	CBMH1	STMH13	0.00	0.66	0.00	0.40	1.51	13.72	80.47	338.3	600	0.45%	411.89	1.46	17.1	0.20	82%
ST5	STMH13	STMH12	0.33	0.00	0.00	0.15	2.29	13.91	79.82	559.3	750	0.45%	746.81	1.69	53.2	0.52	75%
	STMH12	STMH11	0.00	0.00	0.00	0.00	2.29	14.44	78.12	548.5	750	0.45%	746.81	1.69	34.2	0.34	73%
ST9	STMH11	STMH10	0.66	0.00	0.00	0.30	2.58	14.78	77.08	605.5	750	0.45%	746.81	1.69	45.0	0.44	81%
	STMH10	DCBMH1	0.00	0.00	0.00	0.00	2.58	15.22	75.76	596.0	750	0.45%	746.81	1.69	14.9	0.15	80%
ST12	DCBMH2	STMH9	0.37	0.00	0.00	0.17	0.17	10.00	96.03	44.5	375	0.40%	110.89	1.00	12.8	0.21	40%
ST12a	STMH9	STMH8	0.44	0.00	0.00	0.20	0.36	10.21	94.94	96.2	375	0.40%	110.89	1.00	68.8	1.14	87%
	STMH8	STMH7	0.00	0.00	0.00	0.00	0.36	11.35	89.57	90.8	375	0.40%	110.89	1.00	15.1	0.25	82%
	STMH7	STMH6	0.00	0.00	0.00	0.00	0.36	11.61	88.49	89.7	375	0.40%	110.89	1.00	16.5	0.27	81%
	STMH6	STMH3	0.00	0.00	0.00	0.00	0.36	11.88	87.34	88.5	375	0.40%	110.89	1.00	37.6	0.62	80%
ST13	STMH5	STMH4	0.36	0.00	0.00	0.16	0.16	10.00	96.03	43.2	300	0.45%	64.87	0.92	20.4	0.37	67%
	STMH4	STMH3	0.00	0.00	0.00	0.00	0.16	10.37	94.15	42.4	300	0.45%	64.87	0.92	31.5	0.57	65%
ST11	STMH3	STMH2	0.43	0.00	0.00	0.19	0.72	12.50	84.85	169.8	525	0.35%	254.43	1.18	78.7	1.12	67%
	STMH2	DCBMH1	0.00	0.00	0.00	0.00	0.72	13.62	80.81	161.7	525	0.37%	261.60	1.21	16.0	0.22	62%
ST10	DCBMH1	OUTLET	0.98	0.00	0.00	0.44	3.74	15.37	75.33	836.1	825	0.50%	1015.01	1.90	26.4	0.23	82%
SWM Facility Outlet - Thompson Road																	
	CBMH23	STMH24								179.0	450	11.01%	946.02	5.95	24.5	0.07	19%
	STMH24	STMH25								179.0	450	6.72%	739.08	4.65	54.0	0.19	24%
	STMH25	STMH26								179.0	450	3.26%	514.77	3.24	21.3	0.11	35%
	STMH26	STMH27	Design flow for these pipes is based on peak discharge from the Cedar Park SWM facility of 0.179 cms or 179 L/s during the 100-year storm event. Original Design was 181 L/s.							179.0	450	0.50%	201.60	1.27	95.5	1.26	89%
	STMH27	STMH28								179.0	450	0.50%	201.60	1.27	99.0	1.30	89%
	STMH28	STMH29								179.0	450	0.50%	201.60	1.27	99.0	1.30	89%
	STMH29	STMH30								179.0	450	0.50%	201.60	1.27	99.0	1.30	89%
	STMH30	Outlet	Add capacity of ex 750mm culvert being replaced at 833L/s							1012.0	900	0.87%	1688.55	2.65	19.6	0.12	60%

LEGEND

- future pipes
- Modified catchment area - design flow from the 21-173 Cottonwood Development is based on peak discharge from the Cottonwood SWM facility of 0.079 cms or 79 L/s during the 100-year storm event
- Modified peak discharge - design flow is based on peak discharge from the Cedar Park SWM facility of 0.179 cms or 179 L/s during the 100-year storm event

21-173 Cottonwood Condominiums
Visual OTTHYMO MODEL



2-YEAR STORM

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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M M M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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DATE: 06/07/2022                          TIME: 10:59:28

USER:


COMMENTS: _____

--------------------------------------------------------------------------------
  ************************************************
  ** SIMULATION : Run 01                        **
  ************************************************


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|                  |              1577726c-47d7-46fc-bc76-c65d8db515e0\53bf0c4f
| Ptotal= 39.38 mm |    Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
--------------------
                TIME     RAIN |  TIME     RAIN |'  TIME     RAIN |  TIME     RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00     3.25 |  1.00     8.94 |  2.00     8.15 |  3.00     4.39
                0.17     3.56 |  1.17    16.92 |  2.17     7.01 |  3.17     4.11
                0.33     3.96 |  1.33    78.82 |  2.33     6.20 |  3.33     3.89
                0.50     4.52 |  1.50    21.89 |  2.50     5.59 |  3.50     3.68
                0.67     5.31 |  1.67    13.00 |  2.67     5.11 |  3.67     3.51
                0.83     6.55 |  1.83     9.88 |  2.83     4.72 |  3.83     3.35

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--------------------
| CALIB            |
| NASHYD   (  0038)|   Area    (ha)=   0.09   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.15

     Unit Hyd Qpeak  (cms)=   0.023

     PEAK FLOW       (cms)=   0.000 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=   2.352
     TOTAL RAINFALL   (mm)=  39.385
     RUNOFF COEFFICIENT   =   0.060

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

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--------------------
| CALIB            |
| NASHYD   (  0070)|   Area    (ha)=   1.74   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.399

     PEAK FLOW       (cms)=   0.006 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=   2.407
     TOTAL RAINFALL   (mm)=  39.385
     RUNOFF COEFFICIENT   =   0.061

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

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--------------------
| CALIB            |
| NASHYD   (  0071)|   Area    (ha)=   0.71   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.163

     PEAK FLOW       (cms)=   0.009 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=   5.149
     TOTAL RAINFALL   (mm)=  39.385
     RUNOFF COEFFICIENT   =   0.131

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

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--------------------
| CALIB            |
| STANDHYD (  0023)|   Area    (ha)=   0.59
|ID= 1 DT=10.0 min |   Total Imp(%)=  47.00   Dir. Conn.(%)=  16.00
--------------------

                                 IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=         0.28          0.31
     Dep. Storage     (mm)=         0.80          1.50
     Average Slope     (%)=         1.00          2.00
     Length            (m)=        62.72         40.00
     Mannings n             =       0.013         0.250
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     Max.Eff.Inten.(mm/hr)=      78.82        18.18
               over (min)       10.00        20.00
     Storage Coeff.  (min)=       2.12 (ii)   16.08 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.06
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.01          0.026 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      38.58         9.56         14.19
     TOTAL RAINFALL   (mm)=      39.38        39.38         39.38
     RUNOFF COEFFICIENT   =       0.98         0.24          0.36

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0025)|   Area    (ha)=   0.52
|ID= 1 DT=10.0 min |   Total Imp(%)=  71.00   Dir. Conn.(%)=  14.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.37         0.15
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      58.88        40.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82        80.66
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       2.04 (ii)    9.74 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.02          0.039 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=      38.58        14.98         18.28
     TOTAL RAINFALL   (mm)=      39.38        39.38         39.38
     RUNOFF COEFFICIENT   =       0.98         0.38          0.46

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0026)|   Area    (ha)=   0.48
|ID= 1 DT=10.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  14.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.24
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      56.57        40.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82        21.15
               over (min)       10.00        20.00
     Storage Coeff.  (min)=       2.00 (ii)   15.13 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.07
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.01          0.020 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      38.59        10.20         14.16
     TOTAL RAINFALL   (mm)=      39.38        39.38         39.38
     RUNOFF COEFFICIENT   =       0.98         0.26          0.36

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0028)|   Area    (ha)=   0.61
|ID= 1 DT=10.0 min |   Total Imp(%)=  62.00   Dir. Conn.(%)=  14.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.38         0.23
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      63.77        40.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82        49.97
               over (min)       10.00        20.00
     Storage Coeff.  (min)=       2.15 (ii)   11.46 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.02          0.028 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      38.58        12.50         16.14
     TOTAL RAINFALL   (mm)=      39.38        39.38         39.38
     RUNOFF COEFFICIENT   =       0.98         0.32          0.41

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0030)|   Area    (ha)=   0.33
|ID= 1 DT=10.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  25.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.20         0.13
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      46.90        40.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82        24.77
               over (min)       10.00        20.00
     Storage Coeff.  (min)=       1.78 (ii)   14.12 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.07
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.01          0.021 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      38.58        10.89         17.80
     TOTAL RAINFALL   (mm)=      39.38        39.38         39.38
     RUNOFF COEFFICIENT   =       0.98         0.28          0.45

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0032)|   Area    (ha)=   0.66
|ID= 1 DT=10.0 min |   Total Imp(%)=  36.00   Dir. Conn.(%)=  10.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.42
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      66.33        40.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82        14.53
               over (min)       10.00        20.00
     Storage Coeff.  (min)=       2.20 (ii)   17.46 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.06
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.01          0.020 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      38.58         8.68         11.66
     TOTAL RAINFALL   (mm)=      39.38        39.38         39.38
     RUNOFF COEFFICIENT   =       0.98         0.22          0.30

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0033)|   Area    (ha)=   0.80
|ID= 1 DT=10.0 min |   Total Imp(%)=  48.00   Dir. Conn.(%)=  13.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.38         0.42
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      73.03        40.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82        20.10
               over (min)       10.00        20.00
     Storage Coeff.  (min)=       2.33 (ii)   15.74 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.06
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.02          0.031 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      38.58         9.98         13.69
     TOTAL RAINFALL   (mm)=      39.38        39.38         39.38
     RUNOFF COEFFICIENT   =       0.98         0.25          0.35

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
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THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
STANDHYD (0034)	Area (ha)= 0.67			
ID= 1 DT=10.0 min	Total Imp(%)= 42.00	Dir. Conn.(%)= 18.00		

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.28	0.39	
Dep. Storage	(mm)=	0.80	1.50	
Average Slope	(%)=	1.00	2.00	
Length	(m)=	66.83	40.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)	=	78.82	14.68	
over (min)		10.00	20.00	
Storage Coeff. (min)	=	2.21 (ii)	17.41 (ii)	
Unit Hyd. Tpeak (min)	=	10.00	20.00	
Unit Hyd. peak (cms)	=	0.17	0.06	
				TOTALS
PEAK FLOW	(cms)=	0.03	0.01	0.031 (iii)
TIME TO PEAK	(hrs)=	1.50	1.67	1.50
RUNOFF VOLUME	(mm)=	38.58	8.72	14.08
TOTAL RAINFALL	(mm)=	39.38	39.38	39.38
RUNOFF COEFFICIENT	=	0.98	0.22	0.36

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 58.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
STANDHYD (0035)	Area (ha)= 0.65			
ID= 1 DT=10.0 min	Total Imp(%)= 30.00	Dir. Conn.(%)= 11.00		

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.19	0.45	
Dep. Storage	(mm)=	0.80	1.50	
Average Slope	(%)=	1.00	2.00	
Length	(m)=	65.83	40.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)	=	78.82	12.01	
over (min)		10.00	20.00	
Storage Coeff. (min)	=	2.19 (ii)	18.66 (ii)	
Unit Hyd. Tpeak (min)	=	10.00	20.00	
Unit Hyd. peak (cms)	=	0.17	0.06	
				TOTALS
PEAK FLOW	(cms)=	0.02	0.01	0.020 (iii)
TIME TO PEAK	(hrs)=	1.50	1.67	1.50
RUNOFF VOLUME	(mm)=	38.58	7.98	11.33
TOTAL RAINFALL	(mm)=	39.38	39.38	39.38
RUNOFF COEFFICIENT	=	0.98	0.20	0.29

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 58.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
STANDHYD (0062)	Area (ha)= 0.51			
ID= 1 DT=10.0 min	Total Imp(%)= 66.00	Dir. Conn.(%)= 16.00		

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.34	0.17	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	1.00	2.00	
Length	(m)=	58.31	40.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)	=	78.82	58.48	
over (min)		10.00	20.00	
Storage Coeff. (min)	=	2.03 (ii)	10.78 (ii)	
Unit Hyd. Tpeak (min)	=	10.00	20.00	
Unit Hyd. peak (cms)	=	0.17	0.08	
				TOTALS
PEAK FLOW	(cms)=	0.02	0.02	0.026 (iii)
TIME TO PEAK	(hrs)=	1.50	1.67	1.50
RUNOFF VOLUME	(mm)=	38.38	13.28	17.29
TOTAL RAINFALL	(mm)=	39.38	39.38	39.38
RUNOFF COEFFICIENT	=	0.97	0.34	0.44

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 58.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
STANDHYD (0064)	Area (ha)= 2.02			
ID= 1 DT=10.0 min	Total Imp(%)= 55.00	Dir. Conn.(%)= 23.00		

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.11	0.91	
Dep. Storage	(mm)=	1.00	16.50	
Average Slope	(%)=	1.00	2.00	
Length	(m)=	116.05	40.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)	=	78.82	10.61	
over (min)		10.00	30.00	
Storage Coeff. (min)	=	3.07 (ii)	20.38 (ii)	
Unit Hyd. Tpeak (min)	=	10.00	30.00	
Unit Hyd. peak (cms)	=	0.16	0.05	
				TOTALS
PEAK FLOW	(cms)=	0.10	0.02	0.102 (iii)
TIME TO PEAK	(hrs)=	1.50	2.00	1.50
RUNOFF VOLUME	(mm)=	38.39	6.45	13.79
TOTAL RAINFALL	(mm)=	39.38	39.38	39.38
RUNOFF COEFFICIENT	=	0.97	0.16	0.35

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 58.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0076)	OVERFLOW IS ON			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0600	0.0600

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0064)	2.020	0.102	1.50	13.79
OUTFLOW: ID= 1 (0076)	2.020	0.015	3.08	13.66
OVERFLOW:ID= 3 (0003)	0.000	0.000	0.00	0.00

TOTAL NUMBER OF SIMULATION OVERFLOW = 0
CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00
PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

PEAK FLOW REDUCTION [Qout/Qin](%)= 14.40
TIME SHIFT OF PEAK FLOW (min)= 95.00
MAXIMUM STORAGE USED (ha.m.)= 0.0146

CALIB				
STANDHYD (0068)	Area (ha)= 0.41			
ID= 1 DT=10.0 min	Total Imp(%)= 45.00	Dir. Conn.(%)= 17.00		

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.18	0.23	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	1.00	2.00	
Length	(m)=	52.28	40.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)	=	78.82	16.59	
over (min)		10.00	20.00	
Storage Coeff. (min)	=	1.90 (ii)	16.38 (ii)	
Unit Hyd. Tpeak (min)	=	10.00	20.00	
Unit Hyd. peak (cms)	=	0.17	0.06	
				TOTALS
PEAK FLOW	(cms)=	0.02	0.01	0.019 (iii)
TIME TO PEAK	(hrs)=	1.50	1.67	1.50
RUNOFF VOLUME	(mm)=	38.38	9.20	14.13
TOTAL RAINFALL	(mm)=	39.38	39.38	39.38
RUNOFF COEFFICIENT	=	0.97	0.23	0.36

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 58.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
STANDHYD (0069)	Area (ha)= 0.86			
ID= 1 DT=10.0 min	Total Imp(%)= 39.00	Dir. Conn.(%)= 15.00		

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.34	0.52	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	1.00	2.00	
Length	(m)=	75.72	40.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)	=	78.82	14.29	
over (min)		10.00	20.00	
Storage Coeff. (min)	=	2.38 (ii)	17.75 (ii)	
Unit Hyd. Tpeak (min)	=	10.00	20.00	
Unit Hyd. peak (cms)	=	0.17	0.06	
				TOTALS
PEAK FLOW	(cms)=	0.03	0.01	0.035 (iii)
TIME TO PEAK	(hrs)=	1.50	1.67	1.50
RUNOFF VOLUME	(mm)=	38.39	8.62	13.07
TOTAL RAINFALL	(mm)=	39.38	39.38	39.38
RUNOFF COEFFICIENT	=	0.97	0.22	0.33

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

21-173 Cottonwood Condominiums
Visual OTTHYMO MODEL

```
          CN*  =  58.0    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  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):     0.59   0.026     1.50    14.19
     + ID2= 2 (  0025):     0.52   0.039     1.50    18.28
       ================================================
       ID = 3 (  0027):     1.11   0.065     1.50    16.11

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

-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     1.11   0.065     1.50    16.11
     + ID2= 2 (  0026):     0.48   0.020     1.50    14.16
       ================================================
       ID = 1 (  0027):     1.59   0.084     1.50    15.52

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

-------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     1.59   0.084     1.50    15.52
     + ID2= 2 (  0028):     0.61   0.028     1.50    16.14
       ================================================
       ID = 3 (  0027):     2.20   0.112     1.50    15.69

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

-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     2.20   0.112     1.50    15.69
     + ID2= 2 (  0030):     0.33   0.021     1.50    17.80
       ================================================
       ID = 1 (  0027):     2.53   0.133     1.50    15.96

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

-------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     2.53   0.133     1.50    15.96
     + ID2= 2 (  0032):     0.66   0.020     1.50    11.66
       ================================================
       ID = 3 (  0027):     3.19   0.153     1.50    15.07

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

-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     3.19   0.153     1.50    15.07
     + ID2= 2 (  0033):     0.80   0.031     1.50    13.69
       ================================================
       ID = 1 (  0027):     3.99   0.184     1.50    14.80

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

-------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     3.99   0.184     1.50    14.80
     + ID2= 2 (  0034):     0.67   0.031     1.50    14.08
       ================================================
       ID = 3 (  0027):     4.66   0.215     1.50    14.69

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

-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     4.66   0.215     1.50    14.69
     + ID2= 2 (  0035):     0.65   0.020     1.50    11.33
       ================================================
       ID = 1 (  0027):     5.31   0.235     1.50    14.28

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

-------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     5.31   0.235     1.50    14.28
     + ID2= 2 (  0062):     0.51   0.026     1.50    17.29
       ================================================
       ID = 3 (  0027):     5.82   0.261     1.50    14.55

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

-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     5.82   0.261     1.50    14.55
     + ID2= 2 (  0068):     0.41   0.019     1.50    14.13
       ================================================
       ID = 1 (  0027):     6.23   0.280     1.50    14.52

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

-------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     6.23   0.280     1.50    14.52
     + ID2= 2 (  0069):     0.86   0.035     1.50    13.07
       ================================================
       ID = 3 (  0027):     7.09   0.314     1.50    14.34

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

-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     7.09   0.314     1.50    14.34
     + ID2= 2 (  0076):     2.02   0.015     3.08    13.66
       ================================================
       ID = 1 (  0027):     9.11   0.321     1.50    14.19

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

-------------------
| CALIB            |
| STANDHYD (  0065)|   Area    (ha)=   0.49
|ID= 1 DT=10.0 min |   Total Imp(%)=  26.00   Dir. Conn.(%)=  17.00
-------------------

                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.13         0.36
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      57.15        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82         9.44
               over (min)        10.00        30.00
     Storage Coeff.  (min)=       2.01 (ii)   20.15 (ii)
     Unit Hyd. Tpeak (min)=      10.00        30.00
     Unit Hyd. peak  (cms)=       0.17         0.05
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.01          0.020 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.83           1.50
     RUNOFF VOLUME    (mm)=      38.38         7.17          12.45
     TOTAL RAINFALL   (mm)=      39.38        39.38          39.38
     RUNOFF COEFFICIENT   =       0.97         0.18           0.32

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

-------------------
| CALIB            |
| STANDHYD (  0066)|   Area    (ha)=   0.25
|ID= 1 DT=10.0 min |   Total Imp(%)=  49.00   Dir. Conn.(%)=  31.00
-------------------

                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.12         0.13
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      40.82        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      78.82        13.51
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       1.64 (ii)   17.36 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.06
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.00          0.018 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67           1.50
     RUNOFF VOLUME    (mm)=      38.39         8.41          17.65
     TOTAL RAINFALL   (mm)=      39.38        39.38          39.38
     RUNOFF COEFFICIENT   =       0.97         0.21           0.45

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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  (  0067)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0065):     0.49   0.020     1.50    12.45
     + ID2= 2 (  0066):     0.25   0.018     1.50    17.65
       ================================================
       ID = 3 (  0067):     0.74   0.038     1.50    14.20
```

21-173 Cottonwood Condominiums
Visual OTTHYMO MODEL

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

DUHYD (0024)				
Inlet Cap.= 0.057				
#of Inlets= 1				
Total(cms)= 0.1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	0.74	0.04	1.50	14.20
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	0.74	0.04	1.50	14.20

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0031) | 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0024):	0.74	0.038	1.50	14.20
+ ID2= 2 (0027):	9.11	0.321	1.50	14.19
ID = 3 (0031):	9.85	0.359	1.50	14.19

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0031) | 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0031):	9.85	0.359	1.50	14.19
+ ID2= 2 (0071):	0.71	0.009	1.50	5.15
ID = 1 (0031):	10.56	0.368	1.50	13.58

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0029) | IN= 2---> OUT= 1 | DT= 1.0 min	OVERFLOW IS ON			
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.1080	0.2030
	0.0085	0.0227	0.1807	0.2551
	0.0130	0.0491	0.2663	0.3117
	0.0163	0.0772	0.3630	0.3731
	0.0190	0.1119	0.4697	0.4393
	0.0512	0.1553	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0031)	10.560	0.368	1.50	13.58
OUTFLOW: ID= 1 (0029)	10.560	0.019	4.50	12.95
OVERFLOW:ID= 3 (0003)	0.000	0.000	0.00	0.00

TOTAL NUMBER OF SIMULATION OVERFLOW = 0
CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00
PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

PEAK FLOW REDUCTION [Qout/Qin](%)= 5.16
TIME SHIFT OF PEAK FLOW (min)=180.00
MAXIMUM STORAGE USED (ha.m.)= 0.1116

CALIB | STANDHYD (0063) | ID= 1 DT=10.0 min	Area (ha)= 0.31	Total Imp(%)= 41.00	Dir. Conn.(%)= 0.00	
	IMPERVIOUS	PERVIOUS (i)		
Surface Area (ha)=	0.13	0.18		
Dep. Storage (mm)=	1.00	1.50		
Average Slope (%)=	1.00	2.00		
Length (m)=	45.46	40.00		
Mannings n =	0.013	0.250		
Max.Eff.Inten.(mm/hr)=	78.82	20.59		
over (min)	10.00	20.00		
Storage Coeff. (min)=	1.75 (ii)	15.03 (ii)		
Unit Hyd. Tpeak (min)=	10.00	20.00		
Unit Hyd. peak (cms)=	0.17	0.07		
			TOTALS	
PEAK FLOW (cms)=	0.00	0.01	0.007 (iii)	
TIME TO PEAK (hrs)=	1.50	1.67	1.67	
RUNOFF VOLUME (mm)=	38.38	10.08	10.05	
TOTAL RAINFALL (mm)=	39.38	39.38	39.38	
RUNOFF COEFFICIENT =	0.97	0.26	0.26	

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 58.0 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 (0037) | 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
*** W A R N I N G : HYDROGRAPH 0024 <ID= 1> IS DRY.				
*** W A R N I N G : HYDROGRAPH 0037 = HYDROGRAPH 0029				
ID1= 1 (0024):	0.00	0.000	0.00	0.00
+ ID2= 2 (0029):	10.56	0.019	4.50	12.95
ID = 3 (0037):	10.56	0.019	4.50	12.95

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0037) | 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0037):	10.56	0.019	4.50	12.95
+ ID2= 2 (0038):	0.09	0.000	1.83	2.35
ID = 1 (0037):	10.65	0.019	4.28	12.87

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0037) | 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0037):	10.65	0.019	4.28	12.87
+ ID2= 2 (0063):	0.31	0.007	1.67	10.05
ID = 3 (0037):	10.96	0.020	4.00	12.79

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0037) | 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0037):	10.96	0.020	4.00	12.79
+ ID2= 2 (0070):	1.74	0.006	1.83	2.41
ID = 1 (0037):	12.70	0.026	1.83	11.36

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

21-173 Cottonwood Condominiums
Visual OTTHYMO MODEL

5-YEAR STORM

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================================================================================

       V    V   I    SSSSS  U   U    A    L             (v 6.2.2007)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\Natalie\AppData\Local\Civica\VH5\b59b925c-1a86-4318-
8861-e38dc4dfd2f8\ad9fd6f1-f1e3-4b67-9dcd-5a39c842545c\scen
  Summary filename: C:\Users\Natalie\AppData\Local\Civica\VH5\b59b925c-1a86-4318-
8861-e38dc4dfd2f8\ad9fd6f1-f1e3-4b67-9dcd-5a39c842545c\scen


DATE: 06/07/2022                          TIME: 10:59:28

USER:


COMMENTS: _____

--------------------------------------------------------------------------------
  ************************************************
  ** SIMULATION : Run 02                        **
  ************************************************


--------------------
|    READ STORM    |    Filename: C:\Users\Natalie\AppD
|                  |              ata\Local\Temp\
|                  |              1577726c-47d7-46fc-bc76-c65d8db515e0\34026209
| Ptotal= 48.48 mm |    Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    3.53 |  1.00   10.19 |  2.00    9.15 |  3.00    4.55
                0.17    3.66 |  1.17   21.62 |  2.17    7.70 |  3.17    4.22
                0.33    4.04 |  1.33  112.37 |  2.33    6.68 |  3.33    3.96
                0.50    4.67 |  1.50   27.76 |  2.50    5.94 |  3.50    3.73
                0.67    5.61 |  1.67   15.75 |  2.67    5.39 |  3.67    3.53
                0.83    7.11 |  1.83   11.43 |  2.83    4.93 |  3.83    3.35

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


--------------------
| CALIB            |
| NASHYD   (  0038)|   Area    (ha)=   0.09   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.15

     Unit Hyd Qpeak  (cms)=   0.023

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   4.401
     TOTAL RAINFALL   (mm)=  48.478
     RUNOFF COEFFICIENT   =   0.091

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0070)|   Area    (ha)=   1.74   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.399

     PEAK FLOW       (cms)=   0.017 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   4.503
     TOTAL RAINFALL   (mm)=  48.478
     RUNOFF COEFFICIENT   =   0.093

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0071)|   Area    (ha)=   0.71   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.163

     PEAK FLOW       (cms)=   0.017 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=   7.903
     TOTAL RAINFALL   (mm)=  48.478
     RUNOFF COEFFICIENT   =   0.163

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0023)|   Area    (ha)=   0.59
|ID= 1 DT=10.0 min |   Total Imp(%)=  47.00   Dir. Conn.(%)=  16.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.28         0.31
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      62.72        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37        44.94
               over (min)       10.00        20.00
     Storage Coeff.  (min)=       1.84 (ii)   11.56 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.08
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.02          0.040 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      47.68        13.81         19.22
     TOTAL RAINFALL   (mm)=      48.48        48.48         48.48
     RUNOFF COEFFICIENT   =       0.98         0.28          0.40

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0025)|   Area    (ha)=   0.52
|ID= 1 DT=10.0 min |   Total Imp(%)=  71.00   Dir. Conn.(%)=  14.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.37         0.15
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      58.88        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37       134.97
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.77 (ii)    8.03 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.04          0.064 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=      47.68        20.92         24.66
     TOTAL RAINFALL   (mm)=      48.48        48.48         48.48
     RUNOFF COEFFICIENT   =       0.98         0.43          0.51

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0026)|   Area    (ha)=   0.48
|ID= 1 DT=10.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  14.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.24
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      56.57        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37        52.16
               over (min)       10.00        20.00
     Storage Coeff.  (min)=       1.73 (ii)   10.89 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.08
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.02          0.031 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      47.68        14.66         19.28
     TOTAL RAINFALL   (mm)=      48.48        48.48         48.48
     RUNOFF COEFFICIENT   =       0.98         0.30          0.40

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0028)|   Area    (ha)=   0.61
|ID= 1 DT=10.0 min |   Total Imp(%)=  62.00   Dir. Conn.(%)=  14.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.38         0.23
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      63.77        40.00
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     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37        85.00
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.86 (ii)    9.39 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.04          0.064 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      47.68        17.71          21.90
     TOTAL RAINFALL   (mm)=      48.48        48.48          48.48
     RUNOFF COEFFICIENT   =       0.98         0.37           0.45

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0030)|   Area    (ha)=   0.33
|ID= 1 DT=10.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  25.00
--------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.20         0.13
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      46.90        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37        60.94
               over (min)       10.00        20.00
     Storage Coeff.  (min)=      1.55 (ii)   10.15 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.01          0.032 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67           1.50
     RUNOFF VOLUME    (mm)=      47.68        15.59          23.60
     TOTAL RAINFALL   (mm)=      48.48        48.48          48.48
     RUNOFF COEFFICIENT   =       0.98         0.32           0.49

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0032)|   Area    (ha)=   0.66
|ID= 1 DT=10.0 min |   Total Imp(%)=  36.00   Dir. Conn.(%)=  10.00
--------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.42
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      66.33        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37        24.63
               over (min)       10.00        20.00
     Storage Coeff.  (min)=       1.91 (ii)   14.27 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.07
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.02          0.031 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67           1.50
     RUNOFF VOLUME    (mm)=      47.68        12.61          16.11
     TOTAL RAINFALL   (mm)=      48.48        48.48          48.48
     RUNOFF COEFFICIENT   =       0.98         0.26           0.33

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0033)|   Area    (ha)=   0.80
|ID= 1 DT=10.0 min |   Total Imp(%)=  48.00   Dir. Conn.(%)=  13.00
--------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.38         0.42
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      73.03        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37        49.61
               over (min)       10.00        20.00
     Storage Coeff.  (min)=       2.02 (ii)   11.36 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.03          0.048 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67           1.50
     RUNOFF VOLUME    (mm)=      47.68        14.37          18.69
     TOTAL RAINFALL   (mm)=      48.48        48.48          48.48
     RUNOFF COEFFICIENT   =       0.98         0.30           0.39

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0034)|   Area    (ha)=   0.67
|ID= 1 DT=10.0 min |   Total Imp(%)=  42.00   Dir. Conn.(%)=  18.00
--------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.28         0.39
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      66.83        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37        24.87
               over (min)       10.00        20.00
     Storage Coeff.  (min)=       1.91 (ii)   14.23 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.07
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.02          0.047 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67           1.50
     RUNOFF VOLUME    (mm)=      47.68        12.67          18.96
     TOTAL RAINFALL   (mm)=      48.48        48.48          48.48
     RUNOFF COEFFICIENT   =       0.98         0.26           0.39

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0035)|   Area    (ha)=   0.65
|ID= 1 DT=10.0 min |   Total Imp(%)=  30.00   Dir. Conn.(%)=  11.00
--------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.19         0.45
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      65.83        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37        20.46
               over (min)       10.00        20.00
     Storage Coeff.  (min)=       1.90 (ii)   15.21 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.07
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.02          0.031 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67           1.50
     RUNOFF VOLUME    (mm)=      47.68        11.65          15.60
     TOTAL RAINFALL   (mm)=      48.48        48.48          48.48
     RUNOFF COEFFICIENT   =       0.98         0.24           0.32

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0062)|   Area    (ha)=   0.51
|ID= 1 DT=10.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  16.00
--------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.17
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      58.31        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37        98.97
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.76 (ii)    8.85 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.03          0.059 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      47.48        18.73          23.32
     TOTAL RAINFALL   (mm)=      48.48        48.48          48.48
     RUNOFF COEFFICIENT   =       0.98         0.39           0.48

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
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      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0064)|   Area    (ha)=   2.02
|ID= 1 DT=10.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  23.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.11         0.91
     Dep. Storage     (mm)=       1.00        16.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     116.05        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37        22.11
               over (min)       10.00        20.00
     Storage Coeff.  (min)=       2.67 (ii)   15.57 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.07
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.14         0.04         0.157 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      47.48        10.31         18.85
     TOTAL RAINFALL   (mm)=      48.48        48.48         48.48
     RUNOFF COEFFICIENT   =       0.98         0.21          0.39

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| RESERVOIR(  0076)|     OVERFLOW IS ON
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0600     0.0600

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0064)     2.020     0.157      1.50      18.85
   OUTFLOW: ID= 1 (  0076)     2.020     0.021      2.67      18.73
   OVERFLOW:ID= 3 (  0003)     0.000     0.000      0.00       0.00

                  TOTAL NUMBER OF SIMULATION OVERFLOW  =     0
                  CUMULATIVE TIME OF OVERFLOW  (HOURS) =  0.00
                  PERCENTAGE OF TIME OVERFLOWING   (%) =  0.00

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 13.61
                  TIME SHIFT OF PEAK FLOW         (min)= 70.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0213

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--------------------
| CALIB            |
| STANDHYD (  0068)|   Area    (ha)=   0.41
|ID= 1 DT=10.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  17.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.18         0.23
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      52.28        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37        28.01
               over (min)       10.00        20.00
     Storage Coeff.  (min)=       1.65 (ii)   13.39 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.07
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.01         0.028 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      47.48        13.31         19.10
     TOTAL RAINFALL   (mm)=      48.48        48.48         48.48
     RUNOFF COEFFICIENT   =       0.98         0.27          0.39

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0069)|   Area    (ha)=   0.86
|ID= 1 DT=10.0 min |   Total Imp(%)=  39.00   Dir. Conn.(%)=  15.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.52
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      75.72        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     112.37        24.22
               over (min)       10.00        20.00
     Storage Coeff.  (min)=       2.06 (ii)   14.51 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.07
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.03         0.052 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      47.48        12.52         17.76
     TOTAL RAINFALL   (mm)=      48.48        48.48         48.48
     RUNOFF COEFFICIENT   =       0.98         0.26          0.37

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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  (  0027)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):     0.59   0.040     1.50    19.22
     + ID2= 2 (  0025):     0.52   0.064     1.50    24.66
       ================================================
       ID = 3 (  0027):     1.11   0.104     1.50    21.77

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

--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     1.11   0.104     1.50    21.77
     + ID2= 2 (  0026):     0.48   0.031     1.50    19.28
       ================================================
       ID = 1 (  0027):     1.59   0.135     1.50    21.02

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

--------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     1.59   0.135     1.50    21.02
     + ID2= 2 (  0028):     0.61   0.064     1.50    21.90
       ================================================
       ID = 3 (  0027):     2.20   0.198     1.50    21.26

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

--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     2.20   0.198     1.50    21.26
     + ID2= 2 (  0030):     0.33   0.032     1.50    23.60
       ================================================
       ID = 1 (  0027):     2.53   0.231     1.50    21.57

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     2.53   0.231     1.50    21.57
     + ID2= 2 (  0032):     0.66   0.031     1.50    16.11
       ================================================
       ID = 3 (  0027):     3.19   0.261     1.50    20.44

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

--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     3.19   0.261     1.50    20.44
     + ID2= 2 (  0033):     0.80   0.048     1.50    18.69
       ================================================
       ID = 1 (  0027):     3.99   0.309     1.50    20.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     3.99   0.309     1.50    20.09
     + ID2= 2 (  0034):     0.67   0.047     1.50    18.96
       ================================================
       ID = 3 (  0027):     4.66   0.356     1.50    19.92

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     4.66   0.356     1.50    19.92
     + ID2= 2 (  0035):     0.65   0.031     1.50    15.60
       ================================================
       ID = 1 (  0027):     5.31   0.387     1.50    19.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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| ADD HYD  (  0027)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     5.31   0.387     1.50    19.40
     + ID2= 2 (  0062):     0.51   0.059     1.50    23.32
       ================================================
       ID = 3 (  0027):     5.82   0.446     1.50    19.74

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

------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     5.82   0.446     1.50    19.74
     + ID2= 2 (  0068):     0.41   0.028     1.50    19.10
       ================================================
       ID = 1 (  0027):     6.23   0.474     1.50    19.70

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

------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     6.23   0.474     1.50    19.70
     + ID2= 2 (  0069):     0.86   0.052     1.50    17.76
       ================================================
       ID = 3 (  0027):     7.09   0.527     1.50    19.46

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

------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     7.09   0.527     1.50    19.46
     + ID2= 2 (  0076):     2.02   0.021     2.67    18.73
       ================================================
       ID = 1 (  0027):     9.11   0.535     1.50    19.30

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
------------------
| CALIB            |
| STANDHYD (  0065)|   Area    (ha)=   0.49
|ID= 1 DT=10.0 min |   Total Imp(%)=  26.00   Dir. Conn.(%)=  17.00
------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.13         0.36
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     57.15        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    112.37        16.18
               over (min)      10.00        20.00
     Storage Coeff.  (min)=     1.74 (ii)   16.37 (ii)
     Unit Hyd. Tpeak (min)=    10.00        20.00
     Unit Hyd. peak  (cms)=     0.17         0.06
                                                      *TOTALS*
     PEAK FLOW       (cms)=     0.03         0.01        0.031 (iii)
     TIME TO PEAK    (hrs)=     1.50         1.67         1.50
     RUNOFF VOLUME    (mm)=    47.48        10.53        16.79
     TOTAL RAINFALL   (mm)=    48.48        48.48        48.48
     RUNOFF COEFFICIENT   =     0.98         0.22         0.35

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
------------------
| CALIB            |
| STANDHYD (  0066)|   Area    (ha)=   0.25
|ID= 1 DT=10.0 min |   Total Imp(%)=  49.00   Dir. Conn.(%)=  31.00
------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.12         0.13
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     40.82        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    112.37        22.94
               over (min)      10.00        20.00
     Storage Coeff.  (min)=     1.42 (ii)   14.14 (ii)
     Unit Hyd. Tpeak (min)=    10.00        20.00
     Unit Hyd. peak  (cms)=     0.17         0.07
                                                      *TOTALS*
     PEAK FLOW       (cms)=     0.02         0.01        0.027 (iii)
     TIME TO PEAK    (hrs)=     1.50         1.67         1.50
     RUNOFF VOLUME    (mm)=    47.48        12.24        23.13
     TOTAL RAINFALL   (mm)=    48.48        48.48        48.48
     RUNOFF COEFFICIENT   =     0.98         0.25         0.48

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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  (  0067)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0065):     0.49   0.031     1.50    16.79
     + ID2= 2 (  0066):     0.25   0.027     1.50    23.13
       ================================================
       ID = 3 (  0067):     0.74   0.058     1.50    18.93

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
------------------
| DUHYD    (  0024)|
| Inlet Cap.= 0.057|
| #of Inlets=    1|
| Total(cms)=   0.1|      AREA     QPEAK     TPEAK    R.V.
------------------           (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   0.74      0.06      1.50   18.93
     ================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      1.50   18.93
     MINOR SYS.(ID= 3):   0.74      0.06      1.50   18.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

------------------
| ADD HYD  (  0031)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0024):     0.74   0.057     1.50    18.93
     + ID2= 2 (  0027):     9.11   0.535     1.50    19.30
       ================================================
       ID = 3 (  0031):     9.85   0.592     1.50    19.27

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

------------------
| ADD HYD  (  0031)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0031):     9.85   0.592     1.50    19.27
     + ID2= 2 (  0071):     0.71   0.017     1.50     7.90
       ================================================
       ID = 1 (  0031):    10.56   0.609     1.50    18.51

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
------------------
| RESERVOIR(  0029)|     OVERFLOW IS ON
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.1080     0.2030
                          0.0085     0.0227   |   0.1807     0.2551
                          0.0130     0.0491   |   0.2663     0.3117
                          0.0163     0.0772   |   0.3630     0.3731
                          0.0190     0.1119   |   0.4697     0.4393
                          0.0512     0.1553   |   0.0000     0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0031)     10.556      0.609      1.50      18.51
   OUTFLOW: ID= 1 (  0029)     10.556      0.044      4.15      17.59
   OVERFLOW:ID= 3 (  0003)      0.000      0.000      0.00       0.00

                  TOTAL NUMBER OF SIMULATION OVERFLOW  =     0
                  CUMULATIVE TIME OF OVERFLOW  (HOURS) =  0.00
                  PERCENTAGE OF TIME OVERFLOWING   (%) =  0.00

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.25
                  TIME SHIFT OF PEAK FLOW         (min)=159.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1458

--------------------------------------------------------------------------------
------------------
| CALIB            |
| STANDHYD (  0063)|   Area    (ha)=   0.31
|ID= 1 DT=10.0 min |   Total Imp(%)=  41.00   Dir. Conn.(%)=   0.00
------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.13         0.18
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     45.46        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    112.37        50.79
               over (min)      10.00        20.00
     Storage Coeff.  (min)=     1.52 (ii)   10.77 (ii)
     Unit Hyd. Tpeak (min)=    10.00        20.00
     Unit Hyd. peak  (cms)=     0.17         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=     0.00         0.01        0.015 (iii)
     TIME TO PEAK    (hrs)=     1.50         1.67         1.67
     RUNOFF VOLUME    (mm)=    47.48        14.51        14.49
     TOTAL RAINFALL   (mm)=    48.48        48.48        48.48
     RUNOFF COEFFICIENT   =     0.98         0.30         0.30

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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Visual OTTHYMO MODEL

```
| ADD HYD  (  0037)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0024):     0.00   0.001     1.50    18.93
     + ID2= 2 (  0029):    10.56   0.044     4.15    17.59
       ================================================
       ID = 3 (  0037):    10.56   0.044     4.15    17.59

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

--------------------
| ADD HYD  (  0037)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0037):    10.56   0.044     4.15    17.59
     + ID2= 2 (  0038):     0.09   0.001     1.67     4.40
       ================================================
       ID = 1 (  0037):    10.65   0.044     4.12    17.48

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

--------------------
| ADD HYD  (  0037)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0037):    10.65   0.044     4.12    17.48
     + ID2= 2 (  0063):     0.31   0.015     1.67    14.49
       ================================================
       ID = 3 (  0037):    10.96   0.046     4.07    17.40

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

--------------------
| ADD HYD  (  0037)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0037):    10.96   0.046     4.07    17.40
     + ID2= 2 (  0070):     1.74   0.017     1.67     4.50
       ================================================
       ID = 1 (  0037):    12.70   0.050     4.00    15.63

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

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Visual OTTHYMO MODEL

10-YEAR STORM

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

       V    V   I    SSSSS  U   U    A    L             (v 6.2.2007)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\Natalie\AppData\Local\Civica\VH5\b59b925c-1a86-4318-
8861-e38dc4dfd2f8\81dabb97-7c31-40df-9e11-203efa1e4d45\scen
  Summary filename: C:\Users\Natalie\AppData\Local\Civica\VH5\b59b925c-1a86-4318-
8861-e38dc4dfd2f8\81dabb97-7c31-40df-9e11-203efa1e4d45\scen


DATE: 06/07/2022                          TIME: 10:59:28

USER:


COMMENTS: _____________________________________________________________

--------------------------------------------------------------------------------
  ************************************************
  ** SIMULATION : Run 03                        **
  ************************************************


--------------------
|    READ STORM    |    Filename: C:\Users\Natalie\AppD
|                  |              ata\Local\Temp\
|                  |              1577726c-47d7-46fc-bc76-c65d8db515e0\458e0cb6
| Ptotal= 56.08 mm |    Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    3.58 |  1.00   11.51 |  2.00   10.31 |  3.00    5.05
                0.17    3.99 |  1.17   25.32 |  2.17    8.66 |  3.17    4.70
                0.33    4.50 |  1.33  133.60 |  2.33    7.52 |  3.33    4.39
                0.50    5.21 |  1.50   32.00 |  2.50    6.65 |  3.50    4.14
                0.67    6.27 |  1.67   19.73 |  2.67    5.38 |  3.67    3.91
                0.83    8.00 |  1.83   12.95 |  2.83    5.49 |  3.83    3.63

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

--------------------
| CALIB            |
| NASHYD   (  0038)|   Area    (ha)=   0.09   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.15

     Unit Hyd Qpeak  (cms)=   0.023

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   6.514
     TOTAL RAINFALL   (mm)=  56.083
     RUNOFF COEFFICIENT   =   0.116

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0070)|   Area    (ha)=   1.74   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.399

     PEAK FLOW       (cms)=   0.028 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   6.665
     TOTAL RAINFALL   (mm)=  56.083
     RUNOFF COEFFICIENT   =   0.119

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0071)|   Area    (ha)=   0.71   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.163

     PEAK FLOW       (cms)=   0.024 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  10.556
     TOTAL RAINFALL   (mm)=  56.083
     RUNOFF COEFFICIENT   =   0.188

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0023)|   Area    (ha)=   0.59
|ID= 1 DT=10.0 min |   Total Imp(%)=  47.00   Dir. Conn.(%)=  16.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.28         0.31
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      62.72        40.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     133.60        60.21
               over (min)       10.00        20.00
     Storage Coeff.  (min)=       1.72 (ii)   10.37 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.08
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.03          0.050 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      55.28        17.76         23.76
     TOTAL RAINFALL   (mm)=      56.08        56.08         56.08
     RUNOFF COEFFICIENT   =       0.99         0.32          0.42

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0025)|   Area    (ha)=   0.52
|ID= 1 DT=10.0 min |   Total Imp(%)=  71.00   Dir. Conn.(%)=  14.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.37         0.15
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      58.88        40.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     133.60       176.58
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.66 (ii)    7.28 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.06          0.084 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=      55.28        26.27         30.32
     TOTAL RAINFALL   (mm)=      56.08        56.08         56.08
     RUNOFF COEFFICIENT   =       0.99         0.47          0.54

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0026)|   Area    (ha)=   0.48
|ID= 1 DT=10.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  14.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.24
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      56.57        40.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     133.60        69.68
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.62 (ii)    9.77 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.03          0.056 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=      55.28        18.80         23.90
     TOTAL RAINFALL   (mm)=      56.08        56.08         56.08
     RUNOFF COEFFICIENT   =       0.99         0.34          0.43

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0028)|   Area    (ha)=   0.61
|ID= 1 DT=10.0 min |   Total Imp(%)=  62.00   Dir. Conn.(%)=  14.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.38         0.23
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      63.77        40.00
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     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     133.60       112.41
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.74 (ii)    8.47 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.05          0.083 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      55.28        22.47          27.06
     TOTAL RAINFALL   (mm)=      56.08        56.08          56.08
     RUNOFF COEFFICIENT   =       0.99         0.40           0.48

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0030)|   Area    (ha)=   0.33
|ID= 1 DT=10.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  25.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.20         0.13
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      46.90        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     133.60        81.15
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.44 (ii)    9.12 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.02          0.051 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      55.28        19.93          28.75
     TOTAL RAINFALL   (mm)=      56.08        56.08          56.08
     RUNOFF COEFFICIENT   =       0.99         0.36           0.51

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0032)|   Area    (ha)=   0.66
|ID= 1 DT=10.0 min |   Total Imp(%)=  36.00   Dir. Conn.(%)=  10.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.42
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      66.33        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     133.60        48.49
               over (min)       10.00        20.00
     Storage Coeff.  (min)=      1.78 (ii)   11.21 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.03          0.040 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67           1.50
     RUNOFF VOLUME    (mm)=      55.28        16.29          20.18
     TOTAL RAINFALL   (mm)=      56.08        56.08          56.08
     RUNOFF COEFFICIENT   =       0.99         0.29           0.36

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0033)|   Area    (ha)=   0.80
|ID= 1 DT=10.0 min |   Total Imp(%)=  48.00   Dir. Conn.(%)=  13.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.38         0.42
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      73.03        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     133.60        66.34
               over (min)       10.00        20.00
     Storage Coeff.  (min)=      1.88 (ii)   10.20 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.04          0.060 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67           1.50
     RUNOFF VOLUME    (mm)=      55.28        18.44          23.23
     TOTAL RAINFALL   (mm)=      56.08        56.08          56.08
     RUNOFF COEFFICIENT   =       0.99         0.33           0.41

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0034)|   Area    (ha)=   0.67
|ID= 1 DT=10.0 min |   Total Imp(%)=  42.00   Dir. Conn.(%)=  18.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.28         0.39
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      66.83        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     133.60        48.96
               over (min)       10.00        20.00
     Storage Coeff.  (min)=      1.79 (ii)   11.18 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.03          0.059 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67           1.50
     RUNOFF VOLUME    (mm)=      55.28        16.35          23.35
     TOTAL RAINFALL   (mm)=      56.08        56.08          56.08
     RUNOFF COEFFICIENT   =       0.99         0.29           0.42

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0035)|   Area    (ha)=   0.65
|ID= 1 DT=10.0 min |   Total Imp(%)=  30.00   Dir. Conn.(%)=  11.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.19         0.45
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      65.83        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     133.60        27.32
               over (min)       10.00        20.00
     Storage Coeff.  (min)=      1.77 (ii)   13.63 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.07
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.03          0.039 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67           1.50
     RUNOFF VOLUME    (mm)=      55.28        15.10          19.51
     TOTAL RAINFALL   (mm)=      56.08        56.08          56.08
     RUNOFF COEFFICIENT   =       0.99         0.27           0.35

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0062)|   Area    (ha)=   0.51
|ID= 1 DT=10.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  16.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.17
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      58.31        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     133.60       130.43
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.65 (ii)    7.99 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.05          0.076 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      55.08        23.69          28.70
     TOTAL RAINFALL   (mm)=      56.08        56.08          56.08
     RUNOFF COEFFICIENT   =       0.98         0.42           0.51

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
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      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0064)|   Area    (ha)=   2.02
|ID= 1 DT=10.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  23.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.11         0.91
     Dep. Storage     (mm)=       1.00        16.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     116.05        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     133.60        44.75
               over (min)       10.00        20.00
     Storage Coeff.  (min)=       2.49 (ii)   12.22 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.07
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.17         0.06          0.195 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67           1.50
     RUNOFF VOLUME    (mm)=      55.08        14.01          23.45
     TOTAL RAINFALL   (mm)=      56.08        56.08          56.08
     RUNOFF COEFFICIENT   =       0.98         0.25           0.42

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| RESERVOIR(  0076)|     OVERFLOW IS ON
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0600     0.0600

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0064)     2.020     0.195      1.50      23.45
   OVERFLOW: ID= 1 (  0076)    2.020     0.027      2.58      23.33
   OVERFLOW:ID= 3 (  0003)     0.000     0.000      0.00       0.00

                  TOTAL NUMBER OF SIMULATION OVERFLOW  =     0
                  CUMULATIVE TIME OF OVERFLOW  (HOURS) =  0.00
                  PERCENTAGE OF TIME OVERFLOWING   (%) =  0.00

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 13.96
                  TIME SHIFT OF PEAK FLOW         (min)= 65.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0272

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0068)|   Area    (ha)=   0.41
|ID= 1 DT=10.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  17.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.18         0.23
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      52.28        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     133.60        55.12
               over (min)       10.00        20.00
     Storage Coeff.  (min)=       1.54 (ii)   10.50 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.02          0.036 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67           1.50
     RUNOFF VOLUME    (mm)=      55.08        17.15          23.58
     TOTAL RAINFALL   (mm)=      56.08        56.08          56.08
     RUNOFF COEFFICIENT   =       0.98         0.31           0.42

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0069)|   Area    (ha)=   0.86
|ID= 1 DT=10.0 min |   Total Imp(%)=  39.00   Dir. Conn.(%)=  15.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.52
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      75.72        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     133.60        47.69
               over (min)       10.00        20.00
     Storage Coeff.  (min)=       1.93 (ii)   11.42 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.05         0.04          0.066 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67           1.50
     RUNOFF VOLUME    (mm)=      55.08        16.18          22.00
     TOTAL RAINFALL   (mm)=      56.08        56.08          56.08
     RUNOFF COEFFICIENT   =       0.98         0.29           0.39

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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  (  0027)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):     0.59   0.050     1.50    23.76
     + ID2= 2 (  0025):     0.52   0.084     1.50    30.32
       ================================================
       ID = 3 (  0027):     1.11   0.133     1.50    26.83

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

--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     1.11   0.133     1.50    26.83
     + ID2= 2 (  0026):     0.48   0.056     1.50    23.90
       ================================================
       ID = 1 (  0027):     1.59   0.189     1.50    25.95

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

--------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     1.59   0.189     1.50    25.95
     + ID2= 2 (  0028):     0.61   0.083     1.50    27.06
       ================================================
       ID = 3 (  0027):     2.20   0.273     1.50    26.25

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

--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     2.20   0.273     1.50    26.25
     + ID2= 2 (  0030):     0.33   0.051     1.50    28.75
       ================================================
       ID = 1 (  0027):     2.53   0.324     1.50    26.58

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

--------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     2.53   0.324     1.50    26.58
     + ID2= 2 (  0032):     0.66   0.040     1.50    20.18
       ================================================
       ID = 3 (  0027):     3.19   0.364     1.50    25.26

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

--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     3.19   0.364     1.50    25.26
     + ID2= 2 (  0033):     0.80   0.060     1.50    23.23
       ================================================
       ID = 1 (  0027):     3.99   0.424     1.50    24.85

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

--------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     3.99   0.424     1.50    24.85
     + ID2= 2 (  0034):     0.67   0.059     1.50    23.35
       ================================================
       ID = 3 (  0027):     4.66   0.483     1.50    24.63

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     4.66   0.483     1.50    24.63
     + ID2= 2 (  0035):     0.65   0.039     1.50    19.51
       ================================================
       ID = 1 (  0027):     5.31   0.522     1.50    24.01

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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21-173 Cottonwood Condominiums
Visual OTTHYMO MODEL

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| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     5.31   0.522     1.50    24.01
     + ID2= 2 (  0062):     0.51   0.076     1.50    28.70
       ================================================
       ID = 3 (  0027):     5.82   0.598     1.50    24.42

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

-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     5.82   0.598     1.50    24.42
     + ID2= 2 (  0068):     0.41   0.036     1.50    23.58
       ================================================
       ID = 1 (  0027):     6.23   0.634     1.50    24.36

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

-------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     6.23   0.634     1.50    24.36
     + ID2= 2 (  0069):     0.86   0.066     1.50    22.00
       ================================================
       ID = 3 (  0027):     7.09   0.700     1.50    24.08

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

-------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     7.09   0.700     1.50    24.08
     + ID2= 2 (  0076):     2.02   0.027     2.58    23.33
       ================================================
       ID = 1 (  0027):     9.11   0.710     1.50    23.91

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0065)|   Area    (ha)=   0.49
|ID= 1 DT=10.0 min |   Total Imp(%)=  26.00   Dir. Conn.(%)=  17.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.13         0.36
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     57.15        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    133.60        21.71
               over (min)      10.00        20.00
     Storage Coeff.  (min)=     1.63 (ii)   14.63 (ii)
     Unit Hyd. Tpeak (min)=    10.00        20.00
     Unit Hyd. peak  (cms)=     0.17         0.07
                                                      *TOTALS*
     PEAK FLOW       (cms)=     0.03         0.02          0.038 (iii)
     TIME TO PEAK    (hrs)=     1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=    55.08        13.70         20.71
     TOTAL RAINFALL   (mm)=    56.08        56.08         56.08
     RUNOFF COEFFICIENT   =     0.98         0.24          0.37

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB            |
| STANDHYD (  0066)|   Area    (ha)=   0.25
|ID= 1 DT=10.0 min |   Total Imp(%)=  49.00   Dir. Conn.(%)=  31.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.12         0.13
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     40.82        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    133.60        45.18
               over (min)      10.00        20.00
     Storage Coeff.  (min)=     1.33 (ii)   11.03 (ii)
     Unit Hyd. Tpeak (min)=    10.00        20.00
     Unit Hyd. peak  (cms)=     0.17         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=     0.03         0.01          0.033 (iii)
     TIME TO PEAK    (hrs)=     1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=    55.08        15.83         27.98
     TOTAL RAINFALL   (mm)=    56.08        56.08         56.08
     RUNOFF COEFFICIENT   =     0.98         0.28          0.50

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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  (  0067)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0065):     0.49   0.038     1.50    20.71
     + ID2= 2 (  0066):     0.25   0.033     1.50    27.98
       ================================================
       ID = 3 (  0067):     0.74   0.072     1.50    23.17

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| DUHYD    (  0024)|
| Inlet Cap.= 0.057|
| #of Inlets=    1|
| Total(cms)=   0.1|      AREA     QPEAK     TPEAK    R.V.
-------------------          (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   0.74      0.07      1.50   23.17
     ================================================
     MAJOR SYS.(ID= 2):   0.04      0.01      1.50   23.17
     MINOR SYS.(ID= 3):   0.70      0.06      1.50   23.17

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD  (  0031)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0024):     0.70   0.057     1.50    23.17
     + ID2= 2 (  0027):     9.11   0.710     1.50    23.91
       ================================================
       ID = 3 (  0031):     9.81   0.767     1.50    23.86

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

-------------------
| ADD HYD  (  0031)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0031):     9.81   0.767     1.50    23.86
     + ID2= 2 (  0071):     0.71   0.024     1.50    10.56
       ================================================
       ID = 1 (  0031):    10.52   0.791     1.50    22.96

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  0029)|     OVERFLOW IS ON
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.1080     0.2030
                          0.0085     0.0227   |   0.1807     0.2551
                          0.0130     0.0491   |   0.2663     0.3117
                          0.0163     0.0772   |   0.3630     0.3731
                          0.0190     0.1119   |   0.4697     0.4393
                          0.0512     0.1553   |   0.0000     0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0031)     10.522      0.791      1.50      22.96
   OUTFLOW: ID= 1 (  0029)     10.522      0.069      4.05      21.89
   OVERFLOW:ID= 3 (  0003)      0.000      0.000      0.00       0.00

                  TOTAL NUMBER OF SIMULATION OVERFLOW  =     0
                  CUMULATIVE TIME OF OVERFLOW  (HOURS) =  0.00
                  PERCENTAGE OF TIME OVERFLOWING   (%) =  0.00

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  8.69
                  TIME SHIFT OF PEAK FLOW         (min)=153.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1700

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0063)|   Area    (ha)=   0.31
|ID= 1 DT=10.0 min |   Total Imp(%)=  41.00   Dir. Conn.(%)=   0.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.13         0.18
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     45.46        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    133.60        67.89
               over (min)      10.00        10.00
     Storage Coeff.  (min)=     1.42 (ii)    9.66 (ii)
     Unit Hyd. Tpeak (min)=    10.00        10.00
     Unit Hyd. peak  (cms)=     0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=     0.00         0.02          0.023 (iii)
     TIME TO PEAK    (hrs)=     1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=    55.08        18.61         18.59
     TOTAL RAINFALL   (mm)=    56.08        56.08         56.08
     RUNOFF COEFFICIENT   =     0.98         0.33          0.33

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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21-173 Cottonwood Condominiums
Visual OTTHYMO MODEL

```
| ADD HYD  (  0037)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0024):     0.04   0.015     1.50    23.17
     + ID2= 2 (  0029):    10.52   0.069     4.05    21.89
       ================================================
       ID = 3 (  0037):    10.56   0.069     4.05    21.90

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

--------------------
| ADD HYD  (  0037)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0037):    10.56   0.069     4.05    21.90
     + ID2= 2 (  0038):     0.09   0.001     1.67     6.51
       ================================================
       ID = 1 (  0037):    10.65   0.069     4.03    21.77

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

--------------------
| ADD HYD  (  0037)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0037):    10.65   0.069     4.03    21.77
     + ID2= 2 (  0063):     0.31   0.023     1.50    18.59
       ================================================
       ID = 3 (  0037):    10.96   0.071     4.00    21.68

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

--------------------
| ADD HYD  (  0037)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0037):    10.96   0.071     4.00    21.68
     + ID2= 2 (  0070):     1.74   0.028     1.67     6.66
       ================================================
       ID = 1 (  0037):    12.70   0.076     4.00    19.62

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

21-173 Cottonwood Condominiums
Visual OTTHYMO MODEL

25-YEAR STORM

```
================================================================================
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2007)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\Natalie\AppData\Local\Civica\VH5\b59b925c-1a86-4318-
8861-e38dc4dfd2f8\9f9a4c00-1a2e-4697-b0b2-8297317f882a\scen
  Summary filename: C:\Users\Natalie\AppData\Local\Civica\VH5\b59b925c-1a86-4318-
8861-e38dc4dfd2f8\9f9a4c00-1a2e-4697-b0b2-8297317f882a\scen


DATE: 06/07/2022                          TIME: 10:59:28

USER:


COMMENTS: _____________________________________________________________


--------------------------------------------------------------------------------
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  ************************************************
  ** SIMULATION : Run 04                        **
  ************************************************


--------------------
|    READ STORM    |    Filename: C:\Users\Natalie\AppD
|                  |              ata\Local\Temp\
|                  |              1577726c-47d7-46fc-bc76-c65d8db515e0\51bcb858
| Ptotal= 66.02 mm |    Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    4.50 |  1.00   13.67 |  2.00   12.32 |  3.00    6.27
                0.17    4.98 |  1.17   27.69 |  2.17   10.44 |  3.17    5.00
                0.33    5.61 |  1.33  158.85 |  2.33    9.14 |  3.33    5.84
                0.50    6.45 |  1.50   35.08 |  2.50    8.15 |  3.50    5.18
                0.67    7.70 |  1.67   20.60 |  2.67    7.39 |  3.67    4.90
                0.83    9.70 |  1.83   15.24 |  2.83    6.78 |  3.83    4.65

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--------------------
| CALIB            |
| NASHYD   (  0038)|   Area    (ha)=   0.09   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.15

     Unit Hyd Qpeak  (cms)=   0.023

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=   9.762
     TOTAL RAINFALL   (mm)=  66.023
     RUNOFF COEFFICIENT   =   0.148

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

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--------------------
| CALIB            |
| NASHYD   (  0070)|   Area    (ha)=   1.74   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.399

     PEAK FLOW       (cms)=   0.044 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   9.988
     TOTAL RAINFALL   (mm)=  66.023
     RUNOFF COEFFICIENT   =   0.151

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0071)|   Area    (ha)=   0.71   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.163

     PEAK FLOW       (cms)=   0.034 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  14.453
     TOTAL RAINFALL   (mm)=  66.023
     RUNOFF COEFFICIENT   =   0.219

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0023)|   Area    (ha)=   0.59
|ID= 1 DT=10.0 min |   Total Imp(%)=  47.00   Dir. Conn.(%)=  16.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.28         0.31
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      62.72        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85        81.47
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.60 (ii)    9.27 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.05          0.090 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=      65.22        23.38         30.07
     TOTAL RAINFALL   (mm)=      66.02        66.02         66.02
     RUNOFF COEFFICIENT   =       0.99         0.35          0.46

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0025)|   Area    (ha)=   0.52
|ID= 1 DT=10.0 min |   Total Imp(%)=  71.00   Dir. Conn.(%)=  14.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.37         0.15
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      58.88        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85       232.42
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.54 (ii)    6.58 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.08          0.110 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=      65.22        33.66         38.07
     TOTAL RAINFALL   (mm)=      66.02        66.02         66.02
     RUNOFF COEFFICIENT   =       0.99         0.51          0.58

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0026)|   Area    (ha)=   0.48
|ID= 1 DT=10.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  14.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.24
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      56.57        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85        93.97
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.51 (ii)    8.74 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.04          0.074 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=      65.22        24.67         30.34
     TOTAL RAINFALL   (mm)=      66.02        66.02         66.02
     RUNOFF COEFFICIENT   =       0.99         0.37          0.46

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0028)|   Area    (ha)=   0.61
|ID= 1 DT=10.0 min |   Total Imp(%)=  62.00   Dir. Conn.(%)=  14.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.38         0.23
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      63.77        40.00
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Visual OTTHYMO MODEL

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     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85       149.79
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.62 (ii)    7.63 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.04         0.07          0.110 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     65.22        29.13         34.17
     TOTAL RAINFALL   (mm)=     66.02        66.02         66.02
     RUNOFF COEFFICIENT   =      0.99         0.44          0.52

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0030)|   Area    (ha)=   0.33
|ID= 1 DT=10.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  25.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.20         0.13
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      46.90        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85       109.04
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.35 (ii)    8.17 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.04         0.03          0.065 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     65.22        26.05         35.83
     TOTAL RAINFALL   (mm)=     66.02        66.02         66.02
     RUNOFF COEFFICIENT   =      0.99         0.39          0.54

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0032)|   Area    (ha)=   0.66
|ID= 1 DT=10.0 min |   Total Imp(%)=  36.00   Dir. Conn.(%)=  10.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.42
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      66.33        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85        65.93
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.66 (ii)   10.00 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.03         0.05          0.080 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     65.22        21.55         25.91
     TOTAL RAINFALL   (mm)=     66.02        66.02         66.02
     RUNOFF COEFFICIENT   =      0.99         0.33          0.39

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0033)|   Area    (ha)=   0.80
|ID= 1 DT=10.0 min |   Total Imp(%)=  48.00   Dir. Conn.(%)=  13.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.38         0.42
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      73.03        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85        89.56
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.76 (ii)    9.13 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.05         0.07          0.117 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     65.22        24.23         29.55
     TOTAL RAINFALL   (mm)=     66.02        66.02         66.02
     RUNOFF COEFFICIENT   =      0.99         0.37          0.45

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0034)|   Area    (ha)=   0.67
|ID= 1 DT=10.0 min |   Total Imp(%)=  42.00   Dir. Conn.(%)=  18.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.28         0.39
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      66.83        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85        66.56
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.67 (ii)    9.97 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.05         0.05          0.100 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     65.22        21.63         29.47
     TOTAL RAINFALL   (mm)=     66.02        66.02         66.02
     RUNOFF COEFFICIENT   =      0.99         0.33          0.45

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0035)|   Area    (ha)=   0.65
|ID= 1 DT=10.0 min |   Total Imp(%)=  30.00   Dir. Conn.(%)=  11.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.19         0.45
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      65.83        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85        55.01
               over (min)       10.00        20.00
     Storage Coeff.  (min)=      1.65 (ii)   10.62 (ii)
     Unit Hyd. Tpeak (min)=     10.00        20.00
     Unit Hyd. peak  (cms)=      0.17         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.03         0.04          0.051 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=     65.22        20.07         25.03
     TOTAL RAINFALL   (mm)=     66.02        66.02         66.02
     RUNOFF COEFFICIENT   =      0.99         0.30          0.38

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0062)|   Area    (ha)=   0.51
|ID= 1 DT=10.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  16.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.17
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      58.31        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85       173.12
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.54 (ii)    7.20 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.04         0.06          0.100 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     65.02        30.60         36.09
     TOTAL RAINFALL   (mm)=     66.02        66.02         66.02
     RUNOFF COEFFICIENT   =      0.98         0.46          0.55

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
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      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0064)|   Area    (ha)=   2.02
|ID= 1 DT=10.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  23.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.11         0.91
     Dep. Storage     (mm)=       1.00        16.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     116.05        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85        66.78
               over (min)       10.00        20.00
     Storage Coeff.  (min)=      2.32 (ii)   10.62 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.20         0.09          0.244 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67           1.50
     RUNOFF VOLUME    (mm)=      65.02        19.40          29.89
     TOTAL RAINFALL   (mm)=      66.02        66.02          66.02
     RUNOFF COEFFICIENT   =       0.98         0.29           0.45

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| RESERVOIR(  0076)|     OVERFLOW IS ON
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0600     0.0600

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0064)    2.020     0.244      1.50      29.89
   OVERFLOW: ID= 1 (  0076)   2.020     0.034      2.58      29.76
   OVERFLOW:ID= 3 (  0003)    0.000     0.000      0.00       0.00

                  TOTAL NUMBER OF SIMULATION OVERFLOW  =     0
                  CUMULATIVE TIME OF OVERFLOW  (HOURS) =  0.00
                  PERCENTAGE OF TIME OVERFLOWING   (%) =  0.00

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 14.10
                  TIME SHIFT OF PEAK FLOW         (min)= 65.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0344

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0068)|   Area    (ha)=   0.41
|ID= 1 DT=10.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  17.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.18         0.23
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      52.28        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85        74.73
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.44 (ii)    9.37 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.03          0.062 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      65.02        22.62          29.82
     TOTAL RAINFALL   (mm)=      66.02        66.02          66.02
     RUNOFF COEFFICIENT   =       0.98         0.34           0.45

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0069)|   Area    (ha)=   0.86
|ID= 1 DT=10.0 min |   Total Imp(%)=  39.00   Dir. Conn.(%)=  15.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.52
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      75.72        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     158.85        64.86
               over (min)       10.00        20.00
     Storage Coeff.  (min)=      1.80 (ii)   10.19 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.06         0.05          0.083 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67           1.50
     RUNOFF VOLUME    (mm)=      65.02        21.42          27.95
     TOTAL RAINFALL   (mm)=      66.02        66.02          66.02
     RUNOFF COEFFICIENT   =       0.98         0.32           0.42

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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  (  0027)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):     0.59   0.090     1.50    30.07
     + ID2= 2 (  0025):     0.52   0.110     1.50    38.07
       ================================================
       ID = 3 (  0027):     1.11   0.200     1.50    33.82

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

--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     1.11   0.200     1.50    33.82
     + ID2= 2 (  0026):     0.48   0.074     1.50    30.34
       ================================================
       ID = 1 (  0027):     1.59   0.273     1.50    32.77

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

--------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     1.59   0.273     1.50    32.77
     + ID2= 2 (  0028):     0.61   0.110     1.50    34.17
       ================================================
       ID = 3 (  0027):     2.20   0.383     1.50    33.16

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

--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     2.20   0.383     1.50    33.16
     + ID2= 2 (  0030):     0.33   0.065     1.50    35.83
       ================================================
       ID = 1 (  0027):     2.53   0.449     1.50    33.50

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

--------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     2.53   0.449     1.50    33.50
     + ID2= 2 (  0032):     0.66   0.080     1.50    25.91
       ================================================
       ID = 3 (  0027):     3.19   0.528     1.50    31.93

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

--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     3.19   0.528     1.50    31.93
     + ID2= 2 (  0033):     0.80   0.117     1.50    29.55
       ================================================
       ID = 1 (  0027):     3.99   0.645     1.50    31.46

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

--------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     3.99   0.645     1.50    31.46
     + ID2= 2 (  0034):     0.67   0.100     1.50    29.47
       ================================================
       ID = 3 (  0027):     4.66   0.745     1.50    31.17

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

--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     4.66   0.745     1.50    31.17
     + ID2= 2 (  0035):     0.65   0.051     1.50    25.03
       ================================================
       ID = 1 (  0027):     5.31   0.796     1.50    30.42

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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21-173 Cottonwood Condominiums
Visual OTTHYMO MODEL

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| ADD HYD  (  0027)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     5.31   0.796     1.50    30.42
     + ID2= 2 (  0062):     0.51   0.100     1.50    36.09
       ================================================
       ID = 3 (  0027):     5.82   0.896     1.50    30.91

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

------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     5.82   0.896     1.50    30.91
     + ID2= 2 (  0068):     0.41   0.062     1.50    29.82
       ================================================
       ID = 1 (  0027):     6.23   0.959     1.50    30.84

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

------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     6.23   0.959     1.50    30.84
     + ID2= 2 (  0069):     0.86   0.083     1.50    27.95
       ================================================
       ID = 3 (  0027):     7.09   1.042     1.50    30.49

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

------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     7.09   1.042     1.50    30.49
     + ID2= 2 (  0076):     2.02   0.034     2.58    29.76
       ================================================
       ID = 1 (  0027):     9.11   1.054     1.50    30.33

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
------------------
| CALIB            |
| STANDHYD (  0065)|   Area    (ha)=   0.49
|ID= 1 DT=10.0 min |   Total Imp(%)=  26.00   Dir. Conn.(%)=  17.00
------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.13         0.36
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     57.15        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    158.85        43.77
               over (min)      10.00        20.00
     Storage Coeff.  (min)=     1.52 (ii)   11.34 (ii)
     Unit Hyd. Tpeak (min)=    10.00        20.00
     Unit Hyd. peak  (cms)=     0.17         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=     0.04         0.02          0.049 (iii)
     TIME TO PEAK    (hrs)=     1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=    65.02        18.30         26.23
     TOTAL RAINFALL   (mm)=    66.02        66.02         66.02
     RUNOFF COEFFICIENT   =     0.98         0.28          0.40

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
------------------
| CALIB            |
| STANDHYD (  0066)|   Area    (ha)=   0.25
|ID= 1 DT=10.0 min |   Total Imp(%)=  49.00   Dir. Conn.(%)=  31.00
------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.12         0.13
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     40.82        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    158.85        61.52
               over (min)      10.00        10.00
     Storage Coeff.  (min)=     1.24 (ii)    9.81 (ii)
     Unit Hyd. Tpeak (min)=    10.00        10.00
     Unit Hyd. peak  (cms)=     0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=     0.03         0.01          0.049 (iii)
     TIME TO PEAK    (hrs)=     1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=    65.02        20.98         34.61
     TOTAL RAINFALL   (mm)=    66.02        66.02         66.02
     RUNOFF COEFFICIENT   =     0.98         0.32          0.52

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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  (  0067)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0065):     0.49   0.049     1.50    26.23
     + ID2= 2 (  0066):     0.25   0.049     1.50    34.61
       ================================================
       ID = 3 (  0067):     0.74   0.097     1.50    29.06

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
------------------
| DUHYD    (  0024)|
| Inlet Cap.= 0.057|
| #of Inlets=     1|
| Total(cms)=   0.1|      AREA     QPEAK     TPEAK    R.V.
------------------           (ha)     (cms)     (hrs)    (mm)
    TOTAL HYD.(ID= 1):   0.74      0.10      1.50    29.06
    ================================================
    MAJOR SYS.(ID= 2):   0.08      0.04      1.50    29.06
    MINOR SYS.(ID= 3):   0.66      0.06      1.50    29.06

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
| ADD HYD  (  0031)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0024):     0.66   0.057     1.50    29.06
     + ID2= 2 (  0027):     9.11   1.054     1.50    30.33
       ================================================
       ID = 3 (  0031):     9.77   1.111     1.50    30.24

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

------------------
| ADD HYD  (  0031)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0031):     9.77   1.111     1.50    30.24
     + ID2= 2 (  0071):     0.71   0.034     1.50    14.45
       ================================================
       ID = 1 (  0031):    10.48   1.145     1.50    29.17

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
------------------
| RESERVOIR(  0029)|     OVERFLOW IS ON
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.1080     0.2030
                         0.0085     0.0227   |   0.1807     0.2551
                         0.0130     0.0491   |   0.2663     0.3117
                         0.0163     0.0772   |   0.3630     0.3731
                         0.0190     0.1119   |   0.4697     0.4393
                         0.0512     0.1553   |   0.0000     0.0000

                                  AREA     QPEAK     TPEAK       R.V.
                                  (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0031)     10.477      1.145      1.50      29.17
   OUTFLOW: ID= 1 (  0029)     10.477      0.103      3.97      27.96
   OVERFLOW:ID= 3 (  0003)      0.000      0.000      0.00       0.00

                  TOTAL NUMBER OF SIMULATION OVERFLOW  =     0
                  CUMULATIVE TIME OF OVERFLOW  (HOURS) =  0.00
                  PERCENTAGE OF TIME OVERFLOWING   (%) =  0.00

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  8.98
                  TIME SHIFT OF PEAK FLOW         (min)=148.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1987

--------------------------------------------------------------------------------
------------------
| CALIB            |
| STANDHYD (  0063)|   Area    (ha)=   0.31
|ID= 1 DT=10.0 min |   Total Imp(%)=  41.00   Dir. Conn.(%)=   0.00
------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.13         0.18
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     45.46        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    158.85        91.60
               over (min)      10.00        10.00
     Storage Coeff.  (min)=     1.32 (ii)    8.63 (ii)
     Unit Hyd. Tpeak (min)=    10.00        10.00
     Unit Hyd. peak  (cms)=     0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=     0.00         0.03          0.033 (iii)
     TIME TO PEAK    (hrs)=     1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=    65.02        24.43         24.41
     TOTAL RAINFALL   (mm)=    66.02        66.02         66.02
     RUNOFF COEFFICIENT   =     0.98         0.37          0.37

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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21-173 Cottonwood Condominiums
Visual OTTHYMO MODEL

```
| ADD HYD  (  0037)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0024):     0.08   0.040     1.50    29.06
     + ID2= 2 (  0029):    10.48   0.103     3.97    27.96
       ================================================
       ID = 3 (  0037):    10.56   0.103     3.97    27.96

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

--------------------
| ADD HYD  (  0037)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0037):    10.56   0.103     3.97    27.96
     + ID2= 2 (  0038):     0.09   0.002     1.50     9.76
       ================================================
       ID = 1 (  0037):    10.65   0.103     3.95    27.81

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

--------------------
| ADD HYD  (  0037)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0037):    10.65   0.103     3.95    27.81
     + ID2= 2 (  0063):     0.31   0.033     1.50    24.41
       ================================================
       ID = 3 (  0037):    10.96   0.106     3.90    27.71

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

--------------------
| ADD HYD  (  0037)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0037):    10.96   0.106     3.90    27.71
     + ID2= 2 (  0070):     1.74   0.044     1.67     9.99
       ================================================
       ID = 1 (  0037):    12.70   0.130     1.50    25.28

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

21-173 Cottonwood Condominiums
Visual OTTHYMO MODEL

50-YEAR STORM

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================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2007)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\Natalie\AppData\Local\Civica\VH5\b59b925c-1a86-4318-
8861-e38dc4dfd2f8\c171ed34-da26-42eb-ad45-59bdc3f23117\scen
  Summary filename: C:\Users\Natalie\AppData\Local\Civica\VH5\b59b925c-1a86-4318-
8861-e38dc4dfd2f8\c171ed34-da26-42eb-ad45-59bdc3f23117\scen


DATE: 06/07/2022                          TIME: 10:59:28

USER:


COMMENTS: _____

--------------------------------------------------------------------------------
  ************************************************
  ** SIMULATION : Run 05                        **
  ************************************************


--------------------
|    READ STORM    |    Filename: C:\Users\Natalie\AppD
|                  |              ata\Local\Temp\
|                  |              1577726c-47d7-46fc-bc76-c65d8db515e0\e7e959a4
| Ptotal= 72.96 mm |    Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    3.99 |  1.00   14.27 |  2.00   12.62 |  3.00    5.79
                0.17    4.45 |  1.17   33.90 |  2.17   10.39 |  3.17    5.33
                0.33    5.08 |  1.33  186.56 |  2.33    8.89 |  3.33    4.98
                0.50    5.97 |  1.50   44.81 |  2.50    7.80 |  3.50    4.65
                0.67    7.29 |  1.67   23.44 |  2.67    6.96 |  3.67    4.37
                0.83    9.53 |  1.83   16.26 |  2.83    6.30 |  3.83    4.14

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--------------------
| CALIB            |
| NASHYD   (  0038)|   Area    (ha)=   0.09   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.15

     Unit Hyd Qpeak  (cms)=   0.023

     PEAK FLOW       (cms)=   0.003 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  12.324
     TOTAL RAINFALL   (mm)=  72.962
     RUNOFF COEFFICIENT   =   0.169

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

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--------------------
| CALIB            |
| NASHYD   (  0070)|   Area    (ha)=   1.74   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.399

     PEAK FLOW       (cms)=   0.065 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  12.608
     TOTAL RAINFALL   (mm)=  72.962
     RUNOFF COEFFICIENT   =   0.173

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0071)|   Area    (ha)=   0.71   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.163

     PEAK FLOW       (cms)=   0.045 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  17.433
     TOTAL RAINFALL   (mm)=  72.962
     RUNOFF COEFFICIENT   =   0.239

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

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--------------------
| CALIB            |
| STANDHYD (  0023)|   Area    (ha)=   0.59
|ID= 1 DT=10.0 min |   Total Imp(%)=  47.00   Dir. Conn.(%)=  16.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.28         0.31
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      62.72        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56       103.35
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.50 (ii)    8.47 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.05         0.06          0.113 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=      72.16        27.58         34.71
     TOTAL RAINFALL   (mm)=      72.96        72.96         72.96
     RUNOFF COEFFICIENT   =       0.99         0.38          0.48

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0025)|   Area    (ha)=   0.52
|ID= 1 DT=10.0 min |   Total Imp(%)=  71.00   Dir. Conn.(%)=  14.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.37         0.15
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      58.88        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56       289.37
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.45 (ii)    6.06 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.14
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.10          0.138 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=      72.16        39.04         43.67
     TOTAL RAINFALL   (mm)=      72.96        72.96         72.96
     RUNOFF COEFFICIENT   =       0.99         0.54          0.60

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0026)|   Area    (ha)=   0.48
|ID= 1 DT=10.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  14.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.24
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      56.57        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56       118.94
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.41 (ii)    8.00 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.06          0.093 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=      72.16        29.03         35.05
     TOTAL RAINFALL   (mm)=      72.96        72.96         72.96
     RUNOFF COEFFICIENT   =       0.99         0.40          0.48

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0028)|   Area    (ha)=   0.61
|ID= 1 DT=10.0 min |   Total Imp(%)=  62.00   Dir. Conn.(%)=  14.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.38         0.23
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      63.77        40.00
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Visual OTTHYMO MODEL

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     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56       188.06
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.52 (ii)    7.00 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.09          0.138 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      72.16        34.04          39.37
     TOTAL RAINFALL   (mm)=      72.96        72.96          72.96
     RUNOFF COEFFICIENT   =       0.99         0.47           0.54

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0030)|   Area    (ha)=   0.33
|ID= 1 DT=10.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  25.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.20         0.13
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      46.90        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56       137.67
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.26 (ii)    7.47 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.04          0.081 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      72.16        30.58          40.97
     TOTAL RAINFALL   (mm)=      72.96        72.96          72.96
     RUNOFF COEFFICIENT   =       0.99         0.42           0.56

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0032)|   Area    (ha)=   0.66
|ID= 1 DT=10.0 min |   Total Imp(%)=  36.00   Dir. Conn.(%)=  10.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.42
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      66.33        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56        83.91
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.56 (ii)    9.13 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.07          0.102 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      72.16        25.50          30.16
     TOTAL RAINFALL   (mm)=      72.96        72.96          72.96
     RUNOFF COEFFICIENT   =       0.99         0.35           0.41

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0033)|   Area    (ha)=   0.80
|ID= 1 DT=10.0 min |   Total Imp(%)=  48.00   Dir. Conn.(%)=  13.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.38         0.42
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      73.03        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56       113.44
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.65 (ii)    8.36 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.05         0.09          0.148 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      72.16        28.53          34.20
     TOTAL RAINFALL   (mm)=      72.96        72.96          72.96
     RUNOFF COEFFICIENT   =       0.99         0.39           0.47

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0034)|   Area    (ha)=   0.67
|ID= 1 DT=10.0 min |   Total Imp(%)=  42.00   Dir. Conn.(%)=  18.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.28         0.39
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      66.83        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56        84.70
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.56 (ii)    9.11 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.06         0.06          0.125 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      72.16        25.59          33.97
     TOTAL RAINFALL   (mm)=      72.96        72.96          72.96
     RUNOFF COEFFICIENT   =       0.99         0.35           0.47

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0035)|   Area    (ha)=   0.65
|ID= 1 DT=10.0 min |   Total Imp(%)=  30.00   Dir. Conn.(%)=  11.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.19         0.45
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      65.83        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56        70.20
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.55 (ii)    9.68 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.06          0.096 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      72.16        23.81          29.12
     TOTAL RAINFALL   (mm)=      72.96        72.96          72.96
     RUNOFF COEFFICIENT   =       0.99         0.33           0.40

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0062)|   Area    (ha)=   0.51
|ID= 1 DT=10.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  16.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.17
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      58.31        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56       216.78
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.44 (ii)    6.62 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.08          0.125 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      71.96        35.66          41.46
     TOTAL RAINFALL   (mm)=      72.96        72.96          72.96
     RUNOFF COEFFICIENT   =       0.99         0.49           0.57

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
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```
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0064)|   Area    (ha)=   2.02
|ID= 1 DT=10.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  23.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.11         0.91
     Dep. Storage     (mm)=       1.00        16.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     116.05        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56        88.81
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       2.18 (ii)    9.58 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.24         0.15          0.385 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      71.96        23.47          34.62
     TOTAL RAINFALL   (mm)=      72.96        72.96          72.96
     RUNOFF COEFFICIENT   =       0.99         0.32           0.47

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0076)|     OVERFLOW IS ON
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0600     0.0600

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0064)     2.020     0.385      1.50      34.62
   OUTFLOW: ID= 1 (  0076)     2.020     0.042      2.33      34.50
   OVERFLOW:ID= 3 (  0003)     0.000     0.000      0.00       0.00

                  TOTAL NUMBER OF SIMULATION OVERFLOW  =     0
                  CUMULATIVE TIME OF OVERFLOW  (HOURS) =  0.00
                  PERCENTAGE OF TIME OVERFLOWING   (%) =  0.00

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 10.95
                  TIME SHIFT OF PEAK FLOW         (min)= 50.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0422

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0068)|   Area    (ha)=   0.41
|ID= 1 DT=10.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  17.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.18         0.23
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      52.28        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56        94.94
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.35 (ii)    8.56 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.04          0.078 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      71.96        26.72          34.39
     TOTAL RAINFALL   (mm)=      72.96        72.96          72.96
     RUNOFF COEFFICIENT   =       0.99         0.37           0.47

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0069)|   Area    (ha)=   0.86
|ID= 1 DT=10.0 min |   Total Imp(%)=  39.00   Dir. Conn.(%)=  15.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.52
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      75.72        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     186.56        82.57
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.68 (ii)    9.30 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.07         0.08          0.148 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      71.96        25.35          32.33
     TOTAL RAINFALL   (mm)=      72.96        72.96          72.96
     RUNOFF COEFFICIENT   =       0.99         0.35           0.44

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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  (  0027)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):     0.59   0.113     1.50    34.71
     + ID2= 2 (  0025):     0.52   0.138     1.50    43.67
       ================================================
       ID = 3 (  0027):     1.11   0.250     1.50    38.91

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

--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     1.11   0.250     1.50    38.91
     + ID2= 2 (  0026):     0.48   0.093     1.50    35.05
       ================================================
       ID = 1 (  0027):     1.59   0.343     1.50    37.74

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

--------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     1.59   0.343     1.50    37.74
     + ID2= 2 (  0028):     0.61   0.138     1.50    39.37
       ================================================
       ID = 3 (  0027):     2.20   0.481     1.50    38.19

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

--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     2.20   0.481     1.50    38.19
     + ID2= 2 (  0030):     0.33   0.081     1.50    40.97
       ================================================
       ID = 1 (  0027):     2.53   0.562     1.50    38.56

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

--------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     2.53   0.562     1.50    38.56
     + ID2= 2 (  0032):     0.66   0.102     1.50    30.16
       ================================================
       ID = 3 (  0027):     3.19   0.664     1.50    36.82

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

--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     3.19   0.664     1.50    36.82
     + ID2= 2 (  0033):     0.80   0.148     1.50    34.20
       ================================================
       ID = 1 (  0027):     3.99   0.812     1.50    36.29

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

--------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     3.99   0.812     1.50    36.29
     + ID2= 2 (  0034):     0.67   0.125     1.50    33.97
       ================================================
       ID = 3 (  0027):     4.66   0.937     1.50    35.96

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

--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     4.66   0.937     1.50    35.96
     + ID2= 2 (  0035):     0.65   0.096     1.50    29.12
       ================================================
       ID = 1 (  0027):     5.31   1.033     1.50    35.12

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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Visual OTTHYMO MODEL

```
| ADD HYD  (  0027)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     5.31   1.033     1.50    35.12
     + ID2= 2 (  0062):     0.51   0.125     1.50    41.46
       ================================================
       ID = 3 (  0027):     5.82   1.158     1.50    35.68

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

------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     5.82   1.158     1.50    35.68
     + ID2= 2 (  0068):     0.41   0.078     1.50    34.39
       ================================================
       ID = 1 (  0027):     6.23   1.236     1.50    35.59

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

------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     6.23   1.236     1.50    35.59
     + ID2= 2 (  0069):     0.86   0.148     1.50    32.33
       ================================================
       ID = 3 (  0027):     7.09   1.385     1.50    35.20

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

------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     7.09   1.385     1.50    35.20
     + ID2= 2 (  0076):     2.02   0.042     2.33    34.50
       ================================================
       ID = 1 (  0027):     9.11   1.401     1.50    35.04

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
------------------
| CALIB            |
| STANDHYD (  0065)|   Area    (ha)=   0.49
|ID= 1 DT=10.0 min |   Total Imp(%)=  26.00   Dir. Conn.(%)=  17.00
------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.13         0.36
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     57.15        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    186.56        56.04
               over (min)       10.00        20.00
     Storage Coeff.  (min)=      1.42 (ii)   10.32 (ii)
     Unit Hyd. Tpeak (min)=     10.00        20.00
     Unit Hyd. peak  (cms)=      0.17         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.04         0.03          0.059 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=     71.96        21.77         30.30
     TOTAL RAINFALL   (mm)=     72.96        72.96         72.96
     RUNOFF COEFFICIENT   =      0.99         0.30          0.42

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
------------------
| CALIB            |
| STANDHYD (  0066)|   Area    (ha)=   0.25
|ID= 1 DT=10.0 min |   Total Imp(%)=  49.00   Dir. Conn.(%)=  31.00
------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.12         0.13
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     40.82        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    186.56        78.39
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.16 (ii)    8.94 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.04         0.02          0.059 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     71.96        24.84         39.44
     TOTAL RAINFALL   (mm)=     72.96        72.96         72.96
     RUNOFF COEFFICIENT   =      0.99         0.34          0.54

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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  (  0067)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0065):     0.49   0.059     1.50    30.30
     + ID2= 2 (  0066):     0.25   0.059     1.50    39.44
       ================================================
       ID = 3 (  0067):     0.74   0.118     1.50    33.39

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
------------------
| DUHYD    (  0024)|
| Inlet Cap.= 0.057|
| #of Inlets=    1|
| Total(cms)=   0.1|      AREA     QPEAK     TPEAK    R.V.
------------------           (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   0.74      0.12      1.50   33.39
     ================================================
     MAJOR SYS.(ID= 2):   0.12      0.06      1.50   33.39
     MINOR SYS.(ID= 3):   0.62      0.06      1.50   33.39

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
| ADD HYD  (  0031)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0024):     0.62   0.057     1.50    33.39
     + ID2= 2 (  0027):     9.11   1.401     1.50    35.04
       ================================================
       ID = 3 (  0031):     9.73   1.458     1.50    34.94

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

------------------
| ADD HYD  (  0031)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0031):     9.73   1.458     1.50    34.94
     + ID2= 2 (  0071):     0.71   0.045     1.50    17.43
       ================================================
       ID = 1 (  0031):    10.44   1.503     1.50    33.74

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
------------------
| RESERVOIR(  0029)|     OVERFLOW IS ON
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.1080     0.2030
                          0.0085     0.0227   |   0.1807     0.2551
                          0.0130     0.0491   |   0.2663     0.3117
                          0.0163     0.0772   |   0.3630     0.3731
                          0.0190     0.1119   |   0.4697     0.4393
                          0.0512     0.1553   |   0.0000     0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0031)     10.435      1.503      1.50      33.74
   OUTFLOW: ID= 1 (  0029)     10.435      0.131      3.18      32.46
   OVERFLOW:ID= 3 (  0003)      0.000      0.000      0.00       0.00

                  TOTAL NUMBER OF SIMULATION OVERFLOW  =     0
                  CUMULATIVE TIME OF OVERFLOW  (HOURS) =  0.00
                  PERCENTAGE OF TIME OVERFLOWING   (%) =  0.00

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  8.69
                  TIME SHIFT OF PEAK FLOW         (min)=101.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.2192

--------------------------------------------------------------------------------
------------------
| CALIB            |
| STANDHYD (  0063)|   Area    (ha)=   0.31
|ID= 1 DT=10.0 min |   Total Imp(%)=  41.00   Dir. Conn.(%)=   0.00
------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.13         0.18
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     45.46        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    186.56       115.99
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.24 (ii)    7.89 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.00         0.04          0.043 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     71.96        28.77         28.75
     TOTAL RAINFALL   (mm)=     72.96        72.96         72.96
     RUNOFF COEFFICIENT   =      0.99         0.39          0.39

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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  (  0037)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0024):     0.12   0.061     1.50    33.39
     + ID2= 2 (  0029):    10.44   0.131     3.18    32.46
       ================================================
       ID = 3 (  0037):    10.56   0.131     3.18    32.47

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

--------------------
| ADD HYD  (  0037)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0037):    10.56   0.131     3.18    32.47
     + ID2= 2 (  0038):     0.09   0.003     1.50    12.32
       ================================================
       ID = 1 (  0037):    10.65   0.131     3.17    32.30

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

--------------------
| ADD HYD  (  0037)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0037):    10.65   0.131     3.17    32.30
     + ID2= 2 (  0063):     0.31   0.043     1.50    28.75
       ================================================
       ID = 3 (  0037):    10.96   0.134     3.10    32.20

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

--------------------
| ADD HYD  (  0037)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0037):    10.96   0.134     3.10    32.20
     + ID2= 2 (  0070):     1.74   0.065     1.67    12.61
       ================================================
       ID = 1 (  0037):    12.70   0.184     1.50    29.51

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

21-173 Cottonwood Condominiums
Visual OTTHYMO MODEL

100-YEAR STORM

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================================================================================

       V    V   I    SSSSS  U   U    A    L             (v 6.2.2007)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\Natalie\AppData\Local\Civica\VH5\b59b925c-1a86-4318-
8861-e38dc4dfd2f8\b5826d04-cd63-4e20-aaf0-9640373591dd\scen
  Summary filename: C:\Users\Natalie\AppData\Local\Civica\VH5\b59b925c-1a86-4318-
8861-e38dc4dfd2f8\b5826d04-cd63-4e20-aaf0-9640373591dd\scen


DATE: 06/07/2022                          TIME: 10:59:28

USER:


COMMENTS: _____

--------------------------------------------------------------------------------
  ************************************************
  ** SIMULATION : Run 06                        **
  ************************************************


--------------------
|    READ STORM    |    Filename: C:\Users\Natalie\AppD
|                  |              ata\Local\Temp\
|                  |              1577726c-47d7-46fc-bc76-c65d8db515e0\fa9309cf
| Ptotal= 83.90 mm |    Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    4.50 |  1.00   16.86 |  2.00   14.83 |  3.00    6.60
                0.17    5.05 |  1.17   41.07 |  2.17   12.12 |  3.17    6.10
                0.33    5.82 |  1.33  205.92 |  2.33   10.31 |  3.33    5.66
                0.50    6.83 |  1.50   54.56 |  2.50    9.02 |  3.50    5.28
                0.67    8.41 |  1.67   29.17 |  2.67    8.03 |  3.67    4.98
                0.83   11.07 |  1.83   19.28 |  2.83    7.24 |  3.83    4.70

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


--------------------
| CALIB            |
| NASHYD   (  0038)|   Area    (ha)=   0.09   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.15

     Unit Hyd Qpeak  (cms)=   0.023

     PEAK FLOW       (cms)=   0.005 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  16.799
     TOTAL RAINFALL   (mm)=  83.902
     RUNOFF COEFFICIENT   =   0.200

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0070)|   Area    (ha)=   1.74   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=  16.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.399

     PEAK FLOW       (cms)=   0.092 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  17.185
     TOTAL RAINFALL   (mm)=  83.902
     RUNOFF COEFFICIENT   =   0.205

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0071)|   Area    (ha)=   0.71   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.163

     PEAK FLOW       (cms)=   0.056 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  22.519
     TOTAL RAINFALL   (mm)=  83.902
     RUNOFF COEFFICIENT   =   0.268

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0023)|   Area    (ha)=   0.59
|ID= 1 DT=10.0 min |   Total Imp(%)=  47.00   Dir. Conn.(%)=  16.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.28         0.31
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      62.72        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       125.35
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.45 (ii)    7.89 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.05         0.08          0.134 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      83.10        34.58          42.33
     TOTAL RAINFALL   (mm)=      83.90        83.90          83.90
     RUNOFF COEFFICIENT   =       0.99         0.41           0.50

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0025)|   Area    (ha)=   0.52
|ID= 1 DT=10.0 min |   Total Imp(%)=  71.00   Dir. Conn.(%)=  14.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.37         0.15
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      58.88        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       343.21
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.39 (ii)    5.70 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.14
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.12          0.163 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      83.10        47.83          52.76
     TOTAL RAINFALL   (mm)=      83.90        83.90          83.90
     RUNOFF COEFFICIENT   =       0.99         0.57           0.63

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0026)|   Area    (ha)=   0.48
|ID= 1 DT=10.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  14.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.24
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      56.57        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       143.86
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.36 (ii)    7.46 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.07          0.111 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      83.10        36.29          42.83
     TOTAL RAINFALL   (mm)=      83.90        83.90          83.90
     RUNOFF COEFFICIENT   =       0.99         0.43           0.51

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0028)|   Area    (ha)=   0.61
|ID= 1 DT=10.0 min |   Total Imp(%)=  62.00   Dir. Conn.(%)=  14.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.38         0.23
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      63.77        40.00
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     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       225.29
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.46 (ii)    6.56 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.05         0.12          0.165 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     83.10        42.12         47.85
     TOTAL RAINFALL   (mm)=     83.90        83.90         83.90
     RUNOFF COEFFICIENT   =      0.99         0.50          0.57

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0030)|   Area    (ha)=   0.33
|ID= 1 DT=10.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  25.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.20         0.13
     Dep. Storage     (mm)=      0.80         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     46.90        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       166.02
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.21 (ii)    6.98 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.05         0.05          0.095 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     83.10        38.11         49.35
     TOTAL RAINFALL   (mm)=     83.90        83.90         83.90
     RUNOFF COEFFICIENT   =      0.99         0.45          0.59

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0032)|   Area    (ha)=   0.66
|ID= 1 DT=10.0 min |   Total Imp(%)=  36.00   Dir. Conn.(%)=  10.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.24         0.42
     Dep. Storage     (mm)=      0.80         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     66.33        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       102.17
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.50 (ii)    8.49 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.04         0.09          0.123 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     83.10        32.12         37.21
     TOTAL RAINFALL   (mm)=     83.90        83.90         83.90
     RUNOFF COEFFICIENT   =      0.99         0.38          0.44

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0033)|   Area    (ha)=   0.80
|ID= 1 DT=10.0 min |   Total Imp(%)=  48.00   Dir. Conn.(%)=  13.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.38         0.42
     Dep. Storage     (mm)=      0.80         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     73.03        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       137.34
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.58 (ii)    7.80 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.06         0.12          0.177 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     83.10        35.71         41.87
     TOTAL RAINFALL   (mm)=     83.90        83.90         83.90
     RUNOFF COEFFICIENT   =      0.99         0.43          0.50

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0034)|   Area    (ha)=   0.67
|ID= 1 DT=10.0 min |   Total Imp(%)=  42.00   Dir. Conn.(%)=  18.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.28         0.39
     Dep. Storage     (mm)=      0.80         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     66.83        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       103.12
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.50 (ii)    8.47 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.07         0.08          0.148 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     83.10        32.23         41.38
     TOTAL RAINFALL   (mm)=     83.90        83.90         83.90
     RUNOFF COEFFICIENT   =      0.99         0.38          0.49

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0035)|   Area    (ha)=   0.65
|ID= 1 DT=10.0 min |   Total Imp(%)=  30.00   Dir. Conn.(%)=  11.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.19         0.45
     Dep. Storage     (mm)=      0.80         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     65.83        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92        85.76
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.49 (ii)    8.99 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.04         0.08          0.116 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     83.10        30.09         35.92
     TOTAL RAINFALL   (mm)=     83.90        83.90         83.90
     RUNOFF COEFFICIENT   =      0.99         0.36          0.43

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0062)|   Area    (ha)=   0.51
|ID= 1 DT=10.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  16.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.34         0.17
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     58.31        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       258.85
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.38 (ii)    6.21 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.14
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.05         0.10          0.149 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     82.90        43.98         50.20
     TOTAL RAINFALL   (mm)=     83.90        83.90         83.90
     RUNOFF COEFFICIENT   =      0.99         0.52          0.60

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
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Visual OTTHYMO MODEL

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      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0064)|   Area    (ha)=   2.02
|ID= 1 DT=10.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  23.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.11         0.91
     Dep. Storage     (mm)=       1.00        16.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     116.05        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       113.24
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       2.09 (ii)    8.81 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.26         0.20          0.460 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      82.90        30.34          42.43
     TOTAL RAINFALL   (mm)=      83.90        83.90          83.90
     RUNOFF COEFFICIENT   =       0.99         0.36           0.51

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0076)|     OVERFLOW IS ON
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0600     0.0600

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0064)     2.020     0.460      1.50      42.43
   OUTFLOW: ID= 1 (  0076)     2.020     0.052      2.33      42.30
   OVERFLOW:ID= 3 (  0003)     0.000     0.000      0.00       0.00

                  TOTAL NUMBER OF SIMULATION OVERFLOW  =     0
                  CUMULATIVE TIME OF OVERFLOW  (HOURS) =  0.00
                  PERCENTAGE OF TIME OVERFLOWING   (%) =  0.00

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 11.30
                  TIME SHIFT OF PEAK FLOW         (min)= 50.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0521

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0068)|   Area    (ha)=   0.41
|ID= 1 DT=10.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  17.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.18         0.23
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      52.28        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       115.33
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.30 (ii)    7.96 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.05          0.093 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      82.90        33.56          41.94
     TOTAL RAINFALL   (mm)=      83.90        83.90          83.90
     RUNOFF COEFFICIENT   =       0.99         0.40           0.50

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0069)|   Area    (ha)=   0.86
|ID= 1 DT=10.0 min |   Total Imp(%)=  39.00   Dir. Conn.(%)=  15.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.52
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      75.72        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       100.57
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.62 (ii)    8.66 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.07         0.10          0.177 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      82.90        31.93          39.57
     TOTAL RAINFALL   (mm)=      83.90        83.90          83.90
     RUNOFF COEFFICIENT   =       0.99         0.38           0.47

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):     0.59   0.134     1.50    42.33
     + ID2= 2 (  0025):     0.52   0.163     1.50    52.76
       ================================================
       ID = 3 (  0027):     1.11   0.297     1.50    47.22

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

--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     1.11   0.297     1.50    47.22
     + ID2= 2 (  0026):     0.48   0.111     1.50    42.83
       ================================================
       ID = 1 (  0027):     1.59   0.408     1.50    45.89

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

--------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     1.59   0.408     1.50    45.89
     + ID2= 2 (  0028):     0.61   0.165     1.50    47.85
       ================================================
       ID = 3 (  0027):     2.20   0.573     1.50    46.43

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

--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     2.20   0.573     1.50    46.43
     + ID2= 2 (  0030):     0.33   0.095     1.50    49.35
       ================================================
       ID = 1 (  0027):     2.53   0.668     1.50    46.82

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

--------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     2.53   0.668     1.50    46.82
     + ID2= 2 (  0032):     0.66   0.123     1.50    37.21
       ================================================
       ID = 3 (  0027):     3.19   0.791     1.50    44.83

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

--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     3.19   0.791     1.50    44.83
     + ID2= 2 (  0033):     0.80   0.177     1.50    41.87
       ================================================
       ID = 1 (  0027):     3.99   0.969     1.50    44.23

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

--------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     3.99   0.969     1.50    44.23
     + ID2= 2 (  0034):     0.67   0.148     1.50    41.38
       ================================================
       ID = 3 (  0027):     4.66   1.117     1.50    43.82

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

--------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     4.66   1.117     1.50    43.82
     + ID2= 2 (  0035):     0.65   0.116     1.50    35.92
       ================================================
       ID = 1 (  0027):     5.31   1.233     1.50    42.86

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

--------------------
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21-173 Cottonwood Condominiums
Visual OTTHYMO MODEL

```
| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     5.31   1.233     1.50    42.86
     + ID2= 2 (  0062):     0.51   0.149     1.50    50.20
       ================================================
       ID = 3 (  0027):     5.82   1.382     1.50    43.50

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

------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     5.82   1.382     1.50    43.50
     + ID2= 2 (  0068):     0.41   0.093     1.50    41.94
       ================================================
       ID = 1 (  0027):     6.23   1.475     1.50    43.40

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

------------------
| ADD HYD  (  0027)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     6.23   1.475     1.50    43.40
     + ID2= 2 (  0069):     0.86   0.177     1.50    39.57
       ================================================
       ID = 3 (  0027):     7.09   1.652     1.50    42.93

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

------------------
| ADD HYD  (  0027)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0027):     7.09   1.652     1.50    42.93
     + ID2= 2 (  0076):     2.02   0.052     2.33    42.30
       ================================================
       ID = 1 (  0027):     9.11   1.672     1.50    42.79

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
------------------
| CALIB            |
| STANDHYD (  0065)|   Area    (ha)=   0.49
|ID= 1 DT=10.0 min |   Total Imp(%)=  26.00   Dir. Conn.(%)=  17.00
------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.13         0.36
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      57.15        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92        68.72
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.37 (ii)    9.57 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.05         0.05          0.094 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      82.90        27.65          37.03
     TOTAL RAINFALL   (mm)=      83.90        83.90          83.90
     RUNOFF COEFFICIENT   =       0.99         0.33           0.44

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
------------------
| CALIB            |
| STANDHYD (  0066)|   Area    (ha)=   0.25
|ID= 1 DT=10.0 min |   Total Imp(%)=  49.00   Dir. Conn.(%)=  31.00
------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.12         0.13
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      40.82        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92        95.57
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.12 (ii)    8.30 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.02          0.069 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      82.90        31.34          47.31
     TOTAL RAINFALL   (mm)=      83.90        83.90          83.90
     RUNOFF COEFFICIENT   =       0.99         0.37           0.56

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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  (  0067)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0065):     0.49   0.094     1.50    37.03
     + ID2= 2 (  0066):     0.25   0.069     1.50    47.31
       ================================================
       ID = 3 (  0067):     0.74   0.163     1.50    40.50

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
------------------
| DUHYD    (  0024)|
| Inlet Cap.= 0.057|
| #of Inlets=    1|
| Total(cms)=   0.1|      AREA     QPEAK     TPEAK    R.V.
------------------        (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   0.74      0.16      1.50   40.50
     ================================================
     MAJOR SYS.(ID= 2):   0.18      0.11      1.50   40.50
     MINOR SYS.(ID= 3):   0.56      0.06      1.50   40.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

------------------
| ADD HYD  (  0031)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0024):     0.56   0.057     1.50    40.50
     + ID2= 2 (  0027):     9.11   1.672     1.50    42.79
       ================================================
       ID = 3 (  0031):     9.67   1.729     1.50    42.66

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

------------------
| ADD HYD  (  0031)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0031):     9.67   1.729     1.50    42.66
     + ID2= 2 (  0071):     0.71   0.056     1.50    22.52
       ================================================
       ID = 1 (  0031):    10.38   1.785     1.50    41.28

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
------------------
| RESERVOIR(  0029)|     OVERFLOW IS ON
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.1080     0.2030
                          0.0085     0.0227   |   0.1807     0.2551
                          0.0130     0.0491   |   0.2663     0.3117
                          0.0163     0.0772   |   0.3630     0.3731
                          0.0190     0.1119   |   0.4697     0.4393
                          0.0512     0.1553   |   0.0000     0.0000

                                AREA     QPEAK     TPEAK      R.V.
                                (ha)     (cms)     (hrs)      (mm)
   INFLOW : ID= 2 (  0031)     10.378     1.785      1.50      41.28
   OUTFLOW: ID= 1 (  0029)     10.378     0.179      2.90      39.88
   OVERFLOW:ID= 3 (  0003)      0.000     0.000      0.00       0.00

                  TOTAL NUMBER OF SIMULATION OVERFLOW  =     0
                  CUMULATIVE TIME OF OVERFLOW  (HOURS) =  0.00
                  PERCENTAGE OF TIME OVERFLOWING   (%) =  0.00

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 10.03
                  TIME SHIFT OF PEAK FLOW         (min)= 84.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.2539

--------------------------------------------------------------------------------
------------------
| CALIB            |
| STANDHYD (  0063)|   Area    (ha)=   0.31
|ID= 1 DT=10.0 min |   Total Imp(%)=  41.00   Dir. Conn.(%)=   0.00
------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.13         0.18
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      45.46        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.92       140.36
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.19 (ii)    7.36 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.00         0.05          0.054 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      82.90        35.98          35.97
     TOTAL RAINFALL   (mm)=      83.90        83.90          83.90
     RUNOFF COEFFICIENT   =       0.99         0.43           0.43

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  58.0    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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21-173 Cottonwood Condominiums
Visual OTTHYMO MODEL

```
| ADD HYD  (  0037)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0024):     0.18   0.106     1.50    40.50
     + ID2= 2 (  0029):    10.38   0.179     2.90    39.88
       ================================================
       ID = 3 (  0037):    10.56   0.179     2.90    39.89

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

--------------------
| ADD HYD  (  0037)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0037):    10.56   0.179     2.90    39.89
     + ID2= 2 (  0038):     0.09   0.005     1.50    16.80
       ================================================
       ID = 1 (  0037):    10.65   0.180     2.88    39.69

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

--------------------
| ADD HYD  (  0037)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0037):    10.65   0.180     2.88    39.69
     + ID2= 2 (  0063):     0.31   0.054     1.50    35.97
       ================================================
       ID = 3 (  0037):    10.96   0.185     2.80    39.59

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

--------------------
| ADD HYD  (  0037)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0037):    10.96   0.185     2.80    39.59
     + ID2= 2 (  0070):     1.74   0.092     1.67    17.19
       ================================================
       ID = 1 (  0037):    12.70   0.267     1.50    36.52

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

APPENDIX D

Domestic Water Demand Calculations
21-173 FIG 3 - Fire Distances
FUS Fire Flow Calculations
OBC Fire Flow Calculations
Cedar Park II Subdivision Watermain Assessment

vallee
Consulting Engineers, Architects & Planners

Subject:	Cottonwood Towns		
Date:	5/12/2022	By:	N.B.N
Project #:	21-173	Page	1

Maximum Daily Demand

Total Number of Units	30	units
Zoning of Land	Residential	
Equiv. Population Density	2.75	ppl/unit
Equiv. Population	83	
Av. Daily Demand Per Capita	0.45	m^3/capita/day
Maximum Daily Demand Peaking Factor	2.25	
Maximum Daily Demand	84.04	m^3/day
	0.97	l/s

Maximum Hourly Demand

Total Number of Units	30	units
Zoning of Land	Residential	
Equiv. Population Density	2.75	ppl/ha
Equiv. Population	83	
Av. Daily Demand Per Capita	0.45	m^3/capita/day
Maximum Hourly Demand Peaking Factor	4	
Maximum Hourly Demand	6.23	m^3/hour
	1.73	l/s

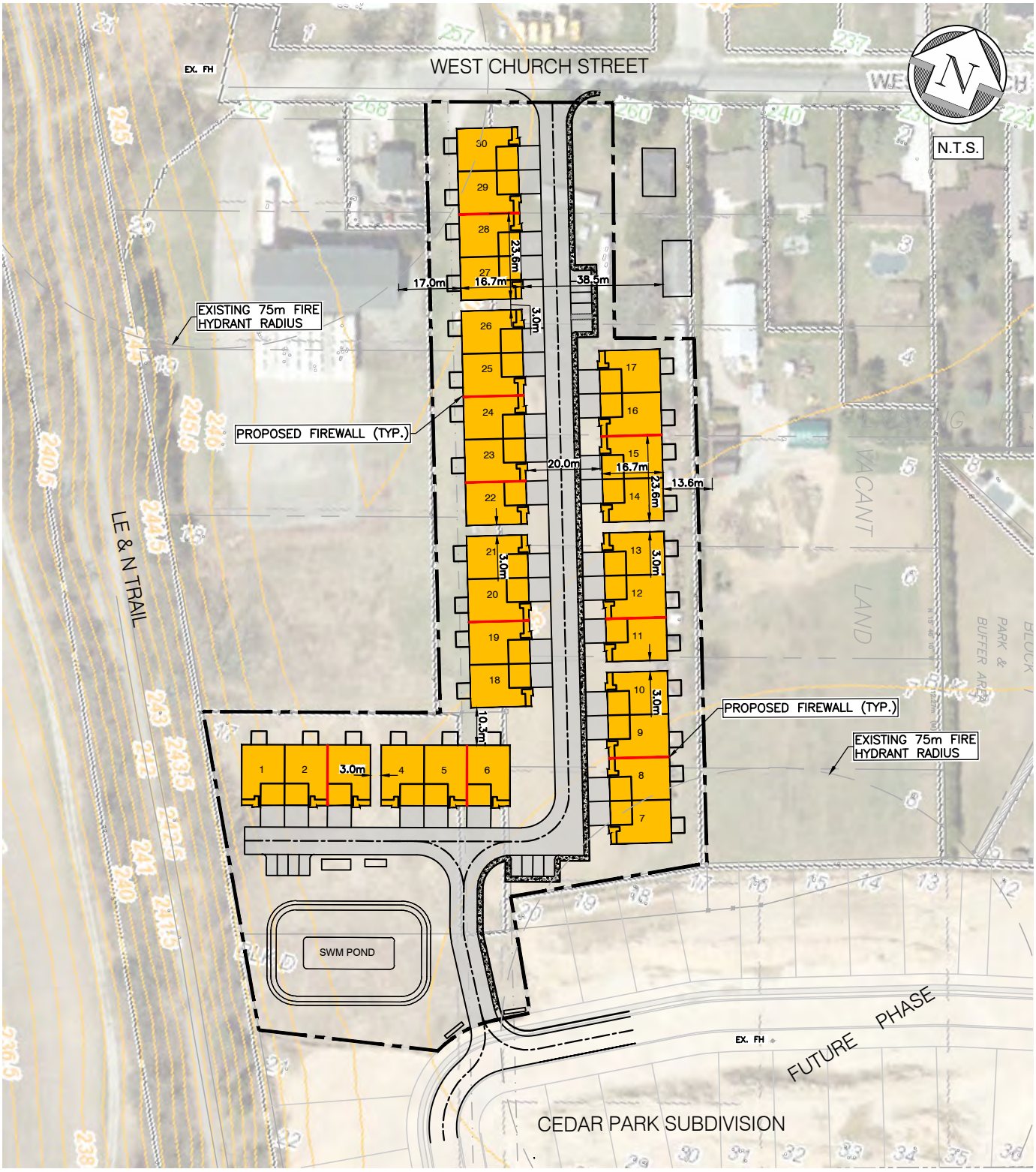

FIG 3 - FIRE DISTANCES

vallee
Consulting Engineers, Architects & Planners

Subject:	Cottonwood Condo's		
Date:	8/9/2022	By:	NLB
Project #:	21-173	Page:	1

UNITS 14-15

1) Fire Flow Requirement

$F_1=220C(A^{1/2})$ (L/min)

C= 1.5 Construction coefficient for wood frame construction

A= 394.1 Total Floor Area m^2 = main floor area (no second storey)

= 394.1 Fire Area m^2

F_1= 6551 L/min

F_1= 7000 L/min (Round to the nearest 1,000 l/min)

2) Occupancy

Occupancy Type: Residential Non-Combustible

Reduction: 25%

Surcharge: 0%

$F_2=F_1+(F_1*Reduction/Surcharge)$ (L/min)

F_2= 5250 L/min

3) Sprinkler System

Sprikler System: Not Applicable (assumed no sprinkler system in service)

Reduction: 0%

$F_3=F_2*Reduction$ (L/min)

F_3= 0 L/min

4) Seperation

Location	Direction	Distance (m)	Surcharge
Front	West	20.0	15%
Side	North	9999	0%
Side	South	3.0	25%
Rear	East	13.6	15%
		Total:	55%

Separation Surcharges	
0 to 3m	25%
3.1m to 10m	20%
10.1m to 20m	15%
20.1 to 30m	10%
30.1 to 45m	5%

F4=(TOTAL)*F2 (L/min)

F_4= 2888 L/min

Total Fire Flow

$F=F_2-F_3+F_4$ = 8138 L/min

= 8000 L/min (Round to the nearest 1,000 l/min)

= **133.3 L/s**

Notes: *1) All calculations and factors from "Water Supply for Public Fire Protection" by the Fire Underwriters Survey, 1999*

2) 9999 denotes either the nearest building > 45m away or a fire wall is provided

UNITS 27-28

1) Fire Flow Requirement

$F_1=220C(A^{1/2})$ (L/min)

C= 1.5 Construction coefficient for wood frame construction

A= 394.1 Total Floor Area m^2 = main floor area (no second storey)
= 394.1 Fire Area m^2

F_1= 6551 L/min
F_1= 7000 L/min (Round to the nearest 1,000 l/min)

2) Occupancy

Occupancy Type: Residential Non-Combustible
Reduction: 25%
Surcharge: 0%

$F_2=F_1+(F_1*Reduction/Surcharge)$ (L/min)
F_2= 5250 L/min

3) Sprinkler System

Sprikler System: Not Applicable (assumed no sprinkler system in service)
Reduction: 0%

$F_3=F_2*Reduction$ (L/min)
F_3= 0 L/min

4) Seperation

Location	Direction	Distance (m)	Surcharge
Front	East	38.5	5%
Side	North	9999	0%
Side	South	3.0	25%
Rear	West	17	15%
		Total:	45%

Separation Surcharges	
0 to 3m	25%
3.1m to 10m	20%
10.1m to 20m	15%
20.1 to 30m	10%
30.1 to 45m	5%

F4=(TOTAL)*F2 (L/min)
F_4= 2363 L/min

Total Fire Flow

$F=F_2-F_3+F_4$ = 7613 L/min
= 8000 L/min (Round to the nearest 1,000 l/min)
= **133.3 L/s**

Notes: *1) All calculations and factors from "Water Supply for Public Fire Protection" by the Fire Underwriters Survey, 1999*
2) 9999 denotes either the nearest building > 45m away or a fire wall is provided

vallee
Consulting Engineers, Architects & Planners

Subject:	Cottonwood Condo's		
Date:	8/9/2022	By:	NLB
Project #:	21-173	Page:	1

ON-SITE FIRE PROTECTION SUPPLY CALCULATION

Per Fire Protection Water Supply Guideline, Ontario Building Code Division 3, Part B, 3.2.5.7

Project:	21-173 Cottonwood Condos	Building/Block #:	Units 14-15
Project Location:	Waterford, ON	Firewalls/Sprinkler:	

Conditions not requiring On-Site Fire Protection:

Building area is Less than 200 m^2 or Less	☐
Building height is 2 Storeys or Less	☑
Building does not have a Group B Occupancy (Care or Detention)	☑
Building does not require a sprinkler system or standpipe and hose system	☑
Limiting distance from the property line is at least 13 m if the building has an F-1 (high hazard industrial) occupancy	☑
Building constitutes no significant environmental contamination potential under fire conditions	☑
On-Site Supply Required?	**YES**

Calculation Information:

$$Q = K^* V * S_{Tot}$$

where: Q = Minimum supply of water in litres (L)
V = Total Building Volume in cubic metres
K = Water supply coefficient from Table 1
S_{Tot} = total of spatial coefficient values from property line exposures on all sides, as obtained from the formula:

$$S_{Tot} = 1.0 + [(S_{Side1}) + (S_{Side2}) + (S_{Side3}) + \text{... etc.}]$$

where: S_{Side} = values are obtained from Figure 1, as modified by Sections 6.3 (e) and 6.3 (f) of the OBC Guideline
S_{Tot} = need not exceed 2.0 (see Section 7.0 of the OBC Guideline)

Determining K Value:

Major Occupancy Classification	Residential Occupancies
Group	C
Division	-

Building is of combustible construction. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire resistance rating.

K Factor **23**

Determining Building Volume:

Average Length (m)	23.6
Average Width (m)	16.7
Height, including basements (m)	11.0

Building Volume (m^3) **4335**

Total Spatial Coefficient:

	Exposure Distance (m)	Factor
North Side	Firewall	0
East Side	>10	0
South Side	3	0.7
West Side	>10	0

S_{Tot} Factor **1.7**

Minimum Water Supply Flow:

Q (L) **169,511**

Minimum Water Supply Flow Rate OBC:

5400 **L/min**
90.0 **L/sec**

Table 2:
Minimum Water Supply Flow Rates

Building Code, Part 3 Buildings	Required Minimum Water Supply Flow Rate (L/min.)
One-storey building with building area not exceeding 600m² (excluding F-1 occupancies)	1800
All other buildings	2700 (If Q ≤ 108,000L)(1) 3600 (If Q > 108,000L and ≤ 135,000L)(1) 4500 (If Q > 135,000L and ≤ 162,000L)(1) 5400 (If Q > 162,000L and ≤ 190,000L)(1) 6300 (If Q > 190,000L and ≤ 270,000L)(1) 9000 (If Q > 270,000L)(1)

Note: (1) $Q=KVS_{Tot}$ as referenced in Section 3(a)

ON-SITE FIRE PROTECTION SUPPLY CALCULATION

Per Fire Protection Water Supply Guideline, Ontario Building Code Division 3, Part B, 3.2.5.7

Project: 21-173 Cottonwood Condos
Building/Block #: Units 27-28
Project Location: Waterford, ON
Firewalls/Sprinkler:

Conditions not requiring On-Site Fire Protection:

Building area is Less than 200 m^2 or Less	☐
Building height is 2 Storeys or Less	☑
Building does not have a Group B Occupancy (Care or Detention)	☑
Building does not require a sprinkler system or standpipe and hose system	☑
Limiting distance from the property line is at least 13 m if the building has an F-1 (high hazard industrial) occupancy	☑
Building constitutes no significant environmental contamination potential under fire conditions	☑

On-Site Supply Required? **YES**

Calculation Information:

$$Q = K^* V * S_{Tot}$$

where: Q = Minimum supply of water in litres (L)
V = Total Building Volume in cubic metres
K = Water supply coefficient from Table 1
S_{Tot} = total of spatial coefficient values from property line exposures on all sides, as obtained from the formula:

$$S_{Tot} = 1.0 + [(S_{Side1}) + (S_{Side2}) + (S_{Side3}) + \ldots \text{etc.}]$$

where: S_{Side} = values are obtained from Figure 1, as modified by Sections 6.3 (e) and 6.3 (f) of the OBC Guideline
S_{Tot} = need not exceed 2.0 (see Section 7.0 of the OBC Guideline)

Determining K Value:

Major Occupancy Classification	Residential Occupancies
Group	C
Division	-

Building is of combustible construction. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire resistance rating.

K Factor **23**

Determining Building Volume:

Average Length (m)	23.6
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S_{Tot} Factor **1.7**

Minimum Water Supply Flow:

Q (L) **169,511**

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5400 L/min
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Note: (1) $Q=KVS_{Tot}$ as referenced in Section 3(a)

Ontario Building Code Tables and Figures

xx

Table 3.1.2.1.
Major Occupancy Classification

Forming Part of Sentences 3.1.2.1.(1), 3.1.2.2.(1) and 3.11.2.1.(3)

Item	Column 1 Group	Column 2 Division	Column 3 Description of *Major Occupancies*
1.	A	1	*Assembly occupancies* intended for the production and viewing of the performing arts
2.	A	2	*Assembly occupancies* not elsewhere classified in Group A
3.	A	3	*Assembly occupancies* of the arena type
4.	A	4	*Assembly occupancies* in which occupants are gathered in the open air
5.	B	1	Detention occupancies
6.	B	2	Care and treatment occupancies
7.	B	3	Care occupancies
8.	C	---	Residential occupancies
9.	D	---	Business and personal services occupancies
10.	E	---	Mercantile occupancies
11.	F	1	High hazard industrial occupancies
12.	F	2	Medium hazard industrial occupancies
13.	F	3	Low hazard industrial occupancies

Table 2:
Minimum Water Supply Flow Rates

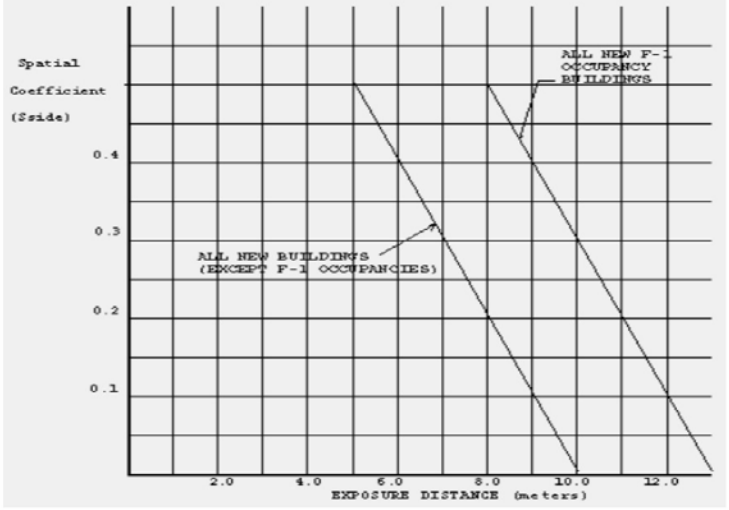
Building Code, Part 3 Buildings	**Required Minimum Water Supply Flow Rate (L/min.)**
One-storey building with building area not exceeding 600m² (excluding F-1 occupancies)	1800
All other buildings	2700 (If **Q** ≤ 108,000L)[1] 3600 (If **Q** > 108,000L **and** ≤ 135,000L)[1] 4500 (If **Q** > 135,000L **and** ≤ 162,000L)[1] 5400 (If **Q** > 162,000L **and** ≤ 190,000L)[1] 6300 (If **Q** > 190,000L **and** ≤ 270,000L)[1] 9000 (If **Q** > 270,000L)[1]

Note: [1] $\mathbf{Q=KVS_{tot}}$ as referenced in Section 3(a)

Table 1:
Water Supply Coefficient - K

TYPE OF CONSTRUCTION	**Classification by Group or Division in Accordance with Table 3.1.2.1 of the Ontario Building Code**				
	A-2 B-1 B-2 B-3 C D	**A-4 F-3**	**A-1 A-3<**	**E F-2**	**F-1**
Building is of noncombustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches.	10	12	14	17	23
Building is of noncombustible construction or of heavy timber construction conforming to Article 3.1.4.6. of the OBC. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.	16	19	22	27	37
Building is of combustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches. Noncombustible construction may be used in lieu of fire-resistance rating where permitted in Subsection 3.2.2. of the OBC.	18	22	25	31	41
Building is of combustible construction. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.	23	28	32	39	53
Column 1	2	3	4	5	6

FIGURE 1
SPATIAL COEFFICIENT VS EXPOSURE DISTANCE



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London Ontario N6E 1A2 Canada
Tel 519 681 9916 Fax 855 833 4022
www.rvanderson.com

TECHNICAL MEMORANDUM

TO: Devin Hunter, C. Tech **RVA:** 173757
FROM: David Evans, P. Eng.
DATE: April 9, 2019
SUBJECT: Waterford Water Distribution Model - Cedar Park II

1.0 INTRODUCTION

R.V. Anderson Associates Limited (RVA) conducted a watermains hydraulic assessment of the proposed Cedar Park II Subdivision in the Town of Waterford, as required by Norfolk County (County).

2.0 Background

The proposed Cedar Park II Subdivision is to be located in the southwest of the town, north of Thompson Road West and east of L.E. & N Trail. The subdivision is to comprise 76 residential units in Phase 1 and 39 residential units in Phase 2.

The objective of this report is to determine the impact of the proposed Cedar Park II Subdivision on the existing distribution system and evaluate the proposed watermains on their ability to deliver sufficient water flow to the proposed development under Maximum Daily Demand (MDD) plus Fire Flow (FF) scenario and provide adequate pressures in the system under a Peak Hour Demand (PHD) scenario.

3.0 Summary of the Water Distribution Hydraulic Modelling

RVA used the existing Waterford Water Distribution Model to review the impact of the proposed development on the system. The following points summarize the assumptions and analysis that were completed:

- Required water demands for the proposed development have been calculated based on an assumed 240 L/cap/day and 2.38 persons per unit. The maximum day demand factor was 1.87 and peak hour demand factor was

3.00 per the Norfolk County Integrated Sustainable Master Plan (ISMP) Report;

- New nodes, pipe network, and Average Day Demand (ADD) were added for the water model. ADDs were calculated based on the above assumptions. The assumed basic demand for Phase 1 is 0.50 L/s, for Phase 2 is 0.26 L/s. Node elevation data of the Cedar Park II Subdivision was obtained from the "Grading Plan" drawing prepared by Vallee Consulting Engineers, Architects and Planners dated March 2016 provided by the County.;
- Minimum residual pressures of 40 psi under Peak Hour Demand (PHD);
- Minimum residual pressure of 20 psi under Max Day Demand (MDD) + Fire Flow (FF);
- Simulations were completed to estimate the pressure in the system during PHD and available FF during MDD. The simulations were completed using the scenarios in the existing Waterford Water Distribution Model;
- The required FF value was 100 L/s based on the Fire Flow Calculations by TGS dated January 2017;
- The following proposed water distribution system upgrades are not yet completed, however were modeled as completed with the understanding these have been approved by the County and as such, included in the Master Water Model:

    - Eden Hill Condominium
    - Nichol & Temperance Street Reconstruction
    - College Avenue Reconstruction
    - Villages of Waterford Subdivision

4.0 Results of the hydraulic analysis

The following points summarize the results of the analysis completed by RVA.

4.1 Existing Conditions

- Figure A-1 – The pressures in the vicinity of the reconstruction area range between 55 psi and 63 psi during PHD conditions.
- Figure A-2 – The existing piping is providing sufficient fire protection on Charles Street prior to the construction.

4.2 Phase 1 Scenario

The existing 300mm watermain that crosses the site will be abandoned. The proposed main runs inside the development and connects back to the existing 300mm watermain east to the extension of Charles Street and west of the western edge of Waterford as shown in Appendix B.

- Figure B-1 – The pressures during PHD are in the range of 55 psi and 57 psi, which is within the MECP recommended pressure range of 40 – 100 psi.
- Figure B-2 – The available fire flows during MDD at the fire hydrant spots are between 109 L/s and 197 L/s, meeting the required fire flow of 100 L/s based on the Fire Flow Calculations by TGS dated January 2017.

4.3 Phase 1 & 2 Scenario

Phase 2 will have a connection to the extension of Cottonwood Street, which will increase the FFs in the surrounding area.

- Figure C-1 – The pressures during PHD are in the range between 54 psi and 57 psi, within the MECP recommended pressure range of 40 – 100 psi.
- Figure C-2 – The available fire flows during MDD at the fire hydrant locations are between 125 L/s and 201 L/s, above the required fire flow 100 L/s based on the Fire Flow Calculations by TGS dated January 2017.

4.4 Supplementary Models

- Figure D-1 – RVA reviewed the effect of disconnecting the 300mm during construction on the available FF during MDD. Flows on Washington Street dropped as a result of this temporary break in the loop. Available FF during MDD on Washington Street dropped by more than 30 L/s. The new watermain connection should be in place prior to disconnecting the existing 300mm watermain.
- Figure D-2 – RVA reviewed the effect of upsizing the pipe on the west end of the development from 150mm to 200mm to determine if the FF during MDD are improved on Cottonwood Street. The upsizing resulted in an increase in available FF at the connecting node from 124 L/s to 150 L/s.

5.0 Conclusions and Recommendations

The recommended watermain sizes for the proposed Cedar Park II Subdivision are a combination of 150mm, 200mm, and 300mm shown in In Figures B-2 and D-2. The watermains travelling through the center of the subdivision are proposed to be 300mm to maintain the water supply from the water treatment plant.

6.0 System Limitations and Proposed Solutions

There are several locations in the town with low available fire flow because of dead-ends. They would be improved by looping back to the system.

RVA noticed that there is a discrepancy between the shapefiles provided by the County and the existing hydraulic model at Bruce Street. It is important to note any discrepancies may have an impact on the result in this memorandum. A detailed calibration, therefore, is recommended to enhance the accuracy and reliability of the water model.

Yours very truly,

R.V. ANDERSON ASSOCIATES LIMITED

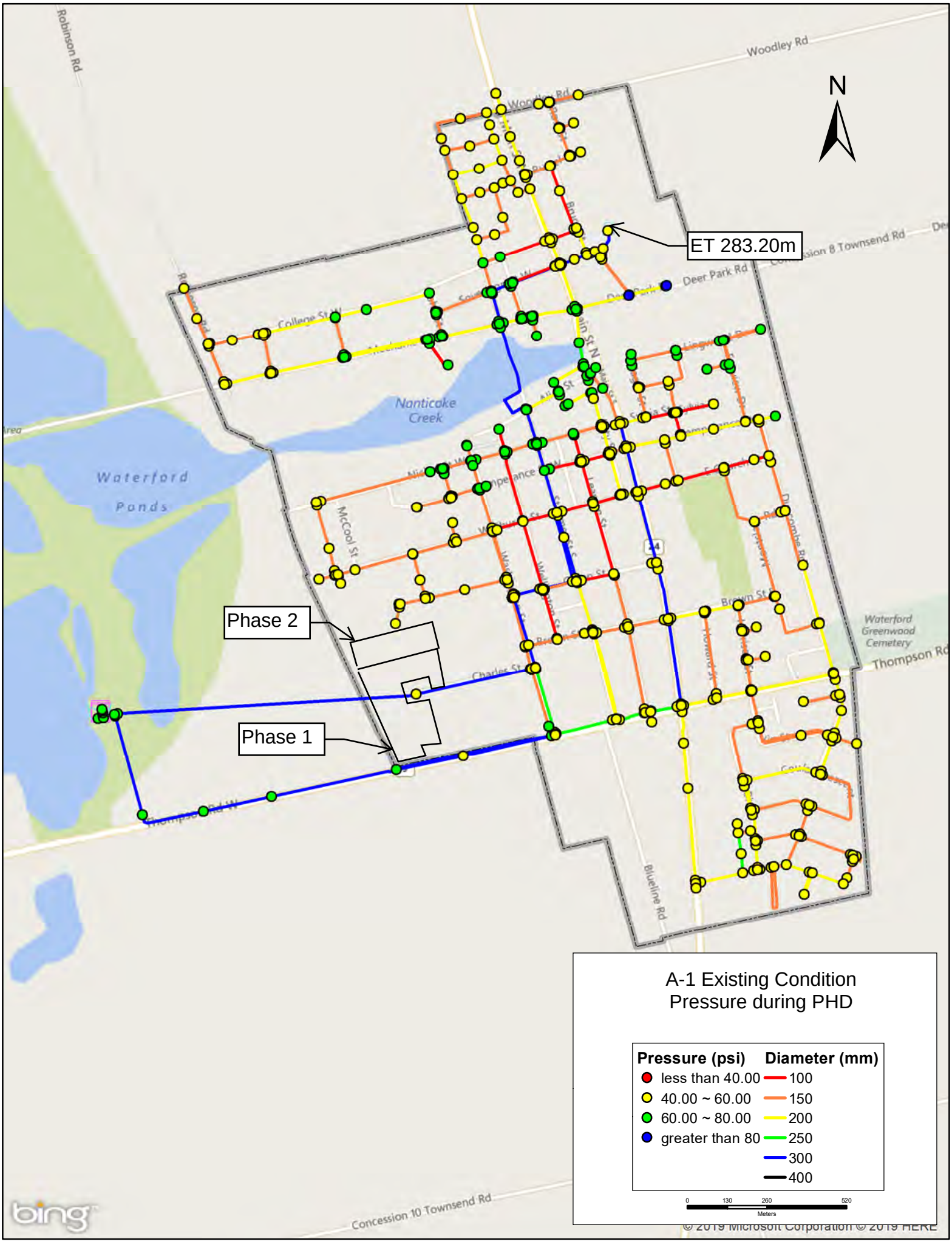
David Evans, P.Eng.
Principal, Regional Manager

Enclosures:

1. Figure A-1 – Existing: Pressure During Peak Hour Demand
2. Figure A-2 – Existing: Available Fire Flow During Max Day Demand + Fire Flow
3. Figure B-1 – Phase 1: Pressures During Peak Hour Demand
4. Figure B-2 – Phase 1: Available Fire Flow During Max Day Demand + Fire Flow
5. Figure C-1 – Phase 1 & 2: Pressures During Peak Hour Demand
6. Figure C-2 – Phase 1 & 2: Available Fire Flow During Max Day Demand + Fire Flow

REVISIONS AND PUBLICATION REGISTER			
Revision #	**Date**	**Details**	**Distribution**
00	April 9, 2019	Tech Memo Issued via email	Devin Hunter, C. Tech

APPENDIX A
Existing Conditions


N
ET 283.20m
Phase 2
Phase 1
Robinson Rd
Woodley Rd
Deer Park Rd
College St W
Nanticoke Creek
Waterford Ponds
McCool St
Main St N
Charles St
Brown St
Waterford Greenwood Cemetery
Thompson Rd
Blueline Rd
Concession 10 Townsend Rd
A-1 Existing Condition
Pressure during PHD
Pressure (psi)
less than 40.00
40.00 ~ 60.00
60.00 ~ 80.00
greater than 80
Diameter (mm)
100
150
200
250
300
400
0 130 260 520
Meters
bing
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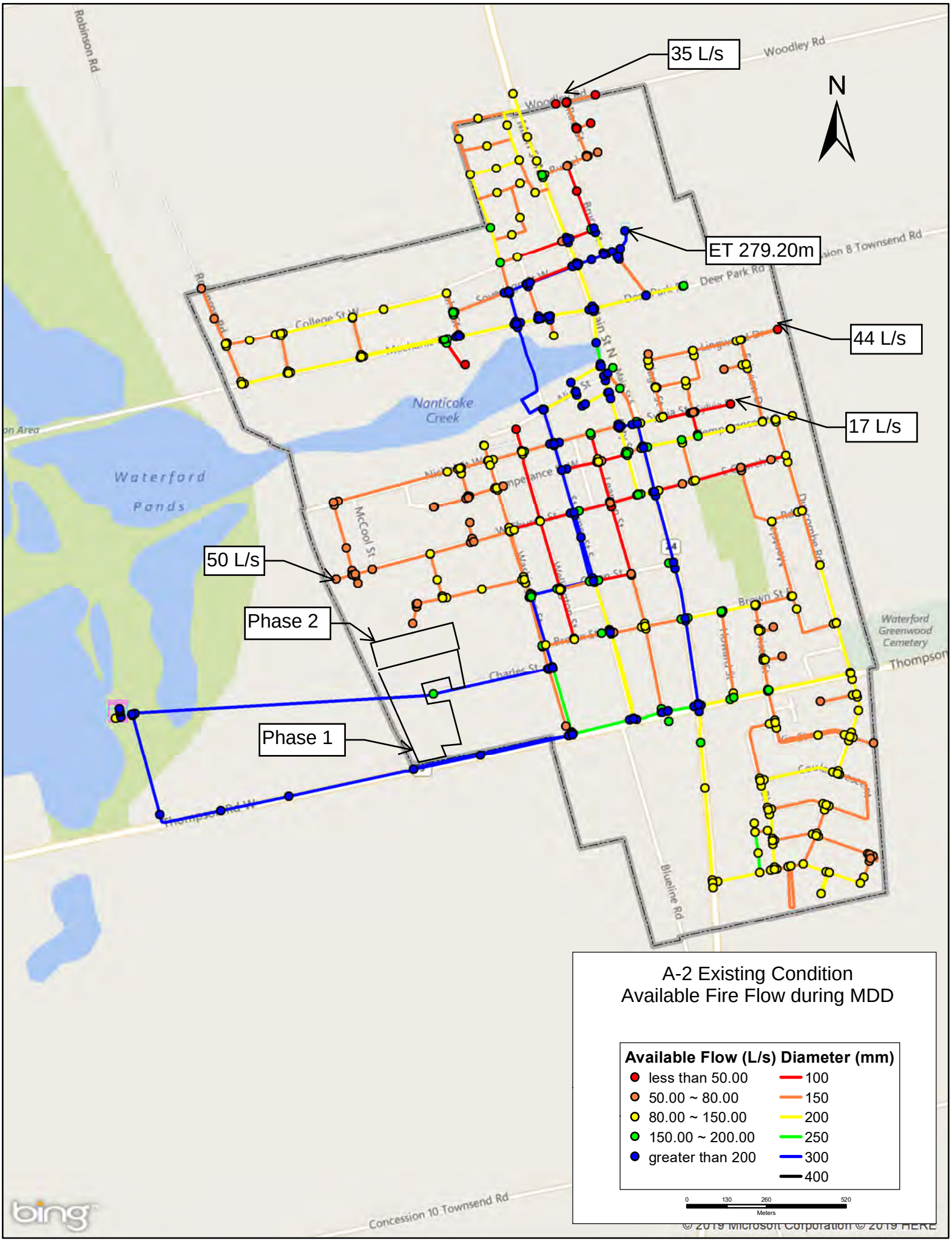
35 L/s
ET 279.20m
44 L/s
17 L/s
50 L/s
Phase 2
Phase 1
N
Woodley Rd
Deer Park Rd
College St W
Nanticoke Creek
Waterford Ponds
McCool St
Brown St
Charles St
Thompson Rd W
Blueline Rd
Waterford Greenwood Cemetery
Concession 10 Townsend Rd
A-2 Existing Condition
Available Fire Flow during MDD
Available Flow (L/s)
less than 50.00
50.00 ~ 80.00
80.00 ~ 150.00
150.00 ~ 200.00
greater than 200
Diameter (mm)
100
150
200
250
300
400
0 130 260 520
Meters
bing
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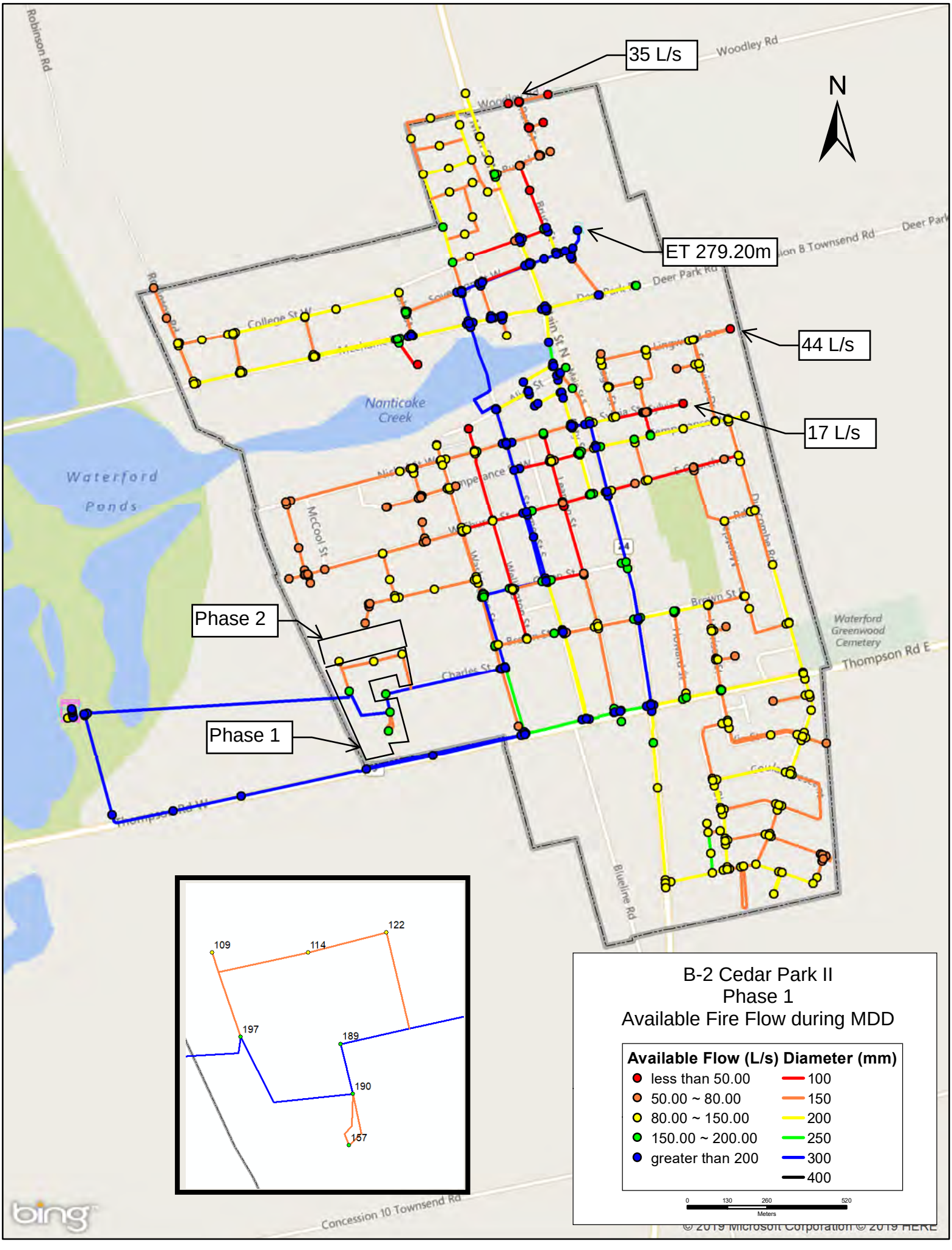
APPENDIX B
Waterford - Cedar Park II
Phase 1


35 L/s
ET 279.20m
44 L/s
17 L/s
Phase 2
Phase 1
N
Woodley Rd
Robinson Rd
Deer Park Rd
College St W
Nanticoke Creek
Waterford Ponds
McCool St
Main St N
Brown St E
Thompson Rd E
Thompson Rd W
Waterford Greenwood Cemetery
Blueline Rd
Concession 10 Townsend Rd
122
109
114
197
189
190
157
B-2 Cedar Park II
Phase 1
Available Fire Flow during MDD
Available Flow (L/s)
less than 50.00
50.00 ~ 80.00
80.00 ~ 150.00
150.00 ~ 200.00
greater than 200
Diameter (mm)
100
150
200
250
300
400
0
130
260
520
Meters
bing
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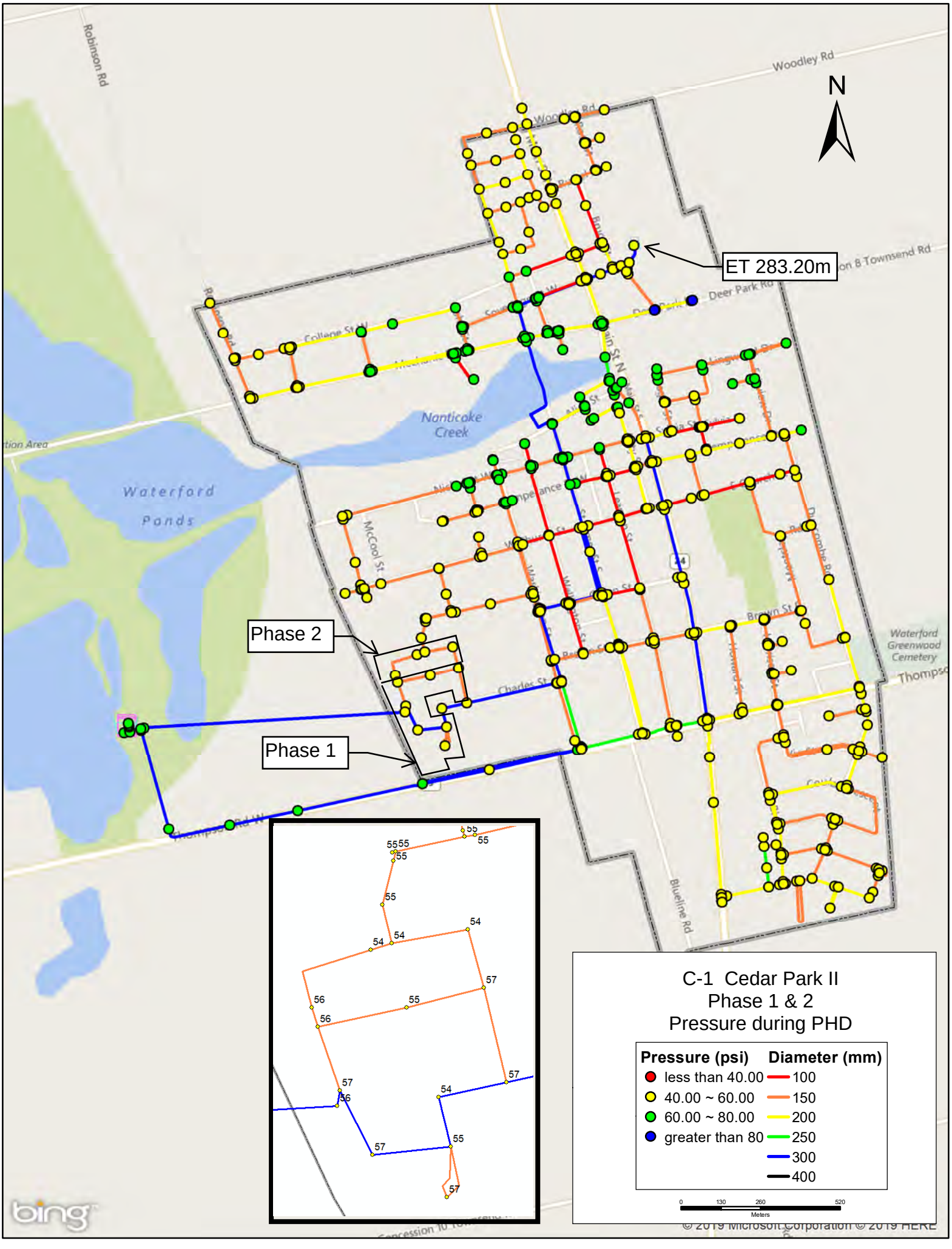
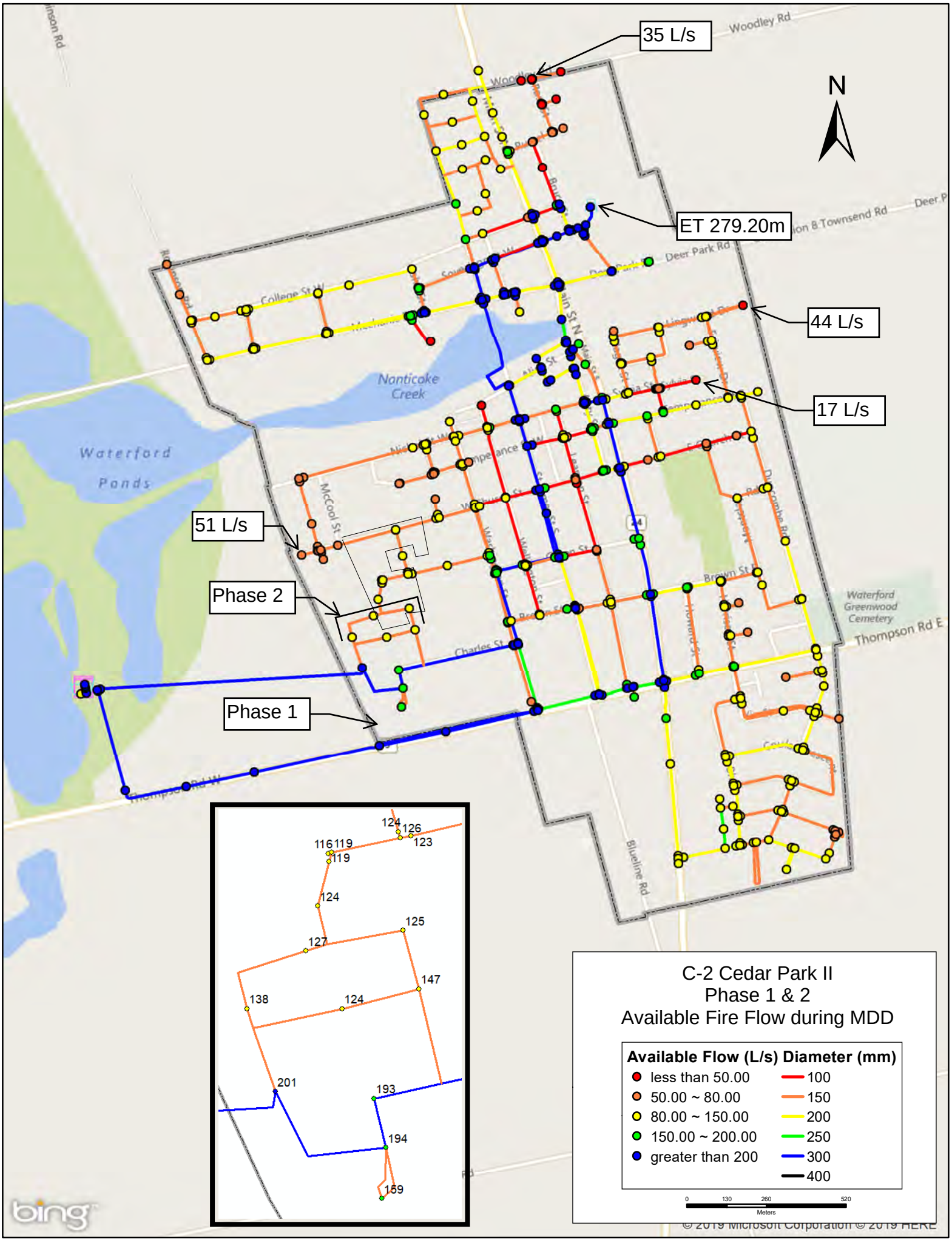
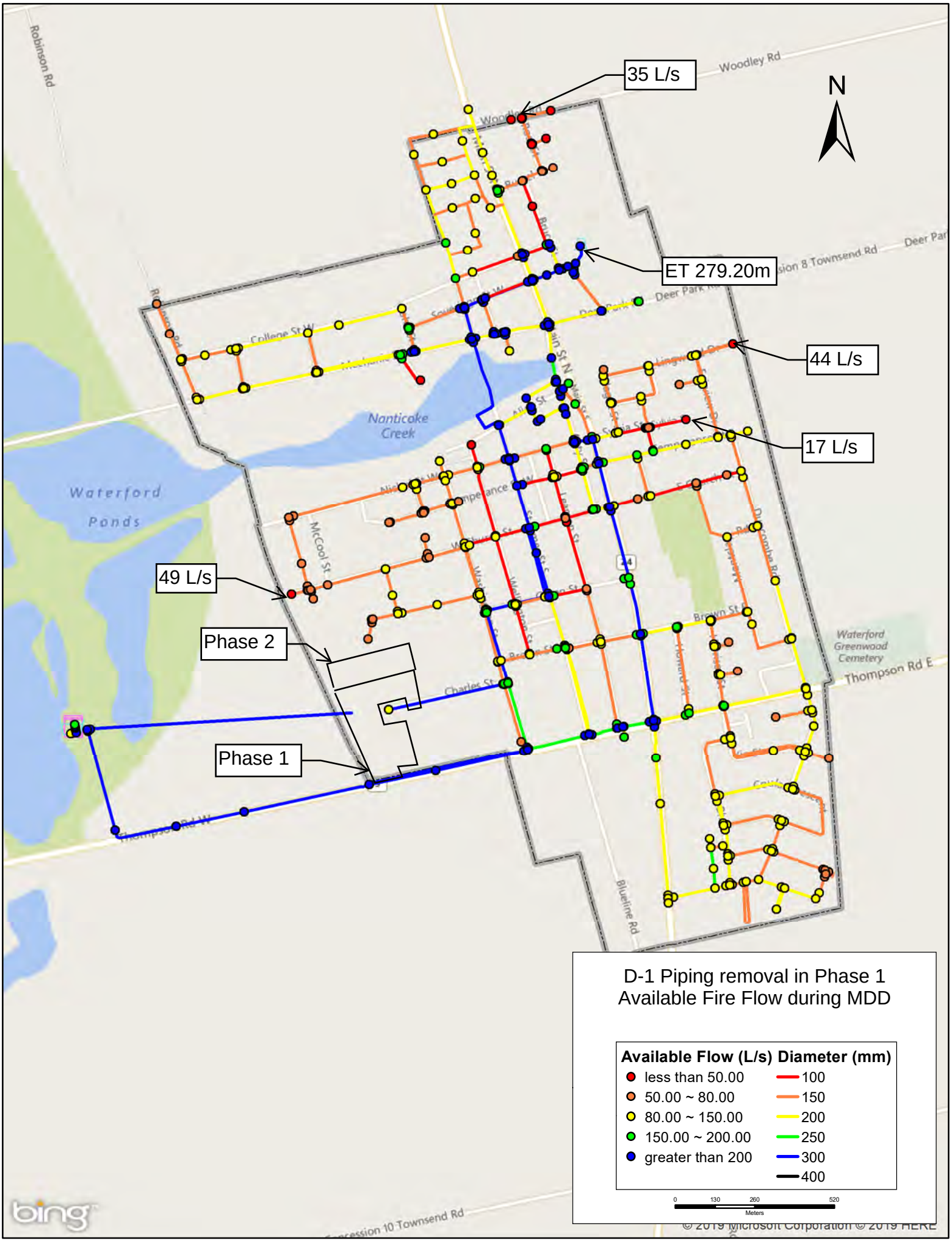
APPENDIX C
Waterford - Cedar Park II
Phase 1 & 2


Robinson Rd
Woodley Rd
N
ET 283.20m
Deer Park Rd
Nanticoke Creek
Waterford Ponds
McCool St
Phase 2
Phase 1
Brown St
Waterford Greenwood Cemetery
Charles St
Blueline Rd
55
54
57
56
C-1 Cedar Park II
Phase 1 & 2
Pressure during PHD
Pressure (psi)
less than 40.00
40.00 ~ 60.00
60.00 ~ 80.00
greater than 80
Diameter (mm)
100
150
200
250
300
400
0 130 260 520
Meters
bing
© 2019 Microsoft Corporation © 2019 HERE



APPENDIX D
SUPLEMENTARY MODELS


35 L/s
ET 279.20m
44 L/s
17 L/s
49 L/s
Phase 2
Phase 1
N
Woodley Rd
Robinson Rd
College St W
Deer Park Rd
Nanticoke Creek
Waterford Ponds
McCool St
Main St N
Charles St
Brown St
Thompson Rd E
Waterford Greenwood Cemetery
Blueline Rd
Concession 10 Townsend Rd
D-1 Piping removal in Phase 1
Available Fire Flow during MDD
Available Flow (L/s)
less than 50.00
50.00 ~ 80.00
80.00 ~ 150.00
150.00 ~ 200.00
greater than 200
Diameter (mm)
100
150
200
250
300
400
0 130 260 520
Meters
bing
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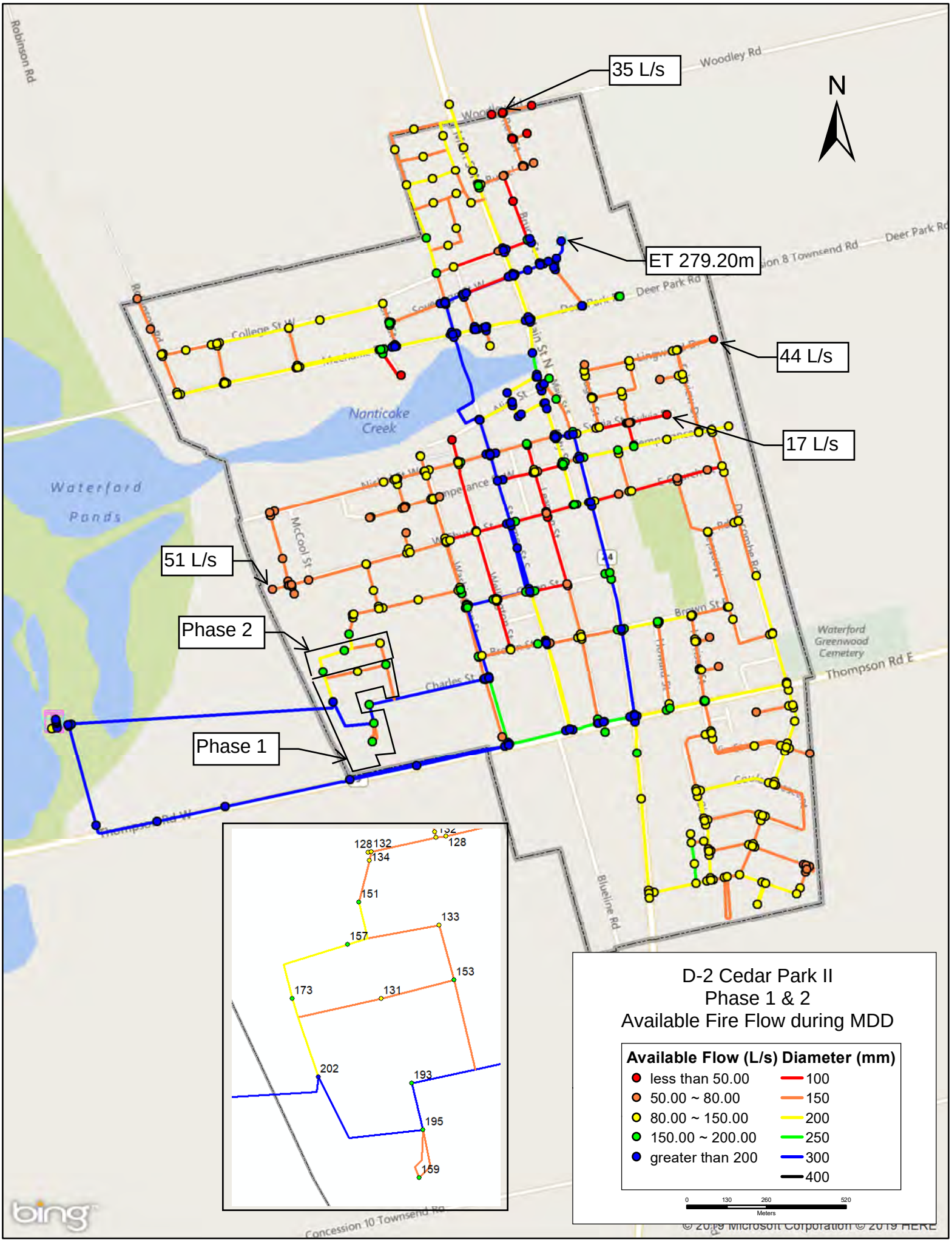
35 L/s
ET 279.20m
44 L/s
17 L/s
51 L/s
Phase 2
Phase 1
N
Woodley Rd
Deer Park Rd
College St W
Nanticoke Creek
Waterford Ponds
McCool St
Brown St E
Charles St
Thompson Rd E
Waterford Greenwood Cemetery
Blueline Rd
Robinson Rd
Concession 10 Townsend Rd
128
132
134
151
133
157
153
173
131
202
193
195
159
D-2 Cedar Park II
Phase 1 & 2
Available Fire Flow during MDD
Available Flow (L/s)
less than 50.00
50.00 ~ 80.00
80.00 ~ 150.00
150.00 ~ 200.00
greater than 200
Diameter (mm)
100
150
200
250
300
400
0
130
260
520
Meters
bing
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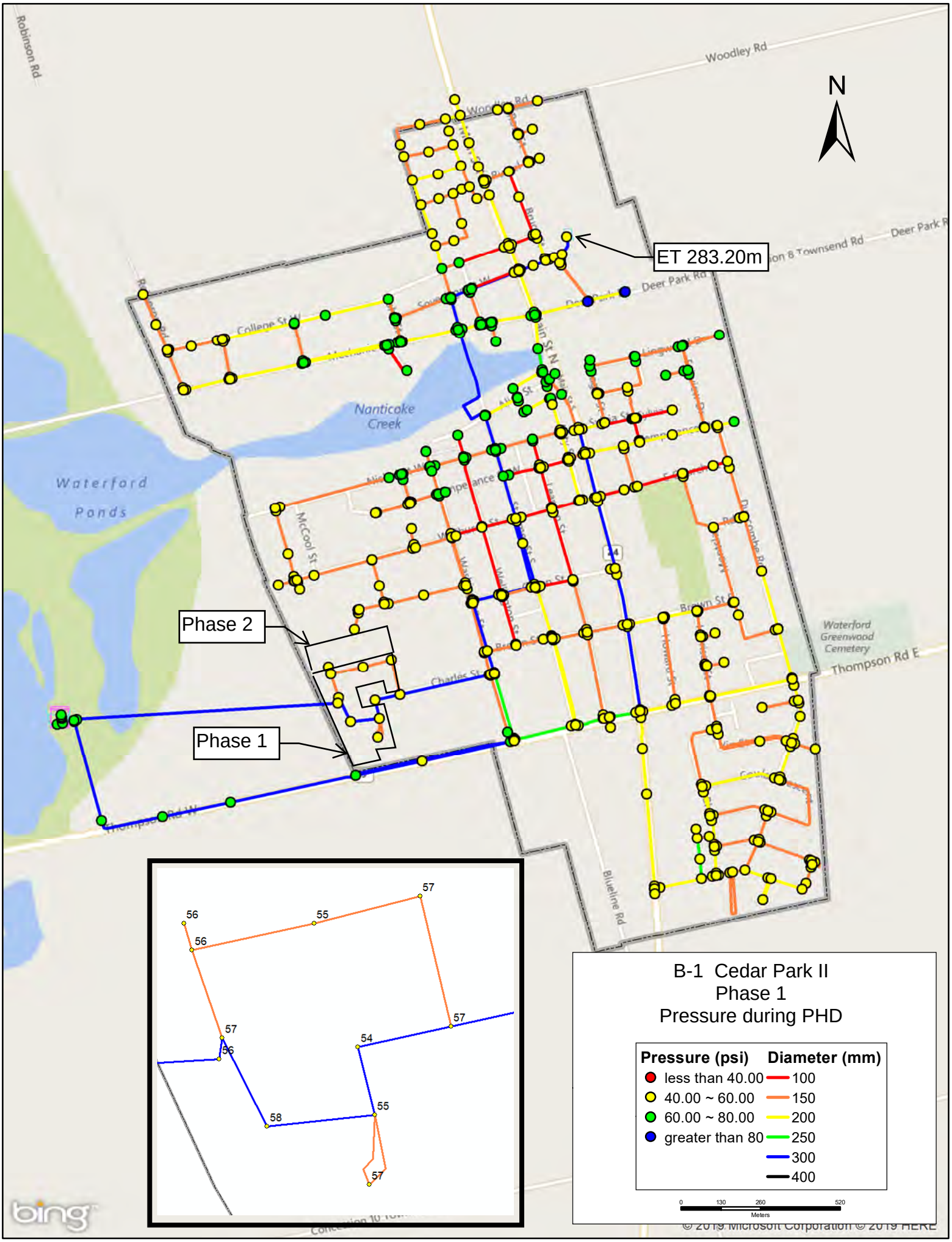
Robinson Rd
Woodley Rd
N
ET 283.20m
Deer Park Rd
College St
Nanticoke Creek
Waterford Ponds
McCool St
Main St N
Brown St
Charles St
Thompson Rd E
Waterford Greenwood Cemetery
Bluelime Rd
Phase 2
Phase 1
57
56
55
56
57
57
54
56
58
55
57
B-1 Cedar Park II
Phase 1
Pressure during PHD
Pressure (psi)
less than 40.00
40.00 ~ 60.00
60.00 ~ 80.00
greater than 80
Diameter (mm)
100
150
200
250
300
400
0
130
260
520
Meters
bing
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D-6 COMPATIBILITY ASSESSMENT
Aucoin-Dixon Development Inc. – Cottonwood Condominiums
Waterford ON

August 5, 2022 Rv1

Prepared for:

Aucoin-Dixon Development Inc.
75 Brant Ave
Brantford ON N3T 3H2
paulaucoin@hotmial.ca

c/o:
G. DOUGLAS VALLEE LIMITED
Scott Puillandre, CD, MSc, Planner
2 Talbot Street North Simcoe Ontario N3Y 3W4
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Prepared by:

CCS Engineering Inc.
69 Lawrence Street
Wellesley, ON N0B 2T0
(519) 504-7241

Project 1069

TABLE OF CONTENTS

ATTACHMENTS

EXECUTIVE SUMMARY

CCS Engineering Inc. (CCS) was retained by Aucoin-Dixon Development Inc. to prepare a D-6 Land Use Compatibility Assessment for the proposed condominium development located 260 West Church Street in Waterford, Norfolk County referred to as “Cottonwood Condominiums”. The parcels are shown as the subject land in Attachment A Figure 1.

The assessment was conducted in accordance with the “Compatibility between Industrial Facilities and Sensitive Land Uses”, published by the Ontario Ministry of the Environment Conservation and Parks (MOECP) as Guideline D-6 (D-6 Guideline).

The proposed development condominium is outside the 20 m separation distance from Class I light industrial operations or commercial operations in compliance with the Guideline D-6 – Land Use Compatibility recommendations.

The proposed Cottonwood Condominiums development is not considered to be adversely impacted by noise, odour or dust from the neighbouring light industrial or commercial operations identified to the west and north.

1.0 INTRODUCTION

CCS Engineering Inc. (CCS) was retained by Aucoin-Dixon Development Inc. to prepare a D-6 Land Use Compatibility Assessment for the proposed condominium development located 260 West Church Street in Waterford, Norfolk County referred to as “Cottonwood Condominiums”. The parcels are shown as the subject land in Attachment A Figure 1.

The purpose of this assessment is to determine if noise, odour, vibration or dust emissions from surrounding sources might adversely impact the proposed condominium development sensitive land uses.

The assessment was conducted in accordance with the “Compatibility between Industrial Facilities and Sensitive Land Uses”, published by the Ontario Ministry of the Environment Conservation and Parks (MOECP) as Guideline D-6 (D-6 Guideline).

This report describes the surrounding commercial operations, industrial zoned land and existing operations on these lands, focusing on the nearest neighbouring businesses and industries to the proposed development as having the highest potential to cause an adverse impact.

Other surrounding facilities within approximately one kilometer diameter have also been reviewed and are considered insignificant for impacts on the proposed development.

2.0 SITE AND NEIGHBOURHOOD DESCRIPTION

The proposed condominium development is located 260 West Church Street in Waterford, Norfolk County.

A satellite site location (Figure 1) and Norfolk zoning map (Figure 2) given in Attachment A show the site location.

The proposed development land is currently zoned MG General Industrial. The proposed development is immediately surrounded by a parcel of general industrial land to the west which also includes the Waterford Heritage Trail and LE and N Trail recreation system, residential zoned and developed lands to the south and east, and general industrial zoned land and residential zoned land to the north of West Church Street.

Attachment B provides the proposed development layout drawing.

2.1 GUIDELINE D-6 LAND USE COMPATIBILITY

Guideline D-6 – Land Use Compatibility deals with the compatibility between industrial uses and sensitive uses by classification of the industry and identifying an area of influence and establishing recommended minimum setback distances between the industrial operations and sensitive land uses.

D-6 indicates that sensitive land uses can include the following:

- recreational uses which are deemed by the municipality or provincial agency to be sensitive; and/or
- any building or associated amenity area (i.e., may be indoor or outdoor space) which is not directly associated with the industrial use, where humans or the natural environment may be adversely affected by emissions generated by the operation of a nearby industrial facility. For example, the building or amenity area may be associated with residences, senior citizen homes, schools, day care facilities, hospitals, churches and other similar institutional uses, or campgrounds.

The D-6 Industrial Categorization Criteria is summarized in Attachment C. There are three industrial classes:

- Class 1 = light industrial,
- Class 2 = medium industrial, and
- Class 3 = heavy industry

The general descriptions of each class are given below:

Class I Industrial Facility – Light Industrial

A place of business for a small scale, self contained plant or building which produces/stores a product which is contained in a package and has low probability of fugitive emissions. Outputs are infrequent and could be point source or fugitive emissions for any of the following: noise, odour, dust and/or vibration. There are daytime operations only, with infrequent movement of products and/or heavy trucks and no outside storage.

Class II Industrial Facility – Medium Industrial

A place of business for medium scale processing and manufacturing with outdoor storage of wastes or materials (i.e., it has an open process) and/or there are periodic outputs of minor annoyance. There are occasional outputs of either point source or fugitive emissions for any of the following: noise, odour, dust and/or vibration, and low probability of fugitive emissions. Shift operations are permitted and there is frequent movement of products and/or heavy trucks during daytime hours.

Class III Industrial Facility – Heavy Industrial

A place of business for large scale manufacturing or processing, characterized by large physical size, outside storage of raw and finished products, large production volumes and continuous movement of products and employees during daily shift operations. It has frequent outputs of major annoyance and there is high probability of fugitive emissions.

The Ministry has identified in the D-6 guideline potential influence areas - areas within which adverse effects may be experienced. The D-6 guideline also outlines recommended minimum separation distances where no development ideally should occur. The D-6 guideline suggests that distances typically be measured between property lines but can also be measured from a specific source to sensitive receptor. These distances are summarized in the table below.

Industry Classification	Recommended Min Separation Distance (m)	Potential Influence Area (m)
Class I – Light Industrial	20	70
Class II – Medium Industrial	70	300
Class III – Heavy Industrial	300	1000

3.0 INDUSTRY CLASSIFICATION AND SURROUNDING LAND USES

Neighbouring property to the south and east is zoned residential and developed residential and are not considered to adversely impact the proposed Cottonwood Condominiums development. These properties include vacant land and residential houses.

Neighbouring properties to the west and north are zoned industrial.

272 West Church Street – Alpha Vico

272 West Church street is a one and a half storey building west of the proposed development. This Alpha Vico company claims to be a school furniture manufacturer. There are no process equipment or exhausts from the building (e.g. dust collectors, paint booth exhaust stacks, etc.). There are no doors or bay doors facing east or west. Two bay doors face north at the NW corner of the building. Two man doors face south on the SW and SE corner of the building.

The building looks largely inactive with one pickup truck in front, and one transport truck in the north bay door. There may be one or two personnel at this building. Eight or nine truck trailers are parked at the back of the facility on the south side. These trailers have been observed in satellite images since 2012 and do not seem to have moved in ten years.

This building appears to operate more as a small warehouse rather than an industrial operation.

This class I light industrial operation is not considered to adversely impact the proposed development for noise, odour or dust. The nearest parked trailer on the south side it is located just outside the potential recommended separation distance of 20 m and within the 70 m influence area.

Waterford Heritage Trail and LE and N Trail recreation system

The Waterford Heritage Trail and LE and N Trail recreation system runs north south along the west side of the industrial zoned land. To the west of the trail system is agricultural zoned land and hazard zoned land (HL) as part of the provincially significant wetland areas.

This trail system is a typically considered a recreational use and deemed by the municipality or provincial agency to be sensitive.

This recreational trail area, agricultural area and wetland area is not considered to adversely impact the proposed development for noise, odour or dust.

268 West Church Street – DR Towing – Residential House

272 West Church street is a one storey house with a driveway and fenced yard. The house appears to be an occupied residence. The back yard fenced area has several derelict cars. It is not an active commercial or industrial operation, rather it is a residential house on industrial land.

This house is not considered to adversely impact the proposed development for noise, odour or dust.

This house is located within 16 m of the Alpha Vico class I light industrial operation building.

257 West Church Street

This property to the north of West Church Street is a former Norfolk Co-op site with a storage silo system at the north end of the property along Nichol St. W that was serviced from the former LE and N (Lake Erie and Northern Railway) and CPR railway system that was discontinued in 1975 and officially abandoned in the early 1990's.

The property currently appears to have two commercial operations, and possibly some storage activities for the town or county. Driveway access on the property is paved asphalt.

Voyago, subsidiary of Transdev

Voyago manages yellow school buses and some small passenger vans onsite. An office building and bus repair shop is located on the south east corner of the property. Five employee vehicles were parked along the west side of the building. A bay door opens towards the north on the north side of the building and does not face the proposed Cottonwood Condominiums property. School buses were parked throughout the east side of the property.

This is a commercial type of operation with some repair garage type activities inside on the north side of the building.

This Voyago school bus operation is not considered to adversely impact the proposed development for noise, odour or dust.

Synergy Group of Companies

Synergy is a telecommunication and utility infrastructure construction company. They appear to operate from the building located on the south west corner of the property. Utility vans and cube vans were parked at the building. Eight employee vehicles were parked along the east side of the building. A bay door opens towards the north on the north side of the building and does not face the proposed Cottonwood Condominiums property. Large reels of telecommunication cable were stored along the west side of the property behind the building.

Sinergy is a commercial type of operation with service vans and some garage type activities on the north side of the building.

This telecommunication construction service operation is not considered to adversely impact the proposed development for noise, odour or dust.

Labels of the various neighboring properties are given in Attachment A Figure 2a.

Photos of the various properties are shown in Attachment D.

Figures showing separation distances and influence zones are given in Attachment E.

4.0 NOISE IMPACT ASSESSMENT

4.1 INDUSTRIAL NOISE IMPACTS

NPC 300 is the Environmental Noise Guideline for Stationary and Transportation Sources - Approval and Planning outlining the proper control of sources of noise emissions to the environment. The Ministry of the Environment, Conservation and Parks (MOECP) ensures sources of emissions to the environment are adequately controlled to prevent potential negative effects.

In the province of Ontario, contaminants released by local industrial, and some commercial facilities are regulated by the MOECP under the Environmental Protection Act. Other Acts including the Planning Act, Municipal Act, etc. establish rules that may require assessment of the effects of noise emissions. The definition of "contaminant" includes sound. The industrial facilities are required to meet NPC 300 guidelines that may apply to limit exposure to noise and vibration that can affect human health and the environment.

The MOECP provides guides and resources to conduct noise and sound level assessments in support of an ECA/EASR. https://www.ontario.ca/page/noise-and-sound-level-assessments-sample-applications-guides-and-resources

The applicable noise limit at the sensitive point of reception is the higher of the existing ambient sound level from road traffic/existing approved industry (background sound level) or the exclusion limit outlined in the NPC 300 guideline.

MOECP NPC 300 provides various definitions for noise sensitive buildings and uses:

> **"Noise sensitive commercial purpose building"**
>
> means a building used for a commercial purpose that includes one or more habitable rooms used as sleeping facilities such as a hotel and a motel.
>
> **"Noise sensitive institutional purpose building"**
>
> means a building used for an institutional purpose, including an educational facility, a day nursery, a hospital, a health care facility, a shelter for emergency housing, a community centre, a place of worship and a detention centre. A place of worship located in commercially or industrially zoned lands is not considered a noise sensitive institutional purpose building.
>
> **"Noise sensitive land use"** means:
>
> - a property of a person that accommodates a dwelling and includes a legal nonconforming residential use; or
> - a property of a person that accommodates a building used for a noise sensitive commercial purpose; or

- a property of a person that accommodates a building used for a noise sensitive institutional purpose.

"Noise sensitive space"

means the living and sleeping quarters of dwellings and sleeping quarters of noise sensitive commercial or institutional land uses. Examples include, but are not limited to bedrooms, sleeping quarters such as patient rooms, living/dining rooms, eat-in kitchens, dens, lounges, classrooms, therapy or treatment rooms, assembly spaces for worship, sleeping quarters of detention centres.

Both identified industrial and commercial operations to the north are located outside the 20 m recommended separation distance from the proposed Cottonwood Condominiums condominium building development.

The Alpha Vico class I light industrial operation to the west of the Cottonwood Condominiums proposed development is located just within the potential recommended influence area distance of 70 m for three (3) of the proposed condominium units.

This Synergy and Voyago commercial operations north of West Church Street and Cottonwood Condominiums proposed development is located within the potential recommended influence area distance of 70 m for one (1) of the proposed condominium units closest to West Church Street.

No sources of vibration were identified around proposed development.

4.2 COMMERCIAL AND INDUSTRIAL NOISE IMPACTS

Site review activities indicated that noise associated with the industrial and commercial operations were not audible at the proposed development.

4.3 ROAD NOISE IMPACTS

There does not appear to be significant road traffic associated with 272 West Church Street – Alpha Vico.

257 West Church Street - Voyago and Synergy – employee traffic was observed to be less than ten (10) cars each. Service vans or school buses may travel on and off the 257 West Church Street property either along Nichol Street to the north or along West Church Street.

These vehicles are not heavy trucks or transport trucks.

Potential noise would be from traffic along West Church Street which already travels through the existing urban residential area. Traffic also use Nichol Street W to the north.

Typical road traffic noise are not expected to impact the Cottonwood Condominiums development first condominium unit at West Church Street any more than the existing road traffic is already impacting the existing houses and residential properties along West Church Street adjacent to the proposed development.

Following NPC 300, these condominium units should be designed with a provision for the installation of central air conditioning to allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment, Conservation, and Parks (MOECP).

5.0 DUST

Potential for dust impacts at the proposed development are not considered significant.

257 West Church Street driveway access on the property is paved asphalt. No activities at this location appear to be dust generating.

272 West Church Street driveway and back drive area is gravel. The amount of traffic or potential traffic at this building appears to be minimal – one or two employees and one transport truck. Access to the building bay doors at the northeast corner of the building will not create dust impact due to the short distance the vehicle will travel from the paved West Church Street into the loading bay which is also concrete paved, and the distance from the proposed Cottonwood Condominiums development in between which is the house located at 268 West Church Street.

6.0 CONCLUSIONS AND RECOMMENDATIONS

There are no industrial or commercial facilities that are expected to adversely impact the proposed condominium development located 260 West Church Street in Waterford, Norfolk County, referred to as “Cottonwood Condominiums”, with noise, dust or odour emissions based on the Guideline D-6 – Land Use Compatibility review for the surrounding industrial and commercial operations.

Proposed development condominium units will be located just outside the D-6 recommended 20 m separation distance or more from a class I industrial operation to the west and approximately 75 m or more further from the commercial operations to the north.

The proposed Cottonwood Condominiums development is not considered to be adversely impacted by noise, odour or dust from the neighbouring light industrial or commercial operations identified to the west of the proposed development and north of West Church Street.

It is recommended that the condominiums be designed with the provision for adding central air conditioning to allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment, Conservation, and Parks (MOECP).

Based on the assessment of the industrial and commercial land uses in the vicinity of the proposed development, review of the MOECP’s D-6 guidelines, there are no industrial or commercial that are expected to adversely impact the proposed development as a result of noise, odour or dust.

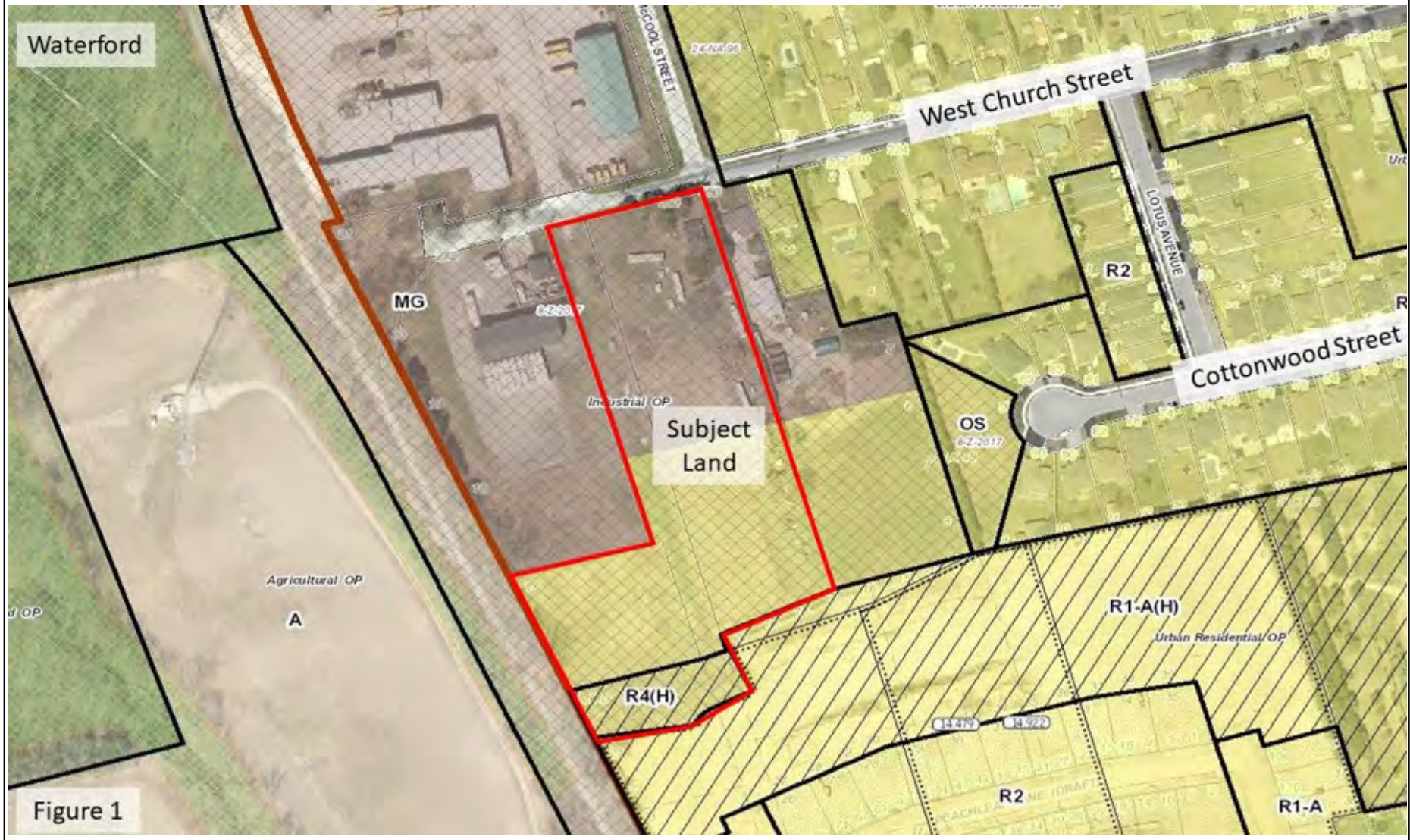
If you have any questions, please contact the undersigned.

Yours truly,
CCS Engineering Inc.

Jim Anderson, M.Eng., P.Eng.
Principal
JA/JA
Attachments

ATTACHMENT A

SITE LOCATION AND ZONING FIGURES



Source: Google Earth

Approximate Scale Metres

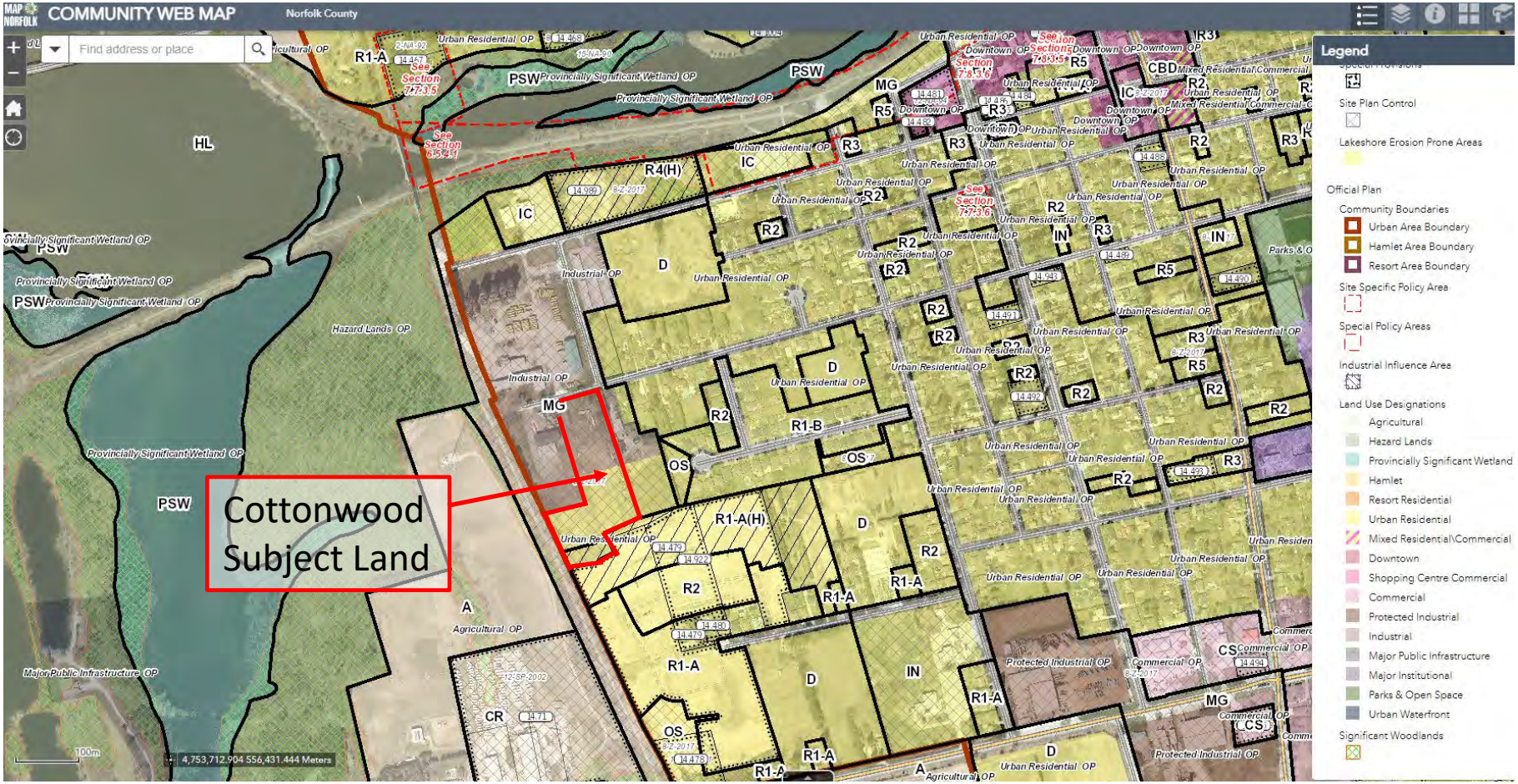
0 130

CCS Engineering Inc.

SITE LOCATION
Cottonwood Condominiums
WATERFORD, ONTARIO

By: JA	Date: 11 July 2022	Project No. 1069

Figure 1



Source: Map Norfolk

Approximate Scale Metres

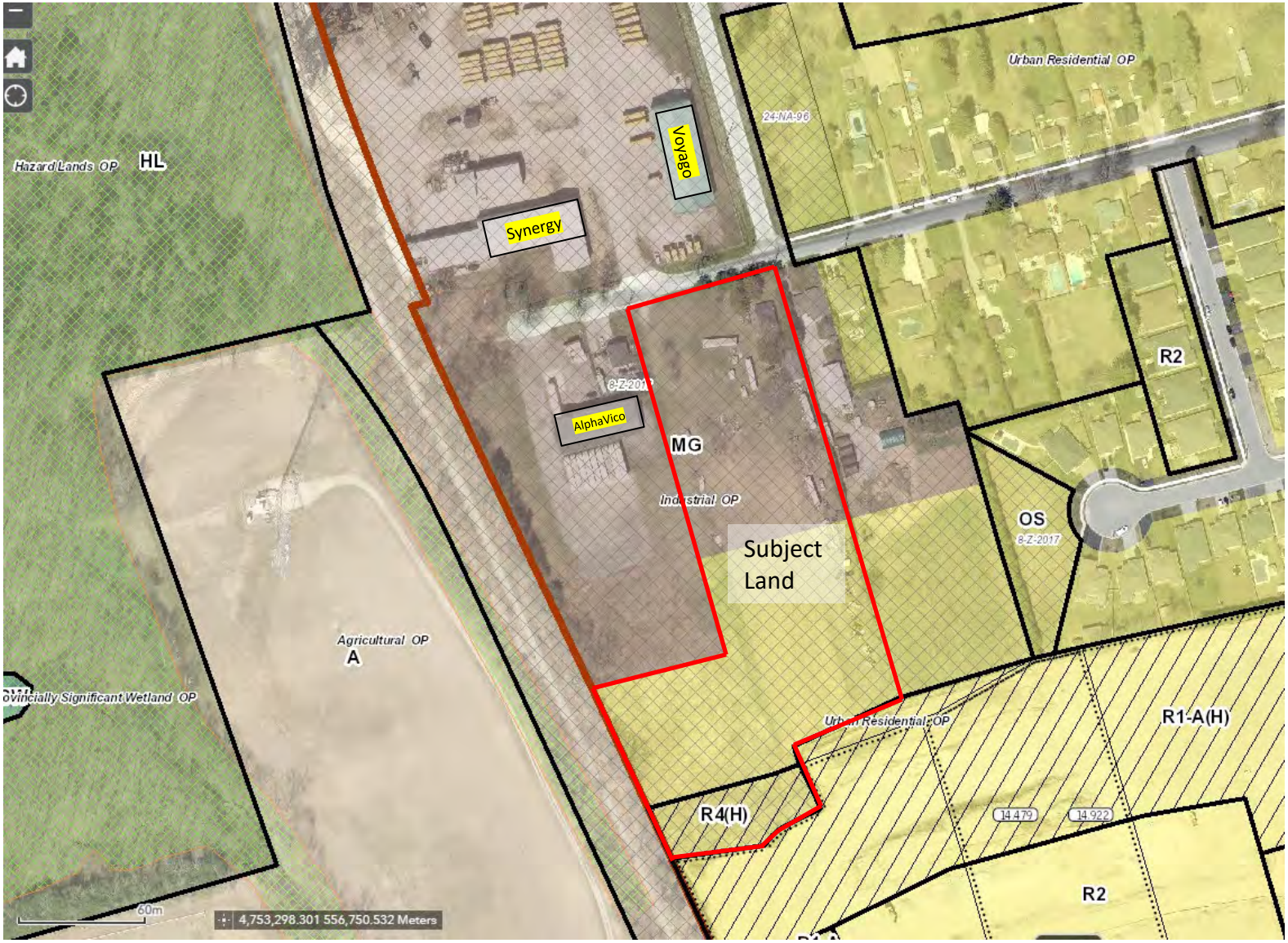
0 100

CCS Engineering Inc.

ZONING
Cottonwood Condominiums
WATERFORD, ONTARIO

By: JA	Date: 11 July 2022	Project No. 1069

Figure 2



Source: Norfolk maps

Approximate Scale Metres

0 60

CCS Engineering Inc.

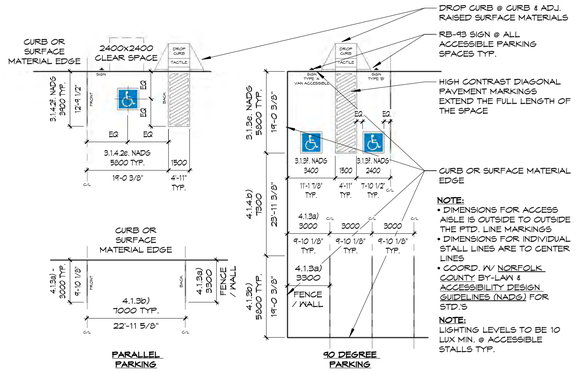
INDUSTRIAL FACILITIES
Cottonwood Condominiums
WATERFORD, ONTARIO

By: JA	Date: 11 July 2022	Project No. 1069

Figure 2a

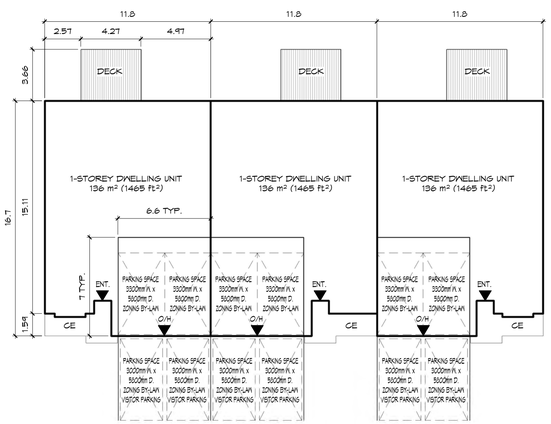
ATTACHMENT B

PROPOSED DEVELOPMENT LAYOUT DWG



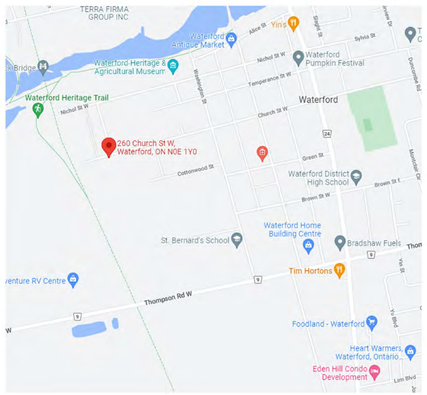
2 PARKING STALL GUIDELINES - NORFOLK COUNTY

PC/Z100 SCALE 1 : 200



3 TYPICAL UNIT LAYOUT

PC/Z100 SCALE 1 : 200

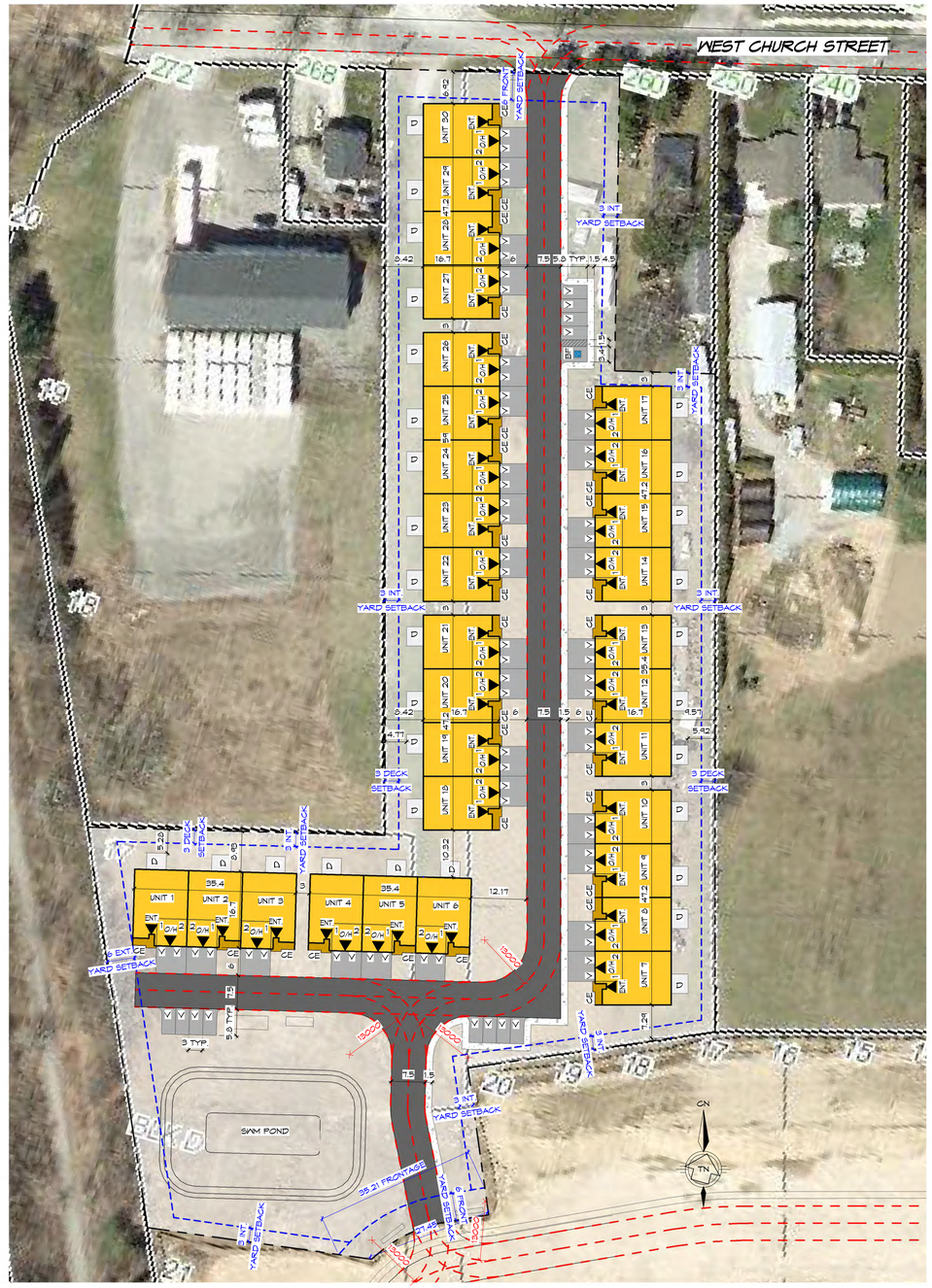


KEY MAP

SCALE 1 : 100

SITE MAP

SCALE 1 : 100



1 SITE PLAN PRECON / ZONING AMENDMENT

PC/Z100 SCALE 1 : 600

SITE STATISTIC & ZONING REQ.'S

PROPERTY LEGAL DESCRIPTION:

PLAN 37R-*, PART *, ROLL # 33503002600
IN THE TOWN OF WATERFORD, IN THE DISTRICT OF NORFOLK COUNTY

ZONING:

IN ACCORDANCE TO THE TOWN OF WATERFORD, ZONING BY-LAW 1-Z-2014 NORFOLK COUNTY - JANUARY-2021-CONSOLIDATION

PROVISION	LAND USE: EXISTING
5.4 5.4.1	URBAN RESIDENTIAL TYPE 4 ZONE (R4) PERMITTED USES In an R4 zone, no land, building or structure shall be used except in accordance with the following uses: a) group townhouse

PROVISION	SETBACKS (m - METERS):	REQUIRED (a) Street Townhouse	REQUIRED (a) Group Townhouse Stacked Townhouse	PROVIDED (m)
5.4.2a)	MIN. LOT AREA: i) ATTACHED GARAGE ii) CORNER LOT	156m² 264m²	185m² 185m²	20,209m² N/A
5.4.2b)	MIN. LOT FRONTAGE i) INTERIOR LOT ii) CORNER LOT	6.5 11	30 30	35.2 N/A
5.4.2c)	MIN. FRONT YARD: i) ATTACHED GARAGE ii) DETACHED GARAGEOR REAR YARD PARKING	6 1.5	6 1.5	6.9 N/A
5.4.2d)	MIN. EXTERIOR SIDE YARD: i) W/ A 6m FRONT YARD ii) W/ A 1.5m FRONT YARD	6 1.5	6 1.5	6 N/A
5.4.2e)	MIN. INTERIOR SIDE YARD	1.2	3	3
5.4.2f)	MIN. REAR YARD : i) ATTACHED GARAGE	7.5	7.5	N/A
5.4.2g)	MIN. SEPARATION BETWEEN TOWNHOUSE DWELLINGS	2	2	3
5.4.2h)	MAX. BLDG. HEIGHT	11 [B-Z-2017]	11 [B-Z-2017]	TBD [B-Z-2017]
5.4.3	MIN. MUTUAL SIDE LOT LINE	1.2	1.2	N/A
5.4.4	MAX UNITS IN A TOWNHOUSE DWELLING	8 UNITS	8 UNITS	5 UNITS

COORD. W/ ZONING BY-LAW FOR ALL OTHER ZONING REQ.'S

PARKING REQ.'D: RESIDENTIAL

PROVISION	NUMBER OF PARKING SPACES	REQUIRED	PROVIDED
4.9a)	TOWNHOUSE DWELLINGS [B-Z-2017]: 2 SPACES / DWELLING UNIT 2 SPACES x 30 DWELLING UNITS = 60	60 SPACE(S)	60 SPACE(S)

PARKING REQ.'D RESIDENTIAL - VISITOR:

4.9f)	VISITOR PARKING: 1 SPACE / 3 DWELLING UNITS 1 SPACE x (30 / 3) = 10	10 SPACE(S)	13 SPACE(S) IN COMMON ELEMENT PLUS 60 SPACE(S) IN PRIVATE DRIVEWAYS

PARKING REQ.'D TOTAL:

TOTAL	70 SPACE(S)	133 SPACE(S)

PARKING REQ.'D - BARRIER FREE: (PART OF REQ.'D VISITOR PARKING)

4.3.3	BARRIER FREE PARKING REQ.'D: 1-25 (VISITOR) PARKING SPACES =		
	TYPE 'A' (3.4m WIDE) PLUS 1.5m AISLE	1 SPACE(S)	1 SPACE(S)
	TYPE 'B' (2.4m WIDE) PLUS 1.5m AISLE	N/A	N/A

PARKING AREA REGULATIONS

4.1 4.1.3a)	PARKING SPACE DIMENSIONS WIDTH OF PARKING SPACE: FOR VEHICLES PARKED SIDE BY SIDE FOR VEHICLES PARKED WITH WALL OR FENCE ADJ.	 3 MIN. 3.3 MIN.	 3 3.3
4.1.3b)	DEPTH OF PARKING SPACE: FOR 90 DEGREE PARKING FOR PARALLEL PARKING	 5.8 MIN. 7 MIN.	 5.8 7
4.1.4 4.1.4b)	PARKING AISLE REQ.'S TWO-WAY TRAFFIC	 7.3 MIN.	 7.3 MIN.

SITE PLAN LEGEND

- ENTRANCE / EXIT DOOR
- ENT. MAIN ENTRANCE / EXIT DOOR
- O/H ENTRANCE / EXIT DOOR (OVERHEAD DOOR W/ OPERATOR)
- PROPERTY LINE
- SETBACKS
- FIRE / WASTE/RECYCLING PICK-UP ROUTE (11.5m WIDE / 13m CENTER RADIUS)
- CE COVERED ENTRANCE
- D DECK / UNENCLOSED PORCH
- PAINTED GRAPHICS ON ASPHALT / CONC.: (COORD. W/ THE CITY / TOWN HAVING JURISDICTION GUIDELINES)
- WHEELCHAIR SIGN ON ASPHALT / CONC. (WHITE & BLUE COLOUR)
- VEHICULAR STALL MARKINGS (YELLOW COLOUR)
  BF - BARRIER-FREE PARKING
  V - VISITOR
  # - PARKING SPACE COUNT / DWELLING UNIT
- DIAGONAL MARKINGS

HATCH IDENTIFICATION LEGEND

- CONC. SIDEWALK / PAD / CROSSWALK / SIDEWALK / LANEWAY / STAIRS / ETC.
- AREA OF ASPHALT
- AREA OF PARKING
- 1-STOREY RESIDENTIAL DWELLING (VEHICULAR - x2 GARAGE, x2 DRIVEWAY) (11800mm W x 16700mm D)
- COVERED ENTRANCE AREA

vallee
Consulting Engineers, Architects & Planners
G. DOUGLAS VALLEE LIMITED
2 TALBOT STREET NORTH
SIMCOE ONTARIO N3Y 3W4
(519) 426-6270

Project Title

COTTONWOOD CONDOMINIUMS

WATERFORD, ONTARIO
N0E 1Y0

PROJECT No.
21-173

Drawing Title
SITE PLAN PRE-CON / ZONING AMENDMENT

Drawing No.
PC/Z100

ATTACHMENT C

D-6-1 Industrial Categorization Criteria

D-6-1 Industrial Categorization Criteria

A guide for land use planning authorities on the appropriate distances between industrial areas and sensitive land uses like people's homes and workplaces.

Industrial categorization criteria *					
Category	**Outputs**	**Scale**	**Process**	**Operation /Intensity**	**Possible examples ******
Class I	• Noise: Sound not audible off property • Dust and/or Odour: Infrequent and not intense • Vibration: No ground borne vibration on plant property	• No outside storage • Small scale plant or scale is irrelevant in relation to all other criteria for this Class	• Self contained plant or building which produces/stores a packaged product. Low probability of fugitive emissions	• Daytime operations only • Infrequent movement of products and/or heavy trucks	• Electronics manufacturing and repair • Furniture repair and refinishing • Beverages bottling • Auto parts supply • Packaging and crafting services • Distribution of dairy products • Laundry and linen supply
Class II	• Noise: Sound occasionally audible off property • Dust and/or Odour: Frequent and occasionally intense • Vibration: Possible ground borne vibration, but cannot be perceived off property	• Outside storage permitted • Medium level of production allowed	• Open process • Periodic outputs of minor annoyance • Low probability of fugitive emissions	• Shift operations permitted • Frequent movement of products and/or heavy trucks with the majority of movements during daytime hours	• Magazine printing • Paint spray booths • Metal command • Electrical production manufacturing • Manufacturing of dairy products • Dry cleaning services • Feed packing plant
Class III	• Noise: sound frequently audible off property • Dust and/or Odour: Persistent and/or intense • Vibration: Ground-borne vibration can frequently be perceived off property	• Outside storage of raw and finished products • Large production levels	• Open process • Frequent outputs of major annoyances • High probability of fugitive emissions	• Continuous movement of products and employees • Daily shift operations permitted	• Manufacturing of paint and varnish • Organic chemicals manufacturing • Breweries • Solvent recovery plants • Soaps and detergent manufacturing • Manufacturing of resins and costing

Industrial categorization criteria *				
Category Outputs	**Scale**	**Process**	**Operation /Intensity**	**Possible examples ****
				• Metal manufacturing

Note: Emissions may be point source or fugitive.

* Note: This Table should not be considered a comprehensive list but is to be used to provide examples of industrial categories.

** Note: The following examples are not limited to the Class indicated on the Table. The categorization of a particular industry will vary with the specifics of the case.

Source: The criteria for categorizing industries into Class I, II or III are derived from Ministry experience and the investigation of complaints related to industrial facilities.

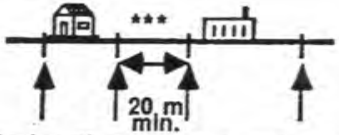
Updated: April 4, 2016
Published: February 26, 2016

SEPARATION DISTANCES

(Section View)

CLASS I INDUSTRIAL:

70 m. potential influence area

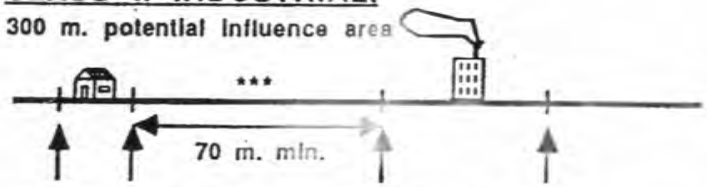


designation, zoning or property lines** of closest existing, committed or proposed Sensitive Land Use

designation, zoning or property lines* of closest existing, committed or proposed Class I Industrial Use

CLASS II INDUSTRIAL:

300 m. potential influence area

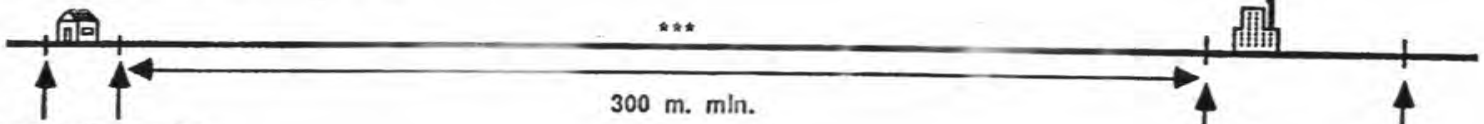


designation, zoning or property lines** of closest existing, committed or proposed Sensitive Land Use

designation, zoning or property lines* of closest existing, committed or proposed Class II Industrial Use

CLASS III INDUSTRIAL:

1000 m. potential influence area



designation, zoning or property lines** of closest existing, committed or proposed Sensitive Land Use

designation, zoning or property lines* of closest existing, committed or proposed Class III Industrial Use

* The set backs established in a zoning by-law can be included in the separation distance measurement if the by-law or site plan control precludes the use of the set back for activites that could create an adverse effect. [See Section 4.4.3, "Zoning/Site Plan Control (Industrial Land Uses)".]

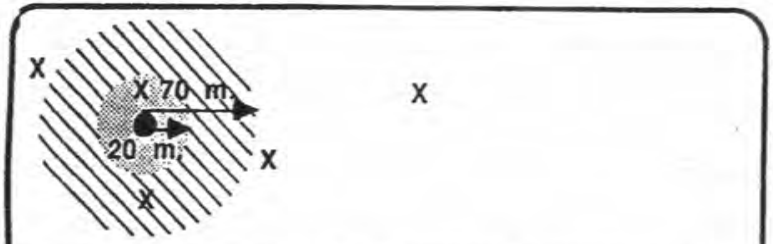
** Where the established use of on-site & ancillary lands associated with a sensitive land use are not of a sensitive nature (e.g. a parking lot or roadway), measurement may be taken to where the sensitive activities actually begin. [See Section 4.4.2, "Site Specific Plans & Section 4.4.4, "Ancillary Uses (Sensitive Land Use)" .)]
This approach may be particularly appropriate for redevelopment/infill proposals. [See Section 4.10, "Redevelopment, Infilling ...."]

*** No incompatible development should normally take place within the Recommended Minimum. [See Section 4.3, "Recommended Minimum", Section 4.10, "Redevelopment, Infilling & Mixed Use Areas" and Section 4.2.5, "Off-Site Separation Distances".]

SEPARATION DISTANCES

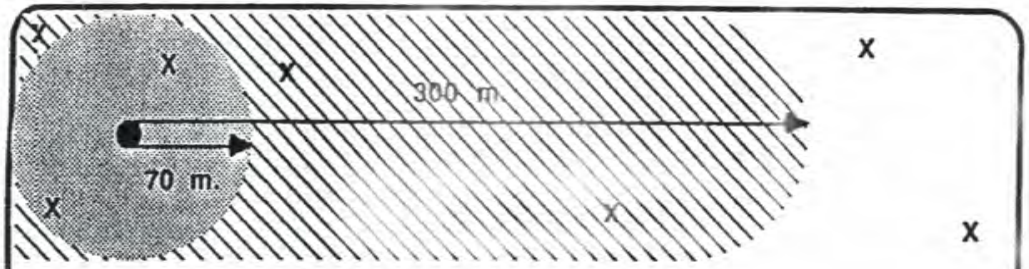
(PLAN VIEW)

CLASS I INDUSTRIAL:



20 m. minimum separation distance recommended **
70 m. potential influence area

CLASS II INDUSTRIAL:



70 m. minimum separation distance recommended **
300 m. potential influence area

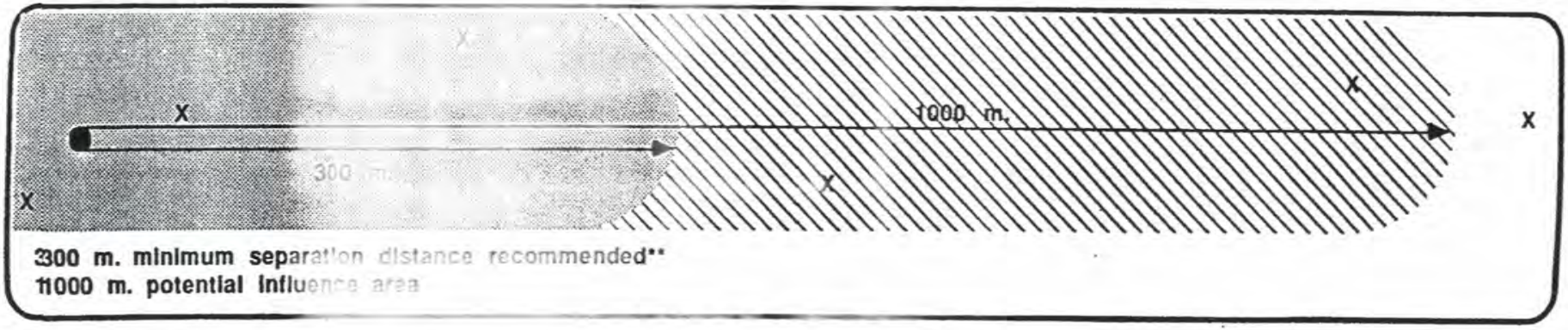
Legend:

- ● Existing* Land Use
- X Proposed* Land Uses
- Recommended Minimum - Incompatible Development should not normally be permitted . [See Section 4.3, "Recommended Minimums" and Section 4.10, "Redevelopment, Infilling ....", for exceptions.]
- Potential Influence Area or Actual Influence Area - "Adverse Effects" need to be identified, mitigation proposed, & an assessment made on the acceptability of the proposal. (See Section 4.1, "Influence Area Concept".)
- Acceptable Range - Beyond the Potential Influence Area or Actual Influence Area, therefore normally development in this range should not pose a compatibility problem. (See also Section 4.5.2, "Separation Distance Greater than the Potential Influence Area" for exceptions.)

* Note: If the existing use is industrial, then the proposed use is sensitive, and vice versa.

** See Section 4.10, "Redevelopment, Infilling & Mixed Use Areas " for exceptions.

CLASS III INDUSTRIAL:



3300 m. minimum separation distance recommended**
11000 m. potential influence area

See also Section 4.4, "Measuring Separation Distance".

Note: Drawing not to scale.

ATTACHMENT D

PHOTOS

272 West Curch St – Alpha Vico – front facing north (above) and back facing south (below)

257 West Church Street - Voyago

257 West Church Street – Synergy

268 West Church Street –residential property adjacent to subject site and industrial zoned land

Residential property south of the subject site.

ATTACHMENT E

SEPARATION AND INFLUENCE ZONE FIGURES

Source: Google Earth

Approximate Scale Metres

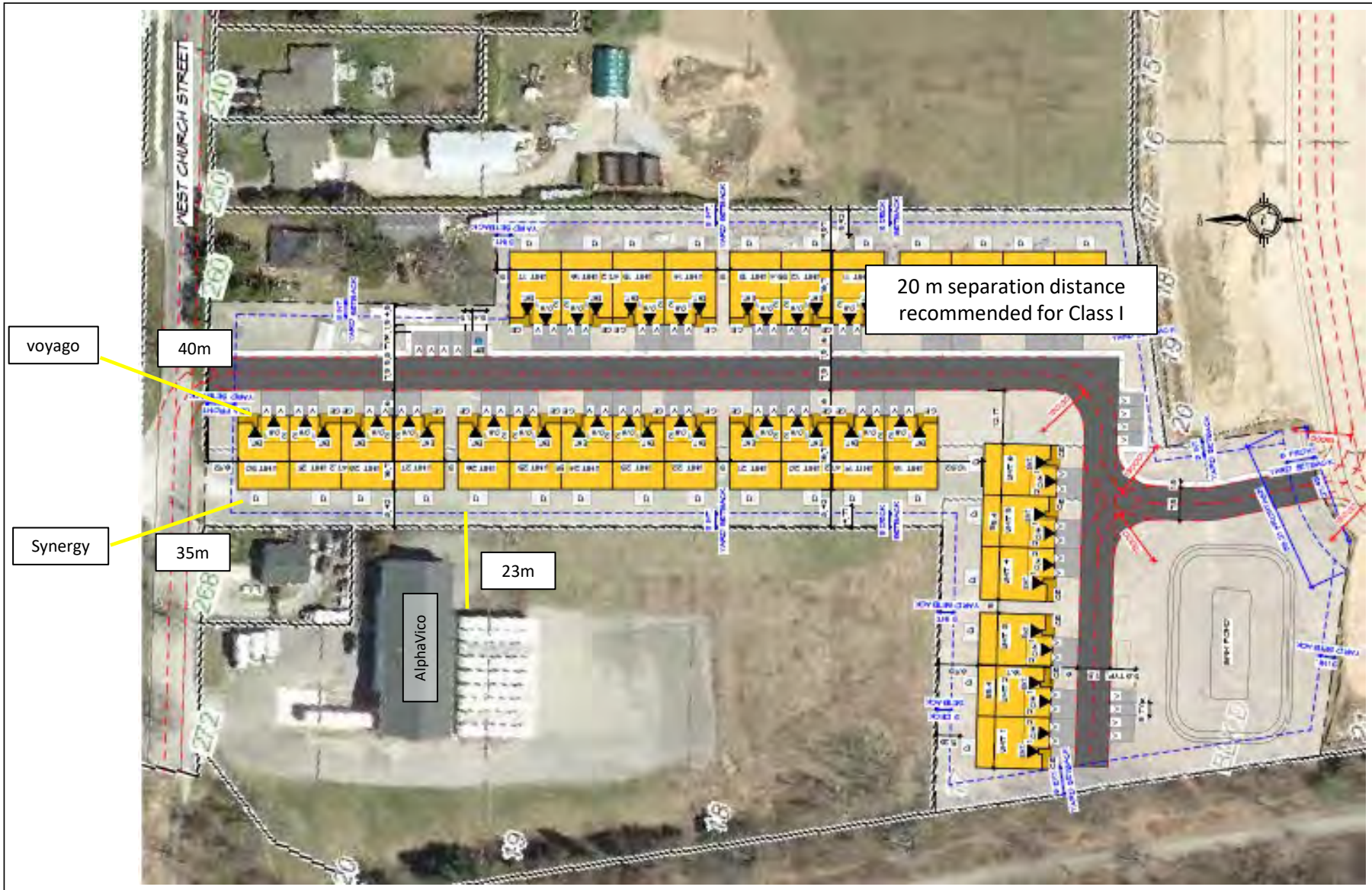
0 100

CCS Engineering Inc.

INDUSTRIAL CLASS SEPARATION
Cedar Park Condominiums
WATERFORD, ONTARIO

By: JA	Date: 11 July 2022	Project No. 1069

Figure 3



Source: Google Earth. Dimensions shown on dwg.

Approximate Scale Metres

0 55

CCS Engineering Inc.

INDUSTRIAL CLASS SEPARATION
Cottonwood Condominiums
WATERFORD, ONTARIO

By: JA	Date: 11 July 2022	Project No. 1069

Figure 3a

MAP A

CONTEXT MAP

Urban Area of WATERFORD

OPNPL2022333
ZNPL2022335

12/7/2022

Legend

Subject Lands

2020 Air Photo

N

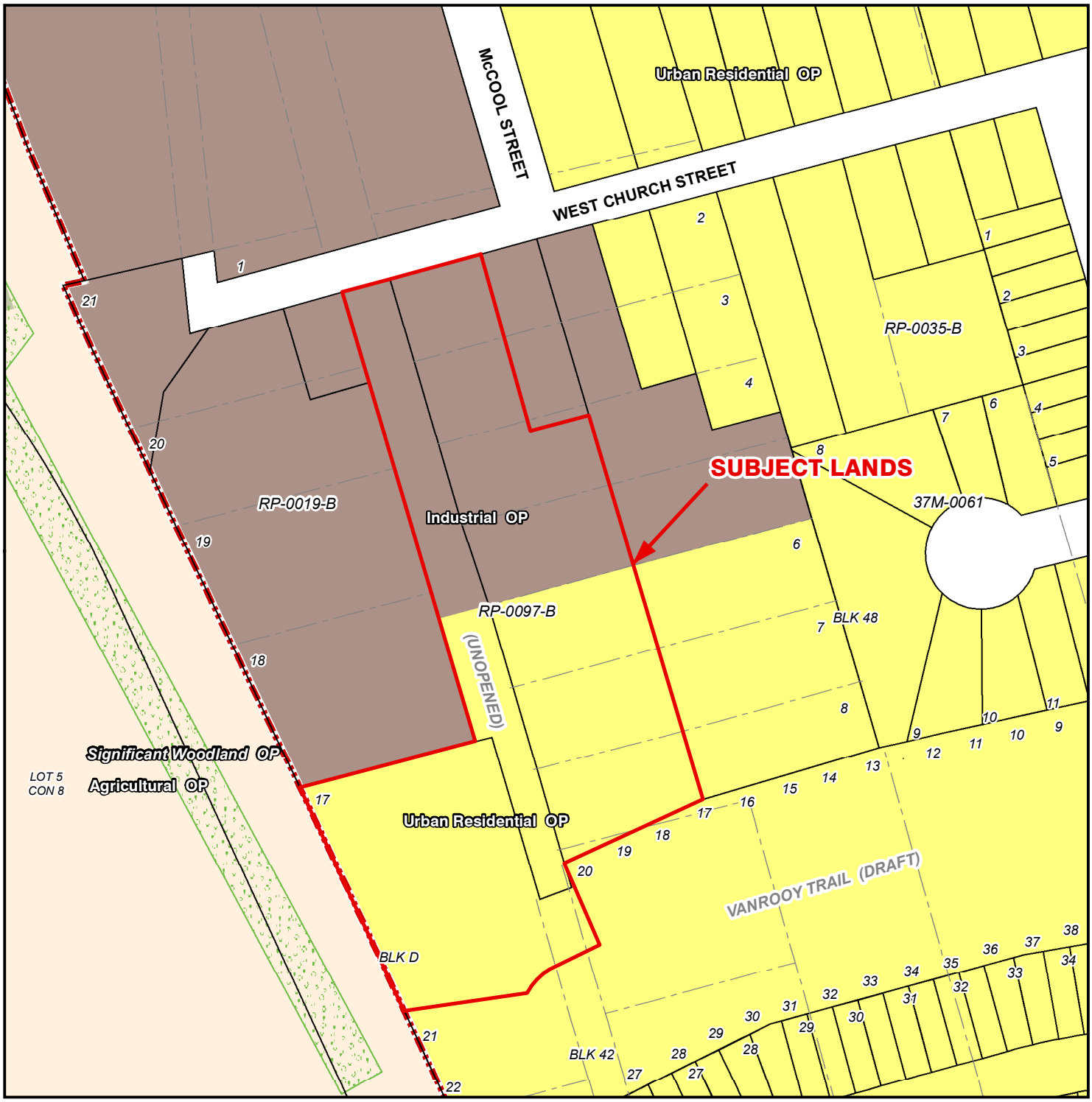
105 0 10 20 30 40 Meters

MAP B

PROPOSED OFFICIAL PLAN AMENDMENT MAP

Urban Area of WATERFORD

OPNPL2022333
ZNPL2022335



Legend

Subject Lands

Official Plan Designations

- Agricultural
- Hazard Lands
- Urban Residential
- Industrial
- Urban Area Boundary
- Significant Woodland

From: Industrial & Urban Residential
To: Urban Residential

12/7/2022

N

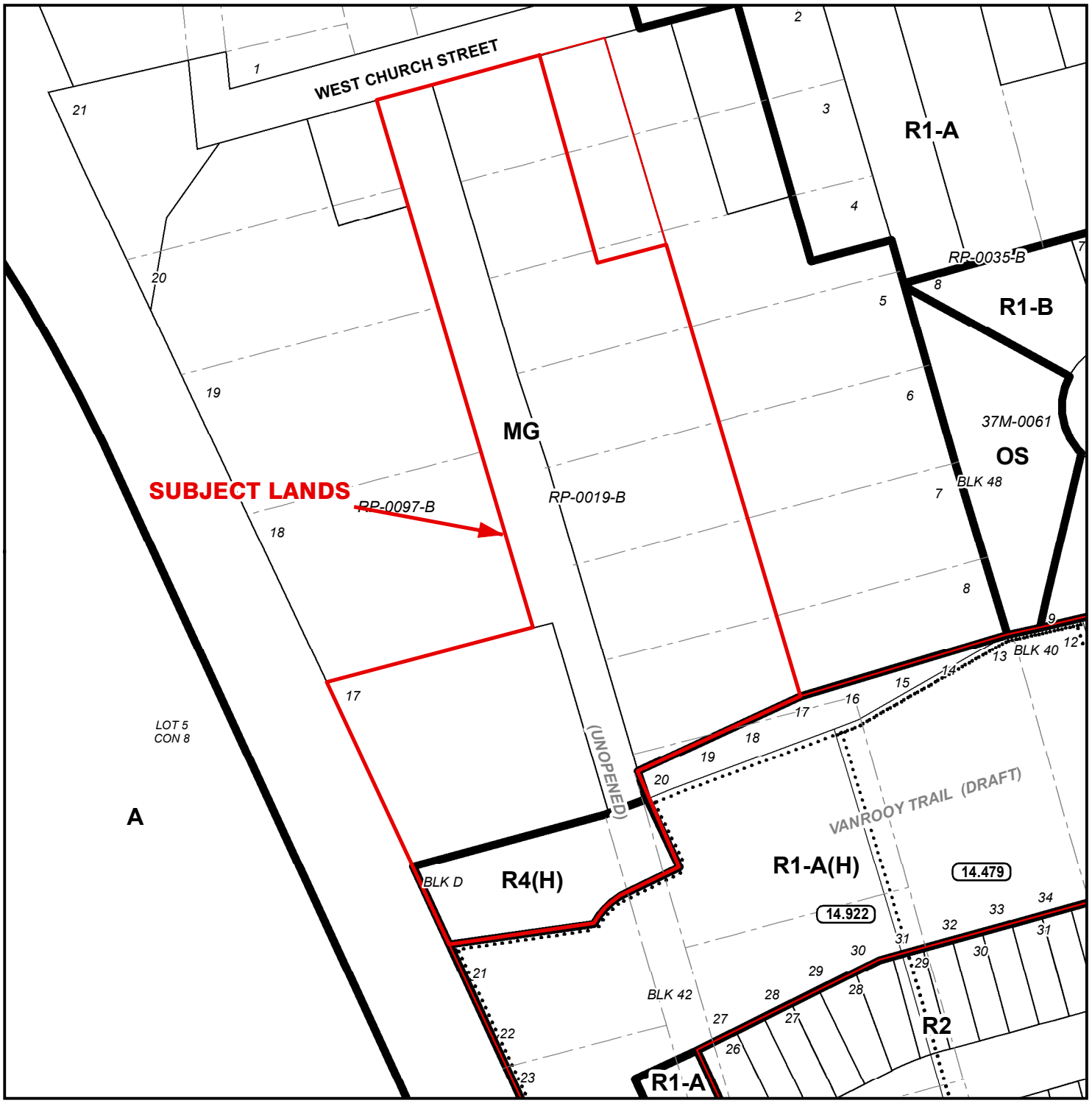
10 5 0 10 20 30 40 Meters

MAP C

PROPOSED ZONING BY-LAW AMENDMENT MAP

Urban Area of WATERFORD

OPNPL2022333
ZNPL2022335



LEGEND

- Subject Lands
- Lands Owned

ZONING BY-LAW 1-Z-2014

- (H) - Holding
- A - Agricultural Zone
- MG - General Industrial Zone
- OS - Open Space Zone
- R1-A - Residential R1-A Zone
- R1-B - Residential R1-B Zone
- R2 - Residential R2 Zone
- R4 - Residential R4 Zone

From: General Industrial Zone
To: Urban Residential Type 4 With Holding

N

10 5 0 10 20 30 40 Meters

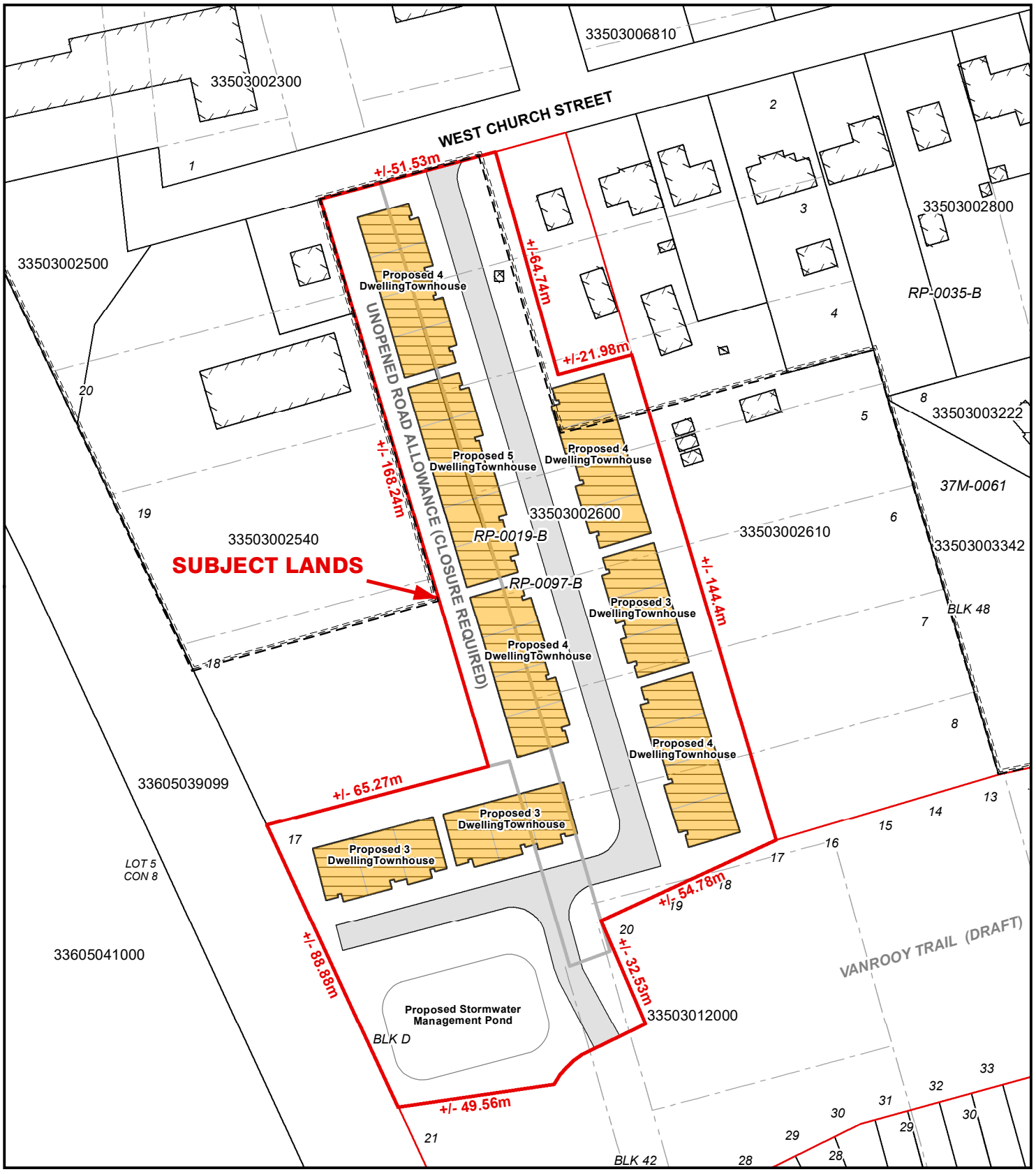
12/7/2022

MAP D

CONCEPTUAL PLAN

Urban Area of WATERFORD

OPNPL2022333
ZNPL2022335



Legend

Subject Lands

12/7/2022

N

10 5 0 10 20 30 40 Meters