

October 11, 2022

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

Attention: Tricia Givens, M.Sc.(PI), 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;
 - o Appendix B Provincial Policy Statement 2020 Policy Compliance;
 - o 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).

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

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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;
 - o 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

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G. DOUGLAS VALLEE LIMITED Consulting Engineers, Architects & Planners







Planning Department Development Application Form

Complete Application

A complete development application consists of the following:

- A properly completed and signed application form (signature must be original in planners file);
- 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,
- 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.

Additional studies required as part of the complete application shall be at the sole expense of the applicant. It should also be noted that in some instances peer reviews may be necessary to review particular studies and that the cost shall be at the expense of the applicant. The company to complete the peer review shall be selected by the County.

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;
- 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
- 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.



| File Number Related File Number Pre-consultation Meeting Application Submitted Complete Application | | Public Notice Sign Application Fee Conservation Authority Fee Well & Septic Info Provided Planner | | |
|---|--|--|--|--|
| | | | | |
| Che | ck the type of planning applica | ition(s) you are submitting. | | |
| X | Official Plan Amendment | | | |
| X | Zoning By-Law Amendment | | | |
| 2 | Temporary Use By-law | | | |
| | Draft Plan of Subdivision/Vaca | ant Land Condominium | | |
| | Condominium Exemption | | | |
| 5 | Site Plan Application | | | |
| | Extension of a Temporary Use | e By-law | | |
| Ģ., | Part Lot Control | | | |
| je. | Cash-in-Lieu of Parking | | | |
| | Renewable Energy Project or | Radio Communication Tower | | |
| zoni and/ simi | ng provision on the subject lands for official plan designation of the lar) Official Plan Amendment to change design | result of this application (for example: a special sto include additional use(s), changing the zone subject lands, creating a certain number of lots, or nation of a portion of the parcel from Industrial to Urban Residential 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 ro | oad NOT an open improved street and to define the "FRONT LOT LINE" | | |
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| | | | | |
| | The second secon | | | |
| | | | | |
| Pro | perty Assessment Roll Numbe | r: 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 | | |
| own and Postal Code Waterford, ON N0E1Y0 | | | |
| Phone Number | | | |
| Cell Number | (519)732-8520 | | |
| Email | paulrlaevens@gmail.com | | |
| Name of Applicant | AUCOIN-DIXON DEVELOPMENTS INC. 75 BRANT AVE | | |
| Town and Postal Code | BRANTFORD, ON, N3T 3H2 | | |
| Phone Number | 519-755-6252 | | |
| Cell Number | 519-754-9942 paulaucoin@hotmail.ca | | |
| Email | padiadeoiri e notinaii.ea | | |
| 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: | | | |



| В. | 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 of 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, lo 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 <i>Ontario</i> 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: | | | |
| | Purpose of Development Application ote: Please complete all that apply. | | | |
| | 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: | | | |
| | | | | |
| | The second control of the second control of the second control of the second of the se | | | |



| | uested amendment alter, replace, or delete a policy of the Official Plan? If yes, identify the policy, and also include a proposed text of the | | | | |
|-----------------------------|---|--|--|--|--|
| | Iment (if additional space is required, please attach a separate sheet): | | | | |
| | | | | | |
| | | | | | |
| Description of Frontage: | of land intended to be severed in metric units: | | | | |
| Depth: | | | | | |
| Width: | | | | | |
| Lot Area: | | | | | |
| Present Use: | | | | | |
| Proposed Us | e: | | | | |
| Proposed fin | al lot size (if boundary adjustment): | | | | |
| If a boundary | If a boundary adjustment, identify the assessment roll number and property owner of | | | | |
| the lands to | which the parcel will be added: | | | | |
| | | | | | |
| Description of Frontage: | of land intended to be retained in metric units: | | | | |
| Depth: | | | | | |
| Width: | | | | | |
| Lot Area: | | | | | |
| Present Use: | | | | | |
| Proposed Us | e: | | | | |
| Buildings on | retained land: | | | | |
| _ | f proposed right-of-way/easement: | | | | |
| Depth: | | | | | |
| Width: | | | | | |
| Area: | | | | | |
| Proposed use | 9: | | | | |
| Name of pers | son(s), if known, to whom lands or interest in lands to be transferred, arged (if known): | | | | |



9. Site Information

Zoning

Proposed

Please indicate unit of measurement, for example: m, m2 or %

| Flease indicate unit of measurement | ent, for example: m, m or | 70 |
|-------------------------------------|---------------------------|--------------|
| 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 Loadin | g Facilities | |
| Number of off street parking space | ces_60 | 120 |
| Number of visitor parking spaces | | 13 |
| Number of accessible parking sp | | 1: |
| Number of off street loading facili | | NA |



| 12. Residential (if applicab | ole) | |
|--|--|--|
| Number of buildings existi | ng: Single detached dw | velling and accessory buildings |
| Number of buildings propo | osed: 30 dwelling uni | ts |
| Is this a conversion or add | dition to an existing building? | ☐ Yes ■ No |
| If yes, describe: | i i i i i i i i i i i i i i i i i i i | |
| Туре | Number of Units | Floor Area per Unit in m2 |
| Single Detached | | |
| Semi-Detached | 4 - E | 5 21014 mag 2 |
| Duplex | | i |
| Triplex | · odertungen | 1 2 3 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 |
| Four-plex | | |
| Street Townhouse | 30 | 136m2 |
| Stacked Townhouse | - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 | |
| Apartment - Bachelor | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 20 mg/s |
| Apartment - One bedroom | No to the second | The second of th |
| Apartment - Two bedroom | <u> </u> | C. T. C. |
| Apartment - Three bedroo | om | of the second |
| Other facilities provided (for swimming pool): | or example: play facilities, un | derground parking, games room, |
| 13. Commercial/Industrial | Uses (if applicable) | |
| Number of buildings exist | ng: | |
| Number of buildings propo | osed: | The state of the s |
| Is this a conversion or add | dition to an existing building? | ☐ Yes ■ No |
| If yes, describe: | | |
| Indicate the gross floor are | ea by the type of use (for exa | mple: office, retail, or storage): |
| 4 | | |



| 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): | | |
| | | |
| Management of the second of th | | |
| | | |
| 15. Describe Recreational or Other Use(s) (if applicable) | | |
| The second secon | | |
| | | |
| | | |
| | | |
| | | |



| revious Use of the Property | | | |
|--|--|--|--|
| las there been an industrial or commercial use on the subject lands or adjacent ands? ■ Yes □ No □ Unknown | | | |
| yes, specify the uses (for example: gas station or petroleum storage): Alpha Vico company claims to be a school furniture manufacturer | | | |
| | | | |
| s there reason to believe the subject lands may have been contaminated by former ses on the site or adjacent sites?□ Yes ■ No □ Unknown | | | |
| rovide the information you used to determine the answers to the above questions: | | | |
| | | | |
| | | | |
| you answered yes to any of the above questions in Section D, a previous use eventory showing all known former uses of the subject lands, or if appropriate, the edjacent lands, is needed. Is the previous use inventory attached? Yes No | | | |
| Provincial Policy | | | |
| Is the requested amendment consistent with the provincial policy statements issued under subsection 3(1) of the <i>Planning Act, R.S.O. 1990, c. P. 13</i> ? ■ Yes □ No | | | |
| f no, please explain: | | | |
| | | | |
| Andrew Committee | | | |
| t 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 | | | |
| f 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 | | |
| | 110t requested by manierpainty | | |
| | 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 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 | 100 | Communal wells | | |
| | ☐ Individual wells | 9 | Other (describe below) | | |
| | Sewage Treatment | | | | |
| | ■ Municipal sewers | 51 | Communal system | | |
| | ☐ Septic tank and tile bed in good working order | b | Other (describe below) | | |
| | Storm Drainage | | | | |
| | ■ Storm sewers | | Open ditches | | |
| | ☐ Other (describe below) | | | | |
| | | | | | |
| 2. | Existing or proposed access to subject lands: | | | | |
| | ■ Municipal road | 129 | Provincial highway | | |
| | ☐ Unopened road | | Other (describe below) | | |
| | Name of road/street: West Church St and Vanroy | Γrail | to the terms of the second | | |
| G. | Other Information | | | | |
| 1. | Does the application involve a local business? If yes, how many people are employed on the sul | | | | |
| 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. | | | | |
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| | | * | | | |



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:

- Concept/Layout Plan
- 2. All measurements in metric
- 3. Key map
- 4. Scale, legend and north arrow
- 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)
- 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

| addition, the following additional plans, studies and reports, including but not limited 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 |
| |



| a | Functional Servicing Report |
|------|--|
| 9. | Geotechnical Study / Hydrogeological Review |
| 0 | Minimum Distance Separation Schedule |
| | Noise or Vibration Study |
| 10 | Record of Site Condition |
| di | Storm water Management Report |
| i.e. | Traffic Impact Study – please contact the Planner to verify the scope required |
| Sit | e Plan applications will require the following supporting materials: |
| | Two (2) complete sets of the site plan drawings folded to 8½ x 11 and an electronic version in PDF format 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 |
| | Property Identification Number (PIN) printout |
| | |
| Sta | andard 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.

Owner/Applicant Signature

Aug 21 2022

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 Jufkhra

2 Aug

Date

Date

Owner

Owner



N. Declaration

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*.

Owner/Applicant Signature

Declared before me

at: Norfolk Count

In Town of Simcoc

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.





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,
- 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.

Additional studies required as part of the complete application shall be at the sole expense of the applicant. It should also be noted that in some instances peer reviews may be necessary to review particular studies and that the cost shall be at the expense of the applicant. The company to complete the peer review shall be selected by the County.

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 Related File Number Pre-consultation Meeting Application Submitted Complete Application | | Conservation Authority Fee |
|--|--|--|
| Chec | ck the type of planning applic | cation(s) you are submitting. |
| | Official Plan Amendment | |
| | Zoning By-Law Amendment | |
| | Temporary Use By-law | |
| | Draft Plan of Subdivision/Vac | cant Land Condominium |
| | Condominium Exemption | |
| | Site Plan Application | |
| | Extension of a Temporary Us | se By-law |
| | Part Lot Control | |
| | Cash-in-Lieu of Parking | |
| | Renewable Energy Project o | r Radio Communication Tower |
| zonir | ng provision on the subject land or official plan designation of th | result of this application (for example: a special ds to include additional use(s), changing the zone subject lands, creating a certain number of lots, or |
| _ | | |
| - | | |
| - | | |
| - | | |
| | | |
| | | |
| Prop | erty Assessment Roll Numb | er: |



A. Applicant Information Aucoin Dixon Developments Inc Name of Owner 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. 75 Brant Ave Address Brantford, ON, N3T 3H2 Town and Postal Code 519-753-9495 Phone Number 519-754-9942 Cell Number paulaucoin@hotmail.ca Email Name of Applicant Address Town and Postal Code Phone Number Cell Number Email G. Douglas Vallee Limited Name of Agent 2 Talbot Street North Address Simcoe Ontario N3Y 3W4 Town and Postal Code 519-426-6270 Phone Number Cell Number scottpuillandre@gdvallee.ca Email 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

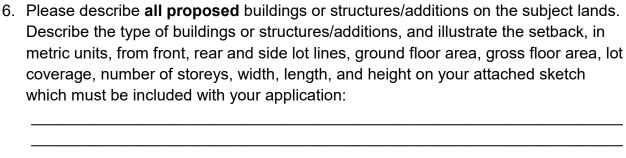
Names and addresses of any holder of any mortgagees, charges or other encumbrances on the subject lands:

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.





| 7. | Are any existing buildings on the subject lands designated under the <i>Ontario</i> Heritage Act as being architecturally and/or historically significant? Yes \square No \square |
|----|---|
| | 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 |
| No | te: 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? \Box Yes \Box No If yes, describe its effect: |
| | |
| | |



| | oes the requested amendment alter, replace, or delete a policy of the Official Places \Box No If yes, identify the policy, and also include a proposed text of the | an : |
|----|--|------|
| p | olicy amendment (if additional space is required, please attach a separate sheet | t): |
| - | | |
| - | | |
| | escription of land intended to be severed in metric units: | |
| | rontage: | |
| | epth: | |
| | /idth: | |
| | ot Area: | |
| F | resent Use: | |
| F | roposed Use: | |
| F | roposed final lot size (if boundary adjustment): | |
| lf | a boundary adjustment, identify the assessment roll number and property owne | r o |
| tŀ | e lands to which the parcel will be added: | |
| _ | | |
| С | escription of land intended to be retained in metric units: | |
| F | rontage: | |
| С | epth: | |
| ٧ | /idth: | |
| L | ot Area: | |
| F | resent Use: | |
| F | roposed Use: | |
| Е | uildings on retained land: | |
| С | escription of proposed right-of-way/easement: | |
| | rontage: | |
| С | epth: | |
| ٧ | /idth: | |
| Δ | rea: | |
| F | roposed use: | |
| | ame of person(s), if known, to whom lands or interest in lands to be transferred, | |
| | assed or charged (if known): | |



| 9. | Site Information | Zoning | Proposed |
|-----|--------------------------------------|------------------------------|----------|
| Ρle | ease indicate unit of measureme | ent, for example: m, m² or % | |
| Lo | t frontage | | |
| Lo | t depth | | |
| Lo | t width | | |
| Lo | t area | | |
| Lo | t coverage | | |
| Fre | ont yard | | |
| Re | ear yard | | |
| Le | ft Interior side yard | | |
| Ri | ght Interior side yard | | |
| Ex | terior side yard (corner lot) | | |
| La | ndscaped open space | | |
| En | trance access width | | |
| Ex | it access width | | |
| Siz | ze of fencing or screening | | |
| Ту | pe of fencing | | |
| 10 | .Building Size | | |
| Nι | ımber of storeys | | |
| Bu | ilding height | | |
| То | tal ground floor area | | |
| То | tal gross floor area | | |
| То | tal useable floor area | | |
| 11 | .Off Street Parking and Loading | g Facilities | |
| Nι | ımber of off street parking space | es | |
| Nι | ımber of visitor parking spaces | | |
| Νι | ımber of accessible parking spa | ces | |
| Νι | ımber of off street loading faciliti | ies | |



| 12. Residential (if applicable) | | |
|---|-----------------------------|--------------------------------------|
| Number of buildings existing | : | |
| Number of buildings propose | ed: | |
| Is this a conversion or addition | on to an existing building | ? □ Yes □ No |
| If yes, describe: | | |
| Туре | 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 or swimming pool): | example: play facilities, ι | underground parking, games room, |
| 13. Commercial/Industrial Us | es (if applicable) | |
| Number of buildings existing | · | |
| Number of buildings propose | :d: | |
| Is this a conversion or addition | on to an existing building | ? □ Yes □ No |
| If yes, describe: | | |
| Indicate the gross floor area | by the type of use (for ex | xample: 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? \Box Yes \Box No \Box 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? \square Yes \square No \square 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? \square Yes \square No |
| E. | Provincial Policy |
| 1. | Is the requested amendment consistent with the provincial policy statements issued under subsection 3(1) of the <i>Planning Act, R.S.O. 1990, c. P. 13</i> ? \Box Yes \Box 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? \square Yes \square 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 |
| | ☐ 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 |
| | ☐ On the subject lands or ☐ within 500 meters – distance |
| | Abandoned gas wells |
| | \Box On the subject lands or \Box 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? \square Yes \square 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
- 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

| 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 |
| Sit | e 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 appraiser5. Property Identification Number (PIN) printout |
| | |
| Sta | andard 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.

| Bark Cun | 09/30/22 |
|---|--|
| Owner/Applicant Signature | Date |
| M. Owner's Authorization | |
| If the applicant/agent is not the registered application, the owner(s) must complete the I/We Paul Aucoin | owner of the lands that is the subject of this the authorization set out below. am/are the registered owner(s) of the |
| lands that is the subject of this application. I/We authorize G. Douglas Vallee my/our behalf and to provide any of my/our processing of this application. Moreover, t authorization for so doing. | Limited to make this application on r personal information necessary for the |
| Owner | Date |
| | |



| N. Decla | aration |
|----------|---------|
| ı, Paul | Aucoir |

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

Owner/Applicant Signature

In Town of Smcoc

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.



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

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

003201

SECURITY FEATURES INCLUDED - SEE REVERSE

CONTIENT DES CARACTÉRISTIQUES DE SÉCURITÉ - VOIR À L'ENDOS

\$1067

DATE 20221003 M M D D

\$ **9,020.00

PAY

******Nine Thousand Twenty and 00/100

TO THE ORDER OF

Norfolk County

AUCOIN DIXON DEVELOPMENTS INC.

MEMO

Cottonwood Condos Official Plan & Zoning Bylaw Amendment Ap

III OO 3 20 1 III 1:01312...0031: 101-994-20

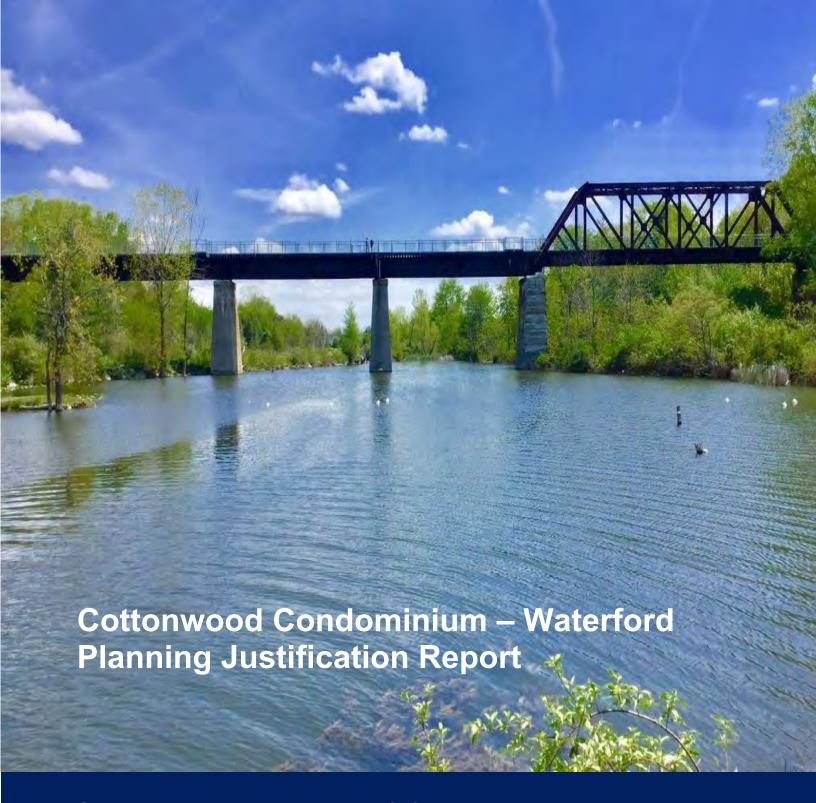
AUCOIN-DIXON DEVELOPMENTS INC.

Norfolk County

2022-10-03

003201

9,020.00



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



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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.

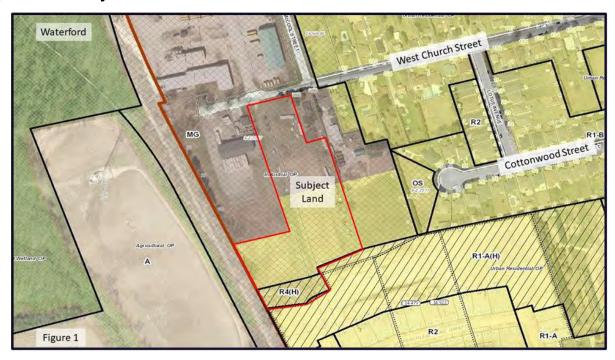
Appendix A provides a detailed site plan for the proposed development which would include group townhouse units. The concept design includes an on-site stormwater management pond along with amenities such as a pedestrian linkage between West Church Street and the new Cedar Park subdivision and bicycle 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;
 - o 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)" | Residential Type 4 "R4" Zone |
| | General Industrial "MG" Zone | |
| Permitted Uses | General Industrial (MG) Zone | Urban Residential Type 4 (R4) Zone |
| | a) ambulance service | To permit group townhouses |
| | 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 | |
| | I) 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. | |

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 semidetached 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. | |
|---|--|
| As new construction, energy efficient dwellings will be built as required under the Ontario Building Code. | ✓ |
| The development will utilize existing municipal infrastructure in the area. | ✓ |
| N/A | ✓ |
| 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. | |
| This policy is mainly a requirement of the municipality. However, applicable agencies will be circulated to ensure adequate provision of these requirements. | ✓ |
| 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. | ✓ |
| This policy is not applicable in this instance. | ✓ |
| This development would provide increased tax revenue to the local and provincial governments. | ✓ |
| The applications will be circulated to all applicable public bodies and agencies for comments as determined by Norfolk County. | ✓ |
| This will be achieved through the planning approvals process. | \checkmark |
| The subject lands are not located within an area of natural hazard and will provide safe and available housing options within Norfolk County. | ✓ |
| | application. As new construction, energy efficient dwellings will be built as required under the Ontario Building Code. The development will utilize existing municipal infrastructure in the area. N/A 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. This policy is mainly a requirement of the municipality. However, applicable agencies will be circulated to ensure adequate provision of these requirements. 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. This policy is not applicable in this instance. This development would provide increased tax revenue to the local and provincial governments. The applications will be circulated to all applicable public bodies and agencies for comments as determined by Norfolk County. This will be achieved through the planning approvals process. The subject lands are not located within an area of natural hazard and will provide safe and available housing options within Norfolk |

| (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:

- o 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;
- o 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 | Through lot – no rear yard |
| | | Note: From a site plan perspective, not less than 7.5m of rear yard space is provided for each unit. | 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 bylaw 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
 - o 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 m³/day (1.07 L/s) and 6.83 m³/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.

Planning Justification Report Cottonwood Condominium – Waterford Our Project #21-173

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List of Appendices

Appendix A - Concept Site Plan - with elevations / floor plans

Appendix B – Provincial Policy Statement 2020 Policy Compliance

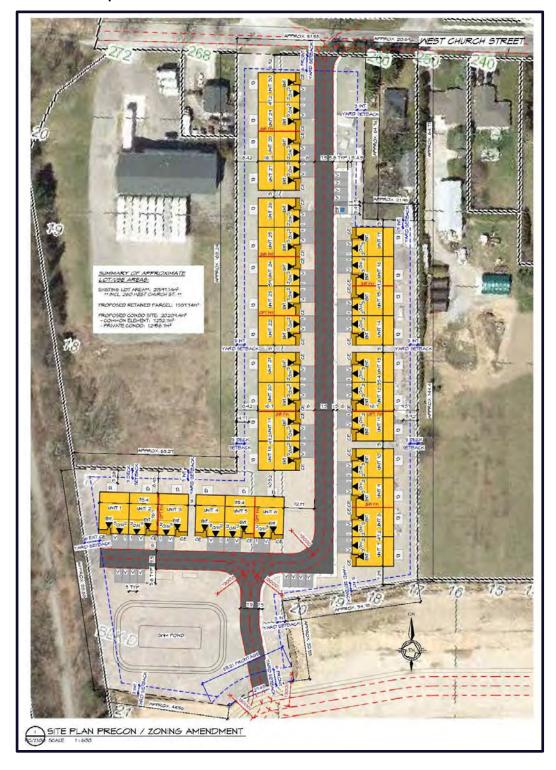
Appendix C - Norfolk County Official Plan Policy Compliance

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

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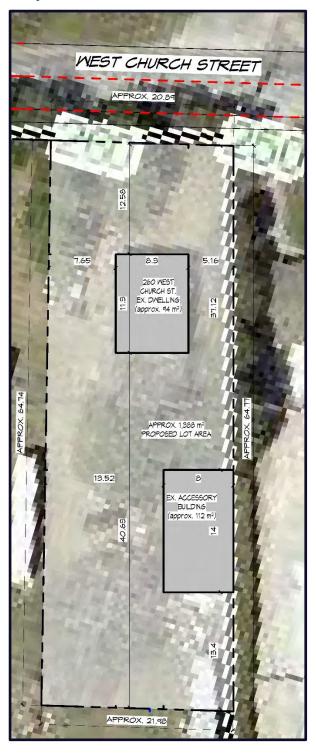
Appendix A – Proposed Plan of Condominium







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; | and efficiently designed form of residential development in an | |
| | b) accommodating an appropriate affordable and market-based range and mix of residential types (including single-detached, additional residential units, multiunit 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; | proposed which considers market housing attainability. | |
| | c) avoiding development and land use patterns which may cause environmental or public health and safety concerns; | completed to ensure the proposed | |
| | d) avoiding development and land use patterns that would prevent the efficient expansion of settlement areas in those areas | | |





| 1.1.3.2 | States that land use patterns within settlement areas shall be based on | | ✓ |
|---------|--|--|---|
| 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. | ✓ |
| | h) promoting development and land use patterns that conserve biodiversity; and; i) preparing for the regional and local impacts of a changing climate. | i) As new construction, these dwelling units will be required to adhere to Ontario Building Code which helps implement this policy. | |
| | in society; g) ensuring that necessary infrastructure and public service facilities are or will be available to meet current and projected needs; | g) Infrastructure and various services exist in the area. Capacity does exist within these services to support the development. | |
| | 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 | 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. | |





| | | 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, | property lines and noise limits at neighbouring houses and recreational areas that are already there and existing. | |
|-------|--|--|----------|
| | 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. | | |
| 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. | |

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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;
- d) promoting densities for new housing which efficiently use land, infrastructure resources, and public service facilities. and use support the of active transportation and transit in areas where it exists or is to be developed;
- e) requiring transit-supportive development and prioritizing intensification, including potential air rights development, in proximity to transit, including corridors and stations; and
- f) establishing development standards for residential intensification, redevelopment

- This development represents residential intensification where public facilities are already available.
- 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) N/A

f) The development is an appropriate density for the size of





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;





Planning Justification Report Cottonwood Condominium – Waterford Our Project #21-173

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.

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.

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 physically is compatible with the adjacent uses.

The proposed application is consistent with the policies of this section of the official This residential plan. development will provide much need additional housing forms. The proposed application provides housing form not readily available in Norfolk County.

- 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.
- 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 Through the site plan uses. 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 redevelopment within the existing builtup 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;
 - ii. the existing water and sanitary sewer services can accommodate the additional development;

- iii. the road network can accommodate the traffic generated;
- iv. the proposed development is compatible with the existing development and physical character of the adjacent properties and surrounding neighbourhood; and
- v. the proposed development is consistent with the policies of the appropriate Land Use Designation associated with the land

- . The proposed development is located within the urban area of Waterford and appropriately located within a residential area.
- A functional servicing report has ii. 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 treatment the water and wastewater treatment facilities to support the development.
- ii. A traffic impact study was completed and determined the road network can accommodate the anticipated traffic demands.
- The proposed condominium is seeking establish to group townhouses which are compatible with the existing development and physical character of the adjacent surrounding properties neighbourhood.
- 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) This development will be subject to the site plan control process which will ensure high quality design.
- 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.
- b) Through the review of development applications, including plans of subdivision, site plans and other development proposals, the County:
 - i. ensure that new shall 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;
 - ii. shall promote efficient and cost-effective development design patterns that minimize land consumption;
 - iii. shall promote the improvement of the physical character, appearance and safety of

- i. The proposed development will achieve 14.8 uph to ensure efficient use of the land while providina density that а 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.
- McCool Street is proposed to be closed and conveyed to the developer to facilitate an efficient condominium layout and density.
- 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, Street such as appropriate and parks; landscaping features that do not interfere with site lines. ίV. shall encourage tree ίV. A tree planting plan can be retention and tree provided during the site plan replacement; process. shall ensure that design is ٧. ٧. The surrounding residential sympathetic to the heritage lands are a mix of established character of an area, and new residential including the area's cultural development. Given the heritage resources; 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. νi. shall strongly encourage As shown on Appendix A, the vi. design that considers and, proposed development will wherever possible, implement the requirements of continues existing and this policy. The design of the traditional street patterns condominium considers the R4 and neighbourhood Zone standards to ensure structure; and traditional neighbourhood structure is maintained. vii. require, the may at vii. This requirement will be met County's sole discretion, during the site plan application that proponents submit process. design guidelines with development applications, establishing how the policies of this Section have considered been and addressed. Such guidelines may also be required to address related issues of residential streetscaping,

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landscaping,



setbacks,

| | 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 | This development is located within the | |
|-----|---------------------------------------|---|--------------|
| | community and agricultural support | urban area of Waterford and does not | V |
| | centre in the County. The following | offend these policies. | |
| | shall be the policy of the County: | ' | |
| | a) Waterford is the closest Urban | A link to the trail to the west will be | |
| | Area to Highway No. 403. The | provided. | |
| | 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. | | |
| | | | |
| 7.7 | Urban Residential Designation | | _ |
| | The Urban Residential Designation | The proposed development will | \checkmark |
| | applies to the Urban Areas of the | provide a form of housing not readily | |
| | County. The Urban Areas are | available in Norfolk County. | |
| | 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. | | |
| | | | |
| | | G DOUGLAS VALLE | LIMITED |





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 generally 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. ΑII 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;

- iii. the development will be encouraged to have direct access to an arterial or collector road, where possible and appropriate;
- 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;
- v. the development is adequately serviced by parks and school facilities;

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;

- yard / rear yard / side yards) to help further reduce potential compatibility issues.
- 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. A functional servicing report has been completed by G. Douglas Vallee and the necessary modelling will be completed during the site plan process.
- 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. 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 underutilized 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, | |

G. DOUGLAS VALLEE LIMITED

Consulting Engineers and Architect





| | | 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. | 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. | ✓ |
| | 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. | | |
| 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 | The proposed application is for an Official Plan and Zoning Bylaw amendment in order to facilitate a | ✓ |
| | Provincial policy and regulations; | medium density multi-unit condominium which will provide | |

G. DOUGLAS VALLEE LIMITED

Consulting Engineers and Architect





- 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.

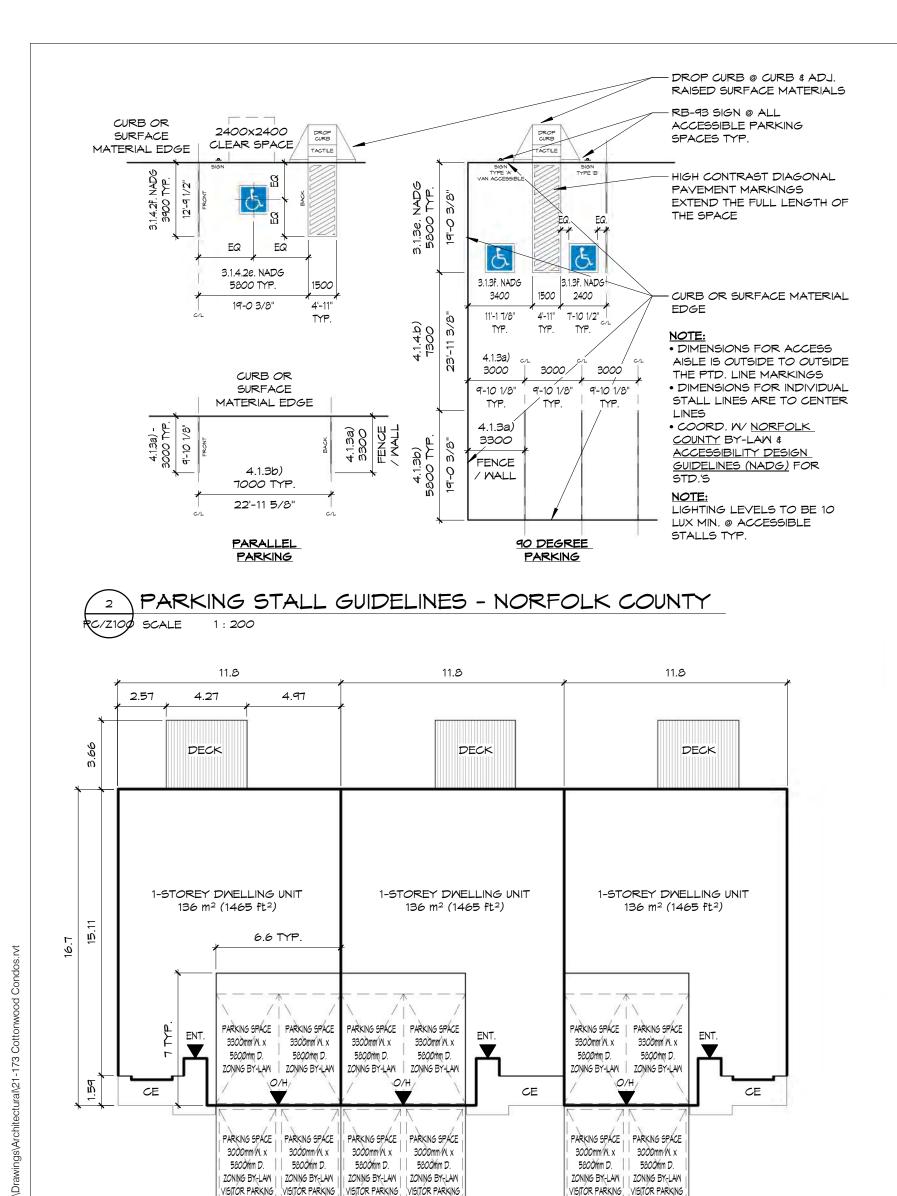




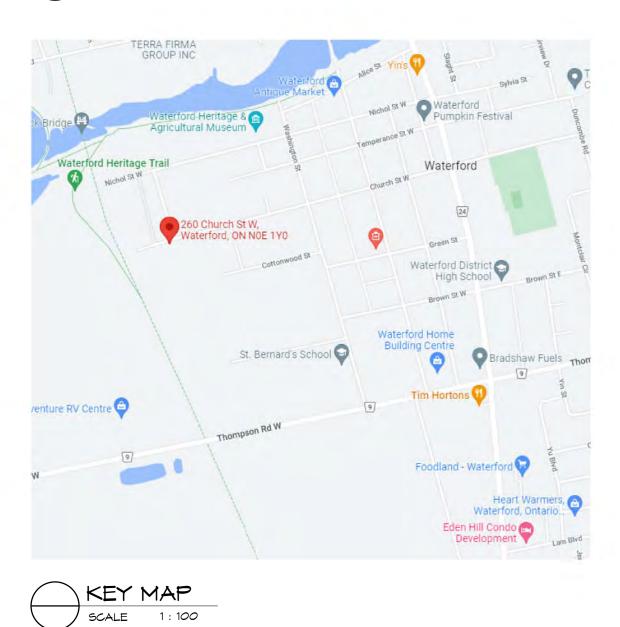
| | consultation with the | | |
|--------|--|---|--------------|
| | appropriate, agencies, to be | | |
| | relevant and applicable. | | |
| 9.10.5 | Parkland Dedication | | |
| 9.10.5 | | At the pre-consultation receting it was | |
| | The County shall secure the maximum | At the pre-consultation meeting, it was | \checkmark |
| | benefit of the Planning Act with respect | indicated that Norfolk County will not | |
| | to land dedication for park | accept a parkland dedication as part of | |
| | development and shall strive to meet | this development. As part of the | |
| | the policies of Section 7.5.1 (Parks) of | approval process, cash-in-lieu of | |
| | this Plan relating to park development. | parkland will be provided in | |
| | g) The County may accept cash-in- | accordance with the applicable policies | |
| | lieu of the land dedication to be | and bylaws. | |
| | 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. | | |
| | Consent. | | |



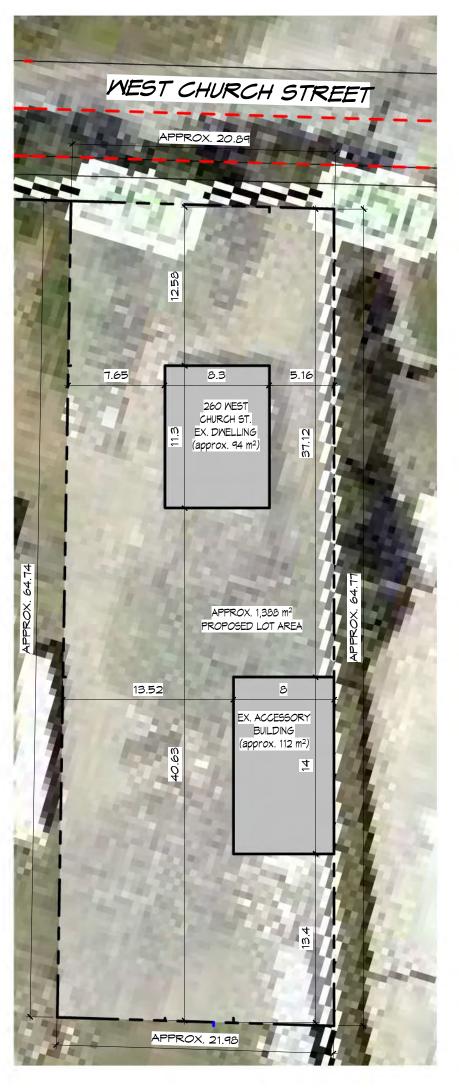








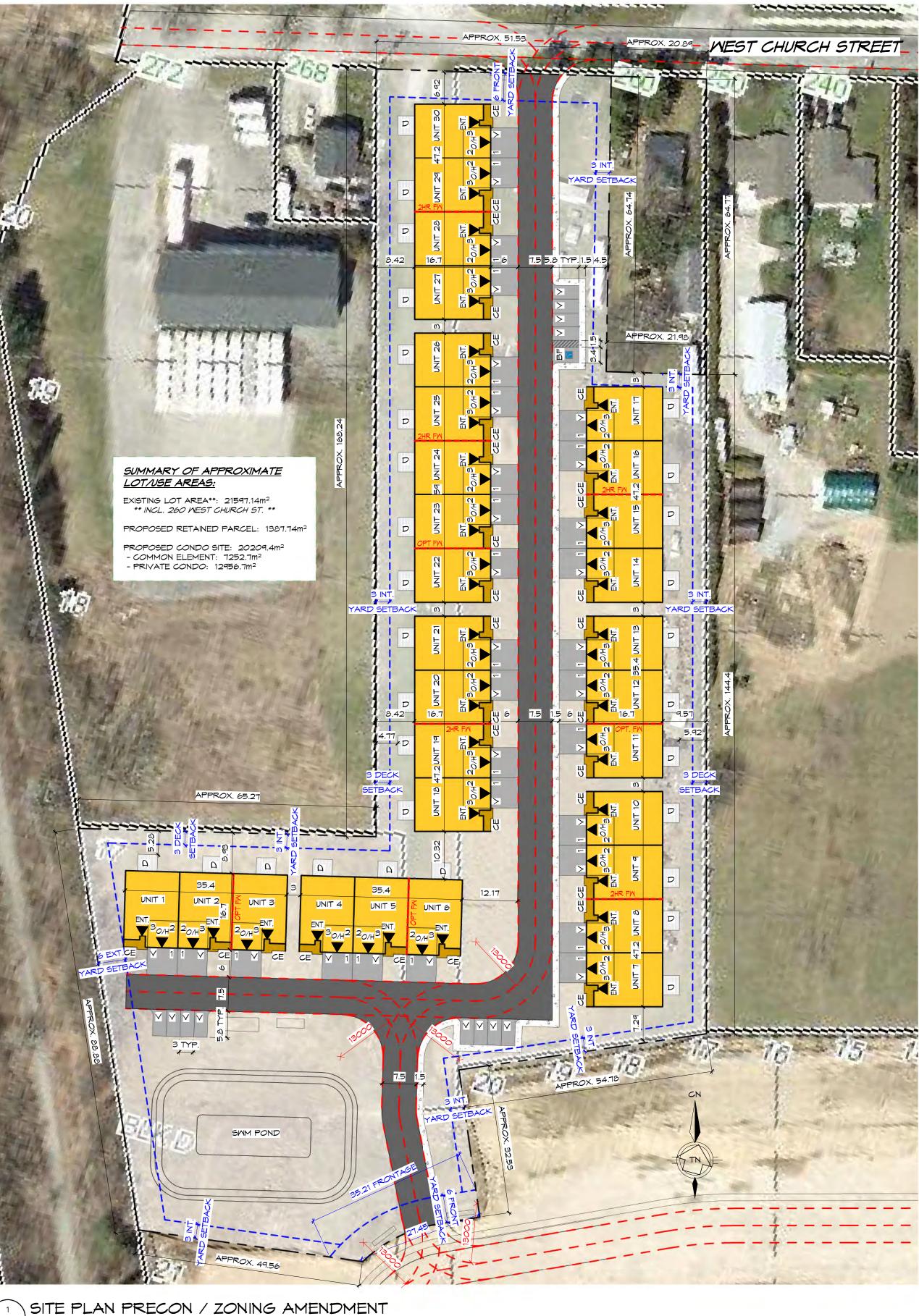




PROPOSED RETAINED PARCEL







| , ,, , , , | 120117 | , ,, | ·—·· | |
|------------|--------|----------|------|---|
| | | | | |
| 600 | | | | |
| | | | | |
| | | | | |
| | | | | _ |

COTTONWOOD CONDOMINIUMS

WATERFORD, ONTARIO N0E 1Y0

vallee Consulting Engineers,

Architects & Planners

G. DOUGLAS VALLEE LIMITED

2 TALBOT STREET NORTH SIMCOE ONTARIO N3Y 3W4 (519) 426-6270

PROJECT No. 21-173

SITE PLAN PRE-CON / **ZONING AMENDMENT**

SITE STATISTIC & ZONING REQ.'S

N THE TOWN OF WATERFORD, IN THE DISTRICT OF NORFOLK COUNTY

IN ACCORDANCE TO THE TOWN OF WATERFORD, ZONING BY-LAW 1-

In an R4 Zone, no land, building or structure shall be used except in

ithin 1.2m of an interior lot line within a rear yard.

o occupy up to 125 m² useable floor area.

) DETACHED GARAGEOR REAR YARD PARKING

Existing accessory structure(s) to existing residential use(s) are permitted

Existing accessory structure(s) to existing residential use(s) are permitted

<u>Street Townhouse</u>

264m²

7.5

[8-Z-2017]

1.2 8 UNITS

60 SPACE(S)

<u>1</u> SPACE(S)

N/A

5.8 MIN.

7 MIN.

7.3 MIN.

SITE PLAN LEGEND

ENTRANCE / EXIT DOOR

ENTRANCE / EXIT DOOR

COVERED ENTRANCE

(WHITE & BLUE COLOUR)

• DIAGONAL MARKINGS

AREA OF ASPHALT

AREA OF PARKING

COVERED ENTRANCE AREA

(YELLOW COLOUR)

• VEHICULAR STALL MARKINGS

BF - BARRIER-FREE PARKING

MAIN ENTRANCE / EXIT DOOR

(OVERHEAD DOOR W/ OPERATOR)

(7.5m WIDE / 13m CENTER RADIUS)

FIRE / WASTE/RECYCLING PICK-UP ROUTE

PAINTED GRAPHICS ON ASPHALT / CONC.: (COORD. W/ <u>THE CITY / TOWN HAVING</u> <u>JURISDICTION</u> GUIDELINES)

• WHEELCHAIR SIGN ON ASPHALT / CONC.

- PARKING SPACE COUNT / DWELLING UNIT

CONC. SIDEMALK / PAD / CROSSMALK / SIDEMALK / LANEWAY / STAIRS / ETC.

1-STOREY RESIDENTIAL DWELLING (VEHICULAR - X2 GARAGE, X2 DRIVEWAY) (11800mm W X 16700mm D)

Group Townhouse

195m²

30

[8-Z-2017]

8 UNITS

70 SPACE(S) 103 SPACE(S)

20,209m²

N/A

35.2

N/A

N/A

N/A

N/A

[8-Z-2017]

N/A

60 REQ'D SPACE(S) PLUS

ELEMENT PLUS 30 SPACE(S)

IN PRIVATE DRIVEWAYS

<u>1</u> SPACE(S)

3.3

5.8 7

7.3 MIN.

30 ADDITIONAL SPACES

Z-2014 NORFOLK COUNTY - JANUARY-2021-CONSOLIDATION

accordance with the following uses:

) dwelling, single detached

URBAN RESIDENTIAL TYPE 4 ZONE (R4)

PROPERTY LEGAL DESCRIPTION:

PROVISION LAND USE: EXISTING

3.2.1 (e)

3.2.1 (g)

5.4.2a)

5.4.2b)

5.4.2f)

PLAN 37R-#, PART #, ROLL # 33503002600

PERMITTED USES

PROVISION SETBACKS (M - METERS):

MIN. LOT AREA:

CORNER LOT

MIN. LOT FRONTAGE:

) INTERIOR LOT

) CORNER LOT

MIN. FRONT YARD:

) ATTACHED GARAGE

MIN. REAR YARD :

MAX. BLDG. HEIGHT

PROVISION | NUMBER OF PARKING SPACES

PARKING REQ.'D RESIDENTIAL - VISITOR:

PARKING REQ.'D: RESIDENTIAL

PARKING REQ.'D TOTAL:

PARKING AREA REGULATIONS

MIN. EXTERIOR SIDE YARD: i) W/ A 6m FRONT YARD i) W/ A 1.5m FRONT YARD

MIN. INTERIOR SIDE YARD

i) ATTACHED GARAGE MIN. SEPARATION BETWEEN

TOWNHOUSE DWELLINGS

MIN. MUTUAL SIDE LOT LINE

MAX. UNITS IN A TOWNHOUSE DWELLING

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

TOWHOUSE DWELLINGS [8-Z-2017]:

2 SPACES X 30 DWELLING UNITS = 60

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

2 SPACES / DWELLING UNIT

SPACE / 3 DWELLING UNITS

BARRIER FREE PARKING REQ.'D: 1-25 (VISITOR) PARKING SPACES = TYPE 'A' (3.4m WIDE) PLUS 1.5m AISLE

TYPE 'B' (2.4m WIDE) PLUS 1.5m AISLE

FOR VEHICLES PARKED WITH WALL OR FENCE ADJ

<u>1</u> SPACE × (<u>30</u> / <u>3</u>) = <u>10</u>

PARKING SPACE DIMENSIONS

FOR VEHICLES PARKED SIDE BY SIDE

WIDTH OF PARKING SPACE

DEPTH OF PARKING SPACE:

FOR 90 DEGREE PARKING

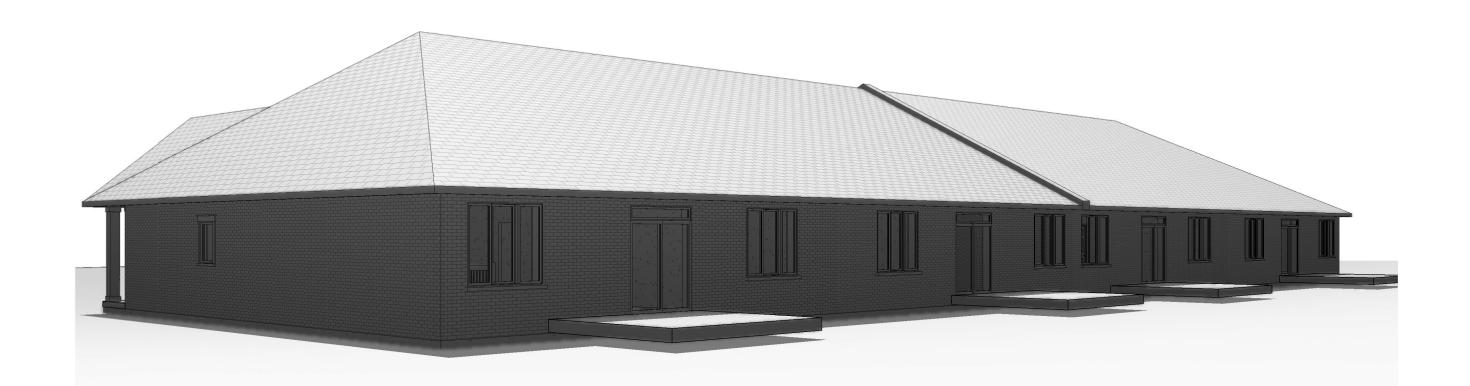
FOR PARALLEL PARKING PARKING AISLE REQ.'S TWO-WAY TRAFFIC

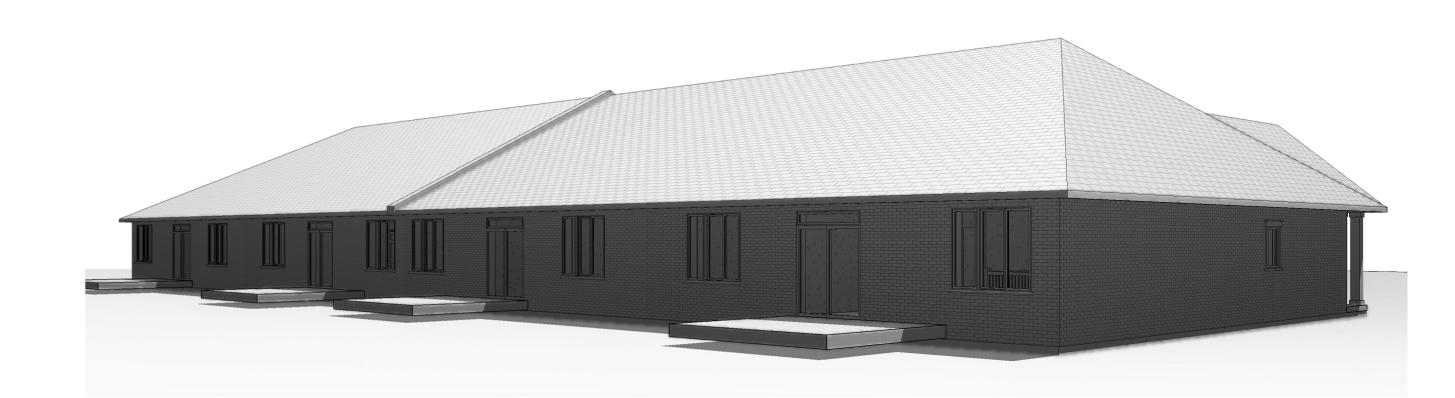
) ATTACHED GARAGE

a) group townhouse











G. DOUGLAS VALLEE LIMITED

2 TALBOT STREET NORTH SIMCOE ONTARIO N3Y 4W3 (519) 426-6270 Project Title

COTTONWOOD CONDOMINIUMS

WATERFORD, ONTARIO N0E 1Y0 PROJECT No.

21-173

Drawing Title

COVER SHEET

A000











G. DOUGLAS VALLEE LIMITED

2 TALBOT STREET NORTH SIMCOE ONTARIO N3Y 4W3 (519) 426-6270 Project Title

COTTONWOOD CONDOMINIUMS

WATERFORD, ONTARIO NOE 1Y0 PROJECT No.

21-173

Drawing Title

ELEVATION

Drawing No.

P100





COTTONWOOD CONDOMINIUMS

WATERFORD, ONTARIO N0E 1Y0

Drawing Title

PRESENTATION PLANS

PROJECT No.

21-173

G. DOUGLAS VALLEE LIMITED

2 TALBOT STREET NORTH SIMCOE ONTARIO N3Y 4W3 (519) 426-6270



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 m³/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 m³/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 m³ 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 C (Cedar | | Proposed Condition (Cedar Park II with Cottonwo | | | | | | | | |
| Event | Storage Volume (m³) | | | 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 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 m³/person/day
 Average Daily Water Demand: 37.35 m³/day (0.43 L/s)

Maximum Day Demand Factor: 2.25

Maximum Day Demand: 84.04 m³/day (0.97 L/s)

• Peak Hourly Demand Factor (Residential) 4.00

• Peak Hourly Demand 6.23 m³/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 m³/day (0.97 L/s) and 6.23 m³/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.

G. DOUGLAS VALLEE LIMITED

Consulting Engineers, Architects and Planners

John lezzi, P.Eng.

ROFESSION

G. DOUGLAS VALLEE LIMITED
Consulting Engineers, Architects and Planners

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

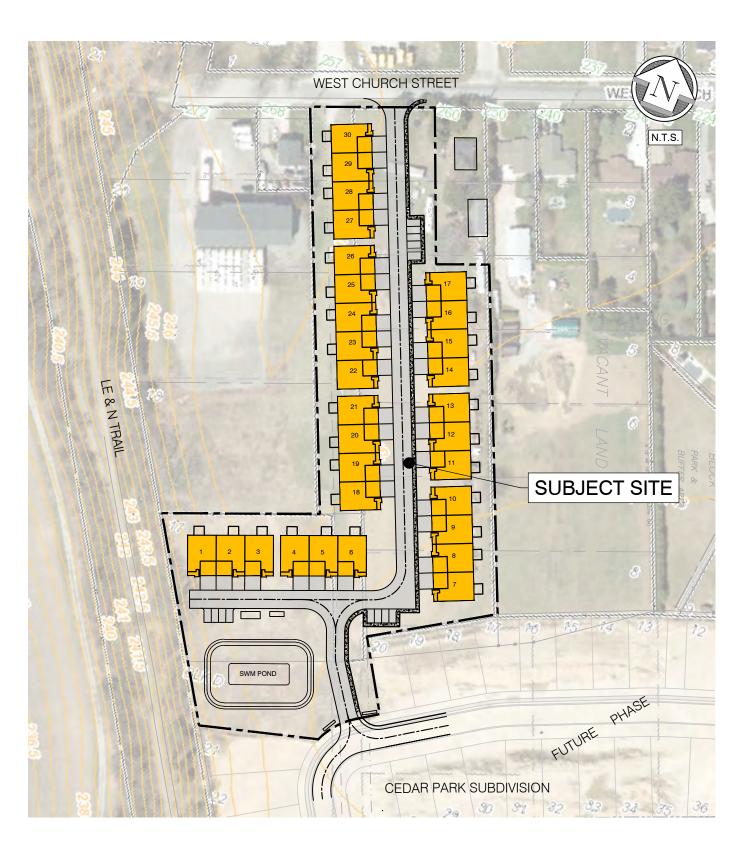


FIG 1 - SITE LOCATION

APPENDIX B

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





Subject:

8/9/2022 By:

21-173

Page

Cottonwood Condo's

N.B.N 1

Norfolk County Design Criteria Section 9.2 - Sanitary Sewage Flow

Date:

Project #:

9.2.01 Tributary Population

Residential Development: 2.75 persons/unit

Units: 30 Units 83 persons Number of Persons: Site Area 2.0 ha

9.2.02 Sewage Flow

0.45 m³/person/day Residential Development:

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

Project No. 21-173

Pipe Material: PVC N: 0.013 Project: Cottonwood Condominiums

Date: 9-Aug-22 Designed by: Checked by:

Sheet of: 1

NLB

| | Location | | | | as with Ex | | Fut. | Res eas | | Total | | | Flow | | | | | | Sewe | r Design | | | |
|------|----------|------|-----|------|------------|------|----------|------------|-------|-------|--------|------|------|-------|----------|------|--------|-------|---------|------------|--------|--|----------|
| Area | Street | From | То | | | | | | Total | Area | M=Peak | Q(i) | Q(s) | Q(d) | Material | Size | Lenath | N | Slope | Cap (Full) | Full V | Cap | Actual V |
| | | MH | МН | Ha | Units | Pop. | Ha | Pop | Pop | ha | Factor | L/s | L/s | L/s | | mm | m | | % | L/s | m/s | % | 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 | 1.6 | 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 |
| 044 | O4 4 A | 10 | 45 | 0.00 | 1 | | | | | 0.00 | 4.45 | 0.00 | 0.00 | 0.00 | D) (O | 000 | 40.0 | 0.040 | 0.000/ | 00.0 | 0.00 | 2.00 | 0.40 |
| SA1 | Street A | 16 | 15 | 0.08 | | 3 | ļ | | 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 | l | | 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 | l | | 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 | <u> </u> | | 25 | 1.24 | 4.37 | 0.35 | 0.44 | 0.74 | PVC | 200 | 35 | 0.013 | 0.70% | 23.2 | 0.74 | 3.9 | 0.25 |
| SA20 | CHARLES | 7 | 6 | 0.10 | 3 | 8 | | | 74 | 2.87 | 4.28 | 0.80 | 1.65 | 2.46 | PVC | 200 | 35.5 | 0.013 | 0.40% | 20.7 | 0.74 | ✓ 3.9✓ 11.8 | 0.25 |
| SA20 | CHARLES | 6 | 5 | 0.23 | 3 | 8 | <u> </u> | | 83 | 3.11 | 4.27 | 0.87 | 1.83 | 2.70 | PVC | 200 | 14.6 | 0.013 | 0.40% | 20.7 | 0.66 | ✓ 11.8 ✓ 13.0 | 0.38 |
| JAZI | CHARLES | 5 | 4 | 0.24 | 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 ✓ 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 | √ 13.0 √ 17.5 | 0.38 |
| SA23 | CHARLES | 3 | 2 | 0.55 | 1 | 3 | 0.27 | 13 | 430 | 12.11 | 4.23 | 3.39 | 8.98 | 12.37 | PVC | 200 | 59.2 | 0.013 | 0.50% | 23.2 | 0.74 | √ 53.3 | 0.43 |
| SA24 | CHARLES | 2 | 1 | 0.55 | 2 | 6 | | | 436 | 12.11 | 4.00 | 3.59 | 9.08 | 12.68 | PVC | 200 | 59.2 | 0.013 | 0.40% | 20.7 | 0.74 | √ 53.3 √ 61.1 | 0.72 |
| UA24 | OHANLLO | + - | - | 0.12 | | | - | | 450 | 12.03 | 4.00 | 3.38 | 9.00 | 12.00 | FVC | 200 | J3.2 | 0.013 | U.+U /0 | 20.1 | 0.00 | 01.1 | 0.04 |

Design Information:

Q(s) = Sewage Flow = P q M / 86.4

Q(i) = Infiltration Flow = IA

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 2.75 Population Density 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





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 We | | | | | | | | | | |
| Area (ha) | 3.75 | 4.45 | 3.13 | | | | | | | |
| Soil Type | Wilsonville – gravelly s | sandy till, sandy textures ov | er gravelly sandy till | | | | | | | |
| | | rapid to well drainage | | | | | | | | |
| Hydrologic Soil Group | | Α | | | | | | | | |
| SCS Curve Number | Pastures | s and other unimproved lan | id - 58 | | | | | | | |
| Initial Abstraction | | 16.5 mm | | | | | | | | |
| | $(IA/S_{0.05} = 0.05, \text{ with } S_{0.05} = 1.33 * S_{0.20}^{1.15} \text{ in inches and}$ | | | | | | | | | |
| | 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
 Municipal Road (includes sidewalk one side)
 (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 | Impervious Area | | Directly Connected | | |
| | (ha) | (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 m²
g = gravitational constant, 9.81 m/s²
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 <u>Stormwater Management Practices Planning and Design Manual</u> (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 m³/ha of contributing area. Of this storage 40 m³/ha is dedicated as extended storage and the remaining 60 m³/ha for permanent pool volume. For the contributing area of 9.22 ha this results in extended storage of 369 m³ required versus the 1,083 m³ 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) <u>Detention Time:</u> 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) <u>Minimum Orifice Size</u>: A minimum orifice of 75mm is recommended for wet pond facilities and compares to the 100mm provided by this facility.
- d) <u>Active Storage Depth:</u> 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) <u>Side Slopes</u>: 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) <u>Forebay Dispersion Length:</u> 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 80m³ over a 10-year period. This compares to the forebay volume of 619 m³ which require approximately 77years of sediment accumulation to completely fill.

i) <u>Length to Width</u>: 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 m³/s
- The design capacity for the pipe at the potential connection location is 3.31 m³/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 m³.
- 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 S | ST17 | | | | | |
| Future | 96 | | 3.5 | | 2.2 | | | |
| Future | 256 | | 9.2 | | 5.8 | | | |
| Future | 256 | | 9.2 | 4 | 5.8 | | | |
| Future | 256 | | 9.2 | | 5.8 | | | |
| Future | 296 | 35.97 | 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 9 | ST14 | . | | | | |
| 1 | 420 | | 7.2 | | 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 | 17.19 | 5.4 | 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:

 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 <u>Stormwater Management Practices Planning and Design Manual</u> (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

H:Projects\2017\17-027 Cedar Park II Phase 1 Design\Design\17027 Stormyater Report.docx





List of Figures

Figure 1: Development Layout

Figure 2: Pre-Development Drainage Areas Figure 3: Pre-Development Drainage Outlets Figure 4: Post Development Drainage Areas Figure 5: Post Development Drainage Outlets

List of Drawings

17-027-10 Stormwater Pond – Plan and Section AA 17-027-11 Stormwater Pond Section BB & CC

17-027-12 Grading Plan

List of Appendices

Appendix A: Pre-Development Model Appendix B: Post Development Model

Appendix C: Miscellaneous Pond Design Calculations



Appendix A: Pre-Development Model



Subject:

Project #:

Cedar Park Extension

Date:

Mar-16

By: 13054 Page TGS

Pre North East

tc calc for upstream drainage area

 $tc = 3.26*(1.1-C)*L^{0.5}/S^{0.33}$

(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

to calc for upstream drainage area

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

(airport formula)

L as above

S as above but as percent

127 m 2.30 %

C, rational Runoff Coefficient (Pre dev)

0.2

tc =

25 min

0.42 hrs

tp = 0.6 *tc

tp =

0.25 hrs

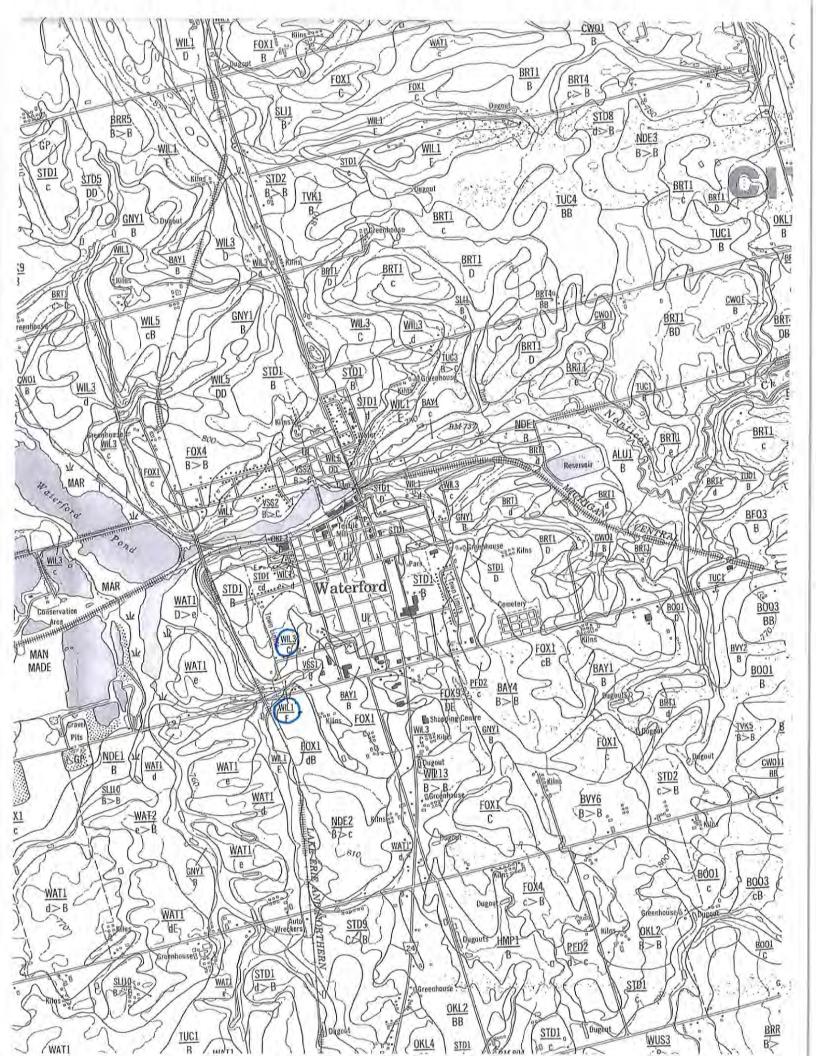
CHART C2-2

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 | АВ |
| - Shallow, overlying precambrian bedrock or clay subsoil | В |
| Coarse loams | |
| - overlying sand, gravel or limestone, well drained | AB |
| - shallow, overlying precambrian bedrock or clay subsoil | В |
| Medium textured loams | |
| - shallow, overlying limestone bedrock | В |
| | - 13 |
| - overlying medium textured subsoil | вс |
| | |
| - overlying medium textured subsoil Silt loams, some loams | 100 |
| - overlying medium textured subsoil Silt loams, some loams - with good internal drainage | ВС |
| - overlying medium textured subsoil Silt loams, some loams | вс |
| - overlying medium textured subsoil Silt loams, some loams - with good internal drainage | BC BC |
| - overlying medium textured subsoil Silt loams, some loams - with good internal drainage - with slow internal drainage and good external drainage | BC BC |
| - overlying medium textured subsoil Silt loams, some loams - with good internal drainage - with slow internal drainage and good external drainage Clays, clay loams, silty clay loams | BC BC |

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.



| DRAINAGE COMPONENTS No. 1 No. 2 | | MAP UNIT SYMBO | MAP (COMPO | | OUME ONE NES | | CON | RAINAGE WPONENTS | |
|--|---|----------------------|-------------|-----------------|--|-----------|------------------------------|--------------------------------|--|
| | | WIL-V | Vilsonville | | | 140. 2 | No. 1 | No. 2 | |
| Variable Very poor Very poor Very poor | Rapid Variable Rapid Rapid to well | WIL 3 WIL 5 WIL 9 | WIL.C | None None WIL.C | Mainly gravelly sandy till 15-40 cm sandy textures over gravelly sandy till see WIL 1 | see WIL 3 | Rapid to well Rapid to well | Flapid to well | |
| ariable ariable | Rapid Rapid to well | | WILL V | | 15-40 cm loamy textures over gravelly sandy till | see WIL 1 | Rapid to well | Flapid to well | |
| ∍ry poor | | WIL 10 WIL 11 | WIL.C W | | see WIL 9 | seeBRT 1 | Rapid to well | V/ell | |
| apid to well | | WIL 12 | WIL.C ST | rD s | ee WIL 3 | see WIL 1 | Rapid to well Rapid to well | Fapid to well Fapid to well | |
| | | WIL 13 | WIL.C NO | | eeWIL 3 | see NDE 1 | Rapid to well | Imperfect | |
| | | WSH-Wa | Isher | | | | Rapid to well | Imperfect | |
| | Sab tere | WSH 1 | WSH Nor | ter | 0-100 cm sandy xtures over custrine t loam | | Well | | |
| ais, and draina | ges. This informa- | WUS - Wat | seon | | 177- | | | | |
| pproximate pr | oportions, and the | WUS 1 | WUS None | | -100 cm sandy | | Poor | | |

textures over lacustrine

15-40 cm organic

see BRR 1

see TLD 2

see SLI 1

15-40 cm sandy

textures over

lacustrine silt loam

materials over

silty clay

lacustrine

see WUS 1

see WUS 1

see WUS 1

see WUS 1

silty clay

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

ent that occupies at least 80%

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

derstand that many soil bound-

to several hectares, of uniden-

ristics to a depth of about 100

neet.

WUS 3

WUS 4

WUS 6

WUS 9

WUS 10

WUS.P

WUS

WUS

WUS

WUS

None

BRR

TLD.C

SLI

TUC.C

N

W

W

Poor

Very poor

Imperfect

Floor

Foor

Imperfect

Poor

Poor

Poor

Poor

CHART C2-8 CHART C2-9

CHART C2-8 - SOIL/LAND USE CURVE NUMBERS

| 400.41410 | | Hydrologic Soil Group | | | | | | | | | |
|---|-------|-----------------------|------|---------|--------|----------------------|----|--|--|--|--|
| Land Use | A | AB | В | BC | . с | 93 84 79 74 | 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) Bare rock draining directly to stre Bare rock draining indirectly to stre Water surfaces | tream | 98 98 70 | (ngo | in spec | rial a | | | | | | |

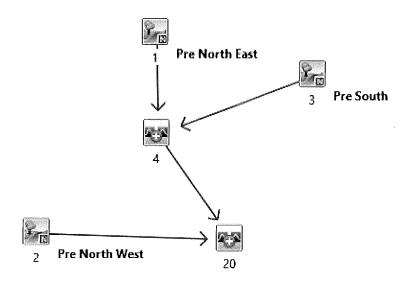
Notes

- 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)



```
Area (ha)= 3.13 Curve Number (CN)= 58.0

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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Copyright 2007 - 2013 Civica Infrastructure
All rights reserved.
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                                                     RAIN TIME RAIN TIME mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs 3.25 1.17 8.94 2.17 3.56 1.33 16.92 2.33 3.96 1.50 72.82 2.57 4.52 1.67 21.89 2.67 5.31 1.83 13.00 2.83 6.55 2.00 9.88 3.00
                                                                                                                                        RAIN | TIME
mm/hr | hrs
8.15 | 3.17
7.01 | 3.33
6.20 | 3.50
5.59 | 3.67
5.11 | 3.83
4.72 | 4.00
                                                                                                                                                                                                                                                          DATE: 01/03/2019
 COMMENTS:
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TIME TO PEAK (hrs)= 2.333
RUNOFF VOLUME (mm)= 2.526
TOTAL RAINFALL (mm)= 39.385
RUNOFF COEFFICIENT = 0.064
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7.70 |
6.68 |
5.94 |
5.39 |
4.93 |
                                        TIME RAIN TIME RAIN 'TIME hrs mm/hr hrs mw/hr hrs hrs 1.17 hrs mw/hr hrs hrs 1.17 hrs 1.17 hrs 1.27 hr
                                                                                                                                         RAIN | TIME
mm/hr | hrs
8.15 | 3.17
7.01 | 3.33
6.20 | 3.50
5.59 | 3.67
5.11 | 3.83
4.72 | 4.00
                                                                                                                                                                                RAIN
mm/hr
4.39
4.11
3.89
                                                                                                                                                                                                                                                             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
            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.
            (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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9.15
7.70
6.68
5.94
5.39
4.93
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+ ID2= 2 ( 0003): 3.75 0.013
ID = 3 ( 0004): 8.20 0.025
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8.15 | 3.17
7.01 | 3.33
6.20 | 3.50
5.59 | 3.67
5.11 | 3.83
4.72 | 4.00
                                                                                                                                                                                                                                                                       Unit Hyd Qpeak (cms)= 0.682
                                                                                                                                         mm/hr
8.15 |
7.01 |
                                                                                                                                                                                                                                                                       PEAK FLOW (cms)= 0.033 (i)
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RUNOFF COEFFICIENT = 0.096
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| 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(hre) = 0.25 Unit Hyd Qpeak (cms) = 0.478 FEAX FLOW (cms) = 0.026 (i) TIME TO FEAX (hrs) = 1.833 RUNOFF VOLUME (mm) = 4.632 TOTAL RAINFALL (mm) = 48.478 RUNOFF COEFFICIENT = 0.097 (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | ADD HYD (0004) |
| ADD HYD (0020) | De8a6531.634-4fdd-9449-24493b98ea8\S7bf828e De8a6531.634-4fdd-9449-24493b98ea8\S7bf828e De8a6531.634-4fdd-9449-24493b98ea8\S7bf828e De8a6531.634-4fdd-9449-24493b98ea8\S7bf828e De8a6531.634-4fdd-9449-24493b98ea8\S7bf828e De8a6531.634-4fd-9449-24493b98ea8\S7bf828e De8a6531.634-4fd-9449-24493bea8-24493be |
| V V I SSSS U U A L (V 5.1.2003) V V I SS U U A A L V V I SS U U A A L V V I SS U U A A L V V I SS U U A A L V V I SS U U A A L V V I SS U U A A L V V I SS U U A A L V V I SS U U A A L V V I SS U U A A L V V I SS U U A A L V V I SS U U A A L V V I SS U U A A L V V I SS U U A A L V V I SS U U A A L V V I SSS U U A A L V V I SSS U U A A L V V I SS U U A A L V V I SSS U U A A L V V I S U A A L V V I S U A A L V V I S U A A L V V I S U A A L V V I S U A A L V V I S U A A L V V I S U A A L V V I S U A A L V V I S U A A L V V I S U A A L V V I S U A A L V V I S U A A L V V I S U A A L V V I S U | CALIB |
| Input filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\VO2\voin.dat Output filename: C:\Usera\Greg\AppData\Local\Civica\VHS\b59b925c-la86-4318-8861- e38dc4dfd2f8\1894le4c-0d61-4572-aa74-fd006a3e8704\scenari Summary filename: C:\Usera\Greg\AppData\Local\Civica\VHS\b59b925c-la86-4318-8861- e38dc4dfd2f8\1894le4c-0d61-4572-aa74-fd006a3e8704\scenari DATE: 01/03/2019 TIME: 03:46:30 USER: | ADD HYD (0020) |
| COMMENTS: | V V I SSSS U U A L (V 5.1.2003) V V I SS U U AA L V V I SS U U AAAA V V I SS U U AAAAA L V V I SSSS UUUU A A L UV I SSSS UUUU A A L UV I SSSS UUUU A A L UV I SSSS UUUU A A C OO T T T H H Y Y M M OOO TM O O T T H H Y Y M M O O OOO T T H H Y Y M M O O |
| READ STORM Filename: C:\Users\Greg\AppD ata\Loca\Greg\AppD ata\Loca\Greg\AppD ata\Loca\Greg\AppD ata\Loca\Greg\AppD ata\Loca\Greg\AppD ata\Greg\AppD ata\Gre | OOO T T H H Y M M OOO Developed and Distributed by Civica Infrastructure Copyright 2007 - 2013 Civica Infrastructure All rights reserved. ***** DETAILED OUTPUT**** Input filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\VO2\voin.dat Output filename: C:\Users\Greg\AppOBata\Local\Civica\VS5\b59b925c-la86-4318-8861- e38cdddfd26\42676-a03b-4907-a19F-94ccdd3696f\scarari |
| 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 3.83 3.91 1.00 8.00 2.00 12.95 3.00 5.49 4.00 3.63 | Summary filename: C:\Usere\Qreg\AppData\Local\Civica\VB5\b59b925c-la86-4318-8861-e38dc4dfd2f8\4e2f61ca-403b-4907-a19f-94c0ed34696f\scenari DATE: 01/03/2019 |
| Unit Hyd Opeak (cmm)= 0.447 PEAK PLOM (cmm)= 0.051 (1) TIME TO PEAK (hrs)= 2.000 RUNOPF VOLUME (mm)= 6.994 TOTAL RAINFALL (mm)= 56.083 RUNOPF COSFFICIENT = 0.125 (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | ** SIMULATION : Run 04 ** SIMULATION : Run 04 READ STORM Filename: C:\Users\Greg\AppD ata\Local\Temp\ |
| READ STORM Filename: C:\Users\Greg\AppD | be8a6531-6b4d-4fdd-9d49-2b493b99ea8\9207a5aa Ptotal= 66.02 mm Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI |

```
TIME
hrs
1.17
1.33
1.50
1.67
1.83
2.00
                                                                                                                                                                                                                             TIME
hrs
2.17
2.33
2.50
2.67
2.83
                                                                                                                                                                               mm/hr
13.67
27.69
158.85
35.08
20.60
15.24
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Input filename: C:\Program Files (x86)\Visual OTHYMO 5.1\V02\voin.dat
Output filename: C:\Users\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\Oxers\
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DATE: 01/03/2019
| 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
                     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
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      READ STORM
                    READ STORM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TIME RAIN TIME RAIN 'TIME hrs mm/hr hrs mm/hr hrs mw/hr hrs hrs 10.17 4.27 4.33 4.98 1.33 27.69 2.33 6.50 5.61 1.50 1.88 55 2.50 6.67 6.48 1.67 35.08 2.67 6.83 7.70 1.83 2.06 2.63 2.00 9.70 1.83 2.06 2.83 1.00 9.70 1.83 2.00 15.24 3.00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Unit Hyd Opeak (cms)= 0.447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PEAK FLOW (cms)= 0.111 (1)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 13.230
TOTAL RAINFALL (mm)= 72,962
RUNOFF COEFFICIENT = 0.181
                    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.
TIME RAIN TIME RAIN 'TIME RAIN 'TIME RAIN hrs mm/hr hrs mm/hr hrs mm/hr 12.62 | 12.62 | 13.3 | 33.90 | 2.33 | 10.39 | 1.50 | 56.56 | 2.50 | 8.89 | 0.67 | 5.97 | 1.67 | 44.81 | 2.67 | 7.80 | 1.60 | 8.3 | 7.29 | 1.83 | 23.44 | 2.83 | 6.96 | 1.00 | 9.53 | 2.00 | 16.26 | 3.00 | 6.30 | 1.00 | 9.53 | 2.00 | 16.26 | 3.00 | 6.30 |
                  NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | CALIB | NASHYO ( 0003) | Area (ha)= 3.75 Curve Number (CN)= 58.0 | LID= 1 DT=10.0 min | Ia (mm)= 16.50 # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= 0.21
                                                                                                   be8a6531-6b40-4fdd-9d49-2b493bb98ea8\9207a5aa
Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
                                                                         TIME RAIN TIME RAIN THE RAIN THE RAIN TIME hrs nmm/hr h
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Unit Hvd Opeak (cms)= 0.682
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PEAK FLOW (CMS)= 0.134 (1)
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.
 CALIB

NASHTD ( 0002) | Area (ha)= 3.13 Curve Number (CR)=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
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ID = 3 ( 0004): 8.20 0.223
                  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
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                READ STORM | Filename: C:\Users\Greg\AppD ata\Loca\Temp\ be865531-6b4d-4fdd-9d49-2b493bb98ea8\51b849c0 |
Ptotal= 72.96 mm | Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
                     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| ADD HYD ( 0020)|
| 1 + 2 = 3 |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | RAIN | TIME | RAIN | TIME | RAIN | TIME | IMP/hr | hrs | mm/hr | hrs | mm/hr | hrs | mm/hr | hrs | mm/hr | hrs | 1,99 | 1,17 | 14.27 | 2.17 | 12.62 | 3.17 | 4.45 | 1.33 | 33.90 | 2.33 | 10.39 | 3.33 | 5.08 | 1.50 | 18.65 | 2.50 | 8.89 | 3.50 | 5.97 | 1.67 | 44.81 | 2.67 | 7.80 | 3.67 | 7.29 | 1.83 | 23.44 | 2.83 | 6.95 | 3.83 | 3.90 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 |
                     ID = 3 ( 0020): 11.33 0.219
                                                                                                                                                                                                            1.83
                                                                                                                                                                                                                                                   10.39
                    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CALIB
| NASHYD ( 0002) | Area (ha)= 3.13 Curve Number (CN)= 58.0
| Linear Res.(N)= 3.00
| Linear Res.(N)= 3.00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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.
                                                                                  ***** DETAILED OUTPUT *****
```

```
| ADD HYD ( 0020)|
| 1 + 2 = 3 |
                                ID = 3 ( 0020): 11.33 0.322
                                                                                                                                                                                   (hrs) (mm)
1.67 13.11
1.83 13.11
                      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
   ------
                             V V I SSSS U U AAA L
V V I SS U U AAAAA L
V V I SS U U AAAAA L
V V I SS U U AAAAA L
VV I SS U U A A L
VV I SSSS UUUU A A LLLLL
 000 TITTT TITTT H H Y Y M M 000
0 0 T T H H YY M6 MM 0 0
0 0 T T H H YY M M 00
0 000 T T H H Y M M 000
Developed and Distributed by Civica Infrastructure
Copyright 2007 - 2013 civica Infrastructure
                                                                               ***** DETAILED OUTPUT *****
Input filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\Vo\voin.dat output filename: C:\Dserb\Greg\Appbata\Local\Civica\VH5\b59925c-1a86-4318-8861-e38dc4df2f2f5/df5/57b7-07-4195-add9-4096531b3640\genari
Summary filename: C:\Dserb\Greg\Appbata\Local\Civica\VH5\b59925c-1a86-4318-8861-e38dc4df2f2f5/df5/57b7-07-4195-add9-4096531b3640\genari
 DATE: 01/03/2019
                                                                                                                                                                                TIME: 03:46:31
          ************************************
           Filename: C:\Users\Greg\AppD

ta\Local\Temp\

be8a6531-644-fdd-9d49-2b493bb98ea8\c02acabe

Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
                      READ STORM
                                                                      TIME RAIN TIME
hrs mm/hr hrs
0.17 4.50 1.17
0.33 5.05 1.33
                                                                                                                                                                     RAIN | TIME
                                                                                                                                    TIME RAIN | TIME RAIN | TIME |
                                                                                                5.82 |
6.83 |
8.41 |
11.07 |
   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\
                                                                                              ata\Local\Temp\
be8a6531-6b4d-4fdd-9d49-2b493bb98ea8\c02acabe
Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
                                                                      TIME RAIN TIME hrs mm/hr hrs 0.17 4.50 1.17 0.33 5.05 1.33 0.50 5.82 1.50 0.67 6.83 1.67 0.83 8.41 1.83 1.00 11.07 2.00
                                                                                                                                                                       RAIN | TIME
                                                                                                                                                                                                                                            RAIN | TIME
                                                                                                                                     TIME RAIN ' TIME RAIN | THME RAIN | THME | T
   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 |
                    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

Appendix B: Post Development Model

```
(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Filename: C:\Users\Greg\AppD
ata\Local\Temp\
838a855-294-4b71-a467-7100b13d0872\fd561058
Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
 000 TITTT TITTT H H Y Y M M 000
0 0 T T H H YY M0 MM 0 0
0 0 T T H H Y M M 0 0
0 000 T T H H Y M M 000
Developed and Distributed by Civica Infrastructure
Copyright 2007 - 2013 Civica Infrastructure
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TIME RAIN TIME RAIN 'TIME RAIN TIME 
                                                                                  ***** DETAILED OUTPUT *****
Input filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\VO2\voin.dat
Output filename: C:\Dsera\Grey\Appbata\Local\Civica\VHS\D59925c-la86-4318-8861-
e38dcddfdffs\f34286c-a=a64-422c-a994-1665dbd1456\Queenari
Summary filename: C:\Ubera\Grey\Appbata\Local\Civica\VHS\D59925c-la86-4318-8861-
e38dcdfdffs\f34286c-a=a64-422c-a994-1665db1456\Queenari
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | CALIB | CALI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IMPERVIOUS PERVIOUS (1)
0.28 0.31
0.80 1.50
1.00 2.00
62.72 40.00
0.013 0.250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Surface Area (ha)=
Dep. Storage (mm)=
Average Slope (%)=
Length (m)=
Mannings n =
  COMMENTS: ___
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Max.Eff.Inten.(mm/hr) = over (min)
Storage Coeff. (min) = Unit Hyd. Tpeak (min) = Unit Hyd. peak (cms) =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      78.82
10.00
2.12 (ii)
10.00
0.17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     18.18
20.00
16.08 (ii)
20.00
0.06
            *****************
             PEAK FLOW (cms) =
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0.02
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0.026 (iii)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1.50
38.58
39.38
0.98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1.50
                     READ STORM
                                                                                                  Filename: C:\Users\Greg\AppD
          ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.
                                                                        TIME RAIN TIME RAIN 'TIME RAIN 'T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (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) PRAK FLOW DOES NOT INCLUDE BRASEFLOW IF ANY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    READ STORM | Filename: C:\Users\Greg\AppD ata\Local\Temp\
838a855-2964-4b71-a467-7100b13d0872\fd561058
Ptotal= 39.38 mm | Comments: 2 TEAR CHICAGO 4 HOUR DESIGN STORM DISTR
    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.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    READ STORM Filename: C:\Unera\Greg\AppD ata\Local\Temp\ asaacsis-2abi-4ab71-a467-7100b13d0872\td561058
Ptotal= 39.38 mm | Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Surface Area (ha)=
Dep. Storage (mm)=
Average Slope
Length (m)=
Mannings n =
                                                                        RAIN | TIME
mm/hr | hrs
8.15 | 3.17
7.01 | 3.33
6.20 | 3.50
5.59 | 3.67
5.11 | 3.83
4.72 | 4.00
                                                                                                                                                                                                                                                                                                                         RAIN
mm/hr
4.39
4.11
3.89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Max.Eff.Inten.(mm/hr) = over (min)
Storage Coeff. (min) = Unit Hyd. Tpeak (min) = Unit Hyd. peak (cms) =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2.04 (ii)
10.00
0.17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9.74 (ii)
10.00
0.11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                *TOTALS*
0.039 (iii)
1.50
18.28
39.38
0.46
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0.02
1.50
38.58
39.38
0.98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0.02
1.50
14.98
39.38
0.38
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PEAK FLOW (cms) =
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT =
    | CALIB
| NASHYD ( 0070) | Area (ha)= 1.74 Curve Number (CH)= 58.0
| LD= 1 DT=10.0 min | Ia (mm)= 16.50 # of Linear Res.(N)= 3.00
| U.H. Tp(hrs)= 0.17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.
                      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) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (1) ON PROCEDURE SELECTED FOR PRIVIOUS DOSSES-
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.
                      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Filename: C:\Users\Greg\AppD
ata\Loca\Temp\
838a855-29b4-4b71-a467-7100b13d0872\fd561058
Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
                     READ STORM | Filename: C:\Users\Greg\AppD
         ata\Local\Temp\
ata\Local\Temp\
838a855b-29b4-4b71-a467-7100b13d0872\fd561058
Ptotal= 39.38 mm | Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       THE RAIN TIME RAIN 'TIME RAIN' TIME RAIN'
hrs nmm/hr hrs mm/hr hrs nmm/hr
0.17 3.25 1.17 8.94 2.17 8.15
0.33 3.56 1.33 16.92 2.33 7.01
0.50 3.96 1.50 78.82 2.50 6.20
0.67 4.52 1.67 21.89 2.67 5.59
0.83 5.31 1.83 13.00 2.83 5.11
1.00 6.55 2.00 9.88 3.00 4.72
                                                                          TIME RAIN TIME RAIN TIME white mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs 0.17 0.33 3.56 1.33 16.92 2.33 0.50 0.67 4.52 1.167 21.89 2.67 0.68 3.31 1.83 3.00 2.83 1.00 6.55 2.00 9.88 3.00
                                                                                                                                                                                                                                                      RAIN | TIME

mm/hr | hrs

8.15 | 3.17

7.01 | 3.33

6.20 | 3.50

5.59 | 3.67

5.11 | 3.83

4.72 | 4.00
                                                                                                                                                                                                                                                    mm/hr |
8.15 |
7.01 |
6.20 |
5.59 |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IMPERVIOUS
0.24
0.80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PERVIOUS (i)
0.24
1.50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (ha) =
(mm) =
(%) =
(m) =
                      Unit Hyd Qpeak (cms)= 0.163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Average Slope
Length
Mannings n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1.00
56.57
0.013
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2.00
40.00
0.250
                      PEAK FLOW (cms)= 0.009 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 5.149
TOTAL RAINFALL (mm)= 39.385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Max.Eff.Inten.(mm/hr) =
          over (min)
```

```
2.00 (ii) 15.13 (ii)

10.00 20.00

0.17 0.07

0.01 0.1

1.50 1.67

38.59 10.20

39.38 39.38

0.98 0.26
                     Storage Coeff. (min) =
Unit Hyd. Tpeak (min) =
Unit Hyd. peak (cms) =
                     PEAK FLOW (cms)=
TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT =
***** 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:

(IN* = 58.0 Ia = Dep. Storage (Above)
(i) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.
(ii) PEAK FLOW DOES NOT INCLIDE BASEFLOW IF ANY.
                     READ STORM
                                                                                                 Filename: C:\Users\Greg\AppD
                                                                                                 ata\Local\Temp\
838a65b-29b4-4b71-a467-7100b13d0872\fd561058
Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
         Ptotal= 39.38 mm
                                                                                                       | CALIB |
| STANDHYD ( 0028) |
|ID= 1 DT=10.0 min |
                                                                                               Area (ha)= 0.61 Total \ Imp(\$)= 62.00 \ Dir. \ Conn.(\$)= 14.00
                                                                                                                         IMPERVIOUS PERVIOUS (i)
                     Surface Area
Dep. Storage
Average Slope
Length
Mannings n
                                                                                                                                           0.38
0.80
1.00
63.77
0.013
                                                                                                                                                                                                   0.23
1.50
2.00
40.00
0.250
                                                                                                                                          78.82
10.00
2.15 (ii)
10.00
0.17
                     Max.Eff.Inten.(mm/hr)=
                     over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)=
                                                                                                                                                                                                 20.00
11.46 (ii)
20.00
0.08
                      PEAK FLOW (Cms) =
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT =
                                                                                                                                           0.02
1.50
38.58
39.38
0.98
***** 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 (ET) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COFFFICIENT:

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                  Filename: C:\Users\Greg\AppD
ata\Local\Tremp\
838a855b-29b4-4b71-a467-7100b13d0872\fd561058
Comments: 2 YRAR CHICAGO 4 HOUR DESIGN STORM DISTR
                     READ STORM
         Ptotal= 39.38 mm
                                                                                                       | RAIN | TIME | RAIN | TIME | mm/hr | hrs | mm/hr | hrs | mm/hr | hrs | mm/hr | hrs 
                                                                                                                                                                                                                                              RAIN | mm/hr | 8.15 | 7.01 | 6.20 | 5.59 | 5.11 | 4.72 |
   | CALIB |
| STANDHYD ( 0030) |
|ID= 1 DT=10.0 min |
                                                                                                                               IMPERVIOUS
                                                                                                                                                                                           PERVIOUS (i)
                   Surface Area
Dep. Storage
Average Slope
Length
Mannings n
                                                                                                                                  0.20
0.80
1.00
46.90
0.013
                                                                                                                                                                                                   0.13
1.50
2.00
40.00
0.250
                                                                                                                                   78.82
10.00
1.78 (ii)
10.00
0.17
                                                                                                                                                                                                   24.77
20.00
14.12 (ii)
20.00
0.07
                     Max.Eff.Inten.(mm/hr)=
                     over (mm/nr) =
over (min)
Storage Coeff. (min) =
Unit Hyd. Tpeak (min) =
Unit Hyd. peak (cms) =
                     PEAK FLOW (cms)=
TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT =
  **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
                   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 58.0 Ia = Dep. Storage (Above)

(i) TIME STEPE (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.

(ii) PEAK PLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                 Filename: C:\Users\Greg\AppD
ata\Local\Temp\
838a855b-294-4b71-a467-7100b13d0872\fd561058
Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
                                                                                                      RAIN |
mm/hr |
3.25 |
3.56 |
3.96 |
                                                                                                                                       TIME
hrs
1.17
1.33
1.50
1.67
1.83
2.00
                                                                                                                                                                                                                                               RAIN | TIME
mm/hr | hrs
8.15 | 3.17
7.01 | 3.33
6.20 | 3.50
5.59 | 3.67
5.11 | 3.83
4.72 | 4.00
                                                                                                                                                                     mm/hr hrs
8.94 2.17
16.92 2.33
78.82 2.50
```

| CALIB STANDHYD (0032) ID= 1 DT=10.0 min | Area (| ha)= 0.66 (%)= 36.00 | Dir. Conn. | (%)= 10.00 | |
|---|--|--|---------------------------|--|---------------|
| | TM | PERVIOUS P | | | |
| Surface Area Dep. Storage | | 0.24 | 0.42 1.50 | | |
| Average Slope | (%)= | 1.00 | 2.00 | | |
| Length Mannings n | (m)= = | 66.33 0.013 | 40.00 0.250 | | |
| Max.Eff.Inten.(| mm/hr)= | 78.82 | 14.53 | | |
| over Storage Coeff. | (min) (min)= | 10.00 2.20 (ii) | 20.00 17.46 (ii) | | |
| Unit Hyd. Tpeak Unit Hyd. peak | (min)= | 10.00 2.20 (ii) 10.00 0.17 | 20.00 | | |
| | | | | *TOTALS* | |
| PEAK FLOW TIME TO PEAK | (cms)= (hrs)= | 0.01 1.50 | 0.01 1.67 | 0.020 (iii) 1.50 | |
| RUNOFF VOLUME TOTAL RAINFALL | (mm) = (mm) = | 38.58 | 8.68 | 11.66 39.38 | |
| RUNOFF COEFFICI | ENT = | 0.98 | 0.22 | 0.30 | |
| **** WARNING: STORA **** WARNING:FOR AR | GE COEFF. IS | SMALLER THAN | TIME STEP! | | |
| YOU SH | OULD CONSIDE | R SPLITTING T | HE AREA. | | |
| (i) CN PROCED | URE SELECTED | FOR PERVIOUS | LOSSES: | | |
| (ii) TIME STEP | (DT) SHOULD | Dep. Storage BE SMALLER O | R EQUAL | | |
| (iii) PEAK FLOW | STORAGE COEF DOES NOT IN | | W IF ANY. | | |
| | | | | | |
| | | | | | |
| READ STORM | Filename | : C:\Users\Gr ata\Local\T | eg\AppD emp\ | | |
| Ptotal= 39.38 mm | Commerce | 838a855b-29 | b4-4b71-a46 | 7-7100b13d0872\f | d561058 |
| | | | | | |
| TIM hr | E RAIN s mm/hr | TIME RAIN hrs mm/hr | ' TIME hrs | RAIN TIME | RAIN mm/hr |
| 0.1 | 7 3.25 | 1.17 8.94 | 2.17 | 8.15 3.17 7.01 3.33 | 4.39 |
| 0.5 | 0 3.96 | 1.50 78.82 | 2.50 | 6.20 3.50 | 3.89 |
| 0.6 0.8 | 7 4.52 3 5.31 0 6.55 | 1.83 13.00 | 2.67 | RAIN TIME mm/hr hrs 8.15 3.17 7.01 3.33 6.20 3.50 5.59 3.67 5.11 3.83 4.72 4.00 | 3.68 |
| 1.0 | 0 6.55 | 2.00 9.88 | 3.00 | 4.72 4.00 | 3.35 |
| | | | | | |
| CALIB | | | | | |
| STANDHYD (0033) | Area (| ha)= 0.80 (%)= 48.00 | | | |
| STANDHYD (0033) | Total Imp | | | (₹)= 13.00 | |
| | IM | PERVIOUS P 0.38 | 0.42 | | |
| Surface Area Dep. Storage Average Slope | (mm) = (%) = | 0.38 0.80 1.00 73.03 | 1.50 | | |
| Length | (m)= | | 40.00 | | |
| Mannings n | = | 0.013 | 0.250 | | |
| Max.Eff.Inten.(over | (min) | 78.82 10.00 | 20.10 | | |
| Storage Coeff. Unit Hyd. Tpeak | (min)= (min)= | 2.33 (ii) 10.00 0.17 | 15.74 (ii) 20.00 | | |
| Unit Hyd. peak | (cms)= | 0.17 | 0.06 | | |
| PEAK FLOW | (cms)= | 0.02 | 0.02 | *TOTALS* 0.031 (iii) | |
| TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL | (hrs)= (mm)= | 1.50 38.58 | 1.67 9.98 | 1.50 13.69 | |
| TOTAL RAINFALL RUNOFF COEFFICI | (mm)= ENT = | 39.38 | 39.38 | 39.38 0.35 | |
| | | | | 0.33 | |
| **** WARNING: STORA **** WARNING:FOR AR | EAS WITH IMP | ERVIOUS RATIO | S BELOW 20% | | |
| | | R SPLITTING T | | | |
| (i) CN PROCED CN* = | URE SELECTED 58.0 Ia = | FOR PERVIOUS Dep. Storage | LOSSES: (Above) | | |
| CN* = (ii) TIME STEP THAN THE | (DT) SHOULD STORAGE COEF | BE SMALLER O | R EQUAL | | |
| (iii) PEAK FLOW | | | W IF ANY. | | |
| | | | | | |
| | | | | | |
| READ STORM | Filename | : C:\Users\Gr ata\Local\T | emp\ | | |
| Ptotal= 39.38 mm | Commento | 838a855b-29 | b4-4b71-a46 | 7-7100b13d0872\f DESIGN STORM DIS | d561058 TR |
| | | | | | |
| TIM hr | E RAIN s | rIME RAIN hrs mm/hr | ' TIME hrs | mm/hr TIME | RAIN mm/hr |
| 0.1 | 7 3.25 | 1.17 8.94 1.33 16.92 | 2.17 | RAIN TIME mm/hr hrs 8.15 3.17 7.01 3.33 6.20 3.50 5.59 3.67 | 4.39 |
| 0.5 | 0 3.96 | 1.50 78.82 | 2.50 | 6.20 3.50 | 3.89 |
| 0.8 | 3 5.31 | 1.83 13.00 | 2.83 | 5.11 3.83 | 3.51 |
| 1.0 | 0 6.55 | 2.00 9.88 | 3.00 | 4.72 4.00 | 3.35 |
| | | | | | |
| CALIB | | | | | |
| STANDHYD (0034) | Area (| ha)= 0.67 (%)= 42.00 | Dir. Conn. | (%)= 18.00 | |
| ID= I DT=10.0 min | | | | 10,- 10.00 | |
| Surface Area | (ha)= | 0.28 | ERVIOUS (i) 0.39 | | |
| Dep. Storage Average Slope | (mm)= (%)= | 0.80 1.00 | 1.50 | | |
| Length | (m)= | 66.83 | 40.00 0.250 | | |
| Mannings n | | 0.013 | | | |
| Max.Eff.Inten.(over | mm/hr)= (min) | 78.82 10.00 | 14.68 | | |
| over Storage Coeff. | (min)= | 2.21 (ii) 10.00 | 17.41 (ii) 20.00 | | |
| Unit Hyd. Tpeak Unit Hyd. peak | (cms)= | 0.17 | 0.06 | 4ma | |
| PEAK FLOW | (cms) = | 0.03 | 0.01 | *TOTALS* 0.031 (iii) | |
| TIME TO PEAK | (hrs)= (mm)= | 1.50 38.58 | 1.67 8.72 | 1.50 | |
| RUNOFF VOLUME TOTAL RAINFALL | (mm)= | 39.38 | 39.38 | 39.38 | |
| RUNOFF COEFFICI | | 0.98 | 0.22 | U.36 | |
| **** WARNING: STORA **** WARNING:FOR AR | GE COEFF. IS EAS WITH IMP | SMALLER THAN ERVIOUS RATIO | TIME STEP! S BELOW 20% | | |
| YOU SH | OULD CONSIDE | R SPLITTING T | HE AREA. | | |
| (i) CN PROCED | | POR DERITORS | LOSSES: | | |
| | URE SELECTED | Den Charac- | (Aborro) | | |
| CN* = (ii) TIME STEP | 58.0 Ia = (DT) SHOULD | Dep. Storage BE SMALLER O | (Above) R EQUAL | | |
| CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW | 58.0 Ia = (DT) SHOULD STORAGE COEF | Dep. Storage BE SMALLER O FICIENT. | (Above) R EQUAL | | |
| THAN THE | 58.0 Ia = (DT) SHOULD STORAGE COEF | Dep. Storage BE SMALLER O FICIENT. | (Above) R EQUAL | | |

| READ STORM | TOTAL RAINFALL (mm)= 39.38 39.38 39.38 RUNOFF COEFFICIENT = 0.97 0.29 0.42 |
|--|---|
| Protal= 39.38 mm | **** WARNING: STORAGE COEFF. IS SWALLER THAN TIME STEP! ***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 204 YOU SHOULD CONSIDER SPLITTING THE AREA. (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 58.0 Ta = Dep. Storage (Above) (ii) TIME STEP (UT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. |
| CALIB | READ STORM Filename: C:\Users\Greq\AppD |
| IMPERVIOUS PERVIOUS (1) | TIME RAIN TIME RAIN 'TIME RAIN 'TIME RAIN TIME RAIN RAIN TIME RAIN RAIN RAIN RAIN RAIN RAIN RAIN RAIN |
| Over (min) 10.00 20.00 | CALIB |
| 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 | ID= 1 DT=10.0 min Total Imp(%)= 45.00 |
| **** MARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! **** MARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA. (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: | 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 |
| 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. | 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* |
| READ STORM Filename: C:\Users\Gre\AppD | 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 |
| TIME RAIN TIME R | **** WARNING-FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SMOULD CONSIDER SPLITTING THE AREA. (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 58.0 In = Dep. Storage (Above) (ii) TIME STEE (D'ESHOULD BE SMALLER OR EQUAL (iii) FEAR FLOW DOES NOT INCLIDE BASEFLOW IF ANY. |
| CALIB STANDHYD (0062) Area (ha)= 0.51 | READ STORM |
| 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 FEAK FLOW (cms)= 0.02 0.02 0.026 (iii) TIME TO FEAK (hrs)= 1.50 1.67 1.50 RUNDIFF VOLUME (min)= 38.38 13.28 17.29 TOTAL RAINFALL (min)= 35.38 39.38 RUNDIFF COEFFICIENT = 0.97 0.34 0.44 | CALIE CALIES STANDSYD (0069) Area (ha)= 0.86 ID=1 DT=10.0 min |
| **** MARNING: STORAGE COEFF. IS SWALLER THAN TIME STEP! ****** WARNING:FOR AREAS WITH IMPREVIOUS RATIOS BELOW 204 YOU SHOULD CONSIDER SPLITTING THE AREA. | Average Slope (%)= 1.00 2.00 Length (m)= 75.72 40.00 Manninge n = 0.013 0.250 |
| (i) ON PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 58.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAIN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | 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* |
| READ STORM Filename: C:\Users\Greg\AppD ata\tocal\Temp\ | PEAK FLOW (cms)= 0.03 0.01 0.035 (iii) TIME TO PEAK (hrs)= 1.50 1.67 1.50 RUNOFF VOLIME (mm)= 38.39 8.62 13.07 TOTAL RAINFALL (mm)= 39.38 39.38 39.38 RUNOFF COEFFICIENT = 0.97 0.22 0.33 |
| 838a8555-29b4-4b71-a467-7100b13d0872\fd561058 Ptotal= 39.38 mm | **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP: **** WARNING: FOR AMEAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AMEA. |
| 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 3.57 3.68 0.83 5.31 1.83 13.00 2.83 5.13 3.83 3.51 1.00 6.55 2.00 9.88 3.00 4.72 4.00 3.35 | (i) ON PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* - 50. Is - Dep 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)= 0.68 | ADD HYD (0027) AREA QPEAK TPEAK R.V. 1 + 2 = 3 |
| Meanings n | ADD HYD (0027) AREA QPEAK TPEAK R.V. |
| 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 | ID1 = 3 (0027): 1.11 0.065 1.50 16.11 + ID2 = 2 (00265): 0.48 0.020 1.50 14.16 |

| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | 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 |
|--|--|
| ADD HYD (0027) AREA QPEAK TPEAK R.V. (mm) IDl= 1 (0027): 1.59 0.084 1.50 15.52 T.59 1.028 1.50 16.14 | 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 |
| ID = 3 (0027): 2.20 0.112 1.50 15.69 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | STANDRYD (0065) |
| ADD HYD (0027) AREA QPEAK TPEAK F.V. 1 | 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. peak (min)= 10.00 30.00 Unit hyd. peak (min)= 0.17 0.5 **TOTALS** |
| ADD HYD (0027) | PEAK FLOW (cms)= 0.02 0.01 0.020 (iii) TIMM TO PEAK (hrs)= 1.50 1.83 1.50 RUMOFF VOLDIME (mm)= 38.38 7.17 12.45 TOTAL RAINFALL (mm)= 39.38 39.38 39.38 RUMOFF COEFFICIENT = 0.97 0.18 0.32 |
| 1 + 2 = 3 | **** 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 |
| ADD HYD (0027) AREA QPEAK TPEAK R.V. AREA QPEAK TPEAK R.V. Graph (mm) (hrs) (mm) Graph (mm) Grap | READ STORM Filename: C:\Users\Greg\AppD ata\Local\Temp\ 838a855b-29b4-4b71-a467-7100b13d0872\fd561058 Ptotal= 39.38 mb |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ADD HYD (0027) 1 + 2 = 3 | TIME RAIN TIME RAIN 'TIME RAIN TIME RAIN TIME RAIN No. 11 the RAIN 1 TIME RAIN 1 TIME RAIN 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 |
| ID1= 1 (0027): 3.99 0.184 1.50 14.80 + ID2= 2 (0034): 0.67 0.031 1.50 14.08 ==================================== | CALIB |
| ADD HYD (0027) | Surface Area (ha) = 0.12 |
| ADD HYD (0027) AREA | TIME TO PEAK (hrs)= 1.50 1.67 1.50 RINDEF VOLUME (mm)= 38.39 8.41 17.65 TOTAL RAINFALL (mm)= 39.38 39.38 39.38 39.38 RINDEF 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 1a = Dep. 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) | ADD HYD (0067) |
| ADD HYD (0027) | DUHYD |
| ADD HYD (0027) AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm) (ms) (1.73 + 1.02 + 1.0 | ADD HYD (0031) AREA QFEAK TFEAK R.V. (ha) (cms) (hrs) (cms) (hrs) (cms) 1.50 14.20 (hrs) (cms) (hrs) (cms) (c |
| READ STORM Filename: C:\Users\Oreg\AppD ata\Loca\Uremp\ | ADD HYD (0031) |

```
NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
            RESERVOIR( 0029) |
IN= 2---> OUT= 1 |
                                                                                                                                                                                                                                                                                                                                (cms)
0.1080
0.1807
0.2663
0.3630
0.4697
0.0000
                                                                                                                                                                        (cms)
0.0000
0.0085
0.0130
0.0163
0.0190
0.0512
                  | AREA | QPEAK | TPEAK | R.V. | (ha) | (cms) | (hrs) | (mm) | (hrs) | (mm) | (hrs) | (mm) | (hrs) | (mm) | (hrs) | (mr) | (hrs) | (hrs) | (13.79 | (13.79 | 13.28 | 13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 13.28 | (13.28 | 13.28 | 
                                                                                                                           PEAK FLOW REDUCTION [Qout/Qin](%)= 4.71
TIME SHIFT OF PEAK FLOW (min)=165.00
MAXIMUM STORAGE USED (ha.m.)= 0.1083
                                                                                                                                               Filename: C:\Users\Greg\AppD
ata\Local\Temp\
838a855b-29b4-4b71-a467-7100b13d0872\fd561058
Comments: 2 YEAR CHICAGO 4 HOUR DESIGN STORM DISTR
                                                                                                          TIME RAIN TIME RAIN TIME RAIN TIME RAIN TIME hrs nmm/hr nmm/hr hrs nmm/hr nmm/hr hrs nmm/hr nmm/hr hrs nmm/hr nm
      Surface Area (ha)=
Dep. Storage (mm)=
Average Slope (%)=
Length (m)=
Mannings n =
                            Max.Eff.Inten.(mm/hr) = over (min)
Storage Coeff. (min) = Unit Hyd. Tpeak (min) = Unit Hyd. peak (cms) =
                                                                                                                                                                                                78.82
10.00
1.75 (ii)
10.00
0.17
                                                                                                                                                                                                                                                                                                       20.59
20.00
15.03 (ii)
20.00
0.07
                                                                                                                                                                                                                                                                                                                                                                                                 *TOTALS*
0.007 (iii)
1.67
10.05
39.38
                            PEAK FLOW (cms)= 0.00
TIME TO PEAK (hrs)= 1.50
RUNOFF VOLUME (mm)= 38.38
TOTAL RAINFALL (mm)= 39.38
RUNOFF COEFFICIENT = 0.97
***** 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)

(i) TIME STEP (IT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.

(ii) PEAR FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| ADD HYD ( 0037) | AREA QPEAK TPEAK R.V. (ma) (cms) (hre) (mm) (mm) | AREA R N.I.N.G: HYDROGRAPH 0024 * LD=1 > 15 DMY. | AREA R N.I.N.G: HYDROGRAPH 0024 * LD=1 > 15 DMY. | AREA R N.I.N.G: HYDROGRAPH 0037 = HYDROGRAPH 0029 | LD=1 ( 0024) * 0.00 0.000 0.00 0.00 0.00 | LD=2 ( 0029): 9.22 0.019 4.25 13.28 | LD=3 ( 0037): 9.22 0.019 4.25 13.28
                            NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                        DB HYD ( 0037)| AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mrs) (hrs) (res) (res)
                              NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                              NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
  | ADD HYD ( 0037)|
| 3 + 2 = 1
                              NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
  ------
                                         V V I SSSS U U A L
V V I SS U U AAA L
V V I SS U U AAAAA L
V V I SS U U AAAAA L
VV I SS U U A A L
UV I SSSS UUUUU A A LLLLL
                                                                                                                                                                                                                                                                                                                                                                               (v 5.1.2003)
```

OOO TTTTT TTTTT H H Y Y M M OOO TM

| 0 0 T 0 0 T 000 T 0000 T Developed and Distri | buted by Ci | lvica In: | frastruc | M O O M O O M OOO | | | | |
|--|---|-------------------------------------|----------------------------------|---|----------------------|--------------------|---------------|--|
| • | **** DE | r A I L I | ED O | UTPUT | **** | | | |
| Input filename: Output filename: 238dc4dfd2f8\91bf6bc Summary filename: 238dc4dfd2f8\91bf6bc | 0-fe51-45b4 C:\Users\G | l-afc8-c reg\AppD | 024478ad ata\Loca | lfca\scenar :1\Civica\V | i H5\b59b92 | | | |
| DATE: 01/05/2019 USER: | | | TIM | ΠΕ: 10:33:0 | 9 | | | |
| COMMENTS: | | | | | | | | |
| ** SIMULATION : Ru | | | | ** | | | | |
| | | | | | | | | |
| READ STORM | | ata\: | Local\Te | mp\ 4-4b71-a46 | 7-7100b13 | d0872\4 | 32754d6 | |
| Ptotal= 48.48 mm | | s: 5 YE | AR CHICA | GO 4 HOUR | DESIGN DI | STRIBUT | IO | |
| TIM hr | E RAIN s mm/hr | TIME | RAIN mm/hr | TIME 1 2.17 2.33 2.50 2.67 2.83 3.00 | mm/hr | TIME hrs | RAIN mm/hr | |
| 0.1 0.3 | 7 3.53 3 3.66 | 1.17 | 10.19 21.62 | 2.17 | 9.15 7.70 | 3.17 | 4.55 4.22 | |
| 0.5 0.6 | 0 4.04 7 4.67 | 1.50 | 112.37 27.76 | 2.50 | 6.68 5.94 | 3.50 3.67 | 3.96 3.73 | |
| 0.6 0.8 1.0 | 3 5.61 0 7.11 | 1.83 | 15.75 11.43 | 2.83 | 5.39 4.93 | 3.83 4.00 | 3.53 | |
| | | | | | | | | |
| CALIB NASHYD (0038) ID= 1 DT=10.0 min | Area Ia U.H. Tp | (ha)= (mm)= (hrs)= | 0.09 16.50 0.15 | Curve Numb | er (CN) r Res.(N) | = 58.0 = 3.00 | | |
| Unit Hyd Qpeak | | 0.023 | | | | | | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI | (cms) = ((hrs) = 1 (mm) = 4 (mm) = 48 | 0.001 (i 1.667 1.401 3.478 |) | | | | | |
| (i) PEAK FLOW D | | | SEFLOW I | F ANY. | | | | |
| | | | | | | | | |
| READ STORM | Filenar | ata\ | Local\Te | /qme | | 100001 4 | | |
| Ptotal= 48.48 mm | | s: 5 YE | AR CHICA | 04-4b71-a46 GO 4 HOUR | DESIGN DI | STRIBUT | 32754d6 IO | |
| TIM | E RAIN | TIME | RAIN | TIME hrs 2.17 2.33 2.50 2.67 2.83 3.00 | RAIN | TIME | RAIN | |
| hr 0.1 | s mm/hr 7 3.53 | 1.17 | mm/hr 10.19 | 2.17 | mm/hr 9.15 | hrs 3.17 | | |
| 0.3 0.5 | 3 3.66 0 4.04 | 1.33 | 21.62 112.37 | 2.33 | 7.70 6.68 | 3.33 3.50 | 4.22 3.96 | |
| 0.6 | 7 4.67 3 5.61 | 1.67 | 27.76 15.75 | 2.67 | 5.94 | 3.67 3.83 | 3.73 | |
| 1.0 | 0 7.11 | 2.00 | 11.43 | 3.00 | 4.93 | 4.00 | 3.35 | |
| CALIB NASHYD (0070) ID= 1 DT=10.0 min | Area Ia U.H. Tp | (ha)= (mm)= (hrs)= | 1.74 16.50 0.17 | Curve Numb # of Linea | er (CN) | = 58.0 = 3.00 | | |
| Unit Hyd Qpeak | | 399 | | | | | | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI | (mm) = 48 | 3.4/8 |) | | | | | |
| (i) PEAK FLOW D | OES NOT INC | CLUDE BA | SEFLOW 1 | F ANY. | | | | |
| READ STORM | | 838a | Local\Te 855b-29b AR CHICA | emp\ o4-4b71-a46 ago 4 HOUR | DESIGN DI | d0872\4 STRIBUT | 32754d6 IO | |
| TIM hr | | | RAIN | ' TIME ' hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | |
| 0.1 | 7 3.53 | 1.17 | 10.19 | 2.1/ | | 3.17 | 4.55 | |
| 0.3 0.5 | 0 4.04 | 1.50 | 112.37 | 2.50 | 6 68 | 3.33 | 4.22 3.96 | |
| 0.6 | 7 4.67 3 5.61 | 1.67 1.83 2.00 | 27.76 15.75 | 2.67 2.83 3.00 | 5.94 | 3.67 | 3.73 | |
| 1.0 | 0 7.11 | 2.00 | 11.43 | 3.00 | 4.93 | 4.00 | 3.35 | |
| | | | | | | | | |
| CALIB NASHYD (0071) ID= 1 DT=10.0 min | Ia | (ha)= (mm)= (hrs)= | 0.71 5.00 0.17 | Curve Numb # of Linea | er (CN) r Res.(N) | = 58.0 = 3.00 | | |
| Unit Hyd Qpeak | (cms)= | 163 | | | | | | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI | (hrs)= 1 (mm)= 1 (mm)= 48 | 0.017 (i 1.500 7.903 8.478 |) | | | | | |
| (i) PEAK FLOW D | | | SEFLOW I | F ANY. | | | | |
| | | | | | | | | |
| READ STORM | Filenar | ne: C:\U ata\: 838a | Local\Te | eg\AppD emp\ o4-4b71-a46 | 7-7100b13 | d0872\4 | 32754d6 | |
| | | | | | | | | |

| Ptotal= 48.48 mm | | | | | |
|--|--|--|---|--|-----------------------|
| hi 0.: | rs mm/hr | hrs mm/hi | 11ME hrs | RAIN TIME mm/hr hrs 9.15 3.17 7.70 3.33 6.68 3.50 5.94 3.67 5.39 3.83 4.93 4.00 | RAIN mm/hr 4.55 |
| 0.1 0.5 0.6 | 33 3.66 50 4.04 | 1.33 21.63 1.50 112.33 | 2.33 | 7.70 3.33 | 4.22 3.96 |
| 0.8 | 33 5.61 00 7.11 | 1.83 15.75 2.00 11.43 | 2.83 3 3.00 | 5.39 3.83 4.93 4.00 | 3.53 3.35 |
| | | | | | |
| CALIB STANDHYD (0023) ID= 1 DT=10.0 min | Area | (ha) = 0.59 mp(%) = 47.00 | Dir Conn | (%)- 16.00 | |
| | - | MPERVIOUS I | ERVIOUS (i) | (0)- 10.00 | |
| Surface Area Dep. Storage Average Slope Length Mannings n | (mm)= (%)= (m)= | 0.28 0.80 1.00 62.72 0.013 | 0.31 1.50 2.00 40.00 0.250 | | |
| Max.Eff.Inten. | (mm/hr)= | | 44.94 | | |
| Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (min)- | 112.37 10.00 1.84 (ii) 10.00 0.17 | 20.00 11.56 (ii) 20.00 0.08 | *TOTALS* | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFIC: | (cms) = (hrs) = (mm) = (mm) = | 0.03 1.50 47.68 48.48 0.98 | 0.02 1.67 13.81 48.48 0.28 | 0.040 (iii) 1.50 19.22 48.48 0.40 | |
| **** WARNING: STORA **** WARNING:FOR AN YOU SE | AGE COEFF. : REAS WITH IN HOULD CONSII | IS SMALLER THAN MPERVIOUS RATIO DER SPLITTING T | TIME STEP! DS BELOW 20% THE AREA. | | |
| (i) CN PROCEI | OURE SELECTI | ED FOR PERVIOUS | LOSSES: | | |
| (ii) TIME STEE THAN THE (iii) PEAK FLOW | STORAGE COR | | | | |
| | | | | | |
| READ STORM Ptotal= 48.48 mm | | | ?emp\ 0b4-4b71-a46 | 7-7100b13d0872\4 | |
| | | | | | |
| 0.1 | 17 3.53 33 3.66 | 1.17 10.19 1.33 21.63 | 2.17 | RAIN TIME mm/hr hrs 9.15 3.17 7.70 3.33 6.68 3.50 5.94 3.67 5.39 3.83 4.93 4.00 | 4.55 |
| 0.9 0.6 0.8 | 50 4.04 57 4.67 33 5.61 | 1.50 112.3° 1.67 27.76 | 2.50 | 6.68 3.50 5.94 3.67 5.39 3.83 | 3.96 3.73 3.53 |
| 1.0 | 00 7.11 | 2.00 11.4 | 3.00 | 4.93 4.00 | 3.35 |
| CALIB STANDHYD (0025) ID= 1 DT=10.0 min Surface Area Dep. Storage Average Slope | Area Total In | (ha) = 0.52 mp(%) = 71.00 EMPERVIOUS 0.37 0.80 1.00 | PERVIOUS (i) 0.15 1.50 | (%)= 14.00 | |
| Average Slope Length Mannings n Max.Eff.Inten. | (m)= | 58.88 0.013 | 2.00 40.00 0.250 | | |
| | | 112.37 10.00 1.77 (ii) 10.00 0.17 | 10.00 8.03 (ii) 10.00 0.12 | | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL | (cms) = (hrs) = (mm) = (mm) = | 0.02 1.50 47.68 48.48 | 0.04 1.50 20.92 48.48 | *TOTALS* 0.064 (iii) 1.50 24.66 48.48 | |
| RUNOFF COEFFIC: **** WARNING: STORA **** WARNING: FOR AR | ENT = | 0.98 | 0.43 | 0.51 | |
| YOU SI | HOULD CONSII | DER SPLITTING | THE AREA. | | |
| CN* = (ii) TIME STEE | 58.0 Ia P (DT) SHOUI STORAGE COI | | (Above) | | |
| | | | | | |
| READ STORM Ptotal= 48.48 mm | | ne: C:\Users\G ata\Local\7 838a855b-29 | ?emp\ 9b4-4b71-a46 | 7-7100b13d0872\4 | 32754d6 |
| TIP | - ME RAIN | TIME RAIN | | | RAIN mm/hr |
| 0.1 | 17 3.53 | 1.17 10.19 | 2.17 | 9.15 3.17 | 4.55 |
| 0.9 0.6 0.8 | 50 4.04 57 4.67 33 5.61 | 1.50 112.3° 1.67 27.76 1.83 15.79 2.00 11.43 | 2.50 | 6.68 3.50 5.94 3.67 5.39 3.83 | 3.96 3.73 3.53 |
| 1.0 | 7.11 | 2.00 11.4 | 3.00 | 4.93 4.00 | 3.35 |
| CALIB STANDHYD (0026) | _ Area | (ha)= 0.48 | | | |
| ID= 1 DT=10.0 min | - | | Dir. Conn. | (%)= 14.00 | |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha) = (mm) = (%) = (m) = | 0.24 0.80 1.00 56.57 0.013 | 0.24 1.50 2.00 40.00 0.250 | | |
| Max.Eff.Inten. over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (min) = | 112.37 10.00 1.73 (ii) 10.00 0.17 | 52.16 20.00 10.89 (ii) 20.00 0.08 | | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFIC: | (cms) = (hrs) = (mm) = (mm) = | 0.02 1.50 47.68 48.48 0.98 | 0.02 1.67 14.66 48.48 0.30 | *TOTALS* 0.031 (iii) 1.50 19.28 48.48 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 (UT) SHOULD BE SWALLER OR EQUAL

 THAN THE STORAGE COEFFICIENT:

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

| READ STORM | Filenam | | sers\Gre | | | | |
|------------------|---------|----------|-----------|-----------|------------|-----------|----------|
| | | | Local\Te | | | | |
| | | 838a | 1855b-29b | 4-4b71-a4 | 167-7100b1 | .3d0872\- | 432754d6 |
| Ptotal= 48.48 mm | Comment | :s: 5 YE | AR CHICA | GO 4 HOUR | R DESIGN D | DISTRIBU | TIO |
| | | | | | | | |
| 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 (0028) ID= 1 DT=10.0 min | | | | Conn.(%)= 14.00 |) |
|--|---------|--------|-------------|-----------------|-------|
| | | | | | |
| | | | JS PERVIOU: | | |
| Surface Area | | | | | |
| 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 COEFFICI | ENT = | 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.

- YOU SHOULD CONSIDER SPLITTING THE AREA.

 (i) ON PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 (IN* = 58.0 In = Dep. Storage (Above)

 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

 THAN THE STORAGE CORFFICIENT.

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

| READ STORM | Filename | ata\ | sers\Gre Local\Te | | 67-7100b1 | 13d0872\ | 43275486 |
|------------------|----------|------|----------------------|-----------|-----------|----------|----------|
| Ptotal= 48.48 mm | Comments | | | GO 4 HOUR | | | |
| 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 |
| 0.65 | 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 | | | | |
| 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.(| | | | |
| | | 10.00 | | |
| Storage Coeff. | (min)= | 1.55 (ii) | 10.15 (ii) | |
| Unit Hyd. Tpeak | | | | |
| Unit Hyd. peak | (cms)= | 0.17 | 0.08 | |
| | | | ** | rotals* |
| 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 |
| RUNOFF COEFFICI | ENT = | 0.98 | 0.32 | 0.49 |

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CN* = 58.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP [CT] SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.

 (iii) PEAK FLOW DOES NOT INCLIDE BASEFLOW IF ANY.

| READ STORM | Filename: C:\Users\Greg\AppD ata\Local\Temp\ 838a855b-29b4-4b71-a467-7100b13d0872\43; | | | |
|---|---|--|--|--------------------------------------|
| Ptotal= 48.48 mm | Comments: 5 Y | EAR CHICAGO 4 HOUR | DESIGN DISTRIBU | rio |
| TIME hrs 0.17 0.33 0.50 0.67 0.83 | mm/hr hrs 3.53 1.17 3.66 1.33 4.04 1.50 4.67 1.67 5.61 1.83 | RAIN ' TIME mm/hr ' hrs 10.19 2.17 21.62 2.33 112.37 2.50 27.76 2.67 15.75 2.83 11.43 3.00 | mm/hr hrs 9.15 3.17 7.70 3.33 6.68 3.50 5.94 3.67 5.39 3.83 | 4.55 4.22 3.96 3.73 3.53 |
| CALIB | | | (%)= 10.00 | |
| | | 0.42 0.1.50 0.2.00 |) | |

| Mannings n = 0.013 0.250 Max.Eff.Inten.(mm/hr) = 112.37 24.63 over [min] 10.00 20.00 | 0.67 4.67 1.67 27.76 2.67 0.83 5.61 1.83 15.75 2.83 1.00 7.11 2.00 11.43 3.00 |
|--|--|
| Max.Fil.Timeter. 121.37 24.03 | |
| PRAK FLOW (cms)= 0.02 0.02 0.031 (iii) TIME TO PRAK (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 | CALIB STANDHYD (0035) Area (ha)= 0.65 ID= 1 DT=10.0 min Total Imp(%)= 30.00 Dir. Conn. |
| RUNOFF COEFFICIENT = 0.98 0.26 0.33 ****** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! ******* WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% | Surface Area (ha) = 0.19 0.45 Dep. Storage (mn) = 0.80 1.50 Average Slope (%) = 1.00 2.00 Length (m) = 65.83 40.00 Mannings = 0.013 0.250 |
| YOU SHOULD CONSIDER SPLITTING THE AREA. (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: | Max.Eff.Inten.(mm/hr)= 112.37 20.46 |
| CN* = 58.0 Ia = Dep. Storage (Above) (ii) TIME STEE (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | Wax.Ell.lined.(um)fir) = 12.37 |
| READ STORM Filename: C:\Users\Greg\AppD ata\Local\Temp\ 838855b-29b4-4b71-a467-7100b13d0872\432754d6 | PEAK FLOW (cms) = 0.02 0.02 TIME TO PEAK (hrs) = 1.50 1.67 RUNDFF VOLUME (mm) = 47.68 11.65 TOTAL RAILWRALL (mm) = 48.48 48.48 RUNDFF COEFFICIENT = 0.98 0.24 |
| Ptotal= 48.48 mm Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO | ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! **** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA |
| TIME RAIN TIME RAIN TIME RAIN TIME RAIN I TIME RAIN hrs mum/hr hrs mum/hr hrs mum/hr hrs mum/hr 0.17 3.53 1.17 10.19 2.17 9.15 3.17 4.55 0.33 3.44 1.15 11.59 11.67 2.37 6.76 1.87 1.87 1.87 1.87 1.87 1.87 1.87 1.87 | (i) CN FROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 58.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) ISHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. |
| CALIB | READ STORM Filename: C:\Users\Greg\AppD ata\Local\Temp\ 838855-2994-4571-a46 |
| ID= 1 DT=10.0 min Total Imp(%) = 48.00 Dir. Conn.(%) = 13.00 IMPERVIOUS PERVIOUS (i) | Ptotal= 48.48 mm Comments: 5 YEAR CHICAGO 4 HOUR TIME RAIN TIME RAIN TIME hrs mm/hr hrs mm/hr hrs |
| 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 | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ |
| Max.Eff.Inten.(mm/hr)= 12.37 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 | 1.00 7.11 2.00 11.43 3.00 |
| PEAK FLOW (cms) = 0.03 0.03 0.048 (iii) TIME TO PEAK (hrs) = 1.50 1.67 1.50 RINOFF VOLUME (mm) = 47.68 14.37 18.69 TOTAL RAINFALL (mm) = 48.48 48.48 RINOFF COEFFICIENT = 0.98 0.30 0.39 | CALIB STANDHYD (0062) Area (ha) = 0.51 ID= 1 DT=10.0 min Total Imp(%) = 66.00 Dir. Conn. |
| RUNOFF COEFFICIENT = 0.98 0.30 0.39 WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! WARNING:FOR AREAS WITH IMPREVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA. | 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 = 0.013 0.250 |
| (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. | 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 |
| (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | Unit Hyd. peak (cms) = 0.17 0.12 PEAK FLOW (cms) = 0.03 0.03 TIME TO PEAK (hrs) = 1.50 1.50 |
| READ STORM Filename: C:\Users\Greg\AppD ata\Loca\\Temp\ 838a855b-29b4-4b71-a467-7100b13d0872\432754d6 Ptotal= 48.48 mm Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO | RUNDFF VOLUME (mm)= 47.48 18.73 TOTAL RAINFALL (mm)= 48.48 48.48 RUNDFF COEFFICIENT = 0.98 0.39 |
| TIME RAIN TIME RAIN TIME RAIN TIME RAIN TIME RAIN | ***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA. |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: (1) ** = 58.0 I a= Dep. Storage (Above) (i) TIME STEP (DT) SHOULD BE SWALLER OR EQUAL THAN THE STORAGE COFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. |
| CALIB | READ STORM Filename: C:\Users\Greg\AppD ata\LocalYemp\ |
| STANDHYD (0034) Area (ha)= 0.67 ID=1 DT=10.0 min | 838a855b-29b4-4b71-a46 Ptotal= 48.48 mm Comments: 5 YEAR CHICAGO 4 HOUR |
| | TIME RAIN TIME RAIN TIME TIME |
| 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 | 0.83 5.61 1.83 15.75 2.83 1.00 7.11 2.00 11.43 3.00 |
| Unit Hyd. peak (cms)= 0.17 0.07 *TOTALS* PEAK FLOW (cms)= 0.04 0.02 0.047 (iii) | CALIB |
| RUNOFF COEFFICIENT = 0.98 0.26 0.39 | MPERVIOUS (1) PERVIOUS (1) |
| ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! ***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA. | Average Slope (%) = 1.00 2.00 Length (m) = 67.33 40.00 Mannings n = 0.013 0.250 |
| (i) ON PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 58.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SWALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOM DOES NOT INCLUDE BASEFLOW IF ANY. | 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 |
| READ STORM Filename: C:\Users\Greg\AppD | PEAK FLOW (cms)= 0.04 0.03 TIME TO PEAK (hrs)= 1.50 1.67 RINDFF VOLUME (mm)= 47.48 16.45 TOTAL RAINFALL (mm)= 48.48 48.48 |
| ata Local/Temp\ 838855-2994-4D71-a467-7100b13d0872\432754d6 Ptotal= 48.48 mm Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO TIME RAIN TI | RUNDFF COEFFICIENT = 0.98 0.34 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! ***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 208 YOU SHOULD CONSIDER SELITING THE AREA YOU SHOULD CONSIDER SELITING THE AREA |
| 1102 FALS 1170 | (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 58.0 |

| | 0.67 0.83 1.00 | 4.67 5.61 7.11 | 1.67 1.83 2.00 | 27.76 15.75 11.43 | 2.67 2.83 3.00 | 5.94 3.6° 5.39 3.8° 4.93 4.00 | 7 3.73 3 3.53 3 3.35 |
|--|--|--|--|--|--|--|---|
| CALIB STANDHYD (0 | | | | | | | |
| STANDHYD (0 ID= 1 DT=10.0 | min | | | | Dir. Conn. | .(%)= 11.00 | |
| Surface Ar | rea | | IMPERVIOU 0.19 | | ERVIOUS (i) 0.45 | | |
| Dep. Stora Average Sl Length | ige lope | (mm) = (%) = (m) = | 0.80 1.00 65.83 | | 1.50 2.00 40.00 | | |
| Mannings n | ı | (m)= | 0.013 | | 0.250 | | |
| Max.Eff.In | over | (min) | 112.37 10.00 | | 20.46 20.00 15.21 (ii) | | |
| Storage Co Unit Hyd. Unit Hyd. | eff. Tpeak | (min) = (min) = | 1.90 | (ii) | 15.21 (ii) 20.00 | | |
| | | | 0.17 | | 0.07 | *TOTALS* 0.031 (: | (11) |
| PEAK FLOW TIME TO PE RUNOFF VOL TOTAL RAIN | EAK JUME | (hrs)= (mm)= | 1.50 | | 1.67 | 1.50 15.60 | , |
| TOTAL RAIN RUNOFF COE | FALL FFICIE | (mm) = NT = | 48.48 0.98 | | 48.48 0.24 | 48.48 0.32 | |
| ***** WARNING: | STORAG | E COEFF. | IS SMALLE | R THAN | TIME STEP! | ! k | |
| Y | OU SHO | ULD CONSI | DER SPLIT | TING T | HE AREA. | | |
| CN* | = 5 | RE SELECTI 8.0 Ia | = Dep. S | torage | (Above) | | |
| (ii) TIME THAN (iii) PEAK | THE S | (DT) SHOUL | EFFICIENT | · . | | | |
| (III) PEAR | L FLOW | DOES NOT . | INCLUDE E | MSEFLO | W IF ANI. | | |
| | | | | | | | |
| READ STORM | 1 | Filena | ata\I | ocal\Te | /qme | | |
| Ptotal= 48.48 | B mm | | ts: 5 YEA | R CHICA | AGO 4 HOUR | | BUTIO |
| | TIME | RAIN mm/hr | TIME hrs | RAIN mm/hr | ' TIME | RAIN TIM mm/hr him 9.15 3.1' 7.70 3.3' 6.68 3.50 5.94 3.6' 5.39 3.8' 4.93 4.00 | ME RAI |
| | 0.17 | 3.53 | 1.17 | 10.19 | 2.17 | 9.15 3.1 7.70 3.3 | 7 4.55 3 4.22 |
| | 0.50 | 4.04 4.67 | 1.50 | 112.37 27.76 | 2.50 | 6.68 3.50 5.94 3.6° | 3.96 |
| | 0.83 | 5.61 7.11 | 1.83 | 15.75 11.43 | 3.00 | 5.39 3.83 4.93 4.00 | 3.53 |
| | | | | | | | |
| CALIB STANDHYD (0 ID= 1 DT=10.0 | min | | (ha)= mp(%)= 6 IMPERVIOU | | Dir. Conn. | | |
| Surface Ar Dep. Stora | rea age | (114) | 0.34 | | 0.17 1.50 | | |
| Average Si Length | lope | (mm) = (%) = (m) = | 1.00 58.31 | | 2.00 40.00 | | |
| Mannings n | | = | 0.013 | | 0.250 | | |
| Max.Eff.In | | | 112.37 | (ii) | 98.97 10.00 8.85 (ii) | | |
| Unit Hyd. | Tpeak neak | (min)= (cms)= | 10.00 | (11) | 10.00 | | |
| Unit Hvd. | | | 0.03 | | 0.03 | *TOTALS* 0.059 (: | Lii) |
| Storage Co Unit Hyd. Unit Hyd. PEAK FLOW | | (cms)= | 0.03 | | | | |
| PEAK FLOW TIME TO PE | EAK | (hrs)= | 1.50 47.48 | | 1.50 18.73 | 1.50 23.32 | |
| Unit Hyd. PEAK FLOW TIME TO PE RUNOFF VOL TOTAL RAIN RUNOFF COE | EAK LUME IFALL | (hrs)= (mm)= (mm)= | 1.50 | | 1.50 | 1.50 23.32 48.48 0.48 | |
| PEAK FLOW TIME TO PE RUNOFF VOL TOTAL RAIN RUNOFF COE | EAK LUME FFALL EFFICIE | (hrs) = (mm) = (mm) = NT = | 1.50 47.48 48.48 0.98 | | 1.50 18.73 48.48 0.39 | 23.32 48.48 0.48 | |
| PEAK FLOW TIME TO PE RUNOFF VOL TOTAL RAIN RUNOFF COE ***** WARNING: Y | EAK LUME IFALL EFFICIE STORAG FOR ARE | (hrs) = (mm) = (mm) = NT = ECOEFF.: | 1.50 47.48 48.48 0.98 IS SMALLE MPERVIOUS DER SPLIT | ER THAN E RATIOS TING TI | 1.50 18.73 48.48 0.39 TIME STEP! S BELOW 20% HE AREA. | 23.32 48.48 0.48 | |
| PEAK FLOW TIME TO PE RUNOFF VOL TOTAL RAIN RUNOFF COE ***** WARNING: Y (i) CN F | EAK LUME IFALL EFFICIE STORAG FOR ARE FOU SHO PROCEDU = 5 | (hrs)= (mm)= (mm)= (NT = EE COEFF.: AS WITH IN ULD CONSIDERE SELECTION (NE SELECTION (| 1.50 47.48 48.48 0.98 IS SMALLE MPERVIOUS DER SPLIT ED FOR PE = Dep. S | ER THAN ER RATION TING THE ERVIOUS Storage | 1.50 18.73 48.48 0.39 TIME STEP! S BELOW 208 HE AREA. LOSSES: (Above) | 23.32 48.48 0.48 | |
| PEAK FLOW TIME TO PE RUNOFF VOL TOTAL RAIN RUNOFF COE ***** WARNING: Y (i) CN P CN* (ii) THAN | EAK JUME HFALL STORAG FOR ARE FOU SHO PROCEDU = 5 STEP THE S | (hrs)= (mm)= (mm)= (hr)= ECOEFF.: EAS WITH II ULLD CONSII RE SELECTI 8.0 Ia (DT) SHOUL | 1.50 47.48 48.48 0.98 IS SMALLE MPERVIOUS DER SPLIT ED FOR PE = Dep. S LD BE SMA EFFICIENT | ER THAN ERATION TING THE ERVIOUS Storage ALLER ON | 1.50 18.73 48.48 0.39 TIME STEP! S BELOW 20% HE AREA. LOSSES: (Above) R EQUAL | 23.32 48.48 0.48 | |
| PEAK FLOW TIME TO PE RUNOFF VOL TOTAL RAIN RUNOFF COE ***** WARNING: Y (i) CN P CTIME (ii) TIME (ii) TIME | EAK JUME HFALL STORAG FOR ARE FOU SHO PROCEDU = 5 STEP THE S | (hrs)= (mm)= (mm)= (hr)= ECOEFF.: EAS WITH II ULLD CONSII RE SELECTI 8.0 Ia (DT) SHOUL | 1.50 47.48 48.48 0.98 IS SMALLE MPERVIOUS DER SPLIT ED FOR PE = Dep. S LD BE SMA EFFICIENT | ER THAN ERATION TING THE ERVIOUS Storage ALLER ON | 1.50 18.73 48.48 0.39 TIME STEP! S BELOW 20% HE AREA. LOSSES: (Above) R EQUAL | 23.32 48.48 0.48 | |
| PEAK FLOW TIME TO PE RUNOFF VOL TOTAL RAIN RUNOFF COE ***** WARNING: Y (i) CN P CN* (ii) THAN | EAK JUME HFALL STORAG FOR ARE FOU SHO PROCEDU = 5 STEP THE S | (hrs)= (mm)= (mm)= NT = ECOEFF.: EAS WITH IN ULLD CONSI RE SELECTI 8.0 Ia (DT) SHOUL TORAGE COI DOES NOT: | 1.50 47.48 48.48 0.98 IS SMALLE MPERVIOUS DER SPLIT ED FOR PE = Dep. S LID BE SMA EFFICIENT INCLUDE E | ER THAN S RATION TING THE ERVIOUS STORAGE LLLER OF SASEFLOR | 1.50 18.73 48.48 0.39 TIME STEP! S BELOW 208 HE AREA. LOSSES: (Above) R EQUAL W IF ANY. | 23.32 48.48 0.48 | |
| PEAK FLOW TIME TO PE RUNOFF VOL TOTAL RAIN RUNOFF COE ***** WARNING: Y (i) CN P CN* (ii) THAN | EAK JUME HFALL FFICIE STORAG FOR ARE OU SHO PROCEDU = 5 STEP STEP N THE S C FLOW | (hrs)= (mm)= (mm)= NT = ECOEFF.: EAS WITH IN ULLD CONSI RE SELECTI 8.0 Ia (DT) SHOUL TORAGE COI DOES NOT: | 1.50 47.48 48.48 0.98 IS SMALLE MPERVIOUS DER SPLIT ED FOR PE = Dep. S. LD BE SMM EFFICIENT INCLUDE E mme: C:\Use ata\t | ER THAN RETIONS TRIVIOUS STORAGE LLLER OF ASSEFLOR GERS GREEN GERS GREEN | 1.50 18.73 48.48 0.39 TIME STEP: S BELOW 20% HE AREA. LOSSES: (Above) R EQUAL W IF ANY. | 23.32 48.48 0.48 | |
| PEAK FLOW TIME TO PE RUNOFF VOL TOTAL RAIN RUNOFF COE ***** WARRING: **** WARRING: **** (i) CN P (ii) TIME THAN (iii) PEAK | EAK JUME HFALL STORAG FOR ARE FOU SHO PROCEDU = 5 STEP H THE S C FLOW | (hrs)= (mm)= (mm)= (mm)= ECOEFF.: ECOEF | 1.50 47.48 48.48 0.98 IS SMALLE MPERVIOUS DER SPLIT ED FOR PE = Dep. S LD BE SMM EFFICIENT INCLUDE E ata\t\ 838a8 ts: 5 YEA | ER THANN S RATIOS TING TI ERVIOUS Storage LLLER OF ABASEFLOR SETS Gr. SETS Gr. SETS GR. STS D-291 R CHICK | 1.50 18.73 48.48 0.39 TIME STEP! S BELOW 208 HE AREA. LOSSES: (Above) R EQUAL W IF ANY. | 23.32 48.48 0.48 ! ! 57-7100b13d08' | BUTIO |
| PEAK FLOW TIME TO PE RUNOFF VOL TOTAL PAIN RUNOFF COE WARNING: (i) CN P (ii) TIME THAM (iii) PEAK READ STORM | EAK JUME JUME JUME JUME JUME JUME JUME JUME | (hrs)= (mm)= (mm)= (mm)= ECOEFF.: ECOEF | 1.50 47.48 48.48 0.98 IS SMALLE MPERVIOUS DER SPLIT ED FOR PE = Dep. S LD BE SMM EFFICIENT INCLUDE E ata\t\ 838a8 ts: 5 YEA | ER THANN S RATIOS TING TI ERVIOUS Storage LLLER OF ABASEFLOR SETS Gr. SETS Gr. SETS GR. STS D-291 R CHICK | 1.50 18.73 48.48 0.39 TIME STEP! S BELOW 208 HE AREA. LOSSES: (Above) R EQUAL W IF ANY. | 23.32 48.48 0.48 ! ! 57-7100b13d08' | BUTIO |
| PEAK FLOW TIME TO PE RUNOFF VOL TOTAL RAIN RUNOFF COE WARNING: (i) CN P (ii) TIME THAM (iii) PEAK READ STORM | EAK JUME FFALL FFALL STORAG FOR ARE FOU SHO FROCEDU FR | (hrs)= (mm)= (mm)= (mm)= ECOEFF.: ECOEF | 1.50 47.48 48.48 0.98 IS SMALLE MPERVIOUS DER SPLIT ED FOR PE = Dep. S LD BE SMM EFFICIENT INCLUDE E ata\t\ 838a8 ts: 5 YEA | ER THANN S RATIOS TING TI ERVIOUS Storage LLLER OF ABASEFLOR SETS Gr. SETS Gr. SETS GR. STS D-291 R CHICK | 1.50 18.73 48.48 0.39 TIME STEP! S BELOW 208 HE AREA. LOSSES: (Above) R EQUAL W IF ANY. | 23.32 48.48 0.48 ! ! 57-7100b13d08' | IBUTIO |
| PEAK FLOW TIME TO PE RUNOFF VOL TOTAL PAIN RUNOFF COE WARNING: (i) CN P (ii) TIME THAM (iii) PEAK READ STORM | ZAK JUME HFALL HFALL STORAG FOR ARE FOU SHO FOR STEP SE STEP N THE S FLOW TIME HRS 0.17 0.33 0.50 | (hrs)= (mm)= (mm)= (mm)= ECOEFF.: ECOEF | 1.50 47.48 48.48 0.98 IS SMALLE MPERVIOUS DER SPLIT ED FOR PE = Dep. S LD BE SMM EFFICIENT INCLUDE E ata\t\ 838a8 ts: 5 YEA | ER THANN S RATIOS TING TI ERVIOUS Storage LLLER OF ABASEFLOR SETS Gr. SETS Gr. SETS GR. STS D-291 R CHICK | 1.50 18.73 48.48 0.39 TIME STEP! S BELOW 208 HE AREA. LOSSES: (Above) R EQUAL W IF ANY. | 23.32 48.48 0.48 ! ! 57-7100b13d08' | BUTIO |
| PEAK FLOW TIME TO PE RUNOFF VOL TOTAL PAIN RUNOFF COE WARNING: (i) CN P (ii) TIME THAM (iii) PEAK READ STORM | EAK LUME LUME LIFALL STORAGE FOR ARE FOU SHO PROCEDU = 5 STEP THE S C FLOW THE S 0.17 0.33 | (hrs)= (mm)= (mm)= (mm)= ECOEFF.: ECOEF | 1.50 47.48 48.48 0.98 IS SMALLE MPERVIOUS DER SPLIT ED FOR PE = Dep. S LD BE SMM EFFICIENT INCLUDE E ata\t\ 838a8 ts: 5 YEA | ER THANN S RATIOS TING TI ERVIOUS Storage LLLER OF ABASEFLOR SETS Gr. SETS Gr. SETS GR. STS D-291 R CHICK | 1.50 18.73 48.48 0.39 TIME STEP! S BELOW 208 HE AREA. LOSSES: (Above) R EQUAL W IF ANY. | 23.32 48.48 0.48 ! ! 57-7100b13d08' | IBUTIO |
| PEAK FLOW TIME TO PE RUNOFF VOL TOTAL RAIN RUNOFF COE WARNING: (i) CN P (ii) TIME THAM (iii) PEAK READ STORM | SAK JUME FFALL FFFACIE STORAGG FOOR ARE FFOOU SHO FROCEDUM FFACIE STORAGG FFACIO STORAGG FFACI F | (hrs)= (mm)= (mm)= (mm)= ECOEFF.: ECOEF | 1.50 47.48 48.48 0.98 IS SMALLE MPERVIOUS DER SPLIT ED FOR PE = Dep. S LD BE SMM EFFICIENT INCLUDE E ata\t\ 838a8 ts: 5 YEA | ER THANN S RATIOS TING TI ERVIOUS Storage LLLER OF ABASEFLOR SETS Gr. SETS Gr. SETS GR. STS D-291 R CHICK | 1.50 18.73 48.48 0.39 TIME STEP! S BELOW 208 HE AREA. LOSSES: (Above) R EQUAL W IF ANY. | 23.32 48.48 0.48 | BUTIO |
| PEAK FLOW TIME TO PE RONOFF VAL RONOFF CAN RUNOFF CAN WARNING: (i) CN P (ii) TIME THAM (iii) PEAK RUNOFF CAN READ STORM READ STORM PLOTAL 48.48 | CAK JUME JUME JUME JUME JUME JUME JUME JUME | (hrs)= (mm)= (mm)= NT = ECOEFF.: AS WITH HULD CONSIL RE SELECTI 8.0 Ia (COTT) GROUND CONTINUE | 1.50 47.48 48.48 0.98 8IS SMALLE MPERVIOUS DEER SPLITI ED FOR PE = Dep. S. LO BE SMAP EFFICIENT INCLUDE E ATAN 838a8 ES: 5 YEA 1.13 1.13 1.50 1.67 1.1.37 1.1.37 1.1.50 1.67 1.1.37 2.00 | CR THAN S RATIO: TING TI TI | 1.50 18.73 48.48 0.39 TIME STEP! S BELOW 208 HE AREA. LOSSES: (Above) R EQUAL W IF ANY. | 23.32 48.48 0.48 ! ! 57-7100b13d08' | BUTIO |
| PEAK FLOW TIME TO PE RUMOFF VOL TOTAL BAIN WARNING: WARNING: (i) CN P (i) THE THE THE THE READ STORM PLOTAL PLOTAL READ STORM PLOTAL READ STORM READ STORM PLOTAL READ STORM READ STORM | TIME O.17 | (hrs)= (mm)= (mm)= NTT = ECOEFF.: AS WITH H ULD CONSIL RE SELECT SELECT Filenat Comment RAIN RAIN RAIN RAIN RAIN RAIN RAIN RAIN | 1.50 47.48 48.48 0.98 SIS SMALLE MPERVIOUS DER SPLTI ED FOR PE = Dep. S LLD BE SMAD EFFICIENT INCLUDE E atali 838a8 ES: 5 YER TIME hrs 1.17 1.33 1.50 1.67 1.83 2.00 | IR THAN S RATIO() S RASEFLO() S RASEFLO() S RAIN S RAI | 1.50 18.73 48.48 28.48 18.73 48.48 29.39 TIME STEPP. TIME STEPP. EQUAL LOSSES: (Above) 204 E ACRA EQUAL W IF ANY. 29.\App 29.\App | 23.32 48.48 0.48 ! ! 57-7100b13d08' | BUTIO |
| PEAR FLOW TIME TO PE RONOFF VOL TONOFF CAB WARRING: WARRING: (i) ON P (ii) THM (iii) PEAR READ STORM PLOTAL 48.48 | CAK JUME JUME FFALL FFAL | (Nrs)= (mm)= (mm)= NT = ECOEFF Filenam COMMENT Filenam COMMENT ECOEFF ECOEFF Filenam A. 1. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. | 1.50 47.48 48.48 0.98 16 SMALLE MOPEN OF 15 ED FOR PE = Dep. S. LD BE SMM EFFICIENT INCLUDE E me: C:\US ata\1. 838.8 E: 5 YER TIME | IR THAN S RATIOST TING TI THAN S RATIOST TING TI THAN S RATIOST TING TI THAN S | 1.50 18.73 48.48 0.39 TIME STEP! 8 BELON 2014E AREA. LOSSES: ((Above) 8 EQUAL W IF ANY. | 23.32 48.48 0.48 57-7100bl3d08 585CM DISTR: RAIN TIMEN/hr hr 9.15 3.1 6.68 3.5 5.94 3.6 5.94 4.0 4.0 4.0 4.0 4.0 5.1 6.1 6.1 7.1 8.1 8.1 8.1 8.1 8.1 8.1 8.1 8.1 8.1 8 | BUTIO |
| PEAR FLOW TIME TO PE RINGFF VOI TOTAL FARM WARNING: WARNING: (i) CN P (ii) TIME (ii) THM (iii) PEAR READ STORM PLOTAL 48.48 PLOTAL 48.48 CALLB STANDHYD (0 ID-1 DT-10.0 | CAK JUME JUME JUME JUME JUME JUME JUME JUME | (Nrs)= (mm)= (mm)= NT = ECOEFF AS WITH IN ULD CONSIL RE SELECTION FILENCE SHOULD CONSIL | 1.50 47.48 48.48 48.18 4 | IR THAN S RATIOST TING TI THAN S RATIOST TING TI THAN S RATIOST TING TI THAN S | 1.50 18.73 48.48 0.39 TIME STEPS S BELOW 200 HE AREA. LOSSES: (Above) R EQUAL W IF ANY | 23.32 48.48 0.48 57-7100bl3d08 585CM DISTR: RAIN TIMEN/hr hr 9.15 3.1 6.68 3.5 5.94 3.6 5.94 4.0 4.0 4.0 4.0 4.0 5.1 6.1 6.1 7.1 8.1 8.1 8.1 8.1 8.1 8.1 8.1 8.1 8.1 8 | BUTIO |
| PEAK FLOW TIME TO PE ROMOFF VOL TOTAL PAIN WARNING:F WARRING:F (i) CN F (ii) THA (iii) PEAK READ STORM PLOTAL= 48.48 | CAK JUME JUME JUME JUME JUME JUME JUME JUME | (hrs)= (mm)= (mm)= NT = (mm)= NT = EDEFF : 1 | 1.50 47.48 46.48 46.48 46.18 4 | IR THAN S RATIOST TING TI THAN S RATIOST TING TI THAN S RATIOST TING TI THAN S | 1.50 18.73 48.48 48.03 71ME STEPP 5 SELOW 201 1E AREA. LOSSES: (Above) 2 EQUAL 6 IF ANY. 1 TIME 1 hrs. 1 LOSSES: (Above) 1 TIME 1 LOSSES: 1 LOSSES: (Above) 1 TIME 2 LOSSES: 1 | 23.32 48.48 0.48 57-7100bl3d08 585CM DISTR: RAIN TIMEN/hr hr 9.15 3.1 6.68 3.5 5.94 3.6 5.94 4.0 4.0 4.0 4.0 4.0 5.1 6.1 6.1 7.1 8.1 8.1 8.1 8.1 8.1 8.1 8.1 8.1 8.1 8 | BUTIO |
| PEAK FLOW TIME TO PE RONOFF VOL RONOFF COE WARRING: (i) CN P (ii) TIME (iii) PEAK (iii) PEAK READ STORM PLOTAL= 48.48 PLOTAL= 48.48 STANDHYD (0 ID= 1 DT=10.0 SUrface Ar Dep. Stora Average S1 Length Mannings In Max.Eff.In Max | LIME LUME LUME LUME LUME LUME LUME LUME LU | (hrs)= (mm)= (mm)= NT = (mm)= NT = ECOEFF.: LOGGEF.: LOGG | 1.50 47.48 48.48 4 | ir THANN FRATICI TING TI STORY STORY FRATION FRATICI F | 1.50 18.73 48.48 0.39 TIME STEP: S BELOW 20% 1E AREA. LOSSES: (Above) R EQUAL W IF ANY. | 23.32 48.48 0.48 57-7100bl3d08 585CM DISTR: RAIN TIMEN/hr hr 9.15 3.1 6.68 3.5 5.94 3.6 5.94 4.0 4.0 4.0 4.0 4.0 5.1 6.1 6.1 7.1 8.1 8.1 8.1 8.1 8.1 8.1 8.1 8.1 8.1 8 | BUTIO |
| PEAR FLOW TIME TO PE RUNGPF VOL TOTAL PARM WARNING: F (i) CLP (ii) TIME (ii) TIME (iii) PEAR READ STORM PLOTAL 48.48 PLOTAL 48.48 CALLB STANDHYD (0 ID- 1 DT-10.0 SURface Ar Dep. Stora Average Sl Length Mannings n Max Eff.in Max Eff.in Storage Co | JUME JUME JUME JUME JUME JUME JUME JUME | (Nrs)= (mm)= (mm)= NT = (mm)= NT = ECOEFF : ASS WITH IN ULD CONSIL RE SELECTI SHOULD CONSIL Filenan COMMENT Filenan COMMENT Filenan A.04 4.67 5.61 7.11 Area Total In (ha)= (ha)= (mm)= (mm)= (mm)= (mm)= (mm)= (mm)= | 1.50 47.48 48.48 4 | IR THAN IN RATIO TIME TO THE PROPERTY OF THE P | 1.50 18.73 48.48 0.39 TIME STEP 8 BELOW 201 18 AREA. LOSSES: (Above) R EQUAL W IF ANY | 23.32 48.48 0.48 0.48 0.48 0.57-7100bl3d08 DESIGN DISTR: mm/hr him mm/hr h | BUTIO |
| PEAK FLOW TIME TO PE RUNGPF VOL TOTAL FAIN WARNING: WARNING: (i) CN P (ii) THE THE THE THE THE READ STORM PLOTAL 48.48 PLOTAL 48.48 CALLB CALL | JUME JUME JUME JUME JUME JUME JUME JUME | (Nrs)= (mm)= (mm)= NT = (mm)= NT = ECOEFF : ASS WITH IN ULD CONSIL RE SELECTI SHOULD CONSIL Filenan COMMENT Filenan COMMENT Filenan A.04 4.67 5.61 7.11 Area Total In (ha)= (ha)= (mm)= (mm)= (mm)= (mm)= (mm)= (mm)= | 1.50 47.48 48.48 4 | IR THAN IN RATIO TIME TO THE PROPERTY OF THE P | 1.50 18.73 48.48 18.73 48.48 20.39 TIME STEPP S SELOW 201 E AREA. LOSSES: (Above) E QUAL W IF ANY. LOSSES: (Above) M E QUAL I TIME TIME TIME TIME L.33 1 2.50 2.17 2.33 3.00 Dir. Conn. ERWIOUS (i) 0.27 1.50 2.00 40.00 0.250 69.90 | 23.32 48.48 0.48 9.77-7100b13d08 DESIGN DISTR: Mmn/hr hr 9.15 3.17 7.70 3.33 6.68 3.55 5.94 3.67 5.94 3.67 5.94 3.67 5.94 3.67 5.94 3.67 5.94 3.67 5.94 3.67 5.94 3.67 5.94 3.67 5.94 3.67 6.68 3.57 6.68 3.57 6.78 | IBUTIO |
| PEAK FLOW TIME TO PE RUNGFF VOL TOTAL FAIN WARNING: WARNING: WARNING: (i) CN P (ii) THE (ii) PEAK (iii) PEAK READ STORM PLOTAL 48.48 PLOTAL 48.48 CALIB STANDBYD (0 ID= 1 DT=10.0 Surface Ar. Pep. Storm Average Sl Length Mannings n Max.Eff.In Storage Co Unit Hyd. Unit Hyd. PEAK FLOW | LAK JUME JUME JUME JUME JUME JUME JUME JUME | (hrs)= (mm)= (mm)= (mm)= (mm)= (mm)= (mm)= (mm)= (mm)= (mm)= (ma)= (ma)= (ma)= (ma)= (pr) SHOUU (pr | 1.50 47.48 48.48 4 | IR THAN IN RATIO TIME TO THE PROPERTY OF THE P | 1.50 18.73 48.48 18.73 48.48 0.39 TIME STEPP SECOND 201 1E AREA. LOSSES: (Above) 1E AUDIA 1E AREA 1. LOSSES: 1E CADOVE 1E AUDIA 1 | 23.32 48.48 0.48 57-7100b13d08 DESIGN DISTR. Man(hr h) 9.15 3.17 7.70 3.3 6.68 3.5 5.94 3.6 5.94 3.6 5.94 3.6 5.99 3.8 4.93 4.0 | ME RAIF ME |
| PEAK FLOW TIME TO PE RONOFF VOL RONOFF COE WARRING: (i) CN P (ii) TIME (iii) PEAK (iii) PEAK READ STORM PEOTAL 48.48 PLOTAL 48.48 PLOTAL 48.48 PLOTAL 48.48 STANDHYD (0 ID= 1 DT=10.0 SULFACE AVERAGE SI MANNINGS MARKET IN STORMER MAX. RF. IN STORMER STORMER MAX. RF. IN THE TO PEAK PLOW TIME TO WITHER PLOW TIME TO WITHER TO MAX. RF. IN PEAK FLOW TIME TO WITHER | LIAM JUME JUME JUME JUME JUME JUME JUME JUME | (hrs)= (mm)= (mm)= NT = (mm)= NT = ECOEFF : IALS WITH ILLUD CONSII RE SELECTI ALS WITH ILLUD CONSII RE SELECTI COMMENT FILENAM COMMENT COMMENT ALON A S | 1.50 47.48 48.48 4 | IR THAN IN RATIO TIME TO THE PROPERTY OF THE P | 1.50 18.73 48.48 18.73 48.48 20.39 TIME STEPP. TIME STEPP. S RELOW 201 E AREA. LOSSES: (Above) E QUAL W IF ANY. LOSSES: (Above) E QUAL I TIME TIME TIME TIME TIME 12.33 1.2.50 2.17 1.50 2.20 0.27 1.50 0.27 1.50 0.27 1.50 0.27 1.50 0.27 1.50 0.27 1.50 0.27 1.50 0.27 1.50 0.27 1.60 0.27 1.60 0.27 1.60 0.27 1.60 0.27 1.60 0.27 1.60 0.27 1.60 0.27 1.60 0.27 1.60 0.27 1.60 0.27 1.60 0.27 1.60 0.27 1.60 0.27 1.60 0.28 0.00 0.03 1.67 16.45 | 23.32 48.48 0.48 57-7100b13d08 DESIGN DISTR: Umm/hr hh 77.70 3.3: 6.68 3.5; 5.94 3.6: 5.99 3.8: 4.93 4.00 | ME RAIF ME |
| PEAK FLOW TIME TO PE RINGFF VOL TOTAL FAIN WARNING: WARNING: WARNING: (i) CN P (ii) THM (ii) PEAK (iii) PEAK READ STORM Ptotal= 48.48 CALIB STANDBYD (0 LD= 1 DT=10.0 LD= 1 DT=10.0 Surface Ar Pep. Storm Average Sl Length Mannings n Max.Eff.In Storage CO Unit Hyd. Unit Hyd. Unit Hyd. | UMME UMME UMME UMME UMME UMME UMME UMME | (hrs)= (mm)= | 1.50 47.48 48.48 4 | IR THAN IN SERVICE AND A SERVI | 1.50 18.73 48.48 18.73 48.48 20.39 TIME STEPP. TIME STEPP. SEQUAL WIF AREA. LOSSES: (Above) EQUAL WIF ANY. LOSSES: (Above) LOSSES: (Above) LOSSES: (Above) EQUAL WIF ANY. LOSSES: (Above) LOSSES: (Ab | 23.32 48.48 0.48 9.77-7100b13d08 DESIGN DISTR: Num./hr hp 9.15 3.17 7.70 3.3 6.68 3.5 5.99 3.8 4.93 4.0 0.055 (.8) | ME RAIF ME |

```
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                                                                                                                                                                                          ID = 3 ( 0027): 2.20 0.198 1.50 21.26
                                                                                                                                                                                                                                                                   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                                      Filename: C:\Users\Greg\AppD
           READ STORM
                                                                                ata\Local\Temp\
838a855b-29b4-4b71-a467-7100b13d0872\432754d6
5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO
                                                                                                                                                                                                                                                                                                                                                                     TPEAK R.V.
(hrs) (mm)
1.50 21.26
1.50 23.60
                                                                                                                                                                                                                                                                                                                             (ha) (cms)
2.20 0.198
0.33 0.032
                                                      RAIN TIME RAIN TIME mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs 3.53 1.17 10.19 2.17 3.66 1.33 21.62 2.33 4.04 1.50 112.37 2.50 4.67 1.67 27.76 2.67 5.61 1.83 15.75 2.83 7.11 2.00 11.43 3.00
                                                                                                                                      RAIN | TIME
mm/hr | hrs
9.15 | 3.17
7.70 | 3.33
6.68 | 3.50
5.94 | 3.65
5.94 | 3.83
4.93 | 4.00
                                                                                                                                                                                                                                                                     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
  ID = 3 ( 0027):
                                                                                                                                                                                                                                                                                                                          3.19 0.261
                                                                                                                                                                                                                                                                                                                                                                    1.50
                                                                                                                                                                                                                                                                                                                                                                                        20.44
                                                                                                                                                                                                                                                                    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
            Max.Eff.Inten.(mm/hr)=
                                                                                                                                                                                                                                                         | ADD HYD ( 0027)|
| 3 + 2 = 1 |
                                                                                                                                                                                                                                                                                                                          AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm) 3.19 0.261 1.50 20.44 0.80 0.048 1.50 18.69
                                                                        10.00
1.65 (ii)
10.00
0.17
                                                                                                                                              *TOTALS*
0.028 (iii)
1.50
            PEAK FLOW (cms) =
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT =
                                                                                                                                                                                                                                                                         ID = 1 ( 0027):
                                                                                                                                                                                                                                                                  NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                                                                                                                                 19.10
48.48
***** 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)

(i) TIME STEP LTT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.

(ii) PEAR FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                                                                                                                                                                                      ID1= 1 ( 0027):
+ ID2= 2 ( 0034):
                                                                                                                                                                                                                                                                    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
           READ STORM |
                                                     Filename: C:\Users\Greg\AppD
ata\Local\Temp\
838855b-29b4-4b71-a467-7100b13d0872\432754d6
Comments: 5 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTIO
                                                     RAIN | TIME | RAIN | TIME | TI
                                                                                                                                                                                                                                                                        ID = 1 ( 0027):
                                                                                                                                       9.15 |
7.70 |
6.68 |
5.94 |
5.39 |
4.93 |
                                                                                                                                                                                                                                                                                                                          5.31 0.387
                                                                                                                                                                                                                                                                                                                                                                    1.50
                                                                                                                                                                                                                                                                                                                                                                                        19.40
                                                                                                                                                                                                                                                                   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                                                                                                                                                                                                                                         | ADD HYD ( 0027)|
| 1 + 2 = 3 |
                                                                                                                                                                                                                                                                         ID1= 1 ( 0027):
+ ID2= 2 ( 0062):
                                                      IMPERVIOUS
                                                                                                        PERVIOUS (i)
           Surface Area (ha)=
Dep. Storage (mm)=
Average Slope
Length (m)=
Mannings n =
            over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)=
                                                                                                                                                                                                                                                                         ID = 1 ( 0027): 6.50 0.502
                                                                              10.00
2.06 (ii)
                                                                                                                                                                                                                                                                  ID1= 3 ( 0027):
+ ID2= 2 ( 0064):
                                                                         2.06 ..
10.00
0.17
                                                                                                               20.00
                                                                                                                                               *TOTALS*
0.052 (iii)
1.50
17.76
48.48
0.37
                                                                                                                                                                                                                                                                                                                                                                     1.50
           PEAK FLOW (Cms) =
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT =
                                                                              0.04
1.50
47.48
48.48
0.98
                                                                                                                                                                                                                                                                    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 ***** 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:

(IN* = 58.0 Ia = Dep. Storage (Above)
(i) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.
(ii) PEAR FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                                                                                                                                                                                          ID = 3 ( 0027):
                                                                                                                                                                                                                                                                                                                           6.91 0.530
                                                                                                                                                                                                                                                                                                                                                                     1.50
                                                                                                                                                                                                                                                                    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 | ADD HYD ( 0027)|
| 1 + 2 = 3 |
                                                                                                                                                                                                                                                         | ADD HYD ( 0027)|
| 3 + 2 = 1 |
                                                                                                                                                                                                                                                                         ID = 1 ( 0027):
                                                                                                                                                                                                                                                                                                                            7.77 0.582
                 ID = 3 ( 0027):
                                                                    1.11 0.104
                                                                                                             1.50
                                                                                                                                 21.77
                                                                                                                                                                                                                                                                                                                                                                     1.50
                                                                                                                                                                                                                                                                                                                                                                                        19.71
            NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                                                                                                                                                                                                                                                    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                                                                                                                                                                                                                                                    READ STORM
   ADD HYD ( 0027)
                                                                                                                                                                                                                                                                                                                 mm/hr
9.15
7.70
6.68
5.94
5.39
           NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
     ADD HYD ( 0027) |
1 + 2 = 3
                                                                                                                                                                                                                                                       | CALIB |
```

| STANDHYD (0065) Area (ha)= 0.49 ID= 1 D7=10.0 min | 0.0085 |
|---|--|
| 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 | 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 |
| Max.Eff.Inten.(mm/hr)= 112.37 16.18 | 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 |
| PEAK FLOW (cms)= 0.03 0.01 0.031 (iii) TIME TO PEAK (hrs)= 1.50 1.67 1.50 RINOSF VOLUME (mm)= 47.48 10.53 16.79 TOTAL RAINFALL (mm)= 48.48 48.48 48.48 RINOSF COEFFICIENT = 0.98 0.22 0.35 | READ STORM Filename: C:\Users\Greg\AppD ats\Local\Temp\ 8388555-2904-4b71-a467-7100b13d0872\432754d6 |
| WARNING: STORAGE CORFF. IS SMALLER THAN THE STEP! WARNING: FOR AREAS WITH IMPREVIOUS RATIOS BELOW 204 YOU SMOULD CONSIDER SPLITTING THE AREA. | Ptotal = 48.48 mm Comments: 5 YEAR CHICKOO 4 HOUR DESIGN DISTRIBUTO TIME RAIN TIME RAIN TIME RAIN TIME RAIN RAIN RAIN THE RAIN TIME RAIN THE RAI |
| (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 58.0 Ia = Dep. Storage (Above) (ii) THEM STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | 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 3.40 3.67 3.73 0.83 5.51 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 |
| READ STORM Filename: C:\Usera\Grey\AppD ata\Local\Temp\ | CALIB |
| TIME RAIN TIME RAIN 'TIME RAIN TIME RAIN TIME RAIN TIME RAIN TIME TAIN TIME | IMPERVIOUS PERVIOUS (1) |
| 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 | Max.Eff.Inten.(mm/hr)= 112.37 50.79 |
| CALIB | PEAK FLOW (cms)= 0.00 0.01 0.015 (iii) TIME TO PEAK (hrs)= 1.50 1.67 1.67 RUNDFF VOLUME (mm)= 47.48 14.51 14.49 TOTAL RAINFALL (mm)= 48.48 48.48 48.48 RUNDFF COMFFICENTY = 0.98 0.30 0.30 |
| 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 | **** MARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! **** MARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA. |
| Max.Eff.Inten.(mm/hr)= 112.37 22.94 | (i) CM PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 58.0 I a = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. |
| PERK FLOW (cms)= 0.02 0.01 0.027 (iii) TIME TO PERK (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 | ADD HYD (0037) 1 + 2 = 3 |
| RUNOFF COEFFICIENT = 0.98 0.25 0.48 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! | (ma) (ms) (ms) (ms) (ms) (ms) (ms) (ms) (ms |
| (i) ON 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. | ID = 3 (0037): 9.22 0.041 4.07 17.95 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| ADD HYD (0067) 1 + 2 = 3 | ADD HYD (0037) 3 + 2 = 1 |
| (ha) (cms) (hrs) (mm) (ln = 1 | + 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 INCLUIDE BASEFLOWS IF ANY. |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | ADD HYD (0037) 1 + 2 = 3 |
| Inlet Cap.= 0.057 #of Inlets= 1 Total(cms)= 0.1 AREA QPEAK T.V. | 1 + 2 = 3 Alexa (yezak lezak k.v. |
| (ha) (cms) (hrs) (mm) TOTAL HYD, (ID= 1): 0.74 0.06 1.50 18.93 *********************************** | ID = 3 (0037): 9.62 0.043 4.00 17.71 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | ADD HYD (0037) 3 + 2 = 1 |
| ADD HYD (0031) AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm) (bl 1 (0024) (0.74 0.057 1.50 18.93 | ID1= 3 (0.037): 9.52 0.043 4.00 17.71 $+$ $1D2=2$ (0.070): 1.74 0.017 1.67 4.50 ID = 1 (0.037): 11.36 0.047 1.67 4.50 |
| 1102=2 (0027); 7.77 0.582 1.50 19.71 1102=2 (0027); 7.77 0.582 1.50 19.71 110 = 3 (0031); 8.51 0.639 1.50 19.65 | NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | V V I SSSS U U A L (v 5.1.2003) |
| ADD HYD (0031) | V V I SSS U U AAA L V V I SS U U AAAAA L V V I SS U U AAAAA L VV I SSSS UUUUU A A LLLLL |
| + 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. | OOD TITIT TITT H H Y Y M M OOD TM O O T T H H Y Y MM MO O O O T T H H Y Y MM MO O O O T T H H Y M M OO Developed and Distributed by Civica Infrastructure Copyright 2007 - 2013 Civica Infrastructure |
| RESERVOIR(0029) IN- 2> OUT- 1 | All rights reserved. |
| DT= 1.0 min | Input filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\VO2\voin.dat |

Output filename: C:\Usera\Greg\AppData\Local\Crivica\VH5\b59b925c-la86-4318-8861-e1886ddfd2f8\cc7ce50-29aa-4592-b2f1-6bf32e96f3d9\scenari
Summary filename: C:\Usera\Greg\AppData\Local\Crivica\VH5\b59b925c-la86-4318-8861-e38dcddfd2f8\ccc7ce50-29aa-4592-b2f1-6bf32e96f3d9\scenari DATE: 01/05/2019 TIME: 10:33:09 ** SIMULATION : Run 03 READ STORM | Filename: C:\Users\Greg\AppD Ptotal= 56.08 mm RAIN TIME RAIN TIME
mm/hr hrs mm/hr hrs
3.58 1.17 11.51 2.17
3.99 1.33 25.32 2.33
4.50 1.50 133.60 2.50
5.21 1.67 32.00 2.67
6.27 1.83 19.73 2.83
8.00 2.00 12.95 3.00 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 | RAIN | TIME | RAIN | TIME | 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. READ STORM Filename: C:\Users\Greq\AppD ata\Local\Temp\ 838a655-2964-4971-a467-7100b13d0872\5a9247c8
Ptotal= 56.08 mm Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT TIME RAIN TIME RAIN TIME RAIN TIME RAIN AIN TIME RAIN hrs mm/hr hrs mm/hr hrs mm/hr

| 0.50 | 3.58 3.99 4.50 5.21 6.27 8.00 | 1.50 1.67 1.83 2.00 | 133.60 32.00 19.73 12.95 | 2.50 2.67 2.83 3.00 | 7.52 6.65 5.38 5.49 | 3.50 3.67 3.83 4.00 | 4.39 4.14 3.91 3.63 |
|--|---|--|---|--|---|--|--|
| CALIB NASHYD (0071) ID= 1 DT=10.0 min Unit Hyd Qpeak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIE | Area Ia U.H. Tp((cms) = 0 (cms) = 0 (hrs) = 1 (mm) = 10 (mm) = 56 | (ha) = (mm) = hrs) = .163 .024 (i .500 .556 .083 | 0.71 5.00 0.17 | | | | |
| (i) PEAK FLOW DO | | | | | | | |
| READ STORM Ptotal= 56.08 mm | | ata\ 838a | Local\Te 855b-29b | mp\ 04-4b71-a4 | | | |
| 0.17 0.33 0.50 0.67 0.83 | RAIN mm/hr 3.58 3.99 4.50 5.21 6.27 8.00 | 1.17 1.33 1.50 1.67 1.83 2.00 | 11.51 25.32 133.60 32.00 19.73 12.95 | 2.17 2.33 2.50 2.67 2.83 3.00 | 10.31 8.66 7.52 6.65 5.38 5.49 | 3.17 3.33 3.50 3.67 3.83 4.00 | 5.05 4.70 4.39 4.14 3.91 3.63 |
| | | | | | | | |

| CALIB STANDHYD (0023) | | | | | | |
|--|--------------------------------|--|------------------------------|---------------|------------------------------|---------------|
| STANDHYD (0023) ID= 1 DT=10.0 min | Total Imp | ha)= 0.59 (%)= 47.00 | Dir. Conn | (%)= 1 | 6.00 | |
| Surface Area | (ha)= | | PERVIOUS (i) |) | | |
| Surface Area Dep. Storage Average Slope Length | (mm) = (%) = | 1.00 | 1.50 2.00 40.00 | | | |
| Length Mannings n | (m)= = | 62.72 0.013 | 0.250 | | | |
| Max.Eff.Inten.(| mm/hr)= | 133.60 | 60.21 20.00 | | | |
| Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (min)= | 1.72 (ii) 10.00 | 10.37 (ii) 20.00 |) | | |
| | (Cms) = | 0.17 | 0.08 | *TOT | ALS* | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL | (cms)= (hrs)= | 0.03 1.50 55.28 | 0.03 1.67 17.76 | | 050 (iii .50 |) |
| TOTAL RAINFALL RUNOFF COEFFICE | (mm)= ENT = | 56.08 0.99 | 56.08 0.32 | 56 | | |
| ***** WARNING: STORA | GE COEFF. IS | SMALLER THAN | N TIME STEP | ! | | |
| ***** WARNING: FOR AF YOU SE | EAS WITH IMP HOULD CONSIDE | R SPLITTING | OS BELOW 201 THE AREA. | i . | | |
| (i) CN PROCEE CN* = | URE SELECTED | FOR PERVIOUS | S LOSSES: | | | |
| CN* = (ii) TIME STEE THAN THE | STORAGE COEF | FICIENT. | | | | |
| (iii) PEAK FLOW | DOES NOT IN | CLUDE BASEFLO | OW IF ANY. | | | |
| | | | | | | |
| READ STORM | Filename | : C:\Users\G ata\Local\ | Temp\ | | | |
| Ptotal= 56.08 mm | Comments | | 9b4-4b71-a46 ICAGO 4 HOUF | | | |
| TIM | E RAIN | TIME RAIN | N TIME | RAIN mm/bx | TIME | RAIN |
| 0.1 | 7 3.58 | 1.17 11.5 | 2.17 | 10.31 | 3.17 | 5.05 |
| 0.5 | 0 4.50 7 5.21 | 1.50 133.60 1.67 32.00 | 2.50 | 7.52 | 3.50 | 4.39 |
| 0.8 | 13 6.27 10 8.00 | TIME RAII hrs mm/hi 1.17 11.5; 1.33 25.3; 1.50 133.60 1.67 32.00 1.83 19.7; 2.00 12.99 | 3 2.83 | 5.38 | 3.83 | 3.91 |
| | | | | | | |
| CALIB | | | | | | |
| CALIB STANDHYD (0025) ID= 1 DT=10.0 min | Area (Total Imp | ha)= 0.52 (%)= 71.00 | Dir. Conn. | .(%)= 1 | 4.00 | |
| | | | | | | |
| Surface Area Dep. Storage Average Slope | (ha)= (mm)= (%)= (m)= | 0.37 0.80 | 0.15 | | | |
| Average Slope Length Mannings n | | 1.00 58.88 0.013 | 2.00 40.00 0.250 | | | |
| = | | | 176.58 | | | |
| Max.Eff.Inten.(over Storage Coeff. | (min) (min)= | 10.00 1.66 (ii) | 10.00 | , | | |
| Unit Hyd. Tpeak Unit Hyd. peak | (min)= (cms)= | 10.00 | 10.00 | | | |
| DRIV BLOW | () | 0.03 | 0.06 | | 084 (iii |) |
| TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICE | (hrs)= (mm)= | 1.50 55.28 | 1.50 | 30 | .50 | |
| TOTAL RAINFALL RUNOFF COEFFICI | (mm)= ENT = | 56.08 0.99 | 56.08 0.47 | 56 0 | .08 | |
| **** WARNING: STORA | GE COEFF. IS | SMALLER THAN | N TIME STEP: | ! | | |
| YOU SE | OULD CONSIDE | R SPLITTING | THE AREA. | | | |
| (i) CN PROCEE CN* = (ii) TIME STER | URE SELECTED 58.0 Ia = | FOR PERVIOUS Dep. Storage | S LOSSES: e (Above) | | | |
| (ii) TIME STEF THAN THE (iii) PEAK FLOW | STORAGE COEF | FICIENT. | | | | |
| (III) PEAR FLOW | DOES NOT IN | CLUDE BASEFLO | JW IF ANI. | | | |
| | | | | | | |
| READ STORM | Filename | : C:\Users\G ata\Local\? | Temp\ | | | |
| Ptotal= 56.08 mm | | 838a855b-29 :: 10 YEAR CH | 9b4-4b71-a46 CAGO 4 HOUR | | | |
| TIM hr | E RAIN | TIME RAIN | N TIME | RAIN mm/hr | TIME hrs | RAIN mm/hr |
| 0.1 | 7 3.58 | 1.17 11.5 | 2.17 | 10.31 | 3.17 | 5.05 |
| 0.5 | 0 4.50 | 1.50 133.60 | 2.50 | 7.52 | 3.50 | 4.39 |
| 0.8 | 3 6 27 1 | 1.83 19.7 2.00 12.9 | 3 2.83 | 5.38 | 3.50 3.67 3.83 4.00 | 3.91 |
| | | | | | | |
| CALIB | | | | | | |
| STANDHYD (0026) ID= 1 DT=10.0 min | Area (| ha)= 0.48 (%)= 50.00 | Dir. Conn. | (%)= 1 | 4.00 | |
| <u> </u> | | IPERVIOUS I | PERVIOUS (i) | | | |
| Surface Area Dep. Storage | (ha)= (mm)= | 0.24 | 0.24 1.50 | | | |
| Average Slope Length | (%)= (m)= | 1.00 56.57 | 2.00 40.00 | | | |
| Mannings n | = | 0.013 | 0.250 | | | |
| Max.Eff.Inten.(over Storage Coeff | (min) | 133.60 | 69.68 | | | |
| Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (min)= : (min)= | 1.62 (ii) 10.00 0.17 | 9.77 (ii) 10.00 0.11 | , | | |
| опіс нуа. реак | (Cms) = | U.1/ | 0.11 | **** | *2.TA | |

PEAK FLOW (cms)= 0.02
TIME TO PEAK (hrs)= 1.50
RUNOFF VOLUME (mm)= 55.28
TOTAL RAINFALL (mm)= 56.08
RUNOFF COEFFICIENT = 0.99

***** 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:

CM* = 58.0 Ia = Dep. Storage (Above)

(i) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.

(ii) PEAK FLOW DOES NOT INCLIDE BASEFLOW IF ANY.

0.056 (iii) 1.50 23.90 56.08 0.43

| READ STORM | Filenan | ata\L 838a8 | ocal\Te | eg\AppD emp\ 54-4b71-a46 CAGO 4 HOUF | 57-7100h | 013d0872\5 | 5a9247c8 |
|--|--|------------------------------------|-----------------------------|---|----------------|-------------------|------------------------------|
| | | | | | | | |
| hrs | mm/hr | hrs | mm/hr | hrs | mm/hr | hrs | mm/hr |
| 0.33 | 3.99 | 1.33 | 25.32 | 2.33 | 8.66 | 3.33 | 5.05 4.70 4.39 4.14 |
| 0.67 | 5.21 | 1.67 | 32.00 | 2.67 | 6.65 | 3.67 | 4.14 |
| 1.00 | 8.00 | 2.00 | 12.95 | TIME hrs 2.17 2.33 2.50 2.67 2.83 3.00 | 5.49 | 4.00 | 3.91 3.63 |
| | | | | | | | |
| CALIB STANDHYD (0028) ID= 1 DT=10.0 min | | np(%)= 6 | 2.00 | Dir. Conn. | | 4.00 | |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha)= | 0.38 0.80 1.00 | S PI | 0.23 | | | |
| Dep. Storage Average Slope | (mm)= (%)= | 1.00 | | 2.00 | | | |
| Length Mannings n | (m)= | 1.00 63.77 0.013 | | 40.00 0.250 | | | |
| | (2) | 122 60 | | 10.41 | | | |
| Max.EII.Inten.(N over Storage Coeff. | (min) (min)= | 10.00 | (ii) | 10.00 8.47 (ii) | | | |
| Unit Hyd. Tpeak Unit Hyd. peak | (111111)- | 10.00 | | 10.00 | | | |
| | | 0.03 | | 0.05 | | ALS* 083 (iii) |) |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL | (hrs)= (mm)= | 0.03 1.50 55.28 | | 1.50 | 1 | .50 | |
| TOTAL RAINFALL RUNOFF COEFFICIE | (mm)= | 1.50 55.28 56.08 0.99 | | 56.08 | 56 | .08 | |
| **** WARNING: STORAGE COEFF, IS SMALLER THAN TIME STEP! **** WARNING: STORAGE COEFF, IS SMALLER THAN TIME STEP! **** WARNING: FOR AREAS WITH IMPREVIOUS 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) PEAR FLOW DOES NOT INCLUDE BASSEFLOW IF ANY. | | | | | | | |
| | | | | | | | |
| READ STORM | Filenan | ata\L 838a8 | ocal\Te | emp\ o4-4b71-a46 | 7-7100b | 513d0872\ | 5a9247c8 |
| Ptotal= 56.08 mm | comment | .o. 10 YE | MK CHIC | CAGO 4 HOUR | DESIG | n DISTRII | D3.*** |
| TIME hrs | mm/hr | hrs | mm/hr | ' TIME ' hrs 2.17 2.33 2.50 2.67 2.83 3.00 | mm/hr | hrs | RAIN mm/hr |
| 0.17 | 3.58 | 1.17 | 25.32 | 2.17 | 8.66 | 3.17 | 5.05 4.70 4.39 4.14 |
| 0.50 | 4.50 5.21 | 1.50 | 133.60 32.00 | 2.50 | 7.52 6.65 | 3.50 | 4.39 |
| 0.83 | 6.27 8.00 | 1.83 | 19.73 12.95 | 3.00 | 5.38 | 3.83 4.00 | 3.91 |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha)= (mm)= (%)= (m)= | 0.20 0.80 1.00 46.90 | S PI | Dir. Conn. CRVIOUS (i) 0.13 1.50 2.00 40.00 0.250 | | 5.00 | |
| Max.Eff.Inten.(n | - (bac) | 122 60 | | 01 15 | | | |
| over Storage Coeff. | (min) | 133.60 10.00 1.44 | (ii) | 10.00 9.12 (ii) | | | |
| Unit Hyd. Tpeak | (min)= (cms)= | 10.00 | (11) | 10.00 | | | |
| | | | | 0.02 | *TOT | ALS* 051 (iii | , |
| TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL | (hrs)= | 0.03 1.50 | | 1.50 | 1 | .50 | , |
| TOTAL RAINFALL RUNOFF COEFFICIE | (mm)= | 55.28 56.08 0.99 | | 56.08 | 56 | .08 | |
| **** WARNING: STORAG | | | R THAN | | | | |
| (i) CN PROCEDU | RE SELECTE 68.0 Ia (DT) SHOUI STORAGE COE | ED FOR PE = Dep. S LD BE SMA | RVIOUS torage LLER OF | LOSSES: (Above) R EQUAL | | | |
| READ STORM | Filenam | ne: C:\Us | ers\Gre | eg\AppD | | | |
| , | | ata\L 838a8 | ocal\Te | emp\ o4-4b71-a46 | | | |
| Ptotal= 56.08 mm | | | | | | | RAIN |
| hrs | | TIME hrs | mm/hr | ' TIME ' hrs | RAIN mm/hr | TIME hrs | mm/hr |
| 0.17 0.33 | 3.58 | 1.17 | 25.32 | 2.17 | 8.66 | 3.17 | 5.05 |
| 0.50 0.67 | 4.50 5.21 | 1.50 | 133.60 32.00 | 2.50 | 7.52 | 3.50 | 4.39 |
| 0.83 | 6.27 8.00 | 1.83 | 19.73 12.95 | 2.17 2.33 2.50 2.67 2.83 3.00 | 5.38 | 3.83 4.00 | 3.91 3.63 |
| CALIB STANDHYD (0032) ID= 1 DT=10.0 min | Area | (ha)- | 0 66 | Dir. Conn. | | | |
| | 1 | IMPERVIOU | S PI | ERVIOUS (i) | | | |
| Surface Area Dep. Storage | (mm)= | 0.24 | | 0.42 1.50 | | | |
| Average Slope Length | (%)= (m)= | 1.00 | | 2.00 | | | |
| Mannings n | = | 0.013 | | 0.250 | | | |
| Max.Eff.Inten.(m | | 133.60 | | 48.49 20.00 | | | |
| Storage Coeff. | (min) = (min) = | 10.00 | (ii) | 11.21 (ii) | | | |
| Unit Hyd. Tpeak Unit Hyd. peak | (mln)= (cms)= | 10.00 | | 20.00 | | | |
| PEAK FLOW | (cms)= | 0.02 | | 0.03 | 0. | ALS* 040 (iii |) |
| TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL | (hrs) = (mm) = | 55.28 | | 1.67 16.29 | 20 | .50 | |
| TOTAL RAINFALL | (mm)= | 56.08 | | 56.08 | 56 | .08 | |
| | | | | | | | |

RUNOFF COEFFICIENT = 0.99 ***** 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)

(i) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.

(ii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. READ STORM Filename: C:\Users\Greg\AppD
ata\Local\Temp\
818a855b-29b4-4b71-a467-7100b13d0872\5a9247c8
Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT RAIN | TIME TIME RAIN | TIME nrs 0.17 0.33 0.50 0.67 0.83 1.00 mm/hr 10.31 | 8.66 | 7.52 | 6.65 | 5.38 | 5.49 | | CALIB | STANDHYD (0033) | Area (ha)= 0.80 | Dir. Conn.(%)= 13.00 | Conn.(%)= 13.0 IMPERVIOUS Surface Area Dep. Storage Average Slope Length Mannings n 0.38 0.80 1.00 73.03 0.013 0.42 1.50 2.00 40.00 0.250 133.60 10.00 1.88 (ii) 10.00 0.17 66.34 20.00 10.20 (ii) 20.00 0.08 Max.Eff.Inten.(mm/hr)= Max.Eff.Inten.(mm/hr)=
over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= *TOTALS* 0.060 (iii) 1.50 23.23 56.08 0.41 PEAK FLOW (cms) =
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT = 0.04 1.50 55.28 56.08 0.99 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA. READ STORM Filename: C:\Users\Greg\AppD
ata\Local\Temp\
838a855b-294-4b71-a467-7100b13d0872\5a9247c8
Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT RAIN TIME RAIN TIME mm/hr hrs mm/hr hrs mm/hr hrs 3.58 1.17 11.51 2.17 3.99 1.33 25.32 2.33 4.50 1.50 13.00 2.50 5.21 1.67 32.00 2.67 6.27 1.83 19.73 2.83 8.00 2.00 12.95 3.00 TIME mm/hr 10.31 | 8.66 | 7.52 | 6.65 | 5.38 | 5.49 | | CALIB | | STANDHYD (0034)| |ID= 1 DT=10.0 min | Area (ha)= 0.67 Total Imp(\$)= 42.00 Dir. Conn.(\$)= 18.00 IMPERVIOUS PERVIOUS (i) Surface Area Dep. Storage Average Slope Length Mannings n (ha)= (mm)= (%)= (m)= 0.28 0.80 1.00 66.83 0.013 0.39 1.50 2.00 40.00 0.250 Max.Eff.Inten.(mm/hr)=
over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 133.60 10.00 1.79 (ii) 10.00 0.17 48.96 20.00 11.18 (ii) 20.00 0.08 *TOTALS*
0.059 (iii)
1.50
23.35
56.08
0.42 PEAK FLOW (cms) =
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT = ***** 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:

(IN* = 58.0 Ia = Dep. Storage (Above)
(i) TIME STEPE (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.
(iii) PEAK PLOW DOES NOT INCLUDE BASEFLOW IF ANY. READ STORM Filename: C:\Users\Greg\AppD
ata\Local\Temp\
838a855b-29b4-4b71-a467-7100b13d0872\Sa9247c8
Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT RAIN | TIME RAIN | 1 mm/hr | hrs mm/hr | 3.58 | 1.17 | 11.51 | 3.99 | 1.33 | 25.32 | 4.50 | 1.50 | 133.60 | 5.21 | 1.67 | 32.00 | 6.27 | 1.83 | 19.73 | 8.00 | 2.00 | 12.95 | RAIN | TIME mm/hr | hrs 11.51 | 2.17 25.32 | 2.33 133.60 | 2.67 32.00 | 2.67 19.73 | 2.83 12.95 | 3.00 TIME hrs 0.17 0.33 0.50 0.67 0.83 1.00 mm/hr 10.31 8.66 7.52 6.65 5.38 5.49 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) | hrs mm/hr hrs mm/hr <th< td=""></th<> |
|--|---|
| Storage Coeff. (min)= 1.77 (ii) 13.63 (ii) Unit Hyd. Tpeak (min)= 10.00 20.00 Unit Hyd. Tpeak (min)= 0.17 0.07 PEAK FLOW (cms)= 0.03 0.03 0.039 (iii) TIME TO PEAK (hrs)= 1.50 1.67 1.50 RUNOFF VOLUME (min)= 55.28 15.10 19.51 TOTAL BAINFALL (min)= 56.08 56.08 56.08 RUNOFF COEFFICIENT 0.99 0.25 ***** MRANING: STORAGE COEFF. IS SAULLER THAN TIME STEP! | CALIB STANDHYD (0068) Area (ha)= 0.41 |
| ***** 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. | Left |
| (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. READ STORM Filename: C:\Users\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | ************************************** |
| TIME RAIN TIME RAIN 'TIME RAIN TIME RAIN TIME RAIN RAIN COLOR TO THE C | **** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN = 58.0 Ia = Dep. Storage (Above) (ii) THMS STEE (DT) SHOULD BE SMALLER OR EQUIAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. |
| CALIB | READ STORM Filename: C:\Users\Greg\AppD ata\Local\Temp\ |
| Surface Area (ha)= 0.34 0.17 Dep. Storage (mm)= 1.00 1.50 Average Slope (4)= 1.00 2.00 Length (m)= 58.31 40.00 Mamnings 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) | hrs mm/hr 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 4.56 1.50 33.66 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 1.973 2.83 5.38 3.38 3.91 1.00 8.00 2.00 12.95 3.00 5.49 4.00 3.63 |
| Unit hyd. peak (min) = 10.00 10.00 Unit hyd. peak (ms) = 0.17 0.12 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 RUNOFF COEFFICIENT = 0.98 0.42 0.51 | CALIB |
| **** WARNING: STORAGE COEFF. IS SHALLER 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* 5.80. In = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | Average Slope (%)= 1.00 2.00 Length (m)= 75.72 40.00 Mannings n = 0.013 0.250 Manx.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 (cma)= 0.17 0.08 |
| READ STORM Filename: C:\Users\Greg\AppD | PRAK 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)= 55.08 56.08 56.08 RUNOFF COEFICIENT = 0.98 0.29 0.39 |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | **** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN = 58.0 In = Dep. Storage (Above) (ii) THMS TREP [JT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. |
| CALIB STANDHYD (0064) Area (ha) = 0.68 STANDHYD (0064) Total Imp(%) = 60.00 Dir. Conn.(%) = 19.00 | ADD HYD (0027) |
| Mannings n = 0.013 0.250 Max.Eff.Inten.(nm/hr) = 133.60 92.82 | ADD HYD (0027) |
| **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! **** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS RELOW 20% YOU SHOULD CONSIDER SPLITING THE AREA. (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CM* = 58.0 In = Dep. 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) AREA QPEAK TPEAK R.V. 1 + 2 = 3 (ha) (cma) (hra) (mm) 150 = 1 (0027): 1.59 0.189 1.50 25.95 150 = 2 (0028): 0.61 0.083 1.50 27.06 150 = 3 (0027): 2.20 0.273 1.50 26.25 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| READ STORM Filename: C:\Users\Greg\AppD ata\Local\Temp\ 838a855b-29b4-4b71-a467-7100b13d0872\Sa9247c8 Ptotal= 56.08 mm Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT TIME RAIN TIME RAIN TIME RAIN TIME RAIN TIME RAIN | ADD HYD (0027) 3 + 2 = 1 AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm) IDl= 3 (0027): 2.20 0.273 1.50 26.25 |

| + ID2= 2 (0030): | Storage Coeff. (min)= 1.63 (ii) 14.63 (ii) Unit Hyd. Tpeak (min)= 10.00 20.00 Unit Hyd. Tpeak (min)= 0.17 0.07 PEAK FLOW (cms)= 0.17 0.07 PEAK FLOW (cms)= 0.03 0.02 0.08 (iii) TIME TO FRAK (hrs)= 1.50 1.67 1.50 RINNEF VOLUME (mm)= 55.08 13.7 20.71 TOTAL ALHEALL (mm)= 56.08 56.08 56.08 56.00 RUNDEF COMPICIENT 0.98 0.24 0.37 *********************************** |
|--|--|
| ADD HYD (0027) | READ STORM |
| IDL-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 NYD (0027) AREA OPEAK TPEAK R.V. 34.2 1 | CALIE STANDHYD (0066) Area (ha) = 0.25 ID-1 DT-10.0 min Total Imp(%) = 49.00 Dir. Conn.(%) = 31.00 |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ADD WYD (0027) | Unit Nyd. peak (cms) = 0.17 0.08 PEAK FLOW (cms) = 0.03 0.01 0.033 (iii) TIME TO PEAK (hrs) = 1.50 1.67 1.50 RUNDFF VOLUME (mm) = 55.08 15.83 27.98 TOTAL RAINFALL (mm) = 56.08 56.08 56.08 56.08 RUNDFF COEFFICIENT = 0.98 0.28 0.50 ***** MARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 58.0 1 as Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR BOUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. |
| ADD NYD (0027) | ADD HYD (0067) |
| ADD NYD (0027) | DUNYD (0024) Inlet Cap. 0.057 Inlet Cap. 0.057 Total (ms) = 0.1 AREA QPEAK TPEAK R.V. TOTAL (MTO.(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 (0027) AREA OPEAK TEEAK R.V. 101=3 (0027): (ha) (cma) (hrs) (mm) 101=3 (0027): 6.91 0.730 1.50 24.66 102=2 (0069): 0.86 0.066 1.50 22.00 102=2 (0069): 7.77 0.796 1.50 24.37 101=1 (0027) | ADD HYD (0031) AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm) (mm) (101-1 (0024): ha) (cms) (hrs) (rs) (23.17 + 102-2 (0027): 7.77 0.796 1.50 23.17 (101-1) (101- |
| READ STORM Filename: C:\Users\Greg\AppD | ADD HYD (0031) |
| CALIB STANDHYD (0065) Area (ha) = 0.49 Dir. Conn.(\$) = 17.00 ID= 1 DT=10.0 min Total Imp(\$) = 26.00 Dir. Conn.(\$) = 17.00 ID= 1 DT=10.0 min Total Imp(\$) = 26.00 Dir. Conn.(\$) = 17.00 IMPERVIOUS PERVIOUS (i) Total Imp(\$) = 10.03 0.36 Dep. Storage (mm) = 1.00 1.50 Average Slope (\$) = 1.00 2.00 Length (m) = 57.15 40.00 Manninge n = 0.013 0.250 Max.Eff.Inten.(mm/hr) = 133.60 21.71 over (min) 10.00 20.00 | IMP 2> OUT= 1 OUTFLOW STORAGE OUTFLOW OUTFLOW OUTFLOW OUTFL |

| | MAXIMUM | | USED | | m.)= 0.1649 | |
|---|---|---------------------------------------|--|---|---|----|
| | | | | | | |
| READ STORM | - File | anama: C | :\Users\G | nan Inno | | |
| READ STORM | 1 | a | ta\Local\? | remp\ | | |
| Ptotal= 56.08 mm | Comr | ments: 1 | 38a855b-29 0 YEAR CH | 964-4671- CAGO 4 H | a467-7100b13d0872\5a9247c8 DURS DESIGN DISTRIBUT | |
| TI | - ME RA: | IN TI | ME RAII | TIM | E RAIN TIME RAIN | |
| r o. | rs mm/l 17 3. | hr h: | rs mm/hi 17 11.5: | r 'hr | s mm/hr hrs mm/hr 10.31 3.17 5.05 | |
| 0. | 33 3.5 50 4.5 | 99 1. 50 1. | 33 25.32 50 133.60 | 2 2.33 | 8.66 3.33 4.70 7.52 3.50 4.39 | |
| 0. | 67 5.3 | 21 1. | 67 32.00 | 2.67 | 6.65 3.67 4.14 | |
| 1. | 00 8.0 | 00 2. | 00 12.9 | 3.00 | E RAIN TIME RAIN 10.31 3.17 5.05 8.66 3.33 4.70 7.52 3.50 4.39 6.65 3.65 4.14 5.38 3.83 3.91 5.49 4.00 3.63 | |
| | | | | | | |
| | - | | | | | |
| CALIB STANDHYD (0063) | Area | (ha) | = 0.31 = 41.00 | | | |
| ID= 1 DT=10.0 min | Tota: | | | | nn.(%)= 0.00 | |
| Surface Area | (ha)= | IMPER | VIOUS I | 0.18 | (i) | |
| Surface Area Dep. Storage Average Slope | (mm)= (%)= | 1 | .00 | 1.50 | | |
| Length | (m)= | 45 | .00 | 2.00 40.00 0.250 | | |
| Mannings n | - | | 013 | | | |
| Max.Eff.Inten. | (mm/nr)= r (min) | 133 10 1 | .60 .00 .42 (ii) .00 | 10.00 | | |
| ove Storage Coeff. Unit Hyd. Tpes | k (min)= | 10 | .00 | 9.66 (10.00 | ii) | |
| Unit Hyd. peak | (cms)= | | .17 | 0.11 | *TOTALS* | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALI | (cms)= (hrs)= | 0 | .00 | 0.02 | 0.023 (iii) 1.50 | |
| RUNOFF VOLUME | (mm)= | 55 56 | .08 | 18.61 56.08 | 18.59 56.08 | |
| RUNOFF COEFFIC | IENT = | 0 | .98 | 0.33 | 0.33 | |
| **** WARNING: STOR | AGE COEFI | F. IS SM. | ALLER THAN | N TIME ST | EP! | |
| ***** WARNING: FOR A | REAS WITH | H IMPERV | IOUS RATIO | OS BELOW | 20% | |
| (i) CN PROCE | | | | | | |
| CN* = (ii) TIME STE | 58.0 | Ia = De | p. Storage | (Above) |) | |
| THAN THE | STORAGE | COEFFIC | IENT. | | | |
| (iii) PEAK FLO | w DOES NO | DI INCLU | DE BASEFLO | JW IF ANY | : | |
| | | | | | | |
| ADD HYD (0037) | - I | | | | | |
| ADD HYD (0037) 1 + 2 = 3 | į | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. | |
| ID1= 1 (C + ID2= 2 (C | 024): | 0.04 | 0.015 | 1.50 | 23.17 | |
| | | | | | ====== | |
| ID = 3 (0 | | | 0.063 | | 22.28 | |
| NOTE: PEAK FI | OWS DO NO | OT INCLU | DE BASEFLO | OWS IF AN | Υ. | |
| | | | | | | |
| ADD HYD (0037) | - I | | | | | |
| 3 + 2 = 1 | | AREA | QPEAK | TPEAK | R.V. | |
| ID1= 3 (C + ID2= 2 (C | 037): | 9.22 | 0.063 | 3.83 | 22.28 | |
| | | | | | | |
| ID = 1 (0 | | 9.31 | | | 22.13 | |
| NOTE: PEAK FI | OWS DO NO | OT INCLU | DE BASEFLO | OWS IF AN | Υ. | |
| | | | | | | |
| app uvp / 00271 | - | | | | | |
| ADD HYD (0037) 1 + 2 = 3 | | AREA | QPEAK | TPEAK | R.V. | |
| ID1= 1 (C + ID2= 2 (C | 037): | (ha) 9.31 | (cms) | (hrs) 3.82 | (mm) 22.13 | |
| + ID2= 2 (C | 063): | 0.31 | 0.023 | 1.50 | 18.59 | |
| ID = 3 (0 | 037): | 9.62 | 0.065 | 3.75 | 22.01 | |
| NOTE: PEAK FI | OWS DO NO | OT INCLU | DE BASEFLO | OWS IF AN | Υ. | |
| | | | | | | |
| | - | | | | | |
| ADD HYD (0037) | | AREA | QPEAK | TPEAK | R.V. | |
| | 037): | (ha) | | (hrs) 3.75 | (mm) 22.01 | |
| ID1= 3 (0 + ID2= 2 (0 | 070): | 1.74 | 0.028 | 1.67 | 6.66 | |
| ID = 1 (0 | | | | | | |
| NOTE: PEAK FI | | | | | | |
| | | | | | | |
| FINISH | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| v v i | SSSSS | u u | A L | | (v 5.1.2003) | |
| A A I A A I | SSSSS SS SS SS | U U | AA L AAAAA L A A L A A LLI | | | |
| V V I V V I V V I | SS | n n | A A L | | | |
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| 000 TTTTT 0 0 T 0 0 T 000 T | TTTTT | H H | MM Y Y | M 000 | TM D | |
| 0 0 T | т | н н | Y M Y M | M 0 | 0 | |
| 000 | Ŧ | | _ M | 000 icture | | |
| 000 T Developed and Distr | ibuted by | y Civica | Infrastru | | | |
| OOO T Developed and Distr Copyright 2007 - 20 All rights reserved | 13 Civica | y Civica a Infras | Infrastrı tructure | | | |
| Copyright 2007 - 20 | 13 Civica | a Infras | tructure | | | |
| Copyright 2007 - 20 | 13 Civica | a Infras | Infrastrutructure | | т ***** | |
| Copyright 2007 - 20 All rights reserved | 13 Civics | E T A I | LED (| OUTPU | HYMO 5 1\VO2\voin dat | |
| Copyright 2007 - 20 All rights reserved Input filename: Output filename: | 13 Civica ***** D C:\Progr | E T A I ram File: | L E D (| O U T P U | HYMO 5.1\VO2\voin.dat a\VH5\b59b925c-1a86-4318-886 | 1- |
| Input filename: 00tput filename: 00tput filename: 838d4dfd2f8\le8cde | 13 Civica ***** D C:\Progr C:\Usera 6e-7081 C:\Usera | E T A I ram File. s\Greg\A; 41c1-bae | L E D (s (x86)\V: ppData\Loo 5-c5bf5be: ppData\Loo | O U T P U isual OTT cal\Civic 1484a\sce | HYMO 5.1\VO2\voin.dat a\VH5\b59b925c-1a86-4318-886 nari a\VH5\b59b925c-1a86-4318-886 | |
| Topyright 2007 - 2C All rights reserved Input filename: Output filename: | 13 Civica ***** D C:\Progr C:\Usera 6e-7081 C:\Usera | E T A I ram File. s\Greg\A; 41c1-bae | L E D (s (x86)\V: ppData\Loo 5-c5bf5be: ppData\Loo | O U T P U isual OTT cal\Civic 1484a\sce | HYMO 5.1\VO2\voin.dat a\VH5\b59b925c-1a86-4318-886 nari a\VH5\b59b925c-1a86-4318-886 | |

Filename: C:\Users\Greg\AppD
ata\Local\Temp\
838a855b-29b4-4b71-a467-7100b13d0872\817e5206
Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI Ptotal= 66.02 mm RAIN TIME RAIN TIME mm/hr hrs mm/hr hrs 4.50 1.17 13.67 2.17 4.98 1.33 27.69 2.33 5.61 1.50 18.85 2.50 6.45 1.67 35.08 2.67 7.70 1.83 20.60 2.83 9.70 2.00 15.24 3.00 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 TIME RAIN TIME RAIN ' TIME RAIN' ' TIME RAIN' hrs mm/hr ' hrs mm/h Unit Hyd Qpeak (cms)= 0.399 PEAK FLOW (CMS)= 0.044 (1)
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. TIME RAIN TIME RAIN 'TIME hrs mm/hr hrs mm/hr hrs mm/hr hrs la 7.1 (2.17 0.33 4.88 1.33 27.69 2.33 0.50 5.61 1.50 158.85 2.50 0.67 6.45 1.167 35.08 2.67 0.83 7.70 1.83 20.60 2.83 1.00 9.70 2.00 15.24 3.00 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. READ STORM TIME RAIN TIME RAIN hrs mm/hr hrs mm/hr 13.67 0.37 4.98 1.33 27.69 0.50 5.61 1.50 158.85 0.67 6.45 1.10 0.83 20.60 1.00 9.70 2.00 15.24 RAIN | TIME RAIN mmm/hr | hrs mm/hr 13.67 | 2.17 | 12.32 | 27.69 | 2.33 | 10.44 | 158.85 | 2.50 | 9.14 | 35.08 | 2.67 | 8.15 | 20.60 | 2.83 | 7.39 | 15.24 | 3.00 | 6.78 |

IMPERVIOUS PERVIOUS (i)

HSER: COMMENTS:

READ STORM

DATE: 01/05/2019 TIME: 10:33:08

| Surface Area Dep. Storage Average Slope Length Mannings n | (ha) = (mm) = (%) = (m) = | 0.28 0.80 1.00 62.72 0.013 | 0.31 1.50 2.00 40.00 0.250 | | | |
|---|---|--|---|----------------------------|--------------------------|------------------------------|
| Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak | (min) | 158.85 10.00 1.60 (ii) 10.00 | 81.47 10.00 9.27 (ii) 10.00 | | | |
| Unit Hyd. peak | (Clib) = | 0.04 | 0.05 | | ALS* 090 (iii) | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICE | ENT = | 65.22 66.02 0.99 | 23.38 66.02 0.35 | 30 66 0 | .07 | |
| ***** WARNING: STORA ***** WARNING:FOR AF YOU SE | REAS WITH IMP | SMALLER THAN ERVIOUS RATIO R SPLITTING T | S BELOW 20% | | | |
| CN* = (ii) TIME STEE | 58.0 Ia = (DT) SHOULD STORAGE COEF | FICIENT. | (Above) R EQUAL | | | |
| READ STORM | | : C:\Users\Gr ata\Local\T 838a855b-29 : 25 YEAR CHI | emp\ b4-4b71-a46 | | | |
| TIM hr | | | | | | RAIN mm/hr |
| 0.1 0.3 0.5 | 4.50 33 4.98 50 5.61 | 1.17 13.67 1.33 27.69 1.50 158.85 | 2.17 2.33 2.50 | 12.32 10.44 9.14 | 3.17 3.33 3.50 | 6.27 5.00 5.84 5.18 |
| 0.6 0.8 1.0 | 6.45 33 7.70 00 9.70 | TIME RAIN hrs mm/hr 1.17 13.67 1.33 27.69 1.50 158.85 1.67 35.08 1.83 20.60 2.00 15.24 | 2.67 2.83 3.00 | 8.15 7.39 6.78 | 3.67 3.83 4.00 | 5.18 4.90 4.65 |
| | | | | | | |
| CALIB STANDHYD (0025) ID= 1 DT=10.0 min | Total Imp | | Dir. Conn. | | 4.00 | |
| Surface Area Dep. Storage Average Slope Length | (ha)= (mm)= | 0.00 | 1.50 | | | |
| Average Slope Length Mannings n | = | 1.00 58.88 0.013 | 2.00 40.00 0.250 | | | |
| Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (min)= | 10.00 1.54 (ii) | 232.42 10.00 6.58 (ii) 10.00 0.13 | *TOT. | | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICE | (mm) = | 0.03 1.50 65.22 66.02 0.99 | 0.08 1.50 33.66 66.02 0.51 | 0. 1 38 66 | 110 (iii) .50 .07 | |
| **** WARNING: STORA | AGE COEFF. IS REAS WITH IMP | SMALLER THAN ERVIOUS RATIO R SPLITTING T | TIME STEP! | | | |
| (i) CN PROCEI CN* = (ii) TIME STEE | DURE SELECTED 58.0 Ia = 0 (DT) SHOULD STORAGE COEF | FOR PERVIOUS Dep. Storage BE SMALLER O FICIENT. | LOSSES: (Above) R EQUAL | | | |
| | | | | | | |
| READ STORM Ptotal= 66.02 mm | | : C:\Users\Gr ata\Local\T 838a855b-29 : 25 YEAR CHI | emp\ b4-4b71-a46 | | | |
| TIN hr | ME RAIN | TIME RAIN hrs mm/hr | ' TIME | RAIN mm/hr | TIME hrs | RAIN mm/hr |
| 0.1 0.3 0.5 | mm/hr 17 4.50 183 4.98 190 5.61 | TIME RAIN hrs mm/hr 1.17 13.67 1.33 27.69 1.50 158.85 | 2.17 2.33 2.50 | 12.32 10.44 9.14 | 3.17 3.33 3.50 | 6.27 5.00 5.84 |
| 0.6 0.8 1.0 | 67 6.45 83 7.70 9.70 | 1.67 35.08 1.83 20.60 2.00 15.24 | 2.67 2.83 3.00 | 8.15 7.39 6.78 | 3.67 3.83 4.00 | 5.18 4.90 4.65 |
| CALIB STANDHYD (0026) | Area (| ha)= 0.48 | | | | |
| ID= 1 DT=10.0 min | Total Imp | (%)= 50.00 | Dir. Conn. | | 4.00 | |
| Surface Area Dep. Storage Average Slope | (ha)= (mm)= (%)= | 0.24 0.80 1.00 | 0.24 1.50 2.00 | | | |
| Length Mannings n | (m)= | 56.57 0.013 | 40.00 0.250 | | | |
| Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (min) | 1.51 (ii) 10.00 | 93.97 10.00 8.74 (ii) 10.00 | | | |
| Unit Hyd. peak PEAK FLOW TIME TO PEAK | (cms)= | 0.17 | 0.12 | *TOT. | 074 (iii) | |
| RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICE | (mm)= ENT = | 1.50 65.22 66.02 0.99 | 1.50 24.67 66.02 0.37 | 30 66 0 | .50 .34 .02 .46 | |
| ***** WARNING: STORA ***** WARNING: FOR AF YOU SE | AGE COEFF. IS REAS WITH IMP HOULD CONSIDE | SMALLER THAN ERVIOUS RATIO R SPLITTING T | TIME STEP! S BELOW 20% HE AREA. | | | |
| CN* = (ii) TIME STEE | 58.0 Ia = (DT) SHOULD STORAGE COEF | FICIENT. | (Above) R EQUAL | | | |
| | | | | | | |
| READ STORM | | : C:\Users\Gr ata\Local\T 838a855b-29 : 25 YEAR CHI | emp\ b4-4b71-a46 | 7-7100b | 13d0872\8 | 17e5206 |
| TIN | | | CAGO 4 HOUR | | TIME | rain |

| hrs mm/hr 0.17 4.50 0.33 4.98 0.50 5.61 0.67 6.45 0.68 7.70 1.00 3.70 | hrs mm/hr 1.17 13.67 1.33 27.69 1.50 158.88 1.67 35.00 1.83 20.60 2.00 15.24 | r hrs 7 2.17 9 2.33 5 2.50 8 2.67 0 2.83 4 3.00 | mm/hr hrs 12.32 3.17 10.44 3.33 9.14 3.50 8.15 3.67 7.39 3.83 6.78 4.00 | mm/hr 6.27 5.00 5.84 5.18 4.90 4.65 | | | | |
|--|--|---|---|---|--|--|--|--|
| CALIB | (ha)= 0.61 p(%)= 62.00 | Dir. Conn | (%)= 14.00 | | | | | |
| | MPERVIOUS I 0.38 0.80 1.00 63.77 0.013 | 0.23 1.50 2.00 40.00 0.250 | | | | | | |
| <pre>Max.Eff.Inten.(mm/hr)= over (min) Storage Coeff. (min)= Unit Hyd. Tpeak (min)= Unit Hyd. peak (cms)=</pre> | 158.85 10.00 1.62 (ii) 10.00 0.17 | 149.79 10.00 7.63 (ii: 10.00 0.12 | *TOTALS* | | | | | |
| PEAK FLOW (cms)= TIME TO PEAK (hrs)= RUNOFF VOLUME (mm)= TOTAL RAINFALL (mm)= RUNOFF COEFFICIENT = | 0.04 1.50 65.22 66.02 0.99 | 0.07 1.50 29.13 66.02 0.44 | 0.110 (iii) 1.50 34.17 66.02 0.52 | | | | | |
| ***** WARNING: STORAGE COEFF. I ***** WARNING:FOR AREAS WITH IM YOU SHOULD CONSID | S SMALLER THAN PERVIOUS RATIO ER SPLITTING T | TIME STEP! OS BELOW 209 THE AREA. | | | | | | |
| (i) CN PROCEDURE SELECTED FOR PRRVIOUS LOSSES: CN* = 58.0 Ia - Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAM THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | | | | | | | | |
| READ STORM Filenam | e: C:\Users\Gr ata\Local\T | Temp\ | 57-7100h13d0872\8 | 117-5006 | | | | |
| | s: 25 YEAR CHI | CAGO 4 HOUR | DESIGN DISTRIBU | | | | | |
| hrs mm/hr 0.17 4.50 0.33 4.98 0.50 5.61 0.67 6.45 0.83 7.70 | TIME RAIN hrs mm/hr 1.17 13.67 1.33 27.69 1.50 158.89 1.67 35.00 1.83 20.60 2.00 15.24 | hrs 2.17 2.17 2.33 5 2.50 3 2.67 2.83 | mm/hr hrs 12.32 3.17 10.44 3.33 9.14 3.50 8.15 3.67 | mm/hr 6.27 5.00 5.84 5.18 4.90 | | | | |
| 1.00 9.70 | 2.00 15.24 | 3.00 | 6.78 4.00 | 4.65 | | | | |
| CALIB STANDHYD (0030) Area ID= 1 DT=10.0 min Total Im | (ha)= 0.33 | Dir. Conn. | (%)= 25.00 | | | | | |
| | MPERVIOUS I | PERVIOUS (i) | | | | | | |
| Dep. Storage (mm)= Average Slope (%)= Length (m)= Mannings n = | 0.80 1.00 46.90 0.013 | 1.50 2.00 40.00 0.250 | | | | | | |
| Max.Eff.Inten.(mm/hr)= over (min) Storage Coeff. (min)= Unit Hyd. Tpeak (min)= Unit Hyd. peak (cms)= | 158.85 10.00 1.35 (ii) 10.00 0.17 | 109.04 10.00 8.17 (ii) 10.00 0.12 | *TOTALS* | | | | | |
| PEAK FLOW (cms)= TIME TO PEAK (hrs)= RUNOFF VOLUME (mm)= TOTAL RAINFALL (mm)= RUNOFF COEFFICIENT = | 0.04 1.50 65.22 66.02 0.99 | 0.03 1.50 26.05 66.02 0.39 | 0.065 (iii) 1.50 35.83 66.02 0.54 | | | | | |
| ***** WARNING: STORAGE COEFF. I | | | | | | | | |
| (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 58.0 In = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SWALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | | | | | | | | |
| READ STORM Filenam | e: C:\Users\Gr ata\Local\1 838a855b-29 | Temp\ | 57-7100b13d0872\8 | 17e5206 | | | | |
| TIME RAIN | | | E DESIGN DISTRIBU | RAIN | | | | |
| hrs mm/hr 0.17 4.50 0.33 4.98 0.50 5.61 | TIME RAIN hrs mm/hr 1.17 13.67 1.33 27.69 | hrs 2.17 | 12.32 3.17 | mm/hr 6.27 5.00 5.84 | | | | |
| 0.50 5.61 0.67 6.45 0.83 7.70 0.83 7.70 0.83 9.70 0.83 | 1.33 27.69 1.50 158.89 1.67 35.08 1.83 20.60 2.00 15.24 | 2.50 3 2.67 3 2.83 4 3.00 | 9.14 3.50 8.15 3.67 7.39 3.83 6.78 4.00 | 5.18 4.90 4.65 | | | | |
| | | | | | | | | |
| | | | (%)= 10.00 | | | | | |
| Surface Area (ha) = Dep. Storage (mm) = Average Slope (%) = Length (m) = Mannings n = | MPERVIOUS F 0.24 0.80 1.00 66.33 0.013 | 0.42 1.50 2.00 40.00 0.250 | | | | | | |
| Max.Eff.Inten.(mm/hr)= over (min) Storage Coeff. (min)= Unit Hyd. Tpeak (min)= Unit Hyd. peak (cms)= | 158.85 10.00 1.66 (ii) 10.00 0.17 | 65.93 10.00 10.00 (ii) 10.00 0.11 | | | | | | |
| PEAK FLOW (cms)= TIME TO PEAK (hrs)= RUNOFF VOLUME (mm)= TOTAL RAINFALL (mm)= RUNOFF COEFFICIENT = | 0.03 1.50 65.22 66.02 0.99 | 0.05 1.50 21.55 66.02 0.33 | *TOTALS* 0.080 (iii) 1.50 25.91 66.02 0.39 | | | | | |
| ***** WARNING: STORAGE COEFF. I ***** WARNING: FOR AREAS WITH IM YOU SHOULD CONSID | S SMALLER THAN | TIME STEP: OS BELOW 209 THE AREA. | | | | | | |
| (i) CN PROCEDURE SELECTE | D FOR PERVIOUS | LOSSES: | | | | | | |

| CN* = 5: (ii) TIME STEP THAN THE S' (iii) PEAK FLOW ! | FORAGE COEF | FICIENT. | | | | |
|---|---|--|--|---|--|--|
| READ STORM Ptotal= 66.02 mm TIME | Comments | 8388855D-29 | Cemp\ 0b4-4b71-a4 CAGO 4 HOU | R DESIGN | DISTRIBU | TI |
| CALIB STANDHYD (0033) ID= 1 DT=10.0 min | | (ha) = 0.80 (%) = 48.00 MPERVIOUS F | Dir. Conn | | 3.00 | |
| Dep. Storage Average Slope Length Mannings n | (ha)= (mm)= (%)= (m)= | 0.38 0.80 1.00 73.03 0.013 | 0.42 1.50 2.00 40.00 0.250 | | | |
| Max.Eff.Inten.(m over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | n/hr)= (min) (min)= (min)= (cms)= | 158.85 10.00 1.76 (ii) 10.00 0.17 | 0.11 |) *TOT | 'ALS* | |
| | (cms)= (hrs)= (mm)= (mm)= NT = | 0.05 1.50 65.22 66.02 0.99 | 0.07 1.50 24.23 66.02 0.37 | 1 29 66 | 117 (iii) .50 .55 .02 .45 | |
| ***** WARNING: STORAGE ***** WARNING:FOR ARE: YOU SHO | E COEFF. IS AS WITH IME ULD CONSIDE | S SMALLER THAN PERVIOUS RATIO OR SPLITTING T | TIME STEP OS BELOW 20 THE AREA. | ! | | |
| (i) CN PROCEDU | RE SELECTEI 8.0 Ia = (DT) SHOULI FORAGE COEF | FOR PERVIOUS Dep. Storage BE SMALLER C | LOSSES: (Above) OR EQUAL | | | |
| READ STORM | Comments | ata\Local\T 838a855b-29 s: 25 YEAR CHI | Cemp\ 0b4-4b71-a4 CAGO 4 HOU | R DESIGN | DISTRIBU | TI |
| TIME hrs 0.17 0.33 0.50 0.67 0.83 | RAIN mm/hr 4.50 4.98 5.61 6.45 7.70 | TIME RAIN hrs mm/hr 1.17 13.67 1.33 27.69 1.50 158.85 1.67 35.08 1.83 20.60 2.00 15.24 | TIME hrs 2.17 2.33 2.50 2.67 2.83 | RAIN mm/hr 12.32 10.44 9.14 8.15 7.39 | TIME hrs 3.17 3.33 3.50 3.67 3.83 | 6.27 5.00 5.84 5.18 4.90 |
| 1.00 | 9.70 | 2.00 15.24 | 3.00 | 6.78 | 4.00 | 4.65 |
| | TN | (ha)= 0.67 p(%)= 42.00 MPERVIOUS F | PERVIOUS (i | | 8.00 | |
| Dep. Storage Average Slope Length Mannings n | (%)= (m)= = | 0.80 1.00 66.83 0.013 | 0.39 1.50 2.00 40.00 0.250 | | | |
| Max.Eff.Inten.(m over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | | 1.67 (ii) 10.00 0.17 | 0.11 |) *TOT | 'ALS* | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIES | (mm)= (mm)= | 0.05 1.50 65.22 66.02 0.99 | 0.05 1.50 21.63 66.02 0.33 | 1 29 66 | 100 (iii) .50 .47 .02 .45 | |
| ***** WARNING: STORAGE ***** WARNING: FOR AREA YOU SHOW | AS WITH IME | S SMALLER THAN PERVIOUS RATIO OR SPLITTING T | S BELOW 20 | ! | | |
| (i) CN PROCEDUI CN* = 5; (ii) TIME STEP THAN THE S' (iii) PEAK FLOW I | RE SELECTEI 8.0 Ia = (DT) SHOULI FORAGE COEF | FOR PERVIOUS Dep. Storage BE SMALLER C | S LOSSES: (Above) OR EQUAL | | | |
| READ STORM | | : C:\Users\Gr ata\Local\T 838a855b-29 | ?emp\ 0b4-4b71-a4 | | | |
| TIME | | | | | | |
| 0.17 0.33 0.50 0.67 0.83 1.00 | 4.50 4.98 5.61 6.45 7.70 9.70 | TIME RAIN hrs mm/hr 1.17 13.67 1.33 27.69 1.50 158.85 1.67 35.08 1.83 20.60 2.00 15.24 | 2.17 2.33 3.2.50 3.2.67 2.83 4.3.00 | 12.32 10.44 9.14 8.15 7.39 6.78 | 3.17 3.33 3.50 3.67 3.83 4.00 | 6.27 5.00 5.84 5.18 4.90 4.65 |
| CALIB STANDHYD (0035) ID= 1 DT=10.0 min | | | Dir. Conn | | 1.00 | |
| Dep. Storage Average Slope Length Mannings n | (ha) = (mm) = (%) = (m) = | 0.19 0.80 1.00 65.83 0.013 | 0.45 1.50 2.00 40.00 0.250 |) | | |
| Max.Eff.Inten.(m | n/hr)= | 158.85 | 55.01 | | | |

| Storage Coeff. Unit Hyd. Peak Unit Hyd. Peak Unit Hyd. Peak Unit Hyd. Peak TIME TO PEAK RUNOFF VOLUME TOTAL RAHFALL RUNOFF COEFFICIE WARNING: STORAG WARNING: STORAG (1) CN PROCEDE CN* 5 5 (1) ITME STEP | (min) = (min) = (cms) = (cms) = (hrs) = (hrs) = (mm) = (mm) = (mm) = (mm) = (mn) = (mn | 0.03 1.50 65.22 66.02 0.99 SMALLE ERVIOUS R SPLIT FOR PE Dep. S BE SMA FICIENT | R THAN RATIOS TING TH RVIOUS torage tLLER OR | 0.04 1.67 20.07 66.02 0.30 TIME STEP! BELOW 20% E AREA. LOSSES: (Above) EQUAL | *TOTA 0.0 1. 25. 66. | 51 (iii) 50 03 02 | |
|---|--|---|---|---|---|---|---|
| READ STORM | Filename | : C:\Us | ers\Gre | g\AppD mp\ | | | |
| Ptotal= 66.02 mm | | 838a8 : 25 YE | 55b-29b AR CHIC | 4-4b71-a46 AGO 4 HOUR | DESIGN | DISTRIBU | ΓI |
| TIME hrs 0.17 0.33 0.55 0.67 0.83 | mm/hr 4.50 4.98 5.61 6.45 7.70 9.70 | TIME hrs 1.17 1.33 1.50 1.67 1.83 2.00 | RAIN mm/hr 13.67 27.69 158.85 35.08 20.60 15.24 | TIME hrs 2.17 2.33 2.50 2.67 2.83 3.00 | RAIN mm/hr 12.32 10.44 9.14 8.15 7.39 6.78 | TIME hrs 3.17 3.33 3.50 3.67 3.83 4.00 | RAIN mm/hr 6.27 5.00 5.84 5.18 4.90 4.65 |
| CALIB | | | | | | | |
| STANDHYD (0062) ID= 1 DT=10.0 min Surface Area Dep. Storage Average Slope Length Mannings n | (ha)= (mm)= (%)= | ha)= (%)= 6 PERVIOU 0.34 1.00 1.00 58.31 0.013 | S PE | Dir. Conn. RVIOUS (i) 0.17 1.50 2.00 40.00 0.250 | | .00 | |
| Max.Eff.Inten.(m over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (min) (min)= (min)= | 158.85 10.00 1.54 10.00 0.17 | (ii) | 73.12 10.00 7.20 (ii) 10.00 0.13 | | | |
| PEAK FLOW | (cms) = (hrs) = (mm) = (mm) = | 0.04 1.50 65.02 66.02 0.98 | | 0.06 1.50 30.60 66.02 0.46 | *TOTA 0.1 1. 36. 66. | 00 (iii) 50 09 02 | |
| ***** WARNING: STORAG | SE COEFF. IS CAS WITH IMP | SMALLE ERVIOUS | R THAN RATIOS | TIME STEP! BELOW 20% | | | |
| (i) CN PROCEDU CN* = 5 (ii) TIME STEP THAN THE S (iii) PEAK FLOW | RE SELECTED 18.0 Ia = (DT) SHOULD TORAGE COEF DOES NOT IN Filename | FOR PE Dep. S BE SMA FICIENT CLUDE B : C:\Us ata\L 838a8 | RVIOUS torage LLER OR ASEFLOW ers\Gre ocal\Te 55b-29b | LOSSES: (Above) EQUAL IF ANY. | 7-7100b1 | 3d0872\8 | 17e5206 |
| TIME | : RATN | | | | | | RAIN mm/hr |
| 0.17 0.33 0.55 0.67 0.83 1.00 | 4.98 5.61 6.45 7.70 | 1.17 1.33 1.50 1.67 1.83 2.00 | 13.67 27.69 158.85 35.08 20.60 15.24 | TIME hrs 2.17 2.33 2.50 2.67 2.83 3.00 | 12.32 10.44 9.14 8.15 7.39 6.78 | 3.17 3.33 3.50 3.67 3.83 4.00 | 6.27 5.00 5.84 5.18 4.90 4.65 |
| CALIB STANDHYD (0064) ID= 1 DT=10.0 min | Area () | | | | (%)= 19 | .00 | |
| Surface Area Dep. Storage | (ha)= (mm)= | 0.41 1.00 | S PE | RVIOUS (i) 0.27 1.50 | | | |
| Average Slope Length Mannings n | (%)= (m)= = | 1.00 67.33 0.013 | | 2.00 40.00 0.250 | | | |
| Max.Eff.Inten.(n over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (min) (min)= (min)= | 158.85 10.00 1.67 10.00 0.17 | | 24.30 10.00 8.14 (ii) 10.00 0.12 | *TOTA | T.S.* | |
| | (cms) = (hrs) = (mm) = (mm) = CNT = | 0.06 1.50 65.02 66.02 0.98 | | 0.07 1.50 27.30 66.02 0.41 | | 25 (iii) 50 46 02 | |
| ***** WARNING: STORAG **** WARNING:FOR ARE YOU SHO | E COEFF. IS EAS WITH IMP | SMALLE ERVIOUS R SPLIT | R THAN RATIOS TING TH | TIME STEP! BELOW 20% E AREA. | | | |
| (i) CN PROCEDU CN* = 5 (ii) TIME STEP | RE SELECTED 8.0 Ia = (DT) SHOULD STORAGE COEF | FOR PE Dep. S BE SMA FICIENT | RVIOUS torage LLER OR | LOSSES: (Above) EQUAL | | | |
| READ STORM | Filename Comments | ata\L 838a8 | ocal\Te 55b-29b | g\AppD mp\ 4-4b71-a46 AGO 4 HOUR | | | |
| TIME | | | | | | | RAIN mm/hr |
| 0.17 0.33 0.50 0.67 0.83 | 4.50 4.98 5.61 6.45 7.70 9.70 | 1.17 1.33 1.50 1.67 1.83 2.00 | 13.67 27.69 158.85 35.08 20.60 15.24 | TIME hrs 2.17 2.33 2.50 2.67 2.83 3.00 | 12.32 10.44 9.14 8.15 7.39 6.78 | 3.17 3.33 3.50 3.67 3.83 4.00 | 6.27 5.00 5.84 5.18 4.90 4.65 |

| | ADD HYD (0027) 1 + 2 = 3 AREA QPEAK TPEAK R.V. (ha) (cms) (hys) (mm) |
|--|--|
| CALIB | |
| TANDRATANA DEPARTANA (4) | ID = 3 (0027): 3.19 0.528 1.50 31.93 |
| 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 Manninge n = 0.013 0.250 | NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| Max.Eff.Inten.(mm/hr)= 158.85 74.73 | ADD HYD (0027) |
| over (min) 10.00 10.00 Storage Coeff. (min)= 1.44 (ii) 9.37 (ii) Unit Hyd. Tpeak (min)= 10.00 10.00 | 3 + 2 = 1 |
| Unit Hyd. peak (cms)= 0.17 0.11 *TOTALS* | + ID2= 2 (0033): 0.80 0.117 1.50 29.55 |
| PEAK FLOW $(cms) = 0.03$ 0.03 0.062 (iii) TIME TO PEAK $(hrs) = 1.50$ 1.50 1.50 1.50 0.062 0.0 | ID = 1 (0027): 3.99 0.645 1.50 31.46 |
| RUNOFF VOLIME (mm)= 65.02 22.62 29.82 TOTAL RAINFALL (mm)= 65.02 66.02 RUNOFF COEFFICIENT = 0.98 0.34 0.45 | NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! **** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% | ADD HYD (0027) |
| YOU SHOULD CONSIDER SPLITTING THE AREA. (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: | 1 + 2 = 3 |
| (1) CM PROCEDURE SELECTED FOR PERVIOUS DOSSES. CN* = 58.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL | + ID2= 2 (0034): 0.67 0.100 1.50 29.47 |
| THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | ID = 3 (0027): 4.66 0.745 1.50 31.17 |
| | NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| READ STORM Filename: C:\Users\Greg\AppD | |
| ata\Local\Temp\ 838a855b-29b4-4b71-a467-7100b13d0872\817e5206 | ADD HYD (0027) 3 + 2 = 1 AREA QFEAK TPEAK R.V. |
| Ptotal= 66.02 mm Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI | ID1= 3 (0027): 4.66 0.745 1.50 31.17 |
| TIME RAIN TIME RAIN TIME RAIN TIME RAIN THE 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 | + ID2= 2 (0035): 0.65 0.051 1.50 25.03 |
| 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 | NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| 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 | ADD HYD (0027) |
| | 1 + 2 = 3 |
| CALIB STANDHYD (0069) Area (ha)= 0.86 | ID1= 1 (0027): 5.31 0.796 1.50 30.42 + ID2= 2 (0062): 0.51 0.100 1.50 36.09 |
| ID= 1 DT=10.0 min Total Imp(%) = 39.00 Dir. Conn.(%) = 15.00 | ID = 3 (0027): 5.82 0.896 1.50 30.91 |
| Surface Area (ha)= 0.34 0.52 Dep. Storage (mm)= 1.00 1.50 | NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| 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 | ADD HYD (0027) 3 + 2 = 1 |
| Max.Eff.Inten.(mm/hr)= 158.85 64.86 over (min) 10.00 20.00 Storage Coeff. (min)= 1.80 (ii) 10.19 (ii) | 3 + 2 = 1 AREA QPEAK TPEAK R.V. |
| Unit Hyd. Tpeak (min)= 10.00 20.00 Unit Hyd. peak (cms)= 0.17 0.08 | + ID2= 2 (0064): 0.68 0.125 1.50 34.46 |
| *TOTALS* PEAK FLOW (cms)= 0.06 0.05 0.083 (iii) TIME TO PEAK (hrs)= 1.50 1.67 1.50 | ID = 1 (0027): 6.50 1.021 1.50 31.29 |
| PEAK FLOW (cms)= 0.06 0.05 0.083 (iii) TIME TO PEAK (hr.s)= 1.50 1.67 1.50 RUNOFF VOLUME (mm)= 65.02 21.42 27.95 TOTAL RAINFALL (mm)= 66.02 66.02 | NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| RUNOFF COEFFICIENT = 0.98 0.32 0.42 | |
| **** WARNING: STORAGE COEFF. IS SWALLER THAN TIME STEP! **** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA. | ADD HYD (0027) 1 + 2 = 3 |
| (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: | ID1= 1 (0027): 6.50 1.021 1.50 31.29 + ID2= 2 (0068): 0.41 0.062 1.50 29.82 |
| CN* = 58.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL | ID = 3 (0027): 6.91 1.084 1.50 31.20 |
| THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| | |
| ADD HYD (0027) 1 + 2 = 3 | ADD HYD (0027) 3 + 2 = 1 |
| ID1= 1 (0023): 0.59 0.090 1.50 30.07 | ID1= 3 (0027): 6.91 1.084 1.50 31.20 |
| + ID== 2 (0025): 0.52 0.110 1.50 38.07 | + 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. | NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| | |
| ADD HYD (0027) | READ STORM Filename: C:\Users\Greg\AppD |
| 3 + 2 = 1 AREA QPEAK TPEAK R.V (ha) (cms) (hrs) (mm) | ata\Local\Temp\ 838a855b-29b4-4b71-a467-7100b13d0872\817e5206 |
| ID1= 3 (0027): 1.11 0.200 1.50 33.82 + ID2= 2 (0026): 0.48 0.074 1.50 30.34 | Ptotal= 66.02 mm Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI |
| ID = 1 (0027): 1.59 0.273 1.50 32.77 | 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 |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | 0.33 |
| | 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 |
| ADD HYD (0027) 1 + 2 = 3 | 1.00 9.70 2.00 15.24 3.00 6.78 4.00 4.65 |
| ID1= 1 (0027): 1.59 0.273 1.50 32.77 | |
| + ID2= 2 (0028): 0.61 0.110 1.50 34.17 | CALIB STANDHYD (0065) Area (ha)= 0.49 ID= 1 DT=10.0 min |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | 1D= 1 DT=10.0 min Total imp(*)= 26.00 |
| 1010 Late 1200 30 101 Include 2002 200 11 Art. | Surface Area (ha)= 0.13 0.36 Dep. Storage (mm)= 1.00 1.50 |
| Language (0000) | Average Slope (%)= 1.00 2.00 Length (m)= 57.15 40.00 |
| ADD HYD (0027) 3 + 2 = 1 | Mannings n = 0.013 0.250 Max.Eff.Inten.(mm/hr) = 158.85 43.77 |
| (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 | over (min) 10.00 20.00 Storage Coeff. (min)= 1.52 (ii) 11.34 (ii) |
| ID = 1 (0027): 2.53 0.449 1.50 33.50 | Unit Hyd. Tpeak (min)= 10.00 20.00 Unit Hyd. peak (cms)= 0.17 0.08 |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | "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 CORFFICIENT = 0.98 0.28 0.40 | ata\Local\Temp\ 838a65b-29b4-4b71-a467-7100b13d0872\817e5206 |
|--|--|
| ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! | Ptotal= 66.02 mm Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI |
| ***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA. | TIME RAIN 1.17 13.67 2.17 12.32 3.17 6.27 |
| (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 58.0 Ia = Dep. Storage (Above) | 0 33 4 98 1 33 27 69 2 33 10 44 3 33 5 00 |
| (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | 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 |
| (III) PEAK FLOW DUES NOT INCLIDUE BASEFLOW IF ANT. | 1.00 9.70 2.00 15.24 3.00 0.76 4.00 4.05 |
| READ STORM | CALIB STANDHYD (0063) Area (ha)= 0.31 |
| Ptotal= 66.02 mm Comments: 25 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI | ID= 1 DT=10.0 min Total Imp(%)= 41.00 Dir. Conn.(%)= 0.00 |
| TIME RAIN TIME RAIN TIME RAIN TIME RAIN THE RAI | Surface Area (ha) = 0.13 |
| 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 | Length (m)= 45.46 40.00 Mannings n = 0.013 0.250 |
| 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 | 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 |
| STANDHYD (0066) Area (ha)= 0.25 | TIME TO PEAK (EMP) = 1.50 1.50 1.50 RUNDEF (MULNE (mm)) = 65.02 24.43 24.41 TOTAL RAINFALL (mm) = 66.02 66.02 66.02 RUNDEF COESPICIENT = 0.98 0.37 0.37 |
| Surface Area (ha)= 0.12 0.13 Dep. Storage (mm)= 1.00 1.50 | **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! **** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% |
| Average Slope (%) = 1.00 2.00 Length (m) = 40.82 40.00 Mannings n = 0.013 0.250 | YOU SHOULD CONSIDER SPLITTING THE AREA. (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: |
| Max.Eff.Inten.(mm/hr)= 158.85 61.52 over (min) 10.00 10.00 Storage Coeff. (min)= 1.24 (ii) 9.81 (ii) | CN* = 58.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL |
| Unit Hyd. Tpeak (min)= 10.00 10.00 Unit Hyd. peak (cms)= 0.17 0.11 | THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. |
| PEAK FLOW (cms)= 0.03 0.01 0.049 (iii) | |
| TIME TO PEAK (hre) = 1.50 1.50 1.50 1.50 RUNDIFF VOLUME (mm) = 65.02 20.98 34.61 TOTAL RAINFALL (mm) = 66.02 66.02 66.02 66.02 RUNDIFF COEFFICIENT = 0.98 0.32 0.52 | ADD HYD (0037) 1 + 2 = 3 |
| **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! | ID1= 1 (0024): 0.08 0.040 1.50 29.06 + ID2= 2 (0029): 9.14 0.097 3.25 28.38 |
| (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 58.0 Ia = Dep. Storage (Above) | ID = 3 (0037): 9.22 0.097 3.25 28.38 |
| (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAR FLOW DOES NOT INCLUDE BRASEFLOW IF ANY. | NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| | ADD HYD (0037) |
| ADD HYD (0067) | 3 + 2 = 1 AREA QPEAK TPEAK R.V. |
| 1 + 2 = 3 AREA QPEAK TPEAK R.V. | |
| + ID2= 2 (0066): 0.25 0.049 1.50 34.61 | ID = 1 (0037): 9.31 0.098 3.23 28.20 |
| <pre>ID = 3 (0067): 0.74 0.097 1.50 29.06 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.</pre> | NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| | ADD HYD (0037) |
| DUHYD (0024) Inlet Cap.= 0.057 #of Inlets= 1 | 1 + 2 = 3 |
| #of Inlets= 1 AREA QPEAK TPEAK R.V | + ID2= 2 (0063): 0.31 0.033 1.50 24.41 |
| TOTAL HYD.(ID= 1): 0.74 0.10 1.50 29.06 | ID = 3 (0037): 9.62 0.101 3.17 28.08 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| MINOR SYS.(ID= 3): 0.66 0.06 1.50 29.06 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | |
| | ADD HYD (0037) 3 + 2 = 1 |
| ADD HYD (0031) | (ha) (cms) (hrs) (mm) ID1= 3 (0037): 9.62 0.101 3.17 28.08 |
| 1 + 2 = 3 AREA OPEAK TYEAK R.V. | + ID2= 2 (0070): 1.74 0.044 1.67 9.99 |
| + ID2= 2 (0027): 7.77 1.167 1.50 30.84 | NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| ID = 3 (0031): 8.43 1.224 1.50 30.70 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | |
| | V V I SSSSS U U A L (v 5.1.2003) |
| 3 + 2 = 1 AREA QPEAK TPEAK R.V. | V V I SS U U AA L V V I SS U U AAAAA L V V I SS U U A A L |
| 3 + 2 = 1 AREA QPEAK TYEAK R.V. | VV I SSSS UUUUU A A LLLLL OOO TTTTT TTTTT H H Y Y M M OOO TM |
| ID = 1 (0031): 9.14 1.259 1.50 29.44 | 000 TTTTTTTTT H H Y Y W M 000 TM O T T H H Y Y M M O O O O T T H H Y M M O O 000 T T H H Y M M OOO |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | OOO T T H H Y M M OOO Developed and Distributed by Civica Infrastructure Copyright 2007 - 2013 Civica Infrastructure |
| RESERVOIR(0029) | All rights reserved. |
| IN= 2> OUT= 1 DT= 1.0 min OUTFLOW STORAGE OUTFLOW STORAGE | ***** DETAILED OUTPUT ***** |
| (cms) (ha.m.) (cms) (ha.m.) 0.0000 0.0000 0.1080 0.2030 0.0085 0.0227 0.1807 0.2551 | Input filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\V02\voin.dat Output filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-la86-4318-8861- |
| 0.0130 0.0491 0.2663 0.3117 0.0163 0.0772 0.3630 0.3731 | e38dc4dfd2f8\36a9ff03-5b0a-473d-b10e-17f691784387\scenari Summary filename: C:\Users\Greg\AppData\Local\Civica\VH5\b59b925c-1a86-4318-8861- |
| 0.0190 0.1119 0.4697 0.4393 0.0512 0.1553 0.0000 0.0000 | e38dc4dfd2f8\36a9ff03-5b0a-473d-b10e-17f691784387\scenari |
| AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (cms) (hrs) (cms) (10 + 1) | DATE: 01/05/2019 TIME: 10:33:09 USER: |
| DEAK FLOW DEDUCTION [Oout/Oin]/\$)- 7.72 | |
| TIME SHIFT OF PEAK FLOW (min)=105.00 MAXIMUM STORAGE USED (ha.m.)= 0.1939 | COMMENTS: |
| | |
| READ STORM Filename: C:\Users\Greg\AppD | ** SIMULATION : Run 05 |

| READ STORM Filename: C:\Users\Greg\AppD ata\Local\Temp\ | 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 FAILMRALL (mm) = 72.96 RUNOFF COEFFICIENT = 0.99 0.38 0.48 |
|--|--|
| 8388555-2964-467-1001340872\(675\) 8508659 | ***** WARRING: STORAGE COEFF. IS SMALLER THAN TIME STEP! *********************************** |
| CALIB MASHYD (0038) | READ STORM Filename: C:\Users\Greg\AppD ata\Loca\Temp\\ 838a55b-2944-4b7\=a467-7100b13d0872\67 Ptotal= 72.96 mm |
| READ STORM | CALTB STANDHYU (0025) Area (ha)= 0.52 |
| 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 Opeak (cms) = 0.399 PEAK FLOW (cms) = 0.055 (i) TIME TO PEAK (hrs) = 1.667 RINOFF VOLUME (mm) = 12.608 TOTAL RAINFALL (mm) = 72.962 RINOFF COEFFICIENT = 0.173 (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | RUNDEF VOLLME (mm) = 72.16 39.04 43.67 TOTAL RAINALL (mm) = 72.96 72.96 RUNDEF COEFFICIENT = 0.99 0.54 0.60 ****** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! **** WARNING: FOR AREAS NITH IMPERVIOUS RAITOS BELOW 208 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 | READ STORM Filename: C:\Usera\Grey\AppD ata\Local(17em)\Loca |
| CALIB NASHTD (0071) Area (ha)= 0.71 Curve Number (CN)= 58.0 ID=1 IDT=10.0 min Ia (mm)= 5.00 % of Linear Res.(N)= 3.00 Unit Hyd Qpeak (cms)= 0.163 PEAK FLOW (cms)= 0.045 (i) TIME TO PEAK (hrs)= 1.500 RINOFF VOLUME (mm)= 17.433 TOTAL RAINFALL (mm)= 72.962 RINOFF COEFFICIENT = 0.239 (1) 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 |
| hes mm/hr 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 | (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 58.0 |
| Length (m)= 62.72 40.00 Manninge 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 (i1) 8.47 (i1) Unit Hyd. Tpeak (min)= 10.00 10.00 Unit Hyd. peak (cms)= 0.17 0.12 *TOTALS* | 0.50 \$.08 1.50 186.56 2.50 8.89 3.50 0.67 \$.97 1.67 44.81 2.67 7.80 3.67 0.83 7.29 1.83 23.44 2.83 6.96 3.83 1.00 9.53 2.00 16.26 3.00 6.30 4.00 |

| STANDHYD (0028) ID= 1 DT=10.0 min | Area Total In | (ha) = 0.6 p(%) = 62.0 | | | .00 | |
|--|---|---|---|--|------------------------------|------------------------------|
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha)= (mm)= (%)= (m)= = | 0.38 0.80 1.00 63.77 0.013 | PERVIOUS (i 0.23 1.50 2.00 40.00 0.250 | .) | | |
| Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | mm/hr)= (min) | 186.56 10.00 1.52 (ii 10.00 0.17 | 188.06 10.00 7.00 (ii 10.00 0.13 | | | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI | (cms) = (hrs) = (mm) = (mm) = | 0.04 1.50 72.16 72.96 0.99 | 0.09 1.50 34.04 72.96 0.47 | *TOTA 0.1 1. 39. 72. | 38 (iii) 50 37 96 | |
| **** WARNING: STORA **** WARNING:FOR AR | GE COEFF. I | | HAN TIME STEF TIOS BELOW 20 | 18 | | |
| (i) CN PROCED CN* = (ii) TIME STEP | URE SELECTE 58.0 Ia (DT) SHOUI STORAGE COE DOES NOT I | D FOR PERVI = Dep. Stor D BE SMALLE FFICIENT. | OUS LOSSES: age (Above) R OR EQUAL FLOW IF ANY. | | | |
| READ STORM Ptotal= 72.96 mm | Filenan | e: C:\Users ata\Loca 838a855b | \Greg\AppD 1\Temp\ -29b4-4b71-a4 | | | |
| | | | | | | |
| 0.1 | 7 3.99 | 1.17 14 | .27 2.17 .90 2.33 | 12.62 | 3.17 | 5.79 |
| 0.5 0.6 0.8 1.0 | 5.08 7 5.97 3 7.29 0 9.53 | 1.50 186 1.67 44 1.83 23 2.00 16 | AIN TIME hrs 27 2.17 .90 2.33 .56 2.50 .81 2.67 .44 2.83 .26 3.00 | 7.80 6.96 6.30 | 3.50 3.67 3.83 4.00 | 4.98 4.65 4.37 4.14 |
| CALIB STANDHYD (0030) ID= 1 DT=10.0 min | | (ha)= 0.3 | | | | |
| | , | MDEBUTOIIS | PERVIOUS (i | | .00 | |
| Surface Area Dep. Storage Average Slope Length Mannings n | = | 0.013 | 1.50 2.00 40.00 0.250 | | | |
| Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (min)= (cms)= | 186.56 10.00 1.26 (ii 10.00 0.17 | 137.67 10.00) 7.47 (ii 10.00 0.13 |) *TOTA | LS* | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI | | 0.04 1.50 72.16 72.96 0.99 | 0.04 1.50 30.58 72.96 0.42 | 0.0 1. 40. 72. 0. | 81 (iii) 50 97 96 | |
| **** WARNING: STORA (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW | URE SELECTE 58.0 Ia (DT) SHOUI STORAGE COE DOES NOT I | D FOR PERVI = Dep. Stor D BE SMALLE FFICIENT. NCLUDE BASE | OUS LOSSES: age (Above) R OR EQUAL | | | |
| READ STORM Ptotal= 72.96 mm | | e: C:\Users ata\Loca 838a855b s: 50 year | 1\Temp\ -29h4-4h71-a4 | 67-7100b1 | .3d0872\6 | 7b5ebc |
| | | | AIN TIME /hr hrs .27 2.17 | | TIME | RAIN |
| 0.1 0.3 0.5 0.6 0.8 | 3 4.45 0 5.08 7 5.97 | 1.33 33 1.50 186 1.67 44 | .27 2.17 .90 2.33 .56 2.50 .81 2.67 .44 2.83 .26 3.00 | 10.39 8.89 7.80 | 3.33 3.50 3.67 | E 70 |
| CALIB STANDHYD (0032) ID= 1 DT=10.0 min | Area Total In | (ha) = 0.6 | 6 0 Dir. Conn | 1.(%)= 10 | .00 | |
| Surface Area Dep. Storage Average Slope Length Mannings n | | MPERVIOUS 0.24 0.80 1.00 66.33 0.013 | PERVIOUS (1 0.42 1.50 2.00 40.00 0.250 | .) | | |
| Max.Eff.Inten.(| (min) | 186.56 10.00 1.56 (ii 10.00 0.17 | 83.91 10.00 | .) | | |
| PEAK FLOW TIME TO PEAK | (cms)= (hrs)= (mm)= (mm)= | 0.03 1.50 72.16 72.96 0.99 | 0.07 1.50 25.50 72.96 0.35 | *TOTA 0.1 1. 30. 72. 0. | 02 (iii) 50 16 96 | |
| **** WARNING: STORA **** WARNING:FOR AR YOU SH | | | HAN TIME STEF TIOS BELOW 20 G THE AREA. | !! | | |
| (i) CN PROCED CN* = (ii) TIME STEP | URE SELECTE 58.0 Ia (DT) SHOUI STORAGE COE | D FOR PERVI = Dep. Stor D BE SMALLE FFICIENT. | OUS LOSSES: age (Above) R OR EQUAL | | | |
| READ STORM | Filenan | e: C:\Users | \Greg\AppD | | | |
| Ptotal= 72.96 mm | Comment | 838a855b | -29b4-4b71-a4 | | | |

| TIMM hre 0.17 0.33 0.55 0.67 0.83 1.00 | mm/hr 3.99 4.45 5.08 5.97 7.29 | TIME hrs 1.17 1.33 1.50 1.67 1.83 2.00 | RAIN mm/hr 14.27 33.90 186.56 44.81 23.44 16.26 | TIME hrs 2.17 2.33 2.50 2.67 2.83 3.00 | RAIN mm/hr 12.62 10.39 8.89 7.80 6.96 6.30 | TIME hrs 3.17 3.33 3.50 3.67 3.83 4.00 | RAIN mm/hr 5.79 5.33 4.98 4.65 4.37 4.14 |
|--|--|--|--|---|---|---|---|
| CALIB STANDHYD (0033) ID= 1 DT=10.0 min | Area Total In | (ha)= mp(%)= 4 | | Dir. Conn | | 13.00 | |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha) = (mm) = (%) = (m) = | 0.38 0.80 1.00 73.03 0.013 | | 0.42 1.50 2.00 40.00 0.250 | , | | |
| Max.Eff.Inten.(w over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (min) = (min) = | 10.00 | (ii) | 13.44 10.00 8.36 (ii 10.00 0.12 | | rals* | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIE | (cms) = (hrs) = (mm) = (mm) = (NT = | 0.05 1.50 72.16 72.96 0.99 | | 0.09 1.50 28.53 72.96 0.39 | 0. 3 34 72 | 148 (iii 1.50 1.20 2.96).47 |) |
| **** WARNING: STORAG **** WARNING: FOR ARE YOU SHO | E COEFF. : | IS SMALLI | ER THAN S RATIOS | TIME STEP BELOW 20 E AREA. | ! | | |
| (i) CN PROCEDU CN* = 5 (ii) TIME STEP THAN THE (iii) PEAK FLOW | 8.0 Ia (DT) SHOUI TORAGE CON DOES NOT | = Dep. S LD BE SMA EFFICIENT | Storage ALLER OR F. BASEFLOW | (Above) EQUAL IF ANY. | | | |
| READ STORM | Comment | 838a8 s: 50 YI: | Local\Te 855b-29b EAR CHIC | mp\ 4-4b71-a4 AGO 4 HOU | R DESIGN | DISTRIB | |
| TIME hrs 0.17 | RAIN mm/hr 3.99 | TIME hrs 1.17 | RAIN mm/hr 14.27 | TIME hrs 2.17 2.33 2.50 2.67 2.83 3.00 | RAIN mm/hr 12.62 | TIME hrs 3.17 | RAIN mm/hr 5.79 |
| 0.50 0.67 | 4.45 5.08 5.97 | 1.33 1.50 1.67 | 33.90 186.56 44.81 | 2.33 | 10.39 8.89 7.80 | 3.33 3.50 3.67 | 5.79 5.33 4.98 4.65 4.37 4.14 |
| 0.83 1.00 | 9.53 | 2.00 | 16.26 | 3.00 | 6.30 | 4.00 | 4.14 |
| Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW | (m) = = = = = = = = = = = = = = = = = = = | 1.56 10.00 0.17 | (ii) | 40.00 0.250 84.70 10.00 9.11 (ii 10.00 0.11 0.06 1.50 | *TOT | TALS* 125 (iii |) |
| RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIE | (mm) = (mm) = NT = | 72.16 72.96 0.99 | | 25.59 72.96 0.35 | 33 72 0 | 3.97 2.96).47 | |
| **** WARNING:FOR ARE YOU SHO (i) CN PROCEDU CN* = 5 (ii) TIME STEP THAN THE S (iii) PEAK FLOW | WE SELECTE 8.0 Ia (DT) SHOUL TORAGE CON DOES NOT | DER SPLIT ED FOR PI = Dep. S LD BE SM EFFICIENT INCLUDE I | TTING TH ERVIOUS Storage ALLER OR F. BASEFLOW | LOSSES: (Above) EQUAL | | | |
| READ STORM | | 838a8 | Local\Te | mp\ 4-4b71-a4 | 67-7100h R DESIGN | o13d0872\ DISTRIB | 67b5ebc UTI |
| TIME hrs 0.17 0.33 0.50 0.67 0.83 | mm/hr | TIME hrs 1.17 1.33 1.50 1.67 1.83 2.00 | RAIN mm/hr 14.27 33.90 186.56 44.81 23.44 16.26 | TIME hrs 2.17 2.33 2.50 2.67 2.83 3.00 | RAIN mm/hr 12.62 10.39 8.89 7.80 6.96 6.30 | TIME hrs 3.17 3.33 3.50 3.67 3.83 4.00 | RAIN mm/hr 5.79 5.33 4.98 4.65 4.37 4.14 |
| CALIB STANDHYD (0035) ID= 1 DT=10.0 min | Area Total In | (ha)= np(%)= | 0.65 | Dir. Conn | .(%)= 1 | 11.00 | |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha) = (mm) = (%) = (m) = | 0.19 0.80 1.00 65.83 0.013 | | RVIOUS (1 0.45 1.50 2.00 40.00 0.250 |) | | |
| Max.Eff.Inten.(w over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (min) (min)= | 186.56 10.00 1.55 10.00 0.17 | (ii) | 70.20 10.00 9.68 (ii 10.00 0.11 | | | |
| TIME TO PEAK | (cms) = (hrs) = (mm) = (mm) = | 0.04 1.50 72.16 72.96 0.99 | | 0.06 1.50 23.81 72.96 0.33 | 0. 1 29 72 | TALS* .096 (iii L.50 9.12 2.96).40 |) |
| **** WARNING: STORAG | E COEFF. | IS SMALLI | ER THAN | TIME STEP | ! | | |

TOTALS 0.078 (iii)

0.148 (iii)

38.56

```
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (m)=
                   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

(IN* = 58.0 Ia = Dep. Storage (Above)
(i) TIME STEPE (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASSFLOW IF ANY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Max.Eff.Inten.(mm/hr)=
over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             186.56
10.00
1.35 (ii)
10.00
0.17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     94.94
10.00
8.56 (ii)
10.00
0.12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0.04
1.50
71.96
72.96
0.99
                                                                                                                                                                                                                                                                                                                                                                                                                                                               PEAK FLOW (Cms) =
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0.04
1.50
26.72
72.96
0.37
                    READ STORM
                                                                                                Filename: C:\Users\Greg\AppD
                                                                                                ata\Loca\\Temp\
ata\Loca\\Temp\
838855b-29b4-4b71-a467-7100b13d0872\67b5ebc9
Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
                                                                                                                                                                                                                                                                                                                                                                                                                                          ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.
        Ptotal= 72.96 mm
                                                                                            | RAIN | TIME | RAIN | TIME | RAIN | TIME | 
                                                                                                                                                                                                                                                                                                            mm/hz
5.79
5.33
4.98
4.65
4.37
4.14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                            (1) CR 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
Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
   Ptotal= 72.96 mm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IMPERVIOUS
                                                                                                                                                                                   PERVIOUS (i)
                                                                                                                                     0.34
1.00
1.00
58.31
0.013
                     Surface Area
                     Dep. Storage
Average Slope
Length
Mannings n
                   Max.Eff.Inten.(mm/hr) = over (min)
Storage Coeff. (min) = Unit Hyd. Tpeak (min) = Unit Hyd. peak (cms) =
                                                                                                                                10.00 10.00

1.44 (ii) 6.62 (ii)

10.00 10.00

0.17 0.13
                                                                                                                                                                                                                                                                                                                                                                                                                                             PEAK FLOW (cms) =
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IMPERVIOUS PERVIOUS (i)
0.34 0.52
1.00 1.50
1.00 2.00
75.72 40.00
0.013 0.250
***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Average Slope
Length
Mannings n
                   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

(IN* = 58.0 Ia = Dep. Storage (Above)
(i) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.
(ii) PEAR FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Max.Eff.Inten.(mm/hr) = over (min)
Storage Coeff. (min) =
Unit Hyd. Tpeak (min) =
Unit Hyd. peak (cms) =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             186.56
10.00
1.68 (ii)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   82.57
10.00
9.30 (ii)
10.00
0.11
                                                                                                                                                                                                                                                                                                                                                                                                                                                               PEAK FLOW (cms) =
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0.07
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0.08
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1.50
71.96
72.96
0.99
                    READ STORM
                                                                                             Filename: C:\Users\Greg\AppD
       ata\Local\Temp\
ata\Local\Temp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0.35
                                                                                                                                                                                                                                                                                                                                                                                                                                          ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.
                                                                    TIME RAIN TIME RAIN | TIME mw/hr | Thre mm/hr | Thre mm/h
                                                                                                                                                                 RAIN | TIME
mm/hr | hrs
14.27 | 2.17
33.90 | 2.33
186.56 | 2.50
44.81 | 2.67
23.44 | 2.83
16.26 | 3.00
                                                                                                                                                                                                                                mm/hr
12.62 |
10.39 |
8.89 |
7.80 |
6.96 |
6.30 |
                                                                                                                                                                                                                                                                                                                                                                                                                                                             (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 58.0 Ia = Dep. Storage (Above)
(ii) TIME STEP LOT) SHOULD BE SMALLER OR EQUATION THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                             AREA QPEAK TPEAK R.V.

TDL= 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 20
   | CALIB
| STANDHYD ( 0064)
|ID= 1 DT=10.0 min
                                                                                             Area (ha)= 0.68 Total Imp(%)= 60.00 Dir. Conn.(%)= 19.00
                                                                                                                      IMPERVIOUS PERVIOUS (i)
                                                                                                                                      0.41
1.00
1.00
                                                                                                                                                                                              0.27
1.50
2.00
                    Dep. Storage
Average Slope
Length
Mannings n
                                                                                                                                                                                                                                                                                                                                                                                                                                                               NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                                                                                                                      67.33
                                                                                                                                                                                            40.00
                    Max.Eff.Inten.(mm/hr)=

over (min)

Storage Coeff. (min)=

Unit Hyd. Tpeak (min)=

Unit Hyd. peak (cms)=
                                                                                                                                   186.56
10.00
1.57 (ii)
10.00
0.17
                                                                                                                                                                                       156.58
10.00
7.47 (ii)
10.00
0.13
                                                                                                                                                                                                                                                                                                                                                                                                                                           | ADD HYD ( 0027)|
| 3 + 2 = 1 |
                                                                                                                                                                                                                                                                                                                                                                                                                                                               PEAK FLOW (cms) =
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT =
                                                                                                                                      0.07
1.50
71.96
72.96
0.99
                                                                                                                                                                                                                                                                                                                                                                                                                                                             NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.
                                                                                                                                                                                                                                                                                                                                                                                                                                             | ADD HYD ( 0027)|
| 1 + 2 = 3 |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TPEAK R.V.
(hrs) (mm)
1.50 37.74
1.50 39.37
                   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

(IN* = 58.0 Ia = Dep. Storage (Above)

(i) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.

(ii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ID1= 1 ( 0027):
+ ID2= 2 ( 0028):
                                                                                                                                                                                                                                                                                                                                                                                                                                                               NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                    READ STORM
                                                                                                ata\Local\Temp\
838a855b-29b4-4b71-a467-7100b13d0872\67b5ebc9
Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI
                                                                                                                                                                                                                                                                                                                                                                                                                                           | ADD HYD ( 0027)|
| 3 + 2 = 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm) 2.20 0.481 1.50 38.19 0.33 0.081 1.50 40.97
                                                                                                2.53 0.562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1.50
                                                                                                                                                                                                                                                                                                                                                                                                                                                               NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                                                                                                                                                                                                                                                                                                                                                                                                                           | ADD HYD ( 0027)|
| 1 + 2 = 3 |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AREA QPEAK
(ha) (cms)
2.53 0.562
0.66 0.102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TPEAK R.V.
(hrs) (mm)
1.50 38.56
1.50 30.16
  ID1= 1 ( 0027):
+ ID2= 2 ( 0032):
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ID = 3 ( 0027):
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3.19 0.664
                    Surface Area (ha)=
Dep. Storage (mm)=
Average Slope (%)=
                                                                                                                                                                                                                                                                                                                                                                                                                                                             NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY
```

| ADD HYD (0027) | |
|--|--|
| 3 + 2 = 1 | READ STORM Filename: C:\Users\Greg\AppD ata\Local\Tremp\ 8384855b-29b4-4b71-a467-7100b13d0872\67b5ebc9 |
| + ID2= 2 (0033): 0.80 0.148 1.50 34.20 | Ptotal= 72.96 mm Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI |
| ID = 1 (0027): 3.99 0.812 1.50 36.29 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | TIME RAIN TIME R |
| | 0.33 |
| ADD HYD (0027) | 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 |
| 1 + 2 = 3 | |
| + ID2= 2 (0034): | CALIB |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | ID= 1 DT=10.0 min Total Imp(%)= 49.00 Dir. Conn.(%)= 31.00 |
| | IMPERVIOUS PERVIOUS (i) |
| ADD HYD (0027) 3 + 2 = 1 | Average Slope (%) = 1.00 2.00 Length (m) = 40.82 40.00 Mannings n = 0.013 0.250 |
| ID1= 3 (0027): 4.66 0.937 1.50 35.96 | Man 766 Taban (mg/bu) 100 50 70 70 |
| + ID2= 2 (0035): | |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | *TOTALS* |
| | TIME TO PEAK (http://discrete.com/line/reserved. |
| 1 + 2 = 3 | ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! |
| + ID2= 2 (0062): 0.51 0.125 1.50 41.46 | (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 58.0 Ia = Dep. Storage (Above) |
| ID = 3 (0027): 5.82 1.158 1.50 35.68 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | (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) | ADD HYD (0067) |
| 3 + 2 = 1 | 1 + 2 = 3 |
| + ID2= 2 (0064): 0.68 0.156 1.50 39.57 | + ID2= 2 (0066): 0.25 0.059 1.50 39.44 |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| | |
| ADD HYD (0027) 1 + 2 = 3 | DUHYD (0024) Inlet Cap.= 0.057 #of Inlets= 1 |
| | Total(cms)= 0.1 AREA QPEAK TPEAK R.V. (mm) (cms) (hrs) (mm) (TOTAL HYD.(ID=1): 0.74 0.12 1.50 33.39 |
| ID = 3 (0027): 6.91 1.393 1.50 35.98 | MAJOR SYS.(ID= 2): 0.12 0.06 1.50 33.39 |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | MINOR SYS.(ID= 3): 0.62 0.06 1.50 33.39 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| | |
| ADD HYD (0027) 3 + 2 = 1 | ADD HYD (0031) 1 + 2 = 3 |
| 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 | ID = 3 (0031): 8.39 1.598 1.50 35.42 |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| READ STORM Filename: C:\Users\Greg\AppD | |
| ata\Local\Temp\ 838a855b-29b4-4971-a467-7100b13d0872\67b5ebc9 Ptotal= 72.96 mm | ADD HYD (0031) 3 + 2 = 1 |
| TIME RAIN TIME RAIN TIME RAIN TIME RAIN | ID1= 3 (0031): 8.39 1.598 1.50 35.42 + ID2= 2 (0071): 0.71 0.045 1.50 17.43 |
| hrs mm/hr 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 | ID = 1 (0031): 9.10 1.643 1.50 34.02 |
| 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 | NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| 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 | RESERVOIR (0029) |
| | DT= 1.0 min OUTFLOW STORAGE OUTFLOW STORAGE |
| CALIB STANDHYD (0065) Area (ha) = 0.49 | 0.0130 0.0491 0.2663 0.3117 |
| IMPERVIOUS PERVIOUS (i) Surface Area (ha)= 0.13 0.36 | 0.0163 0.0772 0.3630 0.3731 0.0190 0.1119 0.4697 0.4393 0.0512 0.1553 0.0000 0.0000 |
| Dep. Storage (mm)= 1.00 1.50 | ADPA ODPAK TOPAK D.U. |
| Mannings n = 0.013 0.250 | (ma) (cms) (hrs) (mm) (hrs) (mm) (hrs) (cms) (hrs) (cms) (hrs) (mm) (hrs) (cms) (cms |
| Max.Eff.Inten.(mm/hr) = 186.56 56.04 over (min) 10.00 20.00 Storage Coeff. (min) = 1.42 (ii) 10.32 (ii) | PEAK FLOW REDUCTION [Qout/Qin](%)= 7.85 TIME SHIFT OF PEAK FLOW (min)= 75.00 |
| Unit Hyd. Tpeak (min)= 10.00 20.00 Unit Hyd. peak (cms)= 0.17 0.08 | MAXIMUM STORAGE USED (ha.m.)= 0.2180 |
| *TOTALS* PEAK FLOW (cms)= 0.04 0.03 0.059 (iii) TIME TO FEAK (hrs)= 1.50 1.67 1.50 | |
| PERK FLOW (cmms)= 0.04 0.03 0.059 (iii) TIME TO PERK (hrs)= 1.50 1.67 1.50 RUNOFF VOLUME (mm)= 71.96 21.77 30.30 TOTAL RAINFALL (mm)= 72.96 72.96 RUNOFF COEFFCIENT = 0.99 0.30 0.42 | READ STORM Filename: C:\Users\Greg\AppD at\Local\Temp\ |
| **** MARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! *********************************** | Ptotal= 72.96 mm Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI TIME RAIN TIME RAIN TIME RAIN TIME RAIN hrs mm/hr hrs hrs mm/hr hrs |
| (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 58.0 | 0.17 |
| (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | 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 |
| (III) FEAR FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | 1.00 9.55 2.00 16.26 3.00 6.30 4.00 4.14 |

| | 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 |
|--|--|
| CALIB STANDHYD (0063) Area (ha)= 0.31 ID= 1 Dr=10.0 min | 1.00 11.07 2.00 19.28 3.00 7.24 4.00 4.70 |
| IMPERVIOUS PERVIOUS (i) | CALIB |
| 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 FLOM (cms) = 0.005 (i) TIME TO PEAK (hrs) = 1.500 RINDIFF VOLUME (mm) = 16.799 TOTAL RAINFALL (mm) = 83.902 RINDIFF CORFICIENT = 0.200 |
| PEAK FLOW (cms)= 0.00 0.04 0.043 (iii) TIME TO PEAK (hrs)= 1.50 1.50 1.50 1.50 RINDEF VOLUME (mm)= 71.96 28.77 28.75 TOTAL RAINFALL (mm)= 72.96 72.96 72.96 RINDEF COEFFICIENT = 0.99 0.39 0.39 | (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. |
| ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! **** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% *YOU SMOULD CONSIDER SPLITTING THE AREA. | READ STORM Filename: C:\Users\Greg\AppD ata\Loca\Tremp\ |
| (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 58.0 Ia = Dep. Storage (Above) (ii) THME STEP (LT) SHOULD BE SMALLER OR EQUIDA THAIN THE STOKAGE CODEFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | Ptotal = 83.90 mm Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS TIME |
| ADD HYD (0037) | 1.00 11.07 2.00 19.28 3.00 7.24 4.00 4.70 |
| ID = 3 (0037): 9.22 0.129 2.75 32.91 NOTE: PEAK FLONS DO NOT INCLUDE BASEFLOWS IF ANY. | NASHYD (0070) |
| | Unit Hyd Qpeak (cms)= 0.399 PEAK FLOW (cms)= 0.092 (i) |
| ADD HYD (0037) | TIME TO PEAK (hrs)= 1.667 RUNDFF VOLUME (mm)= 17.185 TOTAL RAINFALL (mm)= 83.902 RUNDFF COEFFICIENT = 0.205 |
| ID1= 3 (0037): 9.22 0.129 2.75 32.91 + ID2= 2 (0038): 0.09 0.003 1.50 12.32 | (1) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. |
| ID = 1 (0037): 9.31 0.130 2.73 32.71 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | READ STORM Filename: C:\Users\Greg\AppD |
| | Tablanum |
| ADD HTD (0037) | TIME RAIN TIME RAIN TIME RAIN TIME RAIN TIME RAIN hrs mm/hr 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 2.12 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 |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | 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 |
| ADD HYD (0037) | CALIB NASHYD (0071) Area (ha)= 0.71 Curve Number (CN)= 58.0 ID= 1.0 min Ia (mm)= 5.00 # of Linear Res.(N)= 3.00 |
| ID1= 3 (0037): 9.62 0.134 2.65 32.58 + ID2= 2 (0070): 1.74 0.065 1.67 12.61 | ID= 1 DT=10.0 min Ta (mm) = 5.00 # of Linear Res.(N) = 3.00 |
| ID = 1 (0037): 11.36 0.185 1.50 29.52 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | PEAK FLOW (cms)= 0.056 (i) TIME TO PEAK (hrs)= 1.500 RUNDGF VOLUME (mm)= 22.519 |
| | RUNOFF VOLUME (mm) = 83.902 TOTAL RAINFALL (mm) = 83.902 RUNOFF COEFFICIENT = 0.268 |
| 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 | (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. |
| V V I SS U U A A L VV I SSSS UUUU A A LLLLL | READ STORM Filename: C:\Users\Greg\AppD ata\Local\Temp\ |
| 000 TTTTT TTTTT H H Y Y M M 000 TM 0 0 T T H H YY MM MM 0 0 0 0 T T H H Y M M 0 0 000 T T H H Y M M 000 | 838855b-2964-4677-120513d0877\d573de18 Ptotal= 83.90 mm Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS TIME RAIN TIME RAIN |
| 000 T H H Y M M 000 beveloped and Distributed by Civica Infrastructure topyright 2007 - 2013 Civica Infrastructure ll rights reserved. | TIME RAIN TIME RAIN 'TIME RAIN TIME RAIN RAIN RAIN 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 |
| ***** DETAILED OUTPUT***** | 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 |
| Input filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\VOZ\voin.dat Output filename: C:\Users\Greg\AppGata\Local\Civica\VH5\b59b935c-la86-4318-8861- | 1.00 11.07 2.00 19.28 3.00 7.24 4.00 4.70 |
| 38dc4dfd2f8\8e89fb65-26b5-4fca-b495-0fa80ff2ba97\scenari Summary filename: C'\Usera\Creg\Apphata\Local\Crivica\WH\$\b59b925c-1a86-4318-8861- 38dc4dfd2f8\8e98fb65-26b5-4fca-b495-0fa80ff2ba97\scenari | CALIB STANDHYD (0023) Area (ha)= 0.59 |
| ATE: 01/05/2019 TIME: 10:33:09 | ID= 1 DT=0.0 min Total Imp(%) = 47.00 Dir. Conn.(%) = 16.00 Total Imp(%) = 47.00 Dir. Conn.(%) = 47.00 Dir. Co |
| SER: | Dep. Storage (mm)= 0.80 1.50 Average Slope (%)= 1.00 2.00 Length (m)= 62.72 40.00 |
| OMMENTS: | 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 |
| ** SIMULATION : Run 06 | PEAK FLOW (cms) = 0.17 |
| READ STORM Filename: C:\Users\Greg\AppD | RUNOFF COEFFICIENT = 0.99 0.41 0.50 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! |
| Ptotal= 83.90 mm Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS | ***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA. |
| hrs um/hr hrs um/hr hrs um/hr hrs um/hr hrs um/hr 0.17 4.50 1.17 16.86 2.17 14.83 3.17 6.60 | (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.
                                                                                                                                                                Filename: C:\Users\Greg\AppD
ata\Local\Temp\
838a855b-29b4-4b71-a467-7100b13d0872\d57abe18
Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
                                                                                                                      IMPERVIOUS PERVIOUS (i)
0.37 0.15
0.80 1.50
1.00 2.00
58.88 40.00
0.013 0.250
                                   Surface Area
Dep. Storage
Average Slope
Length
Mannings n
                                 Max.Eff.Inten.(mm/hr) = over (min)
Storage Coeff. (min) =
Unit Hyd. Tpeak (min) =
Unit Hyd. peak (cms) =
                                                                                                                                                                                                                          205.92
10.00
1.39 (ii)
10.00
0.17
                                                                                                                                                                                                                                                                                                                                 343.21
10.00
5.70 (ii)
10.00
0.14
                                                                                                                                                                                                                                                                                                                                                                                                                                       *TOTALS*
0.163 (iii)
                                   PEAK FLOW (cms) =
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT =
                                                                                                                                                                                                                                     0.04
                                                                                                                                                                                                                                                                                                                                            0.12
                                                                                                                                                                                                                                                                                                                                                                                                                                                   1.50
  ***** 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)

(i) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.

(ii) PEAK PLOW DOES NOT INCLUDE BASEFLOW IF ANY.
      | READ STORM | Filename: C:\Users\Greg\AppD | ata\Loca\Temp\ | 838855b-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 
      | CALIB | STANDHYD ( 0026) | Area (ha) = 0.48 | ID= 1 DT=10.0 min | Total Imp(%) = 50.00 Dir. Conn.(%) = 14.00 | IMPERVIOUS (i) | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ..
                                   Surface Area
Dep. Storage
Average Slope
Length
Mannings n
                                 Max.Eff.Inten.(mm/hr)=
over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)=
                                                                                                                                                                                                                                                                                                                            143.86
10.00
7.46 (ii)
10.00
0.13
                                                                                                                                                                                                                                 10.00
1.36 (ii)
10.00
0.17
                                                                                                                                                                                                                                                                                                                                                                                                                                     *TOTALS*
0.111 (iii)
1.50
42.83
83.90
0.51
                                                                                                                                                                                                                                        0.04
1.50
83.10
83.90
0.99
                                                                                                                                                                                                                                                                                                                                          0.07
1.50
36.29
83.90
0.43
                                   PEAK FLOW (Cms) =
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT =
***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.
                                 Filename: C:\Users\Greg\AppD
ata\Local\Temp\
838a855b-29b4-4b71-a467-7100b13d0872\d57abe18
Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS
                                                                                                                                                                | PAIN | TIME | RAIN | TIME | RAIN | TIME | IMP/RT | TIME | TIM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       mm/hr
6.60
6.10
5.66
5.28
4.98
4.70
      (ha)=
(mm)=
(%)=
(m)=
                                   Dep. Storage
Average Slope
Length
Mannings n
                                                                                                                                                                                                                                        1.00
63.77
0.013
                                   Max.Eff.Inten.(mm/hr)=
          over (min)
```

| Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (min) = (min) = (cms) = | 1.46 (ii) 10.00 0.17 | 6.56 (ii 10.00 0.13 |) *TOTALS* | |
|--|--|--|--|--|--|
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICE | (cms) = (hrs) = (mm) = (mm) = | 0.05 1.50 83.10 83.90 0.99 | 0.12 1.50 42.12 83.90 0.50 | 0.165 (iii) 1.50 47.85 83.90 0.57 | |
| ***** WARNING: STORA ***** WARNING:FOR AR YOU SH | EAS WITH IM | S SMALLER THA PERVIOUS RATI ER SPLITTING | OS BELOW 20 | ! | |
| (i) CN PROCED CN* = (ii) TIME STEP THAN THE: (iii) PEAK FLOW | 58.0 Ia (DT) SHOUL STORAGE COE | = Dep. Storag D BE SMALLER FFICIENT. | ge (Above) OR EQUAL | | |
| | | | | | |
| READ STORM | Comment | s: 100 YEAR 0 | Temp\ 29b4-4b71-a4 2HICAGO 4 HO | | 57abe18 IS |
| TIM hr 0.1 | s mm/hr | hrs mm/r 1.17 16.8 1.33 41.0 | IN TIME or hrs 36 2.17 | RAIN TIME mm/hr hrs 14.83 3.17 12.12 3.33 | RAIN mm/hr 6.60 |
| 0.3 0.5 0.6 | 3 5.05 0 5.82 7 6.83 | 1.33 41.0 1.50 205.9 1.67 54.5 | 07 2.33 02 2.50 66 2.67 | 12.12 3.33 10.31 3.50 9.02 3.67 8.03 3.83 7.24 4.00 | 6.10 5.66 5.28 |
| 0.8 | 3 8.41 0 11.07 | 1.83 29.1 2.00 19.2 | .7 2.83 28 3.00 | 8.03 3.83 7.24 4.00 | 4.98 4.70 |
| | | | | | |
| CALIB STANDHYD (0030) ID= 1 DT=10.0 min | Area Total Im | (ha)= 0.33 p(%)= 60.00 | Dir. Conn | .(%)= 25.00 | |
| | I | | PERVIOUS (i | | |
| Surface Area Dep. Storage Average Slope Length | (mm) = (%) = (m) = | 0.80 1.00 46.90 | 1.50 2.00 40.00 | | |
| Mannings n Max.Eff.Inten.() | = | 0.013 | 0.250 | | |
| over Storage Coeff. | (min) (min)= | 10.00 1.21 (ii) 10.00 | 10.00 6.98 (ii 10.00 |) | |
| Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW | | 0.17 | 0.13 | *TOTALS* 0.095 (iii) | |
| TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICE | (hrs)= (mm)= (mm)= | 0.05 1.50 83.10 83.90 0.99 | 1.50 38.11 83.90 0.45 | 1.50 49.35 83.90 0.59 | |
| **** WARNING: STORA | | | | ! | |
| (i) CN PROCED CN* = (ii) TIME STEP | 58.0 Ia (DT) SHOUL | = Dep. Storag D BE SMALLER | JS LOSSES: ge (Above) OR EQUAL | | |
| THAN THE | STORAGE COE DOES NOT I | FFICIENT. | OW TE ANY | | |
| (III) PEAK PLOW | | NCDODD DRODE | OW IF ANI. | | |
| | | | | | |
| READ STORM Ptotal= 83.90 mm | Filenam Comment | e: C:\Users\G ata\Local\ 838a855b-2 s: 100 YEAR G | Greg\AppD Temp\ 19b4-4b71-a4 CHICAGO 4 HO | 67-7100b13d0872\d UR DESIGN STORM D | IS |
| READ STORM Ptotal= 83.90 mm | Filenam Comment | e: C:\Users\G ata\Local\ 838a855b-2 s: 100 YEAR G | Greg\AppD Temp\ 19b4-4b71-a4 CHICAGO 4 HO | UR DESIGN STORM D | IS |
| READ STORM Ptotal= 83.90 mm TIM Dr. 0.1 0.2 0.5 0.5 | Filenam Comment | e: C:\Users\G ata\Local\ 838a855b-2 s: 100 YEAR G | Greg\AppD Temp\ 19b4-4b71-a4 CHICAGO 4 HO | UR DESIGN STORM D | IS |
| READ STORM Ptotal= 83.90 mm TIM hr: 0.1. 0.3 0.5 | Filenam Comment | e: C:\Users\G ata\Local\ 838a855b-2 s: 100 YEAR G | Greg\AppD Temp\ 19b4-4b71-a4 CHICAGO 4 HO | UR DESIGN STORM D | IS |
| READ STORM Ptotal= 83.90 mm TIM Dr. 0.1 0.2 0.5 0.5 | Filenam Comment | e: C:\Users\G ata\Local\ 838a855b-2 s: 100 YEAR G | Greg\AppD Temp\ 19b4-4b71-a4 CHICAGO 4 HO | UR DESIGN STORM D | IS |
| READ STORM Ptotal= 83.90 mm TIM Dr. 0.1 0.2 0.5 0.5 | Filenam Comment E RAIN 8 mm/hr 7 4.50 3 5.05 0 5.82 7 6.83 7 6.83 1 3 8.41 0 11.07 | e: C:\Users\c ata\Local\d ata\d ata\Local\d ata\d atad | Sreg\AppD Temp\ 19b4-4571-a4i HICAGO 4 HOI HICAGO 4 HOI N ' TIME N ' TIME 10 | RAIN TIME mm/hr hrs 14.83 3.17 12.12 3.33 10.31 3.50 9.02 3.67 8.03 3.83 7.24 4.00 | IS |
| READ STORM Ptotal= 83.90 mm | Filenam Comment E RAIN 8 mm/hr 7 4.50 3 5.05 0 5.82 7 6.83 3 8.41 0 11.07 Area Total Im | e: C:\Users\Coal\Unitar\Users\Coal\Unitar\Users\Coal\Unitar\Users\Coal\Unitar\Users\Coal\Unitar\Users\Coal\Unitar\Users\Coal\Unitar\Users\Coal\Unitar\Users\Coal\Unitar\Unitar\Unitar\Users\Coal\Unitar\Unitar\Unitar\Users\Coal\Unitar\Unit | Sreg\AppD Temp\ 19b4-4571-a4i HICAGO 4 HOI HICAGO 4 HOI N ' TIME N ' TIME 10 | RAIN TIME mm/hr hrs 14.83 3.17 12.12 3.33 10.31 3.50 9.02 3.67 8.03 3.83 7.24 4.00 | IS |
| READ STORM Ptotal= 83.90 mm | Filenam Comment E RAIN 8 mm/hr 7 4.50 13 5.05 10 5.02 11 1.07 Area Total Im I (ha) = (mm) = (%) = | e: C:\Usera\collapse\ | Sreg\AppD Temp\. Temp\. 100 100 100 100 100 100 100 100 100 10 | RAIN TIME mm/hr hrs 14.83 3.17 12.12 3.33 10.31 3.50 9.02 3.67 8.03 3.83 7.24 4.00 | IS |
| Ptotal= 83.90 mm Ptotal= 83.90 mm TIM 0.1. 0.2. 0.5. 0.6. 0.8. 1.0 CALTB STANDHYD (0032) ID= 1 DT=10.0 min Surface Area Dep. Storage Average Slope Mannings n | Filenam Comment E RAIN s mm/hr 17 4.50 3 5.05 18 18 18 18 18 18 18 1 | e: C:\Users\ ata\Local\ ata\Local | Sreg\AppD Cremp\ | RAIN TIME mm/hr hrs 14.83 3.17 12.12 3.33 10.31 3.50 9.02 3.67 8.03 3.83 7.24 4.00 | IS |
| PEAD STORM PEOTAL= 83.90 mm TIM hr 0.1. 0.3 0.5. 0.6. 1.0 CALIB STANDHYD (0032) ID- 1 DT-10.0 min Surface Area Peyrage Slope Length Mannings n Max.Eff.Inten.((| Filenam Comment E RAIN S mm/hr S mm/hr S 1,505 S 1,05 | e: C:\Users\arka\Local | Sreg\AppD Temp\ Temp\ 1954-4571-a4 1954-4571-a4 11CAGO 4 BOO N ' TIME ir ' hrs 16 2 .17 77 2 .33 22 2 .50 66 2 .67 77 2 .83 8 3 .00 Dir. Conn PERVIOUS (1 0 .42 1 .50 2 .00 4 0 .00 4 0 .00 | UR DESIGNS STORM D PAIN THE MEMORY BAIN THE MEMORY 14.88 3.17 12.12 3.30 9.02 3.67 9.02 3.67 8.03 3.83 7.24 4.00 | IS |
| PEAD STORM Ptotal= 83.90 mm This has been been been been been been been bee | Filenam Comment E RAIN 8 mm/hr 7 4.50 3 5.05 10 5.82 7 6.83 3 8.41 0 11.07 Area Total Im (min = (min = (min) = (m | e: C:\Usera\colonial ata\cocal\colonial ata\cocal\colonial ata\cocal\colonial ata\cocal\colonial ata\cocal\colonial ata\cocal\colonial ata\cocal\colonial ata\colonial ata\col | Sreg\AppD Tempy Sines April - a44 HICAGO 4 HOI HICAGO 4 HOI HICAGO 4 HOI HICAGO 1 H | WR DESIGNS STORM D RAIN TIME mm/hr hrs 14.63 3.17 14.63 3.17 14.63 3.17 14.63 3.17 14.63 3.17 14.63 3.17 14.63 3.17 15.60 16.61 16.61 16.61 16.61 16.6 | IS |
| PEAD STORM Ptotal= 83.90 mm | Filenam Comment E RAIN 8 mm/hr 7 4.50 3 5.05 10 5.82 7 6.83 1 7 0 1 1.07 Area Total Im (mm) = (min) = (mi | e: C:\Users\article ata\Local\article ata\Local\ | Sireg\AppD Cremp\ | WR DESIGNS STORM D PAIN TIME BM/hr hrs 14.83 3.17 12.12 3.35 10.31 3.50 9.02 3.67 8.03 3.83 7.24 4.00 .(%)= 10.00) *TOTALS* 0.123 (iii) | IS |
| PEAD STORM Ptotal= 83.90 mm Ptotal= 83.90 mm TIM | Filenam Comment E RAIN B mm/hr B mm/hr C 4.5 C 5.62 T 6.63 T 6.63 T 11.07 Area Total Im [(m) = ((m) = ((min) = ((mi | e: C:\Usera\colonial ata\cos\lambda | Dir. Conn | WR DESIGNSTORM D RAIN TIME mm/hr | IS |
| PREAD STORM Ptotal= 83.90 mm The harmonic process of the state of th | Filenam Comment E RAIN E RAIN F R | e: C:\Usera\colonial acalcocal acalc | DIR. Conn DIR. C | WR DESIGNSTORM D RAIN TIME mm/hr | IS |
| PEOLE STANDAY (0032) CALIB 3.90 mm 1.00 mm 1.0 | Filenam Comment S mm/hr A50 3 | e: C:\Usera\colonial ata\Local\ata ata\ta at | Dir. Conn | WR DESIGNSTORM D RAIN TIME mm/hr | IS |
| PEAD STORM PLOTAL = 83.90 mm Ptotal = 83.9 | Filenam Comment E RAIN B mm/hr Comment E RAIN B mm/hr Comment I (15.00 I (| e: C:\Usera\c ata\Local\ata ata\ta\ta\ta\ta\ta\ta\ta\ta\ta\ta\ta\ta\ | Sireg AppD Cress AppD Cre | WR DESIGNSTORM D RAIN TIME mm/hr | IS |
| READ STORM Ptotal= 83.90 mm The state of t | Filenam Comment E RAIN B mm/hr B mm/hr C 0.5 C 0.5 | e: C:\Users\circ (ha) = c:\use | Sreg\AppD | WR DESIGNSTORM D RAIN TIME mm/hr | EAIN mm.hb. mm.h |
| READ STORM Ptotal= 83.90 mm TIM | Filenam Comment E RAIN B mm/hr S mm/hr M min M | e: C:\Users\capacity C:\ | Sreg\AppD | R DESIGN STORM DE RAIN The The RAIN The Th | IS PAIN UMP/hr PAI |
| PLOTAL = 83.90 mm PLOTAL = 83.90 mm TIM THA 0.1. 0.3 0.5 0.8 1.0 CALLE STANDBYD (0032) ID= 1 DT=10.0 min SUFFACE Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(over Storage Coeff Unit Hyd. Tpeak Unit Hyd. Tpe | Filenam Comment E RAIN B mm/hr S mm/hr M mm S mm/hr M mm M | e: C:\Users\capacity C:\ | Sreg\AppD | R DESIGN STORM DE RAIN The The RAIN The Th | IS RAIN mm/hr 6.10 157abe18 IS RAIN mm/hr 6.00 6.10 6.10 157abe18 IS RAIN mm/hr 6.00 6.10 6.00 157abe18 IS |
| READ STORM Ptotal= 83.90 mm Ptotal= 83.90 mm TIM 0.1.1 0.0.5 0.6.6 0.8 1.0 CALIB SUMFACE AVEAS BYENDER AVEAS BYENDER STORAGE AVEASE STORAGE THE TO PEAK RINDER FOR AR RINDER FOR AR RINDER FOR AR YOU SH (1) CH PEAK TOTAL RAIMFALL (11) THAN THE (11) THAN THE (11) PEAK FLOW TIMAN THE (11) PEAK STORAGE PTOTAL RAIMFALL READ STORM READ STORM PEOTAL STORAGE PEOTAL STORAGE | Filenam Comment E RAIN B mm/hr S mm/hr M mm S mm/hr M mm M | e: C:\Users\capacity C:\ | Sreg\AppD | R DESIGN STORM DE RAIN The The RAIN The Th | IS RAIN mm/hr 6:10 5.66 5.28 4.70 |
| PLOTAL = 83.90 mm PLOTAL = 83.90 mm TIM THAT O.1. O.3. O.6. O.8. 1.0 CALID STANDBUYD (0032) ID=1 DT=10.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. | Filenam Comment E RAIN B mm/hr S mm/hr M mm S mm/hr M mm M | e: C:\Users\capacity C:\ | Sreg\AppD | RAIN TIME | IS RAIN mm/hr 6.10 157abe18 IS RAIN mm/hr 6.00 6.10 6.10 157abe18 IS RAIN mm/hr 6.00 6.10 6.00 157abe18 IS |

| | ha)= 0.80 o(%)= 48.00 | | | |
|--|---|--|--|-------------------------------|
| Surface Area (ha)= Dep. Storage (mm)= Average Slope (%)= Length (m)= Mannings n = | 0.38 0.80 1.00 73.03 0.013 | 0.42 1.50 2.00 40.00 0.250 | | |
| <pre>Max.Eff.Inten.(mm/hr)=</pre> | 205.92 10.00 1.58 (ii) 10.00 0.17 | | *TOTALS* | |
| PEAK FLOW (Cms) = TIME TO PEAK (hrs) = RUNOFF VOLUME (mm) = TOTAL RAINFALL (mm) = RUNOFF COEFFICIENT = | 0.06 1.50 83.10 83.90 0.99 | 0.12 1.50 35.71 83.90 0.43 | 0.177 (iii) 1.50 41.87 83.90 0.50 | |
| ***** WARNING: STORAGE COEFF. IS ***** WARNING: FOR AREAS WITH IME YOU SHOULD CONSIDE | PERVIOUS RATIO | S BELOW 20% | | |
| (i) CN PROCEDURE SELECTEI CN* = 58.0 Ia = | FOR PERVIOUS | LOSSES: | | |
| (ii) TIME STEP (DT) SHOULD THAN THE STORAGE COEF (iii) PEAK FLOW DOES NOT IN | BE SMALLER OFFICIENT. | OR EQUAL | | |
| | | | | |
| READ STORM Filename | 838a855b-29 8: 100 YEAR CH | ?emp∖ 9b4-4b71-a46 HICAGO 4 HOU | | IS |
| TIME RAIN hrs mm/hr 0.17 4.50 | TIME RAIN hrs mm/hr 1.17 16.86 | TIME hrs | RAIN TIME mm/hr hrs 14.83 3.17 12.12 3.33 10.31 3.50 9.02 3.67 8.03 3.83 7.24 4.00 | RAIN mm/hr 6.60 |
| 0.50 5.82 0.67 6.83 0.83 8.41 | 1.50 205.92 1.67 54.56 | 2.50 | 12.12 3.33 10.31 3.50 9.02 3.67 8.03 3.83 | 5.66 5.28 4.98 |
| 1.00 11.07 | 2.00 19.28 | 3.00 | 7.24 4.00 | 4.70 |
| CALIB | ha)= 0.67 | | | |
| ID= 1 DT=10.0 min Total Imp | | PERVIOUS (i) | | |
| Surface Area (ha)= Dep. Storage (mm)= Average Slope (%)= Length (m)= | 0.80 1.00 66.83 | 0.39 1.50 2.00 40.00 | | |
| Maintings ii - | 0.013 | 0.250 | | |
| Max.Eff.Inten.(mm/hr)= over (min) Storage Coeff. (min)= Unit Hyd. Tpeak (min)= Unit Hyd. peak (cms)= | 10.00 1.50 (ii) 10.00 0.17 | 0.12 | *TOTALS* | |
| PEAK FLOW (cms) = TIME TO PEAK (hrs) = RUNOFF VOLUME (mm) = TOTAL RAINFALL (mm) = RUNOFF COEFFICIENT = | 0.07 1.50 83.10 83.90 0.99 | 0.08 1.50 32.23 83.90 0.38 | 0.148 (iii) 1.50 41.38 83.90 0.49 | |
| ***** WARNING: STORAGE COEFF. IS ***** WARNING:FOR AREAS WITH IME YOU SHOULD CONSIDE | ERVIOUS RATIO | S BELOW 20% | | |
| (i) CN PROCEDURE SELECTED CN* = 58.0 Ia = | FOR PERVIOUS | LOSSES: | | |
| (ii) TIME STEP (DT) SHOULE THAN THE STORAGE COEF (iii) PEAK FLOW DOES NOT IN | BE SMALLER OFFICIENT. | OR EQUAL | | |
| | | | | |
| READ STORM Filename | ata\Local\7 838a855b-29 | ?emp\ 0b4-4b71-a46 | 7-7100b13d0872\d | |
| Ptotal= 83.90 mm Comments | TIME RAIN | I TIME | RAIN TIME | RAIN |
| hrs mm/hr 0.17 4.50 0.33 5.05 0.50 5.82 | hrs mm/hr 1.17 16.86 1.33 41.07 | hrs 2.17 2.33 2.50 | mm/hr hrs 14.83 3.17 12.12 3.33 10.31 3.50 | mm/hr 6.60 6.10 5.66 |
| 0.50 5.82 0.67 6.83 0.83 8.41 1.00 11.07 | 1.17 16.86 1.33 41.07 1.50 205.92 1.67 54.56 1.83 29.17 2.00 19.28 | 2.67 | 9.02 3.67 8.03 3.83 7.24 4.00 | 5.28 4.98 4.70 |
| | | | | |
| CALIB STANDHYD (0035) Area (| ha)= 0.65 | | | |
| ID= 1 DT=10.0 min Total Imp | MPERVIOUS E | PERVIOUS (i) | (%)= 11.00 | |
| Surface Area (ha)= Dep. Storage (mm)= Average Slope (%)= Length (m)= Mannings n = | 0.19 0.80 1.00 65.83 0.013 | 0.45 1.50 2.00 40.00 0.250 | | |
| <pre>Max.Eff.Inten.(mm/hr)=</pre> | 205.92 10.00 1.49 (ii) | 85.76 10.00 8.99 (ii) | | |
| Unit Hyd. Tpeak (min)= Unit Hyd. peak (cms)= | 10.00 0.17 | 10.00 0.11 | *TOTALS* | |
| PEAK FLOW (cms) = TIME TO PEAK (hrs) = RUNOFF VOLUME (mm) = TOTAL RAINFALL (mm) = RUNOFF COEFFICIENT = | 0.04 1.50 83.10 83.90 0.99 | 0.08 1.50 30.09 83.90 0.36 | 0.116 (iii) 1.50 35.92 83.90 0.43 | |
| ***** WARNING: STORAGE COEFF. IS ***** WARNING: FOR AREAS WITH IME YOU SHOULD CONSIDE | S SMALLER THAN | S BELOW 20% | | |
| (i) CN PROCEDURE SELECTER CN* = 58.0 Ia = (ii) TIME STEP (DT) SHOULL THAN THE STORAGE COEF (iii) PEAK FLOW DOES NOT IN | Dep. Storage BE SMALLER OFFICIENT. | (Above) OR EQUAL | | |
| (III, FEAR FLOW DOES NOT IF | a DMSEFLC | 1. ANI. | | |
| | | | | |

| | Filend | me: C:\Users\ ata\Local | Greg\AppD \Temp\ | | |
|--|--|--|--|--|---|
| Ptotal= 83.90 mm | Commen | 838a855b- ts: 100 YEAR | 29b4-4b71-a4 CHICAGO 4 HO | OUR DESIGN S | 10872\d57abe18 STORM DIS |
| TIM hr | E RAIN s mm/hr | TIME RA hrs mm/ 1.17 16. 1.33 41. 1.50 205. 1.67 54. 1.83 29. 2.00 19. | IN TIME | RAIN mm/hr | TIME RAIN hrs mm/hr 3.17 6.60 |
| 0.1 0.3 0.5 | 7 4.50 3 5.05 | 1.17 16. | 86 2.17 07 2.33 | 14.83 3 | 3.17 6.60 3.33 6.10 3.50 5.66 |
| 0.6 | 7 6.83 3 8.41 | 1.67 54. 1.83 29. | 56 2.67 17 2.83 | 9.02 3 | 3.67 5.28 3.83 4.98 |
| 1.0 | 0 11.07 | 2.00 19. | 28 3.00 | 7.24 4 | 1.00 4.70 |
| | | | | | |
| CALIB STANDHYD (0062) ID= 1 DT=10.0 min | Area Total I | (ha)= 0.51 mp(%)= 66.00 | Dir. Conr | 1.(%)= 16.0 | 10 |
| | | IMPERVIOUS | | | |
| Surface Area Dep. Storage Average Slope Length | (na)= (mm)= (%)= | 0.34 1.00 1.00 58.31 | 0.17 1.50 2.00 | | |
| Length Mannings n | (m)= = | 58.31 0.013 | 40.00 0.250 | | |
| Max.Eff.Inten.(| mm/hr)= (min) | 205.92 10.00 | 258.85 10.00 | | |
| over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (min) = (min) = | 1.38 (ii) 10.00 0.17 | | L) | |
| PEAK FLOW | (cms)= | 0.05 | 0.10 | *TOTALS | (iii) |
| TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL | (hrs)= (mm)= | 1.50 82.90 83.90 | 1.50 43.98 83.90 | 1.50 50.20 83.90 |)) |
| RUNOFF COEFFICI | ENT = | 0.99 | 0.52 | 0.60 | |
| ***** WARNING: STORA **** WARNING: FOR AR YOU SH | GE COEFF. EAS WITH I | IS SMALLER TH MPERVIOUS RAT DER SPLITTING | AN TIME STEE IOS BELOW 20 THE AREA. |)% ?! | |
| (i) CN PROCED | HRE SELECT | ED FOR PERVIO | US LOSSES: | | |
| CN* = (ii) TIME STEP THAN THE | STORAGE CO | EFFICIENT. | | | |
| (iii) PEAK FLOW | DOES NOT | INCLUDE BASEF | LOW IF ANY. | | |
| | | | | | |
| READ STORM | | me: C:\Users\ ata\Local | \Temp\ 29h4_4h71_a4 | 167-7100b13d | 10872\d57abe18 |
| Ptotal= 83.90 mm | | ts: 100 YEAR | CHICAGO 4 HO | OUR DESIGN S | STORM DIS |
| TIM hr 0.1 | E RAIN s mm/hr 7 4.50 | TIME RA hrs mm/ 1.17 16. 1.33 41. 1.50 205. 1.67 54. 1.83 29. 2.00 19. | IN TIME hr hrs 86 2.17 | RAIN mm/hr 14.83 3 | TIME RAIN hrs mm/hr 3.17 6.60 |
| 0.3 | 3 5.05 0 5.82 | 1.33 41. 1.50 205. | 07 2.33 92 2.50 | 12.12 3 | 3.33 6.10 3.50 5.66 |
| 0.6 0.8 1.0 | 7 6.83 3 8.41 0 11 07 | 1.67 54. 1.83 29. | 56 2.67 17 2.83 | 9.02 3 | 3.67 5.28 3.83 4.98 4.00 4.70 |
| | | | | | |
| CALIB | | | | | |
| CALIB STANDHYD (0064) ID= 1 DT=10.0 min | Area Total I | (ha)= 0.68 mp(%)= 60.00 | Dir. Conr | n.(%)= 19.0 | 00 |
| | | | | | |
| Curfoso Avon | (hn)- | IMPERVIOUS | PERVIOUS (i | .) | |
| Surface Area Dep. Storage Average Slope | (ha)= (mm)= (%)= | 0.41 1.00 1.00 | 0.27 1.50 2.00 | 1) | |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha) = (mm) = (%) = (m) = | 0.41 1.00 1.00 67.33 0.013 | 0.27 | 1) | |
| Mannings n Max.Eff.Inten.(| (mm) = (%) = (m) = = mm/hr) = | 1.00 1.00 67.33 0.013 205.92 10.00 | 0.27 1.50 2.00 40.00 0.250 188.32 10.00 | | |
| Mannings n Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak | (mm)= (%)= (m)= = mm/hr)= (min) (min)= (min)= | 1.00 67.33 0.013 205.92 10.00 1.51 (ii) | 0.27 1.50 2.00 40.00 0.250 188.32 10.00 6.99 (iii | | |
| Mannings n Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (mm)= (%)= (m)= = mm/hr)= (min) (min)= (min)= (cms)= | 1.00 67.33 0.013 205.92 10.00 1.51 (ii) 10.00 0.17 | 0.27 1.50 2.00 40.00 0.250 188.32 10.00 6.99 (iii | *TOTALS 0.185 | (iii) |
| Mannings n Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (mm)= (%)= (m)= = mm/hr)= (min) (min)= (min)= (cms)= | 1.00 67.33 0.013 205.92 10.00 1.51 (ii) 10.00 0.17 0.07 1.50 82.90 | 0.27 1.50 2.00 40.00 0.250 188.32 10.00 6.99 (ii 10.00 0.13 0.11 1.50 39.75 | *TOTALS 0.188 1.50 47.94 | 5 (iii)) 1 |
| Lengtn Mannings n Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAIMFALL RUNOFF COEFFICI | (mm)= (%)= (m)= = mm/hr)= (min) (min)= (min)= (cms)= (cms)= (hrs)= (mm)= (mm)= (mm)= | 1.00 1.00 67.33 0.013 205.92 10.00 1.51 (ii) 10.00 0.17 0.07 1.50 82.90 83.90 0.99 | 0.27 1.50 2.00 40.00 0.250 188.32 10.00 6.99 10.00 0.13 0.11 1.50 39.75 83.90 0.47 | *TOTALS 0.188 1.55 47.94 83.90 0.57 | 5 (iii)) 1 |
| Length Mannings n Max.Eff.Inten. Storage Coeffea Unit Hyd. peak Unit Hyd. peak PEAN FLOW TIME TO PEAN RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICE MARBHING: STORA MARBHING: FOR AR MARBHING: FOR AR | (mm)= (%)= (m)= = mm/hr)= (min) (min)= (min)= (cms)= (cms)= (hrs)= (mm)= (mm)= ENT = GE COEFF. EAS WITH II | 1.00 1.00 67.33 0.013 205.92 10.00 1.51 (ii) 10.00 0.17 1.50 82.90 83.90 0.99 15 MALLER TH MPERVIOUS RAT | 0.27 1.50 2.00 40.00 0.250 188.32 10.00 6.99 10.00 0.13 0.11 1.50 39.75 83.90 0.47 AN TIME STEIL | *TOTALS 0.188 1.55 47.94 83.90 0.57 | 5 (iii)) 1 |
| Length Mannings n Max.Eff.Inten. Storage Coeffea Unit Hyd. peak Unit Hyd. peak PEAN FLOW TIME TO PEAN RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICE MARBHING: STORA MARBHING: FOR AR MARBHING: FOR AR | (mm)= (%)= (m)= = = = = = = = = = | 1.00 1.00 67.33 0.013 205.92 10.00 1.51 (ii) 10.00 0.17 0.07 1.50 82.90 83.90 0.99 15 SMALLER TH MPERVIOUS RAT | 0.27 1.50 2.00 40.00 0.250 188.32 10.00 6.99 (ii 10.00 0.13 0.11 1.50 39.75 83.90 0.47 AN TIME STEIL IOS BELOW 2(THE AREA. | *TOTALS 0.188 1.55 47.94 83.90 0.57 | 5 (iii)) 1 |
| Length Mannings n Max. Rff. Inten. (| (mm)= (%)= (m)= ================================ | 1.00 1.00 67.33 0.013 205.92 10.00 1.51 (ii) 10.00 0.17 0.07 1.50 82.90 83.90 0.99 IS SMALLER TH MPERVIOUS RAT DER SPLITTING | 0.27 1.50 2.00 40.00 0.250 188.32 10.00 6.99 (ii 10.00 0.13 0.11 1.50 39.75 83.90 0.47 AN TIME STEILOS BELOW 20 THE AREA. | *TOTALS 0.188 1.55 47.94 83.90 0.57 | 5 (iii)) 1 |
| Length Mannings n Max. Rff. Inten. (| (mm)= (%)= (%)= (m)= mm/hr)= (min) (min)= (min)= (min)= (min)= (mm)= (mm)= (mm)= ENT = EAS WITH I OULD CONSI (MT) SHOU STORAGE OO S | 1.00 67.33 0.013 205.92 10.00 1.51 10.00 0.17 0.07 1.50 82.90 83.90 0.99 1S SMALLER TH MPERVIOUS RAT DER SPLITTING ED FOR PERVIOL D EDEP, STOTA LD BE SMALLER ED FOR PERVIOL D EDEP, STOTA LD BE SMALLER | 0.27 1.50 2.00 40.00 0.250 188.32 10.00 6.99 (ii 10.00 0.13 0.11 1.50 39.75 83.90 0.47 THE AREA. US LOSSES: US LOSSESS: US (ABSCESSES: US (CREQUAL) | *TOTALS 0.188 1.55 47.94 83.90 0.57 | 5 (iii)) 1 |
| Length Mannings n Max.Eff.Inten.(over Storage Coeff Unit Byd. Tpeak Unit Byd. Tpeak Unit Byd. Tpeak TIME TO DEAK RUNDFY OULIME TOTAL RAINFALL RUNDFY COEFFICE **** WARNING: STORA **** WARNING: FOR AR ***** WARNING: FOR AR ***** WARNING: FOR AR ***** (1) CN PROCEE (1) CN PROCEE (1) TIME STEP (11) TIME STEP (12) THAN THE | (mm)= (%)= (%)= (m)= mm/hr)= (min) (min)= (min)= (min)= (min)= (mm)= (mm)= (mm)= ENT = EAS WITH I OULD CONSI (MT) SHOU STORAGE OO S | 1.00 67.33 0.013 205.92 10.00 1.51 10.00 0.17 0.07 1.50 82.90 83.90 0.99 1S SMALLER TH MPERVIOUS RAT DER SPLITTING ED FOR PERVIOL D EDEP, STOTA LD BE SMALLER ED FOR PERVIOL D EDEP, STOTA LD BE SMALLER | 0.27 1.50 2.00 40.00 0.250 188.32 10.00 6.99 (ii 10.00 0.13 0.11 1.50 39.75 83.90 0.47 THE AREA. US LOSSES: US LOSSESS: US (ABSCESSES: US (CREQUAL) | *TOTALS 0.188 1.55 47.94 83.90 0.57 | 5 (iii)) 1 |
| Length Mannings n Max.Eff.Inten.(over Storage Coeff Unit Byd. Tpeak Unit Byd. Tpeak Unit Byd. Tpeak TIME TO DEAK RUNDFY OULIME TOTAL RAINFALL RUNDFY COEFFICE **** WARNING: STORA **** WARNING: FOR AR ***** WARNING: FOR AR ***** WARNING: FOR AR ***** (1) CN PROCEE (1) CN PROCEE (1) TIME STEP (11) TIME STEP (12) THAN THE | (mm)= (%)= (m)= mm/hr)= (min)= (min)= (min)= (cms)= (hrs)= (mm)= EMT = GE COEFF. EAS WITH I OULD CONSI: URE SELECT 58.0 Ia (DT) SHOULD STORAGE CO DOES NOT | 1.00 67.33 0.013 205.92 10.00 1.51 (ii) 10.00 0.17 0.07 1.50 83.90 0.99 IS SMALLER TH MPERVIOUS RAT MERCHUOUS RATUEDER SPLITTINGER SPLITTI | 0.27 1.50 2.00 40.00 0.250 188.32 188.32 189.91 1.50 0.13 0.11 1.50 39.75 83.90 0.47 AN TIME STEELOW 20 THE ARRA. US LOSSES: 99 (ADOVE) OR EQUAL LOW IF ANY. | *TOTALS 0.188 1.55 47.94 83.90 0.57 | 5 (iii)) i) 7 |
| Length Mannings n Max.Eff.Inten.(over Storage Coeff., Unit Byd. Tpeak Unit Byd. Tpeak Unit Byd. Tpeak HEAN THOM TIME TO PEAK RUMOFF VOLUME TOTAL RAINFALL RUMOFF COEFFICI WARRING: STORA (1) CN PROCEE (CN* = (11) TIME STEP THAN THE (11) PEAK FLOW | (mm)= (%)= (%)= (mi)= mm/hr)= (min) (min)= (min)= (cms)= (hrs)= (mm)= (mm)= (mm)= (mm)= (mm)= (mm)= (mm)= (mm)= (mm)= for Comprise (DOILD CONSI UNE SELECT 58.0 Ia (DT) SHOU STORAGE CO DOES NOT | 1.00 67.33 0.013 205.92 10.00 1.51 10.00 1.51 10.00 0.17 0.07 1.50 82.90 83.90 93.99 15 SMALLER TH THOME SPLITTINGER SPLITTING | 0.27 1.50 2.00 40.00 0.250 188.32 189.32 10.00 6.99 11.00 0.13 0.11 1.50 0.13 0.11 1.50 0.47 AN TIME SAREA. US BELOW 2(THE AREA. US LOSSES: ge (Above) OR EQUIAL LOW IF ANY. CGreg\AppD Vremp\ | *TOTALS 0.188 1.55 47.94 83.92 0.51 | 5 (iii) 1 1 1 7 |
| Length Mannings n Max. Eff.Inten.(over Storage CoEff. Inten. (Unit Hyd. feak Unit Hyd. peak Unit Hyd. peak FEAN FLOW TIME TO PEAK RUMORF VOLUME TOTAL RAINFALL RUMORF COEFFICI **** MARRING: STORA (1) CN PROCEE (CN* = (11) TIME STEP (TIAN THE (11) PEAK FLOW READ STORM READ STORM Ptotal= 83.90 mm | (mm)= (%)= (%)= (mi)= mm/hr)= (min) (min)= (min)= (mm)= (mm) | 1.00 67.33 0.013 205.92 10.00 1.50 10.00 1.50 10.00 0.17 1.50 22.90 28.9 | 0.27 1.50 2.00 40.00 0.250 188.32 180.00 6.99 10.00 6.99 11.00 0.13 0.11 1.55 83.90 0.47 ANT TIME SAFEA. US LOSSES: US LO | *TOTALS 0.18* 1.50 47.29 87.29 87.29 97.30 97.57 | 10872\d57abel8 STORM DIS TIME RAIN hrs mm/hr |
| Length Mannings n Max. Eff.Inten.(| (m) = (%) = | 1.00 67.33 0.013 205.92 10.00 1.51 (ii) 10.00 0.17 1.50 82.90 0.07 1.50 82.90 83.90 0.99 15 SEMALIER TH MPERVIOUS RATURE PRIVITION ED FOR PERVIOUS ED FOR PERV | 0.27 1.50 2.00 40.00 0.250 188.32 180.00 6.99 10.00 6.99 11.00 0.13 0.11 1.55 83.90 0.47 ANT TIME SAFEA. US LOSSES: US LO | *TOTALS 0.18* 1.50 47.29 87.29 87.29 97.30 97.57 | 10872\d57abel8 STORM DIS TIME RAIN hrs mm/hr |
| Length Mannings n Max. Eff. Inten. (over Storage Coeff. (Unit Hyd. Tpeak Unit Hyd. Tpeak Unit Hyd. Tpeak TIME TO PEAK RUMOFF VOLUME TOTAL BAINFALL WARNING: STORA WARNING: STORA (i) CN PROCED (CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW READ STORM Ptotal = 83.90 mm TIME | (mm) = (min) = | 1.00 67.33 0.013 205.92 205.92 10.00 1.50 10.00 1.50 10.00 0.17 1.50 22.90 28. | 0.27 1.50 2.00 40.00 0.250 188.32 180.00 6.99 10.00 6.99 11.00 0.13 0.11 1.55 83.90 0.47 ANT TIME SAFEA. US LOSSES: US LO | *TOTALS 0.18* 1.50 47.29 87.29 87.29 97.30 97.57 | 10872\d57abel8 STORM DIS TIME RAIN hrs mm/hr |
| Length Mannings in Max. Eff.Inten. (over Storage Coeff. Unit Byd. Teak Unit Byd. Teak Unit Byd. Teak Unit Byd. Teak TIME TO DEAK RUNDFY OLUME TOTAL RAINFALL RUNDFY COEFFICI (1) CN PROCEED (1) CN PROCEED (11) THE STEE (11) PEAK FLOW TIME (11) PEA | (mm) = (min) = | 1.00 67.33 0.013 205.92 10.00 1.51 (ii) 10.00 0.17 1.50 82.90 0.07 1.50 82.90 83.90 0.99 15 SEMALIER TH MPERVIOUS RATURE PRIVITION ED FOR PERVIOUS ED FOR PERV | 0.27 1.50 2.00 40.00 0.250 188.32 180.00 6.99 10.00 6.99 11.00 0.13 0.11 1.55 83.90 0.47 ANT TIME SAFEA. US LOSSES: US LO | *TOTALS 0.181 -1.55 43.9 83.9 0.57 0.57 0.57 0.57 0.57 0.57 0.57 0.57 | 10872\d57abel8 STORM DIS TIME RAIN hrs mm/hr |
| Length Mannings n Max. Rff. Inten.(| (mm) = (min) = | 1.00 67.33 0.013 205.92 205.92 10.00 1.50 10.00 1.50 10.00 0.17 1.50 22.90 28. | 0.27 1.50 2.00 40.00 0.250 188.32 180.00 6.99 10.00 6.99 11.00 0.13 0.11 1.55 83.90 0.47 ANT TIME SAFEA. US LOSSES: US LO | *TOTALS 0.18* 1.50 47.29 87.29 87.29 97.30 97.57 | 10872\d57abel8 STORM DIS TIME RAIN hrs mm/hr |
| Length Mannings n Max. Rff. Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. Tpeak Unit Hyd. Tpeak TIME TO PEAK RUMOFF VOLDNE TOTAL BALIFFALL WARRING: STORA WARRING: STORA Unit Hyd. (1) CN PROCED CN* = (ii) THAN THE (iii) PEAK FLOW READ STORM Ptotal = 83.90 mm Ptotal = 83.90 mm TIME CO. O. 1. O. 2. O. 3. O. 5. O. 6. O. 8. O. 6. O. 8. O. 6. O. 8. O. 9. O. 8. O. 8. O. 9. O. 1. O. 1. O. 1. O. 1. O. 2. O. 3. O. 5. O. 6. O. 8. O. 8. O. 9. O. 1. O. 1. O. 1. O. 1. O. 2. O. 3. O. 5. O. 6. O. 8. O. 8. O. 9. O. 1. O. 1. O. 1. O. 1. O. 2. O. 3. O. 5. O. 6. O. 8. O. 8. O. 9. O. 9. O. 1. O. 1. O. 1. O. 1. O. 1. O. 1. O. 2. O. 3. O. 4. O. 5. O. 6. O. 7. O. 8. O. 8. O. 9. O. | (m)= (m)= (m)= (min)= (| 1.00 67.33 0.013 205.92 10.00 1.51 (ii) 10.00 1.51 (ii) 10.00 0.17 1.50 82.90 83.90 0.99 83.90 0.99 83.804LLER TH MPERVIOUS RATOR SPLITTING SPRING SPLITTING SPRING | 0.27 1.50 2.00 40.00 2.50 1.88.32 1.88.32 1.90 1.10.00 1.13 1.50 3.9.75 83.90 0.13 0.11 1.50 3.9.75 83.90 0.47 AN TIME STEE 1.05 BELOW 26 THE AREA 27 THE AREA 27 THE AREA 28 THE AREA 20 | *TOTALS 0.181 -1.50 43.9 83.9 0.57 0.57 0.57 0.57 0.57 0.57 0.57 0.57 | 10872\d57abe18 5TORM DIS TIME RAIN hrs ms/hr 1.50 5.66 1.67 5.28 1.83 4.98 1.00 4.70 |
| Length Mannings in Max. Eff. Inten. (Over Storage Coeff. Unit Hyd. Tpeak ENNOFY COEFFLCT (COEFFLCT WARNING: STORA MARNING: STORA MARNING: STORA WARNING: FOR AR WARNING: FOR ARMING: FOR ARMIN | (mm)= (min)= (mi | 1.00 67.33 0.013 205.92 10.00 1.51 (ii) 10.00 1.51 (ii) 10.00 0.17 0.07 1.50 83.90 0.99 IS SMALLER TH WREEVIOUS RAT WEEVING ENGAGE SPLITTING ENGAGE SPLITTING ENGAGE SPLITTING ENGAGE SPLITTING ENGAGE SPLITTING ENGAGE EN | 0.27 1.50 2.00 40.00 2.20 40.00 0.250 188.32 10.00 6.99 11.00 39.75 83.90 0.47 11.50 39.75 83.90 0.47 THE AREA. US LOSSES: ge (Above) OR EGUAL LOW IF ANY. Greg\AppD VTemp\ VTemp\ The APPD The ANY. Greg\AppD Temp\ T | *TOTALS 0.181 -1.50 43.3 9.3 9.57 9.1 167-7100bl3 0.57 9.1 14.83 3 17.24 4 4 3.(*)= 17.0 | 10872\d57abe18 5TORM DIS TIME RAIN hrs ms/hr 1.50 5.66 1.67 5.28 1.83 4.98 1.00 4.70 |
| Length Mannings in Max. Eff. Inten. (Over Storage Coeff. Unit Hyd. Teak Unit Hyd. Teak Unit Hyd. Teak Unit Hyd. Teak The To Teak End To To Tak End To | (m)= (m)= (m)= mm/hr= (min) (min)= (min)= (min)= (hra)= (mn)= (mn)= SET = GE COEFF. EAS WITH I OULD CONSI: URE SELECT SES.0 I al. (DT) SHOU Filena COMMEN E RAIN 8 mm/hr 7 4.50 3 5.83 3 3.8.41 0 11.07 | 1.00 67.33 0.013 205.92 10.00 1.51 10.00 1.51 10.00 0.17 1.50 82.90 83.9 | 0.27 1.50 2.00 40.00 2.50 1.50 2.00 40.00 0.250 188.32 10.00 6.99 10.00 6.99 11.00 6.99 11.00 13.75 83.90 11.15 83.90 83 | *TOTALS 0.181 -1.50 43.3 9.3 9.57 9.1 167-7100bl3 0.57 9.1 14.83 3 17.24 4 4 3.(*)= 17.0 | 10872\d57abe18 5TORM DI TIME RAIN hrs ms/hr 10.50 5.66 1.67 5.28 1.83 4.98 1.00 4.70 |
| Length Mannings n Max. Eff.Inten.(over Storage CoEff. Unit Hyd. flex Unit Hyd. flex Unit Hyd. peak Unit Hyd. peak FEAN FLOW TIME TO PEAK REMORE TOTAL RAINFALL RUMOFF COEFFICE **** WARRING: STORA (1) CN PROCEE (CN' = (1i) TIME STOP TIME STORA READ STORM PLOTAL RAINFALL READ STORM PLOTAL STORM PLOTAL STORM READ STORM PLOTAL STORM CALIB STAMBHYD (0068) STAMBHYD (0068) STAMBHYD (0068) CALIB CALIB | (mm) = (min) = mmm/hr) = (min) | 1.00 67.33 0.013 205.92 10.00 1.51 (ii) 10.00 1.51 (ii) 10.00 0.17 1.50 82.90 83.90 0.99 83.90 0.99 83.90 83.90 0.99 83.90 84.90 84.90 85.90 86. | 0.27 1.50 2.00 40.00 2.20 40.00 0.250 188.32 16.09 6.99 11.00 39.75 83.90 0.47 11.50 39.75 83.90 0.47 THE AREA. US LOSSES: ge (Above) OR EQUAL LOW IF ANY. Gres\AppD VTemp\ VTemp\ VTemp\ The Area 1.50 66 2.17 07 2.33 29 2.50 66 2.17 07 2.33 29 2.50 07 2.33 20 3.00 Dir. Conr PERVIOUS (1 | *TOTALS 0.181 -1.50 43.3 9.3 9.57 9.1 167-7100bl3 0.57 9.1 14.83 3 17.24 4 4 3.(*)= 17.0 | 10872\d57abe18 5TORM DI TIME RAIN hrs ms/hr 10.50 5.66 1.67 5.28 1.83 4.98 1.00 4.70 |
| Length Mannings n Max.Eff.Inten.(over Storage Coeff Unit Hyd. Tpeak TIME TO PEAK ENDRY VOLUME TOTAL RAINFALL RUNGF COEFFICE "MARNING: STORA "MARNING: FOR AR "ARNING: TOTAL (1) CN PROCEE (1) CN PROCEE (11) THME STEP THAN THE (11) PEAK FLOW PHOTAL = 83.90 mm TIM hr 0.1 0.2 0.5 0.6 0.8 1.0 CALIB STANDHYD (0068) ID= 1 DT-10.0 min Surface Area Dep. Storage Average Slope Length Max.Hff.inten.(Max.Eff.inten.(| (mm)= (m)= (m)= (min) (min)= (| 1.00 67.33 0.013 205.92 10.00 1.51 (ii) 10.00 0.17 1.50 82.90 83.90 0.99 IS SMALLER TH MPERVIOUS RATHER SELFUTION 0.07 1.50 82.90 1.99 IS SMALLER TH MPERVIOUS RATHER SELFUTION 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0 | 0.27 1.50 2.00 40.00 0.250 188.32 180.90 110.00 6.99 110.00 6.99 110.00 6.99 110.00 133 0.11 1.50 39.75 83.90 0.47 THE AREA. US LOSSES: ge (Above) 0.00 COR EGUAL LOW IF ANY. Greq\AppD Vremp\ Tremp\ | *TOTALS 0.181 -1.50 43.3 9.3 9.57 9.1 167-7100bl3 0.57 9.1 14.83 3 17.24 4 4 3.(*)= 17.0 | 10872\d57abe18 5TORM DI TIME RAIN hrs ms/hr 10.50 5.66 1.67 5.28 1.83 4.98 1.00 4.70 |
| Length Mannings n Max. Eff. Inten.(| (m)= (m)= (m)= (min) (min)= (m | 1.00 67.33 0.013 205.92 110.00 1.51 (ii) 10.00 0.17 1.50 205.92 10.00 1.51 (iii) 10.00 0.17 1.50 82.90 83.90 10.99 11.5 MALLER TH THE PREVIOUS RASEPTICIENT. ANALYSE THE PREVIOUS RASEPTICENT. ANALYSE THE RASEPTICENT. ANALYSE THE PREVIOUS RASEPTICENT. ANALYSE THE PREV | 0.27 1.50 2.00 40.00 0.250 188.32 180.00 6.99 10.00 6.99 110.00 0.13 0.11 1.50 82.90 0.47 AN TIME STATE 105 BELOW 26 THE AREA. US LOSSES: US LO | *TOTALS 0.181 1.50 4.3.9 3.3.9 0.57 2.1 3.667-7100bl3.3 0.57 2.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3 | 10872\d57abe18 5TORM DI TIME RAIN hrs ms/hr 10.50 5.66 1.67 5.28 1.83 4.98 1.00 4.70 |
| Length Mannings n Max.Eff.Inten.(over Storage Coeff. Unit Byd. Tpeak TIME TO PEAK ENORY COEFFICE **** WARRING: STORA **** WARRING: STORA **** WARRING: TOTAL RAINFALL RUNOFF COEFFICE (C1's = (i) IN PROCEED (C1's = (ii) THE STEP (III) PEAK FLOW READ STORM PHOTAL = 83.90 mm PHOTAL = 83.90 mm Photal = 83.90 mm PLOTAL = 83.90 mm CALLB STANDHYD (0068) 1.0 CALLB STANDHYD (0068) 1.0 CALLB STANDHYD (0068) CALLB | (m) = (%) = | 1.00 67.33 0.013 205.92 10.00 1.51 (ii) 10.00 1.51 (ii) 10.00 0.17 1.50 82.90 83.90 0.99 15.SMALLER TH THE RAPE TO THE REPORT OF | 0.27 1.50 2.00 40.00 0.250 188,32 10.00 10.00 110.00 111 1.50 10.1 | *TOTALS 0.188 1.50 47.94 83.90 0.51 21 8467-7100bl3a 9000 DESIGN S RAIN mm/hr 14.83 2 10.31 3 9.02 3 8.03 3 7.24 4 | 10872\d57abel8 STORM DIS TIME RAIN hrs mm/hr mm/hr 10.17 6.60 1.17 6.60 1.19 6.10 1.19 6.10 1.10 |
| Length Mannings n Max.Eff.Inten.(over Storage CoEff. Unit Hyd. Tpeak Unit Hyd. peak Unit Hyd. peak Unit Hyd. peak TIME TO PEAK RUNDFY POLIME TOTAL RAINFALL RUNDFY COEFFICE (CH' = (i) TIME STOR (i) CN PROCEE (CH' = (ii) TIME STEP (TIAN THE (iii) PEAK FLOW READ STORM PEAK STORM PEOTAL = 83.90 mm PTOTAL = 83.90 mm TOTAL RAINFALL (III) PEAK FLOW READ STORM READ STORM PLOTAL = 83.90 mm SUTAL = 83.90 mm TOTAL RAINFALL (III) PEAK FLOW PLOTAL = 83.90 mm SUTAL = 83.90 mm TOTAL = 83.90 mm TOTAL = 83.90 mm POTAL = 83.90 mm TOTAL = 83.90 mm POTAL = 83.90 mm TOTAL = 83.90 mm TOTAL = 83.90 mm POTAL = 83.90 mm TOTAL = 83.90 mm TOTAL = 83.90 mm POTAL = 83.90 mm TOTAL = 83.90 mm | (m)= (m)= (m)= (min) (min)= (m | 1.00 67.33 0.013 205.92 110.00 1.51 (ii) 10.00 0.17 1.50 205.92 10.00 1.51 (iii) 10.00 0.17 1.50 82.90 83.90 10.99 11.5 MALLER TH THE PREVIOUS RASEPTICIENT. ANALYSE THE PREVIOUS RASEPTICENT. ANALYSE THE RASEPTICENT. ANALYSE THE PREVIOUS RASEPTICENT. ANALYSE THE PREV | 0.27 1.50 2.00 40.00 0.250 188.32 180.00 6.99 10.00 6.99 110.00 0.13 0.11 1.50 82.90 0.47 AN TIME STATE 105 BELOW 26 THE AREA. US LOSSES: US LO | *TOTALS 0.188 1.50 47.94 83.90 0.51 21 8467-7100bl3a 9000 DESIGN S RAIN mm/hr 14.83 2 10.31 3 9.02 3 8.03 3 7.24 4 | 10872\d57abel8 STORM DIS TIME RAIN hrs mm/hr 1.17 6.60 1.33 6.10 1.09 5.68 1.83 4.98 1.00 4.70 |

| TOTAL RAINFALL (mm)= 83.90 83.90 83.90 RUNOFF CORFFICIENT = 0.99 0.40 0.50 | |
|--|--|
| **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! **** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% **YOU SHOULD CONSIDES SPLITTING THE AREA. | ADD HYD (0027) |
| (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: | (ha) (cms) (hrs) (mm) ID1= 1 (0027): 3.99 0.969 1.50 44.23 |
| CN* = 58.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. | + ID2= 2 (0034): 0.67 0.148 1.50 41.38 ID = 3 (0027): 4.66 1.117 1.50 43.82 |
| (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| READ STORM Filename: C:\Users\Greq\AppD | ADD HTD (0027) AREA QPEAK TPEAK R.V. |
| Ptotal= 83.90 mm Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS TIME RAIN TIME RAIN TIME RAIN TIME RAIN TIME RAIN | (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 |
| hrs mm/hr 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 | ID = 1 (0027): 5.31 1.233 1.50 42.86 |
| 0.50 5.62 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 12.00 19.28 3.00 7.24 4.00 4.70 | NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| 1.00 11.07 2.00 15.28 3.00 7.24 4.00 4.70 | ADD HYD (0027) 1 + 2 = 3 |
| CALIB | |
| ID= 1 DT=10.0 min Total Imp(%)= 39.00 Dir. Conn.(%)= 15.00 IMPERVIOUS PERVIOUS (1) | ID = 3 (0027): 5.82 1.382 1.50 43.50 |
| Surface Area (ha)= 0.34 0.52 Dep. Storage (mn)= 1.00 1.50 Average Slope (%)= 1.00 2.00 Length (m)= 75.72 40.00 Mannings = 0.013 0.250 | NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| Mannings n = 0.013 0.250 Max.Eff.Inten.(mm/hr)= 205.92 100.57 | ADD HYD (0027) 3 + 2 = 1 AREA QPEAK TPEAK R.V. |
| over (min) 10.00 10.00 Storage Coeff. (min) 1.62 (ii) 8.66 (ii) Unit Myd. Tpeak (min) 10.00 10.00 | (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 |
| Onit hyd. peak (cms) = 0.17 0.12 Thit hyd. peak (cms) = 0.17 0.12 *TOTALS* PEAK FLOW (cms) = 0.07 0.10 0.177 (iii) | ID = 1 (0027): 6.50 1.566 1.50 43.96 |
| 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 | NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| RUNOFF COEFFICIENT = 0.99 0.38 0.47 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! *********************************** | ADD HYD (0027) |
| TOU SHOULD CONSIDER SPLITTING THE AREA. (i) On PROCEDURE SELECTED FOR PERVIOUS LOSSES: | 1 |
| CN* = 58.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. | ID = 3 (0027): 6.91 1.659 1.50 43.84 |
| (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| ADD HYD (0027) | ADD HYD (0027) |
| | (ha) (cms) (hrs) (mm) III= 3 (0027): 6.91 1.659 1.50 43.84 + ID2= 2 (0069): 0.86 0.177 1.50 39.57 |
| ID = 3 (0027): 1.11 0.297 1.50 47.22 | ID = 1 (0027): 7.77 1.837 1.50 43.37 |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| ADD HYD (0027) | READ STORM Filename: C:\Users\Greg\AppD ata\Loca\Temp\ |
| (ha) (cms) (hrs) (mm) (ms) (1) (1) | 838a855b-29b4-4b71-a467-7100b13d0872\d57abe18 Ptotal= 83.90 mm Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS |
| ID = 1 (0027): 1.59 0.408 1.50 45.89 | TIME RAIN TIME R |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | 0.33 5.05 1.33 41.07 2.33 12.12 3.33 6.10 0.50 5.82 1.50 05.92 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 |
| ADD HYD (0027) | 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 |
| ID = 3 (0027): 2.20 0.573 1.50 46.43 | STANDHYD (0065) Area (ha)= 0.49 ID=1 DT=10.0 min Total Imp(%)= 26.00 Dir. Conn.(%)= 17.00 |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | IMPERVIOUS PERVIOUS (i) Surface Area (ha)= 0.13 0.36 Dep. Storage (mm)= 1.00 1.50 |
| ADD HYD (0027) | Average Slope (%)= 1.00 2.00 Length (m)= 57.15 40.00 Mannings n = 0.013 0.250 |
| 3 + 2 = 1 | Max.Eff.Inten.(mm/hr)= 205.92 68.72 over (min) 10.00 10.00 |
| + ID2= 2 (0030): 0.33 0.095 1.50 49.35 | MAX_RT.inten.(mm,nr)= 205.92 68.72 over (min) 10.00 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* |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | PEAK FLOW (cms)= 0.05 0.05 0.094 (iii) TIME TO PEAK (brs)= 1.50 1.50 1.50 |
| ADD HYD (0027) | RUNOFF COEFFICIENT = 0.99 0.33 0.44 |
| 1 + 2 = 3 | ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! **** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA. |
| + ID2= 2 (0032): 0.66 0.123 1.50 37.21 | (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 58.0 Ia = Dep. Storage (Above) |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | (ii) TIME STEP (DT) SHOULD BE SWALLER OR EQUAL THAN THE STORAGE COMPFICIENT (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. |
| ADD HYD (0027) | READ STORM Filename: C:\Users\Greg\AppD |
| 3 + 2 = 1 ARRA QPEAK TERAK R.V. | ata\Local\Temp\ 838a855b-29b4-4b71-a467-7100b13d0872\d57abe18 |
| ID = 1 (0027): 3.99 0.969 1.50 44.23 | Ptotal= 83.90 mm Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS |
| NOTE: FEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | TIME RAIN 0.17 4.50 1.17 16.86 2.17 14.83 3.17 6.60 |

| 0.33 5. 0.50 5. | 05 1.33 41 82 1.50 205 | .07 2.33 .92 2.50 | 3 12.12 0 10.31 | 3.33 | 6.10 5.66 |
|---|---|--|--------------------------------------|--|---|
| 0.67 6. 0.83 8. 1.00 11. | 05 1.33 41 82 1.50 205 83 1.67 54 41 1.83 29 07 2.00 19 | .56 2.6° .17 2.8° .28 3.00 | 9.02 8.03 7.24 | 3.67 3.83 4.00 | 5.28 4.98 4.70 |
| CALIB STANDHYD (0066) Area | (ha) = 0.2 1 Imp(%) = 49.0 | 5 0 Dir. Co | onn.(%)= | 31.00 | |
| Surface Area (ha)= Dep. Storage (mm)= Average Slope (%)= Length (m)= Mannings n | IMPERVIOUS 0.12 1.00 1.00 | PERVIOUS 0.13 1.50 2.00 40.00 0.250 | (i) | | |
| Max.Eff.Inten.(mm/hr)= | 205.92 10.00 | 95.57 10.00 | | | |
| PEAK FLOW (cms)= TIME TO PEAK (hrs)= RUNOFF VOLUME (mm)= TOTAL RAINFALL (mm)= RUNOFF COEFFICIENT = | 0.04 1.50 82.90 83.90 | 0.02 1.50 31.34 83.90 0.37 | 4 | TALS* 0.069 (iii 1.50 17.31 83.90 0.56 |) |
| **** WARNING: STORAGE COEF (i) CN PROCEDURE SEL CN* = 58.0 (ii) TIME STEP (DT) S THAN THE STORAGE (iii) PEAK FLOW DOES N | ECTED FOR PERVIOUS TA = Dep. Store HOULD BE SMALLE COEFFICIENT. | OUS LOSSES age (Above R OR EQUAL | : | | |
| ADD HYD (0067) 1 + 2 = 3 ID1= 1 (0065): + ID2= 2 (0066): | AREA QPEAK (ha) (cms) 0.49 0.094 0.25 0.069 | TPEAK (hrs) 1.50 | R.V. (mm) 37.03 | | |
| + ID2= 2 (0066): | 0.74 0.163 | 1.50 | 40.50 | | |
| DUHYD (0024) Inlet Cap. = 0.057 #of Inlets = 1 | | | | | |
| TOTAL HYD.(ID= 1): 0 | | | | | |
| MAJOR SYS.(ID= 2): 0 MINOR SYS.(ID= 3): 0 NOTE: PEAK FLOWS DO N | | | | | |
| | | | | | |
| ADD HYD (0031) 1 + 2 = 3 | AREA QPEAK (ha) (cms) 0.56 0.057 7.77 1.837 | TPEAK (hrs) 1.50 | R.V. (mm) 40.50 | | |
| + ID2= 2 (0027): =========== ID = 3 (0031): | | | | | |
| NOTE: PEAK FLOWS DO N | OT INCLUDE BASE | FLOWS IF A | WY. | | |
| ADD HYD (0031) 3 + 2 = 1 | AREA QPEAK | TPEAK | R.V. | | |
| | AREA QPEAK (ha) (cms) 8.33 1.894 0.71 0.056 | (hrs) 1.50 1.50 | (mm) 43.18 22.52 | | |
| ID = 1 (0031): NOTE: PEAK FLOWS DO N | 9.04 1.950 OT INCLUDE BASE | | | | |
| RESERVOIR(0029) | | | | | |
| 0 0 0 0 | .0130 0.049 .0163 0.077 | 7 0.1 | 2663 3630 4697 | CORAGE ha.m.) 0.2030 0.2551 0.3117 0.3731 0.4393 | |
| INFLOW: ID= 2 (0031) OUTFLOW: ID= 1 (0029) | AREA Q: (ha) (19.038 9.038 | | | 0.0000 R.V. (mm) 41.56 40.35 | |
| TIME SHI | LOW REDUCTION FT OF PEAK FLOW STORAGE USED | (T |](%)= 9.2 min)= 63.0 .m.)= 0.2 | 0 | |
| | | | | | |
| READ STORM Fil | ename: C:\Users ata\Loca 838a855b ments: 100 YEAR | l\Temp\ -29b4-4b71- | -a467-7100 | b13d0872\c | 157abe18 |
| TIME RA hrs mm/ 0.17 4. | IN TIME R | AIN TIN | ME RAIN | TIME hrs | RAIN mm/hr 6.60 6.10 5.66 5.28 4.98 4.70 |
| CALIB STANDHYD (0063) Area | | | | | |
| | IMPERVIOUS 0.13 1.00 | Dir. Co PERVIOUS 0.18 1.50 2.00 | | 0.00 | |

| Length (m)= | 45 | .46 | 40.00 | | | |
|---|-------------|-----------|------------------------|----------------|------------------------|--|
| Mannings n = | . 0. | 013 | 0.250 | | | |
| May Pff Inton (mm/hy)- | 205 | 0.2 | 140.36 | | | |
| Max.Eff.Inten.(mm/hr)= over (min) | 10 | .92 | 10.00 | | | |
| Storage Coeff. (min)= | : 1 | .19 (ii) | | ii) | | |
| Unit Hyd. Tpeak (min)= | : 10 | .00 | 10.00 | | | |
| Unit Hyd. peak (cms)= | . 0 | .17 | 0.13 | | | |
| | | .00 | 0.05 | • | TOTALS* 0.054 (iii) | |
| PEAK FLOW (cms)= | | 50 | 1.50 | | 1.50 | |
| RUNOFF VOLUME (mm)= TOTAL RAINFALL (mm)= | : 1 : 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 COEF ***** WARNING:FOR AREAS WIT YOU SHOULD CO | TH IMPERV | IOUS RATI | THE AREA. | 20% | | |
| (i) CN PROCEDURE SEL CN* = 58.0 | | | | | | |
| (ii) TIME STEP (DT) S | ta = Dej | p. Storag | ge (ADOVE |) | | |
| THAN THE STORAGE | | | OK LOOM | | | |
| (iii) PEAK FLOW DOES N | OT INCLU | DE BASEFI | LOW IF ANY | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| ADD HYD (0037) | | | | | | |
| 1 + 2 = 3 | (ha) | (QPEAK | (bxa) | R.V. | | |
| ID1= 1 (0024): | 0.18 | 0.106 | 1.50 | 40.50 | | |
| ID1= 1 (0024): + ID2= 2 (0029): | 9.04 | 0.181 | 2.55 | 40.35 | | |
| | | | | 40.36 | | |
| ID = 3 (0037): | 9.22 | 0.181 | 2.55 | 40.36 | | |
| NOTE: PEAK FLOWS DO N | OT INCLU | DE BASEFI | LOWS IF AN | Υ. | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| ADD HYD (0037) | | | | | | |
| 3 + 2 = 1 | AREA | QPEAK | TPEAK (hrs) | R.V. | | |
| | (na) | (CMS) | (nrs) | 40 26 | | |
| ID1= 3 (0037): + 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 N | OT INCLU | DE BASEFI | LOWS IF AN | Υ. | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| ADD HVD (0037) | | | | | | |
| 1 + 2 = 3 | AREA | QPEAK | TPEAK (hrs) 2.55 | R.V. | | |
| | (ha) | (cms) | (hrs) | (mm) | | |
| ID1= 1 (0037): + ID2= 2 (0063): | 0.31 | 0.182 | 2.55 | 40.13 35 97 | | |
| | | | | | | |
| ID = 3 (0037): | 9.62 | 0.188 | 2.47 | 39.99 | | |
| | | | | | | |
| NOTE: PEAK FLOWS DO N | OF INCLU | de Baséfi | LOWS IF AN | Ι. | | |
| | | | | | | |
| | | | | | | |
| ADD HYD (0037) | | | | | | |
| ADD HYD (0037) | AREA | OPEAK | TPEAK | R.V. | | |
| | (ha) | (cms) | (hrs) | (mm) | | |
| ID1= 3 (0037): + ID2= 2 (0070): | 9.62 | 0.188 | 2.47 | 39.99 | | |
| + ID2= 2 (0070): | 1.74 | 0.092 | 1.67 | 17.19 | | |
| ID = 1 (0037): | | | | | | |
| | | | | | | |
| NOTE: PEAK FLOWS DO N | OT INCLU | DE BASEFI | LOWS IF AN | Υ. | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Appendix C: Misc Pond Calculations



Subject:

Project #:

Cedar Park Extendsion

Date:

Jan-18 17-027 By:
Page

TGS

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

CII

d= Vf=

127

dist=

0.5 6.4

4) Forebay Design: Bottom Width

Equation 4.7

Width=Dist/8



Subject:

Cedar Park Extendsion

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Jan-18 E

By:

Project #:

17-027

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TGS

Given

Dist=

28

width=

3.5

5) Forebay Design: Cleanout Frequency

Table 6.3 of SWM Planning and Design Manual

35% Impervious 55% Impervious

0.6 m3/ha, annual sediment loading

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

Target Removal eff. For normal protection

70%

Anticipate Accumulation

8.0675 m3/year

11.525 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



Subject: Ceder Park Extension
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Project #: 17027 Page

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|-----|------|
| Dy. | Page |
| | 27 |

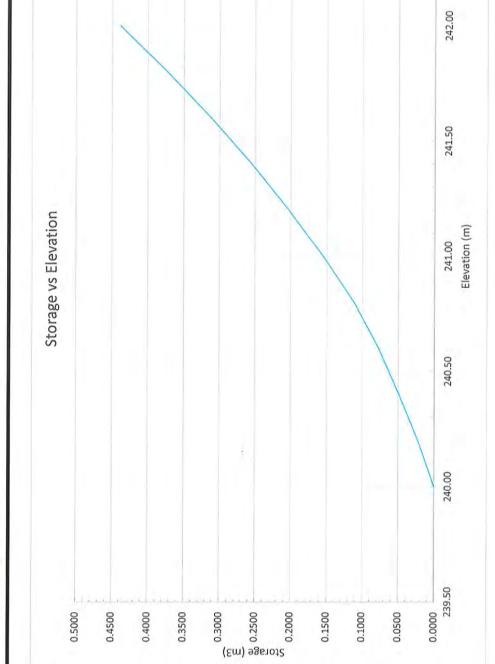
| Contour | Permanent Pool Volume | ool Volume | | | | | | | | | | |
|--|-----------------------|------------|-----|------|--------|---------|-------------|---------------|-------------|--------|-----------|----------|
| 48 228 276 0 62 62 154 171 395 566 92 154 228 553 841 153 432 288 553 841 153 432 288 565 1033 187 619 Compares to 586m3 by Civil 3D 288 565 1033 187 619 Compares to 586m3 by Civil 3D 288 665 1033 187 619 Compares to 586m3 by Civil 3D 289 665 1033 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | | A2 | Ā | | | Volume | | | | | | |
| 81 268 349 62 62 62 62 62 62 62 6 | 239.00 | 48 | 228 | 276 | Ü | | | | | | | |
| 171 395 566 92 154 222 462 684 125 279 288 553 841 155 279 288 665 1033 187 619 Compares to 586m3 by Civil 3D 288 665 1033 187 619 Compares to 586m3 by Civil 3D 288 665 1033 0 0 0 0 0 0.0000 1232 m2 m2 m3 m3 (ha*m) cms cms hr 288 665 1033 0 0 0 0 0.0000 1410 1410 264 491 0.04907 0.0103 0.0103 2277 2277 434 1563 0.0256 0.0256 0.0365 0.0645 2494 2494 477 2030 0.02099 0.0236 0.0645 2577 2277 434 1563 0.0256 0.0236 0.0365 0.1662 25494 277 2551 0.2551 0.0256 0.0365 0.1662 25494 277 2030 0.02099 0.0236 0.0365 0.1662 25494 277 2030 0.02099 0.0236 0.0365 0.1662 25494 277 2030 0.02099 0.0236 0.0366 0.1080 25494 373 0.37306 0.0299 0.0236 0.0366 0.1080 25495 3185 662 3177 0.37306 0.0299 0.0334 0.3830 0.541367 3435 8435 662 4393 compares to 4439 by Civil 3D | 239.20 | 81 | 268 | 349 | 9 | | | | | | | |
| 222 462 684 125 279 288 553 841 153 432 368 665 1033 187 619 Compares to 586m3 by Civil 3D Area 0.007854 A1 A2 At Incr V Volume 0.1.0 Cms cms cms hr cms m2 m2 m3 m3 (ha ⁴ m) cms cms cms hr cms m2 m2 m3 m3 (ha ⁴ m) cms cms cms hr cms m2 m3 m3 (ha ⁴ m) cms cms cms hr cms m2 m3 m3 (ha ⁴ m) cms cms cms hr cms m2 m3 m3 (ha ⁴ m) cms cms cms cms m3 (ha ⁴ m) cms cms cms cms m3 (ha ⁴ m) cms cms cms cms m3 (ha ⁴ m) cms cms cms cms cms hr cms cms cms cms cms hr cms cms cms cms hr cms cms cms cms cms cms hr cms | 239.40 | 171 | 395 | 999 | 6 | | | | | | | |
| 288 553 841 153 432 368 665 1033 187 619 Compares to 586m3 by Civil 3D Liam 100 0.2 mm CL Elev 240.05 240.80 m Area 0.007854 Al Incr V 100 0.00000 1232 | 239.60 | 222 | 462 | 684 | 125 | | | | | | | |
| 368 665 1033 187 619 Compares to 586m3 by Civil 3D Diam 100 0.2 mm CL Elev 240.05 240.80 m Area 0.007854 Area 0.007854 A1 Incr V 101 0.00000 1232 m2 m3 m3 (ha*m) cms cms rms hr 368 665 1033 0 0 0.00000 1232 226 226 0.02265 0.0085 1410 1404 281 772 0.04907 0.0130 0.0180 2063 2267 491 0.04907 0.0130 0.0180 2077 2277 434 1553 0.1552 0.0246 0.0255 0.0845 2277 2277 434 1553 0.1552 0.0246 0.0256 0.0548 2277 2277 2277 434 1553 0.1552 0.0255 0.0845 2277 2277 2277 434 1563 0.2561 0.0236 0.0364 2277 2277 434 1563 0.1562 0.0236 0.0543 2277 2277 2277 230 0.2029 0.0235 0.0845 2277 2277 237 2370 0.2029 0.0235 0.0845 2494 477 2030 0.2029 0.0235 0.0845 2494 477 2030 0.2029 0.0235 0.0845 2495 2497 566 3117 0.31174 0.0273 0.2390 0.2663 3435 662 4393 0.43926 0.0306 0.4391 0.4697 0.441694 3435 3435 662 4393 0.43926 0.0306 0.4391 0.4697 0.441694 | 239.80 | 288 | 553 | 841 | 153 | | | | | | | |
| Alianaria Diamaria 100 0.2 mm CL Elev 240.05 240.80 m Alianaria Area 0.007854 1.0cr V 240.05 240.80 m Alianaria Area 0.007854 1.0cr V 240.05 1.0cm | 240.00 | 368 | 999 | 1033 | 187 | | Compares to | 586m3 by (| Sivil 3D | | | |
| CL Elev 240.05 240.80 m Area 0.007854 Area 0.00785 Area 0.00 | Rating Curve | | | | | | | | | | | |
| Area 0.007854 Area 0.00786 A | | | | | | Diam | 100 | 0.2 | mm | | | |
| A1 A2 At IncrV Volume Orf. Q Weir Q Tot Q Drawdown m2 m2 m2 m3 m3 (ha*m) cms cms hr cms hr cms cms hr cms lo 0.00000 0.0000 0.00000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.000000 | | | | | | CL Elev | 240.05 | 240.80 | ш | | | |
| A1 A2 A4 Incr V Volume Orf. Q Weir Q Tot Q Tot Q Drawdown 0.00 368 665 1033 0 0 0 0.0000 0.00100 0.00100 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td>Area</td> <td>0.007854</td> <td></td> <td></td> <td></td> <td></td> <td></td> | | | | | | Area | 0.007854 | | | | | |
| m2 m2 m3 m3 (ha*m) cms cms hr 368 665 1033 0 0 0 0.0000 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00130 0.0140 0.0130 0.0140 | Contour | | A2 | At | Incr V | | Volume | Orf. Q | Weir Q | Tot Q | Drawdown | Tot Drw. |
| 368 665 1033 0 0 0 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00130 0.0143 0.0143 0.0143 0.0143 0.0143 0.0143 0.0143 0.0143 0.0143 0.0143 0.0143 0.0143 0.0143 0.0143 0.0144 | | | m2 | m2 | ш3 | m3 | (ha*m) | cms | cms | cms | 74 | hr |
| 1232 1236 226 0.02265 0.0085 0.0085 14.824162 1410 1410 264 491 0.04907 0.0130 0.0130 0.0130 6.841310 1404 281 772 0.07721 0.0163 0.0163 5.360166 8.841310 2063 247 1119 0.11188 0.0190 0.0000 0.0163 5.466523 2277 2277 434 1553 0.15528 0.0214 0.0299 0.0612 3.433825 2494 2494 477 2030 0.20299 0.0235 0.0845 0.1080 1.664554 2717 2717 521 2551 0.25510 0.0255 0.1552 0.1807 1.002793 2947 566 3117 0.31174 0.0273 0.2390 0.2663 0.703997 3185 613 3731 0.37306 0.0306 0.4391 0.441694 4395 0.9845 0.0306 0.4394 0.441694 < | 240.00 | 368 | 999 | 1033 | 0 | 0 | 0 | 0.0000 | | 0.0000 | 0.000000 | 0 |
| 1410 1410 264 491 0.04907 0.0130 0.0130 6.841310 1404 1404 281 772 0.07721 0.0163 0.0163 5.350166 2063 2063 347 1119 0.1188 0.0190 0.0000 0.0190 5.466523 2277 2277 434 1553 0.15528 0.0214 0.0299 0.0512 3.433825 2494 477 2030 0.20299 0.0235 0.0845 0.1080 1.664554 2717 521 2551 0.25510 0.0255 0.1552 0.1807 1.002793 2947 566 3117 0.31174 0.0273 0.2390 0.2663 0.703997 3185 613 3731 0.37306 0.0306 0.4391 0.4697 0.441694 4395 0.4392 0.0306 0.4391 0.441694 0.441694 | 240.20 | 1232 | | 1232 | 226 | 226 | 0.02265 | 0.0085 | | 0.0085 | 14.824162 | 14.82416 |
| 1404 281 772 0.07721 0.0163 0.0163 5.350166 2063 2063 347 1119 0.11188 0.0190 0.0000 0.0190 5.466523 2277 2277 434 1553 0.15528 0.0214 0.0299 0.0512 3.433825 2494 477 2030 0.20299 0.0235 0.0845 0.1080 1.664554 2717 2717 521 2551 0.25510 0.0255 0.1552 0.1807 1.002793 2947 566 3117 0.31174 0.0273 0.2390 0.2663 0.703997 3185 613 3731 0.37306 0.0290 0.3340 0.3630 0.541367 3435 662 4393 0.43926 0.0306 0.4391 0.4697 0.441694 4393 compares to 4439 by Civil 3D 0.441694 0.441694 0.441694 | 240.40 | 1410 | | 1410 | 264 | 491 | 0.04907 | 0.0130 | | 0.0130 | 6.841310 | 21.66547 |
| 2063 2063 347 1119 0.11188 0.0190 0.0000 0.0190 5.466523 2277 434 1553 0.15528 0.0214 0.0299 0.0512 3.433825 2494 477 2030 0.20299 0.0235 0.0845 0.1080 1.664554 2717 2717 521 2551 0.25510 0.0255 0.1552 0.1807 1.002793 2947 566 3117 0.31174 0.0273 0.2390 0.2663 0.703997 3185 613 3731 0.37306 0.0290 0.3340 0.3630 0.541367 3435 662 4393 0.43926 0.0306 0.4391 0.4697 0.41694 4393 compares to 4439 by Civil 3D 0.24697 0.41694 | 240.60 | 1404 | | 1404 | 281 | 772 | 0.07721 | 0.0163 | | 0.0163 | 5.350166 | 27.01564 |
| 2277 434 1563 0.15528 0.0214 0.0299 0.0512 3.433825 2494 477 2030 0.20299 0.0235 0.0845 0.1080 1.664554 2717 2717 521 2551 0.25510 0.0255 0.1552 0.1807 1.002793 2947 566 3117 0.31174 0.0273 0.2390 0.2663 0.703997 3185 613 3731 0.37306 0.0290 0.3340 0.3630 0.541367 3435 662 4393 0.43926 0.0306 0.4391 0.4697 0.41694 4393 compares to 4439 by Civil 3D 0.2403 by Civil 3D 0.41694 | 240.80 | 2063 | | 2063 | 347 | 1119 | 0.11188 | 0.0190 | 0.0000 | 0.0190 | 5.466523 | 32.48216 |
| 2494 2494 477 2030 0.20299 0.0235 0.0845 0.1080 1.664554 2717 2717 521 2551 0.25510 0.0255 0.1552 0.1807 1.002793 2947 566 3117 0.31174 0.0273 0.2390 0.2663 0.703997 3185 613 3731 0.37306 0.0290 0.3340 0.3630 0.541367 3435 662 4393 0.43926 0.0306 0.4391 0.4697 0.441694 4393 compares to 4439 by Civil 3D | 241.00 | 2277 | | 2277 | 434 | 1553 | 0.15528 | 0.0214 | 0.0299 | 0.0512 | 3.433825 | 35.91599 |
| 2717 2717 521 2551 0.25510 0.0255 0.1552 0.1807 1.002793 2947 2947 566 3117 0.31174 0.0273 0.2390 0.2663 0.703997 3185 613 3731 0.37306 0.0290 0.3340 0.3630 0.541367 3435 662 4393 0.48926 0.0306 0.4391 0.4697 0.441694 4393 compares to 4439 by Civil 3D | 241.20 | 2494 | | 2494 | 477 | 2030 | 0.20299 | 0.0235 | 0.0845 | 0.1080 | 1.664554 | 37.58054 |
| 2947 566 3117 0.31174 0.0273 0.2390 0.2663 0.703997 3185 613 3731 0.37306 0.0290 0.3340 0.3630 0.541367 3435 662 4393 0.43926 0.0306 0.4391 0.4697 0.441694 4393 compares to 4439 by Civil 3D | 241.40 | 2717 | | 2717 | 521 | 2551 | 0.25510 | 0.0255 | 0.1552 | 0.1807 | 1.002793 | 38.58333 |
| 3185 3185 613 3731 0.37306 0.0290 0.3340 0.3630 0.541367 3435 662 4393 0.43926 0.0306 0.4391 0.4697 0.441694 4393 compares to 4439 by Civil 3D | 241.60 | 2947 | | 2947 | 999 | 3117 | 0.31174 | 0.0273 | 0.2390 | 0.2663 | 0,703997 | 39.28733 |
| 3435 662 4393 0.43926 0.0306 0.4391 0.4697 0.441694 4393 compares to 4439 by Civil 3D | 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 compa | res to 4439 l | by Civil 3D | | | |



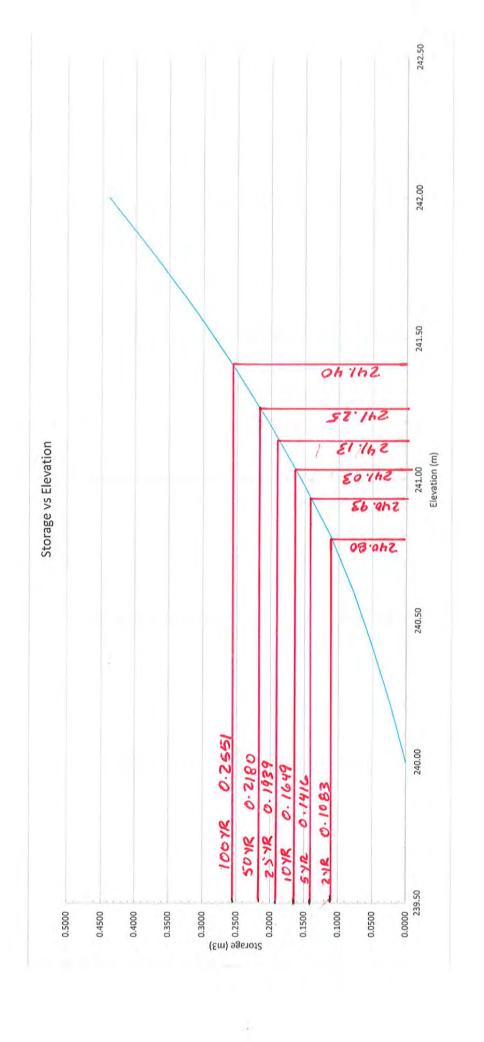
Subject: Cedar Park Extension

9 By: 17027 Page Jan-19 Date: Project #:

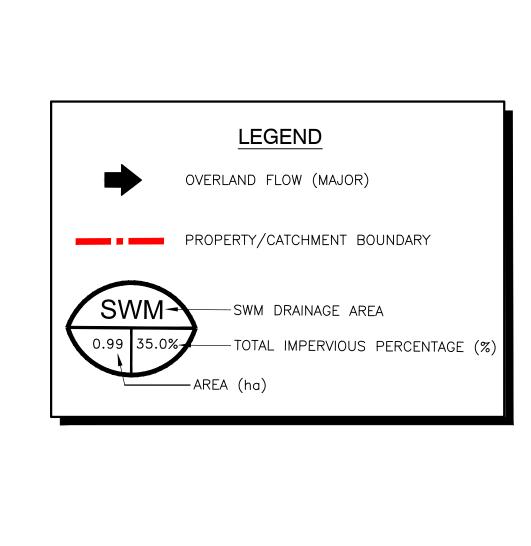
TGS



242.50







WEST CHURCH STRE

WEST CHURCH STREET

CEDAR PARK SUBDIVISION

30 30 37 32 33 34 35 36 37

VTRAIL

SWM POND



SCALE:

7.5
22.5
37.5

HORIZONTAL: 1:750



G. DOUGLAS VALLEE LIMITED
2 TALBOT STREET NORTH
SIMCOE, ONTARIO N3Y 3W4
(519) 426-6270

Stamp

CEDAR PARK condos

WATERFORD - NORFOLK COUNTY

Drawing Title
SWM DRAINAGE AREA

Designed by:

NLB

Checked by:

Date Started:

JUNE 3, 2022

Drawing Scale:

1:750

Project No.

21-173

NATE LAST PLOTTED :



Subject: Date:

Project #:

Catchment Parameters 6/1/2022 21-173

By: Page

NLB 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 Impervio | ous (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

CN (-)

A - gravelly sandy till, sandy textures over gravelly sandy till

58

16.5 mm la



Subject: Date:

Project #:

Target Volumes/Flow Rates 6/1/2022 By: NI

21-173

_ By: Page NLB 2

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



Stage-Storage-Discharge Estimate Subject:

6/1/2022 Ву: Project #: 21-173

Page

NLB 3

Proposed Cottonwood SWM Facility

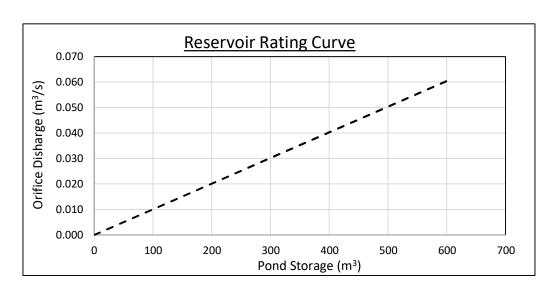
| Pond Parameters | Orifice Parameters |
|-----------------|--------------------|
|-----------------|--------------------|

| Bottom of Pond Elev. (m) | 0.00 | Diameter | 0.150 | m |
|--------------------------|-------|-----------------|--------|----|
| | | Orifice #1 Area | 0.0177 | m2 |
| Target Flow Rate (m3/s) | 0.160 | Elevation | 0.00 | m |
| Active Storage Depth (m) | 1.5 | | | |
| Required Volume (m3) | 600 | | | |

Date:

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 |





Subject:
Date:
Project #:

Pre to Post Flows 6/1/2022

21-173

By: Page NLB 4

Pre to Post-Development Flow Rates to WSMD

| | | | Q (m3/s) | | |
|---------------|-------|---|---|---|-------|
| Return Period | Pre | Total Post from Original Cedar Park II - 17-027 | Total Post from Cedar Park II including Cottonwood | Net (Pre to Post with Cottonwood) | Check |
| 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

 \checkmark

100-YR Flow Rate from Cedar Park II Pond (m3/s)

Target 0.192 m3/s Actual Provided 0.179 m3/s





Subject: Date: Project #:

Utilized Storage Volumes 6/1/2022

By:

NLB

5

21-173 Page

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)

| Approximate Fond Stages from OTTITIMO Model (Cedal Fark in Fond) | | | | | | | | |
|--|--------------------------|----------------------|-----------|--|--|--|--|--|
| 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.

| Storm | 5-year | Storm | 6-year | 6-yea

| | Location | | Area | | | Individual | Cumulative | Time of | Rainfall | Flow | | Sewer Design | | | | | |
|---|--------------|---------|---------|--------------|---------------|-------------|-----------------|--|------------|------------|------|--------------|-----------------|--------------|--------|-------|--------------|
| Area | From | То | На | Ha | Ha | R*A | R*A | Concentration | mm/hr | 2.78*I*A*R | Size | Slope | Capacity (Full) | Vel (Full) | Length | Time | Сар |
| | | | 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 Out | let - Thomps | on Road | | | | | | | | | | | | | | | |
| , | CBMH23 | STMH24 | | | | • | | | | 192.0 | 450 | 11.01% | 946.02 | 5.95 | 24.5 | 0.07 | √ 20% |
| | STMH24 | STMH25 | 1 | | | | | | | 192.0 | 450 | 6.72% | 739.08 | 4.65 | 54.0 | 0.19 | √ 26% |
| | STMH25 | STMH26 | 1, , , | | | | | | | 192.0 | 450 | 3.26% | 514.77 | 3.24 | 21.3 | 0.11 | √ 37% |
| | STMH26 | STMH27 | | | | | | the Cedar Park S riginal Design was | | 192.0 | 450 | 0.50% | 201.60 | 1.27 | 95.5 | 1.26 | 95% |
| | STMH27 | STMH28 | 0.192 0 | ins of 192 L | ./s during tr | ie iuu-year | Storm event. Of | iginai Design was | 5 101 L/S. | 192.0 | 450 | 0.50% | 201.60 | 1.27 | 99.0 | 1.30 | 95% |
| | STMH28 | STMH29 | 1 | | | | | | | 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% | | | |
| | 2 | 2 31101 | | | | | | | | .020.0 | | 3.31 / | | 00 | | J. 12 | ¥ 5170 |

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 0.013

C= 0.703

17-027 Cedar Park II

Designed by NLB
Checked by JI

Town/County Waterford

Project

| | | ··· , <u>···</u> | | |
|----------|---|------------------|----|---|
| Sheet of | : | 1 | of | 1 |

Date June 7 2022

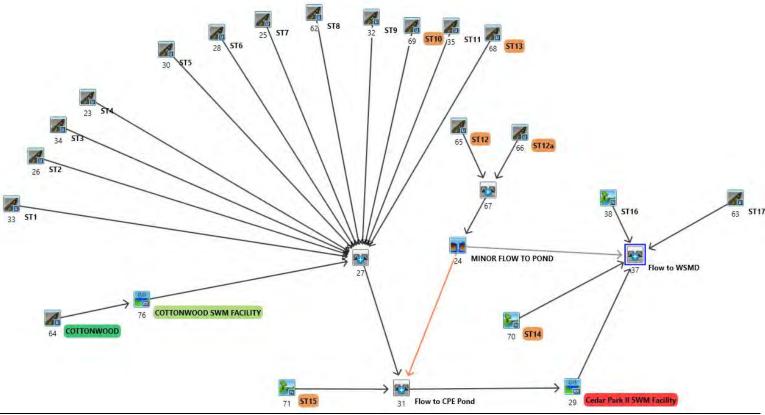
| | lown/County wateriord | | | | | Sneet or: 1 or 1 | | | | | | | | | | | |
|-------------------|-----------------------|----------------|---|--------------|--------------|------------------|------------------|--------------------|----------------|------------|------------|--------|-----------------|------------|--------------|------|---------------------------------------|
| Location | | | Area Individual Cumulative Time of Rainfall | | | | | Flow | | | Sewer Des | | | | | | |
| Area | From | То | Ha | Ha | Ha | R*A | R*A | Concentration | mm/hr | 2.78*I*A*R | Size | Slope | Capacity (Full) | Vel (Full) | Length | Time | Сар |
| | | | 0.45 | 0.60 | 0.75 | | | min | mm/hr | L/s | mm | % | L/s | m/s | m | min | % |
| ST1 | СВМН3 | 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% |
| 010 | 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 | | √ 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 | 0.37 | 0.00 | 0.00 | 0.17 | 0.17 | 10.21 | 94.94 | 96.2 | 375 | 0.40% | 110.89 | 1.00 | 68.8 | 1.14 | √ 40 % |
| 31 12a | STMH8 | STMH7 | 0.00 | 0.00 | 0.00 | 0.20 | 0.36 | 11.35 | 89.57 | 90.2 | 375 | 0.40% | 110.89 | 1.00 | 15.1 | 0.25 | √ 87 % |
| | STMH7 | STMH7 | 0.00 | 0.00 | 0.00 | 0.00 | 0.36 | | 88.49 | 89.7 | | 0.40% | 110.89 | 1.00 | 16.5 | 0.23 | ✓ 82%✓ 81% |
| | STMH6 | STMH6 STMH3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.36 | 11.61 11.88 | 87.34 | 88.5 | 375 375 | 0.40% | 110.89 | 1.00 | 37.6 | | √ 81% √ 80% |
| 0740 | | | | | | | | | | | | + | | | | | |
| ST13 | STMH5 STMH4 | STMH4 | 0.36 0.00 | 0.00 | 0.00 | 0.16 0.00 | 0.16 0.16 | 10.00 | 96.03 94.15 | 43.2 | 300 | 0.45% | 64.87 64.87 | 0.92 | 20.4 | 0.37 | √ 67% |
| 0711 | | STMH3 | | | ! | | | 10.37 | | 42.4 | 300 | 0.45% | | 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% |
| 0710 | 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% |
| | | <u></u> | | | | | | | | | | | | | | | |
| SWM Facility Outl | | | | | | | | | | | | | | | | | |
| | CBMH23 | STMH24 | | | | | | | | 179.0 | 450 | 11.01% | 946.02 | 5.95 | 24.5 | | √ 19% |
| | STMH24 | STMH25 | | | | | | | | 179.0 | 450 | 6.72% | 739.08 | 4.65 | 54.0 | 0.19 | √ 24% |
| | STMH25 | STMH26 | Design flow | for these ni | nes is has | ed on neak o | discharge from | the Cedar Park S | WM facility of | 179.0 | 450 | 3.26% | 514.77 | 3.24 | 21.3 | | √ 35% |
| | STMH26 | STMH27 | | | | | | riginal Design was | | 1/9.0 | 450 | 0.50% | 201.60 | 1.27 | 95.5 | | √ 89% |
| | STMH27 | STMH28 | I | : | | , | 2.2 0 | J 20.g Nac | | 179.0 | 450 | 0.50% | 201.60 | 1.27 | 99.0 | 1.30 | √ 89% |
| | STMH28 | STMH29 |] | | | | | | | | 450 | 0.50% | 201.60 | 1.27 | 99.0 | 1.30 | 4 89% |
| STMH29 STMH30 | | | | | | | | 179.0 | 450 | 0.50% | 201.60 | 1.27 | 99.0 | 1.30 | √ 89% | | |
| | STMH30 | Outlet | | Add ca | pacity of ex | x 750mm cu | lvert being repl | aced 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



2-YEAR STORM

| V V I V V V V V V V V V V V V V V V V V | SS U U | A A AAAAA A A | L L L LLLLL | (v 6.2.2007) |
|--|---|----------------------------------|--|--|
| 000 TTTTT 0 0 T 0 0 T 000 T 000 T Developed and Distri Copyright 2007 - 202 All rights reserved. | T H H T H H buted by Smar | Y Y Y Y t City W | MM MM 0 0 M M 0 0 M M 000 | тм |
| * | **** DETA | ILED | OUTPUT | **** |
| Output filename: 8861-e38dc4dfd2f8\b8 | C:\Users\Nata 8c4b27-9c1d-4 C:\Users\Nata | lie\AppD c80-9ff8 lie\AppD | ata\Local\Civi -34e59014e744\ ata\Local\Civi | ca\VH5\b59b925c-la86-4318- |
| DATE: 06/07/2022 | | | TIME: 10:59: | 28 |
| USER: | | | | |
| COMMENTS: | | | | |
| ******************* ** SIMULATION : Ru ************** | n 01 | | ** | |
| READ STORM | Filename: | | s\Natalie\AppD | |
| Ptotal= 39.38 mm | Comments: | 1577726 | c-47d7-46fc-bc | 76-c65d8db515e0\53bf0c4f DESIGN STORM DISTR |
| TIM | E RAIN ' | TIME | RAIN TIME | RAIN TIME RAIN |

hrs 1.00 1.17

1.33

1.67

1.83

mm/hr

8.94 16.92

78 82

21.89

13.00

9.88

hrs

2.00

2 33

2.50

2.83

mm/hr

8.15 7.01

6.20

5.59

5.11

hrs

3.00

3 33

3.67

mm/hr

4.39

4.11

3.89

3.68

3.51

3.35

hrs

0.00

0 33

0.67

mm/hr

3.25

3 96

4.52

5.31

6.55

```
CALIB |
NASHYD ( 0038)
                              Area (ha)= 0.09 Curve Number (CN)= 58.0 Ia (mm)= 16.50 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.15
|ID= 1 DT=10.0 min |
                            Ia (mm)=
U.H. Tp(hrs)=
     Unit Hyd Qpeak (cms)= 0.023
                           (cms)= 0.000
(hrs)= 1.833
      TIME TO PEAK
     RUNOFF VOLUME (mm) = 2.352
TOTAL RAINFALL (mm) = 39.385
RUNOFF COEFFICIENT = 0.060
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 CALIB
                            Area (ha)= 1.74 Curve Number (CN)= 58.0 Ia (mm)= 16.50 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.17
ID= 1 DT=10.0 min
     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.
                            Area (ha)= 0.71 Curve Number (CN)= 58.0 Ia (mm)= 5.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.17
 NASHYD ( 0071)
|ID= 1 DT=10.0 min |
     Unit Hyd Qpeak (cms)= 0.163
                                      0.009 (i)
     PEAK FLOW
                            (cms)=
     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.
  STANDHYD ( 0023)
                              ID= 1 DT=10.0 min |
                                        IMPERVIOUS
                                                           PERVIOUS (i)
     Surface Area
Dep. Storage
Average Slope
                                             0.28
                                                               0.31
                             (mm)=
                              (%)=
                                             1.00
                                                               2.00
     Length
Mannings n
                                            62.72
```

| Max.Eff.Inten.(| nm/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 COEFFICIE | ENT = | 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:
- (i) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (ii) 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 | |
| | | | | | | | |
| | | IMPERVIO | | PERVIOUS | S (i) | | |
| Surface Area | (ha)= | 0.37 | | 0.15 | | | |
| Dep. Storage | | | | 1.50 | | | |
| Average Slope | (%)= | 1.00 | | 2.00 | | | |
| Length | (m) = | 58.88 | | 40.00 | | | |
| Mannings n | = | 0.013 | | 0.250 | | | |
| | | | | | | | |
| Max.Eff.Inten.(r | | | | 80.66 | | | |
| over | (min) | 10.00 | | 10.00 | | | |
| Storage Coeff. | | | | | (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 COEFFICIA | ENT = | 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.

| CALIB | | | | Conn.(%)= | 14.00 | |
|-----------------|-----------|-------|----------|-----------|-------------|---|
| | | | | | | |
| | | | S PERVIO | , | | |
| Surface Area | | | | | | |
| Dep. Storage | | | | - | | |
| Average Slope | | | | | | |
| Length | (m) = | 56.57 | 40.0 | D | | |
| Mannings n | = | 0.013 | 0.25 | D | | |
| Max.Eff.Inten.(| mm /hr) = | 78 82 | 21.1 | 5 | | |
| | | | 20.0 | - | | |
| Storage Coeff. | | | | | | |
| | | | | | | |
| Unit Hyd. Tpeak | | | | | | |
| Unit Hyd. peak | (cms)= | 0.17 | 0.0 | | | |
| | | | | | FOTALS* | |
| PEAK FLOW | (cms)= | 0.01 | 0.0 | 1 | 0.020 (iii) |) |
| TIME TO PEAK | (hrs)= | 1.50 | 1.6 | 7 | 1.50 | |
| RUNOFF VOLUME | (mm) = | 38.59 | 10.2 | D | 14.16 | |
| TOTAL RAINFALL | (mm) = | 39.38 | 39.3 | В | 39.38 | |
| RUNOFF COEFFICI | ENT = | 0.98 | 0.2 | б | 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:
 - (1) 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) ID= 1 DT=10.0 min | | (ha)= Imp(%)= | | Dir. (| Conn.(%)= | 14.00 | |
|--|----------|------------------|------|----------|-----------|-------------|--|
| | | _ | | | | | |
| | | IMPERVI | DUS | PERVIOUS | S (i) | | |
| Surface Area | (ha)= | 0.38 | 3 | 0.23 | | | |
| Dep. Storage | (mm) = | 0.80 |) | 1.50 | | | |
| Average Slope | (%)= | 1.00 |) | 2.00 | | | |
| Length | (m) = | 63.7 | 7 | 40.00 | | | |
| Mannings n | = | 0.01 | 3 | 0.250 | | | |
| | | | | | | | |
| Max.Eff.Inten.(| | | 2 | 49.97 | | | |
| over | (min) | 10.00 |) | 20.00 | | | |
| Storage Coeff. | (min) = | 2.1 | (ii) | 11.46 | (ii) | | |
| Unit Hyd. Tpeak | (min) = | 10.00 |) | 20.00 | | | |
| Unit Hyd. peak | (cms)= | 0.1 | 7 | 0.08 | | | |
| | | | | | *T | OTALS* | |
| PEAK FLOW | (cms)= | 0.0 | 2 | 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 COEFFICIEN | IT = | 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:
- (ii) 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 | |
| | | | | | | | |
| | | IMPERVIC | | | S (i) | | |
| Surface Area | | | | | | | |
| Dep. Storage | (mm) = | 0.80 | | 1.50 | | | |
| Average Slope | | | | | | | |
| Length | | | | | | | |
| Mannings n | = | 0.013 | | 0.250 | | | |
| Max.Eff.Inten. | mm/hr)= | 78 82 | | 24 77 | | | |
| | | | | | | | |
| over Storage Coeff. | (min)= | 1 78 | (ii) | 14 12 | (ii) | | |
| Unit Hyd. Tpeak | (min)= | 10.00 | (+ +) | 20 00 | (11) | | |
| Unit Hyd. peak | | | | | | | |
| onic nya. peak | (Cilib)- | 0.17 | | 0.07 | *1 | OTALS* | |
| PEAK FLOW | (cmg)- | 0.02 | | 0 01 | | | |
| TIME TO PEAK | | | | | | | |
| RUNOFF VOLUME | | | | | | 17.80 | |
| TOTAL RAINFALL | | | | | | | |
| RUNOFF COEFFICE | | | | | | | |
| RUNOFF COEFFIC | ENI - | 0.90 | | 0.20 | | 0.45 | |
| **** WARNING: STORA | GE COEFF | . IS SMALL | ER THAN | TIME S | STEP! | | |
| | | | | | | | |
| (i) CN PROCEI | URE SELE | CTED FOR P | ERVIOUS | LOSSES | 3: | | |
| CN* = | 58.0 | Ia = Dep. | Storage | (Abov | ze) | | |
| (ii) TIME STEE | (DT) SH | OULD BE SM | ALLER C | R EQUAI | _ | | |
| THAN THE | STORAGE (| COEFFICIEN | T. | _ | | | |
| (iii) PEAK FLOW | DOES NO | T INCLUDE | BASEFLO | W IF A | WY. | | |
| | | | | | | | |

| CALIB STANDHYD (0032) | | | | | |
|-------------------------------|----------|------------|-------------|-----------------|----|
| ID= 1 DT=10.0 min | Total | Imp(%) = 3 | 6.00 Dir. 0 | Conn.(%)= 10.00 | |
| | | | | | |
| | | | S PERVIOUS | 3 (i) | |
| Surface Area | | | 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 (ii | i) |
| TIME TO PEAK | (hrs)= | 1.50 | 1.67 | 1.50 | |
| RUNOFF VOLUME | (mm)= | 38.58 | 8.68 | 11.66 | |
| TOTAL RAINFALL | | | | | |
| RUNOFF COEFFICI | | | | | |
| | | 0.50 | 0.22 | 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: $\hbox{CN*} = 58.0 \quad \hbox{Ia = Dep. Storage} \quad (Above) \\ \hbox{(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL}$

- THAN THE STORAGE COEFFICIENT.

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

| CALI | IB | | | | | | | | |
|-------|------------------|-----------|-----------|-------|----------|---------|---------|----|--|
| | NDHYD (0033) | | | | | | | | |
| ID= 1 | L DT=10.0 min | Total | Imp(%)= | 48.00 | Dir. 0 | Conn.(% |)= 13.0 | 10 | |
| | | | | | | | | | |
| | | | | | PERVIOUS | | | | |
| | Surface Area | | | | | | | | |
| Ι | Dep. Storage | (mm) = | 0.80 |) | 1.50 | | | | |
| | Average Slope | | | | | | | | |
| | Length | | | | | | | | |
| N | Mannings n | = | 0.013 | 3 | 0.250 | | | | |
| | | | | | | | | | |
| N | Max.Eff.Inten.(r | nm/hr)= | 78.82 | 2 | 20.10 | | | | |
| | | | 10.00 | | | | | | |
| | Storage Coeff. | | | | | | | | |
| | Jnit Hyd. Tpeak | | | | | | | | |
| Ţ | Jnit Hyd. peak | (cms)= | 0.17 | 7 | 0.06 | | | | |
| | | | | | | | *TOTALS | | |
| | PEAK FLOW | | | | | | | | |
| | TIME TO PEAK | | | | | | | | |
| | RUNOFF VOLUME | | | | | | | | |
| | TOTAL RAINFALL | | | | | | | | |
| F | RUNOFF COEFFICIE | ENT = | 0.98 | 3 | 0.25 | | 0.35 | | |
| | | | | | | | | | |
| | WARNING: STORAG | | | | | | | | |
| **** | WARNING: FOR ARI | | | | | | | | |
| | YOU SHO | OULD CONS | SIDER SPL | TTING | THE ARE | A. | | | |
| | | | | | | | | | |

- - (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: ${
 m CN^{*}}$ = 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.

STANDHYD (0034) Area (ha)= |ID= 1 DT=10.0 min | Total Imp(%)= 42.00 Dir. Conn.(%)= 18.00 PERVIOUS (i) IMPERVIOUS Surface Area (ha)= 0 28 Dep. Storage (mm)= 0.80 Average Slope Length (%)= (m)= 1.00 2.00 66 83 Mannings n 0.013 0.250 Max.Eff.Inten.(mm/hr)= 78.82 14.68 10.00 over (min) 20.00 over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)= 2.21 (ii) 17.41 (ii) 10.00 20.00 Unit Hyd. peak (cms)= 0.17 0.06 *TOTALS* PEAK FLOW TIME TO PEAK 0.03 0.01 0.031 (iii) TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) = 1.50 1.67 1.50 38.58 8.72 39.38 14.08 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.

CALTB | CALIB | STANDHYD (0035)| |ID= 1 DT=10.0 min | Area (ha) = 0.65Total Imp(%) = 30.00 Dir. Conn.(%) = 11.00IMPERVIOUS PERVIOUS (i) 0.45 1.50 2.00 Surface Area (ha)= 0.19 Dep. Storage Average Slope (mm) = (%) = 0.80 1.00 65.83 Length (m)= 40.00 0.013 Max.Eff.Inten.(mm/hr)= 78.82 12.01 over (min)
Storage Coeff. (min)= 10.00 20.00 2.19 (ii) 18.66 (ii) Unit Hyd. Tpeak (min) = Unit Hyd. peak (cms) = 10 00 20 00 *TOTALS* PEAK FLOW (cms) =
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) = 0.01 0.020 (iii) 1.50 0.02 1.50 38.58 7.98 11.33 RUNOFF COEFFICIENT 0.98 0.20

***** 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.

| STAN | TB IDHYD (0062) . DT=10.0 min | | (ha)= Imp(%)= | | Dir. | Conn.(%)= | 16.00 |) |
|------|--|-----------|------------------|---------|----------|-----------|---------|-------|
| | | | IMPERVI | OTTO: | DEBUTOII | e (i) | | |
| _ | Surface Area | (he)- | | | | - , , | | |
| | | | | | 1.50 | | | |
| | Dep. Storage | | | | | | | |
| | verage Slope | | | | | | | |
| | ength | | | | | | | |
| M | Mannings n | = | 0.01 | 3 | 0.250 | | | |
| | | | | _ | | | | |
| M | <pre>!ax.Eff.Inten.(r</pre> | | | | | | | |
| | | | 10.00 | | | | | |
| | Storage Coeff. | | | | | | | |
| τ | Jnit Hyd. Tpeak | (min)= | 10.0 | 0 | 20.00 | | | |
| U | Jnit Hyd. peak | (cms)= | 0.1 | 7 | 0.08 | | | |
| | | | | | | *T | 'OTALS* | + |
| F | PEAK FLOW | (cms)= | 0.0 | 2 | 0.02 | | 0.026 | (iii) |
| T | TIME TO PEAK | (hrs)= | 1.50 |) | 1.67 | | 1.50 | |
| R | UNOFF VOLUME | (mm)= | 38.38 | 3 | 13.28 | | 17.29 | |
| | OTAL RAINFALL | | | | | | 39.38 | |
| R | UNOFF COEFFICIE | ENT = | 0.9 | 7 | 0.34 | | 0.44 | |
| | | | | | | | | |
| **** | WARNING: STORAG | GE COEFF. | IS SMAL | LER THA | AN TIME | STEP! | | |

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

| 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 | n/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 COEFFICIEN | JT = | 0.97 | 0.16 | 0.35 |

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

- THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| RESERVOIR(0076) IN= 2> OUT= 1 | OVERFLOW | IS ON | | | |
|--------------------------------------|----------|---------|--------|----------|-------|
| DT= 5.0 min | OUTFLOW | STORAGE | OUTE | FLOW STO | RAGE |
| · | (cms) | (ha.m.) | (cn | ns) (ha | .m.) |
| | 0.0000 | 0.0000 | 0.0 | 0600 0 | .0600 |
| | | | | | |
| | A | REA QP | EAK TI | PEAK | R.V. |
| | (| ha) (c | ns) (h | nrs) | (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.)= 0.014 (min)= 95.00 (ha.m.)= 0.0146

| CALIB | | | | | | | | |
|-------------------|---------|----------|-------|---------|-----------|---------|-------|--|
| STANDHYD (0068) | Area | (ha)= | 0.41 | | | | | |
| ID= 1 DT=10.0 min | Total | Tmp (%)= | 45.00 | Dir. | Conn.(%)= | 17.00 |) | |
| | | | | | | | | |
| | | IMPERVIO | TTC | PERVIOU | s (i) | | | |
| Surface Area | (ha)- | | | | 5 (1) | | | |
| | | | | | | | | |
| Dep. Storage | | | | 1.50 | | | | |
| Average Slope | | | | | | | | |
| Length | (m) = | 52.28 | | 40.00 | | | | |
| Mannings n | = | 0.013 | | 0.250 | | | | |
| | | | | | | | | |
| Max.Eff.Inten.(m | m/hr)= | 78.82 | | 16.59 | | | | |
| | | 10.00 | | | | | | |
| Storage Coeff. | | | | | | | | |
| | | | | | (11) | | | |
| Unit Hyd. Tpeak | | | | | | | | |
| Unit Hyd. peak | (cms)= | 0.17 | | 0.06 | | | | |
| | | | | | *7 | COTALS' | * | |
| 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 | | | | | | 39.38 | | |
| RUNOFF COEFFICIE | | | | 0.23 | | 0.36 | | |
| RUNOFF COEFFICIE | 11/1 = | 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 | | (ha)= | | | | | | |
| ID= 1 DT=10.0 mir | Total | Imp(%)= | 39.00 | Dir. Co | nn.(%)= | 15.00 | | |
| | | | | | | | | |
| | | IMPERVIO | | 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.Inter | .(mm/hr)= | 78.82 | | 14.29 | | | | |
| ov | er (min) | 10.00 | | 20.00 | | | | |
| Storage Coeff | . (min)= | 2.38 | (ii) | 17.75 (| ii) | | | |
| Unit Hyd. Tpe | ak (min)= | 10.00 | | 20.00 | | | | |
| Unit Hyd. pea | k (cms)= | 0.17 | | 0.06 | | | | |
| | | | | | *T | OTALS* | | |
| 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 RAINFAL | L (mm)= | 39.38 | | 39.38 | | 39.38 | | |
| RUNOFF COEFFI | CIENT = | 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:

0.020 (iii) 1.50 12.45

TOTALS
0.018 (iii)
1.50
17.65
39.38

| 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) 3 + 2 = 1 |
|--|--|
| ADD HYD (0027) 1 + 2 = 3 | + ID2= 2 (0068): 0.41 0.019 1.50 14.13 |
| ID1= 1 (0023): 0.59 0.026 1.50 14.19 + ID2= 2 (0025): 0.52 0.039 1.50 18.28 | ADD HYD (0027) 1 + 2 = 3 |
| ADD HYD (0027) AREA QPEAK TPEAK R.V. | ID = 3 (0027): 7.09 0.314 1.50 14.34 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| ID = 1 (0027): 1.59 0.084 1.50 15.52 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | ADD HYD (0027) AREA QPEAK TPEAK R.V. 3 + 2 = 1 AREA QPEAK (hrs) (mm) |
| ADD HYD (0027) 1 + 2 = 3 | ID = 1 (0027): 9.11 0.321 1.50 14.19 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| + 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. | CALIB |
| ADD HYD (0027) AREA QPEAK TPEAK R.V. 3 + 2 = 1 | 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 |
| ADD HYD (0027) 1 + 2 = 3 | #TOTALS* PEAK FLOW (cms)= 0.02 0.01 0.20 (i 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. |
| ADD HYD (0027) 3 + 2 = 1 | (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. CALIB |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ADD HYD (0027) | IMPERVIOUS PERVIOUS (1) |
| ADD HYD (0027) 3 + 2 = 1 | PEAK FLOW (cms)= 0.02 0.00 0.018 (i TIME TO PEAK (hrs)= 1.50 1.67 1.50 RUMOFF 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: |
| ADD HYD (0027) | ADD HYD (0067) |

| | | | | | | 21-173 Cott |
|---|--|---|--|---|--|---|
| | | | | | | <u>Visua</u> |
| NOTE: PEAK FI | | | | | NY. | |
| | | | | | | |
| DUHYD (0024) Inlet Cap.= 0.057 | | | | | | |
| #of Inlets= I | , i | DEA | ODEAN | TDEAK | D 17 | |
| #of Inlets= 1 Total(cms)= 0.1 TOTAL HYD.(ID= | (| ha) | (cms) | (hrs) | (mm) | |
| TOTAL HYD.(ID= | | | | | | |
| MAJOR SYS.(ID= MINOR SYS.(ID= | | | 0.00 | 0.00 | | |
| NOTE: PEAK FI | | | | | | |
| | | | | | | |
| | | | | | | |
| ADD HYD (0031) $1 + 2 = 3$ | ' | AREA | QPEAK | TPEAK | R.V | |
| TD1- 1 () | | (ha) | (cms) | (hrs) | (mm | |
| 1 + 2 = 3 ID1= 1 ((+ ID2= 2 ((| 024): | 9.11 | 0.321 | 1.50 | 14.19 | |
| ID = 3 ((| | | | | | = |
| NOTE: PEAK FI | | | | | | |
| | | | | | | |
| ADD HYD (0031) |) | | | | | |
| 3 + 2 = 1 | | AREA | QPEAK | TPEAK (hrs) | R.V (mm | |
| 3 + 2 = 1 ID1= 3 ((+ ID2= 2 ((| 0031): | 9.85 | 0.359 | 1.50 | 14.19 | ' |
| + ID2= 2 ((|)071): ======= | 0.71 ====== | 0.009 | 1.50 | 5.15 ====== | = |
| ID = 1 ((| | | | | 13.58 | |
| NOTE: PEAK FI | | OT INCL | UDE BASEFI | LOWS IF A | NY. | |
| RESERVOIR(0029 |) ov | ERFLOW | IS ON | | | |
| IN= 2> OUT= 1 DT= 1.0 min | l on | TFLOW | STORAGE | ן חווים | FLOW | STORAGE |
| | (| cms) | (ha.m.) 0.0000 | (cı | ms) | (ha.m.) |
| | 0 | .0000 | 0.0000 | (cr | 1080 1807 | 0.2030 0.2551 |
| | 0 | .0130 | 0.0491 | 0. | 2663 | 0.3117 |
| | 0 | .0163 .0190 | 0.0772 0.1119 0.1553 | 0. | 3630 4697 | 0.3731 0.4393 |
| | | | | | | 0.0000 |
| | | AR | EA QPE | EAK T | PEAK | R.V. |
| INFLOW : ID= 2 | (0031) | 10. | a) (cn 560 (| ns) (!).368 | 1.50 | (mm) 13.58 |
| INFLOW: ID= 2 OUTFLOW: ID= 1 OVERFLOW: ID= 3 | 0029) | 10. | 560 (000 r | 0.019 | 4.50 | 12.95 0.00 |
| | | | | | | |
| | CUMULATI | VE TIME | OF OVERFI | LOW (HOU | RS) = (| 0.00 |
| | | | IME OVERFI | | | |
| | TIME SHI | FT OF P | EAK FLOW | (1 | | 0.00 |
| | MAXIMUM | STORAG | E USED | (na | .m.)= | 7.1116 |
| | | | | | | |
| CALIB | 1 | | | | | |
| CALIB | 1 | (ha 1 Imp(% |)= 0.31)= 41.00 | Dir. C | onn.(%): | = 0.00 |
| CALIB STANDHYD (0063) ID= 1 DT=10.0 min | Area Tota | | | | | = 0.00 |
| CALIB STANDHYD (0063) ID= 1 DT=10.0 min | Area Tota | | | | | = 0.00 |
| CALIB STANDHYD (0063) ID= 1 DT=10.0 min | Area Tota | | | | | = 0.00 |
| CALIB STANDHYD (0063) ID= 1 DT=10.0 min | Area Tota | | | | | = 0.00 |
| CALIB STANDHYD (0063) ID= 1 DT=10.0 min Surface Area Dep. Storage Average Slope Length Mannings n | Area Tota Tota | IMPE | RVIOUS 0.13 1.00 1.00 5.46 | PERVIOUS 0.18 1.50 2.00 40.00 0.250 | (i) | = 0.00 |
| CALIB STANDHYD (0063) ID= 1 DT=10.0 min Surface Area Dep. Storage Average Slope Length Mannings n | Area Tota Tota | IMPE | RVIOUS 0.13 1.00 1.00 5.46 | PERVIOUS 0.18 1.50 2.00 40.00 0.250 | (i) | = 0.00 |
| CALIB STANDHYD (0063) ID= 1 DT=10.0 min Surface Area Dep. Storage Average Slope Length Mannings n | Area Tota Tota | IMPE | RVIOUS 0.13 1.00 1.00 5.46 | PERVIOUS 0.18 1.50 2.00 40.00 0.250 | (i) | = 0.00 |
| CALIB STANDHYD (0063) ID= 1 DT=10.0 min Surface Area Dep. Storage Average Slope Length Mannings n | Area Tota Tota | IMPE | RVIOUS 0.13 1.00 1.00 5.46 | PERVIOUS 0.18 1.50 2.00 40.00 0.250 | (i) (ii) | |
| CALIB STANDHYD (0063; ID= 1 DT=10.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten ove Storage Coeff Unit Hyd. Tpee Unit Hyd. peal | Area Tota Tota (ha) = (mm) = (%) = (m) = (min) = er (min) = (min) = ak (min) = c (cms) = | IMPE 4 0 7 1 1 | RVIOUS 0.13 1.00 1.00 5.46 .013 8.82 0.00 1.75 (ii) 0.00 0.17 | PERVIOUS 0.18 1.50 2.00 40.00 0.250 20.59 20.00 15.03 20.00 0.07 | (i) (ii) | *TOTALS* |
| CALIB STANDHYD (0063; ID= 1 DT=10.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten ove Storage Coeff Unit Hyd. Tpee Unit Hyd. peal | Area Tota Tota (ha) = (mm) = (%) = (m) = (min) = er (min) = (min) = ak (min) = c (cms) = | IMPE 4 0 7 1 1 | RVIOUS 0.13 1.00 1.00 5.46 .013 8.82 0.00 1.75 (ii) 0.00 0.17 | PERVIOUS 0.18 1.50 2.00 40.00 0.250 20.59 20.00 15.03 20.00 0.07 | (i) (ii) | *TOTALS* 0.007 (iii) 1.67 |
| Max.Eff.Inten. ove Storage Coeff Unit Hyd. Tpea Unit Hyd. peal | Area Tota Tota (ha) = (mm) = (%) = (m) = (min) = er (min) = (min) = ak (min) = c (cms) = | IMPE 4 0 7 1 1 | RVIOUS 0.13 1.00 1.00 5.46 .013 8.82 0.00 1.75 (ii) 0.00 0.17 | PERVIOUS 0.18 1.50 2.00 40.00 0.250 20.59 20.00 15.03 20.00 0.07 | (i) (ii) | *TOTALS* 0.007 (iii) 1.67 10.05 39.38 |
| CALIB STANDHYD (0063) ID= 1 DT=10.0 min Surface Area Dep. Storage Average Slope Length Mannings n | Area Tota Tota (ha) = (mm) = (%) = (m) = (min) = er (min) = (min) = ak (min) = c (cms) = | IMPE 4 0 7 1 1 | RVIOUS 0.13 1.00 1.00 5.46 .013 8.82 0.00 1.75 (ii) 0.00 0.17 | PERVIOUS 0.18 1.50 2.00 40.00 0.250 20.59 20.00 15.03 20.00 0.07 | (i) (ii) | *TOTALS* 0.007 (iii) 1.67 10.05 |
| CALIB STANDHYD (0063; ID= 1 DT=10.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. ove Storage Coeff. Unit Hyd. Tpee Unit Hyd. Tpee Unit Hyd. Tpee Unit Hyd. Tpee Total RainFall RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFIC **** WARNING: STO! | Area Tota Tota (mm) = (mm) = (mm/hr) = r (min) (min) = (cms) = (cms) = (mm) = (| IMPE 4 0 7 1 1 3 3 3 3 F. IS SiH IMPER | RVIOUS 0.13 1.00 1.00 1.00 5.46 0.013 8.82 0.00 1.75 (ii) 0.00 0.17 0.00 1.50 8.38 9.38 0.97 MALLER THA | PERVIOUS 0.18 1.50 2.00 40.00 0.250 20.59 20.00 15.03 20.00 0.07 0.01 1.67 10.08 39.38 0.26 AN TIME S' TOS BELLOW | (i) (ii) TEP! 20% | *TOTALS* 0.007 (iii) 1.67 10.05 39.38 |
| CALIB STANDHYD (0063; ID= 1 DT=10.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten OVE Storage Coeff. Unit Hyd. Tpee Unit Hyd. Tpee Unit Hyd. Peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALI RUNOFF COEFFIC **** WARNING: STOE **** WARNING: STOE **** WARNING: STOE | Area Tota Tota Tota (ha) = (mm) = (%) = | IMPE 4 0 7 1 1 3 3 F. IS SI H IMPERINSIDER | RVIOUS 0.13 1.00 1.00 5.46 .013 8.82 0.00 1.75 (ii) 0.00 0.17 0.00 0.17 0.00 1.50 8.38 0.97 MALLER THAVIOUS RATIS | PERVIOUS 0.18 1.50 2.00 40.00 0.250 20.59 20.00 15.03 20.00 0.07 0.01 1.67 10.08 39.38 0.26 AN TIME S' LOS BELOW THE AREA | (i) (ii) TEP! 20% | *TOTALS* 0.007 (iii) 1.67 10.05 39.38 |
| CALIB STANDHYD (0063; ID= 1 DT=10.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. ove Storage Coeff. Unit Hyd. Tpee Unit Hyd. Tpee Unit Hyd. PEAK RUNOFF VOLUME TOTAL RAINFALI RUNOFF VOLTME TOTAL RAINFALI RUNOFF COEFFIC **** WARNING: STOI **** WARNING: FOR J YOU S (i) CN PROCI | Area Tota | IMPE 4 0 7 1 1 3 3 F. IS SI H IMPER' NSIDER | RVIOUS 0.13 1.00 1.00 5.46 .013 8.82 0.00 1.75 (ii) 0.00 0.17 0.00 1.50 8.38 9.38 0.97 MALLER THAVIOUS RATISPLITTING | PERVIOUS 0.18 1.50 2.00 40.00 0.250 20.59 20.00 15.03 20.00 0.07 0.01 1.67 10.08 39.38 0.26 AN TIME S' LOSS BELOW THE AREA | (ii) (iii) TEP! 20% | *TOTALS* 0.007 (iii) 1.67 10.05 39.38 |
| CALIB STANDHYD (0063; ID= 1 DT=10.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten ove Storage Coeff, Unit Hyd. Tpes Unit Hyd. Tpes Unit Hyd. peal PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALI RUNOFF COEFFIC **** WARNING: STOE **** WARNING: FOR I YOU S (i) CN PROCI CN* = (ii) TIME STI | Area Tota Area Tota (mm) = (mm | IMPE 4 0 7 1 1 3 3 F. IS SI H IMPER NSIDER ECTED F Ia = D HOULD B | RVIOUS 0.13 1.00 1.00 1.00 5.46 0.13 8.82 0.00 1.75 (ii) 0.00 0.17 0.00 0.17 0.00 0.15 8.38 9.38 0.97 MALLER THA VIOUS RATI SPLITTING OR PERVIOUS OR PERVIOUS E. SMALLER E. SMALLER | PERVIOUS | (i) (ii) TEP! 20% | *TOTALS* 0.007 (iii) 1.67 10.05 39.38 |
| CALIB STANDHYD (0063; ID= 1 DT=10.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten ove Storage Coeff, Unit Hyd. Tpes Unit Hyd. Tpes Unit Hyd. peal PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALI RUNOFF COEFFIC **** WARNING: STOE **** WARNING: FOR I YOU S (i) CN PROCI CN* = (ii) TIME STI | Area Tota | IMPE 4 0 7 1 1 3 3 3 F. IS SI H IMPER NSIDER ECTED F Ia = D HOULD B COEFFII | RVIOUS 0.13 1.00 1.00 5.46 .013 8.82 0.00 1.75 (ii) 0.00 0.175 (iii) 0.00 1.50 8.38 9.38 9.38 9.38 9.38 9.37 MALLER THAY VIOUS RATI SPLITTING OOR PERVIOU ep. Storage E SMALLER CIENT. | PERVIOUS 0.18 1.50 2.00 40.00 0.250 20.59 20.00 15.03 20.00 0.07 0.01 1.67 10.08 39.38 0.26 AN TIME S' COS BELOW THE AREA JS LOSSES ge (Above OR EQUAL | (ii) (iii) TEP! 20% | *TOTALS* 0.007 (iii) 1.67 10.05 39.38 |
| CALIB STANDHYD (0063; D= 1 DT=10.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. ove Storage Coeff. Unit Hyd. The Unit Hyd. Peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALI RUNOFF COEFFIC **** WARNING: STOI **** WARNING: STOI **** WARNING: FOR 2 (i) CN PROCI CN* = (ii) TIME STI THAN THI (iii) PEAK FLO | (ha) = (mm) = (%) = (mm) = (%) = (mn) | IMPE 4 0 7 1 1 1 3 3 3 F. IS SI H IMPER' NSIDER ECTED F. IA = D HOULD B COEFFI OT INCL | RVIOUS 0.13 1.00 1.100 5.46 0.013 8.82 0.00 1.75 (ii) 0.00 0.17 0.00 1.50 8.38 9.38 9.38 0.97 MALLER THY VIOUS RATI SPLITTING OR PERVIOU ep. Storag E SMALLER CIENT. UDE BASEFI | PERVIOUS 0.18 1.50 2.00 40.00 0.250 20.59 20.00 15.03 20.00 0.07 0.01 1.67 10.08 39.38 0.00 THE AREA US LOSSES ge (Abov. OR EQUAL LOW IF AN | (i) (ii) (iii) TEP! 20%: e) | *TOTALS* 0.007 (iii) 1.67 10.05 39.38 0.26 |
| CALIB STANDHYD (0063; ID=1 DT=10.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. ove Storage Coeff Unit Hyd. Tpea Unit Hyd. Tpea Unit Hyd. Peak RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFIC **** WARNING: STO! **** WARNING: STO! TYOU \$ (i) CN PROC! (ii) TIME ST! THAN THH (iii) PEAK FLO | Area Tota | IMPE 4 0 7 1 1 1 3 3 3 F. IS SI H IMPER' NSIDER ECTED F. IA = D HOULD B COEFFI OT INCL | RVIOUS 0.13 1.00 1.100 5.46 0.013 8.82 0.00 1.75 (ii) 0.00 0.17 0.00 1.50 8.38 9.38 9.38 0.97 MALLER THY VIOUS RATI SPLITTING OR PERVIOU ep. Storag E SMALLER CIENT. UDE BASEFI | PERVIOUS 0.18 1.50 2.00 40.00 0.250 20.59 20.00 15.03 20.00 0.07 0.01 1.67 10.08 39.38 0.00 THE AREA US LOSSES ge (Abov. OR EQUAL LOW IF AN | (i) (ii) (iii) TEP! 20%: e) | *TOTALS* 0.007 (iii) 1.67 10.05 39.38 |
| CALIB STANDHYD (0063; ID=1 DT=10.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. ove Storage Coeff. Unit Hyd. Tpea Unit Hyd. Tpea PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALI RUNOFF COEFFIC **** WARNING: STOI **** WARNING: STOI **** WARNING: FOR 2 (i) CN PROCI CN* = (ii) TIME STI THAN THI (iii) PEAK FLO ADD HYD (0037, 1 + 2 = 3 | Area Tota Area Tota (ha) = (mm) = (%) = | IMPE 4 0 7 1 1 3 3 F. IS SI H IMPER NSIDER ECTED F IA = D HOULD B COEFFI OT INCL | RVIOUS 0.13 1.00 1.00 1.00 1.00 5.46 0.013 8.82 0.00 1.75 (ii) 0.00 0.17 0.00 0.17 0.00 0.150 8.38 9.38 9.38 0.97 MALLER THA VIOUS RATI SPLITTING OR PERVIOL ED SMALLER CIENT. UDE BASEFI UDE BASEFI | PERVIOUS | (ii) (iii) TEP! 20% | *TOTALS* 0.007 (iii) 1.67 10.05 39.38 0.26 |
| CALIB STANDHYD (0063; ID= 1 DT=10.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. OV. Storage Coeff. Unit Hyd. peal PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFIC **** WARNING: STOI **** WARNING: STOI **** WARNING: STOI THAN THI (ii) PEAK FLOW ADD HYD (0037; 1 + 2 = 3 | (ha)= (mm)= (%)= (mm/hr= (min)= (min)= (min)= (min)= (cms)= (cms) | IMPE 4 0 7 1 1 3 3 F. IS SI H IMPER NSIDER ECTED F Ia = D HOULD B COBFFI OT INCL AREA | RVIOUS 0.13 1.00 1.00 5.46 .013 8.82 0.00 1.75 (ii) 0.00 1.75 (ii) 0.00 1.75 0.00 0.17 0.00 1.50 8.38 9.38 0.97 MALLER THY VIOUS RATISPLITTING OF PERVIOUS PS. Storag E SMALLER CIENT. UDE BASEFI QPEAK (CMS) | PERVIOUS | (i) (ii) (iii) TEP! 20% e) Y. | *TOTALS* 0.007 (iii) 1.67 10.05 39.38 0.26 |
| CALIB STANDHYD (0063; ID= 1 DT=10.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. ove Storage Coeff Unit Hyd. Tpee Unit Hyd. peal PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFIC **** WARNING: STO! *** WARNING: STO! THAN THH (ii) PEAK FLO ADD HYD (0037; 1 + 2 = 3 *** W A R N I N G *** W A R N I N G *** W A R N I N G | Area Tota Area Tota (ha) = (mm) = (%) = | IMPE 4 0 7 1 1 3 3 F. IS SH HIMPER HIMPER HOULD B COEFFIL OT INCL AREA (ha) RAPH RAPH | RVIOUS 0.13 1.00 1.10 5.46 .013 8.82 0.00 1.75 (ii) 0.00 0.175 (iii) 0.00 1.75 0.00 1.50 8.38 9.38 9.38 9.38 9.39 0.97 MALLER THAVIOUS RATISPLITTING CENT. UDE BASEFI QPEAK (cms) 0.24 <id= (cms)="" (cms)<="" +="" 0.024="" 0.037="" <id="0.027" international="" property="" td=""><td>PERVIOUS</td><td>(i) (ii) (iii) TEP! 20%</td><td>*TOTALS* 0.007 (iii) 1.67 10.05 39.38 0.26</td></id=> | PERVIOUS | (i) (ii) (iii) TEP! 20% | *TOTALS* 0.007 (iii) 1.67 10.05 39.38 0.26 |
| CALIB STANDHYD (0063; ID= 1 DT=10.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. ove Storage Coeff Unit Hyd. Tpee Unit Hyd. peal PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFIC **** WARNING: STO! *** WARNING: STO! THAN THH (ii) PEAK FLO ADD HYD (0037; 1 + 2 = 3 *** W A R N I N G *** W A R N I N G *** W A R N I N G | Area Tota Area Tota (ha) = (mm) = (%) = | IMPE 4 0 7 1 1 3 3 F. IS SH HIMPER HIMPER HOULD B COEFFIL OT INCL AREA (ha) RAPH RAPH | RVIOUS 0.13 1.00 1.10 5.46 .013 8.82 0.00 1.75 (ii) 0.00 0.175 (iii) 0.00 1.75 0.00 1.50 8.38 9.38 9.38 9.38 9.39 0.97 MALLER THAVIOUS RATISPLITTING CENT. UDE BASEFI QPEAK (cms) 0.24 <id= (cms)="" (cms)<="" +="" 0.024="" 0.037="" <id="0.027" international="" property="" td=""><td>PERVIOUS</td><td>(i) (ii) (iii) TEP! 20%</td><td>*TOTALS* 0.007 (iii) 1.67 10.05 39.38 0.26</td></id=> | PERVIOUS | (i) (ii) (iii) TEP! 20% | *TOTALS* 0.007 (iii) 1.67 10.05 39.38 0.26 |
| CALIB STANDHYD (0063; ID= 1 DT=10.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. OV. Storage Coeff. Unit Hyd. peal PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFIC **** WARNING: STOI **** WARNING: STOI **** WARNING: STOI THAN THI (ii) PEAK FLOW ADD HYD (0037; 1 + 2 = 3 | Area Tota Area Tota (hm) = (%) = (%) = (%) (mm/hr) = = (%) (min) = (min) | IMPE 4 0 7 1 1 3 3 F. IS SH HIMPER HIMPER HOULD B COEFFII OT INCL AREA (ha) RAPH RAPH RAPH 0.00 10.56 | RVIOUS 0.13 1.00 1.10 5.46 .013 8.82 0.00 1.75 (ii) 0.00 0.17 0.00 1.50 8.38 9.38 9.38 9.38 9.39 0.97 MALLER THA VIOUS RATISPLITTING CENT. UDE BASEFI QPEAK (cms) 0.24 <id= 0.000="" 0.019<="" 0.024="" <id="0.037" =="" hyi="" td=""><td>PERVIOUS 0.18 1.50 2.00 40.00 0.250 20.59 20.00 15.03 20.00 0.07 0.01 1.67 10.08 39.38 0.26 AN TIME S' COS BELOW THE ARCA SI LOSSES GE (Abov. OR EQUAL LOW IF AN TPEAK (hrs) 1> IS DR' ROGGRAPH 0.00 4.50</td><td>(i) (ii) (iii) TEP! 20% . : e) Y. R.V (mm Y. 0.009 0.00 12.95</td><td>*TOTALS* 0.007 (iii) 1.67 10.05 39.38 0.26</td></id=> | PERVIOUS 0.18 1.50 2.00 40.00 0.250 20.59 20.00 15.03 20.00 0.07 0.01 1.67 10.08 39.38 0.26 AN TIME S' COS BELOW THE ARCA SI LOSSES GE (Abov. OR EQUAL LOW IF AN TPEAK (hrs) 1> IS DR' ROGGRAPH 0.00 4.50 | (i) (ii) (iii) TEP! 20% . : e) Y. R.V (mm Y. 0.009 0.00 12.95 | *TOTALS* 0.007 (iii) 1.67 10.05 39.38 0.26 |

| ADD HYD (0037) | | | | | |
|---------------------|----------|------------|----------|-------|--|
| | AREA | OPEAK | TPEAK | R.V. | |
| | | | | | |
| ID1= 3 (0037): | 10.56 | 0.019 | 4.50 | 12.95 | |
| + ID2= 2 (0038): | | | | | |
| ID = 1 (0037): | | | | | |
| NOTE: PEAK FLOWS DO | | | | | |
| | | | | | |
| ADD HYD (0037) | | | | | |
| | AREA | OPEAK | TDEAK | R V | |
| | | | | | |
| ID1= 1 (0037): | | | | | |
| + ID2= 2 (0063): | | | | | |
| ID = 3 (0037): | | | | | |
| | | | | | |
| NOTE: PEAK FLOWS DO | NOT INCL | UDE BASEFL | OWS IF A | VY. | |
| | | | | | |
| ADD HYD (0037) | | | | | |
| 3 + 2 = 1 | | QPEAK | | | |
| | | (cms) | | | |
| ID1= 3 (0037): | | | | | |
| | | 0 006 | 1.83 | 2.41 | |
| + ID2= 2 (0070): | | | | | |

5-YEAR STORM _____ SSSSS U U A (v 6.2.2007) U U A A L U U AAAAA L S U SS U I SS I SS U U A A L I SSSSS UUUUU A A LLLLL vv Y M OOO TTTTT TTTTT H H Y 000 O T T H H Y Y M M O O
O T T H H Y M M O O
O T T H H Y M M O O 0 0 000 Developed and Distributed by Smart City Water Inc Copyright 2007 - 2021 Smart City Water Inc rights reserved. **** DETAILED OUTPUT **** Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
Output filename: C:\Users\Natalie\AppData\Local\civica\VH5\b59b925c-la86-43188861-e386d46fd2f8\ad9f66f1-fle3-4b6f7-9dcd-5a39c842545c\scen
Summary filename: C:\Users\Natalie\AppData\Local\Civica\VH5\b59b925c-la86-4318-8861-e38dc4dfd2f8\ad9fd6f1-f1e3-4b67-9dcd-5a39c842545c\scen DATE: 06/07/2022 TIME: 10:59:28 USER: COMMENTS: ********** 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 mm/hr 3.53 3.66 hrs 1.00 mm/hr | 10.19 hrs hrs mm/hr | hrs mm/hr 9.15 | 7.70 | 0.00 2.00 3.00 4.55 1.00 10.19 1.17 21.62 1.33 112.37 1.50 27.76 1.67 15.75 3.17 0.17 2.17 4.22 0.33 4.04 2.33 6.68 3.33 3.96 4.67 2.50 5.94 3.50 4.93 0.83 7.11 | 1.83 | 11.43 | 2.83 3.83 3.35 CALIB NASHYD (0038) | CANIDS | 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. CALTB NASHYD (0070) Area (ha)= 1.74 Curve Number (CN)= 58.0 Ia (mm)= 16.50 # of Linear Res.(N)= 3.00 | NASHYD (00.0, | Ia (mm)= 10.00 | ID= 1 DT=10.0 min | Ia (mm)= 10.00 | 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. CALTB NASHYD (0071) | CARIDS | | CA 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.

| CAI | LIB | | | | | | | |
|------|--------------------|----------|------------|-------|-----------|---------|----------|-------|
| ST | ANDHYD (0023) | Area | (ha) = | 0.59 | | | | |
| ID= | 1 DT=10.0 min | Total | Imp(%)= | 47.00 | Dir. | Conn.(% | 16.00 | |
| | | | IMPERVIO | NTTS | DEBATO | TS (i) | | |
| | Surface Area | (ha)- | | | | | | |
| | Dep. Storage | (mm) = | 0.20 | | 1 5/ | 1 | | |
| | Average Slope | | | | | | | |
| | Length | | 62.72 | | | | | |
| | Mannings n | | | | | | | |
| | riainiiings ii | | 0.01. | ' | 0.25 | , | | |
| | Max.Eff.Inten.(r | mm/hr)= | 112.37 | , | 44.9 | 4 | | |
| | over | (min) | 10.00 |) | 20.00 |) | | |
| | Storage Coeff. | (min)= | 1.84 | (ii) | 11.56 | 5 (ii) | | |
| | Unit Hyd. Tpeak | | | | | | | |
| | Unit Hyd. peak | (cms)= | 0.17 | , | 0.08 | 3 | | |
| | | | | | | | *TOTALS* | |
| | PEAK FLOW | (cms)= | 0.03 | 3 | 0.02 | 2 | 0.040 | (iii) |
| | TIME TO PEAK | (hrs)= | 1.50 |) | 1.6 | 7 | 1.50 | |
| | RUNOFF VOLUME | | | | | | | |
| | TOTAL RAINFALL | (mm) = | 48.48 | 1 | 48.48 | 3 | 48.48 | |
| | RUNOFF COEFFICIE | ENT = | 0.98 | } | 0.28 | 3 | 0.40 | |
| | | | | | | | | |
| | * WARNING: STORAG | | | | | | | |
| ***: | * WARNING: FOR ARI | | | | | | | |
| | YOU SHO | OULD CON | SIDER SPLI | TTING | THE ARI | EA. | | |
| | (i) CN PROCEDU | TOP CPIE | THE EOD I | EDITO | TO T OCC! | | | |
| | | | Ia = Dep. | | | | | |
| | CN^ = : | | | | | ove) | | |

- (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 | (he)- 0 F2 | | |
|-----------------------------------|-----------------|----------------|-------------|
| ID= 1 DT=10.0 min Tota | | | - 14 00 |
| 1D= 1 D1=10.0 MIII 10ca | 1 Imp(0)- /1.00 | DII. COIII.(6) | 11.00 |
| | IMPERVIOUS | PERVIOUS (i) | |
| Surface Area (ha)= | | , | |
| Dep. Storage (mm)= | | | |
| Average Slope (%)= | | | |
| | 58.88 | | |
| Mannings n = | | | |
| - | | | |
| 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)= | | 0.04 | 0.064 (iii) |
| TIME TO PEAK (hrs)= | | | 1.50 |
| RUNOFF VOLUME (mm)= | | | 24.66 |
| TOTAL RAINFALL (mm)= | | | 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.

CALIB STANDHYD (0026) Area (ha)= 0.48 | ID= 1 DT=10.0 min | Total Imp(%)= 50.00 Dir. Conn.(%)= 14.00 Surface Area (ha) = 0.80
Dep. Storage (mm) = 0.80
Average Slope (%) = 1.00
*-ength (m) = 56.57
= 0.013 IMPERVIOUS PERVIOUS (i) 0.24 0.24 1.50 40.00 0.250 Max.Eff.Inten.(mm/hr)= 112.37 over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)= 10.00 1.73 (ii) 20.00 10.89 (ii) 10.00 20.00 0.17 Unit Hyd. peak (cms)= (cms)= 0.02 0.02 0.031 (iii) PEAK FLOW TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) = 1.50 47.68 48.48 14.66 48.48 48.48 RUNOFF COEFFICIENT =

***** 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.

| Area | (ha)= | 0.61 | | | |
|----------|------------------------|---|---|---|--|
| Total | Imp(%)= | 62.00 | Dir. Conn. | .(%)= 14.00 | |
| | | | | | |
| | IMPERVI | OUS | PERVIOUS (i) |) | |
| (ha)= | 0.3 | 8 | 0.23 | | |
| (mm) = | 0.8 | 0 | 1.50 | | |
| (%)= | 1.0 | 0 | 2.00 | | |
| (m) = | 63.7 | 7 | 40.00 | | |
| | Total (ha)= (mm)= (%)= | Total Imp(%) = IMPERVI (ha) = 0.33 (mm) = 0.88 (%) = 1.00 | Total Imp(%)= 62.00 IMPERVIOUS (ha)= 0.38 (mm)= 0.80 (%)= 1.00 | Total Imp(%)= 62.00 Dir. Conn. IMPERVIOUS PERVIOUS (i (ha)= 0.38 0.23 (mm)= 0.80 1.50 (%)= 1.00 2.00 | Total Imp(%)= 62.00 Dir. Conn.(%)= 14.00 IMPERVIOUS PERVIOUS (i) (ha)= 0.38 0.23 (mm)= 0.80 1.50 (%)= 1.00 2.00 |

| Mannings n | = | 0.013 | 0.250 | |
|-----------------|------------------|-----------------|----------------|-------------|
| Max.Eff.Inten.(| mm/hr)= (min) | 112.37 10.00 | 85.00 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 COEFFICI | ENT = | 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) ID= 1 DT=10.0 min | | (ha)= Imp(%)= | | | Conn.(%)= | 25.00 | 0 | |
| | | IMPERVIO | JS | PERVIOUS | S (i) | | | |
| Surface Area | (ha)= | | | | - (-/ | | | |
| Dep. Storage | | | | 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 | | | | |
| | | 10.00 | | | | | | |
| 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 | | | | |
| | | | | | | 'OTALS' | | |
| PEAK FLOW | | | | | | 0.032 | (iii) | |
| TIME TO PEAK | , | | | | | 1.50 | | |
| | . , | 47.68 | | | | 23.60 | | |
| TOTAL RAINFALL | | | | | | 48.48 | | |
| RUNOFF COEFFICI | ENT = | 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.

| ST | LIB ANDHYD (0032) 1 DT=10.0 min | | (ha)= Imp(%)= | | | Conn.(%)= | 10.00 | |
|----|--|---------|------------------|----|----------|-----------|-----------|-----|
| | | | IMPERVIO | US | PERVIOUS | S (i) | | |
| | Surface Area | (ha)= | | | | - (-) | | |
| | Dep. Storage | | | | | | | |
| | Average Slope | | | | | | | |
| | Length | (m)= | 66.33 | | 40.00 | | | |
| | Mannings n | = | 0.013 | | 0.250 | | | |
| | Max.Eff.Inten.(| nm/hr)= | 112.37 | | 24.63 | | | |
| | over | (min) | 10.00 | | 20.00 | | | |
| | Storage Coeff. | | | | | | | |
| | Unit Hyd. Tpeak | (min) = | 10.00 | | 20.00 | | | |
| | Unit Hyd. peak | (cms)= | 0.17 | | 0.07 | | | |
| | | | | | | _ | OTALS* | |
| | PEAK FLOW | | | | 0.02 | | 0.031 (i: | ii) |
| | TIME TO PEAK | | | | | | 1.50 | |
| | RUNOFF VOLUME | | | | | | 16.11 | |
| | TOTAL RAINFALL | | | | | | 48.48 | |
| | RUNOFF COEFFICIE | ENT = | 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: $\begin{array}{ccc} \text{CN*} &=& 58.0 & \text{Ia} = \text{Dep. Storage} & (\text{Above}) \\ \text{(ii)} & \text{TIME STEP (DT)} & \text{SHOULD BE SMALLER OR EQUAL} \\ & & \text{THAN THE STORAGE COEFFICIENT.} \end{array}$
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| STA | IB NDHYD (0033) | | | | |
|-----|-----------------------|----------|----------------|----------------|-------------|
| ID= | 1 DT=10.0 min | Total | Imp(%) = 48.00 | Dir. Conn.(%)= | 13.00 |
| | | | | | |
| | | | | 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.(n | m/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 |
|------------------|----------|-------|-------|-------|
| DIMORE COPPETCIE | NTT - | 0.00 | 0.20 | 0.20 |

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

| CALIB | | | | | | | |
|-----------------------|----------|------------|--------|---------|-----------|--------|-------|
| STANDHYD (0034) | Area | (ha)= | 0.67 | | | | |
| ID= 1 DT=10.0 min | Total | Imp(%)= | 42.00 | Dir. | Conn.(%)= | 18.00 |) |
| | | | | | | | |
| | | IMPERVIO | US : | PERVIOU | S (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.(n | m/hr)= | 112.37 | | 24.87 | | | |
| over | (min) | 10.00 | | 20.00 | | | |
| Storage Coeff. | | | | | | | |
| Unit Hyd. Tpeak | (min)= | 10.00 | | 20.00 | | | |
| Unit Hyd. peak | (cms)= | 0.17 | | 0.07 | | | |
| | | | | | r* | OTALS' | + |
| 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 COEFFICIE | ENT = | 0.98 | | 0.26 | | 0.39 | |
| | | | | | | | |
| ***** WARNING: STORAG | E COEFF | . IS SMALL | ER THA | N 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 | (1) 0.65 | | |
|--------------------------|-------------------|--------------|-------------|
| STANDHYD (0035) Area | | | |
| ID= 1 DT=10.0 min Tota | 1 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)= | | | |
| Mannings n = | | | |
| | | | |
| 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)= | | | |
| | | | *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 |
| RUNOFF COEFFICIENT = | | 0.24 | 0.32 |
| ROBOTI COMPTICIANI - | 0.50 | 0.21 | 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 (0062) | Area | (ha)= 0 | .51 | |
| ID= 1 DT=10.0 min | Total | Imp(%)= 66 | .00 Dir. Con | n.(%)= 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.(| | | | |
| | | 10.00 | | |
| Storage Coeff. | | | | i) |
| 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 COEFFICI | ENT = | 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.

| CALIB STANDHYD (0064) ID= 1 DT=10.0 min | | (ha)= Imp(%)= | | Dir. | Conn.(%)= | 23.00 | ס |
|--|----------|------------------|-------|---------|-----------|--------|-------|
| | | IMPERVIO | IIS | PERVIOU | S (i) | | |
| Surface Area | (ha)= | | | 0.91 | | | |
| Dep. Storage | | | | 16.50 | | | |
| Average Slope | | | | 2.00 | | | |
| Length | | | | 40.00 | | | |
| Mannings n | = | 0.013 | | 0.250 | | | |
| | | | | | | | |
| Max.Eff.Inten.(n | mm/hr)= | 112.37 | | 22.11 | | | |
| over | (min) | 10.00 |) | 20.00 | | | |
| Storage Coeff. | (min) = | 2.67 | (ii) | 15.57 | (ii) | | |
| Unit Hyd. Tpeak | | | | | | | |
| Unit Hyd. peak | (cms)= | 0.17 | , | 0.07 | | | |
| | | | | | | OTALS' | |
| PEAK FLOW | | | | 0.04 | | 0.157 | (iii) |
| TIME TO PEAK | | | | 1.67 | | 1.50 | |
| RUNOFF VOLUME | | | | | | 18.85 | |
| TOTAL RAINFALL | | | | | | 48.48 | |
| RUNOFF COEFFICIE | ENT = | 0.98 | | 0.21 | | 0.39 | |
| **** WARNING: STORAG | E COEFF. | TS SMALL | ER TH | AN TIME | STEP! | | |

WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

| RESERVOIR(0076) | OVERFLOW | IS ON | | | |
|-------------------|----------|-------|-------|---------|---------|
| IN= 2> OUT= 1 | | | | | |
| DT= 5.0 min | OUTFLOW | STORA | AGE | OUTFLOW | STORAGE |
| | (cms) | (ha.r | n.) | (cms) | (ha.m.) |
| | 0.0000 | 0.00 | 000 | 0.0600 | 0.0600 |
| | 2 | REA | OPEAK | 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

| | LIB | | | | | | | | |
|-----|----------------|------------|----------|-------|----------|-----------|---------|-------|--|
| ST | ANDHYD (0068 | Area | (ha)= | 0.41 | | | | | |
| ID= | 1 DT=10.0 min | Total | Imp(%)= | 45.00 | Dir. (| Conn.(%)= | 17.00 |) | |
| | | | | | | | | | |
| | | | IMPERVIO | US | PERVIOUS | S (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 | | | | |
| | ove | er (min) | 10.00 | | 20.00 | | | | |
| | Storage Coeff | (min)= | 1.65 | (ii) | 13.39 | (ii) | | | |
| | Unit Hyd. Tpea | ak (min)= | 10.00 | | 20.00 | | | | |
| | Unit Hyd. peal | (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 RAINFALI | (mm) = | 48.48 | | 48.48 | | 48.48 | | |
| | RUNOFF COEFFIC | CIENT = | 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.

| CAL | IB | | | | | |
|------|------------------|----------|--------------|-------------|---------------|-------|
| STAI | NDHYD (0069) | Area | (ha)= 0. | 86 | | |
| ID= | 1 DT=10.0 min | Total | Imp(%) = 39. | 00 Dir. Con | nn.(%)= 15.00 |) |
| | | | TMDDDUTOUG | DEDUTOR | (2) | |
| | _ | | IMPERVIOUS | PERVIOUS | (1) | |
| | Surface Area | | 0.34 | | | |
| 1 | Dep. Storage | (mm) = | 1.00 | 1.50 | | |
| 1 | Average Slope | (%)= | 1.00 | 2.00 | | |
| 1 | Length | (m)= | 75.72 | 40.00 | | |
| 1 | Mannings n | = | 0.013 | 0.250 | | |
| , | Max.Eff.Inten.(m | m/hr)= | 112 37 | 24.22 | | |
| | | . , | 10.00 | | | |
| | | | | | 2.2.3 | |
| | Storage Coeff. | | | | 11) | |
| | Unit Hyd. Tpeak | | | 20.00 | | |
| 1 | Unit Hyd. peak | (cms)= | 0.17 | 0.07 | | |
| | | | | | *TOTALS* | r |
| 1 | PEAK FLOW | (cms)= | 0.04 | 0.03 | 0.052 | (iii) |
| | | | | | | |

| HIMO MODEL | | | | | |
|---|---------------------------|------------------------------|--------------------------------|-----------------------|--------------------------------|
| TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIE | (hrs) = (mm) = 4 (mm) = 4 | 1.50 7.48 8.48 0.98 | 1.67 12.52 48.48 0.26 | | 1.50 17.76 48.48 0.37 |
| ***** WARNING: STORAG **** WARNING:FOR ARE YOU SHO | | VIOUS RATI | OS BELOW | 20% | |
| (i) CN PROCEDU CN* = 5 (ii) TIME STEP | 8.0 Ia = D | ep. Storag | ge (Above | | |
| | TORAGE COEFFI | CIENT. | | r. | |
| ADD HYD (0027) | | | | | |
| ID1= 1 (002 + ID2= 2 (002 | AREA (ha) 3): 0.59 | QPEAK (cms) 0.040 | TPEAK (hrs) 1.50 | R.V. (mm) 19.22 | |
| + ID2= 2 (002 ======== ID = 3 (002 | | | | | |
| NOTE: PEAK FLOW | S DO NOT INCL | | | | |
| ADD HYD (0027) | 2002 | 00004 | mpna.v | D. 11 | |
| ID1= 3 (002 + ID2= 2 (002 | (ha) | (cms) | (hrs) | (mm) | |
| + ID2= 2 (002 | 6): 0.48 | 0.031 | 1.50 | 19.28 | |
| ID = 1 (002 NOTE: PEAK FLOW | 7): 1.59 | 0.135 | 1.50 | 21.02 | |
| NOIE. FEAR FLOW | | ODE BASEFI | | | |
| ADD HYD (0027) | AREA | OPEAK | TPEAK | R.V. | |
| ID1= 1 (002 + ID2= 2 (002 | (ha) 7): 1.59 | (cms) 0.135 | (hrs) | (mm) 21.02 | |
| ID = 3 (002 | | | | | |
| NOTE: PEAK FLOW | S DO NOT INCL | UDE BASEFI | | | |
| | | | | | |
| ADD HYD (0027) | AREA | OPEAK | TPEAK | R.V. | |
| ID1= 3 (002 + ID2= 2 (003 | (ha) 7): 2.20 | (cms) | (hrs) 1.50 | (mm) 21.26 | |
| ========= | | | | | |
| ID = 1 (002 NOTE: PEAK FLOW | | | | | |
| | | | | | |
| ADD HYD (0027) | | | | | |
| 1 + 2 = 3 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) | |
| ID1= 1 (002 + ID2= 2 (003 | 7): 2.53 | 0.231 | 1.50 | 21.57 16.11 | |
| ID = 3 (002 | | | | | |
| NOTE: PEAK FLOW | S DO NOT INCL | UDE BASEFI | OWS IF AN | IY. | |
| | | | | | |
| ADD HYD (0027) | AREA | QPEAK | TPEAK | R.V. | |
| ID1= 3 (002 + ID2= 2 (003 | (ha) | (cms) | (hrs) | (mm) | |
| + ID2= 2 (003 | 3): 0.80 | 0.048 | 1.50 | 18.69 | |
| ID = 1 (002 | | | | | |
| NOTE: PEAK FLOW | | | | | |
| ADD HYD (0027) | | | | | |
| 1 + 2 = 3 1 + 2 = 3 ID1= 1 (002 + ID2= 2 (003 | AREA | QPEAK | TPEAK | R.V. | |
| ID1= 1 (002 | 7): 3.99 | 0.309 | 1.50 | 20.09 | |
| ========= | | | | | |
| ID = 3 (002 NOTE: PEAK FLOW | S DO NOT INCL | | OWS IF AN | | |
| | | | | | |
| ADD HYD (0027) 3 + 2 = 1 | ADEA | ODEVA | TDEAR | R M | |
| TD3 2 / 000 | (ha) | (cms) | (hrs) | (mm) | |
| ID1= 3 (002 + ID2= 2 (003 | 7): 4.66 5): 0.65 | 0.356 0.031 | 1.50 | 19.92 15.60 | |
| ID = 1 (002 | | | | | |
| NOTE: PEAK FLOW | | | | | |
| | | | | | |

| | | | | <u>2</u> | | ott |
|---|--------------------------|-----------------------|----------------------|----------------|-----------------------|-----|
| | | | | | Visu | ıaı |
| ADD HYD (0027) | | | | | | |
| 1 + 2 = 3 ID1= 1 (002 + ID2= 2 (006 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) | | |
| ID1= 1 (002 + ID2= 2 (006 | 7): 5.31 2): 0.51 | 0.387 | 1.50 | 19.40 23.32 | | |
| ID = 3 (002 | | | | | | |
| | | | | | | |
| NOTE: PEAK FLOW | | | | | | |
| | | | | | | |
| ADD HYD (0027) | AREA | QPEAK | TPEAK | R.V. | | |
| 3 + 2 = 1 ID1= 3 (002 + ID2= 2 (006 | (ha) | (cms) | (hrs) | (mm) 19.74 | | |
| + ID2= 2 (006 | 8): 0.41 | 0.028 | 1.50 | 19.10 | | |
| ID = 1 (002 | | | | | | |
| NOTE: PEAK FLOW | S DO NOT INC | LUDE BASEFI | LOWS IF AN | IY. | | |
| | | | | | | |
| ADD HYD (0027) | | | | | | |
| 1 + 2 = 3 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) | | |
| 1 + 2 = 3 ID1= 1 (002 + ID2= 2 (006 | 7): 6.23 9): 0.86 | 0.474 0.052 | 1.50 | 19.70 17.76 | | |
| ID = 3 (002 | | 0.527 | | 19.46 | | |
| NOTE: PEAK FLOW | S DO NOT INC | LUDE BASEFI | LOWS IF AN | IY. | | |
| | | | | | | |
| ADD HYD (0027) | | | | | | |
| ADD HYD (0027) 3 + 2 = 1 | AREA | QPEAK | TPEAK | R.V. | | |
| 3 + 2 = 1 ID1= 3 (002 + ID2= 2 (007 | 7): 7.09 | 0.527 | (nrs) 1.50 | (mm) 19.46 | | |
| | | | | | | |
| ID = 1 (002 | 7): 9.11 | 0.535 | 1.50 | 19.30 | | |
| NOTE: PEAK FLOW | S DO NOT INC | LUDE BASEFI | LOWS IF AN | ΓΥ. | | |
| CALIB | | | | | | |
| STANDHYD (0065) ID= 1 DT=10.0 min | Area (ha | a)= 0.49 | Dir Co | nn (%)= | 17 00 | |
| | | | | | 17.00 | |
| Surface Area | (ha)= | ERVIOUS 0.13 | 0.36 | (1) | | |
| Dep. Storage Average Slope | (mm) = (%) = (m) = | 1.00 | 1.50 2.00 | | | |
| Length Mannings n | (m) = = | 57.15 0.013 | 40.00 0.250 | | | |
| Max.Eff.Inten.(m | m/hr)= 1: | 12.37 | 16.18 | | | |
| Max.Eff.Inten.(m over Storage Coeff. | (min) = | 10.00 1.74 (ii) | 20.00 | ii) | | |
| Unit Hyd. Tpeak | (min)= | 10.00 | 20.00 | / | | |
| Unit Hyd. peak | | | | | OTALS* | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME | (cms)= (hrs)= | 1.50 | 0.01 1.67 | | 0.031 (iii) 1.50 | |
| RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIE | (mm) = - | 48.48 | 10.53 | | 16.79 48.48 | |
| RUNOFF COEFFICIE | NT = | 0.98 | 0.22 | | 0.35 | |
| **** WARNING: STORAG **** WARNING:FOR ARE | | | | | | |
| YOU SHO | ULD CONSIDER | SPLITTING | THE AREA. | | | |
| (i) CN PROCEDU CN* = 5 | RE SELECTED : | | | | | |
| (ii) TIME STEP | | BE SMALLER | | , | | |
| (iii) PEAK FLOW | | | LOW IF ANY | | | |
| | | | | | | |
| CALIB | | | | | | |
| STANDHYD (0066) ID= 1 DT=10.0 min | Area (ha Total Imp(| a)= 0.25 %)= 49.00 | Dir. Co | nn.(%)= | 31.00 | |
| | IMP | ERVIOUS | | (i) | | |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha)= (mm)= | 0.12 1.00 | 0.13 1.50 2.00 | | | |
| Average Slope Length | (%)= (m)= | 1.00 40.82 | 2.00 40.00 | | | |
| | | | 0.250 | | | |
| Max.Eff.Inten.(m | m/hr) = 1 | 12.37 | 22.94 | | | |
| Storage Coeff. | (min)= | 1.42 (ii) | 14.14 (| ii) | | |
| Max.Eff.Inten.(m over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (min)= (cms)= | 0.17 | 20.00 0.07 | | | |
| | | | | | OTALS* 0.027 (iii) | |
| TIME TO PEAK RUNOFF VOLUME | (hrs)= (mm)= | 1.50 47.48 | 1.67 12.24 | | 1.50 23.13 | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIE | (mm) = | 48.48 | 48.48 | | 48.48 | |
| **** WARNING: STORAG | | | | | 3.10 | |
| | | | | | | |
| | 8.0 Ia = 1 | Dep. Storag | ge (Above | | | |
| | TORAGE COEFF | ICIENT. | | | | |
| (iii) PEAK FLOW | DOES NOT INC | LUDE BASEFI | LOW IF ANY | | | |
| | | | | | | |

| ADD HYD (0067) | | | | | |
|--|------------------------------|--|------------------|----------------------|------------------------|
| ID1= 1 (0065 + ID2= 2 (0066 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) | |
| ID1= 1 (0065 + ID2= 2 (0066 |): 0.49): 0.25 | 0.031 0.027 | 1.50 1.50 | 16.79 23.13 | |
| ID = 3 (0067 | | | | 18.93 | |
| NOTE: PEAK FLOWS | DO NOT INCLU | UDE BASEFI | LOWS IF AN | IY. | |
| | | | | | |
| DUHYD (0024) Inlet Cap.= 0.057 | | | | | |
| #of Inlets= 1 Total(cms)= 0.1 | AREA | QPEAK | TPEAK | R.V. | |
| TOTAL HYD.(ID= 1) | (ha): 0.74 | (cms) 0.06 | (hrs) 1.50 | (mm) 18.93 | |
| =========== | | | | | |
| MAJOR SYS.(ID= 2) MINOR SYS.(ID= 3) | : 0.74 | 0.06 | 1.50 | 18.93 | |
| NOTE: PEAK FLOWS | DO NOT INCLU | UDE BASEFI | LOWS IF AN | IY. | |
| | | | | | |
| ADD HYD (0031) | | | | | |
| ID1= 1 (0024 + ID2= 2 (0027 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) | |
| ID1= 1 (0024 + ID2= 2 (0027 |): 0.74): 9.11 | 0.057 0.535 | 1.50 | 18.93 19.30 | |
| ID = 3 (0031 | | | | 19.27 | |
| NOTE: PEAK FLOWS | | | | | |
| | | | | | |
| ADD HYD (0031) | | | | | |
| 3 + 2 = 1 | AREA | QPEAK (cms) 0.592 | TPEAK | R.V. | |
| ID1= 3 (0031 + ID2= 2 (0071 |): 9.85 | 0.592 | 1.50 | 19.27 | |
| ========= | | | | | |
| ID = 1 (0031 NOTE: PEAK FLOWS | | | | | |
| NOIE. PEAR FLOWS | | | JOWS IF AN | | |
| RESERVOIR(0029) IN= 2> OUT= 1 | OVERFLOW : | IS ON | | | |
| DT= 1.0 min | OUTFLOW (cms) | STORAGE | OUTF | LOW : | STORAGE |
| | 0.0000 | STORAGE (ha.m.) 0.0000 0.0227 | 0.1 | .080 | 0.2030 |
| | 0.0130 | 0.0491 | 1 0.2 | 2003 | 0.311/ |
| | 0.0163 0.0190 | 0.1119 | 0.3 | 1697 | 0.3731 |
| | 0.0512 | | | | 0.0000 R.V. |
| INFLOW : ID= 2 (0 | | EA QPI a) (cr | ns) (h | PEAK nrs) 1.50 | (mm) 18.51 |
| OUTFLOW: ID= 2 (0 OVERFLOW: ID= 1 (0 OVERFLOW: ID= 3 (0 | 029) 10.5 | 556 (| 0.044 | 4.15 | 17.59 |
| OVERTEON-ID- 5 (0 | AL NUMBER OF | | | | 0.00 |
| CUM | ULATIVE TIME CENTAGE OF T | OF OVERFI | LOW (HOUR | RS) = 0 | .00 |
| | K FLOW RI | | | | |
| TIM | E SHIFT OF PI | EAK FLOW | (m | nin)=159 m.)= 0 | .00 |
| | | | | | |
| CALIB | | | | | |
| STANDHYD (0063) ID= 1 DT=10.0 min | Area (ha Total Imn/% |)= 0.31)= 41 nn | Dir Co | nn.(%)- | 0.00 |
| | | RVIOUS | | | |
| Surface Area Dep. Storage | (ha)= (| 0.13 | 0.18 1.50 | / | |
| Average Slope | (%)= (%) = 3 (%) = 4! = 0 | 1.00 | 2.00 | | |
| Length Mannings n | (m) = 4: | .013 | 40.00 0.250 | | |
| Max.Eff.Inten.(mm | /hr)= 112 | 2.37 | 50.79 | | |
| over (Storage Coeff. (| min) 10 min)= | 0.00 1.52 (ii) 0.00 | 20.00 10.77 (| ii) | |
| over (Storage Coeff. (Unit Hyd. Tpeak (Unit Hyd. peak (| min)= 10 cms)= 0 | 0.00 0.17 | 20.00 0.08 | | |
| PEAK FLOW (TIME TO PEAK (RUNOFF VOLUME TOTAL RAINFALL | cms)= (| | 0.01 | | TOTALS* 0.015 (iii) |
| TIME TO PEAK (RUNOFF VOLUME TOTAL RAINFALL | nrs) = (mm) = 4 | 0.00 1.50 7.48 8.48 | 1.67 14.51 | | 1.67 14.49 |
| TOTAL RAINFALL RUNOFF COEFFICIEN | (mm) = 48 T = 0 | 8.48 0.98 | 48.48 0.30 | | 48.48 0.30 |
| ***** WARNING: STORAGE ***** WARNING:FOR AREA YOU SHOU | | VIOUS RAT | OS BELOW | 20% | |
| (i) CN PROCEDUR | | | | | |
| | .0 Ia = De | ep. Storag | ge (Above | | |
| | ORAGE COEFFIC | CIENT. | | | |
| | | | | | |

$\frac{\textbf{21-173 Cottonwood Condominiums}}{\textbf{Visual OTTHYMO MODEL}}$

| ID1= 1 (0024 + ID2= 2 (0029 |): 10.56 | 0.044 ======= 0.044 | 4.15 4.15 | 17.59 ====== 17.59 | |
|---|---|--|---------------------------------------|--|--|
| | | | | | |
| | | | | | |
| ADD HYD (0037) | | | | | |
| 3 + 2 = 1 | | QPEAK | | | |
| ID1= 3 (0037 | (ha) | (cms) | (hrs) | (mm) | |
| ID1= 3 (0037 + ID2= 2 (0038 | | | | | |
| + 1D2= 2 (0036 | | | | | |
| ID = 1 (0037 |): 10.65 | 0.044 | 4.12 | 17.48 | |
| | | | | | |
| | | | | | |
| NOTE: PEAK FLOWS | | | | | |
| | | | | | |
| | | | | | |
| ADD HYD (0037) | | | | | |
| | AREA | OPEAK | TPEAK | R.V. | |
| ADD HYD (0037) 1 + 2 = 3 | AREA (ha) | QPEAK | TPEAK (hrs) | R.V. | |
| ADD HYD (0037) 1 + 2 = 3 | AREA (ha)): 10.65): 0.31 | QPEAK (cms) 0.044 0.015 | TPEAK (hrs) 4.12 1.67 | R.V. (mm) 17.48 14.49 | |
| ADD HYD (0037) 1 + 2 = 3 | AREA (ha)): 10.65): 0.31 | QPEAK (cms) 0.044 0.015 | TPEAK (hrs) 4.12 1.67 | R.V. (mm) 17.48 14.49 | |
| ADD HYD (0037) 1 + 2 = 3 | AREA (ha)): 10.65): 0.31 | QPEAK (cms) 0.044 0.015 | TPEAK (hrs) 4.12 1.67 | R.V. (mm) 17.48 14.49 | |
| ADD HYD (0037) 1 + 2 = 3 | AREA (ha)): 10.65): 0.31 | QPEAK (cms) 0.044 0.015 | TPEAK (hrs) 4.12 1.67 | R.V. (mm) 17.48 14.49 ======= 17.40 | |
| ADD HYD (0037) 1 + 2 = 3 | AREA (ha)): 10.65): 0.31 | QPEAK (cms) 0.044 0.015 | TPEAK (hrs) 4.12 1.67 | R.V. (mm) 17.48 14.49 ======= 17.40 | |
| ADD HYD (0037) 1 + 2 = 3 | AREA (ha)): 10.65): 0.31 | QPEAK (cms) 0.044 0.015 | TPEAK (hrs) 4.12 1.67 | R.V. (mm) 17.48 14.49 ======= 17.40 | |
| ADD HYD (0037) 1 + 2 = 3 | AREA (ha)): 10.65): 0.31 | QPEAK (cms) 0.044 0.015 | TPEAK (hrs) 4.12 1.67 | R.V. (mm) 17.48 14.49 ======= 17.40 | |
| ADD HYD (0037) 1 + 2 = 3 | AREA (ha)): 10.65): 0.31 | QPEAK (cms) 0.044 0.015 ====== 0.046 | TPEAK (hrs) 4.12 1.67 | R.V. (mm) 17.48 14.49 ====== 17.40 | |
| ADD HYD (0037) 1 + 2 = 3 | AREA (ha)): 10.65): 0.31 =========): 10.96 DO NOT INCL AREA (ha) | QPEAK (cms) 0.044 0.015 0.046 UDE BASEFI QPEAK (cms) | TPEAK (hrs) 4.12 1.67 4.07 COWS IF AI | R.V. (mm) 17.48 14.49 ====== 17.40 NY. | |
| ADD HYD (0037) 1 + 2 = 3 ID1= 1 (0037 + ID2= 2 (0063 | AREA (ha)): 10.65): 0.31 | QPEAK (cms) 0.044 0.015 | TPEAK (hrs) 4.12 1.67 4.07 OWS IF AI | R.V. (mm) 17.48 14.49 ====== 17.40 NY | |
| ADD HYD (0037) 1 + 2 = 3 | AREA (ha)): 10.65): 10.96 DO NOT INCL AREA (ha)): 10.96 | QPEAK (cms) 0.044 0.015 ======= 0.046 UDE BASEFI QPEAK (cms) 0.046 0.017 | TPEAK (hrs) 4.12 1.67 4.07 OWS IF AI | R.V. (mm) 17.48 14.49 ====== 17.40 NY. R.V. (mm) 17.40 4.50 | |

| 10-YEAR STORM | | | | | | | | | |
|--|------|--|--|--|--|--|--|--|--|
| V V I SSSSS U U A L (v 6.2.2007) V V I SS U U AAA L V V I SS U U AAAAA L V V I SS U U A A 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 Y M M O O OOO T T H H Y M M OOO Developed and Distributed by Smart City Water Inc Copyright 2007 - 2021 Smart City Water Inc All rights reserved. | | | | | | | | | |
| ***** DETAILED OUTPUT ***** | | | | | | | | | |
| Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat Output filename: C:\Users\Natalie\AppData\Local\Civica\VH5\b59b925c-la86-4318- 8861-e38dc4dfd2f8\81dabb97-7c31-40df-9e11-203efale4d45\scen Summary filename: C:\Users\Natalie\AppData\Local\Civica\VH5\b59b925c-la86-4318- 8861-e38dc4dfd2f8\81dabb97-7c31-40df-9e11-203efale4d45\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\458e0c Ptotal= 56.08 mm Comments: 10 YEAR CHICAGO 4 HOURS DESIGN DISTRIBUT | b6 | | | | | | | | |
| TIME RAIN TIME R | r | | | | | | | | |
| CALIB | | | | | | | | | |
| 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 | | | | | | | | | |
| 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 | | | | | | | | | |
| 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. | | | | | | | | | |
| | | | | | | | | | |

| STAN | | | | (ha)= Imp(%)= | | | Conn.(% |)= 16.00 | ı |
|------|-----------|---------|----------|------------------|---------|-----------|---------|----------|-------|
| | | | | | | | | | |
| | | | | IMPERVIO | DUS | PERVIOU | JS (i) | | |
| S | urface An | rea | (ha)= | 0.28 | 3 | 0.31 | L | | |
| D | ep. Stora | age | (mm) = | 0.80 |) | 1.50 |) | | |
| A | verage Sl | lope | (%)= | 1.00 |) | 2.00 |) | | |
| L | ength | | (m) = | 62.72 | 2 | 40.00 |) | | |
| M | annings r | n | = | 0.013 | 3 | 0.250 |) | | |
| М | ax.Eff.Ir | nten.(m | m/hr)= | 133.60 |) | 60.2 | L | | |
| | | over | (min) | 10.00 |) | 20.00 |) | | |
| S | torage Co | beff. | (min)= | 1.72 | 2 (ii) | 10.37 | 7 (ii) | | |
| U | nit Hyd. | Tpeak | (min)= | 10.00 |) | 20.00 |) | | |
| U | nit Hyd. | peak | (cms)= | 0.17 | 7 | 0.08 | 3 | | |
| | | | | | | | | *TOTALS* | |
| P | EAK FLOW | | (cms)= | 0.03 | 3 | 0.03 | 3 | 0.050 | (iii) |
| T | IME TO PE | EAK | (hrs)= | 1.50 |) | 1.67 | 7 | 1.50 | |
| R | UNOFF VOI | LUME | (mm) = | 55.28 | 3 | 17.76 | 5 | 23.76 | |
| T | OTAL RAIN | NFALL | (mm) = | 56.08 | 3 | 56.08 | 3 | 56.08 | |
| R | UNOFF COL | EFFICIE | ENT = | 0.99 | 9 | 0.32 | 2 | 0.42 | |
| | WADNITHG. | CECDAC | TE COEFE | . IS SMALI | ED 1011 | ANT TETME | CERT | | |
| | | | | . IS SMALI | | | | | |

- ***** 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 | L 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)= | | |
| | 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: ${\tt CN^*} = 58.0 \quad {\tt Ia} = {\tt Dep. Storage} \quad ({\tt Above})$ (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 - THAN THE STORAGE COEFFICIENT.

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

IMPERVIOUS PERVIOUS (i) 0.24 0.80 Surface Area (ha)= 0.24 Dep. Storage Average Slope (mm) = (%)= (m)= 1.00 2.00 Length Mannings n 0.013 0.250 Max.Eff.Inten.(mm/hr)= 133.60 over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 10.00 1.62 (ii) 10.00 10.00 9.77 (ii) 10.00 0.17 0.11 0.03 0.02 0.056 (iii) PEAK FLOW (cms)= TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT = 1.50 55.28 1.50 56.08 56.08 56.08

- ***** 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.

| ı | | | | | | |
|---|-------------------|----------|-----------|-------------------|-----------|--|
| ı | | | | | | |
| ı | | | | | | |
| ı | CALIB | | | | | |
| | STANDHYD (0028) | Area | (ha)= | 0.61 | | |
| | ID= 1 DT=10.0 min | Total | Imp(%)= 6 | 2.00 Dir. Conn.(% | ()= 14.00 | |
| ı | | | | | | |
| | | | IMPERVIOU | S PERVIOUS (i) | | |
| | Surface Area | (ha)= | 0.38 | 0.23 | | |
| | Dep. Storage | (mm) = | 0.80 | 1.50 | | |
| | Average Slope | (%)= | 1.00 | 2.00 | | |
| ı | Longth | (m) = | 62 77 | 40.00 | | |

| Mannings n | = | 0.013 | 0.250 | |
|-----------------|----------|-----------------|-----------------|-------------|
| | (min) | 133.60 10.00 | 112.41 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 COEFFICI | ENT = | 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 | | | | | | | | | |
|-------|---------------|----------|----------|-------|----------|----------|--------|-------|--|
| 1 - | | | | | | | | | |
| | HYD (0030) | | | | | | | | |
| ID= 1 | DT=10.0 min | Total | Imp(%)= | 50.00 | Dir. C | onn.(%)= | 25.00 |) | |
| | | | | | | | | | |
| | | | IMPERVIO | JS | PERVIOUS | S (i) | | | |
| Su | rface Area | (ha)= | 0.20 | | 0.13 | | | | |
| De | p. Storage | (mm) = | 0.80 | | 1.50 | | | | |
| Av | erage Slope | (%)= | 1.00 | | 2.00 | | | | |
| | ngth | | | | | | | | |
| | nnings n | | | | | | | | |
| | | | | | | | | | |
| Ma | x.Eff.Inten.(| mm/hr)= | 133 60 | | 81 15 | | | | |
| 110 | | | 10.00 | | | | | | |
| C+ | orage Coeff. | | | | | (= =) | | | |
| | | | | | | (11) | | | |
| | it Hyd. Tpeak | | | | | | | | |
| Un | it Hyd. peak | (cms)= | 0.17 | | 0.11 | | | | |
| | | | | | | *T | OTALS' | ł . | |
| PE | AK FLOW | (cms)= | 0.03 | | 0.02 | | 0.051 | (iii) | |
| TI | ME TO PEAK | (hrs)= | 1.50 | | 1.50 | | 1.50 | | |
| RU. | NOFF VOLUME | (mm) = | 55.28 | | 19.93 | | 28.75 | | |
| TO | TAL RAINFALL | (mm) = | 56.08 | | 56.08 | | 56.08 | | |
| RU. | NOFF COEFFICI | ENT = | 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.

| | ! | | (ha)= Imp(%)= | | Dir. C | !onn.(%)= | 10.00 |) | |
|--|------------------|----------|------------------|------|---------|-----------|--------|-------|--|
| | | | IMPERVIO | 170 | DEDITOR | () | | | |
| | | | | | |) (I) | | | |
| | Surface Area | | | | | | | | |
| | 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.(m | m/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 | | | | |
| | | | | | | *T | OTALS* | ŧ | |
| | 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 COEFFICIE | NT = | 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.

| | LIB | | | | | | | | |
|-----|------------------|----------|----------|-------|----------|-----------|---------|-------|--|
| ST | ANDHYD (0033) | | | | | | | | |
| ID= | 1 DT=10.0 min | Total | Imp(%)= | 48.00 | Dir. C | Conn.(%)= | 13.00 | | |
| | | | IMPERVIO | US | PERVIOUS | 3 (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.(r | nm/hr)= | 133.60 | | 66.34 | | | | |
| | over | (min) | 10.00 | | 20.00 | | | | |
| | Storage Coeff. | (min)= | 1.88 | (ii) | 10.20 | (ii) | | | |
| | Unit Hyd. Tpeak | | | | | | | | |
| | Unit Hyd. peak | (cms)= | 0.17 | | 0.08 | | | | |
| | | | | | | *T | 'OTALS* | | |
| | 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 |
|------------------|----------|-------|-------|-------|
| DIMORE CORPETCIE | NTT - | n aa | 0.22 | 0.41 |

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

| CALIB STANDHYD (0034) ID= 1 DT=10.0 min | | (ha)= Imp(%)= | | | Conn.(%)= | = 18.00 |) |
|---|---------|------------------|----|---------|-----------|---------|-------|
| | | IMPERVIC | US | PERVIOU | S (i) | | |
| Surface Area (| ha)= | 0.28 | | 0.39 | | | |
| Dep. Storage (| mm) = | 0.80 | | 1.50 | | | |
| Average Slope | (%)= | 1.00 | 1 | 2.00 | | | |
| Length | (m) = | 66.83 | | 40.00 | | | |
| Mannings n | = | 0.013 | | 0.250 | | | |
| | in) | 10.00 | | 20.00 | | | |
| Storage Coeff. (m | | | | | | | |
| Unit Hyd. Tpeak (m | | | | | | | |
| Unit Hyd. peak (c | ms)= | 0.17 | | 0.08 | | | |
| | | | | | | TOTALS* | |
| PEAK FLOW (c | | | | 0.03 | | 0.059 | (iii) |
| TIME TO PEAK (h | , | | | 1.67 | | 1.50 | |
| RUNOFF VOLUME (| | | | | | 23.35 | |
| TOTAL RAINFALL (| | | | | | 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.

CALIB STANDHYD (0035) Area (ha)= 0.65 Total Imp(%)= 30.00 Dir. Conn.(%)= 11.00 ID= 1 DT=10.0 min IMPERVIOUS PERVIOUS (i) Surface Area (ha) = Dep. Storage (mm) = Average Slope (%) = Length (m) = 0.19 1.50 1.00 2 00 Mannings n 0.013 0.250 Max.Eff.Inten.(mm/hr)= over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)= 10.00 1.77 (ii) 10.00 20.00 20.00 Unit Hyd. peak (cms)= 0.17 0.07 *TOTALS* 0.03 0.03 0.039 (iii) PEAK FLOW FEAR FLOW (CMS)=
TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT = 1.50 55.28 56.08 1.67 1.50 56.08 56.08 0.99 ***** 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.

STANDHYD (0062) | Area (ha)= 0.51

| 1 DT=10.0 min | IOLAI | Tmb(%)= | 00.00 | Dir. (| Jonn.(%)= | 16.00 | |
|------------------|---|--|--|--|-----------------------|---------------------------|---------------------------|
| | | TMPERVIO | OTTS | PERVIOUS | S (i) | | |
| Surface Area | (ha)= | | | | - ' ' | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| mannings n | = | 0.013 | 5 | 0.250 | | | |
| Max Eff Inton (m | m /hx) = | 122 60 | 1 | 120 42 | | | |
| | | | | | | | |
| | | | | | | | |
| Storage Coeff. | (min)= | 1.65 | (ii) | 7.99 | (ii) | | |
| Unit Hyd. Tpeak | (min)= | 10.00 |) | 10.00 | | | |
| Unit Hyd. peak | (cms)= | 0.17 | 7 | 0.12 | | | |
| | | | | | *T | OTALS* | |
| PEAK FLOW | (cms)= | 0.03 | 3 | 0.05 | | 0.076 (iii |) |
| TIME TO PEAK | (hrs)= | 1.50 |) | 1.50 | | 1.50 | |
| RUNOFF VOLUME | (mm) = | 55.08 | 3 | 23.69 | | 28.70 | |
| TOTAL RAINFALL | (mm) = | 56.08 | 3 | 56.08 | | 56.08 | |
| RUNOFF COEFFICIE | NT = | 0.98 | 3 | 0.42 | | 0.51 | |
| | Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(n over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL | Surface Area (ha) = Dep. Storage (mm) = Average Slope (%) = Length (m) = Mannings n = Over (min) Storage Coeff. (min) = Unit Hyd. Tpeak (min) = Unit Hyd. peak (cms) = DEAK FLOW (cms) = TIME TO PEAK (hrs) = RUNOFF VOLUME (mm) = TOTAL RAINFALL (mm) = | Surface Area (ha)= Dep. Storage (mm)= 1.00 Average Slope (%)= 1.00 Length (m)= S8.31 Mannings n = 0.013 Max.Eff.Inten.(mm/hr)= over (min) Storage Coeff. (min)= 1.66 Unit Hyd. Tpeak (min)= Unit Hyd. peak (cms)= DEAK FLOW (cms)= PEAK FLOW (cms)= TIME TO PEAK (hrs)= 1.56 RUNOFF VOLUME (mm)= 55.08 TOTAL RAINFALL (mm)= 56.08 | Surface Area (ha) = 0.34 Dep. Storage (mm) = 1.00 Average Slope (%) = 1.00 Length (m) = 58.31 Mannings n = 0.013 Max.Eff.Inten.(mm/hr) = 133.60 over (min) = 10.00 Storage Coeff. (min) = 1.65 (ii) Unit Hyd. Tpeak (min) = 10.00 Unit Hyd. peak (cms) = 0.17 PEAK FLOW (cms) = 0.03 TIME TO PEAK (hrs) = 1.50 RUNOFF VOLUME (mm) = 55.08 TOTAL RAINFALL (mm) = 55.08 | IMPERVIOUS PERVIOUS | IMPERVIOUS PERVIOUS (i) | IMPERVIOUS PERVIOUS (i) |

- ***** 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: = 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.

| | NDHYD (0064) | | (ha)= | | | | | |
|-----|------------------|-------------|----------|-------|---------|-----------|--------|-------|
| ID= | 1 DT=10.0 min | Total | Imp(%)= | 55.00 | Dir. | Conn.(%)= | 23.00 |) |
| | | | IMPERVIO | US | PERVIOU | S (i) | | |
| | Surface Area | (ha)= | 1.11 | | 0.91 | | | |
| | Dep. Storage | (mm) = | 1.00 |) | 16.50 | | | |
| | Average Slope | (%)= | 1.00 |) | 2.00 | | | |
| | Length | . , | 116.05 | | | | | |
| | Mannings n | = | 0.013 | | 0.250 | | | |
| | Max.Eff.Inten.(m | / lb so \ _ | 122 60 | | 44 75 | | | |
| | | | 10.00 | | | | | |
| | Storage Coeff. | | | | | | | |
| | Unit Hyd. Tpeak | | | | | | | |
| | Unit Hyd. peak | | | | 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 COEFFICIE | ENT = | 0.98 | | 0.25 | | 0.42 | |
| | | | | | | | | |

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

| RESERVOIR(0076) IN= 2> OUT= 1 | OVERFLOW | IS ON | | | |
|--------------------------------------|----------|---------|-----------|---------|--|
| DT= 5.0 min | OUTFLOW | STORAGE | OUTFLOW | STORAGE | |
| · | (cms) | (ha.m.) | (cms) | (ha.m.) | |
| | 0.0000 | 0.0000 | 0.0600 | 0.0600 | |
| | A | REA QPI | AK TPEAK | R.V. | |
| | (| ha) (cm | s) (hrs) | (mm) | |
| INFLOW : ID= 2 (| 0064) 2 | .020 | .195 1.50 | 23.45 | |
| OUTFLOW: ID= 1 (| 0076) 2 | .020 | .027 2.58 | 3 23.33 | |
| OVERFLOW: ID= 3 (| 0003) 0 | .000 | .000 0.00 | 0.00 | |

TOTAL NUMBER OF SIMULATION OVERFLOW = 0.00 CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00 PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

| CALIB STANDHYD (0068) ID= 1 DT=10.0 min | | | |)= 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)= | 122 60 | EE 10 | |
| | | 10.00 | | |
| Storage Coeff. (| | | | |
| Unit Hyd. Tpeak (| | | | |
| Unit Hyd. peak (| | | | |
| onic nya. peak (| Citio / - | 0.17 | 0.00 | *TOTALS* |
| PEAK FLOW (| ama) = | 0.02 | 0.02 | 0.036 (iii) |
| TIME TO PEAK (| | | | 1.50 |
| RUNOFF VOLUME | | | | 23.58 |
| TOTAL RAINFALL | | | | |
| RUNOFF COEFFICIEN | | | | |

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

| CALIB | | | |
|------------------------|----------------|---------------------|-------------|
| STANDHYD (0069) A: | rea (ha)= | 0.86 | |
| ID= 1 DT=10.0 min To | otal Imp(%)= 3 | 9.00 Dir. Conn.(%)= | : 15.00 |
| | | | |
| | IMPERVIOU | JS PERVIOUS (i) | |
| Surface Area (ha | a)= 0.34 | 0.52 | |
| Dep. Storage (m | m)= 1.00 | 1.50 | |
| Average Slope (| %)= 1.00 | 2.00 | |
| Length (1 | m)= 75.72 | 40.00 | |
| Mannings n | = 0.013 | 0.250 | |
| | | | |
| Max.Eff.Inten.(mm/h: | r)= 133.60 | 47.69 | |
| over (min | n) 10.00 | 20.00 | |
| Storage Coeff. (min | n)= 1.93 | (ii) 11.42 (ii) | |
| Unit Hyd. Tpeak (min | n)= 10.00 | 20.00 | |
| Unit Hyd. peak (cm | s)= 0.17 | 0.08 | |
| _ | | * | *TOTALS* |
| PEAK FLOW (cm | s)= 0.05 | 0.04 | 0.066 (iii) |
| | | | |

| птис модыь | | | | | |
|---|----------------------|----------------------------------|-------------------|----------------|-------|
| | | | | | |
| TIME TO PEAK (hrs)= RUNOFF VOLUME (mm)= TOTAL RAINFALL (mm)= RUNOFF COEFFICIENT = | 5 | 1.50 5.08 | 1.67 16.18 | | 1.50 |
| TOTAL RAINFALL (mm)= | 5 | 5.08 | 56.08 | | 56.08 |
| RUNOFF COEFFICIENT = | 1 | 0.98 | 0.29 | | 0.39 |
| **** WARNING: STORAGE COEF | r. IS SI | MALLER THA | N TIME S' | rep! | |
| **** WARNING: FOR AREAS WITH | H IMPER | VIOUS RATI | OS BELOW | 20% | |
| YOU SHOULD COI | NSIDER : | SPLITTING | THE AREA | | |
| (i) CN PROCEDURE SELI | ECTED F | OR PERVIOU | S LOSSES | : | |
| CN* = 58.0 | | | | e) | |
| (ii) TIME STEP (DT) SI THAN THE STORAGE | | | OR EQUAL | | |
| (iii) PEAK FLOW DOES NO | | | OW IF AN | Υ. | |
| | | | | | |
| | | | | | |
| | | | | | |
| ADD HYD (0027) | APEA | ODEAK | TDEAK | R.V. | |
| 1 + 2 - 3 | (ha) | (cms) | (hrs) | (mm) | |
| 1 + 2 = 3 1 + 2 = 3 1D1= 1 (0023): + ID2= 2 (0025): | 0.59 | 0.050 | 1.50 | 23.76 | |
| + 1D2= 2 (0025): | 0.52 ====== | 0.084 ======= | 1.50 | 30.32 | |
| ID = 3 (0027): | | | | 26.83 | |
| NOTE: PEAK FLOWS DO NO | OT INCII | THE DACEUT | OWC TE AT | arv. | |
| NOIE: PEAR FLOWS DO NO | | JDE BASEFL | | NI. | |
| | | | | | |
| ADD HYD (0027) | | | | | |
| 3 + 2 = 1 | AREA | QPEAK | TPEAK | R.V. | |
| ID1= 3 (0027): + ID2= 2 (0026): | (ha) | (cms) | (hrs) | (mm) | |
| ID1= 3 (0027): + ID2= 2 (0026): | 0.48 | U.133 0.056 | 1.50 1.50 | 26.83 23.90 | |
| | | | | | |
| ID = 1 (0027): | 1.59 | 0.189 | 1.50 | 25.95 | |
| NOTE: PEAK FLOWS DO NO | OT INCL | JDE BASEFT | OWS IF A | NY. | |
| | | | | | |
| | | | | | |
| ADD HYD (0027) | | | | | |
| 1 + 2 = 3 | AREA | QPEAK | TPEAK | R.V. | |
| TD1- 1 (0027): | (ha) | (cms) | (hrs) | (mm) | |
| + 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 NO | OT INCL | UDE BASEFL | OWS IF A | NY. | |
| | | | | | |
| | | | | | |
| ADD HYD (0027) | | | | | |
| 3 + 2 = 1 | AREA | QPEAK | TPEAK | R.V. | |
| 3 + 2 = 1 | (na) 2.20 | 0.273 | (nrs) 1.50 | (mm) 26.25 | |
| + ID2= 2 (0030): | 0.33 | 0.051 | 1.50 | 28.75 | |
| ID = 1 (0027): | | | | | |
| 15 1 (002.) | 2.55 | 0.521 | 1.50 | 20.50 | |
| NOTE: PEAK FLOWS DO NO | OT INCL | UDE BASEFL | OWS IF A | NY. | |
| | | | | | |
| | | | | | |
| ADD HYD (0027) | APEA | ODEAK | TDFAK | P 17 | |
| | (ha) | QPEAK (cms) | (hrs) | (mm) | |
| TD1= 1 (0027): | 2.53 | 0.324 | 1.50 | 26.58 | |
| + ID2= 2 (0032): | | | | | |
| ID = 3 (0027): | | 0.364 | 1.50 | 25.26 | |
| NOTE: PEAK FLOWS DO NO | יייטיאד יייך | IDE DYGDE | OMG TH ** | αv | |
| MOIE: PEAK FLOWS DO NO | | BASEFL | | | |
| | | | | | |
| ADD HYD (0027) | | | | | |
| 3 + 2 = 1 | AREA | QPEAK | TPEAK | R.V. | |
| ID1= 3 (0027): + ID2= 2 (0033): | (ha) | (cms) | (hrs) | (mm) | |
| ID1= 3 (0027): + ID2= 2 (0033): | 3.19 0.80 | 0.364 0.060 | 1.50 1.50 | 25.26 23.23 | |
| ======================================= | | | ======= | | |
| ID = 1 (0027): | 3.99 | 0.424 | 1.50 | 24.85 | |
| NOTE: PEAK FLOWS DO NO | OT INCL | UDE BASEFL | OWS IF A | NY. | |
| | | | | | |
| | | | | | |
| ADD HYD (0027) | | | | | |
| 1 + 2 = 3 | AREA | QPEAK | TPEAK | R.V. | |
| ID1= 1 (0027): | (ha) 3.99 | QPEAK (cms) 0.424 0.059 | (hrs) 1.50 | (mm) 24.85 | |
| + ID2= 2 (0034): | 0.67 | 0.059 | 1.50 | 23.35 | |
| ID = 3 (0027): | | 0.483 | 1.50 | 24.63 | |
| ID - 3 (0027). | 1.00 | 0.703 | 1.50 | 27.03 | |
| NOTE: PEAK FLOWS DO NO | | | | | |
| | | | | | |
| | | | | | |
| ADD HYD (0027) | | | | | |
| ADD HID (0027) | AREA | QPEAK | TPEAK | R.V. | |
| 3 + 2 = 1 | (hal | (cmc) | | | |
| ABB A1B (0027) 3 + 2 = 1 | (ha) 4.66 | (cms) | (nrs) 1.50 | 24.63 | |
| ID1= 3 (0027): + ID2= 2 (0035): | (ha) 4.66 0.65 | (cms) 0.483 0.039 | 1.50 1.50 | 24.63 | |
| ID1= 3 (0027): + ID2= 2 (0035): | | | | | |
| 3 + 2 = 1 ID1= 3 (0027): + ID2= 2 (0035): ID = 1 (0027): | 5.31 | 0.522 | 1.50 | 24.01 | |
| 3 + 2 = 1 | 5.31 OT INCL | 0.522 UDE BASEFL | 1.50 OWS IF AI | 24.01 | |
| 3 + 2 = 1 | 5.31 OT INCL | 0.522 UDE BASEFL | 1.50 OWS IF AI | 24.01 | |

| | | | | | | Visual |
|---|--|--|--|--|-------------------------|---|
| | | | | | | VISUA |
| ADD HYD (002 1 + 2 = 3 | 27) | AREA | OPEAK | TPEAK | R.V. | |
| TD1= 1 (| | (ha) | (cms) | (hrs) | (mm) | |
| + ID2= 2 (| 0062): | 0.51 | 0.076 | 1.50 | 28.70 | |
| | 0027): | | | | | |
| NOTE: PEAK | | | | | | |
| | | | | | | |
| ADD HYD (002 $3 + 2 = 1$ | 27) | AREA | QPEAK | TPEAK | R.V. | |
| ID1= 3 (| 0027): 0068): | (ha) 5.82 | (cms) | (hrs) 1.50 | (mm) 24.42 | |
| ======= | | | | | | |
| ID = 1 (| 0027): | 6.23 | 0.634 | 1.50 | 24.36 | |
| NOTE: PEAK | FLOWS DO NO | T INCLU | JDE BASEFL | OWS IF AN | IY. | |
| / UVI / UVI | | | | | | |
| ADD HYD (002 1 + 2 = 3 | 27) | AREA | QPEAK | TPEAK | R.V. | |
| ID1= 1 (| 0027): 0069): | 6.23 | 0.634 | 1.50 | 24.36 | |
| ======= | | | | | | |
| ID = 3 (| 0027): | 7.09 | 0.700 | 1.50 | 24.08 | |
| NOTE: PEAK | FLOWS DO NO | T INCLU | JDE BASEFL | OWS IF AN | IY. | |
| (000 | | | | | | |
| ADD HYD (002 3 + 2 = 1 | 27) | AREA | QPEAK | TPEAK | R.V. | |
| ID1= 3 (| 0027): 0076): | (na) 7.09 | 0.700 | (nrs) 1.50 | (mm) 24.08 | |
| ======= | | | | | | |
| | 0027): | | | | | |
| NOTE: PEAK | FLOWS DO NO | T INCLU | JDE BASEFL | OWS IF AN | IY. | |
| CALIB STANDHYD (006 ID= 1 DT=10.0 mi | 65) Area in Total | (ha) |)= 0.49)= 26.00 | Dir. Co | onn.(%)= | 17.00 |
| Surface Area | | IMPE | RVIOUS 0.13 | PERVIOUS | (i) | |
| Dep. Storage Average Slop | e (mm) = |] | 1.00 | 1.50 | | |
| Length | (m)= | 57 | 7.15 | 40.00 | | |
| Mannings n | | | | 0.250 | | |
| Max.Eff.Inte | en.(mm/hr)= over (min) | 133 | 3.60 0.00 | 21.71 20.00 | | |
| Storage Coef | <pre>Ef. (min)= peak (min)=</pre> | 10 | 1.63 (ii) 0.00 | 14.63 (20.00 | ii) | |
| onic nya. pe | eak (CHS)= | (| 0.17 | 0.07 | * | TOTALS* |
| PEAK FLOW | (cms)= (hrs)= | (| 0.03 1.50 | 0.02 1.67 | | 0.038 (iii) 1.50 |
| TIME TO PEAR | ME (mm)= | 55 | 5.08 6.08 | 13.70 56.08 | | 20.71 56.08 |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUM | ΔT.T. (mm) = | | | | | 0.37 |
| TIME TO PEAR RUNOFF VOLUM TOTAL RAINFA RUNOFF COEFF | ALL (mm) = FICIENT = | (| 0.98 | 0.24 | | |
| TOTAL RAINFA RUNOFF COEFF **** WARNING: ST **** WARNING: FOF | ALL (mm)= FICIENT = FORAGE COEFF R AREAS WITH | r. IS SN H IMPERV | MALLER THA | N TIME ST | 20% | |
| TOTAL RAINFA RUNOFF COEFF **** WARNING: ST **** WARNING: FOF YOU | ALL (mm)= FICIENT = FORAGE COEFF R AREAS WITH U SHOULD CON | F. IS SM I IMPERV NSIDER S | MALLER THA VIOUS RATI SPLITTING | N TIME ST OS BELOW THE AREA | 20% | |
| TOTAL RAINFF RUNOFF COEFF **** WARNING: ST **** WARNING: FOF YOU (i) CN PRC CN* | ALL (mm)= FICIENT = FORAGE COEFF R AREAS WITH U SHOULD CON OCCEDURE SELE = 58.0 | F. IS SM I IMPERVISIDER S CCTED FO IA = De | MALLER THA VIOUS RATI SPLITTING OR PERVIOU ep. Storag | N TIME STONE | 20% | |
| TOTAL RAINF! RUNOFF COEF! **** WARNING: ST **** WARNING: FOE YOU (i) CN PRC CN* (ii) THE S THAN T | ALL (mm) = FICIENT = TORAGE COEFF R AREAS WITH U SHOULD CON CCEDURE SELE = 58.0 STEP (DT) SHIFF STORAGE | F. IS SM H IMPERV SIDER S CCTED FO IA = De HOULD BE COEFFICE | MALLER THA VIOUS RATI SPLITTING OR PERVIOU ep. Storag E SMALLER CIENT. | N TIME STONE BELOW THE AREA. S LOSSES: (Above OR EQUAL | 20% | |
| TOTAL RAINF! RUNOFF COEF! **** WARNING: SI **** WARNING: FOR (i) CN PRC CN* (ii) TIME S THAN 1 (iii) PEAK E | ALL (mm) = FICIENT = TORAGE COEFF R AREAS WITH U SHOULD CON DOCEDURE SELF = 58.0 STEP (DT) SH THE STORAGE FLOW DOES NO | F. IS SM H IMPERV NSIDER S ECTED FO IA = De HOULD BH COEFFIC OT INCLU | MALLER THA VIOUS RATI SPLITTING OR PERVIOU ep. Storag E SMALLER CIENT. UDE BASEFL | N TIME STONE SELOW THE AREA. S LOSSES: SE (Above OR EQUAL OW IF ANY | 20% | |
| TOTAL RAINF! RUNOFF COEFF **** WARNING: SI **** WARNING: FOF YOU (i) CN PR (CN** (ii) TIME S THAN 1 (iii) PEAK F | ALL (mm) = FICIENT = FICIE | F. IS SM H IMPERV MSIDER S ECTED FO IA = De HOULD BH COEFFIC OT INCLU | MALLER THA VIOUS RATI SPLITTING OR PERVIOU EP. Storag E SMALLER CIENT. UDE BASEFL | N TIME ST OS BELOW THE AREA. S LOSSES: DE (Above OR EQUAL OW IF ANY | 20% | |
| TOTAL RAINF! RUNOFF COEF! **** WARNING: SI **** WARNING: FOR (i) CN PRC CN* (ii) TIME S THAN 1 (iii) PEAK E CALIB STANDDHYD (000 ED 1 DT=10.0 mi | ALL (mm) = FICIENT = FICIENT = FICIENT = RAFBAS WITT U SHOULD CON CCEDURE SELE STEPP (DT) STEPP (DT | F. IS SM H IMPERV MSIDER S ECTED FO IA = De HOULD BH COEFFIC OT INCLU | MALLER THA VIOUS RATI SPLITTING OR PERVIOU EP. Storag E SMALLER CIENT. UDE BASEFL | N TIME ST OS BELOW THE AREA. S LOSSES: DE (Above OR EQUAL OW IF ANY | 20% | |
| TOTAL RAINF! RUNOFF COEF! **** WARNING: SI **** WARNING: FOF (i) CN PRC CN** (ii) TIME S THAN 1 (iii) PEAK F CALIB STANDHYD (006 ID= 1 DT=10.0 mi | ALL (mm) = FICIENT = FICIENT = FICIENT = RAFAS WITT U SHOULD CON CCEDURE SELF = 58.0 STEEP (DT) SF THE STORAGE FLOW DOES NO FICE SELF FICE STORAGE FLOW DOES NO FICE SELF FICE STORAGE FLOW DOES NO FICE SELF | F. IS SN H IMPERV ISIDER S ECTED FC IA = De HOULD BE COEFFIC OT INCLU (ha Imp(%) | MALLER THA VIOUS RATI SPLITTING OR PERVIOU PP. Storag E SMALLER CIENT. UDE BASEFL)= 0.25)= 49.00 | ON TIME STONE BELOW THE AREA. S LOSSES: DE (Above OR EQUAL OW IF ANY Dir. Co | 20% :) onn.(%)= | |
| TOTAL RAINF! RUNOFF COEF! **** WARNING: SI **** WARNING: FOF (i) CN PRC CN** (ii) TIME S THAN 1 (iii) PEAK F CALIB STANDHYD (006 ID= 1 DT=10.0 mi | ALL (mm) = FICIENT = FICIENT = FICIENT = RAFAS WITT U SHOULD CON CCEDURE SELF = 58.0 STEEP (DT) SF THE STORAGE FLOW DOES NO FICE SELF FICE STORAGE FLOW DOES NO FICE SELF FICE STORAGE FLOW DOES NO FICE SELF | F. IS SN H IMPERV ISIDER S ECTED FC IA = De HOULD BE COEFFIC OT INCLU (ha Imp(%) | MALLER THA VIOUS RATI SPLITTING OR PERVIOU PP. Storag E SMALLER CIENT. UDE BASEFL)= 0.25)= 49.00 | N TIME STORM THE AREA. S LOSSES: E (Above OR EQUAL OW IF ANY Dir. Cc PERVIOUS 0.13 | 20% :) onn.(%)= | |
| TOTAL RAINF! RUNOFF COEF! **** WARNING: SI **** WARNING: FOF (i) CN PRC CN** (ii) TIME S THAN 1 (iii) PEAK F CALIB STANDHYD (006 ID= 1 DT=10.0 mi | ALL (mm) = FICIENT = FICIENT = FICIENT = RAFAS WITT U SHOULD CON CCEDURE SELF = 58.0 STEEP (DT) SF THE STORAGE FLOW DOES NO FICE SELF FICE STORAGE FLOW DOES NO FICE SELF FICE STORAGE FLOW DOES NO FICE SELF | F. IS SN H IMPERV ISIDER S ECTED FC IA = De HOULD BE COEFFIC OT INCLU (ha Imp(%) | MALLER THA VIOUS RATI SPLITTING OR PERVIOU PP. Storag E SMALLER CIENT. UDE BASEFL)= 0.25)= 49.00 | N TIME STORM | 20% :) onn.(%)= | |
| TOTAL RAINF! RUNOFF COEF! **** WARNING: SI **** WARNING: FOR (i) CN PRC (ii) TIME S THAN 1 (iii) PEAK E | ALL (mm) = FICIENT = FICIENT = FICIENT = RAFAS WITT U SHOULD CON CCEDURE SELF = 58.0 STEEP (DT) SF THE STORAGE FLOW DOES NO FICE SELF FICE STORAGE FLOW DOES NO FICE SELF FICE STORAGE FLOW DOES NO FICE SELF | F. IS SN H IMPERV ISIDER S ECTED FC IA = De HOULD BE COEFFIC OT INCLU (ha Imp(%) | MALLER THA VIOUS RATI SPLITTING OR PERVIOU PP. Storag E SMALLER CIENT. UDE BASEFL)= 0.25)= 49.00 | N TIME STORM THE AREA. S LOSSES: E (Above OR EQUAL OW IF ANY Dir. Cc PERVIOUS 0.13 | 20% :) onn.(%)= | |
| TOTAL RAINF! RUNOFF COEF! **** WARNING: SI **** WARNING: FOF YOU (i) CN PRC CN** (ii) TIME S THAN 1 (iii) PEAK E CALIB STANDHYD (006 ID= 1 DT=10.0 min Surface Area Dep. Storage Average Slor Length Mannings n | ALL (mm) = FICIENT = FICIENT = RORAGE COEFF R AREAS WITT U SHOULD CON COEDURE SELF = 58.0 STEEP (DT) SE THE STORAGE FLOW DOES NO 660 Area in Total a (ha) = e (mm) = pee (%) = (m) = | F. IS SM I IMPERI SIDER S COTED FO IA = De OULD BE COEFFIL OT INCLU (ha Imp(%) IMPERI 40 | MALLER THA WIOUS RATI SPLITTING DR PERVIOU ED. Storag E SMALLER CIENT. JDE BASEFL | IN TIME STORM THE AREA. IS LOSSES: IE (Above OR EQUAL OW IF ANY OR EXAMPLE | 20% :) | |
| TOTAL RAINF! RUNOFF COEF! **** WARNING: SI **** WARNING: FOF YOU (i) CN PRC CN** (ii) TIME S THAN 1 (iii) PEAK E CALIB STANDHYD (006 ID= 1 DT=10.0 min Surface Area Dep. Storage Average Slor Length Mannings n | ALL (mm) = FICIENT = FICIENT = RORAGE COEFF R AREAS WITT U SHOULD CON COEDURE SELF = 58.0 STEEP (DT) SE THE STORAGE FLOW DOES NO 660 Area in Total a (ha) = e (mm) = pee (%) = (m) = | F. IS SM I IMPERI SIDER S COTED FO IA = De OULD BE COEFFIL OT INCLU (ha Imp(%) IMPERI 40 | MALLER THA WIOUS RATI SPLITTING DR PERVIOU ED. Storag E SMALLER CIENT. JDE BASEFL | IN TIME STORM THE AREA. IS LOSSES: IE (Above OR EQUAL OW IF ANY OR EXAMPLE | 20% :) | |
| TOTAL RAINF! RUNOFF COEF! **** WARNING: SI **** WARNING: FOF YOU (i) CN PRC CN** (ii) TIME S THAN 1 (iii) PEAK E CALIB STANDHYD (006 ID= 1 DT=10.0 min Surface Area Dep. Storage Average Slor Length Mannings n | ALL (mm) = FICIENT = FICIENT = RORAGE COEFF R AREAS WITT U SHOULD CON COEDURE SELF = 58.0 STEEP (DT) SE THE STORAGE FLOW DOES NO 660 Area in Total a (ha) = e (mm) = pee (%) = (m) = | F. IS SM I IMPERI SIDER S COTED FO IA = De OULD BE COEFFIL OT INCLU (ha Imp(%) IMPERI 40 | MALLER THA WIOUS RATI SPLITTING DR PERVIOU ED. Storag E SMALLER CIENT. JDE BASEFL | IN TIME STORM THE AREA. IS LOSSES: IE (Above OR EQUAL OW IF ANY OR EXAMPLE | 20% :) | |
| TOTAL RAINF! RUNOFF COEF! **** WARNING: ST **** WARNING: FOF YOU (i) CN PRO CN** (ii) TIME % THAN 7 (iii) PEAK F **** CALIB STANDHYD (006 ID= 1 DT=10.0 mi Surface Area Dep. Storage Average Slop Length Mannings n Max.Eff.Inte CStorage Coef Unit Hyd. Ty Unit Hyd. Ty Unit Hyd. Ty | ALL (mm) = FICIENT = FICIE | F. IS SM IMPER SIDER SECTED FG IA = De OULD BE SECTED FG IA = De OULD BE SECTED FG INCLUD INC | MALLER THA VIOUS RATI SPLITTING DR PERVIOU ED. Storag E SMALLER CIENT. UDE BASEFL | N TIME STONE SELOW THE AREA. IS LOSSES: e (Above On EQUAL OW IF ANY Dir. Co. 2.00 40.00 0.250 45.18 20.00 11.03 (20.00 0.08 | 20% :) | 31.00 |
| TOTAL RAINF! RUNOFF COEF! **** WARNING: ST **** WARNING: FOF YOU (i) CN PRO CN** (ii) TIME % THAN 7 (iii) PEAK F CALIB STANDHYD (006 ID= 1 DT=10.0 mi Surface Area Dep. Storage Average Slop Length Mannings n Max.Eff.Inte CStorage Coef Unit Hyd. Ty Unit Hyd. Ty Unit Hyd. Ty | ALL (mm) = FICIENT = FICIE | F. IS SM IMPER SIDER SECTED FG IA = De OULD BE SECTED FG IA = De OULD BE SECTED FG INCLUD INC | MALLER THA VIOUS RATI SPLITTING DR PERVIOU ED. Storag E SMALLER CIENT. UDE BASEFL | N TIME STONE SELOW THE AREA. IS LOSSES: e (Above On EQUAL OW IF ANY Dir. Co. 2.00 40.00 0.250 45.18 20.00 11.03 (20.00 0.08 | 20% :) | 31.00 TOTALS* 0.033 (iii) 1.50 |
| TOTAL RAINF! RUNOFF COEF! **** WARNING: ST **** WARNING: FOF YOU (i) CN PRO CN** (ii) TIME % THAN 7 (iii) PEAK F CALIB STANDHYD (006 ID= 1 DT=10.0 mi Surface Area Dep. Storage Average Slop Length Mannings n Max.Eff.Inte CStorage Country Unit Hyd. Ty Unit Hyd. Ty Unit Hyd. Ty | ALL (mm) = FICIENT = FICIE | F. IS SM IMPER SIDER SECTED FG IA = De OULD BE SECTED FG IA = De OULD BE SECTED FG INCLUD INC | MALLER THA VIOUS RATI SPLITTING DR PERVIOU ED. Storag E SMALLER CIENT. UDE BASEFL | N TIME STONE SELOW THE AREA. IS LOSSES: e (Above On EQUAL OW IF ANY Dir. Co. 2.00 40.00 0.250 45.18 20.00 11.03 (20.00 0.08 | 20% :) | 31.00 TOTALS* 0.033 (iii) 1.50 27.98 56.08 |
| TOTAL RAINF! RUNOFF COEF! **** WARNING: ST **** WARNING: FOF YOU (i) CN PRO CN** (ii) TIME % THAN 7 (iii) PEAK F CALIB STANDHYD (006 ID= 1 DT=10.0 mi Surface Area Dep. Storage Average Slor Length Mannings n Max.Eff.Inte CStorage Coef Unit Hyd. T EVERT FLOW TOTAL RAINF! RUNOFF COEF! | ALL (mm) = FICIENT = FICIENT = FORAGE COEFF R AREAS WITT J SHOULD CON COEDURE SELE = 58.0 STEPP (DT) SE FIFE STORAGE FLOW DOES NO (mm) = COEDURE SELE = 56.0 Area In Total (mm) = COEDURE SELE = 100 Area In Total (mm) = COEDURE SELE (mm) = C | F. IS SM IMPER SIDER SECTED FG IA = De COULD BE COEFFICOT INCLUMENT IMPER SECTED FG IA = DE COEFFICOT INCLUMENT IMPER SECTED IA = DE COEFFICOT INCLUMENT IMPER SECTED IA = DE COEFFICOT IA = DE | MALLER THA VIOUS RATI SPLITTING DR PERVIOU ED. Storag E SMALLER CIENT. UDE BASEFL | N TIME STONE SELOW THE AREA. S LOSSES: (Above On EQUAL OW IF ANY On The Area of the Are | 20% f. conn.(%)= (i) | 31.00 TOTALS* 0.033 (iii) 1.50 27.98 |
| TOTAL RAINF! RUNOFF COEFI **** WARNING: ST **** WARNING: ST **** WARNING: FOR (i) CN PRO (C) (ii) TIME S THAN 1 (iii) PEAK E | ALL (mm) = FICIENT = FICIE | F. IS SN I IMPER STORE S | MALLER THA VIOUS RATI SPLITTING DR PERVIOU ED. Storag E SMALLER CIENT. UDE BASEFL 1 = 0.25) = 49.00 RVIOUS 0.12 1.00 1.00 1.00 1.00 1.00 1.00 1.01 3.60 0.00 1.33 (ii) 0.00 0.17 0.03 1.50 5.08 6.08 0.98 MALLER THA | N TIME STONE SELOW THE AREA. S LOSSES: ee (Above OR EQUAL OW IF ANY OLD THE AREA OR THE AR | 20% :) | 31.00 TOTALS* 0.033 (iii) 1.50 27.98 56.08 |
| TOTAL RAINF! RUNOFF COEF! **** WARNING: ST **** WARNING: ST **** WARNING: FOR (i) CN PRC (ii) TIME S THAN 1 (iii) PEAK I | ALL (mm) = FICIENT = FICIENT = FORAGE COEFF R AREAS WITT J SHOULD CON COEDURE SELE = 58.0 STEPP (DT) SE FIFE STORAGE FLOW DOES NO (mm) = COEDURE SELE = 56.0 Area In Total (mm) = COEDURE SELE = 100 Area In Total (mm) = COEDURE SELE (mm) = C | F. IS SN I IMPER I IMPER I IMPER I IA = De IOULD BI COEFFIC I IT IND I IMPER I | MALLER THA VIOUS RATI SPLITTING DR PERVIOU EP. Storag E SMALLER CIENT. UDE BASEFL)= 0.25)= 49.00 RVIOUS 0.12 1.00 1.00 1.00 1.00 0.00 1.33 (ii) 0.00 0.17 0.03 1.50 5.08 6.08 0.09 MALLER THA MALLER THA DR PERVIOU EP. Storag | N TIME ST OS BELOW THE AREA. S LOSSES: SE (Above OR EQUAL OW IF ANY 0.13 1.50 2.00 40.00 0.250 45.18 20.00 11.03 1.00 0.08 0.01 1.58 3.60 0.08 | 20% :) onn.(%)= (i) ** | TOTALS* 0.033 (iii) 1.50 27.98 56.08 |

| ADD HYD (0067) 1 + 2 = 3 | AREA | QPEAK | TPEAK | R.V. | |
|--|------------------|---|-----------------------|---------------------|------------------------|
| ID1= 1 (0065): + ID2= 2 (0066): | 0.49 | QPEAK (cms) 0.038 | 1.50 | (mm) 20.71 | |
| ID = 3 (0067): | | | | | |
| NOTE: PEAK FLOWS D | | | | | |
| | | | | | |
| DUHYD (0024) Inlet Cap.= 0.057 | | | | | |
| #of Inlets= 1 Total(cms)= 0.1 | AREA | QPEAK | TPEAK | R.V. | |
| TOTAL HYD.(ID= 1): | (ha) 0.74 | (cms) | (hrs) 1.50 | (mm) 23.17 | |
| MAJOR SYS.(ID= 2): | 0.04 | 0.01 | 1.50 | 23.17 | |
| MINOR SYS.(ID= 3): | | 0.06 | 1.50 | | |
| NOTE: PEAK FLOWS D | O NOT INCL | JDE BASEFI | LOWS IF AN | IY. | |
| | | | | | |
| ADD HYD (0031) | 3003 | 00004 | mpn | D | |
| ID1= 1 (0024): + ID2= 2 (0027): | (ha) | (cms) | (hrs) | (mm) | |
| ID1= 1 (0024): + ID2= 2 (0027): | 0.70 9.11 | 0.057 0.710 | 1.50 | 23.17 23.91 | |
| ID = 3 (0031): | | | | | |
| NOTE: PEAK FLOWS D | O NOT INCL | UDE BASEFI | LOWS IF AN | IY. | |
| | | | | | |
| ADD HYD (0031) | | | | | |
| ADD HYD (0031) 3 + 2 = 1 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) | |
| ID1= 3 (0031): + ID2= 2 (0071): | 9.81 0.71 | 0.767 0.024 | 1.50 1.50 | 23.86 10.56 | |
| ID = 1 (0031): | | | | 22.96 | |
| NOTE: PEAK FLOWS D | O NOT INCL | UDE BASEFI | LOWS IF AN | TY. | |
| | | | | | |
| RESERVOIR(0029) IN= 2> OUT= 1 | OVERFLOW | | | | |
| DT= 1.0 min | OUTFLOW (cms) | STORAGE (ha.m.) 0.0000 0.0227 0.0491 0.0772 | OUTE | rLOW | STORAGE (ha.m.) |
| | 0.0000 0.0085 | 0.0000 | 0.1 | L080 | 0.2030 0.2551 |
| | 0.0130 | 0.0491 | 0.2 | 2663 | 0.3117 |
| | 0.0163 | 0.0772 0.1119 0.1553 | 0.4 | 1697 | 0.3731 0.4393 |
| | | | | | |
| TWEETOW . TD 2 / 002 | (h | a) (cm | ns) (h | rs) | (mm) |
| INFLOW : ID= 2 (003 OUTFLOW: ID= 1 (002 OVERFLOW:ID= 3 (000 | 9) 10. | 522 (| 0.069 | 4.05 | 22.96 21.89 |
| | NUMBER OF | | | | |
| CUMUL | ATIVE TIME | OF OVERFI | LOW (HOUR | (8) = 0 | .00 |
| | NTAGE OF T | | | | |
| TIME | SHIFT OF P | EAK FLOW | (n | nin)=153 .m.)= 0 | .00 |
| PIMALIF | | | | | |
| CALIB | | | | | |
| STANDHYD (0063) A | rea (ha |)= 0.31 | Dir C | nn /%\- | 0.00 |
| | TMDE |)- 41.00 | DIII. CC | / 1) | 0.00 |
| Surface Area (h Dep. Storage (m Average Slope (Length (Mannings n | a)= | 0.13 | 0.18 | (± / | |
| Dep. Storage (m Average Slope (| m)= %)= | 1.00 | 2.00 | | |
| Length (Mannings n | m) = 4! = 0 | 5.46 .013 | 40.00 0.250 | | |
| Max.Eff.Inten.(mm/h | r)= 13 | 3.60 | 67.89 | | |
| Max.Eff.Inten.(mm/h over (mi Storage Coeff. (mi Unit Hyd. Tpeak (mi Unit Hyd. peak (cm | n) 1 n)= | 0.00 1.42 (ii) | 10.00 9.66 (| ii) | |
| Unit Hyd. Tpeak (mi Unit Hyd. peak (cm | n)= 1 | 0.00 0.17 | 10.00 | | |
| | | | | * | TOTALS* 0.023 (iii) |
| TIME TO PEAK (hr | rs)= | 1.50 5.08 | 0.02 1.50 18.61 | | 1.50 18.59 |
| PEAK FLOW (cm TIME TO PEAK (hr RUNOFF VOLUME (m TOTAL RAINFALL (m RUNOFF COEFFICIENT | m)= 5 | 6.08 0.98 | 56.08 | | 56.08 |
| ***** WARNING: STORAGE C | OEFF. IS SI | MALLER THE | AN TIME ST | TEP! 20% | |
| (i) CN PROCEDURE | | | | | |
| CN* = 58.0 | Ia = D | ep. Storag | ge (Above | | |
| (ii) TIME STEP (DT THAN THE STOR | AGE COEFFI | CIENT. | | , | |
| (iii) PEAK FLOW DOE | S NOT INCL | UDE BASEFI | OW IF ANY | | |

$\frac{\textbf{21-173 Cottonwood Condominiums}}{\textbf{Visual OTTHYMO MODEL}}$

| ADD HYD (0037) 1 + 2 = 3 | (ha) 0.04 10.52 ==================================== | 0.069 | (hrs) 1.50 4.05 4.05 | (mm) 23.17 21.89 ====== 21.90 | |
|---|---|-------------------------|-----------------------------------|---|--|
| NOTE: PEAK FLOWS DO | NOT INCLU | JDE BASEFL | OWS IF A | NY. | |
| ADD HYD (0037) 3 + 2 = 1 ID1= 3 (0037): + ID2= 2 (0038): | 10.56 0.09 | 0.001 | 4.05 1.67 | 21.90 6.51 | |
| ID = 1 (0037): | | | | | |
| ADD HYD (0037) 1 + 2 = 3 | AREA (ha) 10.65 | QPEAK (cms) 0.069 | TPEAK (hrs) | R.V. (mm) 21.77 | |
| + ID2= 2 (0063): | 0.31 | 0.023 | 1.50 | 18.59 | |
| ID = 3 (0037): | | | | | |
| NOTE: PEAK FLOWS DO | NOT INCL | JDE BASEFL | OWS IF A | NY. | |
| | | | | | |
| ADD HYD (0037) | 1000 | 00000 | mpna | D 1- | |
| | | QPEAK (cms) | | | |
| ID1= 3 (0037): + ID2= 2 (0070): | 1.74 | 0.028 | 1.67 | 6.66 | |
| ID = 1 (0037): | | | | | |
| NOTE: PEAK FLOWS DO | NOT INCL | JDE BASEFL | OWS IF A | NY. | |

| 25-YEAR STORM |
|---|
| V V I SSSSS U U A 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 A L VV I SS U U A 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 H Y M M O O OOO T T H H H Y M M OOO Developed and Distributed by Smart City Water Inc Copyright 2007 - 2021 Smart City Water Inc All rights reserved. |
| ***** DETAILED OUTPUT ***** |
| <pre>Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat Output filename: C:\Users\Natalie\AppData\Local\Civica\VH5\b59b925c-la86-4318- 8861-e38dc4dfd2f8\9f9a4c00-la2e-4697-b0b2-8297317f882a\scen Summary filename: C:\Users\Natalie\AppData\Local\Civica\VH5\b59b925c-la86-4318- 8861-e38dc4dfd2f8\9f9a4c00-la2e-4697-b0b2-8297317f882a\scen</pre> |
| DATE: 06/07/2022 TIME: 10:59:28 |
| USER: |
| COMMENTS: |
| |
| ************************************** |
| READ STORM Filename: C:\Users\Natalie\AppD ata\Local\Temp\ |
| 1577726c-47d7-46fc-bc76-c65d8db515e0\51bcb858 Ptotal= 66.02 mm |
| TIME RAIN TIME RAIN 'TIME RAIN TIME |
| |
| CALIB |
| 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. |
| CALIB |
| 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 |
| 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. |
| |

| HYMO MODEL | ·uiis | | | |
|--|----------------------|-----------------------------|--------------------|------------------------------|
| | | | | |
| CALIB STANDHYD (0023) ID= 1 DT=10.0 min | Area | (ha)= 0.59 |) Din Conn (%)- | 16.00 |
| 1D= 1 D1=10.0 MIII | . IOCAI I | TMPERVIOUS | PERVIOUS (i) | 16.00 |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha)= (mm)= | 0.28 | 0.31 | |
| Average Slope | (%)= (m)= | 1.00 | 2.00 | |
| Mannings n | = | 0.013 | 0.250 | |
| Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | mm/hr)= (min) | 158.85 10.00 | 81.47 10.00 | |
| Storage Coeff. Unit Hvd. Tpeak | (min)= (min)= | 1.60 (ii) 10.00 | 9.27 (ii) 10.00 | |
| Unit Hyd. peak | (cms)= | 0.17 | 0.11 | TOTALS* |
| PEAK FLOW TIME TO PEAK | (cms)= (hrs)= | 0.04 | 0.05 1.50 | 0.090 (iii) 1.50 |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI | (mm) = (mm) = | 65.22 66.02 | 66.02 | 30.07 66.02 |
| | | 0.99 | 0.35 | 0.46 |
| **** WARNING: STORA | REAS WITH I | MPERVIOUS RAT | TIOS BELOW 20% | |
| | | DER SPLITTING | | |
| | 58.0 Ia | a = Dep. Stora | age (Above) | |
| | STORAGE CO | DEFFICIENT. | | |
| (III) FEAR FEOR | | | | |
| CALIB | | | | |
| STANDHYD (0025) ID= 1 DT=10.0 min | Area Total I | (ha)= 0.52 Imp(%)= 71.00 |) Dir. Conn.(%)= | 14.00 |
| | | | | |
| Surface Area Dep. Storage | (ha)= (mm)= | 0.37 | 0.15 1.50 | |
| Surface Area Dep. Storage Average Slope Length Mannings n | (%)= (m)= | 1.00 58.88 | 2.00 40.00 | |
| | | | | |
| Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | mm/hr)= (min) | 158.85 10.00 | 232.42 10.00 | |
| Storage Coeff. Unit Hyd. Tpeak | (min)= : (min)= | 1.54 (ii) 10.00 | 6.58 (ii) 10.00 | |
| Unit Hyd. peak | (cms)= | 0.17 | 0.13 | TOTALS* |
| TIME TO PEAK | (cms)= (hrs)= | 1.50 | 1.50 | 0.110 (iii) 1.50 38.07 |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI | (mm)= | 66.02 | 66.02 | 66.02 0.58 |
| ***** WARNING: STORA | | | | 0.50 |
| **** WARNING: FOR AF | | MPERVIOUS RAT | | |
| | | TED FOR PERVIO | | |
| (ii) TIME STEE | (DT) SHOU | | | |
| THAN THE (iii) PEAK FLOW | | DEFFICIENT. INCLUDE BASE | FLOW IF ANY. | |
| | | | | |
| CALIB | • | (ha)= 0.48 | 3 | |
| STANDHYD (0026) ID= 1 DT=10.0 min | Total I | Imp(%) = 50.00 | Dir. Conn.(%)= | 14.00 |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha)= | IMPERVIOUS 0.24 | PERVIOUS (i) | |
| Dep. Storage Average Slope | (mm) = (%) = | 0.80 | 1.50 | |
| Length Mannings n | (m) = = | 56.57 0.013 | 40.00 0.250 | |
| Max.Eff.Inten.(| mm/hr)= | 158.85 | 93.97 | |
| over Storage Coeff. | (min) (min)= | 10.00 1.51 (ii) | 10.00 8.74 (ii) | |
| Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (min)= (cms)= | 10.00 0.17 | 10.00 0.12 | |
| | | | | TOTALS* 0.074 (iii) |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI | (hrs)= (mm)= | 1.50 65.22 | 1.50 24.67 | 1.50 30.34 |
| RUNOFF COEFFICE | (mm)= ENT = | 0.99 | 0.37 | 66.02 0.46 |
| ***** WARNING: STORA ***** WARNING:FOR AF YOU SH | REAS WITH I | | TIOS BELOW 20% | |
| | | TED FOR PERVIO | | |
| (ii) TIME STEE | (DT) SHOU | | | |
| THAN THE (iii) PEAK FLOW | | DEFFICIENT. INCLUDE BASE | FLOW IF ANY. | |
| | | | | |
| CALIB | | (ha)= 0 61 | | |
| STANDHYD (0028) ID= 1 DT=10.0 min | Total I | Imp(%) = 62.00 | Dir. Conn.(%)= | 14.00 |
| | | IMPERVIOUS | PERVIOUS (i) | |

IMPERVIOUS 0.38 0.80 1.00 63.77

(ha)= (mm)= (%)= (m)=

Surface Area Dep. Storage Average Slope Length PERVIOUS (i) 0.23 1.50 2.00 40.00

| Mannings n | = | 0.013 | 0.250 | |
|-----------------|------------------|-----------------|-----------------|-------------|
| Max.Eff.Inten.(| mm/hr)= (min) | 158.85 10.00 | 149.79 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 COEFFICI | ENT = | 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 SWALLER 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. C | Conn.(%)= | 25.00 |) | |
| | | | | | | | | |
| | | IMPERVIO | | | 3 (i) | | | |
| Surface Area | | | | | | | | |
| Dep. Storage | | | | | | | | |
| Average Slope | | | | | | | | |
| | | 46.90 | | | | | | |
| Mannings n | = | 0.013 | | 0.250 | | | | |
| | | | | | | | | |
| Max.Eff.Inten.(r | | | | | | | | |
| | | 10.00 | | | | | | |
| Storage Coeff. | | | | | (ii) | | | |
| Unit Hyd. Tpeak | | | | | | | | |
| Unit Hyd. peak | (cms)= | 0.17 | | 0.12 | | | | |
| | | | | | *T | 'OTALS' | * | |
| 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 COEFFICIA | ENT = | 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 | | | (ha)= | | | | | | |
| ID= 1 DT=10 | 0.0 min | Total | Imp(%)= | 36.00 | Dir. | Conn.(%)= | 10.00 | 0 | |
| | | | | | | | | | |
| | | | IMPERVIO | | PERVIOU | - , , | | | |
| Surface | | (ha)= | | ł | | | | | |
| Dep. St | | | 0.80 | | 1.50 | | | | |
| Average | e Slope | (%)= | 1.00 |) | 2.00 | | | | |
| Length | | | 66.33 | | | | | | |
| Manning | gs n | = | 0.013 | } | 0.250 | | | | |
| | | | | | | | | | |
| Max.Eft | f.Inten.(| mm/hr)= | 158.85 | , | 65.93 | | | | |
| | over | (min) | 10.00 |) | 10.00 | | | | |
| Storage | e Coeff. | (min) = | 1.66 | (ii) | 10.00 | (ii) | | | |
| Unit Hy | /d. Tpeak | (min) = | 10.00 |) | 10.00 | | | | |
| Unit Hy | /d. peak | (cms)= | 0.17 | , | 0.11 | | | | |
| | | | | | | r* | OTALS' | * | |
| PEAK FI | LOW | (cms)= | 0.03 | } | 0.05 | | 0.080 | (iii) | |
| TIME TO | PEAK | (hrs)= | 1.50 |) | 1.50 | | 1.50 | | |
| RUNOFF | VOLUME | (mm) = | 65.22 | 2 | 21.55 | | 25.91 | | |
| TOTAL I | RAINFALL | (mm) = | 66.02 | 2 | 66.02 | | 66.02 | | |
| RUNOFF | COEFFICI | ENT = | 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.

| GALTE | | | | | | |
|-------------------|-----------|----------|-------|----------------|-------------|--|
| CALIB | _ | | | | | |
| STANDHYD (0033) | | | | | | |
| ID= 1 DT=10.0 min | Total | Imp(%)= | 48.00 | Dir. Conn.(%): | = 13.00 | |
| | | | | | | |
| | | IMPERVIO | US | 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.(| /b.ss \ _ | 150 05 | | 00 56 | | |
| | | | | | | |
| | | 10.00 | | | | |
| Storage Coeff. | | | | | | |
| 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 | |
| | (mm)= | | | 24.23 | 29.55 | |
| TOTOL T VOLUME | () — | 33.22 | | 21.23 | 22.33 | |

| TOTAL RAINFALL (r | nm) = | 66.02 | 66.02 | 66.02 |
|--------------------|--------|-------|-------|-------|
| DINOFF COFFETCIENT | _ | 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.

| CALIB | | | | | |
|------------------|----------|------------|-----------|--------------|------|
| STANDHYD (0034) | | | | | |
| D= 1 DT=10.0 min | Total | Imp(%) = 4 | 2.00 Dir. | Conn.(%)= 18 | 3.00 |
| | | | | | |
| | | IMPERVIOU | S PERVIOU | S (i) | |
| Surface Area | (ha)= | 0.28 | 0.39 | | |
| Dep. Storage | (mm) = | 0.80 | 1.50 | | |
| Average Slope | | | | | |
| Length | (m) = | 66.83 | 40.00 | | |
| Mannings n | = | 0.013 | 0.250 | | |
| | | | | | |
| Max.Eff.Inten.(n | 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 | | |
| | | | | *TOT2 | ALS* |
| PEAK FLOW | (cms)= | 0.05 | 0.05 | | |
| TIME TO PEAK | | | | | |
| RUNOFF VOLUME | | | | | |
| TOTAL RAINFALL | | | | | |
| RUNOFF COEFFICIE | | | | | |

**** 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 |) |
| | | | | | | | |
| | | IMPERVIO | US | PERVIOU | S (i) | | |
| Surface Area | (ha)= | 0.19 | | 0.45 | | | |
| Dep. Storage | (mm) = | 0.80 | | 1.50 | | | |
| Average Slope | | | | 2.00 | | | |
| Length | (m)= | 65.83 | | 40.00 | | | |
| Mannings n | = | 0.013 | | 0.250 | | | |
| _ | | | | | | | |
| Max.Eff.Inten.(m | m/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 | | | | | | 1.50 | |
| RUNOFF VOLUME | | | | | | 25.03 | |
| TOTAL RAINFALL | | | | | | 66.02 | |
| RUNOFF COEFFICIE | | | | 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) | | | | | | | |
| ID= 1 DT=10.0 min | Total | Imp(%)= | 66.00 | Dir. (| Conn.(%)= | 16.00 |) |
| | | | | | | | |
| | | IMPERVIO | OUS | PERVIOUS | S (i) | | |
| Surface Area | (ha)= | 0.34 | l | 0.17 | | | |
| Dep. Storage | (mm) = | 1.00 |) | 1.50 | | | |
| Average Slope | (%)= | 1.00 |) | 2.00 | | | |
| Length | (m)= | 58.31 | L | 40.00 | | | |
| Mannings n | = | 0.013 | 3 | 0.250 | | | |
| | | | | | | | |
| Max.Eff.Inten.(mm | /hr)= | 158.85 | 5 | 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 | 7 | 0.13 | | | |
| | | | | | *T | OTALS* | |
| PEAK FLOW (| cms)= | 0.04 | Į. | 0.06 | | 0.100 | (iii) |
| TIME TO PEAK (| hrs)= | 1.50 |) | 1.50 | | 1.50 | |
| RUNOFF VOLUME | (mm) = | 65.02 | 2 | 30.60 | | 36.09 | |
| TOTAL RAINFALL | . , | | | | | 66.02 | |
| RUNOFF COEFFICIEN | | | | 0.46 | | 0.55 | |
| | - | 0.50 | | 3.10 | | | |

***** 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) ID= 1 DT=10.0 min | | (ha)= Imp(%)= | | Dir (| Jonn (%)= | 22 00 | 1 |
|--|----------|------------------|-------|----------|-------------|--------|-------|
| ID= I D1=10.0 | IOLAI | Imp(*)= | 55.00 | DII. (| .01111.(%)= | 23.00 | , |
| | | IMPERVIO | US | PERVIOUS | S (i) | | |
| Surface Area | (ha)= | 1.11 | | 0.91 | | | |
| Dep. Storage | (mm) = | 1.00 | | 16.50 | | | |
| Average Slope | | | | | | | |
| Length | . , | 116.05 | | | | | |
| Mannings n | = | 0.013 | | 0.250 | | | |
| | | | | | | | |
| Max.Eff.Inten.(| | | | | | | |
| | | 10.00 | | | | | |
| 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 | | | |
| | | | | | *T | 'OTALS | + |
| 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 COEFFICI | ENT = | 0.98 | | 0.29 | | 0.45 | |
| | | | | | | | |

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

| RESERVOIR(0076) IN= 2> OUT= 1 | OVERFLOW | IS ON | | | |
|--------------------------------------|----------|----------|----------|---------|--|
| DT= 5.0 min | OUTFLOW | STORAGE | OUTFLOW | STORAGE | |
| · | (cms) | (ha.m.) | (cms) | (ha.m.) | |
| | 0.0000 | 0.0000 | 0.0600 | 0.0600 | |
| | Al | REA QPE | AK TPEAK | R.V. | |
| | (1 | ha) (cma | s) (hrs) | (mm) | |
| INFLOW : ID= 2 (| 0064) 2 | .020 0 | 244 1.50 | 29.89 | |
| OUTFLOW: ID= 1 (| 0076) 2 | .020 0 | 034 2.58 | 29.76 | |
| OVERFLOW: ID= 3 (| 0003) 0 | .000 0 | 0.00 | 0.00 | |

TOTAL NUMBER OF SIMULATION OVERFLOW = 0.00 CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00 PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

| STANDHYD (0068) ID= 1 DT=10.0 min | | | | %)= 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 (i | ii) 9.37 (ii) | |
| Unit Hyd. Tpeak | | | | |
| 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 COEFFICI | ENT = | 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.

CALIB

| CALIB | 1 | | | | | | | | |
|---------|--------------|----------|----------|-------|----------|-----------|---------|-------|--|
| STANDH | YD (0069) | Area | (ha)= | 0.86 | | | | | |
| ID= 1 D | T=10.0 min | Total | Imp(%)= | 39.00 | Dir. 0 | Conn.(%)= | 15.00 |) | |
| | | | | | | | | | |
| | | | IMPERVIO | JS | PERVIOUS | S (i) | | | |
| | face Area | | 0.34 | | | | | | |
| Dep | . Storage | (mm) = | 1.00 | | 1.50 | | | | |
| Ave | rage Slope | (%)= | 1.00 | | 2.00 | | | | |
| | gth | (m)= | 75.72 | | | | | | |
| Man | nings n | = | 0.013 | | 0.250 | | | | |
| | | | | | | | | | |
| Max | Eff.Inten.(r | . , | | | | | | | |
| | | | 10.00 | | | | | | |
| | rage Coeff. | | | | | (ii) | | | |
| | t Hyd. Tpeak | | 10.00 | | 20.00 | | | | |
| Uni | t Hyd. peak | (cms)= | 0.17 | | 0.08 | | | | |
| | | | | | | | TOTALS: | | |
| PEA | K FLOW | (cms)= | 0.06 | | 0.05 | | 0.083 | (iii) | |
| | | | | | | | | | |

| RU | ME TO | PEAK | (hrs)= E (mm)= LL (mm)= ICIENT = | 65 | 1.50 | 1.67 | | 1.50 27.95 |
|---|--|---|---|--|--|--|--|---------------|
| | | | | | | 66.02 0.32 | | 66.02 0.42 |
| | VARNIN | G:FOR | ORAGE COEF | H IMPER | VIOUS RATI | OS BELOW | 20% | |
| | | | CEDURE SEL | | | | | |
| (| (ii) T | IME S | TEP (DT) SI | HOULD BI | E SMALLER | | -, | |
| (i | | | LOW DOES N | | | OW IF ANY | 7. | |
| | | | | | | | | |
| | | | | | | | | |
| ADD H | + 2 = | 3 | ′′ | AREA | QPEAK | TPEAK | R.V. | |
| | ID1= | 1 (| 0023): 0025): | (ha) 0.59 | (cms) | (hrs) 1.50 | (mm) 30.07 | |
| + | ==== | | | | | | | |
| | ID = | 3 (| 0027): | 1.11 | 0.200 | 1.50 | 33.82 | |
| NC | | | FLOWS DO N | | | | | |
| | | | | | | | | |
| ADD H | HYD (| 002 | 7) | ADEA | ODEAN | TDEAK | D 17 | |
| + ر | - Z = | | 0027): 0026): | (ha) | (cms) | (hrs) | R.V. (mm) | |
| + | ID1= | 3 (| 0027): | 0.48 | 0.200 | 1.50 | 30.34 | |
| | ==== | | 0027): | | | | | |
| NC | TE: | PEAK | FLOWS DO N | OT INCL | UDE BASEFL | OWS IF AN | NY. | |
| | | | | | | | | |
| ADD H | IYD (| 002 | 7) | | | | | |
| 1 + | 2 = | 3 | İ | AREA | QPEAK | TPEAK | R.V. | |
| | ID1= | 1 (| 0027): | (na) 1.59 | 0.273 | (nrs) 1.50 | (mm) 32.77 | |
| + | + ID2= ==== | 2 (===== | 0028): | 0.61 ===== | 0.110 ====== | 1.50 | 34.17 | |
| | ID = | 3 (| 0027): | 2.20 | 0.383 | 1.50 | 33.16 | |
| | | | FLOWS DO N | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | HYD (| | - 1 I | | | | | |
| | | | - 1 I | AREA (ha) | QPEAK | | | |
| | | | - 1 I | AREA (ha) 2.20 0.33 | QPEAK (cms) 0.383 0.065 | | | |
| | HYD (+ 2 = ID1= + ID2= ==== | 002 1 3 (2 (| 7) 0027): 0030): | | | TPEAK (hrs) 1.50 1.50 | R.V. (mm) 33.16 35.83 | |
| ADD H 3 + | HYD (+ 2 = ID1= + ID2= ==== ID = | 002 1 3 (2 (===== 1 (| 7) | 2.53 | 0.449 | TPEAK (hrs) 1.50 1.50 1.50 | R.V. (mm) 33.16 35.83 | |
| ADD H 3 + | HYD (+ 2 = ID1= + ID2= ==== ID = | 002 1 3 (2 (===== 1 (| 7) 0027): 0030): | 2.53 | 0.449 | TPEAK (hrs) 1.50 1.50 1.50 | R.V. (mm) 33.16 35.83 | |
| ADD H 3 + | HYD (+ 2 = ID1= + ID2= ==== ID = | 002 1 3 (2 (===== 1 (| 7) | 2.53 | 0.449 | TPEAK (hrs) 1.50 1.50 1.50 | R.V. (mm) 33.16 35.83 | |
| ADD E | HYD (+ 2 = ID1= + ID2= ==== ID = OTE: | 002 1 3 (2 (===== 1 (PEAK | 7) | 2.53 OT INCLU | 0.449 UDE BASEFL | TPEAK (hrs) 1.50 1.50 1.50 | R.V. (mm) 33.16 35.83 ====== 33.50 | |
| ADD E 1 + | HYD (+ 2 = ID1= + ID2= ==== ID = OTE: HYD (+ 2 = | 002 1 3 (2 (===== 1 (PEAK 002 3 | 7) | 2.53 OT INCLU | 0.449 UDE BASEFL QPEAK (cms) | TPEAK (hrs) 1.50 1.50 1.50 OWS IF AN TPEAK (hrs) 1.50 | R.V. (mm) 33.16 35.83 33.50 WY. | |
| ADD E 1 + | HYD (+ 2 = ID1= + ID2= ==== ID = OTE: | 002 1 3 (2 (===== 1 (PEAK 002 3 1 (2 (| 7) | 2.53 OT INCLU | 0.449 UDE BASEFL QPEAK (cms) 0.449 0.080 | TPEAK (hrs) 1.50 1.50 CWS IF At TPEAK (hrs) 1.50 CWS IF AT TPEAK (hrs) 1.50 1.50 1.50 | R.V. (mm) 33.16 35.83 35.83 33.50 NY. R.V. (mm) 33.50 25.91 | |
| ADD H ADD H 1 + | HYD (+ 2 = ID1= + ID2= ==== ID = DTE: HYD (+ 2 = ID1= + ID2= ==== | 002 1 3 (2 (===== 1 (PEAK 002 3 1 (2 (===== | 7) | 2.53 OT INCLU AREA (ha) 2.53 0.66 | 0.449 UDE BASEFL QPEAK (cms) 0.449 0.080 | TPEAK (hrs) 1.50 1.50 OWS IF AP TPEAK (hrs) 1.50 1.50 1.50 1.50 1.50 | R.V. (mm) 33.16 35.83 33.50 WY. R.V. (mm) 33.50 25.91 | |
| ADD H NO ADD H + | HYD (+ 2 = ID1= + ID2= ID = OTE: HYD (+ 2 = ID1= + ID2= ID = OTE: | 002 1 3 (2 (===== 1 (PEAK 002 3 1 (2 (===== 3 (PEAK | 7) | 2.53 DT INCLU AREA (ha) 2.53 0.66 3.19 DT INCLU | 0.449 UDE BASEFL QPEAK (cms) 0.449 0.080 | TPEAK (hrs) 1.50 TPEAK (hrs) 1.50 TPEAK (hrs) 1.50 1.50 1.50 1.50 | R.V. (mm) 33.16 35.83 33.50 NY. (mm) 33.50 25.91 31.93 | |
| ADD H 3 + NC ADD E 1 + | HYD (+ 2 = ID1= + ID2= ==== ID = OTE: ID1= + ID2= ==== ID1= + ID2= ==== ID = OTE: | 002 1 3 (2 () 1 () 1 () 1 () 1 () 2 () 2 () 3 () 1 () 2 () 3 () 1 () 2 () 3 () 1 () 2 () 3 () 1 () 2 () 3 () 1 () 3 () 1 | 7) | 2.53 DT INCLU AREA (ha) 2.53 0.66 3.19 DT INCLU | 0.449 UDE BASEFL QPEAK (cms) 0.449 0.080 | TPEAK (hrs) 1.50 TPEAK (hrs) 1.50 TPEAK (hrs) 1.50 1.50 1.50 1.50 | R.V. (mm) 33.16 35.83 33.50 NY. (mm) 33.50 25.91 31.93 | |
| ADD H | HYD ((+ 2 = | 002 1 | 7) | 2.53 DT INCLU AREA (ha) 2.53 0.66 3.19 DT INCLU | 0.449 UDE BASEFL QPEAK (cms) 0.449 0.080 0.528 UDE BASEFL | TPEAK (hrs) 1.50 1.50 CWS IF AN 1.50 1.50 CWS IF AN 1.50 1.50 1.50 CWS IF AN 1.50 | R.V. (mm) 33.16 35.83 33.50 NY. (mm) 33.50 25.91 31.93 NY. | |
| ADD E 1 + NC | HYD (| 002 1 3 (2 (| 7) | 2.53 DT INCLU AREA (ha) 2.53 0.66 3.19 DT INCLU | 0.449 UDE BASEFL QPEAK (cms) 0.449 0.080 0.528 UDE BASEFL | TPEAK (hrs) 1.50 1.50 CWS IF AN 1.50 1.50 CWS IF AN 1.50 1.50 1.50 CWS IF AN 1.50 | R.V. (mm) 33.16 35.83 33.50 NY. (mm) 33.50 25.91 31.93 NY. | |
| ADD E + + NC | HYD (| 002 1 () PEAK | 7) | 2.53 DT INCLU AREA (ha) 2.53 0.66 3.19 DT INCLU | 0.449 UDE BASEFL QPEAK (cms) 0.449 0.080 0.528 UDE BASEFL | TPEAK (hrs) 1.50 1.50 CWS IF AN 1.50 1.50 CWS IF AN 1.50 1.50 1.50 CWS IF AN 1.50 | R.V. (mm) 33.16 35.83 33.50 NY. (mm) 33.50 25.91 31.93 NY. | |
| ADD E + + NC | HYD (| 002 1 3 (2 () 2 () 2 () 2 () 2 () 3 () 2 () 2 () 3 () 2 () 3 () 2 () 3 () 2 () 3 () 2 () 3 () 2 () 3 () 3 () 3 () 2 () | 7) | 2.53 OT INCLU AREA (ha) 2.53 0.66 3.19 AREA (ha) 3.19 0.80 | 0.449 UDE BASEFL (cms) 0.449 0.080 0.528 UDE BASEFL QPEAK (cms) 0.528 0.117 | TPEAK (hrs) 1.50 1.50 TPEAK (hrs) 1.50 CWS IF AI 1. | R.V. (mm) 33.16 35.83 ======= 33.50 NY | |
| ADD E ADD E ADD E + + | HYD (| 002 1 3 (2 () 5 | 7) | AREA (ha) 2.53 3.19 DT INCLU | QPEAK (cms) 0.528 UDE BASEFL QPEAK (cms) 0.528 UDE BASEFL 0.528 0.117 0.645 | TPEAK (hrs) 1.50 1.50 COWS IF AN 1.50 COWS IF | R.V. (mm) 33.16 35.83 ==================================== | |
| ADD E ADD E ADD E + + | HYD (| 002 1 3 (2 () 5 | 7) | AREA (ha) 2.53 3.19 DT INCLU | QPEAK (cms) 0.528 UDE BASEFL QPEAK (cms) 0.528 UDE BASEFL 0.528 0.117 0.645 | TPEAK (hrs) 1.50 1.50 COWS IF AN 1.50 COWS IF | R.V. (mm) 33.16 35.83 ==================================== | |
| ADD E | YPD (| 0021 3 (2 () 2 () 1 () PEAK 3 () 2 () 3 () 2 () 1 () 1 () PEAK 1 () 1 () PEAK 1 () 1 () PEAK | 7) | AREA (ha) 2.53 3.19 DT INCLU | QPEAK (cms) 0.528 UDE BASEFL QPEAK (cms) 0.528 UDE BASEFL 0.528 0.117 0.645 | TPEAK (hrs) 1.50 1.50 COWS IF AN 1.50 COWS IF | R.V. (mm) 33.16 35.83 ==================================== | |
| ADD E | HYD (| 002 1 3 (| 7) | AREA (ha) 2.53 0.66 0.66 0.66 0.66 0.66 0.66 0.66 0.6 | QPEAK (cms) 0.449 0.080 0.528 UDE BASEFL (cms) 0.528 UDE BASEFL 0.528 0.117 0.645 UDE BASEFL | TPEAK (hrs) 1.50 1.50 1.50 1.50 1.50 1.50 1.50 1.50 | R.V. (mm) 33.16 35.83 ======= 33.50 NY. R.V. (mm) 31.93 31.93 29.55 ======= 31.46 NY. | |
| ADD E 1 + NC ADD E 2 + NC ADD E 1 + NC ADD E 1 + NC | HYD (| 0021 3 (2 (2 (2 (2 (2 (2 (2 (2 (2 (| 7) | AREA (ha) 2.53 0.66 6.81 0.81 0.81 0.81 0.81 0.81 0.81 0.81 0 | QPEAK (cms) 0.449 0.080 0.528 UDE BASEFL 0.528 0.117 0.645 UDE BASEFL 0.645 | TPEAK (hrs) 1.50 1.50 1.50 1.50 1.50 1.50 1.50 1.50 | R.V. (mm) 33.16 35.83 ======= 33.50 NY. R.V. (mm) 33.50 25.91 ====== 31.93 NY. R.V. (mm) 31.93 29.55 ====== 31.46 NY. | |
| ADD E 1 + NC ADD E 2 + NC ADD E 1 + NC ADD E 1 + NC | HYD (| 002 1 3 (2 (2 (2 (2 (2 (2 (2 (2 (2 (| 7) | AREA (ha) 3.99 AREA (ha) 3.99 AREA (ha) 3.99 AREA (ha) 3.99 | QPEAK (cms) 0.449 0.080 0.528 UDE BASEFL 0.528 0.117 0.645 UDE BASEFL 0.645 0.100 | TPEAK (hrs) 1.50 | R.V. (mm) 33.16 35.83 ======= 33.50 NY. R.V. (mm) 33.50 25.91 ====== 31.93 NY. R.V. (mm) 31.93 29.55 ======= 31.46 NY. | |
| ADD E 1 + NC ADD E 2 + NC ADD E 1 + NC ADD E 1 + NC | YPD (| 002 1 2 (2 (2 (2 (2 (2 (2 (2 (2 (| 7) | 2.53 OT INCLU AREA (ha) 2.53 0.66 3.19 OT INCLU AREA (ha) 3.19 0.80 3.99 OT INCLU AREA (ha) 3.99 OT INCLU | QPEAK (cms) 0.528 UDE BASEFL (cms) 0.528 UDE BASEFL QPEAK (cms) 0.528 0.117 0.645 UDE BASEFL 0.645 UDE BASEFL CMS) 0.645 0.100 | TPEAK (hrs) 1.50 TOWN IF AN 1.50 T | R.V. (mm) 33.16 35.83 33.50 NY. R.V. (mm) 33.50 25.91 31.93 NY. (mm) 31.46 NY. R.V. (mm) 31.46 29.47 | |
| ADD E 1 + NC | HYD (| 0021 1 | 7) | AREA (ha) 3.99 OT INCLU | QPEAK (cms) 0.449 0.080 0.528 UDE BASEFL 0.645 UDE BASEFL 0.645 0.100 0.745 | TPEAK (hrs) 1.50 OWS IF AN TPEAK (hrs) 1.50 | R.V. (mm) 33.16 35.83 ======= 33.50 NY. R.V. (mm) 33.50 25.91 ==================================== | |
| ADD E 1 + NC | HYD (| 0021 1 | 7) | AREA (ha) 3.99 OT INCLU | QPEAK (cms) 0.449 0.080 0.528 UDE BASEFL 0.645 UDE BASEFL 0.645 0.100 0.745 | TPEAK (hrs) 1.50 OWS IF AN TPEAK (hrs) 1.50 | R.V. (mm) 33.16 35.83 ======= 33.50 NY. R.V. (mm) 33.50 25.91 ==================================== | |
| ADD E 3 + + NC ADD E 3 + + NC ADD E 1 + NC ADD E 1 + NC ADD E 3 + ADD E 1 + NC | HYD (| 002 1 3 (2 () 2 () 3 () 4 () 5 () 6 () 7 () 7 () 7 () 8 | 7) | 2.53 OT INCLU AREA (ha) 2.53 0.66 3.19 OT INCLU AREA (ha) 3.19 0.80 0.80 0.80 0.80 0.80 0.80 0.80 0.8 | QPEAK (cms) 0.449 0.528 QPEAK (cms) 0.528 UDE BASEFL QPEAK (cms) 0.528 0.117 0.645 UDE BASEFL QPEAK (cms) 0.745 UDE BASEFL QPEAK (cms) 0.745 | TPEAK (hrs) 1.50 1.50 1.50 1.50 1.50 1.50 1.50 1.50 | R.V. (mm) 33.16 35.83 ======= 33.50 NY. R.V. (mm) 31.93 29.55 ====== 31.46 NY. R.V. (mm) 31.46 29.45 31.93 | |
| ADD E 3 + + NC ADD E 3 + + NC ADD E 1 + NC ADD E 1 + NC ADD E 3 + ADD E 1 + NC | HYD (| 002 1 3 (2 () 2 () 3 () 4 () 5 () 6 () 7 () 7 () 7 () 8 | 7) | 2.53 OT INCLU AREA (ha) 2.53 0.66 3.19 OT INCLU AREA (ha) 3.19 0.80 0.80 0.80 0.80 0.80 0.80 0.80 0.8 | QPEAK (cms) 0.449 0.528 QPEAK (cms) 0.528 QPEAK (cms) 0.528 QPEAK (cms) 0.528 0.117 | TPEAK (hrs) 1.50 1.50 1.50 1.50 1.50 1.50 1.50 1.50 | R.V. (mm) 33.16 35.83 ======= 33.50 NY. R.V. (mm) 31.93 29.55 ====== 31.46 NY. R.V. (mm) 31.46 29.45 31.93 | |
| ADD E 3 + + NC ADD E 1 + + NC ADD E 3 + + ADD E 1 + + ADD E 1 + | YPD (| 002 1 3 (2 (2 (2 (3 3 - 1 (2 (2 (2 (3 3 - 1 (2 (2 (2 (3 3 - 1 (2 (2 (2 (3 3 - 1 (2 (2 (2 (3 3 (2 (2 (3 3 (2 (2 | 7) | 2.53 OT INCLU AREA (ha) 2.53 0.66 3.19 OT INCLU AREA (ha) 3.19 0.80 0.80 0.80 0.80 0.80 0.80 0.80 0.8 | QPEAK (cms) 0.449 0.528 QPEAK (cms) 0.528 QPEAK (cms) 0.528 QPEAK (cms) 0.528 0.117 | TPEAK (hrs) 1.50 1.50 1.50 1.50 1.50 1.50 1.50 1.50 | R.V. (mm) 33.16 35.83 ======= 33.50 NY. R.V. (mm) 31.93 29.55 ====== 31.46 NY. R.V. (mm) 31.46 29.45 31.93 | |
| ADD E 3 + + NC ADD E 1 + + NC ADD E 3 + + ADD E 1 + + ADD E 1 + | YPO (| 002 1 3 (2 () PEAK | 7) | 2.53 OT INCLU AREA (ha) 2.53 0.66 3.19 OT INCLU AREA (ha) 3.19 OT INCLU AREA (ha) 3.99 OT INCLU AREA (ha) 4.66 OT INCLU AREA (ha) 4.66 0.65 | O.449 O.449 O.449 O.449 O.9EAK (cms) O.449 O.080 O.528 UDE BASEFL O.528 O.117 O.528 O.117 O.645 O.100 O.745 O.745 UDE BASEFL O.745 O.745 O.745 O.745 O.745 | TPEAK (hrs) 1.50 TPEAK (hrs) 1.50 TPEAK (hrs) 1.50 TPEAK (hrs) 1.50 OWS IF AN 1.50 TPEAK (hrs) 1.50 OWS IF AN 1.50 TPEAK (hrs) 1.50 OWS IF AN TPEAK (hrs) 1.50 TPEAK (hrs) | R.V. (mm) 33.16 35.83 ======= 33.50 NY. R.V. (mm) 33.50 25.91 ====== 31.93 NY. R.V. (mm) 31.46 29.47 NY. R.V. (mm) 31.46 29.47 SI.17 NY. R.V. (mm) 31.17 25.03 | |

| | | | | <u> 21-1</u> | Visual C |
|--|-------------------------------|------------------------------|---------------------|---------------|----------|
| ADD HYD (0027) | | | | | |
| 1 + 2 = 3 ID1= 1 (00 + ID2= 2 (00 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) | |
| ID1= 1 (00 + ID2= 2 (00 | 27): 5.33 62): 0.53 | 0.796 L 0.100 | 1.50 30 1.50 36 | 0.42 5.09 | |
| ========= | | 0.896 | | ==== | |
| NOTE: PEAK FLO | | | | | |
| | | | | | |
| | AREA | A OPEAK | TPEAK | R.V. | |
| ADD HYD (0027) 3 + 2 = 1 ID1= 3 (00 + ID2= 2 (00 | (ha) | (cms) | (hrs) | (mm) | |
| + ID2= 2 (00 | 68): 0.43 | 0.062 | 1.50 29 | 9.82 | |
| ID = 1 (00 | | | | 0.84 | |
| NOTE: PEAK FLO | WS DO NOT INC | CLUDE BASEFLO | WS IF ANY. | | |
| ADD HYD (0027) | | | | | |
| 1 + 2 = 3 | AREA | QPEAK | TPEAK | R.V. | |
| 1 + 2 = 3 ID1= 1 (00 + ID2= 2 (00 | (na 27): 6.23 | 0.959 | (nrs) 1.50 30 | (mm) | |
| + ID2= 2 (00 | 69): 0.86 ======= | 0.083 ======= | 1.50 27 | 7.95 ==== | |
| | | 1.042 | | 1.49 | |
| NOTE: PEAK FLO | WS DO NOT INC | CLUDE BASEFLO | WS IF ANY. | | |
| ADD HYD (0027) | | | | | |
| 3 + 2 = 1 | AREA (ha | QPEAK | TPEAK (hrs) | R.V. | |
| 3 + 2 = 1 ID1= 3 (00 + ID2= 2 (00 | 27): 7.09 | 1.042 | 1.50 30 | 1.49 | |
| ========= | | | | ==== | |
| | | 1.054 | | 0.33 | |
| NOTE: PEAK FLO | | | | | |
| CALIB STANDHYD (0065) ID= 1 DT=10.0 min | Area (1 | na)= 0.49 | | | |
| | | | | | l |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha)= | 0.13 | 0.36 | | |
| Average Slope | (%)= | 1.00 | 2.00 | | |
| Length Mannings n | (m) = = | 0.013 | 0.250 | | |
| Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | mm/hr)= | 158.85 | 43.77 | | |
| over Storage Coeff. | (min) (min)= | 10.00 1.52 (ii) | 20.00 11.34 (ii) | 1 | |
| Unit Hyd. Tpeak Unit Hyd. peak | (min) = (cms) = | 10.00 0.17 | 20.00 0.08 | | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL | (cms)= | 0.04 | 0.02 | *TOTALS* | |
| TIME TO PEAK RUNOFF VOLUME | (hrs)= (mm)= | 1.50 65.02 | 1.67 18.30 | 1.50 26.23 | |
| TOTAL RAINFALL RUNOFF COEFFICE | (mm) = ENT = | 66.02 0.98 | 66.02 0.28 | 66.02 0.40 | |
| *** WARNING: STORA | GE COEFF. IS | | | | |
| **** WARNING:FOR AR. YOU SH | | ERVIOUS RATIO | | į | |
| (i) CN PROCED CN* = | | FOR PERVIOUS Dep. Storage | | | |
| (ii) TIME STEP THAN THE | (DT) SHOULD STORAGE COEFI | BE SMALLER OF | R EQUAL | | |
| (iii) PEAK FLOW | | | | | |
| CALIB | | | | | |
| STANDHYD (0066) ID= 1 DT=10.0 min | Area (l Total Imp | na)= 0.25 (%)= 49.00 | Dir. Conn. | (%)= 31.00 |) |
| | | | ERVIOUS (i) | | |
| Surface Area Dep. Storage | (ha)= (mm)= | 0.12 1.00 | 0.13 1.50 | | |
| Surface Area Dep. Storage Average Slope Length Mannings n | (%)= (m)= | 1.00 | 2.00 40.00 | | |
| | | | 0.250 | | |
| Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | mm/hr)= | 158.85 | 61.52 10.00 | | |
| Storage Coeff. | (min)= | 1.24 (ii) | 9.81 (ii) | | |
| Unit Hyd. peak | (cms)= | 0.17 | 0.11 | <u> </u> | |
| | | | 0.01 1.50 | *TOTALS* | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL | (hrs)= (mm)= | 1.50 65.02 | 1.50 20.98 | 1.50 34.61 | |
| TOTAL RAINFALL RUNOFF COEFFICI | (mm) = ENT = | 66.02 0.98 | 66.02 0.32 | 66.02 0.52 | |
| *** WARNING: STORA | | | | | |
| (i) CN PROCED | | | | | |
| (ii) TIME STEP | (DT) SHOULD | | | | |
| THAN THE (iii) PEAK FLOW | STORAGE COEFI DOES NOT INC | | W IF ANY. | | |
| | | | | | |

| птис моры | | | | | |
|--|--------------------------------|---|---------------|----------------------|---------------------|
| | | | | | |
| ADD HYD (0067) | | | | | |
| 1 + 2 = 3 | AREA | QPEAK | TPEAK | R.V. | |
| ID1= 1 (006 + ID2= 2 (006 | (ha) (5): 0.49 | (cms) | (hrs) | (mm) 26.23 | |
| + ID2= 2 (006 | 6): 0.25 | 0.049 | 1.50 | 34.61 | |
| | 7): 0.74 | | | | |
| NOTE: PEAK FLOW | S DO NOT INCI | JIDE BASEFI. | OWS TE A | NY | |
| | | | | | |
| DUHYD (0024) | | | | | |
| Inlet Cap.= 0.057 #of Inlets= 1 | | | | | |
| Total(cms)= 0.1 | AREA | QPEAK | TPEAK | R.V. | |
| TOTAL HYD.(ID= 1 | (ha) .): 0.74 | (cms) 0.10 | (hrs) 1.50 | (mm) 29.06 | |
| | | | | | |
| MAJOR SYS.(ID= 2 MINOR SYS.(ID= 3 | 0.66 | 0.06 | 1.50 | 29.06 | |
| NOTE: PEAK FLOW | S DO NOT INCL | UDE BASEFL | OWS IF A | NY. | |
| | | | | | |
| | | | | | |
| ADD HYD (0031) | | | | | |
| 1 + 2 = 3 | AREA (ha) | QPEAK | TPEAK | R.V. | |
| ID1= 1 (002 + ID2= 2 (002 | (4): 0.66 | 0.057 | 1.50 | 29.06 | |
| + ID2= 2 (002 | !7): 9.11 | 1.054 | 1.50 | 30.33 ====== | |
| | 9.77 | | | | |
| NOTE: PEAK FLOW | | | | | |
| | | | | | |
| ADD HYD (0031) | | | | | |
| 3 + 2 = 1 | AREA | QPEAK (cms) 1.111 0.034 | TPEAK | R.V. | |
| ID1= 3 (003 | (na) (1): 9.77 | (cms) 1.111 | (nrs) 1.50 | 30.24 | |
| + ID2= 2 (007 | 1): 0.71 | 0.034 | 1.50 | 14.45 | |
| | 10.48 | | | 29.17 | |
| NOTE: PEAK FLOW | S DO NOT INCL | UDE BASEFL | OWS IF A | NY. | |
| | | | | | |
| RESERVOIR(0029) | OVERFLOW | | | | |
| IN= 2> OUT= 1 DT= 1.0 min | OUTFLOW | STORAGE | OUT | FLOW | STORAGE |
| | (cms) | (ha.m.) | (c | ms) 1080 | (ha.m.) 0.2030 |
| | 0.0085 | 0.0227 | 0. | 1807 | 0.2551 |
| | 0.0130 | 0.0491 | 0. | 2663 3630 | 0.3117 |
| | 0.0190 0.0512 | STORAGE (ha.m.) 0.0000 0.0227 0.0491 0.0772 0.1119 0.1553 | 0. | 4697 0000 | 0.4393 |
| | | | | | |
| | (h | EA QPE a) (cm | AK T | hrs) | (mm) |
| INFLOW: ID= 2 (OUTFLOW: ID= 1 (| 0031) 10. 0029) 10. | 477 1 477 0 | .145 | 1.50 3.97 0.00 | 29.17 27.96 |
| OVERFLOW: ID= 3 (| 0003) 0. | 000 0 | .000 | 0.00 | 0.00 |
| | TAL NUMBER OF | | | | |
| | MULATIVE TIME RCENTAGE OF T | | | | |
| PE | AK FLOW R | EDUCTION [| Qout/Qin |](%)= 8 | .98 |
| TI Ma | ME SHIFT OF P XIMUM STORAG | EAK FLOW | (ha | min)=148 .m.)= 0 | |
| | | | | | |
| | | | | | |
| CALIB STANDHYD (0063) | Area (ha |)= 0.31 | | | |
| STANDHYD (0063) ID= 1 DT=10.0 min | Total Imp(% |)= 41.00 | Dir. C | onn.(%)= | 0.00 |
| | IMPE | RVIOUS | PERVIOUS | (i) | |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha)= (mm)= | U.13 1.00 | 0.18 1.50 | | |
| Average Slope | (%)= (m)= 4 | 1.00 | 2.00 | | |
| Mannings n | = 0 | .013 | 0.250 | | |
| Max.Eff.Inten.(m | m/hr)= 15 | 8.85 | 91.60 | | |
| Max.Eff.Inten.(m over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (min) 1 (min)= | 0.00 1.32 (ii) | 10.00 8.63 | (ii) | |
| Unit Hyd. Tpeak | (min) = 1 | 0.00 | 10.00 | (11) | |
| | | | | * | TOTALS* |
| PEAK FLOW TIME TO PEAK | (cms)= (hrs)= | 0.00 | 0.03 1.50 | | 0.033 (iii) 1.50 |
| RUNOFF VOLUME | (mm) = 6 | 5.02 | 24.43 | | 24.41 |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIE | (mm)= 6 | 0.98 | 66.02 0.37 | | 66.02 0.37 |
| **** WARNING: STORAG | E COEFF. IS S | MALLER THA | OS BELOW | 20% | |
| | ULD CONSIDER | | | | |
| (i) CN PROCEDU CN* = 5 | RE SELECTED F | | | | |
| (ii) TIME STEP | | E SMALLER | | | |
| (iii) PEAK FLOW | | | OW IF AN | Υ. | |
| | | | | | |

$\frac{\textbf{21-173 Cottonwood Condominiums}}{\textbf{Visual OTTHYMO MODEL}}$

| | 0024): 0029): ========= 0037): | 10.48 ====== 10.56 | 0.103 | 3.97 ====== 3.97 | 27.96 ====== 27.96 |
|--|---|---|---|--|--|
| ADD HYD (003 | | | | | |
| 3 + 2 = 1 | | | QPEAK | | |
| ID1= 3 (| 0037): | 10.56 | (cms) | 3.97 | 27.96 |
| + ID2= 2 (| | | | | |
| | 0037): | | | | |
| ID = 1 (| | | | | |
| ID = 1 (| | | | | |
| NOTE: PEAK ADD HYD (003 1 + 2 = 3 ID1= 1 (+ ID2= 2 (| 7) 0037): | AREA (ha) 10.65 0.31 | QPEAK (cms) 0.103 0.033 | TPEAK (hrs) 3.95 1.50 | R.V. (mm) 27.81 24.41 |
| NOTE: PEAK ADD HYD (003 1 + 2 = 3 ID1= 1 (+ ID2= 2 (======== | 7) 0037): 0063): | AREA (ha) 10.65 0.31 | QPEAK (cms) 0.103 0.033 | TPEAK (hrs) 3.95 1.50 | R.V. (mm) 27.81 24.41 |
| ADD HYD (003 1 + 2 = 3 ID1= 1 (+ ID2= 2 (======= ID = 3 (NOTE: PEAK | 7) | AREA (ha) 10.65 0.31 ======== 10.96 | QPEAK (cms) 0.103 0.033 | TPEAK (hrs) 3.95 1.50 ==================================== | R.V. (mm) 27.81 24.41 ======= 27.71 |
| NOTE: PEAK ADD HYD (003 1 + 2 = 3 ID1= 1 (+ ID2= 2 (ID = 3 (| 7) | AREA (ha) 10.65 0.31 ====== 10.96 OT INCLU | QPEAK (cms) 0.103 0.033 0.106 | TPEAK (hrs) 3.95 1.50 3.90 OWS IF A | R.V. (mm) 27.81 24.41 ====== 27.71 |
| ADD HYD (003 1 + 2 = 3 ID1= 1 (+ ID2= 2 (======== ID = 3 (NOTE: PEAK | 0037): 0063): | AREA (ha) 10.65 0.31 ======== 10.96 OT INCLU | QPEAK (cms) 0.103 0.033 | TPEAK (hrs) 3.95 1.50 ======== 3.90 OWS IF AT | R.V. (mm) 27.81 24.41 ====== 27.71 NY. |
| NOTE: PEAK ADD HYD (003 1 + 2 = 3 ID1= 1 (+ ID2= 2 (======= ID = 3 (NOTE: PEAK ADD HYD (003 3 + 2 = 1 ID1= 3 (| 7) 0037): 0037): FLOWS DO N | AREA (ha) 10.96 | QPEAK (cms) 0.103 0.033 | TPEAK (hrs) 3.95 1.50 | R.V. (mm) 27.81 24.41 ===== 27.71 MY |
| ADD HYD (003 1 + 2 = 3 ID1= 1 (+ ID2= 2 (======== ID = 3 (NOTE: PEAK ADD HYD (003 3 + 2 = 1 ID1= 3 (+ ID2= 2 (| 7) 0037): 0037): FLOWS DO N | AREA (ha) 10.65 0.31 ==================================== | QPEAK (cms) 0.103 0.033 0.106 UPEAK (cms) 0.106 OPEAK (cms) 0.106 0.106 0.106 0.106 0.106 0.106 0.106 0.106 0.106 0.044 | TPEAK (hrs) 3.95 1.50 0WS IF At TPEAK (hrs) 3.90 1.67 | R.V. (mm) 27.81 24.41 24.41 27.71 YY. R.V. (mm) 27.71 9.99 |

| 50-YEAR STORM |
|---|
| V V I SSSSS U U A A L (v 6.2.2007) V V I SS U U AAAA L V V I SS U U AAAAA L V V I SS U U A A L V V I SS U U A A L V V I SS U U A A L |
| 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 Developed and Distributed by Smart City Water Inc Copyright 2007 - 2021 Smart City Water Inc All rights reserved. |
| ***** DETAILED OUTPUT ***** |
| Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat Output filename: C:\Users\Natalie\AppData\Local\Civica\VH5\b59b925c-la86-4318- 8861-e38dc4dfd2f8\c17led34-da26-42eb-ad45-59bdc3f23117\scen Summary filename: C:\Users\Natalie\AppData\Local\Civica\VH5\b59b925c-la86-4318- 8861-e38dc4dfd2f8\c17led34-da26-42eb-ad45-59bdc3f23117\scen |
| DATE: 06/07/2022 TIME: 10:59:28 USER: |
| COMMENTS: |
| ************************************** |
| READ STORM Filename: C:\Users\Natalie\AppD ata\Local\Temp\ |
| Ptotal= 72.96 mm Comments: 50 YEAR CHICAGO 4 HOUR DESIGN DISTRIBUTI |
| TIME RAIN 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 |
| CALIB |
| 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. |
| CALIB |
| Unit Hyd Qpeak (cms)= 0.399 PEAK FLOW (cms)= 0.065 (i) |
| 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 |
| 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. |

| YM(| O MODE | <u> </u> | | | | | | | |
|-----|--------------------------------|----------|-----------------------|-------------------------|--------|----------|-------------|----------|-------|
| STA | LIB ANDHYD ((1 DT=10.0 | 0023) | | | | | Conn.(%) | = 16.00 |) |
| | | | | IMPERVIC | US | PERVIOU | S (i) | | |
| | Surface A | rea | | | | | | | |
| | Dep. Stora | | | | | | | | |
| | Average S | lope | (%)= | 1.00 | | 2.00 | | | |
| | Length | - | (m)= | 62.72 | | 40.00 | | | |
| | Mannings 1 | n | = | 0.013 | | 0.250 | | | |
| | Max.Eff.I | nton (r | om /bx)= | 106 56 | | 102 25 | | | |
| | Max.Ell.ii | | | 10.00 | | | | | |
| | Storage Co | neff | (min)= | 1 50 | (ii) | 8 47 | (ii) | | |
| | Unit Hyd. | | | | | | | | |
| | Unit Hyd. | | | | | | | | |
| | onic nya. | pcan | (0) | 0.17 | | 0.12 | | *TOTALS* | |
| | PEAK FLOW | | (cms)= | 0.05 | | 0.06 | | 0.113 | (iii) |
| | TIME TO PI | EAK | (hrs)= | 1.50 | | 1.50 | | 1.50 | |
| | RUNOFF VOI | LUME | (mm) = | 72.16 | | 27.58 | | 34.71 | |
| | TOTAL RAII | NFALL | (mm) = | 72.96 | | 72.96 | | | |
| | RUNOFF COI | EFFICIE | ENT = | 0.99 | | 0.38 | | 0.48 | |
| | | FOR ARE | EAS WITH OULD CONS | IMPERVIOU SIDER SPLI | S RATI | THE ARE | W 20% A. | | |
| | . , . | | | CTED FOR P Ia = Dep. | | | | | |
| | (ii) TIM | E STEP | (DT) SHO | OULD BE SM | ALLER | | | | |
| | | | | COEFFICIEN | | | | | |
| | (iii) PEA | K FLOW | DOES NOT | r include | BASEFI | LOW IF A | NY. | | |

| STANDHYD (0025) | | | | | | | |
|-------------------|----------|------------|------|---------|---------|---------|-------|
| D= 1 DT=10.0 min | Total | Imp(%) = 7 | 1.00 | Dir. | Conn.(% |)= 14.0 | 0 |
| | | IMPERVIOU | IS | PERVIOU | S (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 COEFFICIEN | T = | 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.

| CALIB | | | | |
|----------------------|----------|--------------|---------------|--------------|
| STANDHYD (0026) | Area | (ha)= 0. | 48 | |
| ID= 1 DT=10.0 min | Total | Imp(%) = 50. | 00 Dir. Com | n.(%)= 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.(| m/hr)= | 186.56 | 118.94 | |
| over | (min) | 10.00 | 10.00 | |
| Storage Coeff. | (min)= | 1.41 (i | i) 8.00 (i: | i) |
| 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 COEFFICIE | ENT = | 0.99 | 0.40 | 0.48 |
| | | | | |
| **** WARNING: STORAG | E COEFF | . IS SMALLER | THAN TIME STE | P! |

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- (i) 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 | |
| | | | | |

| Mannings n | = | 0.013 | 0.250 | | |
|------------------|------------------|-----------------|-----------------|-------------|--|
| Max.Eff.Inten.(n | nm/hr)= (min) | 186.56 10.00 | 188.06 10.00 | | |
| Storage Coeff. | | 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 COEFFICIE | ENT = | 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 SWALLER 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 |

| D= | 1 D1=10.0 M111 | IOLAI | TIIID(4)= | 60.00 | DII. | COIIII. (%)= | 25.00 | | |
|----|------------------|----------|-----------|-------|---------|--------------|---------|-------|--|
| | | | | | | | | | |
| | | | IMPERVIO | US | PERVIOU | S (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.(n | m/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 | | | | |
| | | | | | | ** | COTALS* | | |
| | PEAK FLOW | (cms)= | 0.04 | | 0.04 | | 0.081 | (iii) | |
| | TIME TO PEAK | (hrs)= | 1.50 | | 1.50 | | 1.50 | | |
| | RUNOFF VOLUME | | | | | | 40.97 | | |
| | TOTAL RAINFALL | | | | | | 72.96 | | |
| | RUNOFF COEFFICIE | | | | 0.42 | | 0.56 | | |
| | | | 0.,, | | 0.12 | | | | |

**** 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 | 0032) | Area | (ha)= | 0.66 | | |

| 00000 | | 00001 | | (3) | 0 66 | | | | | |
|-------|----------|----------|----------|----------|--------|--------|-----------|---------|-------|--|
| | | 0032) | | (ha)= | | | | | | |
| ID= 1 | l DT=10. | 0 min | Total | Imp(%)= | 36.00 | Dir. | Conn.(%)= | 10.00 |) | |
| | | | | | | | | | | |
| | | | | IMPERVIO | DUS | PERVIO | JS (i) | | | |
| 5 | Surface | Area | (ha)= | 0.2 | 1 | 0.42 | 2 | | | |
| I | Dep. Sto | rage | (mm) = | 0.80 |) | 1.50 | D | | | |
| I | Average | Slope | (%)= | 1.00 |) | 2.00 | D | | | |
| I | Length | | (m)= | 66.3 | 3 | 40.00 | D | | | |
| N | Mannings | n | = | 0.01 | 3 | 0.250 | D | | | |
| | | | | | | | | | | |
| N | Max.Eff. | Inten.(r | nm/hr)= | 186.5 | 5 | 83.93 | 1 | | | |
| | | over | (min) | 10.00 |) | 10.00 | D | | | |
| ٤ | Storage | Coeff. | (min)= | 1.5 | 5 (ii) | 9.13 | 3 (ii) | | | |
| τ | Jnit Hyd | l. Tpeak | (min)= | 10.00 |) | 10.00 | 0 | | | |
| τ | Jnit Hyd | l. peak | (cms)= | 0.1 | 7 | 0.13 | 1 | | | |
| | - | - | | | | | * | TOTALS' | * | |
| I | PEAK FLO | W | (cms)= | 0.0 | 3 | 0.0 | 7 | 0.102 | (iii) | |
| 7 | TIME TO | PEAK | (hrs)= | 1.50 |) | 1.50 | D | 1.50 | | |
| | | | | 72.1 | | 25.50 | n | 30.16 | | |
| | | | | 72.9 | | | | 72.96 | | |
| | | OEFFICIE | . , | 0.99 | | 0.3 | | 0.41 | | |
| 1 | COLVOPP | OBLITCH | - III | 0.5 | , | 0.5. | , | 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: $\begin{array}{ccc} \text{CN*} & = 58.0 & \text{Ia} = \text{Dep. Storage} & (\text{Above}) \\ \text{(ii)} & \text{TIME STEP (DT)} & \text{SHOULD BE SMALLER OR EQUAL} \\ & & \text{THAN THE STORAGE COEFFICIENT.} \end{array}$
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| | IB NDHYD (0033) 1 DT=10.0 min | | | | Dim | Comm (%)- | . 12 00 | |
|-------|---|----------|----------|-------|---------|--------------|---------|-------|
| I TD= | I DI=IU.U MIII | IOLAI | IIID(4)= | 40.00 | DII. | COIIII. (%)= | 13.00 | J |
| | | | IMPERVIO | US | PERVIOU | IS (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.(m | m/hr)= | 186.56 | | 113.44 | | | |
| | | | 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 | | | |
| | | | | | | 1 | 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 |
|----------------------|-------|-------|-------|
| PUNCER COFFETCIENT - | 0.99 | 0.30 | 0.47 |

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

| CALIB | | | | | | | | |
|-------------------|----------|-------------|-------|---------|-----------------|--------|-------|--|
| STANDHYD (0034) | Area | (ha)= | 0.67 | | | | | |
| ID= 1 DT=10.0 min | | | | Dir | Conn.(%)= | 18 00 | 1 | |
| ID- I D1-10.0 MIN | IOCUI | Imp (0) = | 12.00 | DII. | COIIII. (8) - | 10.00 | , | |
| | | IMPERVIO | TTC | DEDUTOR | (c (i) | | | |
| | | | | | - , , | | | |
| Surface Area | | | | | | | | |
| Dep. Storage | (mm) = | 0.80 | | 1.50 |) | | | |
| Average Slope | (%)= | 1.00 | | 2.00 | l . | | | |
| Length | (m) = | 66.83 | | 40.00 | l | | | |
| Mannings n | = | 0.013 | | 0.250 | I | | | |
| . 3 | | | | | | | | |
| Max.Eff.Inten.(| mm/hr)= | 186.56 | | 84.70 | ı | | | |
| | | 10.00 | | | | | | |
| Storage Coeff. | | | | | | | | |
| | | | | | | | | |
| Unit Hyd. Tpeak | | | | | | | | |
| Unit Hyd. peak | (cms)= | 0.17 | | 0.11 | | | | |
| | | | | | *7 | OTALS' | ł . | |
| PEAK FLOW | (cms)= | 0.06 | | 0.06 | i | 0.125 | (iii) | |
| TIME TO PEAK | (hrs)= | 1.50 | | 1.50 | l . | 1.50 | | |
| RUNOFF VOLUME | (mm)= | 72.16 | | 25.59 | 1 | 33.97 | | |
| TOTAL RAINFALL | | | | 72.96 | | 72.96 | | |
| RUNOFF COEFFICE | . , | | | 0.35 | | 0.47 | | |
| RUNOFF COEFFICI. | PTAT = | 0.99 | | 0.35 | , | 0.4/ | | |
| | | | | | | | | |

**** 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.

| ı | | | | | | | | | |
|---|--------------------------|----------|----------|------|---------|-----------|---------|-------|--|
| | CALIB STANDHYD (0035) | | | | Dir. | Conn.(%)= | 11.00 |) | |
| ı | | | IMPERVIO | US | PERVIOU | S (i) | | | |
| ı | Surface Area | (ha)= | | | | | | | |
| ı | Dep. Storage | (mm) = | 0.80 | | 1.50 | | | | |
| ı | Average Slope | (%)= | 1.00 | | 2.00 | | | | |
| ı | Length | (m) = | 65.83 | | 40.00 | | | | |
| ı | Mannings n | = | 0.013 | | 0.250 | | | | |
| ı | Max.Eff.Inten.(| mm/hr)= | 186.56 | | 70.20 | | | | |
| ı | over | (min) | 10.00 | | 10.00 | | | | |
| ı | Storage Coeff. | (min)= | 1.55 | (ii) | 9.68 | (ii) | | | |
| ı | Unit Hyd. Tpeak | (min)= | 10.00 | | 10.00 | | | | |
| ı | Unit Hyd. peak | (cms)= | 0.17 | | 0.11 | | | | |
| ı | | | | | | | TOTALS* | | |
| ı | PEAK FLOW | | | | | | 0.096 | (iii) | |
| ı | TIME TO PEAK | | | | | | 1.50 | | |
| ı | RUNOFF VOLUME | | | | | | | | |
| ı | TOTAL RAINFALL | | | | | | 72.96 | | |
| ı | RUNOFF COEFFICE | ENT = | 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 | 2 | (1) | 0 51 | | | | |
|-------------------|---------|----------|-------|--------|-----------|--------|-------|
| STANDHYD (0062) | | | | | ~ (0) | 16.00 | |
| ID= 1 DT=10.0 min | Total | 1mp(%)= | 66.00 | Dir. | Conn.(%)= | 16.00 | |
| | | | | | | | |
| | | IMPERVIO | | | - , , | | |
| Surface Area | | | | | | | |
| Dep. Storage | | | | | | | |
| Average Slope | | | | | | | |
| Length | (m) = | 58.31 | | 40.00 | | | |
| Mannings n | = | 0.013 | | 0.250 | | | |
| | | | | | | | |
| Max.Eff.Inten.(n | m/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 | | | |
| | | | | | ** | OTALS* | |
| PEAK FLOW | (cms)= | 0.04 | | 0.08 | | 0.125 | (iii) |
| TIME TO PEAK | (hrs)= | 1.50 | | 1.50 | | 1.50 | |
| RUNOFF VOLUME | | | | | | | |
| TOTAL RAINFALL | | | | | | 72.96 | |
| RUNOFF COEFFICIE | | | | | | | |
| MONOIT COMPTECT | | 0.55 | | 0.13 | | 0.57 | |

- **** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA.
 - (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: = 58.0

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| STA | NDHYD (0064) 1 DT=10.0 min | | (ha)= Imp(%)= | | Dir. | Conn.(%)= | 23.00 | |
|-----|-----------------------------|-----------|------------------|------|---------|-----------|-------------|--|
| | | | TMPERVIO | OTIS | PERVIOU | S (i) | | |
| | Surface Area | (ha)= | 1.11 | | 0.91 | - , , | | |
| | Dep. Storage | | | | 16.50 | | | |
| | Average Slope | | | | 2.00 | | | |
| | Length | | 116.05 | | | | | |
| | Mannings n | (111) = | | | 0.250 | | | |
| | mainings ii | _ | 0.01. | , | 0.230 | | | |
| | Max.Eff.Inten.(n | m/hr)= | 186.56 | 5 | 88.81 | | | |
| | over | (min) | 10.00 |) | 10.00 | | | |
| | Storage Coeff. | (min)= | 2.18 | (ii) | 9.58 | (ii) | | |
| | Unit Hyd. Tpeak | | | | 10.00 | | | |
| | Unit Hyd. peak | | | | 0.11 | | | |
| | | | | | | *T | OTALS* | |
| | PEAK FLOW | (cms)= | 0.24 | Į. | 0.15 | | 0.385 (iii) | |
| | TIME TO PEAK | (hrs)= | 1.50 |) | 1.50 | | 1.50 | |
| | RUNOFF VOLUME | (mm) = | 71.96 | 5 | 23.47 | | 34.62 | |
| | TOTAL RAINFALL | | | | 72.96 | | 72.96 | |
| | RUNOFF COEFFICIE | NT = | 0.99 |) | 0.32 | | 0.47 | |
| | | | | | | | | |

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

| RESERVOIR(0076) | OVERFLOW | IS ON | | | |
|----------------------------------|----------|-------|-------|---------|---------|
| IN= 2> OUT= 1 DT= 5.0 min | OUTFLOW | STOR | - 1 | OUTFLOW | STORAGE |
| | (cms) | (ha. | | (cms) | (ha.m.) |
| | 0.0000 | 0.0 | 000 | 0.0600 | 0.0600 |
| | A | REA | 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 = 0.00 CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00 PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

| STA | LIB ANDHYD (0068) 1 DT=10.0 min | | (ha)= Imp(%)= | | Dir. | Conn.(%)= | 17.00 |) |
|-----|--|----------|------------------|------|---------|-----------|---------|-------|
| | | | IMPERVIO | US | PERVIOU | S (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.(r | | | | | | | |
| | | | 10.00 | | | | | |
| | Storage Coeff. | (min) = | 1.35 | (ii) | 8.56 | (ii) | | |
| | Unit Hyd. Tpeak | | | | | | | |
| | Unit Hyd. peak | (cms)= | 0.17 | | 0.12 | | | |
| | | | | | | * | TOTALS' | * |
| | PEAK FLOW | | | | 0.04 | | 0.078 | (iii) |
| | TIME TO PEAK | (hrs)= | 1.50 | | 1.50 | | 1.50 | |
| | RUNOFF VOLUME | (mm) = | 71.96 | | 26.72 | | 34.39 | |
| | | (mm) = | 72.96 | | 72.96 | | 72.96 | |
| | RUNOFF COEFFICIE | ENT = | 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.

| CALIB | 1 | | | | | | | | |
|-------------|----------|----------|----------|-------|----------|----------|--------|-------|--|
| STANDHYD | 0069) | Area | (ha)= | 0.86 | | | | | |
| ID= 1 DT=10 | 0.0 min | Total | Imp(%)= | 39.00 | Dir. C | onn.(%)= | 15.00 |) | |
| | | | | | | | | | |
| | | | IMPERVIO | US | PERVIOUS | (i) | | | |
| Surface | e Area | (ha)= | 0.34 | | 0.52 | | | | |
| Dep. St | orage | (mm) = | 1.00 | | 1.50 | | | | |
| Average | e Slope | (%)= | 1.00 | | 2.00 | | | | |
| Length | | (m) = | 75.72 | | | | | | |
| Manning | js n | = | 0.013 | | 0.250 | | | | |
| | | | | | | | | | |
| Max.Ef: | | . , | 186.56 | | | | | | |
| | | (min) | | | | | | | |
| | | | 1.68 | | | (ii) | | | |
| | d. Tpeak | | 10.00 | | 10.00 | | | | |
| Unit Hy | /d. peak | (cms)= | 0.17 | | 0.11 | | | | |
| | | | | | | | 'OTALS | | |
| PEAK FI | OM | (cms)= | 0.07 | | 0.08 | | 0.148 | (11i) | |
| | | | | | | | | | |

| HYMO MODEL | | | | | |
|--|--------------|----------------------------------|----------------|----------------|---------------|
| TIME TO DEAK (bre)- | | 1.50 | 1.50 | | 1.50 |
| RUNOFF VOLUME (mm)= | 7 | 1.96 | 25.35 | | 32.33 |
| TIME TO PEAK (hrs)= RUNOFF VOLUME (mm)= TOTAL RAINFALL (mm)= RUNOFF COEFFICIENT = | 72 | 2.96 0.99 | 72.96 0.35 | | 72.96 0.44 |
| ***** WARNING: STORAGE COEF ***** WARNING:FOR AREAS WIT YOU SHOULD CO | H IMPER | VIOUS RATI | OS BELOW | 20% | |
| (i) CN PROCEDURE SEL | | | | | |
| CN* = 58.0 | Ia = De | ep. Storag | e (Abov | e) | |
| (ii) TIME STEP (DT) S THAN THE STORAGE | COEFFIC | CIENT. | | | |
| (iii) PEAK FLOW DOES N | OT INCLU | JDE BASEFL | OW IF AN | Υ. | |
| | | | | | |
| 1 | | | | | |
| ADD HYD (0027) 1 + 2 = 3 | AREA | QPEAK | TPEAK | R.V. | |
| ID1= 1 (0023): + ID2= 2 (0025): | (ha) 0.59 | (cms) | (hrs) | (mm) | |
| + ID2= 2 (0025): | 0.52 | 0.138 | 1.50 | 43.67 | |
| ID = 3 (0027): | | | | | |
| NOTE: PEAK FLOWS DO N | OT INCL | UDE BASEFL | OWS IF A | NY. | |
| | | | | | |
| | | | | | |
| ADD HYD (0027) | AREA | QPEAK | TPEAK | R.V. | |
| ID1= 3 (0027): + ID2= 2 (0026): | (ha) | (cms) | (hrs) | (mm) | |
| + ID2= 2 (0026): | 0.48 | 0.093 | 1.50 | 35.05 | |
| ID = 1 (0027): | | | | | |
| | | | | | |
| NOTE: PEAK FLOWS DO N | | DASEFL | Al | | |
| | | | | | |
| ADD HYD (0027) | ADEX | 00527 | TDENE | D 17 | |
| ID1= 1 (0027): + ID2= 2 (0028): | (ha) | (cms) | (hrs) | (mm) | |
| ID1= 1 (0027): + ID2= 2 (0028): | 1.59 0.61 | 0.343 | 1.50 | 37.74 39.37 | |
| ======================================= | | | | | |
| ID = 3 (0027): | | | | | |
| NOTE: PEAK FLOWS DO N | | | | | |
| | | | | | |
| ADD 11MD / 00037\ | | | | | |
| 3 + 2 = 1 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. | |
| ADD HID (0027) 3 + 2 = 1 | 2.20 | 0.481 | 1.50 | 38.19 | |
| =============== | | | | 40.97 | |
| ID = 1 (0027): | 2.53 | 0.562 | 1.50 | 38.56 | |
| NOTE: PEAK FLOWS DO N | OT INCL | JDE BASEFL | OWS IF A | NY. | |
| | | | | | |
| ADD HYD (0027) | | | | | |
| 1 + 2 = 3 | AREA | QPEAK (cms) | TPEAK | R.V. | |
| ID1= 1 (0027): | 2 62 | 0 560 | 1 50 | 20 E6 | |
| + ID2= 2 (0032): | | 0.102 ======= | 1.50 | 30.16 | |
| ID = 3 (0027): | 3.19 | 0.664 | 1.50 | 36.82 | |
| NOTE: PEAK FLOWS DO N | OT INCL | JDE BASEFL | OWS IF A | NY. | |
| | | | | | |
| ADD HYD (0027) | | | | | |
| 3 + 2 = 1 | AREA | QPEAK | TPEAK | R.V. | |
| ID1= 3 (0027): | (ha) 3.19 | QPEAK (cms) 0.664 0.148 | (hrs) 1.50 | (mm) 36.82 | |
| + ID2= 2 (0033): | 0.80 | 0.148 | 1.50 | 34.20 | |
| ID = 1 (0027): | | 0.812 | | | |
| NOTE: PEAK FLOWS DO N | OT INCL | UDE BASEFL | OWS IF A | NY. | |
| | | | | | |
| The same of the sa | | | | | |
| ADD HYD (0027) | AREA | QPEAK | TPEAK | R.V. | |
| | (ha) 3 QQ | QPEAK (cms) 0.812 | (hrs) | (mm) | |
| ID1= 1 (0027): + ID2= 2 (0034): | 0.67 | 0.125 | 1.50 | 33.97 | |
| ID = 3 (0027): | | | | | |
| NOTE: PEAK FLOWS DO N | | | | | |
| MOIT. EDWK LDOM2 DO N | | DAGEFL | | | |
| | | | | | |
| ADD HYD (0027) | ADEA | ODENE | TDEAU | D 17 | |
| | (ha) | (cms) | (hrs) | (mm) | |
| ID1= 3 (0027): + ID2= 2 (0035): | 4.66 0.65 | QPEAK (cms) 0.937 0.096 | 1.50 1.50 | 35.96 29.12 | |
| ID = 1 (0027): | | | | | |
| | | | | | |
| NOTE: PEAK FLOWS DO N | | | | NY. | |
| | | | | | |

| | | | | | _ | | Visual | |
|--|---------------------|----------------------|-------------------------|--------------------------|------------------------|----------------|--------|--|
| ADD HYD (0027) 1 + 2 = 3 | | AREA | ODEAK | TDEAK | R V | | | |
| 1 + 2 = 3 ID1= 1 (00 + ID2= 2 (00 | 127): 162): | (ha) 5.31 0.51 | (cms) 1.033 0.125 | (hrs) 1.50 1.50 | (mm) 35.12 41.46 | | | |
| ID = 3 (00 | | | | | | | | |
| NOTE: PEAK FLO | OWS DO NO | T INCLU | DE BASEFL | OWS IF AN | Υ. | | | |
| | | | | | | | | |
| ADD HYD (0027) | | ADEA | ODEAN | TDEAU | D 17 | | | |
| 3 + 2 = 1 ID1= 3 (00 + ID2= 2 (00 | | (ha) | (cms) | (hrs) | (mm) | | | |
| + ID2= 2 (00 | 168): | 0.41 | 0.078 | 1.50 | 34.39 | | | |
| ID = 1 (00 | | | 1.236 | | 35.59 | | | |
| NOTE: PEAK FLO | OWS DO NO | T INCLU | DE BASEFL | OWS IF AN | Υ. | | | |
| | | | | | | | | |
| ADD HYD (0027) | | AREA | OPEAK | TPEAK | R.V. | | | |
| 1 + 2 = 3 ID1= 1 (00 + ID2= 2 (00 |)27): | (ha) 6.23 | (cms) 1.236 | (hrs) 1.50 | (mm) 35.59 | | | |
| + ID2= 2 (00 |)69): | 0.86 | 0.148 | 1.50 | 32.33 | | | |
| ID = 3 (00 | | | | | | | | |
| NOTE: PEAK FLO | OWS DO NO | T INCLU | DE BASEFL | OWS IF AN | Y. | | | |
| ADD HYD (0027) | | | | | | | | |
| 3 + 2 = 1 ID1= 3 (00 + ID2= 2 (00 | | AREA | QPEAK | TPEAK | R.V. | | | |
| ID1= 3 (00 |)27):)76): | 7.09 | 1.385 | 1.50 | 35.20 | | | |
| ID = 1 (00 | | | | | | | | |
| NOTE: PEAK FLO | | | | | | | | |
| | | | | | | | | |
| CALIB STANDHYD (0065) ID= 1 DT=10.0 min | Area | (ha) | = 0.49 | | | | | |
| ID= 1 DT=10.0 min | | | | | | 17.00 | | |
| Surface Area | (ha)= | 1MPER 0 | 1.13 | PERVIOUS 0.36 1.50 | (1) | | | |
| Surface Area Dep. Storage Average Slope Length Mannings n | (%)= (%)= | 1 | .00 | 2.00 | | | | |
| | | ٠. | 010 | 0.250 | | | | |
| Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | mm/hr)= | 186 | .56 | 56.04 20.00 | | | | |
| Storage Coeff. Unit Hyd. Tpeak | (min)= (min)= | 10 | .42 (ii) | 10.32 (| ii) | | | |
| | | | | 0.08 | ** | rotals* | | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME | (cms)= (hrs)= | 0 | .04 | 0.03 1.67 | | 0.059 1.50 | (iii) | |
| RUNOFF VOLUME TOTAL RAINFALL | (mm) = (mm) = | 71 72 | 96 96 | 21.77 72.96 | | 30.30 72.96 | | |
| RUNOFF COEFFICE | | | 1.99 | 0.30 | | 0.42 | | |
| **** WARNING: STORA *** WARNING: FOR AF | REAS WITH | IMPERV | IOUS RATI | OS BELOW | | | | |
| (i) CN PROCEI | | | | THE AREA. | | | | |
| | 58.0 | Ia = De | p. Storag | e (Above | | | | |
| THAN THE (iii) PEAK FLOW | | | | OW IF ANY | | | | |
| | | | | | | | | |
| CALTR | | (ha) | = 0.25 | | | | | |
| STANDHYD (0066) | Total | Imp(%) | = 49.00 | Dir. Co | nn.(%)= | 31.00 | | |
| Surface Area | (ha)= | IMPER 0 | VIOUS | PERVIOUS 0.13 | (i) | | | |
| Dep. Storage Average Slope | (mm) = (%) = | 1 1 | .00 | 1.50 2.00 | | | | |
| Surface Area Dep. Storage Average Slope Length Mannings n | (m) = = | 40 | 013 | 40.00 0.250 | | | | |
| | | | | | | | | |
| over Storage Coeff. | (min) (min)= | 10 | .00 .16 (ii) | 10.00 8.94 (| ii) | | | |
| Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (min) = (cms) = | 10 | .00).17 | 10.00 0.11 | | | | |
| PEAK FLOW | (cms)= | 0 | .04 | 0.02 | | O.059 | | |
| TIME TO PEAK RUNOFF VOLUME | (hrs)= (mm)= | 1 71 | 50 | 1.50 24.84 | | 1.50 39.44 | | |
| RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICE | (mm) = ENT = | 72 0 | 1.96 1.99 | 72.96 0.34 | | 72.96 0.54 | | |
| **** WARNING: STOR | | | | N TIME ST | EP! | | | |
| (i) CN PROCEI | | | | | | | | |
| (ii) TIME STEE | (DT) SH | OULD BE | SMALLER | ge (Above OR EQUAL |) | | | |
| THAN THE (iii) PEAK FLOW | | | | OW IF ANY | | | | |
| | | | | | | | | |

| ADD HYD (0067) 1 + 2 = 3 | AREA | QPEAK | TPEAK | R.V. | |
|---|---------------------|---|-----------------|---------------------|---------------------|
| 1 + 2 = 3 ID1= 1 (0065): + ID2= 2 (0066): | (ha) 0.49 | (cms) | (hrs) | (mm) 30.30 | |
| ======================================= | | | | | |
| ID = 3 (0067): | | | | | |
| NOTE: PEAK FLOWS DO | | | | | |
| DUHYD (0024) | | | | | |
| Inlet Cap.= 0.057 #of Inlets= 1 | ADEA | ODEAN | MDEAN | D 11 | |
| #of Inlets= 1 Total(cms)= 0.1 | (ha) | (cms) | (hrs) | (mm) | |
| | | | | | |
| MAJOR SYS.(ID= 2): MINOR SYS.(ID= 3): | | 0.06 | 1.50 | | |
| NOTE: PEAK FLOWS DO | NOT INCL | UDE BASEFI | LOWS IF AN | NY. | |
| | | | | | |
| ADD HYD (0031) | | | | | |
| ADD HYD (0031) 1 + 2 = 3 | AREA | QPEAK | TPEAK | R.V. | |
| ID1= 1 (0024): | 0.62 | 0.057 | 1.50 | 33.39 | |
| ======================================= | | | | | |
| ID = 3 (0031): | | | | | |
| NOTE: PEAK FLOWS DO | NOT INCL | UDE BASEFI | LOWS IF AN | VY. | |
| | | | | | |
| ADD HYD (0031) 3 + 2 = 1 | AREA | QPEAK | TPEAK | R.V. | |
| ID1= 3 (0031): + ID2= 2 (0071): | (ha) 9.73 | (cms) 1.458 | (hrs) 1.50 | (mm) 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 | | | | VY. | |
| RESERVOIR(0029) | OVERFLOW | IS ON | | | |
| IN= 2> OUT= 1 | OTTERT OW | STORAGE | l outi | FLOW | STORAGE |
| | (cms) 0.0000 | (ha.m.) 0.0000 0.0227 0.0491 0.0772 | (cr | ms) | (ha.m.) 0.2030 |
| | 0.0085 | 0.0227 | 0.1 | 1807 | 0.2551 |
| | 0.0130 0.0163 | 0.0491 | 0.3 | 3630 | 0.3117 0.3731 |
| | 0.0190 0.0512 | 0.1119 0.1553 | 0.4 | | 0.4393 0.0000 |
| | AR | EA QPE | EAK TI | | |
| INFLOW : ID= 2 (0031 | (h) 10. | a) (cn 435 1 | ns) (1 1.503 | 1.50 | (mm) 33.74 |
| INFLOW : ID= 2 (0031 OUTFLOW: ID= 1 (0029 OVERFLOW:ID= 3 (0003 |) 10. | 435 C | 0.131 0.000 | 3.18 | 32.46 0.00 |
| TOTAL 1 | NUMBER OF | SIMULATIO | ON OVERFLO | OW = | |
| | | OF OVERFI | | | .00 |
| | | EDUCTION [| | | |
| | | EAK FLOW E USED | | min)=101 .m.)= 0 | |
| | | | | | |
| CALIB | | | | | |
| STANDHYD (0063) Are | ea (ha tal Imp(% |) = 0.31) = 41.00 | Dir. Co | onn.(%)= | 0.00 |
| Surface Area (ha Dep. Storage (mm Average Slope (% Length (m Mannings n | IMPE | RVIOUS | PERVIOUS | (i) | |
| Surface Area (ha Dep. Storage (mm |) =) = | 0.13 1.00 | 0.18 1.50 | | |
| Average Slope (% |) = .) = . 4 | 1.00 | 2.00 | | |
| Mannings n | = 0 | .013 | 0.250 | | |
| Max.Eff.Inten.(mm/hr over (min Storage Coeff. (min Unit Hyd. Tpeak (min Unit Hyd. peak (cms |)= 18 | 6.56 | 115.99 | | |
| Storage Coeff. (min |)= . | 1.24 (ii) | 7.89 | (ii) | |
| Unit Hyd. Tpeak (min Unit Hyd. peak (cms | ,= 1)= | 0.17 | 10.00 0.12 | | momat of |
| | | | 0.04 1.50 | * | TOTALS* 0.043 (iii) |
| TIME TO PEAK (hrs RUNOFF VOLUME (mm |) =) = 7 | 1.50 1.96 | 28.77 | | 1.50 28.75 |
| PEAK FLOW (cms TIME TO PEAK (hrs RUNOFF VOLUME (mm TOTAL RAINFALL (mm RUNOFF COEFFICIENT |) = 7 = | 2.96 0.99 | 72.96 0.39 | | 72.96 0.39 |
| ***** WARNING: STORAGE CON ***** WARNING:FOR AREAS W. YOU SHOULD | EFF. IS S | MALLER THA | OS BELOW | 20% | |
| (i) CN PROCEDURE S | | | | | |
| CN* = 58.0 (ii) TIME STEP (DT) | Ia = D | ep. Storag | ge (Above | | |
| THAN THE STORAG | GE COEFFI | CIENT. | | , | |
| (iii) PEAK FLOW DOES | NOI INCL | UPE BASEFI | W IF AN | | |

$\frac{\textbf{21-173 Cottonwood Condominiums}}{\textbf{Visual OTTHYMO MODEL}}$

| ADD HYD (0037) | | | | | |
|--|--|--|--|---|--|
| 1 + 2 = 3 | AREA | QPEAK (cms) | TPEAK | R.V. | |
| | (ha) | (cms) | (hrs) | (mm) | |
| ID1= 1 (0024): + ID2= 2 (0029): | 0.12 | 0.061 | 1.50 | 33.39 | |
| + ID2= 2 (0029): | | | | | |
| ID = 3 (0037): | | | | | |
| NOTE: PEAK FLOWS DO | NOT INCL | JDE BASEFL | OWS IF AN | 1Υ. | |
| | | | | | |
| ADD HYD (0037) | | | | | |
| 3 + 2 = 1 | AREA | QPEAK | TPEAK | R.V. | |
| 3 + 2 = 1 | (na) | (cms) | (mrs) | (mm) | |
| + ID2= 2 (0037): | 0.56 | 0.131 | 3.18 | 12 22 | |
| + 1D2= 2 (0036). | | | | | |
| ID = 1 (0037): | | | | | |
| | | | | | |
| | | | | | |
| NOTE: PEAK FLOWS DO | NOT INCL | JDE BASEFL | OWS IF AN | TY. | |
| ADD HYD (0037) | AREA (ha) 10.65 0.31 | QPEAK (cms) 0.131 0.043 | TPEAK (hrs) 3.17 1.50 | R.V. (mm) 32.30 28.75 | |
| ADD HYD (0037) 1 + 2 = 3 ID1= 1 (0037): + ID2= 2 (0063): | AREA (ha) 10.65 0.31 | QPEAK (cms) 0.131 0.043 | TPEAK (hrs) 3.17 1.50 | R.V. (mm) 32.30 28.75 | |
| ADD HYD (0037) 1 + 2 = 3 TD1= 1 (0037): + ID2= 2 (0063): | AREA (ha) 10.65 0.31 | QPEAK (cms) 0.131 0.043 | TPEAK (hrs) 3.17 1.50 ==================================== | R.V. (mm) 32.30 28.75 ======= 32.20 | |
| ADD HYD (0037) 1 + 2 = 3 ID1= 1 (0037); + ID2= 2 (0063); ID = 3 (0037); | AREA (ha) 10.65 0.31 | QPEAK (cms) 0.131 0.043 | TPEAK (hrs) 3.17 1.50 ==================================== | R.V. (mm) 32.30 28.75 ======= 32.20 | |
| ADD HYD (0037) 1 + 2 = 3 ID1= 1 (0037); + ID2= 2 (0063); ID = 3 (0037); NOTE: PEAK FLOWS DO | AREA (ha) 10.65 0.31 10.96 | QPEAK (cms) 0.131 0.043 | TPEAK (hrs) 3.17 1.50 ======3.10 | R.V. (mm) 32.30 28.75 ====== 32.20 | |
| ADD HYD (0037) 1 + 2 = 3 IDl= 1 (0037); + ID2= 2 (0063); ID = 3 (0037); NOTE: PEAK FLOWS DO | AREA (ha) 10.65 0.31 10.96 | QPEAK (cms) 0.131 0.043 | TPEAK (hrs) 3.17 1.50 ======3.10 | R.V. (mm) 32.30 28.75 ====== 32.20 | |
| ADD HYD (0037) 1 + 2 = 3 | AREA (ha) 10.65 0.31 10.96 NOT INCL | QPEAK (cms) 0.131 0.043 0.134 JDE BASEFL QPEAK (cms) | TPEAK (hrs) 3.17 1.50 3.10 OWS IF AP | R.V. (mm) 32.30 28.75 ====== 32.20 | |
| ADD HYD (0037) 1 + 2 = 3 ID1= 1 (0037): + ID2= 2 (0063): | AREA (ha) 10.65 0.31 10.96 NOT INCL | QPEAK (cms) 0.131 0.043 0.134 UDE BASEFL QPEAK (cms) 0.134 | TPEAK (hrs) 3.17 1.50 3.10 OWS IF AN TPEAK (hrs) 3.10 | R.V. (mm) 32.30 28.75 ====== 32.20 IY | |
| ADD HYD (0037) 1 + 2 = 3 | AREA (ha) 10.65 0.31 10.96 NOT INCL | QPEAK (cms) 0.131 0.043 0.134 DDE BASEFL QPEAK (cms) 0.134 0.134 0.134 | TPEAK (hrs) 3.17 1.50 0WS IF At TPEAK (hrs) 3.10 1.67 1.67 | R.V. (mm) 32.30 28.75 32.20 IY. R.V. (mm) 23.20 12.61 | |

| 100-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 A L VV I SS U U 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 Developed and Distributed by Smart City Water Inc Copyright 2007 - 2021 Smart City Water Inc All rights reserved. | | | | | | | | | | |
| ***** DETAILED OUTPUT ***** | | | | | | | | | | |
| Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat Output filename: C:\Users\Natalie\AppData\Local\Civica\VH5\b59b925c-la86-4318- 8861-e38dc4dfd2f8\b5826d04-cd63-4e20-aaf0-9640373591dd\scen Summary filename: C:\Users\Natalie\AppData\Local\Civica\VH5\b59b925c-la86-4318- 8861-e38dc4dfd2f8\b5826d04-cd63-4e20-aaf0-9640373591dd\scen | | | | | | | | | | |
| DATE: 06/07/2022 TIME: 10:59:28 USER: | | | | | | | | | | |
| | | | | | | | | | | |
| COMMENTS: | | | | | | | | | | |
| ************************************** | | | | | | | | | | |
| | | | | | | | | | | |
| READ STORM Filename: C:\Users\Natalie\AppD ata\Local\Temp\ | | | | | | | | | | |
| Ptotal= 83.90 mm Comments: 100 YEAR CHICAGO 4 HOUR DESIGN STORM DIS | | | | | | | | | | |
| TIME RAIN 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 | | | | | | | | | | |
| 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 PINNOR VOLUME (mm)= 17.185 | | | | | | | | | | |
| 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 | | | | | | | | | | |
| 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. | | | | | | | | | | |

| MO | MODE | G . | | | | | | | | |
|----|------------------------------|------------|----------|------------|---------|----------|-------|------|--------|-------|
| | | | | | | | | | | |
| ST | LIB ANDHYD (1 DT=10.0 | 0023) | | | | | Conn. | (%)= | 16.00 | |
| | | | | IMPERVIO | פוזר | DEBATOR | (i) | | | |
| | Surface I | rea | | 0.28 | | | | | | |
| | Dep. Stor | age | (mm) = | 0.80 |) | 1.50 | | | | |
| | Average S | Slope | (%)= | 1.00 |) | 2.00 | | | | |
| | Average S Length | | (m)= | 62.72 | 2 | 40.00 | | | | |
| | Mannings | n | = | 0.01 | 3 | 0.250 | | | | |
| | Max.Eff.T | nten.(ı | mm/hr)= | 205.92 | 2 | 125.35 | | | | |
| | | over | (min) | 10.00 |) | 10.00 | | | | |
| | Storage C | oeff. | (min)= | 1.49 | (ii) | 7.89 | (ii) | | | |
| | Unit Hyd. | Tpeak | (min)= | 1.49 |) | 10.00 | | | | |
| | Unit Hyd. | peak | (cms)= | 0.17 | 7 | 0.12 | | | | |
| | - | - | | | | | | *T(| OTALS* | |
| | PEAK FLOW | ī | (cms)= | 0.09 | 5 | 0.08 | | (| 0.134 | (iii) |
| | TIME TO F | PEAK | (hrs)= | 1.50 |) | 1.50 | | | 1.50 | |
| | | | | 83.10 | | | | | | |
| | TOTAL RAI | NFALL | (mm) = | 83.90 |) | 83.90 | | | 83.90 | |
| | RUNOFF CO | DEFFICI | ENT = | 0.99 | 9 | 0.41 | | | 0.50 | |
| | * WARNING: * WARNING: | FOR AR | EAS WITH | | JS RATI | OS BELO | W 20% | | | |
| | | | | CTED FOR I | | | | | | |
| | | | | La = Dep. | | | | | | |
| | | | | OULD BE SI | | OR EQUA | L | | | |
| | | | | COEFFICIEN | | | | | | |
| | (111) PEA | AK H'I ()W | DUES NO | T TNCLUDE | BASEFI | VW IF. A | INY. | | | |

| CALIB STANDHYD (0025) | Area | (ha)= | 0.52 | | | | |
|-----------------------------|----------|----------|-------|----------|----------|-------------|--|
| ID= 1 DT=10.0 min | Total | Imp(%)= | 71.00 | Dir. C | onn.(%)= | 14.00 | |
| | | | | | | | |
| | | IMPERVIO | US | 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.(m | m/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 | | | |
| | | | | | *T | OTALS* | |
| 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 COEFFICIE | NT = | 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.

| CALIB STANDHYD (0026) | Area | (ha)= | 0.48 | | | | |
|---------------------------|----------|----------|------|---------|----------|---------|-------|
| D= 1 DT=10.0 min | | | | Dir. | Conn.(%) | = 14.00 |) |
| | | IMPERVIO | US I | PERVIOU | JS (i) | | |
| Surface Area | (ha)= | 0.24 | | 0.24 | | | |
| Dep. Storage | (mm) = | 0.80 | | 1.50 | 1 | | |
| Average Slope | (%)= | 1.00 | | 2.00 | 1 | | |
| Length | (m) = | 56.57 | | 40.00 | 1 | | |
| Mannings n | = | 0.013 | | 0.250 |) | | |
| Max.Eff.Inten.(r | mm/hr)= | 205.92 | | 143.86 | | | |
| over | (min) | 10.00 | | 10.00 | 1 | | |
| Storage Coeff. | (min) = | 1.36 | (ii) | 7.46 | (ii) | | |
| Unit Hyd. Tpeak | (min) = | 10.00 | | 10.00 | 1 | | |
| Unit Hyd. peak | (cms)= | 0.17 | | 0.13 | | | |
| | | | | | | *TOTALS | k |
| PEAK FLOW | (cms)= | 0.04 | | 0.07 | | 0.111 | (iii) |
| TIME TO PEAK | (hrs)= | 1.50 | | 1.50 | 1 | 1.50 | |
| RUNOFF VOLUME | (mm) = | 83.10 | | 36.29 | | 42.83 | |
| TOTAL RAINFALL | (mm) = | 83.90 | | 83.90 |) | 83.90 | |
| RUNOFF COEFFICIA | ENT = | 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.

| 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)= | 0.3 | 8 | 0.23 | |
| Dep. Storage | (mm) = | 0.8 | 0 | 1.50 | |
| Average Slope | (%)= | 1.0 | 0 | 2.00 | |
| Length | (m)= | 63.7 | 7 | 40.00 | |
| | | | | | |

| Mannings n | = | 0.013 | 0.250 | |
|-----------------|------------------|-----------------|-----------------|-------------|
| Max.Eff.Inten.(| mm/hr)= (min) | 205.92 10.00 | 225.29 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 COEFFICI | ENT = | 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.

| CALIB STANDHYD (0030) ID= 1 DT=10.0 min | | | | | Conn.(%)= | 25.00 |) |
|---|---------|----------|------|----------|-----------|---------|-------|
| | | IMPERVIO | IS | PERVIOUS | S (i) | | |
| Surface Area | (ha)= | | | | . (-) | | |
| Dep. Storage | | | | | | | |
| 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 | | | |
| | | 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 | | | |
| | | | | | | 'OTALS' | |
| PEAK FLOW | | | | | | 0.095 | (iii) |
| TIME TO PEAK | | | | | | 1.50 | |
| RUNOFF VOLUME | | | | | | 49.35 | |
| TOTAL RAINFALL | | | | | | | |
| RUNOFF COEFFICI | ENT = | 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.

| | - | | | | | | |
|-------------------|----------|----------|-------|-------|-----------|------------|---|
| CALIB | | | | | | | |
| STANDHYD (0032) | | | | | | | |
| ID= 1 DT=10.0 min | Total | Imp(%)= | 36.00 | Dir. | Conn.(%)= | 10.00 | |
| | - | | | | ~ | | |
| | | IMPERVIO | | | , | | |
| Surface Area | | | | | | | |
| Dep. Storage | | | | | | | |
| Average Slope | (%)= | 1.00 | | 2.00 | | | |
| Length | | 66.33 | | 40.00 | | | |
| Mannings n | = | 0.013 | | 0.250 | | | |
| | | | | | | | |
| Max.Eff.Inten. | | | | | | | |
| ove | r (min) | 10.00 | | 10.00 | | | |
| Storage Coeff. | (min)= | 1.50 | (ii) | 8.49 | (ii) | | |
| Unit Hyd. Tpea | k (min)= | 10.00 | | 10.00 | | | |
| Unit Hyd. peak | (cms)= | 0.17 | | 0.12 | | | |
| | | | | | *7 | OTALS* | |
| 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 COEFFIC | | | | 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: $\begin{array}{ccc} \text{CN*} & = 58.0 & \text{Ia} = \text{Dep. Storage} & (\text{Above}) \\ \text{(ii)} & \text{TIME STEP (DT)} & \text{SHOULD BE SMALLER OR EQUAL} \\ & & \text{THAN THE STORAGE COEFFICIENT.} \end{array}$
- (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. C | onn.(%)= | 13.00 | | |
| | | | | 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 | | | | |
| | | | | | *T | OTALS* | | |
| PEAK FLOW | (cms)= | 0.06 | | 0.12 | | 0.177 (| iii) | |
| TIME TO PEAK | | | | | | 1.50 | | |
| | | 83.10 | | 35.71 | | 41.87 | | |
| | | | | | | | | |

```
TOTAL RAINFALL (mm) = RUNOFF COEFFICIENT =
                                           0.99
                                                                                        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:

 CM* = 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 | | | | |
|---------------------------------|---------|-------------------------|-------|-----------|-----------|-------------|---|
| D= 1 DT=10.0 min | | | | | Conn.(%)= | 18.00 | |
| | | IMPERVIO | US | PERVIOUS | S (i) | | |
| Surface Area | (ha)= | 0.28 | 3 | 0.39 | | | |
| Dep. Storage | (mm) = | 0.80 |) | 1.50 | | | |
| Average Slope | (%)= | 1.00 |) | 2.00 | | | |
| Length | (m)= | 66.83 | 3 | 40.00 | | | |
| Mannings n | = | 0.013 | 3 | 0.250 | | | |
| Max.Eff.Inten.(m | m/hr)= | 205.92 | 2 | 103.12 | | | |
| over | (min) | 10.00 |) | 10.00 | | | |
| Storage Coeff. | (min)= | 1.50 | (ii) | 8.47 | (ii) | | |
| Unit Hyd. Tpeak | | | | | | | |
| Unit Hyd. peak | (cms)= | 0.17 | 7 | 0.12 | | | |
| | | | | | *T | OTALS* | |
| PEAK FLOW | (cms)= | 0.07 | , | 0.08 | | 0.148 (iii) |) |
| TIME TO PEAK | | | | | | | |
| RUNOFF VOLUME | (mm)= | 83.10 |) | 32.23 | | 41.38 | |
| TOTAL RAINFALL | (mm) = | 83.90 |) | 83.90 | | 83.90 | |
| RUNOFF COEFFICIE | NT = | 0.99 |) | 0.38 | | 0.49 | |
| *** WARNING: STORAG | E COEFF | . IS SMALI | ER TH | AN TIME S | STEP! | | |
| **** WARNING:FOR ARE YOU SHO | | IMPERVIOU SIDER SPLI | | | | | |

- 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 |
| | - | | | | |
| | | IMPERVIO | US PERVIO | US (i) | |
| Surface Area | (ha)= | 0.19 | 0.4 | 5 | |
| Dep. Storage | (mm) = | 0.80 | 1.5 | 0 | |
| Average Slope | (%)= | 1.00 | 2.0 | 0 | |
| Length | (m) = | 65.83 | 40.0 | 0 | |
| Mannings n | = | 0.013 | 0.25 | 0 | |
| | | | | | |
| Max.Eff.Inten. | (mm/hr)= | 205.92 | 85.7 | 6 | |
| ove: | r (min) | 10.00 | 10.0 | 0 | |
| Storage Coeff. | (min)= | 1.49 | (ii) 8.9 | 9 (ii) | |
| Unit Hyd. Tpeal | k (min)= | 10.00 | 10.0 | 0 | |
| Unit Hyd. peak | (cms)= | 0.17 | 0.1 | 1 | |
| | | | | *TOTAL | S* |
| PEAK FLOW | (cms)= | 0.04 | 0.0 | 8 0.11 | 6 (iii) |
| TIME TO PEAK | (hrs)= | 1.50 | 1.5 | 0 1.5 | 0 |
| RUNOFF VOLUME | (mm) = | 83.10 | 30.0 | 9 35.9 | 2 |
| TOTAL RAINFALL | (mm) = | 83.90 | 83.9 | 0 83.9 | 0 |
| RUNOFF COEFFIC | IENT = | 0.99 | 0.3 | 6 0.4 | 3 |
| | | | | | |

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

CALTR | CALID | STANDHYD (0062) | Area (ha)= 0.51 | ID= 1 DT=10.0 min | Total Imp(%)= 66.00 Dir. Conn.(%)= 16.00

| _ | 1 21 10:0 11111 | 10041 | 1 mp (0) | | DII. | .01111.(0) | 10.00 | |
|---|------------------|----------|------------|-----|----------|------------|----------|------|
| | | | IMPERVIOUS | | PERVIOUS | G (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.(r | nm/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 COEFFICIE | ENT = | 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.

| | |
|------|------|

| CALIB STANDHYD (0064) | Aros | (ha)= | 2 02 | | | | |
|--------------------------|----------|----------|------|---------|-----------|---------|-------|
| ID= 1 DT=10.0 min | | Imp(%)= | | | Conn.(%)= | 23.00 | |
| | | IMPERVIO | US | PERVIOU | S (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.(| | | | 113.24 | | | |
| | | 10.00 | | | | | |
| Storage Coeff. | | | | | (ii) | | |
| Unit Hyd. Tpeak | | | | 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 COEFFICI | ENT = | 0.99 | | 0.36 | | 0.51 | |
| | | | | | | | |

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

| RESERVOIR(0076) | OVERFLOW | IS ON | | | |
|---|----------------------------|--|-----------------------------|--|--|
| DT= 5.0 min | OUTFLOW (cms) 0.0000 | STORAGE (ha.m.) | OUTFLOW (cms) 0.0600 | STORAGE (ha.m.) 0.0600 | |
| <pre>INFLOW : ID= 2 (OUTFLOW: ID= 1 (OVERFLOW:ID= 3 (</pre> | (1 0064) 2. 0076) 2. | REA QPEAR (cms) 020 0.4 020 0.0 | (hrs) 60 1.50 52 2.33 | R.V. (mm) 42.43 42.30 0.00 | |

TOTAL NUMBER OF SIMULATION OVERFLOW = 0.00 CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00 PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

| STANDHYD (0068) ID= 1 DT=10.0 min | | | | Dir. | Conn.(%)= | 17.00 |) | |
|---|----------|----------|------|---------|-----------|---------|-------|--|
| | | | | | | | | |
| | | IMPERVIO | US | PERVIOU | S (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.(n | m/hr)= | 205.92 | | 115.33 | | | | |
| | | 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: | k . | |
| 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 COEFFICIE | ENT = | 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.

CALIB

| (111) 12111 12011 | DOLL III | I INCLODE DIE | DI DON 11 11111 | | |
|-------------------|----------|---------------|-----------------|--------------|-------|
| | | | | | |
| | | | | | |
| CALIB | | | | | |
| STANDHYD (0069) | Area | (ha)= 0. | 86 | | |
| ID= 1 DT=10.0 min | Total | Imp(%) = 39. | 00 Dir. Conr | 1.(%)= 15.00 | |
| | | | | | |
| | | IMPERVIOUS | PERVIOUS (i | 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.(r | | | | | |
| | | 10.00 | | | |
| Storage Coeff. | (min)= | 1.62 (i | i) 8.66 (ii | L) | |
| 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) |
| | | | | | |

| OMY | MODEL | | | | | |
|------|--|------------------------------|---------------------------------|------------------------|----------------|---------------|
| | | | | | | |
| | TIME TO PEAK RUNOFF VOLUME | (hrs)= (mm)= | 1.50 82.90 | 1.50 31.93 | | 1.50 39.57 |
| | TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI | (mm) = ENT = | 83.90 0.99 | 83.90 0.38 | | 83.90 0.47 |
| **** | * WARNING: STORA * WARNING:FOR AR | GE COEFF. IS | SMALLER T | HAN TIME S' | TEP! 20% | |
| | (i) CN PROCED | | | | | |
| | (ii) TIME STEP | | BE SMALLE | | ≘) | |
| | THAN THE (iii) PEAK FLOW | STORAGE COEF: DOES NOT IN | | FLOW IF AN | ſ. | |
| | | | | | | |
| | | | | | | |
| ADI | D HYD (0027) 1 + 2 = 3 | ARE. | A QPEAK | TPEAK | R.V. | |
| | ID1= 1 (00 + ID2= 2 (00 | 23): 0.5 |) (cms) 9 0.134 | (nrs) 1.50 | (mm) 42.33 | |
| | | | | | | |
| | ID = 3 (00 | | | | 47.22 | |
| | NOTE: PEAK FLO | WS DO NOT IN | BASE | FLOWS IF A | NY. | |
| | D HYD (0027) | | | | | |
| ADI | 3 + 2 = 1 | ARE. | A QPEAK | TPEAK | R.V. | |
| | ID1= 3 (00 + ID2= 2 (00 | (ha 27): 1.1 |) (cms) 1 0.297 | (hrs) 1.50 | (mm) 47.22 | |
| | + ID2= 2 (00 | 26): 0.4 | 8 0.111 | 1.50 | 42.83 | |
| | ID = 1 (00 | | | | | |
| | NOTE: PEAK FLO | | | | | |
| | | | | | | |
| ADI | D HYD (0027) 1 + 2 = 3 | ARE | V ODEVK | TDEAK | R V | |
| | ID1= 1 (00 + ID2= 2 (00 | ARE. (ha |) (cms) | (hrs) | (mm) | |
| | ID1= 1 (00 + ID2= 2 (00 | 27): 1.5 28): 0.6 | 9 0.408 1 0.165 | 1.50 1.50 | 45.89 47.85 | |
| | ID = 3 (00 | | 0.103 | | 46.43 | |
| | NOTE: PEAK FLO | | | | | |
| | | 20 NOT IN | BAGE | IF AI | | |
| ADI | D HYD (0027) | | | | | |
| | 3 + 2 = 1 | ARE. | A QPEAK | TPEAK | R.V. | |
| | ID1= 3 (00 + ID2= 2 (00 | 27): 2.2 | 0 0.573 | 1.50 | 46.43 | |
| | ======== | | | | | |
| | ID = 1 (00 NOTE: PEAK FLO | | | | | |
| | NOIE: PEAK FLO | MS DO NOT IN | BASE | LLOWS IF AI | ×1. | |
| | D HYD (0027) | | | | | |
| | 1 + 2 = 3 | | | TPEAK (hrs) | | |
| | ID1= 1 (00 + ID2= 2 (00 | 27): 2.5 | 3 0.668 | 1.50 | 46.82 | |
| | | | | | 37.21 | |
| | ID = 3 (00 | | 9 0.791 | | 44.83 | |
| | NOTE: PEAK FLO | | | | | |
| | | | | | | |
| | D HYD (0027) 3 + 2 = 1 | ARE. | A QPEAK | TPEAK | R.V. | |
| | ID1= 3 (00 + ID2= 2 (00 | (ha |) (cms) | (hrs) | (mm) | |
| | + ID2= 2 (00 | 33): 0.8 | 0 0.177 | 1.50 | 41.87 | |
| | ID = 1 (00 | | | | | |
| | NOTE: PEAK FLO | WS DO NOT IN | CLUDE BASE | FLOWS IF A | ΨY. | |
| | | | | | | |
| ADI | D HYD (0027) | TQL | A OPEAK | TDEAK | R V | |
| | TD1- 1 / 00 | (ha |) (cms) | (hrs) | (mm) | |
| | ID1= 1 (00 + ID2= 2 (00 | 27): 3.9 34): 0.6 | 0.969 7 0.148 | 1.50 | 44.23 | |
| | ID = 3 (00 | | 6 1.117 | | 43.82 | |
| | NOTE: PEAK FLO | | | FLOWS IF A | NY. | |
| | | | | | | |
| ADI | D HYD (0027) | | A 00000 | mpra.c | D ** | |
| | 3 + 2 = 1 | ARE. (ha | A QPEAK) (cms) | TPEAK (hrs) 1.50 | R.V. (mm) | |
| | ID1= 3 (00 + ID2= 2 (00 | 27): 4.6 35): 0.6 | 6 1.117 [°] 5 0.116 | 1.50 | 43.82 35.92 | |
| | ID = 1 (00 | | | | | |
| | NOTE: PEAK FLO | | | | | |
| | NULE: PEAK FLO | MUI TON OU GN | CLUDE BASE | LTOMS IF AI | .lv | |

| | | | | | _ | 1-173 Cott Visual |
|--|--|--|---|--|---------------|---------------------------------------|
| | | | | | | |
| ADD HYD (0027) 1 + 2 = 3 | | AREA | QPEAK | TPEAK | R.V. | |
| 1 + 2 = 3 ID1= 1 (00 + ID2= 2 (00 | | (ha) 5.31 | (cms) 1.233 | (hrs) 1.50 | (mm) 42.86 | |
| + ID2= 2 (00 | 162): | 0.51 | 0.149 | 1.50 | 50.20 | |
| ID = 3 (00 | | | | | | |
| NOTE: PEAK FLO | | | | | | |
| | | | | | | |
| ADD HYD (0027) | | AREA | OPEAK | TPEAK | R.V. | |
| | | (ha) | (cms) | (hrs) | R.V. (mm) | |
| 3 + 2 = 1 ID1= 3 (00 + ID2= 2 (00 | 127): | 0.41 | 0.093 | 1.50 | 43.50 | |
| ID = 1 (00 | | | | | | |
| | | | | | | |
| NOTE: PEAK FLO | OWS DO NO | T INCLU | JDE BASEFLO | JWS IF AN | Y. | |
| ADD HYD (0027) | | | | | | |
| 1 + 2 = 3 | | AREA | QPEAK | TPEAK | R.V. | |
| 1 + 2 = 3 ID1= 1 (00 + ID2= 2 (00 |)27): | (ha) 6.23 | (cms) 1.475 | (hrs) 1.50 | (mm) 43.40 | |
| + ID2= 2 (00 | 169): | 0.86 | 0.177 | 1.50 | 39.57 | |
| ID = 3 (00 | | | | | 42.93 | |
| NOTE: PEAK FLO | WS DO NO | T INCLU | JDE BASEFLO | OWS IF AN | Υ. | |
| | | | | | | |
| ADD HYD (0027) 3 + 2 = 1 | | | | | | |
| 3 + 2 = 1 | | AREA (ha) | QPEAK (cms) 1.652 | TPEAK (hrs) | R.V. (mm) | |
| ID1= 3 (00 + ID2= 2 (00 | 127): | 7.09 | 1.652 | 1.50 | 42.93 | |
| ========= | | ====== | | | | |
| ID = 1 (00 | 127): | 9.11 | 1.672 | 1.50 | 42.79 | |
| NOTE: PEAK FLO | WS DO NO | T INCLU | JDE BASEFLO | OWS IF AN | Υ. | |
| CALIB | - | | | | | |
| STANDHYD (0065) ID= 1 DT=10.0 min | Area | (ha) | = 0.49 | | | |
| D= 1 DT=10.0 min | Total | Imp(%) | = 26.00 | Dir. Co | nn.(%)= | 17.00 |
| | | IMPER | RVIOUS I | PERVIOUS | (i) | |
| Surface Area Dep. Storage | (ha)= (mm)= | 1 | 00 | 0.36 1.50 | | |
| Average Slope | (mm) = (%) = (m) = | 1 | .00 | 2.00 | | |
| Length Mannings n | (m)= | 0. | 013 | 40.00 0.250 | | |
| Max.Eff.Inten.(| mm/hr)= | 205 | 5.92 | 68.72 | | |
| Max.Eff.Inten.(over Storage Coeff. | (min) | 10 | 0.00 | 10.00 | | |
| Unit Hyd. Tpeak | | 10 |).00 37 (ii)).00 | 9.57 (: 10.00 | 11) | |
| Unit Hyd. peak | (cms)= | C | 1.17 | 0.11 | * | TOTALS* |
| PEAK FLOW | (cms)= | 0 | 0.05 | 0.05 | | 0.094 (iii) |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME | (hrs)= (mm)= | 82 | 50 2.90 | 1.50 27.65 | | 1.50 37.03 |
| TOTAL RAINFALL RUNOFF COEFFICI | (mm) = | 83 | 3.90).99 | 83.90 0.33 | | 83.90 0.44 |
| | | | | | | 0.44 |
| *** WARNING: STORA | REAS WITH | IMPERV | JOUS RATIO | OS BELOW : | | |
| | | | SPLITTING ' | | | |
| (i) CN PROCED CN* = | | | p. Storage | |) | |
| (ii) TIME STER THAN THE | | | | OR EQUAL | | |
| (iii) PEAK FLOW | | | | OW IF ANY | | |
| | | | | | | |
| CALIB | | | | | | |
| | Area | (ha) Imp(%) | = 0.25 | Dir. Co | nn.(%)= | 31.00 |
| STANDHYD (0066) D= 1 DT=10.0 min | Total | | | | | |
| | | IMPER | RVIOUS 1 | PERVIOUS | | |
| | | IMPEF | RVIOUS 1 | 0.13 | | |
| | | IMPER (1 | RVIOUS 1 0.12 00 00 | 0.13 1.50 2.00 | | |
| | | IMPEF (1 1 4(| RVIOUS 1 0.12 00 00 0.82 | 0.13 1.50 2.00 40.00 | | |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha) = (mm) = (%) = (m) = | 0 1 4 0. | 0.12 00 00 0.82 013 | 0.13 1.50 2.00 40.00 0.250 | | |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha) = (mm) = (%) = (m) = | 0 1 4 0. | 0.12 00 00 0.82 013 | 0.13 1.50 2.00 40.00 0.250 | | |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha) = (mm) = (%) = (m) = | 0 1 4 0. | 0.12 00 00 0.82 013 | 0.13 1.50 2.00 40.00 0.250 | ii) | |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha) = (mm) = (%) = (m) = | 0 1 4 0. | 0.12 00 00 0.82 013 | 0.13 1.50 2.00 40.00 0.250 | ii) | |
| Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (ha) = (mm) = (%) = (m) = = mm/hr) = (min) (min) = (min) = (cms) = | 205 10 10 205 10 | 0.12 00 00 0.82 013 6.92 0.00 12 (ii) | 0.13 1.50 2.00 40.00 0.250 95.57 10.00 8.30 (10.00 0.12 | | TOTALS* |
| Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (ha) = (mm) = (%) = (m) = = mm/hr) = (min) (min) = (min) = (cms) = | 205 10 10 205 10 | 0.12 00 00 0.82 013 6.92 0.00 12 (ii) | 0.13 1.50 2.00 40.00 0.250 95.57 10.00 8.30 (10.00 0.12 | | 0.069 (iii) 1.50 |
| Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (ha) = (mm) = (%) = (m) = = mm/hr) = (min) (min) = (min) = (cms) = | 205 10 10 205 10 | 0.12 00 00 0.82 013 6.92 0.00 12 (ii) | 0.13 1.50 2.00 40.00 0.250 95.57 10.00 8.30 (10.00 0.12 | | 0.069 (iii) 1.50 47.31 |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha) = (mm) = (%) = (m) = = mm/hr) = (min) (min) = (min) = (cms) = | 205 10 10 205 10 | 0.12 00 00 0.82 013 6.92 0.00 12 (ii) | 0.13 1.50 2.00 40.00 0.250 95.57 10.00 8.30 (10.00 0.12 | | 0.069 (iii) 1.50 |
| Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICE | (ha) = (mm) = (%) = = mm/hr) = : (min) = (min) = (cms) = (hrs) = (mm) = (mm) = (cmr) = (mm) = (cmr) = (mm) = (cmr) = (| 205 10 11 10 (0 (1 12 82 83 | 0.12 00 00 82 013 92 00 12 (ii) 00 17 00 17 | 0.13 1.50 2.00 40.00 0.250 95.57 10.00 8.30 (10.00 0.12 0.02 1.50 31.34 83.90 0.37 | * | 0.069 (iii) 1.50 47.31 83.90 |
| Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI | (ha) = (mm) = (%) | (0) 10 (0 | 1.12 00 00 82 013 92 00 12 (ii) 00 0.17 0.04 50 90 8.90 | 0.13 1.50 2.00 40.00 0.250 95.57 10.00 8.30 10.00 0.12 0.02 1.50 31.34 83.90 0.37 | * | 0.069 (iii) 1.50 47.31 83.90 |
| Max.Eff.Inten.(over Storage Coeff., Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI **** WARNING: STORA (i) CN PROCEE CN* = | (ha) = (mm) = (%) = (m) = = (min) (min) = (cms) = (cms) = (hrs) = (mm) = | () () () () () () () () () () | 0.12 00 00 00 82 013 5.02 00 12 (ii) 00 17 0.04 50 90 99 MALLER THAI | 0.13 1.50 2.00 40.00 0.250 95.57 10.00 8.30 (.10.00 0.12 0.02 1.50 31.34 83.90 0.37 | EP! | 0.069 (iii) 1.50 47.31 83.90 |
| Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. Peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICE **** WARNING: STORA | (ha) = (mm) = (%) = (m) = = (min) (min) = (min) = (min) = (ms) = (ms) = (mm) = | 205 10 205 10 11 10 (1 82 83 83 . IS SM CTED FC | 1.12 00 00 82 00 12 00 12 (ii) 00 17 04 50 90 90 99 99 | 0.13 1.50 2.00 40.00 0.250 95.57 10.00 8.30 (.10.00 0.12 0.02 1.50 31.34 83.90 0.37 | EP! | 0.069 (iii) 1.50 47.31 83.90 |

| ADD HYD (0067 | v I | | | | | |
|--|------------------|---------------------------|---------------------|------------------------------|---------------------|--------------------------------|
| ID1= 1 (+ ID2= 2 (| - | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) | |
| ID1= 1 (+ ID2= 2 (| 0065): 0066): | 0.49 | 0.094 | 1.50 | 37.03 47.31 | |
| ID = 3 (| | | | | | |
| NOTE: PEAK F | | | | | | |
| NOIB FEAR F | | | | | | |
| DUHYD (0024 | | | | | | |
| Inlet Cap.= 0.05 #of Inlets= Total(cms)= 0. | 1 İ | | | | | |
| TOTAL HYD.(ID | | (ha) | (cms) | TPEAK (hrs) | R.V. (mm) | |
| ========= | | | | | | |
| MAJOR SYS.(ID MINOR SYS.(ID | = 2): = 3): | 0.18 0.56 | 0.11 | 1.50 1.50 | 40.50 40.50 | |
| NOTE: PEAK F | LOWS DO | NOT INCLU | JDE BASEFI | LOWS IF AN | NY. | |
| | | | | | | |
| | | | | | | |
| ADD HYD (0031 1 + 2 = 3 |) | AREA | OPEAK | TPEAK | R.V. | |
| TD1= 1 (| 0024): | (ha) 0.56 | (cms) | TPEAK (hrs) 1.50 | (mm) | |
| + ID2= 2 (| 0027): | 9.11 | 1.672 | 1.50 | 42.79 | |
| ID = 3 (| | | | | | |
| NOTE: PEAK F | LOWS DO | NOT INCLU | JDE BASEFI | LOWS IF AN | NY. | |
| | | | | | | |
| ו מעם מתא (מעז |) | | 00000 | mpn | B | |
| ID1= 3 (+ ID2= 2 (| | (ha) | (cms) | (hrs) | R.V. (mm) | |
| ID1= 3 (+ ID2= 2 (| 0031): 0071): | 9.67 0.71 | 0.056 | 1.50 | 42.66 22.52 | |
| ID = 1 (| | | | | 41.28 | |
| NOTE: PEAK F | LOWS DO | NOT INCLU | JDE BASEFI | LOWS IF AM | TY. | |
| | | | | | | |
| RESERVOIR(0029 IN= 2> OUT= 1 DT= 1.0 min |) (| OVERFLOW 1 | | | | |
| DT= 1.0 min | | OUTFLOW (cms) | STORAGE (ha.m.) | OUTF (cm 0.1 0.1 0.2 0.3 0.4 | FLOW ns) | STORAGE (ha.m.) |
| | | (cms) 0.0000 0.0085 | 0.0000 0.0227 | 0.1 | L080 L807 | 0.2030 0.2551 |
| | | 0.0130 0.0163 | 0.0491 0.0772 | 0.2 | 2663 3630 | 0.3117 0.3731 |
| | | 0.0190 0.0512 | 0.1119 0.1553 | 0.4 | 1697 0000 | 0.4393 0.0000 |
| | | ARI | EA QPI | EAK TI | PEAK | R.V. |
| INFLOW : ID= 2 | (0031) | (ha 10.3 | a) (cr 378 : | ns) (1 L.785 | nrs) 1.50 | (mm) 41.28 |
| <pre>INFLOW : ID= 2 OUTFLOW: ID= 1 OVERFLOW:ID= 3</pre> | (0029) | 0.0 | 378 (| 0.179 0.000 | 2.90 | 39.88 0.00 |
| | | | | ON OVERFLO | | |
| | | | | LOW (HOUR | | |
| | | | | [Qout/Qin] | | |
| | TIME SE | HIFT OF PI | EAK FLOW E USED | (r | nin)= 84 .m.)= 0 | .00 |
| | | | | | | |
| CALIB | 1 | | | | | |
| STANDHYD (0063 |) Are | ea (ha) |)= 0.31)= 41.00 | Dir. Co | onn.(%)= | 0.00 |
| | | TMPE | RVTOUS | PERVIOUS | | |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha) |) = () = | 0.13 | 0.18 | , , | |
| Average Slope | (%) |) = 1) = 4! | L.00 | 2.00 40.00 | | |
| | | | | 0.250 | | |
| Max.Eff.Inten ov Storage Coeff Unit Hyd. Tpe Unit Hyd. pea | .(mm/hr |)= 205 | 5.92 | 140.36 | | |
| Storage Coeff | . (min |)= 1 | L.19 (ii) | 7.36 | (ii) | |
| Unit Hyd. pea | k (cms) |)= (| 0.17 | 0.13 | | momat at |
| PEAK FLOW | (cms |)= (| 0.00 | 0.05 | - | TOTALS* 0.054 (iii) 1.50 |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFAL PUNCEE COFFEE | (mm) |)= 82 | 2.90 | 35.98 | | 35.97 |
| TOTAL RAINFAL RUNOFF COEFFI | L (mm) CIENT | ;= 83 = (| 3.90 0.99 | 83.90 0.43 | | 83.90 0.43 |
| **** WARNING: STO **** WARNING: FOR YOU | AREAS W | TH IMPERV | JIOUS RAT | | 20% | |
| (i) CN PROC | | | | | | |
| | 58.0 | Ia = De | ep. Storag | ge (Above | | |
| | E STORAG | GE COEFFIC | CIENT. | | <i>t</i> . | |
| ,, | 020 | 111011 | | | - | |

$\frac{\textbf{21-173 Cottonwood Condominiums}}{\textbf{Visual OTTHYMO MODEL}}$

| ADD HYD (003' | | | | | | |
|--|--|--|--|--|--|--|
| | | | | | | |
| 1 + 2 = 3 | | AREA | QPEAK (cms) | (beak | R.V. | |
| | | | | | | |
| ID1= 1 (+ ID2= 2 (| 0024): | 10.18 | 0.100 | 2.90 | 39 88 | |
| ======== | | | | | | |
| ID = 3 (| | | | | | |
| | | | | | | |
| NOTE: PEAK I | FLOWS DO N | NOT INCLU | JDE BASEFL | OWS IF AN | IY. | |
| | | | | | | |
| | | | | | | |
| ADD HYD (003' | 7\ | | | | | |
| 3 + 2 = 1 | | AREA | OPEAK | TDEAK | R V | |
| | | (ha) | QPEAK (cms) | (hrs) | (mm) | |
| ID1= 3 (| 0037): | | | | | |
| + ID2= 2 (| | | | | | |
| ======== | | | | | | |
| ID = 1 (| | | | | | |
| | | | | | | |
| NOTE: PEAK I | FLOWS DO N | NOT INCLU | JDE BASEFL | OWS IF AN | IY. | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | 7) | | | | | |
| ADD HYD (003' | | 2002 | ODEAN | TDEAK | D 17 | |
| 1 + 2 = 3 | i i | AREA | QPEAK | TPEAK | R.V. | |
| 1 + 2 = 3 | | (ha) | (cms) | (hrs) | (mm) | |
| 1 + 2 = 3 ID1= 1 (| 0037): | (ha) 10.65 | (cms) | (hrs) 2.88 | (mm) 39.69 | |
| 1 + 2 = 3 ID1= 1 (+ ID2= 2 (| 0037): 0063): | (ha) 10.65 0.31 | (cms) 0.180 0.054 | (hrs) 2.88 1.50 | (mm) 39.69 35.97 | |
| 1 + 2 = 3 ID1= 1 (+ ID2= 2 (| 0037): 0063): | (ha) 10.65 0.31 | (cms) 0.180 0.054 | (hrs) 2.88 1.50 | (mm) 39.69 35.97 | |
| 1 + 2 = 3 ID1= 1 (+ ID2= 2 (| 0037): 0063): | (ha) 10.65 0.31 | (cms) 0.180 0.054 | (hrs) 2.88 1.50 | (mm) 39.69 35.97 | |
| 1 + 2 = 3 ID1= 1 (+ ID2= 2 (======== ID = 3 (| 0037): 0063): =========== | (ha) 10.65 0.31 10.96 | (cms) 0.180 0.054 ======= 0.185 | (hrs) 2.88 1.50 ======= 2.80 | (mm) 39.69 35.97 ===== 39.59 | |
| 1 + 2 = 3 ID1= 1 (+ ID2= 2 (| 0037): 0063): =========== | (ha) 10.65 0.31 10.96 | (cms) 0.180 0.054 ======= 0.185 | (hrs) 2.88 1.50 ======= 2.80 | (mm) 39.69 35.97 ===== 39.59 | |
| 1 + 2 = 3 ID1= 1 (+ ID2= 2 (======== ID = 3 (| 0037): 0063): =========== | (ha) 10.65 0.31 10.96 | (cms) 0.180 0.054 ======= 0.185 | (hrs) 2.88 1.50 ======= 2.80 | (mm) 39.69 35.97 ===== 39.59 | |
| 1 + 2 = 3 ID1= 1 (+ ID2= 2 (======== ID = 3 (| 0037): 0063): ======= 0037): FLOWS DO N | (ha) 10.65 0.31 10.96 | (cms) 0.180 0.054 ======= 0.185 | (hrs) 2.88 1.50 ======= 2.80 | (mm) 39.69 35.97 ===== 39.59 | |
| 1 + 2 = 3 ID1= 1 (+ ID2= 2 (======= ID = 3 (NOTE: PEAK 1 | 0037): 0063): ======== 0037): FLOWS DO N | (ha) 10.65 0.31 10.96 | (cms) 0.180 0.054 ======= 0.185 | (hrs) 2.88 1.50 ======= 2.80 | (mm) 39.69 35.97 ===== 39.59 | |
| 1 + 2 = 3 ID1= 1 (+ ID2= 2 (======== ID = 3 (NOTE: PEAK 1 | 0037): 0063): 0063): 0037): FLOWS DO N | (ha) 10.65 0.31 ======= 10.96 | (cms) 0.180 0.054 ======= 0.185 | (hrs) 2.88 1.50 ======== 2.80 OWS IF AP | (mm) 39.69 35.97 ====== 39.59 | |
| 1 + 2 = 3 ID1= 1 (+ ID2= 2 (================================= | 0037): 0063): ======== 0037): FLOWS DO 1 | (ha) 10.65 0.31 10.96 | (cms) 0.180 0.054 0.185 JDE BASEFL | (hrs) 2.88 1.50 2.80 OWS IF AR | (mm) 39.69 35.97 39.59 MY. | |
| 1 + 2 = 3 ID1= 1 (+ ID2= 2 (================================= | 0037): 0063): 0063): | (ha) 10.65 0.31 | (cms) 0.180 0.054 0.185 JDE BASEFL QPEAK (cms) 0.185 | (hrs) 2.88 1.50 2.80 OWS IF AN TPEAK (hrs) 2.80 | (mm) 39.69 35.97 39.59 NY. R.V. (mm) 39.59 | |
| 1 + 2 = 3 ID1= 1 (+ ID2= 2 (================================= | 0037): 0063): 0063): | (ha) 10.65 0.31 | (cms) 0.180 0.054 0.185 JDE BASEFL QPEAK (cms) 0.185 | (hrs) 2.88 1.50 2.80 OWS IF AN TPEAK (hrs) 2.80 | (mm) 39.69 35.97 39.59 NY. R.V. (mm) 39.59 | |
| 1 + 2 = 3 ID1= 1 (+ ID2= 2 (================================= | 0037): 0063): 0063): 0037): FLOWS DO 1 | (ha) 10.65 0.31 10.96 NOT INCLU AREA (ha) 10.96 1.74 | (cms) 0.180 0.054 0.185 JDE BASEFL QPEAK (cms) 0.185 0.092 | (hrs) 2.88 1.50 2.80 OWS IF AN TPEAK (hrs) 2.80 1.67 | (mm) 39.69 35.97 ====== 39.59 NY. R.V. (mm) 39.59 17.19 | |
| 1 + 2 = 3 ID1= 1 (+ ID2= 2 (================================= | 0037): 0063): | (ha) 10.65 0.31 10.96 NOT INCLU AREA (ha) 10.96 | (cms) 0.180 0.054 0.185 JDE BASEFL QPEAK (cms) 0.185 0.185 0.092 | (hrs) 2.88 1.50 2.80 OWS IF AP TPEAK (hrs) 2.80 1.67 | (mm) 39.69 35.97 ====== 39.59 NY. R.V. (mm) 39.59 17.19 | |
| 1 + 2 = 3 ID1= 1 (+ ID2= 2 (================================= | 0037): 0063): | (ha) 10.65 0.31 10.96 NOT INCLU AREA (ha) 10.96 | (cms) 0.180 0.054 0.185 JDE BASEFL QPEAK (cms) 0.185 0.185 0.092 | (hrs) 2.88 1.50 2.80 OWS IF AP TPEAK (hrs) 2.80 1.67 | (mm) 39.69 35.97 ====== 39.59 NY. R.V. (mm) 39.59 17.19 | |

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



Subject: Cottonwood Towns

Date: 5/12/2022 By:

Project #: 21-173

Page

N.B.N 1

Maximum Daily Demand

30 units **Total Number of Units**

Zoning of Land Residential

Equiv. Population Density 2.75 ppl/unit

Equiv. Population 83

Av. Daily Demand Per Capita 0.45 m³/capita/day

Maximum Daily Demand Peaking Factor 2.25

84.04 m³/day Maximum Daily Demand

0.97 l/s

83

Maximum Hourly Demand

Total Number of Units 30 units

Zoning of Land Residential

Equiv. Population Density 2.75 ppl/ha

Equiv. Population

0.45 m³/capita/day Av. Daily Demand Per Capita Maximum Hourly Demand Peaking Factor

Maximum Hourly Demand 6.23 m³/hour

1.73 l/s

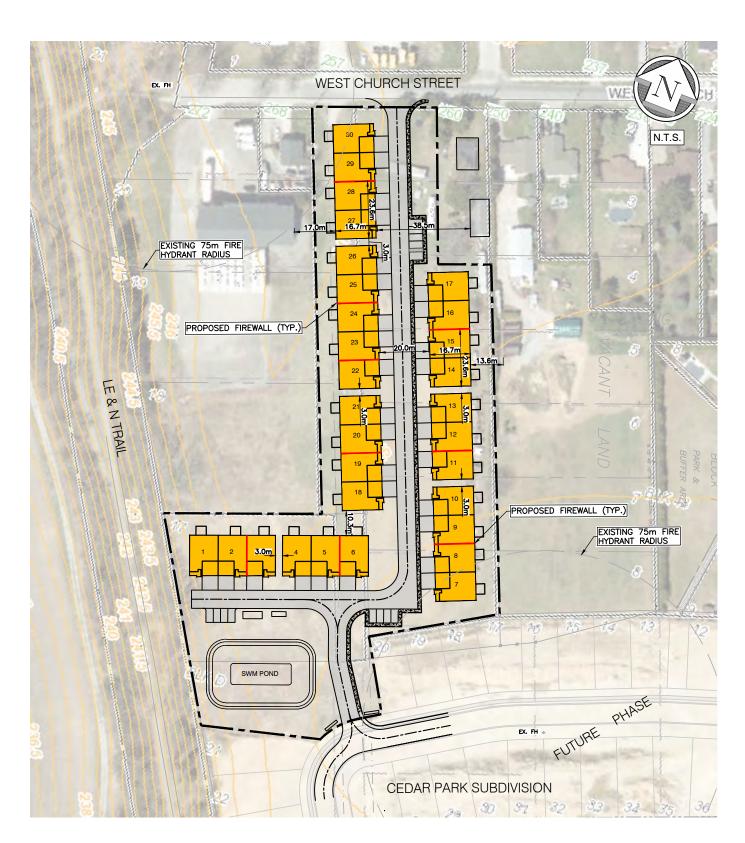


FIG 3 - FIRE DISTANCES



Subject: Cottonwood Condo's

 Date:
 8/9/2022
 By:
 NLB

 Project #:
 21-173
 Page:
 1

UNITS 14-15

1) <u>Fire Flow Requirement</u>

 $F_1 = 220C(A^{1/2})$ (L/min)

C= 1.5 Construction coefficient for wood frame construction

A= 394.1 Total Floor Area m² = main floor area (no second storey)

= 394.1 Fire Area m²

F₁= 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)

F₂= 5250 L/min

3) <u>Sprinkler System</u>

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

| <u>Location</u> | <u>Direction</u> | Distance (m) | <u>Surcharge</u> | Separation S | urcharges |
|-----------------|------------------|--------------|------------------|--------------|-----------|
| Front | West | 20.0 | 15% | 0 to 3m | 25% |
| Side | North | 9999 | 0% | 3.1m to 10n | n 20% |
| Side | South | 3.0 | 25% | 10.1m to 20 | m 15% |
| Rear | East | 13.6 | 15% | 20.1 to 30m | 10% |
| | | Total: | 55% | 30.1 to 45m | 5% |

F4=(TOTAL)*F2 (L/min)

F₄= 2888 L/min

Total Fire Flow

| | = | 133.3 L/s | (Round to the hearest 1,000 lymin) |
|-----------------|---|------------|------------------------------------|
| | = | 8000 L/min | (Round to the nearest 1,000 I/min) |
| $F=F_2-F_3+F_4$ | = | 8138 L/min | |

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



Subject: Cottonwood Condo's

Date: 8/9/2022 By: ________ Project #: 21-173 Page:

NLB

2

UNITS 27-28

1) <u>Fire Flow Requirement</u>

 $F_1 = 220C(A^{1/2})$ (L/min)

C= 1.5 Construction coefficient for wood frame construction

A= 394.1 Total Floor Area m² = main floor area (no second storey)

= 394.1 Fire Area m²

F₁= 6551 L/min

 F_1 = 7000 L/min (Round to the nearest 1,000 l/min)

2) <u>Occupancy</u>

Occupancy Type: Residential Non-Combustible

Reduction: 25% Surcharge: 0%

 $F_2=F_1+(F_1*Reduction/Surcharge)$ (L/min)

F₂= 5250 L/min

3) <u>Sprinkler System</u>

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

| <u>Location</u> | <u>Direction</u> | Distance (m) | <u>Surcharge</u> | Separation | Surcharges |
|-----------------|------------------|--------------|------------------|------------|------------|
| Front | East | 38.5 | 5% | 0 to 3m | 25% |
| Side | North | 9999 | 0% | 3.1m to 10 |)m 20% |
| Side | South | 3.0 | 25% | 10.1m to 2 | 20m 15% |
| Rear | West | 17 | 15% | 20.1 to 30 | m 10% |
| | | Total: | 45% | 30.1 to 45 | m 5% |

F4=(TOTAL)*F2 (L/min) F_4 = 2363 L/min

Total Fire Flow

| | = | 133.3 L/s | |
|-----------------|---|------------|------------------------------------|
| | = | 8000 L/min | (Round to the nearest 1,000 l/min) |
| $F=F_2-F_3+F_4$ | = | 7613 L/min | _ |

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



Subject: Cottonwood Condo's

8/9/2022 Date:

Project #: 21-173

NLB Bv: Page:

J

J

J

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 Firewalls/Sprinkler: Project Location: Waterford, ON

Conditions not requiring On-Site Fire Protection:

Building area is Less than 200 m² 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:

 $|S_{Tot} = 1.0 + [(S_{Side1}) + (S_{Side2}) + (S_{Side3}) + ... etc.]$

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**

Determining Building Volume:

Average Length (m) 23.6 Average Width (m) 16.7 11.0

Height, including basements (m)

Building Volume (m3)

4335

23

Total Spatial Coefficient:

Exposure Distance (m) Factor

North Side Firewall 0 East Side 0 >10 South Side 3 0.7 West Side >10 O

S_{Tot} Factor

1.7

Minimum Water Supply Flow:

5400 L/min **Minimum Water Supply Flow Rate OBC:** 90.0 L/sec

169,511 Q (L) Table 2: Required Minimum Water Supply Flow

Minimum Water Supply Flow Rates **Building Code**, Part 3 Buildings Rate (L/min.) One-storey building with building area not exceeding 600m2 (excluding F-1 occupancies) All other buildings 2700 (If Q \le 108,000L)(1) $3600 (If Q > 108,000L and \le 135,000L)^{(1)}$ 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 O > 270,000L)(1) Note: (1) Q=KVS_{Tot} as referenced in Section 3(a)



Subject: Cottonwood Condo's

8/9/2022 Date:

Project #: 21-173 NLB

Bv:

J

J

J

23

4335

1.7

169,511

Page:

ON-SITE FIRE PROTECTION SUPPLY CALCULATION

Per Fire Protection Water Supply Guideline, Ontario Building Code Division 3, Part B, 3.2.5.7

Firewalls/Sprinkler: Project Location: Waterford, ON

21-173 Cottonwood Condos

Conditions not requiring On-Site Fire Protection:

Building area is Less than 200 m² or Less

Building height is 2 Storeys or Less

Project:

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:

Building/Block #:

Units 27-28

 $|S_{Tot} = 1.0 + [(S_{Side1}) + (S_{Side2}) + (S_{Side3}) + ... etc.]$

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**

Determining Building Volume:

Average Length (m) 23.6 Average Width (m) 16.7

Height, including basements (m) 11.0

Total Spatial Coefficient:

Exposure Distance (m) Factor North Side Firewall 0 East Side 0 >10 South Side 3 0.7 O

West Side >10

S_{Tot} Factor

Minimum Water Supply Flow:

5400 L/min **Minimum Water Supply Flow Rate OBC:** 90.0 L/sec

Table 2: Minimum Water Supply Flow Rates **Building Code**, Required Minimum Water Supply Flow Part 3 Buildings Rate (L/min.) One-storey building with building area not exceeding 600m2 (excluding F-1 occupancies) All other buildings 2700 (If Q \le 108,000L)(1) $3600 (If Q > 108,000L and \le 135,000L)^{(1)}$ 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 O > 270,000L)(1)

Q (L)

Note: (1) Q=KVS_{Tot} as referenced in Section 3(a)

Building Volume (m3)

Ontario Building Code Tables and Figures

XX

Table 3.1.2.1. Major Occupancy Classification

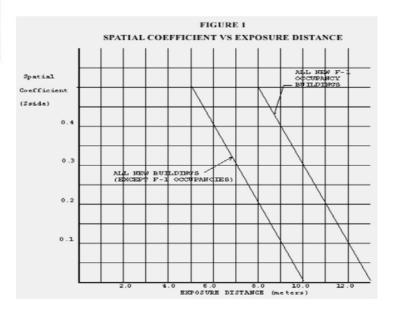
Forming Part of Sentences 3.1.2.1.(1), 3.1.2.2.(1) and 3.11.2.1.(3)

| Item | Column 1 | Column 2 | Column 3 |
|------|----------|----------|---|
| | Group | Division | Description of Major Occupancies |
| 1. | A | 1 | Assembly occupancies intended for the production and viewing of the performing arts |
| 2;. | А | 2 | Assembly occupancies not elsewhere classified in Group |
| 3. | Α | 3 | Assembly occupancies of the arena type |
| 4. | A | 4 | Assembly occupancies in which occupants are gathered in the open air |
| 5. | В | 1 | Detention occupancies |
| 6. | В | 2 | Care and treatment occupancies |
| 7, | В | 3 | Care occupancies |
| 8. | С | | Residential occupancies |
| 9. | D | 212 | Business and personal services occupancies |
| 10. | Е | ** | Mercantile occupancies |
| 11. | F | 1 | High hazard industrial occupancies |
| 12. | F | 2 | Medium hazard industrial occupancies |
| 13. | F | 3 | Low hazard industrial occupancies |

| Minimum Water Supply Flow Rates | | | |
|--|--|--|--|
| Building Code, Required Minimum Water Supply F Part 3 Buildings 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 $\leq 135,000L$) ⁽¹⁾ | | |
| | 4500 (If $Q > 135,000L$ and $\leq 162,000L$) ⁽¹⁾ | | |
| | 5400 (If $Q > 162,000L$ and $\leq 190,000L$)(1) | | |
| | 6300 (If $Q > 190,000L$ and $\leq 270,000L$) ⁽¹⁾ | | |
| | 9000 (If Q > 270,000L)(1) | | |

Note: (1) 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 | A- 4 F- 3 | A- 1 A- 3< | E F- 2 | F- |
| 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 |
| | | | - | 39 | |
| 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 |







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;

- 2 -

- 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.
 - o 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.

- 4 -

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:

Figure A-1 – Existing: Pressure During Peak Hour Demand 1.

Figure A-2 – Existing: Available Fire Flow During Max Day Demand + Fire Flow

Figure B-1 – Phase 1: Pressures During Peak Hour Demand

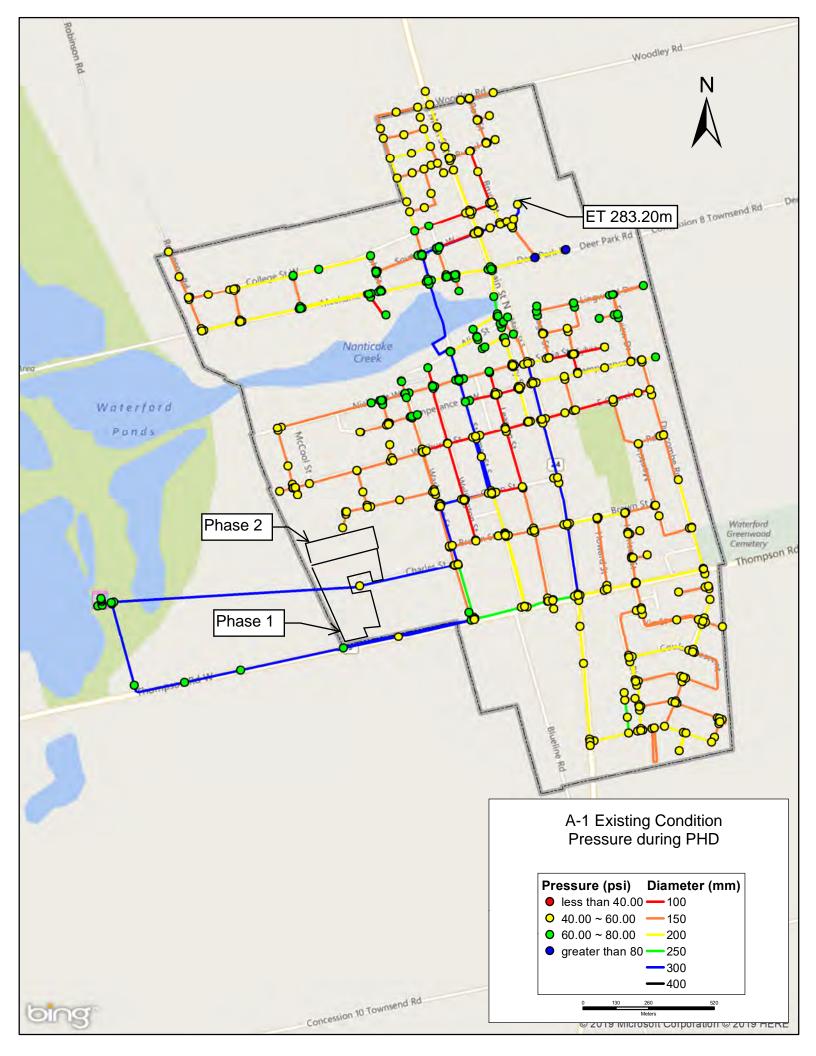
Figure B-2 - Phase 1: Available Fire Flow During Max Day Demand + Fire Flow

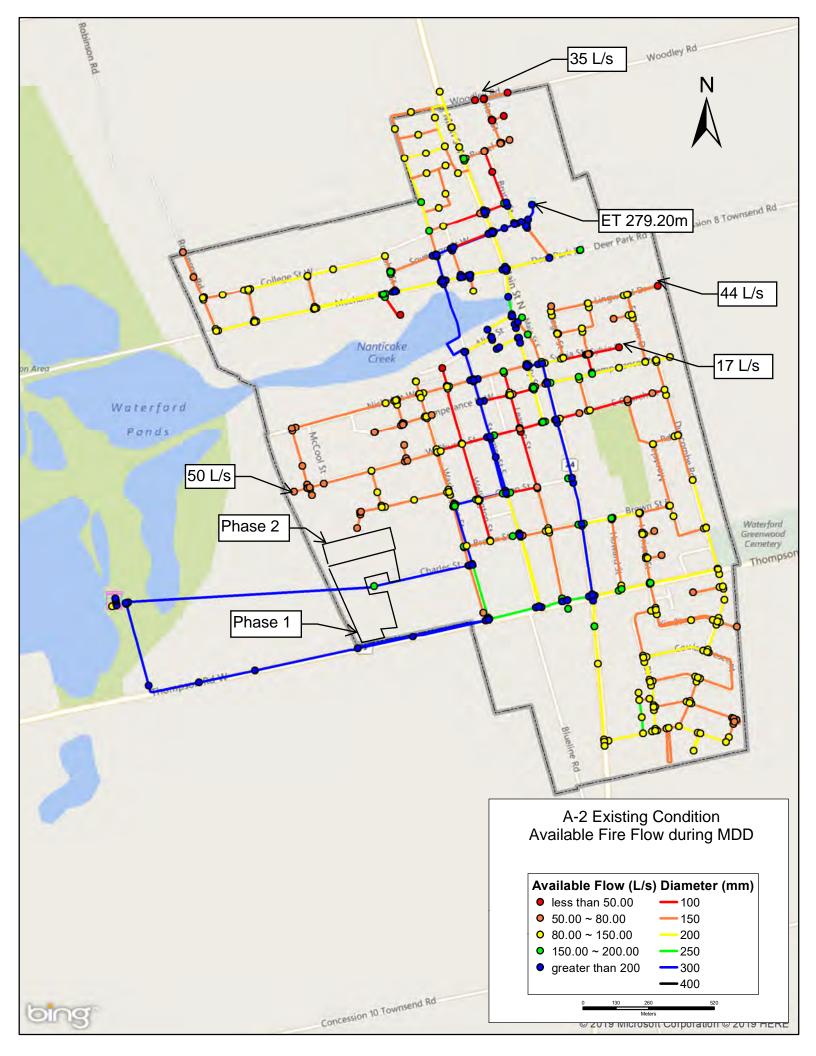
Figure C-1 – Phase 1 & 2: Pressures During Peak Hour Demand

Figure C-2 - Phase 1 & 2: Available Fire Flow During Max Day Demand + Fire Flow

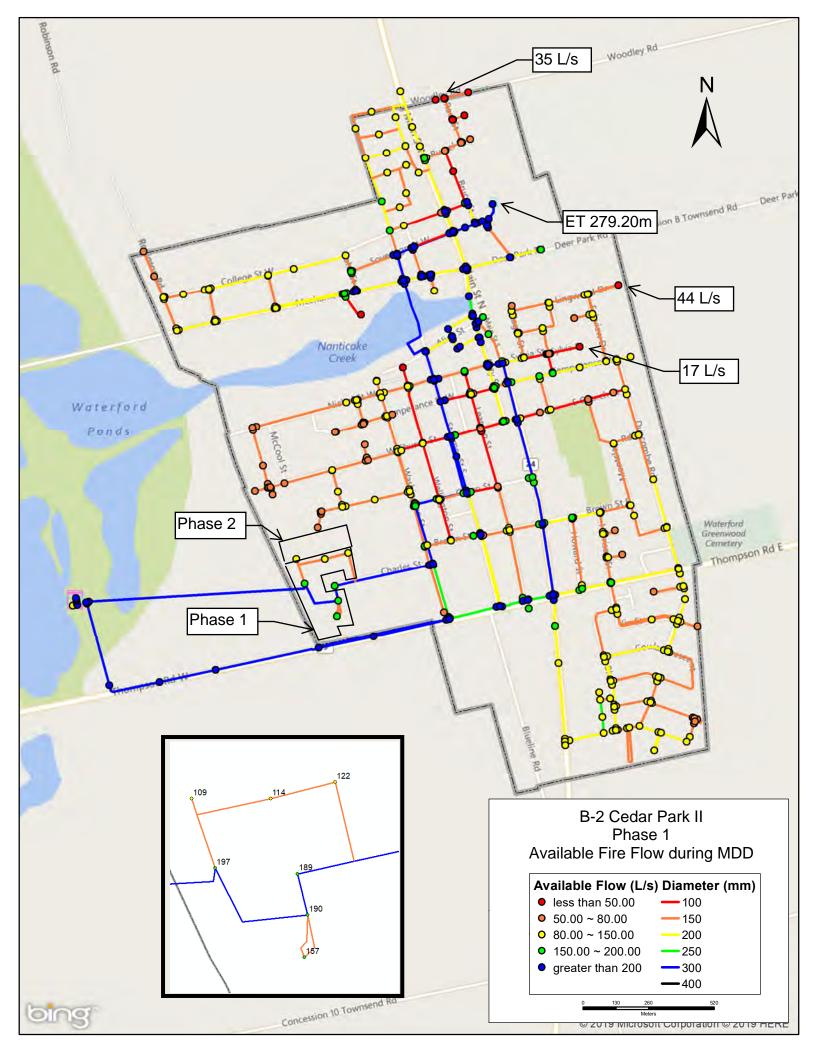
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| Revision # | Date | Details | Distribution | | |
| 00 | April 9, 2019 | Tech Memo Issued via email | Devin Hunter, C. Tech | | |
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APPENDIX A Existing Conditions

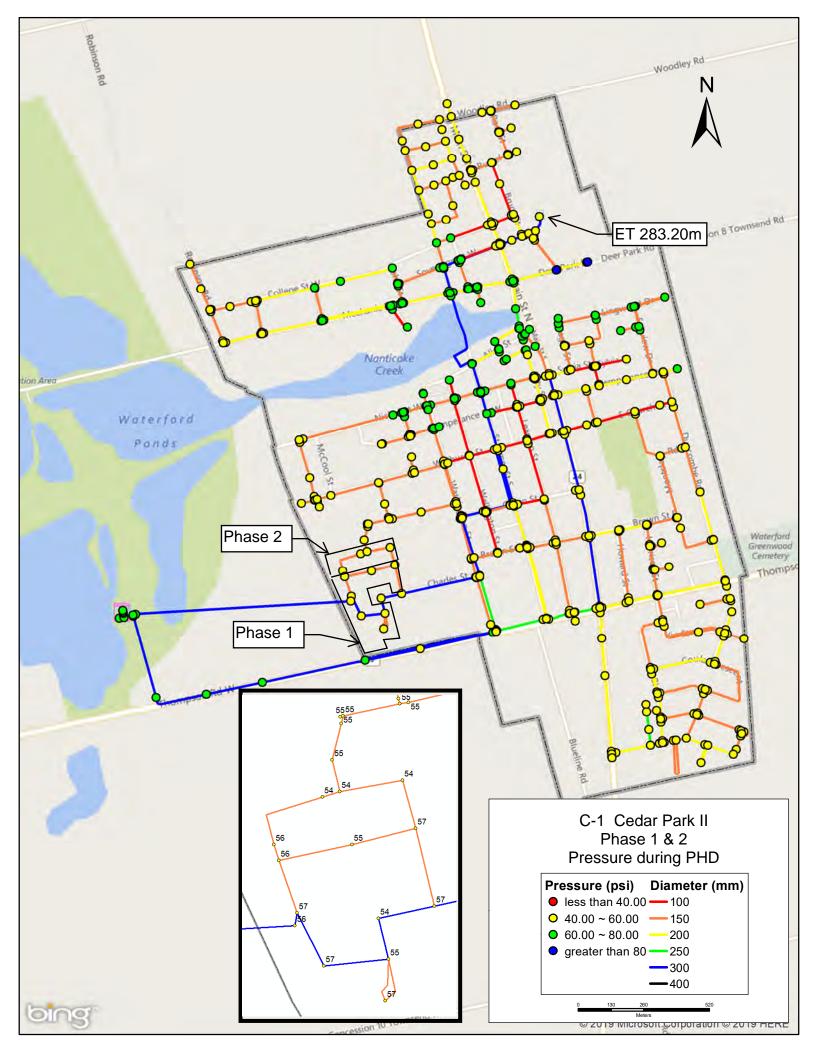


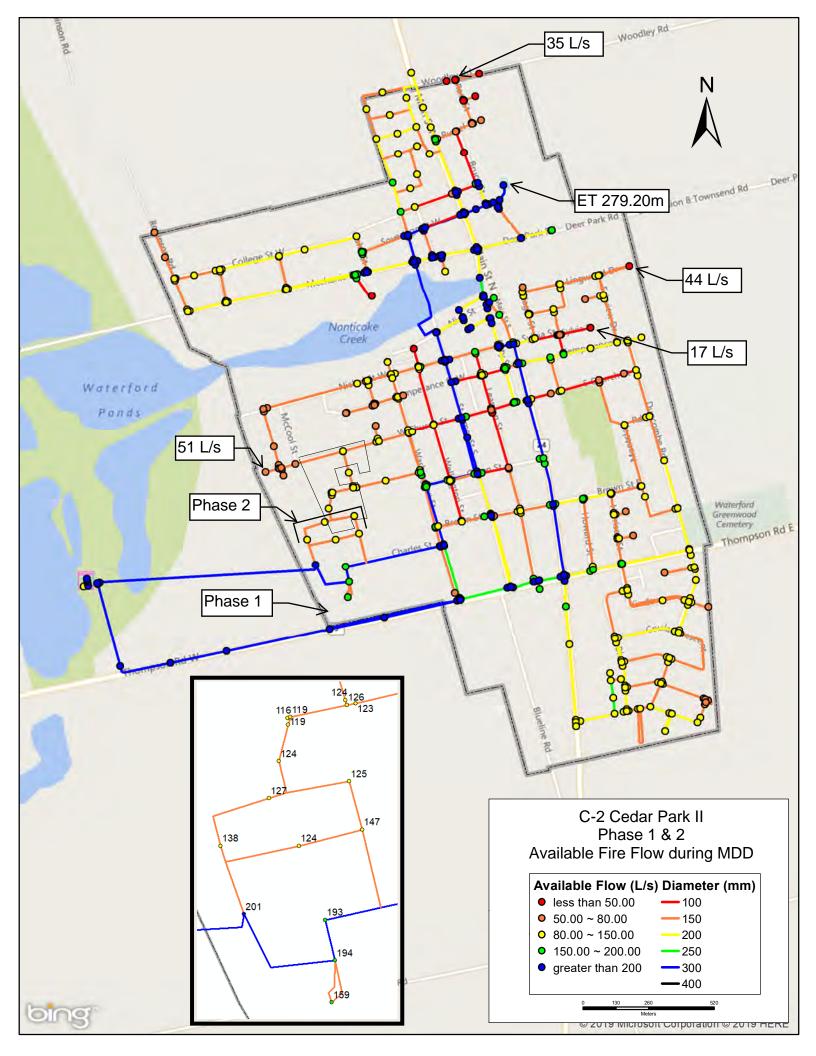


APPENDIX B Waterford - Cedar Park II Phase 1

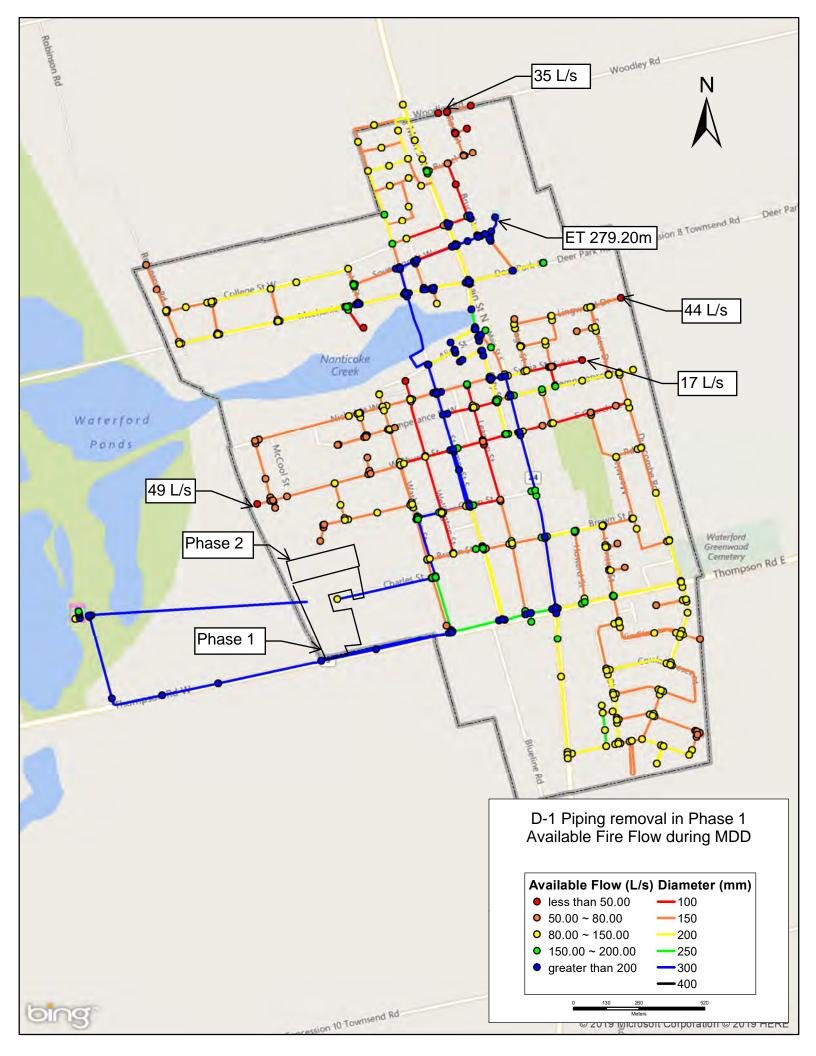


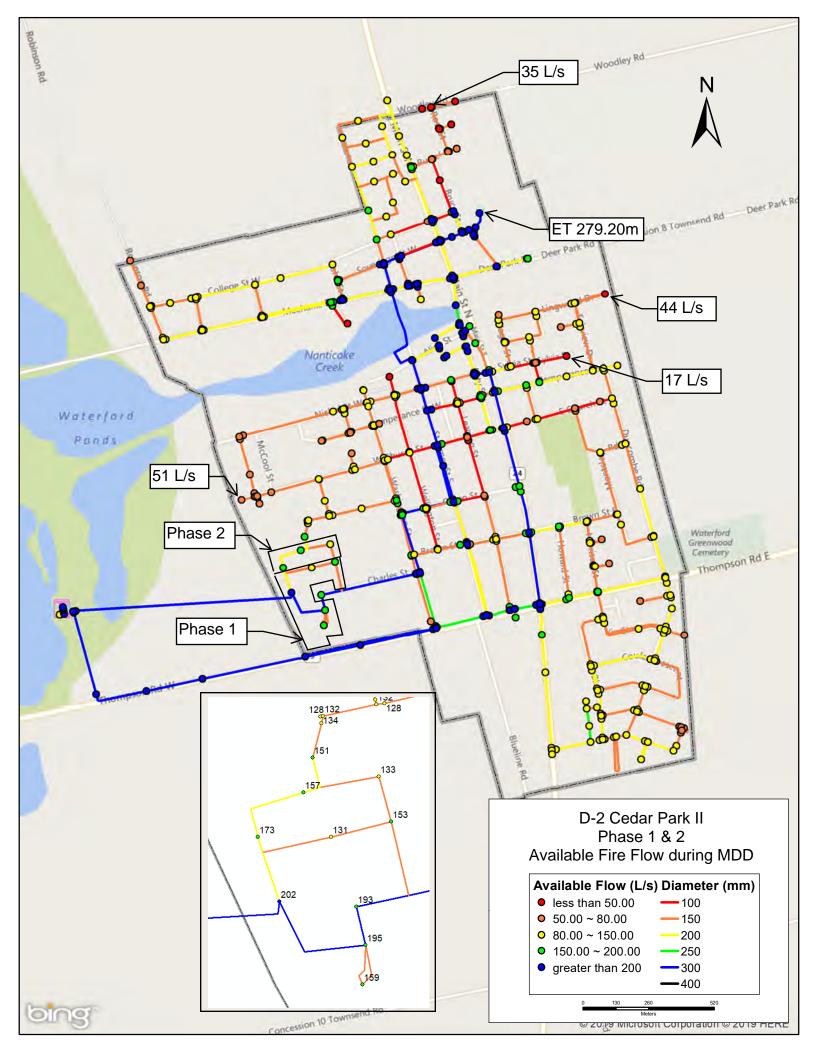
APPENDIX C Waterford - Cedar Park II Phase 1 & 2

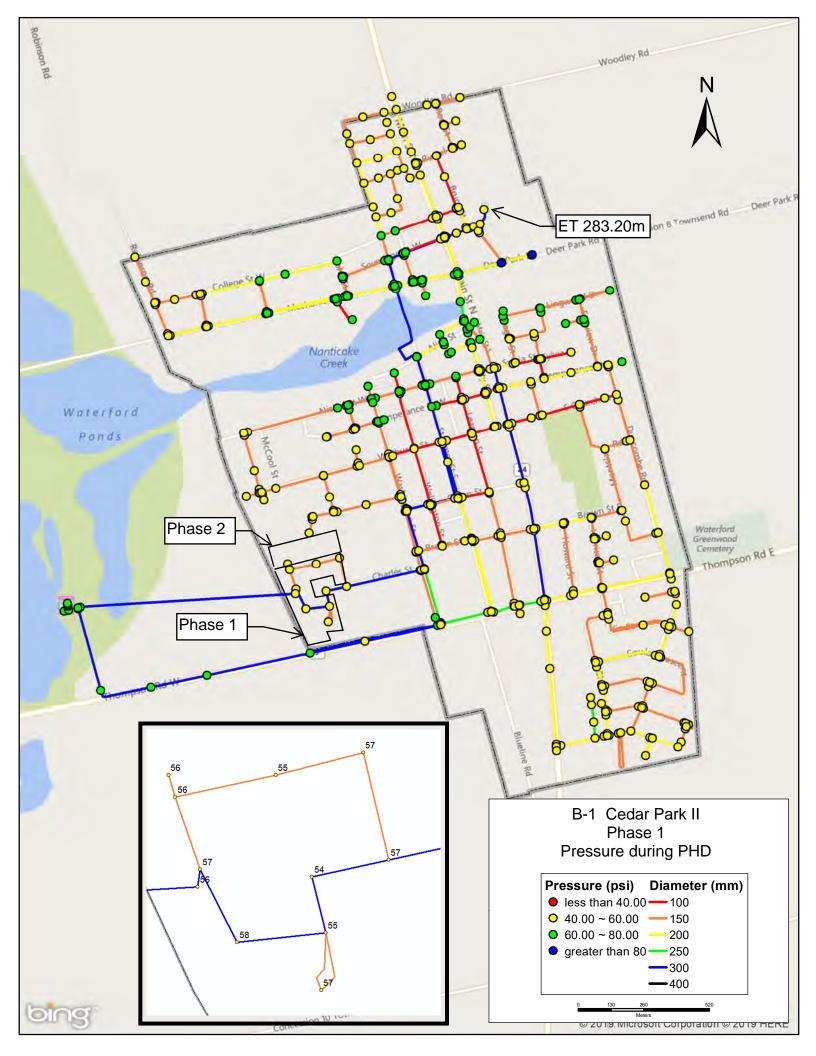




APPENDIX D SUPLEMENTARY MODELS









D-6 COMPATIBILITY ASSESSMENT Aucoin-Dixon Development Inc. – Cottonwood Condominiums Waterford ON

August 5, 2022 Rv1

Prepared for:

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Brantford ON N3T 3H2
paulaucoin@hotmial.ca

c/o:

G. DOUGLAS VALLEE LIMITED

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Project 1069

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ATTACHMENTS

Attachment A: Site Location and Zoning Figures

Attachment B: Proposed Development Layout Drawing
Attachment C: D6 Industrial Categorization Criteria

Attachment D: Neighbouring property photos

Attachment E: Separation and Influence Zone Figures

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 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.

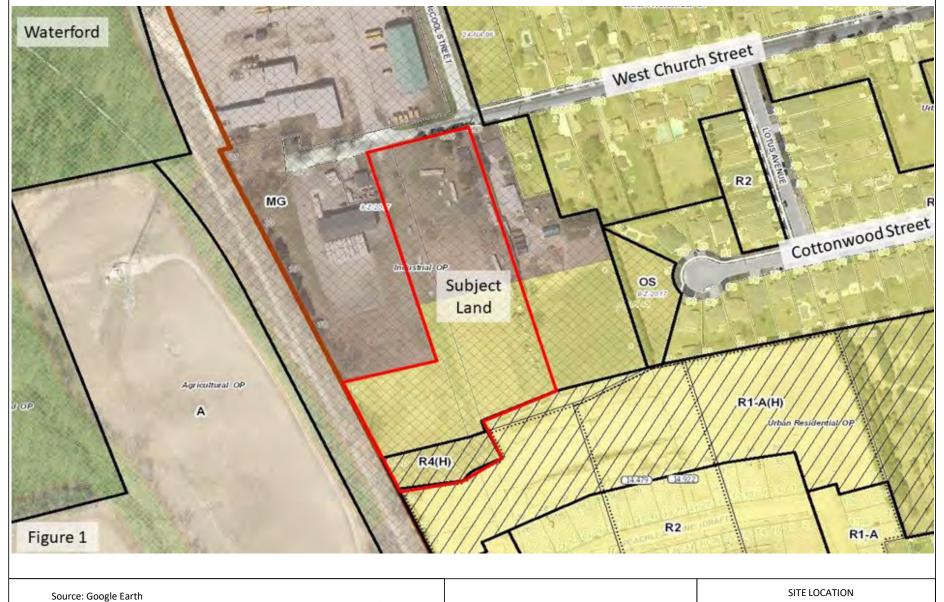
If you have any questions, please contact the undersigned.

Yours truly, CCS Engineering Inc.

Jim Anderson, M.Eng., P.Eng.

Principal JA/JA Attachments





Approximate Scale Metres 130

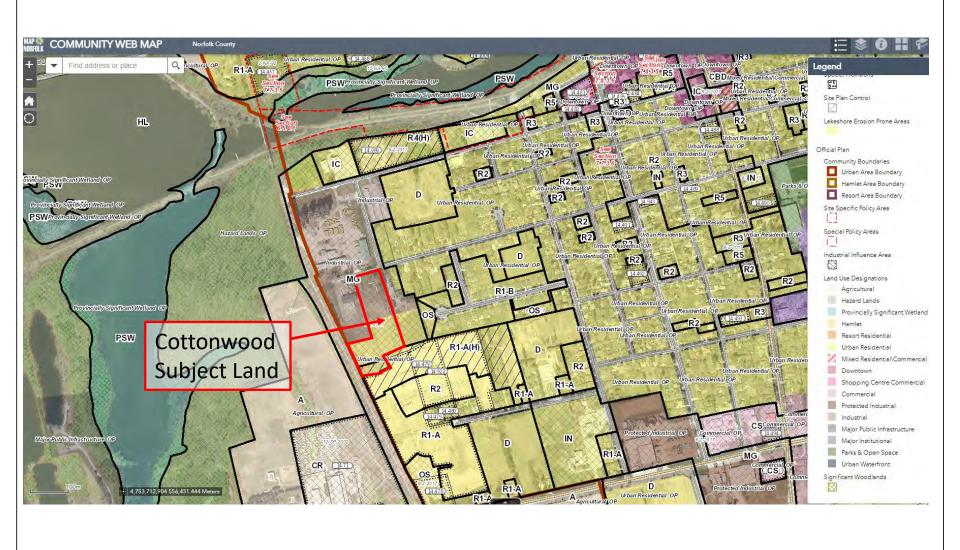




Cottonwood Condominiums WATERFORD, ONTARIO

Project No. 1069 By: JA Date: 11 July 2022

Figure 1



Source: Map Norfolk

Approximate Scale Metres





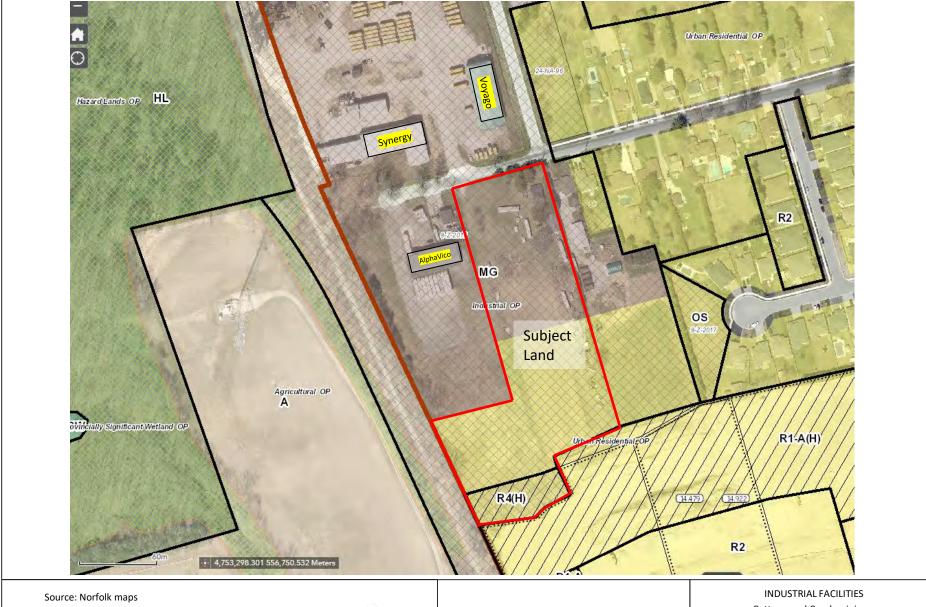
ZONING Cottonwood Condominiums WATERFORD, ONTARIO

By: JA Date: 11 July 2022 Project No. 1069

Figure 2

0

100



Approximate Scale Metres

60 0



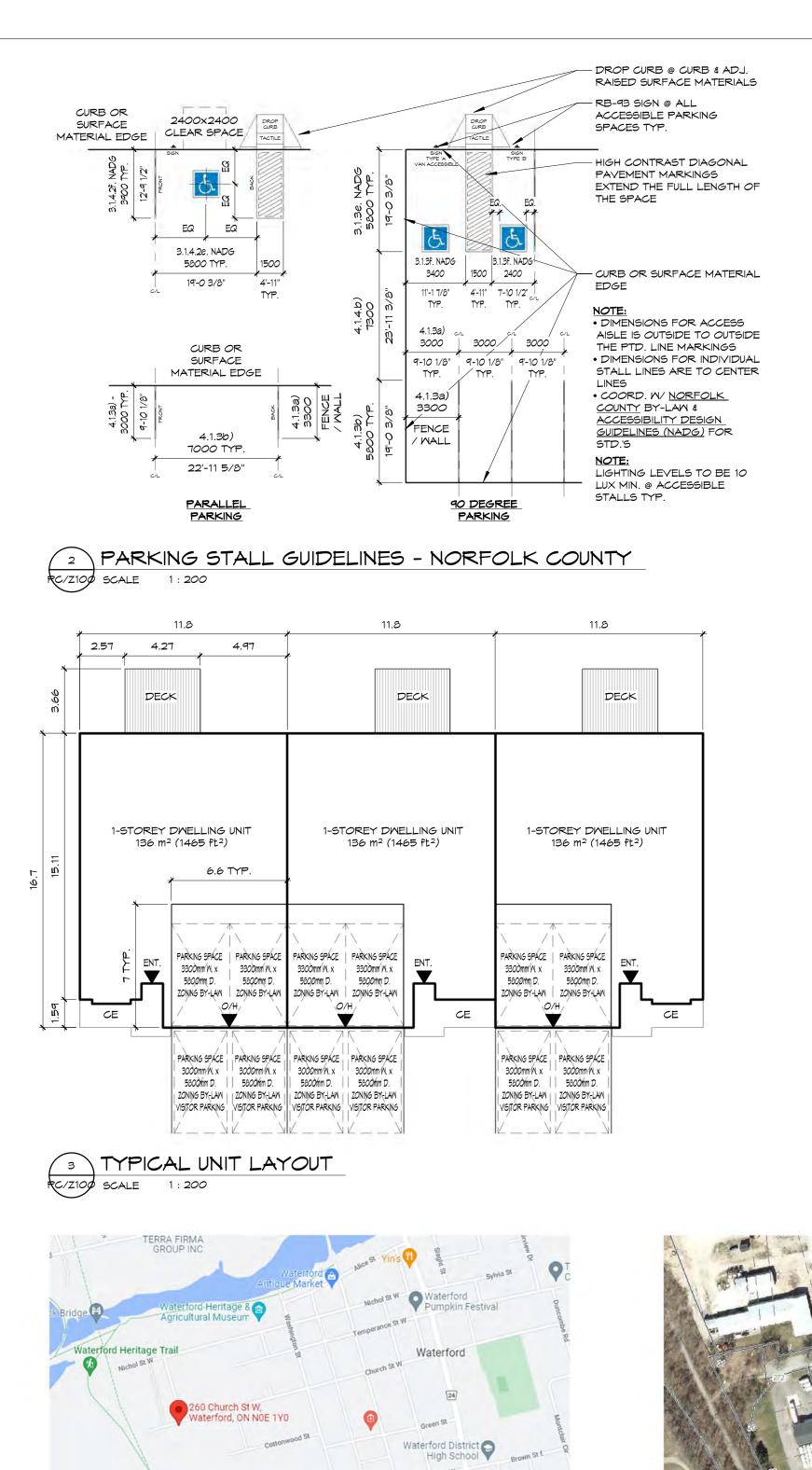


Cottonwood Condominiums WATERFORD, ONTARIO

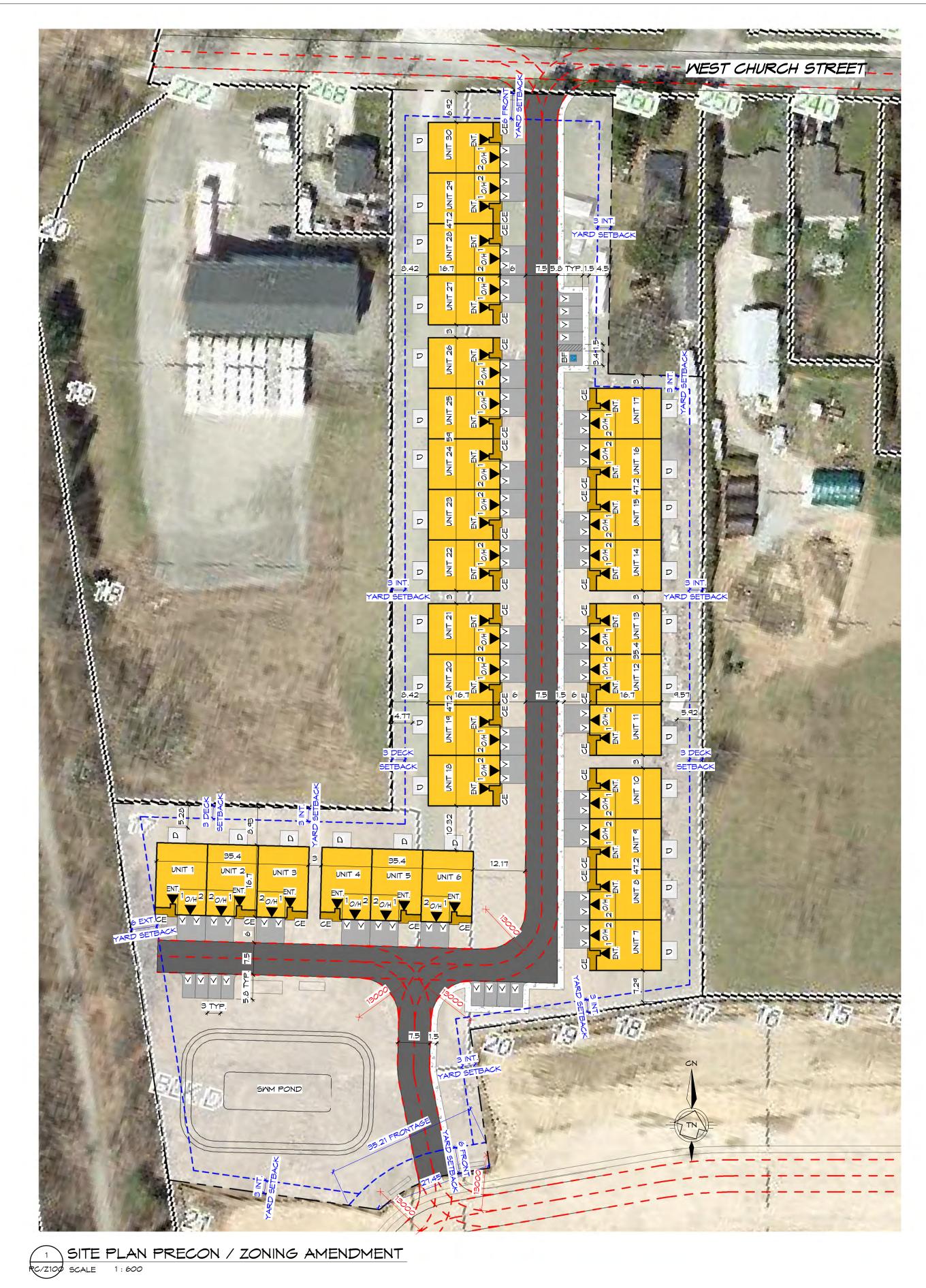
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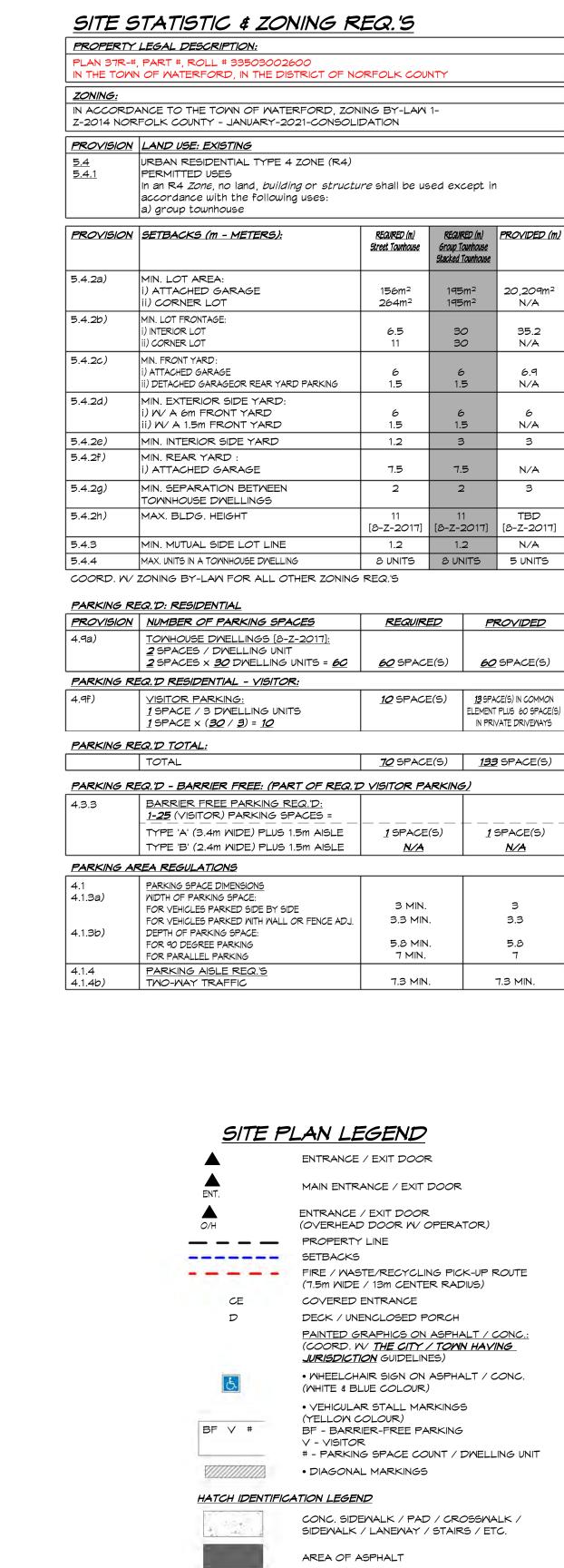
Figure 2a











20,209m²

N/A

N/A

N/A

N/A

N/A

TBD

N/A

PROVIDED

60 SPACE(S)

ELEMENT PLUS 60 SPACE(S) IN PRIVATE DRIVEWAYS

<u>133</u> SPACE(S)

<u>1</u> SPACE(S)

N/A

3.3

5.8

7.3 MIN.



KEY MAP

SCALE 1:100

COTTONWOOD CONDOMINIUMS

WATERFORD, ONTARIO N0E 1Y0

21-173 SITE PLAN PRE-CON / **ZONING AMENDMENT**

AREA OF PARKING

1-STOREY RESIDENTIAL DWELLING (VEHICULAR - X2 GARAGE, X2 DRIVEWAY)

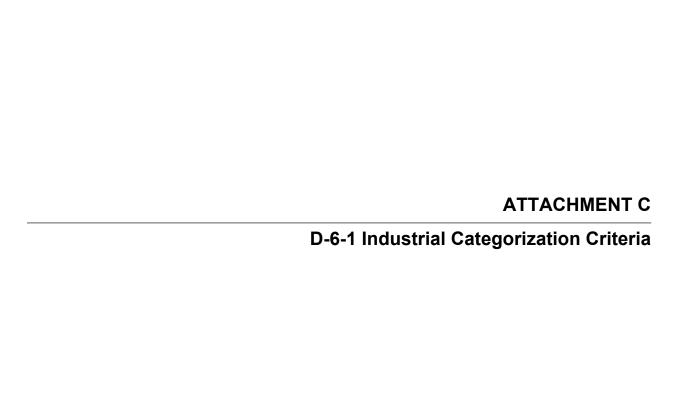
PROJECT No.

(11800mm W x 16700mm D)

COVERED ENTRANCE AREA

G. DOUGLAS VALLEE LIMITED

2 TALBOT STREET NORTH SIMCOE ONTARIO N3Y 3W4 (519) 426-6270



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.

| Category O | | ization criteria <u>*</u> | ale | | rocess | | Operation | on /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 <u>*</u> | | | | | | | |
|---|-------|---------|----------------------|---|--|--|--|
| Category Outputs | Scale | Process | Operation /Intensity | Possible examples ** | | | |
| | | | | Metal manufacturing | | | |

Note: Emissions may be point source or fugitive.

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

^{*} Note: This Table should not be considered a comprehensive list but is to be used to provide examples of industrial categories.

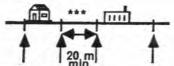
^{**} Note: The following examples are not limited to the Class indicated on the Table. The categorization of a particular industry will vary with the specifics of the case.

(Section View)

SEPARATION DISTANCES

CLASS I INDUSTRIAL:

70 m. potential influence area

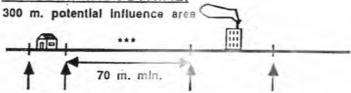


designation, zoning or property lines** of closest existing.

designation, zoning or property lines* of closest existing. committed or proposed Class I Industrial Use

committed or proposed Sensitive Land Use

CLASS II INDUSTRIAL:



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

- 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".]



1000 m. potential influence area



designation, zoning or property lines** of closest existing. committed or proposed Sensitive Land Use

300 m. mln.

designation, zoning or property lines* of closest existing. committed or proposed Class III Industrial Use

SEPARATION DISTANCES

CLASS I INDUSTRIAL:

X
20 m

x

20 m

x

20 m. minimum separation distance recommended ***

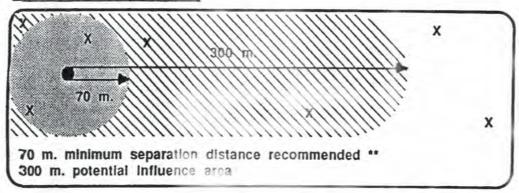
70 m. potential influence area

(PLAN VIEW)

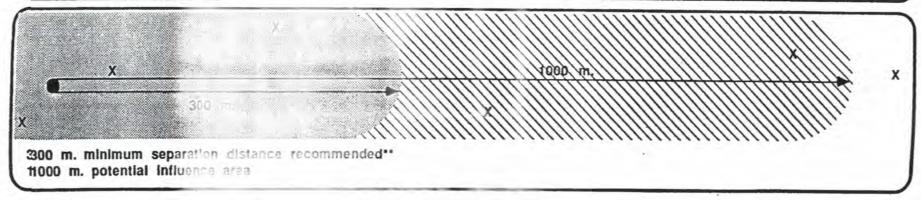
Legend:

- 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 II INDUSTRIAL:



CLASS III INDUSTRIAL:



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



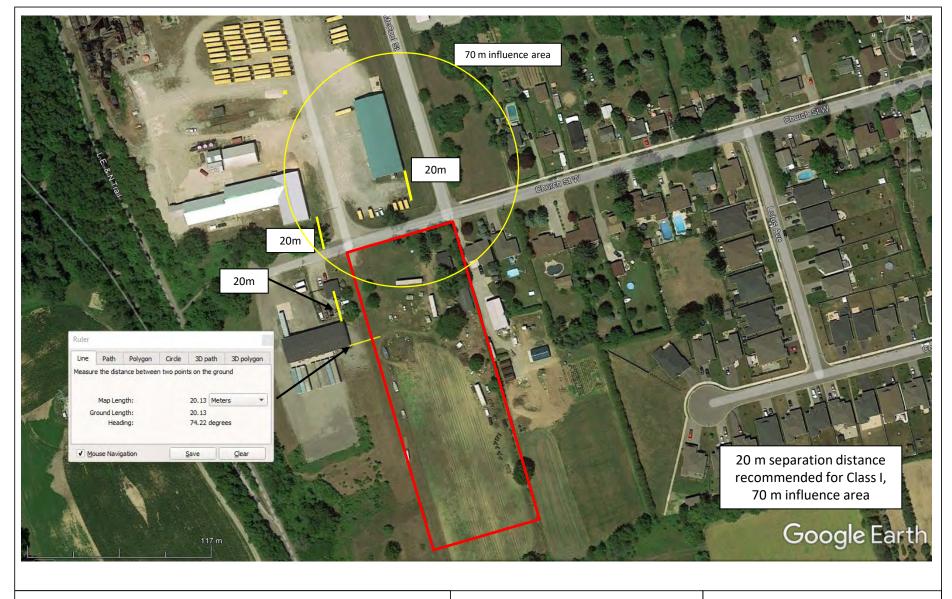


268 West Church Street –residential property adjacent to subject site and industrial zoned land



Residential property south of the subject site.





Source: Google Earth

Approximate Scale Metres

100

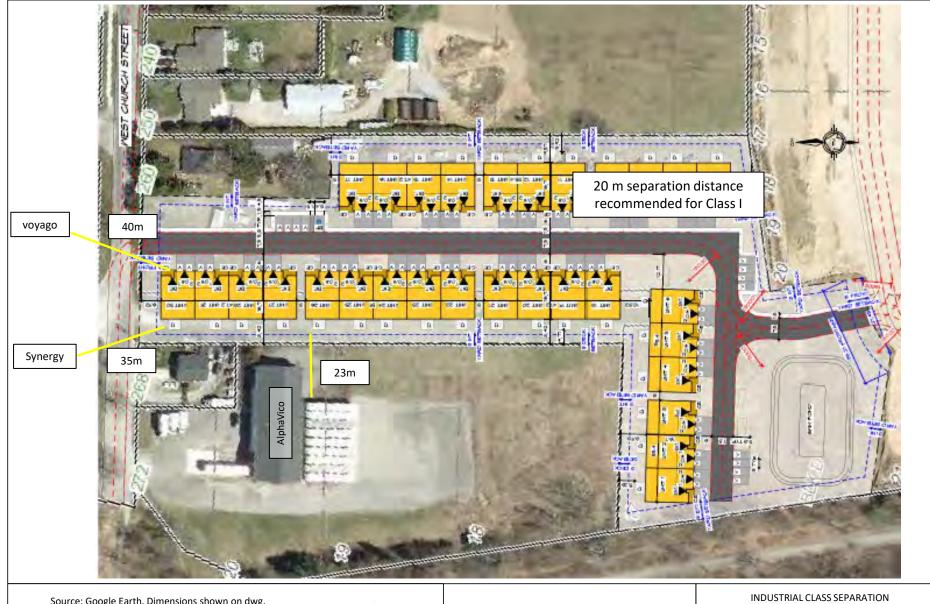




INDUSTRIAL CLASS SEPARATION Cedar Park Condominiums WATERFORD, ONTARIO

By: JA Date: 11 July 2022 Project No. 1069

Figure 3



Source: Google Earth. Dimensions shown on dwg.

Approximate Scale Metres

55 0





Cottonwood Condominiums WATERFORD, ONTARIO

By: JA Date: 11 July 2022 Project No. 1069

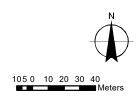
> Figure 3a

MAP A CONTEXT MAP Urban Area of WATERFORD



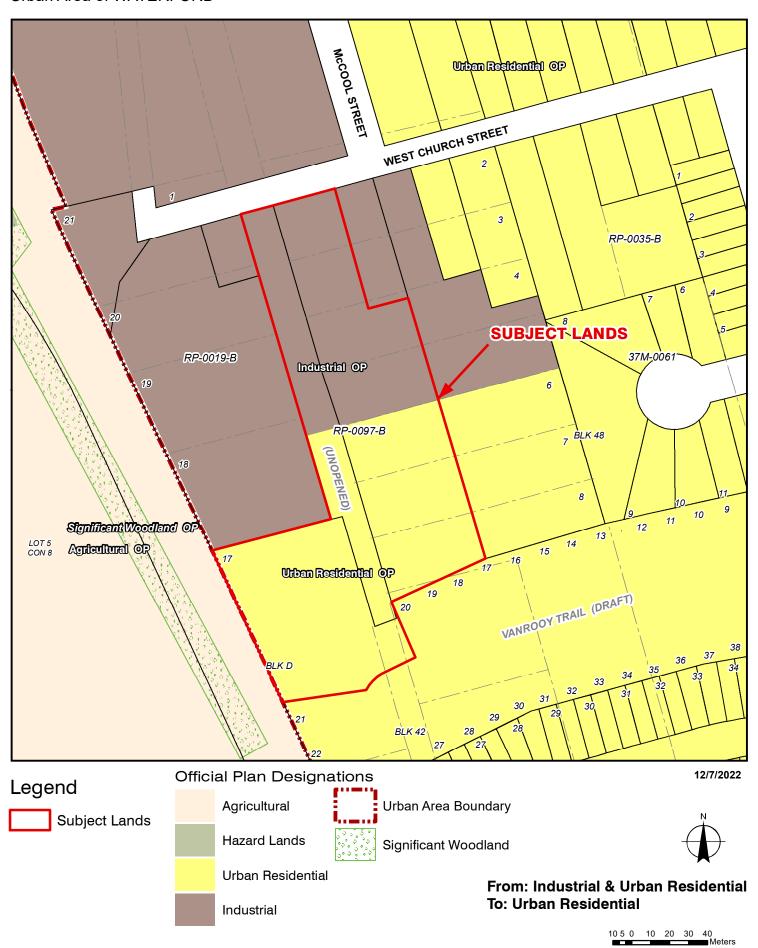
Legend



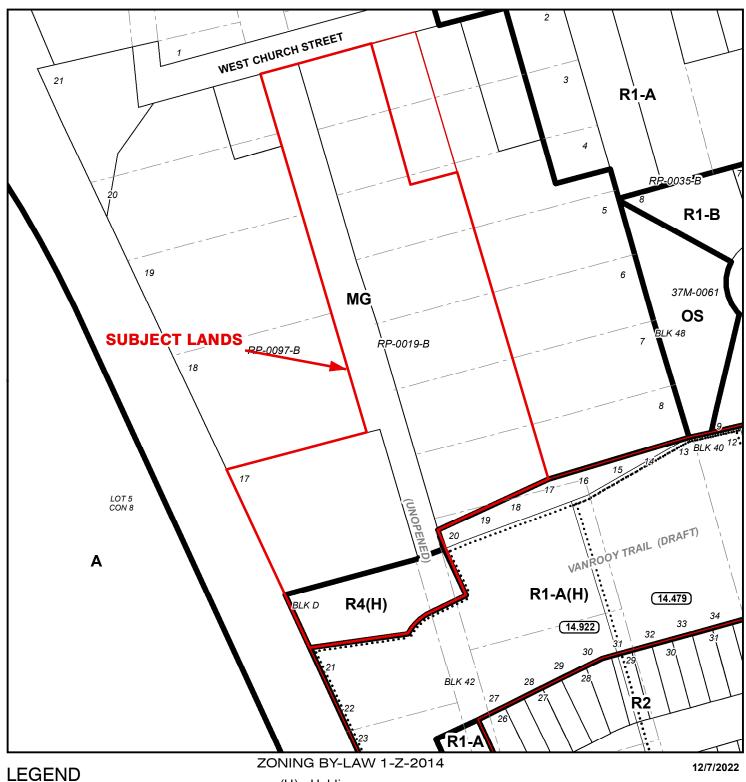


MAP BPROPOSED OFFICIAL PLAN AMENDMENT MAP

Urban Area of WATERFORD



MAP C PROPOSED ZONING BY-LAW AMENDMENT MAP Urban Area of WATERFORD





(H) - Holding

A - Agricultural Zone

MG - General Industrial Zone

OS - Open Space Zone

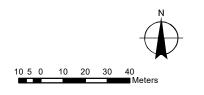
R1-A - Residential R1-A Zone

R1-B - Residential R1-B Zone

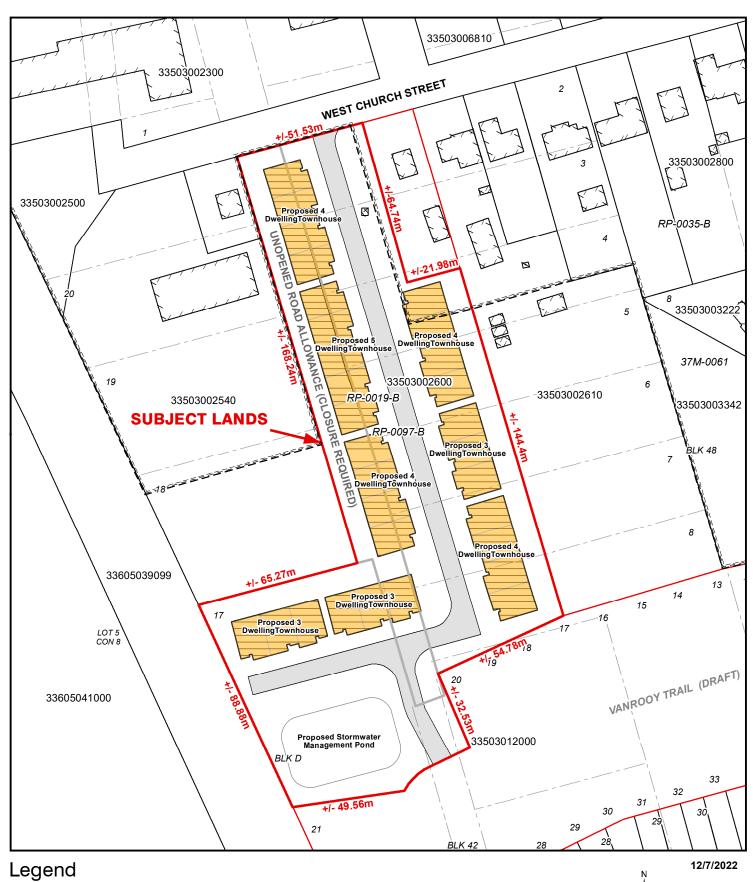
R2 - Residential R2 Zone

R4 - Residential R4 Zone

From: General Industrial Zone To: Urban Residential Type 4 With Holding



CONCEPTUAL PLAN Urban Area of WATERFORD



Subject Lands

