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24 Alfred Street Development

STORMWATER MANAGEMENT REPORT

Pheasant Run Realty Holdings Inc.

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Issue	Date	Description
1	February 14, 2022	Draft Plan of Submission Application
2	May 27, 2022	Incorporating DRC Comments

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1 Introduction

Tatham Engineering has been retained by Pheasant Run Realty Holdings Inc. to prepare a Stormwater Management Report for the proposed 24 Alfred Street Development in the Thornbury, Town of The Blue Mountains.

1.1 OBJECTIVE

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

1.2 SUPPORTING REPORTS

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

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

Additional reports have been prepared in conjunction with this report in support of the proposed residential development, including:

- *24 Alfred Street Development Functional Servicing Report* prepared by Tatham Engineering (May 2022); and
- *24 Alfred Street Development Traffic Impact Brief* prepared by Tatham Engineering (May 2022).



2 Development Site

2.1 SITE LOCATION & DESCRIPTION

The site is legally described as Town Plot Park Part Lots 5 and N/E Alfred Street Plan 107 Part Lot 6, and is bounded by Alice Street West to the north, Bruce Street South to the east, Alfred Street West to the south and Elma Street South to the west. The subject property is zoned as R1-1 – *Residential One* and is not regulated by the Grey Sauble Conservation Authority (GSCA).

2.2 SURFACE CONDITIONS.

A topographic survey of the subject property was completed by GM Blueplan Engineering Ltd. on June 5, 2018 and December 5, 2011. The high spot of the subject site (199.29m) is 126 m south-west of Alice Street West. The subject property generally slopes from the south-west to the north-east at an average gradient of 2.4% to a low point at the rear of 21 Alice Street West, where water ponds and infiltrates into the ground. 21 Alice Street slopes toward the rear yard low point at an average gradient of 0.5%. The remainder of the subject property generally slopes from the high point towards the west at an average gradient of 0.7%, ultimately discharging to the Elma Street storm system. Refer to the Pre-Development Drainage Plan (DP01) for details on existing drainage areas.

While adjacent to numerous residential units on all property lines, the 1.09 ha site is currently vacant, and is primarily grass covered with a sparse number of trees.

2.3 SUBSURFACE CONDITIONS

A geotechnical investigation, submitted under separate cover, was completed by Cambium Inc. dated November 19, 2021. Fieldwork was conducted on August 27, 2021, consisting of four exploratory sampled boreholes. The boreholes extended to a maximum depth of 5 meters below existing ground surface. Subsurface conditions are as follows:

- 100 mm of surficial topsoil;
- silty sand deposit with traces of clay extends to a depth of 0.8 m below surface at boreholes BH102-21 and BH103-21 (this layer extends 1.5 m below surface at boreholes BH101-21 and BH104-21); and
- a layer of silt extends beyond the termination depth of all boreholes ranging from 4.6 m to 6.1 m below grade.; the silt contains varying amounts of clay and trace sand and has a stiff to very hard consistency.



The geotechnical investigation established that all four borehole locations were dry upon drilling. Borehole BH102-21 was outfitted as a monitoring well and recorded a groundwater level 4 m below grade.

The soils have been classified as Brighton Sand (Type A) as per the *Soil Survey of Grey County - Report No. 17 of the Ontario Soil Survey*, completed by the Ontario Department of Agriculture. This soil group has low runoff potential and high infiltration rates even when thoroughly wetted. Pre-development land cover was established using aerial imagery.

2.4 PROPOSED DEVELOPMENT

The proposed development will feature 9 single family detached homes and 8 semi-detached units fronting a 249 m long 7.5 m private road within a common element row, connecting Alice Street West and Alfred Steet West, between Elma Street South and Bruce Street South. Lots will have approximately 20 m frontages and varying depths around 30 m to 34 m. The proposed development is shown on the Site Grading Plan (SG01).

The existing municipal infrastructure along Alice Street, including the storm, sanitary and watermain networks are being replaced as part of the Thornbury Road Infrastructure Project and is scheduled to start in 2023. The proposed sanitary and storm sewers servicing the proposed through-street will discharge into the future Alice Street West sanitary and storm sewer mains, while the proposed watermain will tap into both the Alice Street West and Alfred Street West watermains to create a loop.



3 Existing Drainage Conditions

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

3.1 SURFACE DRAINAGE & RUNOFF

3.1.1 Development Site

Surface runoff from the subject site flows overland as sheet flow towards either the northeast or northwest property lines, the dividing high point located approximately 125 m southwest of Alice Street West. These existing drainage conditions and catchment areas for the subject property are depicted in DP01 - Pre-Development Drainage Plan and are described as follows.

Catchment 101: Encompasses the portion of the site southwest of the high point that is currently undeveloped and is primarily grassed with a sparse number of trees. The catchment generally slopes from the east to west at an average gradient of 1.5% towards Elma Street South. Surface runoff will flow overland before draining onto Elma where it is collected by a 600 mm diameter storm sewer that flows north towards the Beaver River outlet.

Catchment 102: Encompasses the portion of the site northeast of the high point that is currently undeveloped and is primarily grassed with a sparse number of trees and a detached home (21 Alice Street West) that will be demolished as part of the proposed development. The catchment generally slopes northeast towards Alice Street West at an average gradient of 1.4%. Surface runoff will flow overland and onto Alice Street West where it will be collected by a 300 mm diameter storm sewer that conveys stormwater northwest towards Elma Street South. The northeast entrance to the subject property fronts Alice Street, passing through 21 Alice Street West.

3.1.2 Alfred Street West Properties

Catchment 301: The subject property borders four properties which front Alfred Street West. Surface runoff from these properties generally drain from the front towards the rear, through the subject property towards Elma Street South, and is collected by the 600 mm diameter storm sewer on Elma Street South. Ultimately, surface runoff will be conveyed to and discharged into the Beaver River. Refer to the *Pre-Development Drainage Plan (DP01)* for details on existing drainage area.

The southwest entrance to the subject property fronts Alfred Street West and is situated northeast of the adjacent properties mentioned above.



3.1.3 Bruce Street South Properties

Catchment 302: The subject property borders five properties that front Bruce Street South. Surface runoff from these properties generally flows overland towards the northeast and along the rear of the Bruce Street South properties, before draining through the subject property and towards the east end of Alice Street. Runoff is collected by a catchbasin and is conveyed via a 375 mm diameter storm sewer towards Bruce Street. Ultimately, the surface runoff will discharge into the Little Beaver River. Under surcharged pipe conditions, water will also be conveyed overland towards Elma Street South, ultimately draining towards the Beaver River outlet. A 4.5m wide service easement is situated between the properties fronting Bruce Street South and the subject property. Refer to the *Pre-Development Drainage Plan (DP01)* for additional details.

3.1.4 Alice Street West Properties

Catchment 303: The subject property borders the back of two properties which front Alice Street West. Surface runoff from the front of these properties generally flow overland north towards Alice Street West, where runoff is collected by catchbasins that will convey stormwater towards Bruce Street via a 375 mm diameter storm sewer. Surface runoff from the rear yards will flow overland into the subject site before being conveyed back towards Alice Street West to be collected in the storm sewer that flows towards Elma Street South. Under surcharged pipe conditions, stormwater will be conveyed overland towards Elma Street South, ultimately draining towards the Beaver River outlet. Refer to *Pre-Development Drainage Plan (DP01)* for details on existing drainage area.

3.2 THORNBURY WEST RECONSTRUCTION PROJECT

As part of the Thornbury Road Infrastructure Program (TRIP), Tatham Engineering Limited has also been retained by the Town of The Blue Mountains to provide engineering services for the final design of the Thornbury West Reconstruction project. This project area includes sections of Elma Street, Alice Street, Louisa Street, Lorne Street and Park Lane.

The purpose of this project, which will start construction in 2023, is to make improvements to the vertical alignment and grading of these streets, apply current design standards equally throughout the project limits, replace aged and deteriorated infrastructure with properly sized systems, develop proper major storm conveyance and enhance safety and continuity through a consistent level of service for streetlights, sidewalks and passive traffic calming. Elma Street and Alice Street will include a complete reconstruction of the existing roadway and buried municipal infrastructure, including all the services fronting the subject site.



3.3 PRE-DEVELOPMENT PEAK FLOWS

The existing conditions, considering the site's surface and subsurface conditions, have been modelled in Visual OTTHYMO to establish the pre-development peak flows. The pre-development flows results are summarized in Table 1 and supporting calculations are provided in Appendix A.

Table 1: Pre-Development Peak Flow Rate Summary

STORM EVENT	CATCHMENT 101/301 (M ³ /S)		CATCHMENT 102/302/303 (M ³ /S)		TOTAL (M ³ /S)	
	Chicago	SCS 24-Hour	Chicago	SCS 24-Hour	Chicago	SCS 24-Hour
25mm	0.004	-	0.003	-	0.007	-
2-year	0.005	0.012	0.004	0.012	0.009	0.023
5-year	0.010	0.022	0.010	0.025	0.019	0.046
10-year	0.014	0.029	0.016	0.036	0.029	0.063
25-year	0.020	0.040	0.024	0.052	0.043	0.092
50-year	0.025	0.049	0.031	0.065	0.054	0.113
100-year	0.030	0.058	0.039	0.079	0.067	0.137
Timmins	0.050	-	0.070	-	0.120	-



4 Proposed Stormwater Management Plan

4.1 DESIGN CRITERIA

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

4.1.1 Stormwater Quantity Control

Proposed condition peak flow rates discharging into the Alice Street West storm sewer network must be controlled to the post Thornbury West Reconstruction Project 5-year peak flow rate for all storms up to and including the 100-year event to ensure no adverse impacts further downstream. Recognition of the receiving Alice Street storm sewer system capacity is required. Safe conveyance to a sufficient outlet must be provided for the Regulatory Storm event.

4.1.2 Stormwater Quality Control

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

4.1.3 Siltation & Erosion Control

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

4.2 PROPOSED DRAINAGE CONDITIONS

The proposed stormwater management strategy identified for this development includes a proposed internal storm sewer network conveying runoff towards an underground storage system located immediately southwest of Alice Street West. The drainage catchment areas are depicted in the Post-Development Drainage Plan (DP02) and described as follows.

Catchment 201: Defines the drainage from the proposed 249m of 7.5m private road connecting Alice Street West to Alfred Street West. The road connects to the proposed 9 single family detached homes and 8 semi-detached units fronting the proposed through-street. Runoff from the proposed units flow via sideyard and rear yard swales to various catchbasins along the road, which will collect and convey water from catchment 201 to the underground storage system,



which will attenuate storms up to and including the 100-year storm to the post Thornbury West Reconstruction Project Alice Street 5-year peak flow rate.

Catchment 202: Defines the drainage from a portion of the site consisting of the rear yards of lots 4 to 7 that will flow uncontrolled to a rear yard swale which will drain onto Alice Street West. Runoff collected in the underground storage system will be over-controlled to accommodate additional flows from Catchment 202.

Catchment 203: Defines the drainage from a portion of the site consisting of the rear yards of lots 8 to 12 that will be collected by a rear yard swale and conveyed to the underground storage system.

Catchment 301: Defines the drainage from the external catchment southwest of the subject site along Alfred Street. For further details pertaining to the drainage patterns of the catchment, refer to section 3.1.2. The existing drainage conditions are generally maintained with runoff from catchment 301 flowing into the subject site, where it will be collected by the proposed internal storm sewer network and conveyed towards the underground storage system.

Catchment 302: Defines the drainage from the external catchment southeast of the subject site along Bruce Street. For further details pertaining to the drainage patterns of the catchment, refer to section 3.1.3. The existing drainage conditions are generally maintained with runoff from catchment 302 flowing parallel to the subject site and towards Alice Street via overland flow. A proposed false berm will be established between catchment 302 and the subject site to prevent runoff from the catchment from contributing flows to the underground storage system.

Catchment 303: Defines the drainage from the external catchment northeast of the subject site along Alice Street. For further details pertaining to the drainage patterns of the catchment, refer to section 3.1.4. The existing drainage conditions are generally maintained with runoff from catchment 303 flowing into the subject site, where it will be collected by the proposed internal storm sewer network and conveyed towards the underground storage system.

4.2.1 Proposed Internal Storm Sewer Network

A proposed stormwater management strategy includes an internal storm sewer network that will convey runoff from catchments 201, 203, 301 and 303 via 160 m of storm sewer to an underground storage system located immediately southwest of Alice Street West in the designated stormwater management block. The underground storage will discharge into the future 375 mm diameter Alice Street West storm sewer.

The internal storm sewer will be sized to accommodate the 100-year storm. Refer to Appendix F for the storm sewer design sheets, and the Storm Drainage Pan (STM01) for further details.



4.3 WATER QUANTITY

The stormwater flow from the proposed development will be required to maintain the allowable flow in the future Alice Street West storm sewer via 175 m of 200 mm diameter PVC storm sewer that originates southwest of Lot 1. The proposed stormwater management system will connect to a future 300 mm diameter storm sewer, 16 m southeast of future STM MH6. Along with an additional maintenance structure being required to tie into the future storm sewer, the 16 m of 300 mm diameter storm sewer between the tie-in location and STM MH6 will need to be upgraded to 375 mm in diameter. Downstream of STM MH6, the future storm sewer will continue as 450 mm in diameter.

The actual peak flow rate downstream of future STM MH6 is 0.180 m³/s. This value is based on Catchment 306 of the Thornbury West Reconstruction Project, which contributes a total area of 25,032 m² (2.5 ha) including 24 Alfred Street West. The area contributing runoff to the proposed 24 Alfred Street West Development, controlled or uncontrolled is 16,185 m² (1.6 ha). Factoring the allowable peak flow of the Alice Street West sewer will provide the controlled flow rate the proposed 24 Alfred Street West development can contribute to the future Alice Street West storm sewer.

$$(Q_{\text{Catchment 306}})(A_{24 \text{ Alfred}})/(A_{\text{Catchment 306}}) = (0.180 \text{ m}^3/\text{s}) \times (16,185 \text{ m}^2) / (25,032 \text{ m}^2) = \mathbf{0.116 \text{ m}^3/\text{s}}$$

A Visual OTTHYMO model was developed to determine peak flow rates from the subject site under existing and proposed conditions for the 25mm through 100-year storm events. The model was then used to determine the required water quantity storage volume to attenuate the proposed condition peak flow rates to existing condition levels. A summary of proposed condition peak flow rates is provided in Table 2. The proposed condition supporting calculations are provided in Appendix B.



Table 2: Post-Development Peak Flow Rate Summary

STORM EVENT	UGS - CATCHMENT 201/203/301/303 (m ³ /s)		CATCHMENT 202 (m ³ /s)		TOTAL (m ³ /s)		ALLOWED FLOW RATE (m ³ /s)
	Chicago	SCS 24-Hour	Chicago	SCS 24-Hour	Chicago	SCS 24-Hour	
25mm	0.025	-	0.001	-	0.027	-	0.116
2-year	0.030	0.042	0.002	0.004	0.032	0.046	0.116
5-year	0.042	0.059	0.004	0.007	0.046	0.064	0.116
10-year	0.051	0.070	0.005	0.009	0.055	0.078	0.116
25-year	0.062	0.083	0.008	0.013	0.068	0.092	0.116
50-year	0.070	0.091	0.010	0.017	0.076	0.097	0.116
100-year	0.077	0.101	0.012	0.020	0.084	0.107	0.116
Timmins	0.100	-	0.010	-	0.108	-	0.116

The results shown in Table 2 confirm that the proposed condition peak flow rates at the site outlet are maintained below the receiving storm sewer capacity for storms up to and including the 100-year storm event. The water quantity storage volume required to control the 100-year storm is 185 m³ and the system provides 195 m³.



Table 3: Stage-Storage Summary

ELEV.	HEAD	DISCHARGE	VOLUME	ELEV.	HEAD	DISCHARGE	VOLUME
(m)	(m)	(m ³ /s)	(m ³)	(m)	(m)	(m ³ /s)	(m ³)
195.43¹	0.00	0.000	0.0	196.08	0.65	0.073	100.5
195.48	0.05	0.002	7.3	196.13	0.70	0.077	109.3
195.53	0.10	0.009	14.5	196.18	0.75	0.080	118.2
195.58	0.15	0.021	21.8	196.23	0.80	0.083	127.2
195.63	0.20	0.030	29.3	196.28	0.85	0.086	136.2
195.68	0.25	0.038	36.9	196.33	0.90	0.089	145.2
195.73	0.30	0.044	44.7	196.38	0.95	0.091	144.6
195.78	0.35	0.049	52.5	196.43	1.00	0.094	154.1
195.83	0.40	0.054	60.4	196.48	1.05	0.097	170.6
195.88	0.45	0.058	68.4	196.53	1.10	0.099	177.8
195.93	0.50	0.062	76.3	196.58	1.15	0.102	185.1
195.98	0.55	0.066	84.2	196.63	1.20	0.104	192.4
196.03	0.60	0.070	92.0	196.66²	1.25	0.105	195.1

1. Underground Storage System Invert - 195.43

2. Maximum Underground Storage System Water Level - 196.65

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

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

- a 300 mm dia. PVC pipe outletting from the underground storage system discharging to the Alice Street West storm sewer network; and
- a 213 mm orifice at the outlet set at the underground storage system invert of 195.43m.



4.3.1 Tailwater Analysis

The quantity control strategy for this development depends on the downstream storm sewer system and therefore the potential tailwater impacts from the downstream storm sewer must be considered. To evaluate this impact, a PCSWMM hydrologic/hydraulic model was created to analyze the storm sewer system from Alice Street to the Beaver River. This model includes the proposed storm sewer upgrades on Alice Street and Elma Street. The catchment encompassing the 24 Alfred Street development area was conservatively assumed to be 50% impervious. Based on this model, the downstream storm sewer system has ample capacity and the tailwater will have a very minor impact on the stage-storage-discharge relationship. For each storm event, the water surface elevations from the PCSWMM model for the downstream storm sewer and the water surface elevations from the VO model for the underground storage units were used to analyze the outlet pipe capacity in HY-8. The following tables summarize the respective water elevations in the storm sewer and the underground storage system for each storm event and the modelled discharge versus the downstream pipe capacity.

Table 4: Water Surface Elevation Summary

STORM EVENT	WATER SURFACE ELEVATION AT ALICE STREET ¹		WATER SURFACE ELEVATION IN UNDERGROUND STORAGE ²	
	Chicago	SCS 24-Hour	Chicago	SCS 24-Hour
2-year	195.54	195.56	195.65	195.72
5-year	195.59	195.60	195.73	195.87
10-year		195.63	195.79	196.01
25-year	195.68	195.68	195.90	196.21
50-year		195.71	196.01	196.36
100-year	195.92	195.74	196.12	196.57

1. Water surface elevation from PCSWMM model results at Alice Street connection.

2. Water surface elevation based on VO model results and stage-storage-discharge relationship.



Table 5: Discharge Capacity Summary

STORM EVENT	ORIFICE DISCHARGE FROM UNDERGROUND STORAGE (m ³ /s)		HY-8 ANALYSIS FOR 300 mm DIA. OUTLET PIPE (m ³ /s) CAPACITY ¹	
	Chicago	24 Hour SCS	Chicago	24 Hour SCS
2-year	0.033	0.042	>0.04	>0.06
5-year	0.044	0.057	>0.06	>0.10
10-year	0.050	0.068	>0.08	>0.12
25-year	0.060	0.081	>0.09	>0.14
50-year	0.068	0.090	>0.11	>0.16
100-year	0.076	0.101	>0.09	>0.18

1. HY-8 analysis presents capacity for 300 mm diameter outlet pipe with the headwater elevation corresponding to the water surface elevation in the underground storage units and the tailwater elevation corresponding to the water surface elevation at the connecting manhole on Alice Street.

The digital PCSWMM and HY-8 models are included with this submission for reference and the PCSWMM and HY-8 summary results for the 100-year 24 hour SCS event and the 100-year Chicago storm event are included in Appendix D.

4.3.2 Emergency Overland Flow

The internal storm sewer network has been sized for the 100-year storm to adequately convey runoff from major storm events into the underground storage system. However, in the event of a storm exceeding the capacity or a blockage in the internal storm sewer network, emergency overland flows will spill overland onto Alice Street West which ultimately will drain into the Beaver River. The maximum ponding depth within the subject site will be 250 mm. Refer to drawing *STM01 – Storm Drainage Plan* for further details pertaining to overland flow routes and the limits of ponding.

The northeast road entrance to the subject property line will allow for peak weir flow of 0.128 m³/s at 50 mm of depth, which can accommodate a 50% blockage in the modelled 100-year storm peak flows of 0.124 m³/s. Refer to the Post-Development Drainage Plan (DP02) and the Plan and Profile (PP01) drawings for proposed drainage patterns. Weir flow calculations are detailed in Appendix C.



4.4 WATER QUALITY

An oil and grit separator designed to provide at least 80% total solids removal and treatment of 90% of the surface runoff generated from its contributing drainage area will be installed downstream of the underground storage system. A Stormceptor EFO6 treatment unit or approved equal is proposed to provide primary quality control for the site. The Stormceptor EFO6 treatment unit has been sized by using the ETV verified sizing tool available from the manufacturer. This treatment unit will provide 80% total suspended solids removal for the site. The Stormceptor provides the treatment required to satisfy Provincial standards for enhanced quality control. The Stormceptor EFO sizing calculations are attached in Appendix E for reference. The location of the oil and grit separator is illustrated on the Site Servicing Drawing (SS01).

Catchment 202 will consist of primarily grassed and roof areas that drain uncontrolled to a rear yard swale, and Alice Street West. Note that specific water quality controls are not required for Catchment 202, as this area primarily consists of grassed areas, which is considered clean runoff.

4.5 GROUNDWATER

A geotechnical investigation, submitted under separate cover, was completed by Cambium Inc. dated November 19, 2021. Fieldwork was conducted on August 27, 2021, consisting of four exploratory sampled boreholes. The geotechnical investigation established that all four borehole locations were dry upon drilling. Borehole BH102-21 was outfitted as a monitoring well and recorded a groundwater level 4 m below grade (193.26). The underground storage system invert is set to 195.43, 2.17 m above the measured groundwater level.



5 Siltation & Erosion Plan

Siltation and erosion controls will be implemented for all construction activities, including topsoil stripping, material stockpiling, road construction and grading operations as per ESC01 and ESC02. Detailed erosion and sediment control measures to be implemented during and after construction are summarized as follows:

- heavy duty silt fence will be erected before the commencement of any grading operations to control sediment movement;
- a construction vehicle entrance will be constructed and maintained consisting of a stone mud mat to reduce off-site tracking of material;
- regular inspection of control measures will be instituted, and repairs will be made as necessary;
- temporary swales, sediment trap and rock flow check dam will be constructed to control runoff during construction; and
- long term siltation and erosion control will be enhanced with a revegetation strategy for disturbed areas.



6 Summary

As outlined above, the applicable runoff, quantity, quality, and erosion targets of the proposed 24 Alfred Street Development in the Town of Thornbury will be met. A summary of the SWM servicing strategy is as follows:

- Enhanced water quality protection will be provided by Stormsceptor EFO6 unit downstream of the internal storm sewer network and underground storage system.
- Existing drainage patterns will generally be maintained, with stormwater runoff directed via storm sewers and the road network to a proposed underground storage facility to provide quantity control for the site. Stormwater runoff will be controlled to the 5-year storm capacity of the receiving storm sewer on Alice Street.
- Emergency overland flow routes will be conveyed south towards Alice Street West. The maximum ponding depth will not exceed 250 mm.
- Siltation and erosion controls will be implemented for all construction activities, including topsoil stripping, material stockpiling, road construction and grading operations as per Drawings ESC01 and ESC02.



Appendix A: Pre-Development SWM Calculations

Active coordinate

44° 33' 45" N, 80° 27' 14" W (44.562500,-80.454167)

Retrieved: Tue, 14 Dec 2021 21:20:12 GMT



Location summary

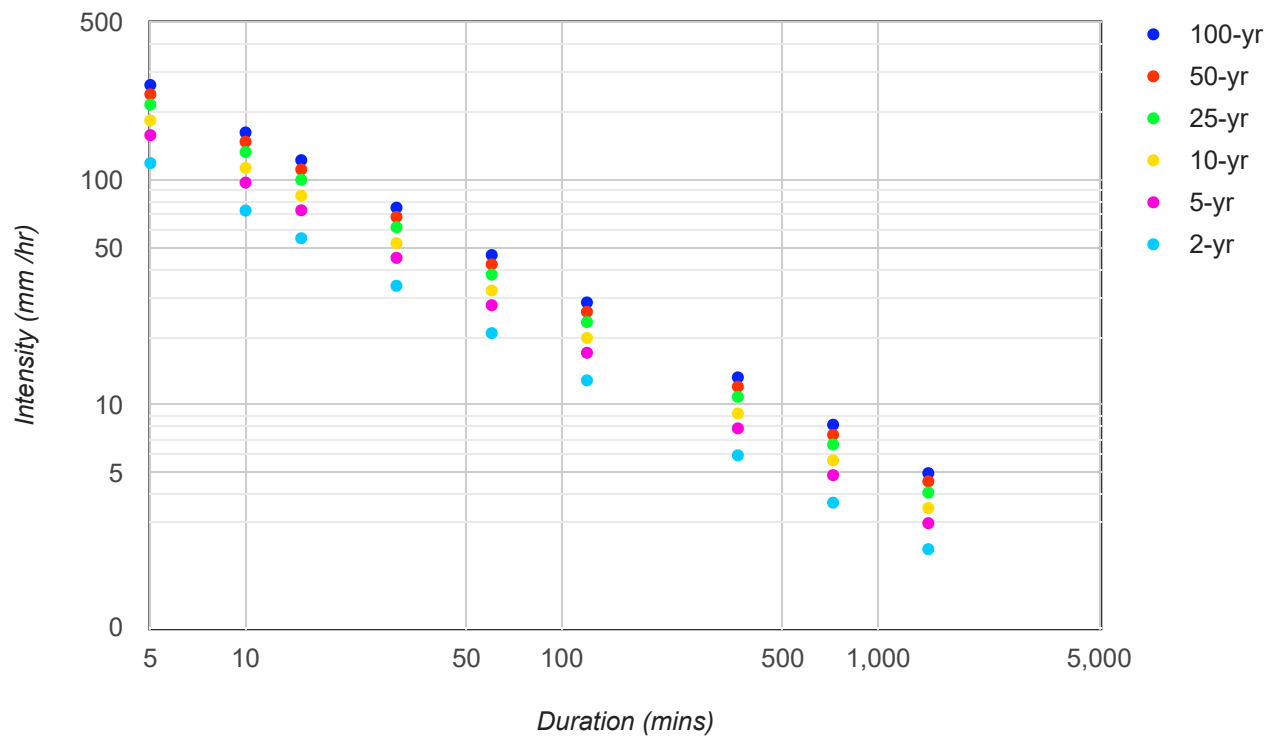
These are the locations in the selection.

IDF Curve: 44° 33' 45" N, 80° 27' 14" W (44.562500,-80.454167)

Results

An IDF curve was found.

Coordinate: 44.562500, -80.454167
IDF curve year: 2010



Coefficient summary

IDF Curve: 44° 33' 45" N, 80° 27' 14" W (44.562500,-80.454167)

Retrieved: Tue, 14 Dec 2021 21:20:12 GMT

Data year: 2010

IDF curve year: 2010

Return period	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
A	20.9	27.8	32.3	38.0	42.2	46.4
B	-0.699	-0.699	-0.699	-0.699	-0.699	-0.699

Statistics

Rainfall intensity (mm hr⁻¹)

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	118.7	73.1	55.1	33.9	20.9	12.9	6.0	3.7	2.3
5-yr	157.9	97.3	73.3	45.1	27.8	17.1	7.9	4.9	3.0
10-yr	183.5	113.0	85.1	52.4	32.3	19.9	9.2	5.7	3.5
25-yr	215.8	133.0	100.1	61.7	38.0	23.4	10.9	6.7	4.1
50-yr	239.7	147.7	111.2	68.5	42.2	26.0	12.1	7.4	4.6
100-yr	263.6	162.3	122.3	75.3	46.4	28.6	13.3	8.2	5.0

Rainfall depth (mm)

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	9.9	12.2	13.8	17.0	20.9	25.7	35.8	44.2	54.4
5-yr	13.2	16.2	18.3	22.6	27.8	34.2	47.7	58.7	72.4
10-yr	15.3	18.8	21.3	26.2	32.3	39.8	55.4	68.2	84.1
25-yr	18.0	22.2	25.0	30.8	38.0	46.8	65.2	80.3	98.9
50-yr	20.0	24.6	27.8	34.3	42.2	52.0	72.4	89.2	109.8
100-yr	22.0	27.1	30.6	37.7	46.4	57.2	79.6	98.0	120.8

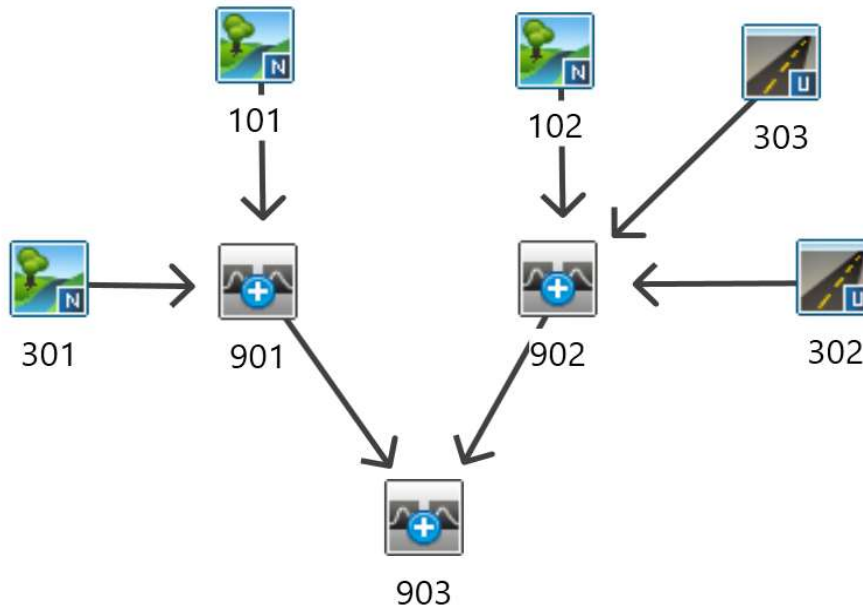
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Last Modified: September 2016

24 ALFRED STREET DEVELOPMENT PRE CONDITIONS



Nashyd



Route Pipe



Duhyd



Standhyd



Route Channel



Diverthyd



Addhyd



Route Reservoir



Project: 24 Alfred Street Development

File No.: 121108

Subject: Otthymo Flow Schematic

Date: May-22

Visual OTTHYMO Model Parameter Calculations (NasHYD)

Project Details

24 Alfred Street	121108
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Data Sources

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

Prepared By

Kyle Gowanlock	May 25, 2021
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Pre-Development Condition

Watershed:	GSCA
Catchment ID:	101
Catchment Area (ha):	0.38
Impervious %:	

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

Soil Symbol		Brs											
Soil Series		Brighton											
Hydrologic Soils Group		A											
Soil Texture		Sand											
Runoff Coefficient Type		1											
Area (ha)		0.38											
Percentage of Catchment		100%											
Land Cover Category	IA	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C
Impervious	2		100	0.95									
Gravel	3		89	0.09									
Woodland	10		32	0.08									
Pasture/Lawns	5		49	0.10									
Meadows	8	0.38	38	0.09									
Cultivated	7		62	0.22									
Waterbody	12		50	0.05									
Average CN		38.00											
Average C		0.09											
Average IA		8.00											

Time to Peak Calculations

Max. Catchment Elev. (m):	199.30
Min. Catchment Elev. (m):	198.30
Catchment Length (m):	95
Catchment Slope (%):	1.05%
Method: Airport Method	
Time of Concentration (mins):	31.55

Summary

Catchment CN:	38.0
Catchment C:	0.09
Catchment IA (mm):	8.00
Time of Concentration (hrs):	0.53
Catchment Time to Peak (hrs):	0.35
Catchment Time Step (mins):	4.21

Visual OTTHYMO Model Parameter Calculations (NasHYD)

Project Details

24 Alfred Street	121108
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Data Sources

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

Prepared By

Kyle Gowanlock	May 25, 2021
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Pre-Development Condition

Watershed:	GSCA
Catchment ID:	102
Catchment Area (ha):	0.71
Impervious %:	4%

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

Soil Symbol		Brs											
Soil Series		Brighton											
Hydrologic Soils Group		A											
Soil Texture		Sand											
Runoff Coefficient Type		1											
Area (ha)		0.71											
Percentage of Catchment		100%											
Land Cover Category	IA	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C
Impervious	2	0.03	100	0.95									
Gravel	3		89	0.09									
Woodland	10		32	0.08									
Pasture/Lawns	5	0.03	49	0.10									
Meadows	8	0.65	38	0.09									
Cultivated	7		62	0.22									
Waterbody	12		50	0.05									
Average CN		41.08											
Average C		0.13											
Average IA		7.62											

Time to Peak Calculations

Max. Catchment Elev. (m):	199.20
Min. Catchment Elev. (m):	197.20
Catchment Length (m):	89
Catchment Slope (%):	2.25%
Method: Airport Method	
Time of Concentration (mins):	22.91

Summary

Catchment CN:	41.1
Catchment C:	0.13
Catchment IA (mm):	7.62
Time of Concentration (hrs):	0.38
Catchment Time to Peak (hrs):	0.25
Catchment Time Step (mins):	3.06

Visual OTTHYMO Model Parameter Calculations (NasHYD)

Project Details

24 Alfred Street	121108
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Data Sources

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

Prepared By

Kyle Gowanlock	May 25, 2021
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Pre-Development Condition

Watershed:	GSCA
Catchment ID:	301
Catchment Area (ha):	0.53
Impervious %:	16%

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

Soil Symbol		Brs											
Soil Series		Brighton											
Hydrologic Soils Group		A											
Soil Texture		Sand											
Runoff Coefficient Type		1											
Area (ha)		0.53											
Percentage of Catchment		100%											
Land Cover Category	IA	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C
Impervious	2	0.09	100	0.95									
Gravel	3		89	0.09									
Woodland	10		32	0.08									
Pasture/Lawns	5	0.44	49	0.10									
Meadows	8		38	0.09									
Cultivated	7		62	0.22									
Waterbody	12		50	0.05									
Average CN		57.66											
Average C		0.24											
Average IA		4.49											

Time to Peak Calculations

Max. Catchment Elev. (m):	200.00
Min. Catchment Elev. (m):	198.50
Catchment Length (m):	65
Catchment Slope (%):	2.31%
Method:	Airport Method
Time of Concentration (mins):	17.07

Summary

Catchment CN:	57.7
Catchment C:	0.24
Catchment IA (mm):	4.49
Time of Concentration (hrs):	0.28
Catchment Time to Peak (hrs):	0.19
Catchment Time Step (mins):	2.28

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

24 Alfred Street	121108
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Data Sources

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

Prepared By

Kyle Gowanlock	May 25, 2022
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Post Development Condition

Watershed:	GSCA
Catchment ID:	302
Catchment Area (ha):	0.50
Impervious %:	22%
Pervious Area (ha):	0.39

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

Soil Symbol		Brs							
Soil Series		Brighton							
Hydrologic Soils Group		A							
Soil Texture		Sand							
Runoff Coefficient Type		1							
Area (ha)		0.39							
Percentage of Catchment		100%							
Land Cover Category	IA	A (ha)	CN	A (ha)	CN	A (ha)	CN	A (ha)	CN
Impervious	2		100						
Gravel	3		89						
Woodland	10		32						
Pasture/Lawns	5	0.39	49						
Meadows	8		38						
Cultivated	7		62						
Waterbody	12		50						
Average CN		49.00							
Average IA		5.00							

Notes

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

Summary

Catchment CN:	49.0
Catchment IA (mm):	5.00

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

24 Alfred Street	121108
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Data Sources

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

Prepared By

Kyle Gowanlock	May 25, 2022
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Post Development Condition

Watershed:	GSCA
Catchment ID:	303
Catchment Area (ha):	0.11
Impervious %:	37%
Pervious Area (ha):	0.07

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

Soil Symbol		Brs							
Soil Series		Brighton							
Hydrologic Soils Group		A							
Soil Texture		Sand							
Runoff Coefficient Type		1							
Area (ha)		0.07							
Percentage of Catchment		100%							
Land Cover Category	IA	A (ha)	CN	A (ha)	CN	A (ha)	CN	A (ha)	CN
Impervious	2		100						
Gravel	3		89						
Woodland	10		32						
Pasture/Lawns	5	0.07	49						
Meadows	8		38						
Cultivated	7		62						
Waterbody	12		50						
Average CN		49.00							
Average IA		5.00							

Notes

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

Summary

Catchment CN:	49.0
Catchment IA (mm):	5.00

=====

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

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

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***** D E T A I L E D O U T P U T *****

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Output filename:
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Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\4
33f77ad-c386-4d5b-a968-62df5ce206e7\s

DATE: 05-26-2022 TIME: 10:06:17

USER:

COMMENTS: _____

** SIMULATION : 1. 25mm **

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| | ata\Local\Temp\

| c5c57d6c-128b-4dfd-88fd-24d73e0f5134\4e593644d
| Ptotal= 24.97 mm | Comments: 25MM BARRIE

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.10	0.00	1.20	2.81	2.30	8.44	3.40	1.76
0.20	1.29	1.30	3.22	2.40	6.21	3.50	1.65
0.30	1.36	1.40	3.77	2.50	4.91	3.60	1.55
0.40	1.44	1.50	4.55	2.60	4.06	3.70	1.46
0.50	1.53	1.60	5.77	2.70	3.47	3.80	1.39
0.60	1.63	1.70	7.86	2.80	3.03	3.90	1.32
0.70	1.75	1.80	12.27	2.90	2.70	4.00	1.26
0.80	1.89	1.90	26.17	3.00	2.43	4.10	1.20
0.90	2.06	2.00	72.58	3.10	2.22		
1.00	2.26	2.10	26.96	3.20	2.04		
1.10	2.50	2.20	13.05	3.30	1.89		

| CALIB |
| NASHYD (0101) | Area (ha)= 0.38 Curve Number (CN)= 38.0
| ID= 1 DT= 5.0 min | Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
| U.H. Tp(hrs)= 0.35

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.001 (i)
TIME TO PEAK (hrs)= 2.500
RUNOFF VOLUME (mm)= 0.663
TOTAL RAINFALL (mm)= 24.951
RUNOFF COEFFICIENT = 0.027

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

| CALIB |
| NASHYD (0301) | Area (ha)= 0.53 Curve Number (CN)= 57.2
| ID= 1 DT= 5.0 min | Ia (mm)= 4.52 # of Linear Res.(N)= 3.00
| U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.004 (i)
TIME TO PEAK (hrs)= 2.167
RUNOFF VOLUME (mm)= 1.975
TOTAL RAINFALL (mm)= 24.951
RUNOFF COEFFICIENT = 0.079

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

ADD HYD (0901)				
1 + 2 = 3				

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0101):	0.38	0.001	2.50	0.66
+ ID2= 2 (0301):	0.53	0.004	2.17	1.97
=====				
ID = 3 (0901):	0.91	0.004	2.25	1.43

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB				
NASHYD (0102)				
ID= 1 DT= 5.0 min				

	Area	(ha)=	0.71	Curve Number (CN)= 41.1
	Ia	(mm)=	7.60	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.25		

Unit Hyd Qpeak (cms)= 0.108

PEAK FLOW (cms)= 0.002 (i)
TIME TO PEAK (hrs)= 2.333
RUNOFF VOLUME (mm)= 0.788
TOTAL RAINFALL (mm)= 24.951
RUNOFF COEFFICIENT = 0.032

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

CALIB				
STANDHYD (0303)				
ID= 1 DT= 5.0 min				

	Area	(ha)=	0.11	
	Total Imp(%)=	37.00	Dir. Conn.(%)=	0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)= 0.04	0.07
Dep. Storage	(mm)= 2.00	5.00
Average Slope	(%)= 2.00	1.00
Length	(m)= 27.08	20.00
Mannings n	= 0.013	0.250

Max.Eff.Inten.(mm/hr)=	72.58	6.39
over (min)	5.00	20.00
Storage Coeff. (min)=	1.08 (ii)	18.31 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.34	0.06

TOTALS

PEAK FLOW	(cms)=	0.00	0.00	0.001 (iii)
TIME TO PEAK	(hrs)=	2.00	2.33	2.33
RUNOFF VOLUME	(mm)=	22.95	2.52	2.41
TOTAL RAINFALL	(mm)=	24.95	24.95	24.95
RUNOFF COEFFICIENT	=	0.92	0.10	0.10

***** 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* = 49.0 Ia = Dep. 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 (0302)				
ID= 1 DT= 5.0 min				

	Area	(ha)=	0.50	
	Total Imp(%)=	22.00	Dir. Conn.(%)=	0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)= 0.11	0.39
Dep. Storage	(mm)= 2.00	5.00
Average Slope	(%)= 2.00	3.00
Length	(m)= 57.74	75.00
Mannings n	= 0.013	0.250

Max.Eff.Inten.(mm/hr)=	72.58	2.62
over (min)	5.00	45.00
Storage Coeff. (min)=	1.70 (ii)	40.79 (ii)
Unit Hyd. Tpeak (min)=	5.00	45.00
Unit Hyd. peak (cms)=	0.32	0.03

TOTALS

PEAK FLOW	(cms)=	0.00	0.00	0.002 (iii)
TIME TO PEAK	(hrs)=	2.00	2.75	2.75
RUNOFF VOLUME	(mm)=	22.95	1.95	1.92
TOTAL RAINFALL	(mm)=	24.95	24.95	24.95
RUNOFF COEFFICIENT	=	0.92	0.08	0.08

***** 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* = 49.0 Ia = Dep. 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 (0902):	AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1	(ha)	(cms)	(hrs)	(mm)

ID1= 3 (0902):	1.21	0.003	2.67	1.26
+ ID2= 2 (0303):	0.11	0.001	2.33	2.41
=====				
ID = 1 (0902):	1.32	0.003	2.42	1.35

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

V	V	I	SSSSS	U	U	A	L													(v 6.1.2001)
V	V	I	SS	U	U	A	A	L												
V	V	I	SS	U	U	AAAA	L													
V	V	I	SS	U	U	A	A	L												
V	V	I	SSSSS	UUUUU	A	A	LLLLL													
000	TTTT	TTTT	H	H	Y	Y	M	M	000											TM
0	0	T	T	H	H	Y	Y	MM	MM	0	0									
0	0	T	T	H	H	Y	Y	M	M	0	0									

COMMENTS: _____

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.17	2.76	1.17	12.83	2.17	5.19	3.17	3.02
0.33	3.08	1.33	73.13	2.33	4.58	3.33	2.84
0.50	3.51	1.50	15.38	2.50	4.12	3.50	2.69
0.67	4.13	1.67	9.64	2.67	3.76	3.67	2.56

0.83	5.11	1.83	7.34	2.83	3.47	3.83	2.44
1.00	6.98	2.00	6.04	3.00	3.23	4.00	2.33

CALIB							
NASHYD (0101)	Area (ha)=	0.38	Curve Number (CN)=	38.0			
ID= 1 DT= 5.0 min	Ia (mm)=	8.00	# of Linear Res.(N)=	3.00			
	U.H. Tp(hrs)=	0.35					

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.001 (i)
 TIME TO PEAK (hrs)= 1.833
 RUNOFF VOLUME (mm)= 1.279
 TOTAL RAINFALL (mm)= 31.693
 RUNOFF COEFFICIENT = 0.040

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

CALIB							
NASHYD (0301)	Area (ha)=	0.53	Curve Number (CN)=	57.2			
ID= 1 DT= 5.0 min	Ia (mm)=	4.52	# of Linear Res.(N)=	3.00			
	U.H. Tp(hrs)=	0.19					

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.005 (i)
 TIME TO PEAK (hrs)= 1.500
 RUNOFF VOLUME (mm)= 3.385
 TOTAL RAINFALL (mm)= 31.693
 RUNOFF COEFFICIENT = 0.107

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

ADD HYD (0901)					
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.	
	(ha)	(cms)	(hrs)	(mm)	
ID1= 1 (0101):	0.38	0.001	1.83	1.28	
+ ID2= 2 (0301):	0.53	0.005	1.50	3.39	
ID = 3 (0901):	0.91	0.005	1.50	2.51	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB							
NASHYD (0102)	Area (ha)=	0.71	Curve Number (CN)=	41.1			
ID= 1 DT= 5.0 min	Ia (mm)=	7.60	# of Linear Res.(N)=	3.00			
	U.H. Tp(hrs)=	0.25					

Unit Hyd Qpeak (cms)= 0.108

PEAK FLOW (cms)= 0.002 (i)
 TIME TO PEAK (hrs)= 1.583
 RUNOFF VOLUME (mm)= 1.492
 TOTAL RAINFALL (mm)= 31.693
 RUNOFF COEFFICIENT = 0.047

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

CALIB							
STANDHYD (0303)	Area (ha)=	0.11					
ID= 1 DT= 5.0 min	Total Imp(%)=	37.00	Dir. Conn.(%)=	0.10			

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.04	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	1.00
Length (m)=	27.08	20.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	73.13	9.27
over (min)	5.00	20.00
Storage Coeff. (min)=	1.07 (ii)	15.92 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.34	0.07

TOTALS

PEAK FLOW (cms)=	0.00	0.00	0.001 (iii)
TIME TO PEAK (hrs)=	1.33	1.58	1.58
RUNOFF VOLUME (mm)=	29.69	4.17	4.12
TOTAL RAINFALL (mm)=	31.69	31.69	31.69
RUNOFF COEFFICIENT =	0.94	0.13	0.13

***** 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* = 49.0 Ia = Dep. 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 ( 0302) | Area (ha)= 0.50
| ID= 1 DT= 5.0 min | Total Imp(%)= 22.00 Dir. Conn.(%)= 0.10
-----
```

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.11	0.39
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	57.74	75.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	73.13	3.62
over (min)	5.00	40.00
Storage Coeff. (min)=	1.69 (ii)	36.07 (ii)
Unit Hyd. Tpeak (min)=	5.00	40.00
Unit Hyd. peak (cms)=	0.32	0.03

		TOTALS
PEAK FLOW (cms)=	0.00	0.00
TIME TO PEAK (hrs)=	1.33	2.00
RUNOFF VOLUME (mm)=	29.69	3.28
TOTAL RAINFALL (mm)=	31.69	31.69
RUNOFF COEFFICIENT =	0.94	0.10

***** 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* = 49.0 Ia = Dep. 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 ( 0902) |
| 1 + 2 = 3 |
-----
ID1= 1 ( 0102): AREA QPEAK TPEAK R.V.
              (ha) (cms) (hrs) (mm)
+ ID2= 2 ( 0302): 0.71 0.002 1.58 1.49
=====
ID = 3 ( 0902): 1.21 0.004 1.92 2.23
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| ADD HYD ( 0902) |
| 3 + 2 = 1 |
-----
ID1= 3 ( 0902): AREA QPEAK TPEAK R.V.
              (ha) (cms) (hrs) (mm)
+ ID2= 2 ( 0303): 0.11 0.001 1.58 4.12
=====
ID = 1 ( 0902): 1.32 0.004 1.83 2.39
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| ADD HYD ( 0903) |
| 1 + 2 = 3 |
-----
ID1= 1 ( 0901): AREA QPEAK TPEAK R.V.
              (ha) (cms) (hrs) (mm)
+ ID2= 2 ( 0902): 0.91 0.005 1.50 2.51
=====
ID = 3 ( 0903): 2.23 0.009 1.58 2.44
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

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

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\V02\voin.dat

Output filename:
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Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\d
f0032bf-4fb8-4d6c-bf85-2b9b3fcb00f\s

DATE: 05-26-2022

TIME: 10:06:17

USER:

COMMENTS: _____

** SIMULATION : 3.5yr - Chicago **

CHICAGO STORM | IDF curve parameters: A= 486.376
Ptotal= 42.16 mm | B= 0.000
C= 0.699
used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.35

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.17	3.67	1.17	17.07	2.17	6.90	3.17	4.02
0.33	4.09	1.33	97.27	2.33	6.09	3.33	3.78
0.50	4.67	1.50	20.46	2.50	5.48	3.50	3.58
0.67	5.50	1.67	12.83	2.67	5.00	3.67	3.40
0.83	6.80	1.83	9.76	2.83	4.61	3.83	3.24
1.00	9.28	2.00	8.04	3.00	4.29	4.00	3.10

CALIB |
NASHYD (0101) | Area (ha)= 0.38 Curve Number (CN)= 38.0
ID= 1 DT= 5.0 min | Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.35

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.002 (i)

TIME TO PEAK (hrs)= 1.750
RUNOFF VOLUME (mm)= 2.598
TOTAL RAINFALL (mm)= 42.157
RUNOFF COEFFICIENT = 0.062

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

CALIB |
NASHYD (0301) | Area (ha)= 0.53 Curve Number (CN)= 57.2
ID= 1 DT= 5.0 min | Ia (mm)= 4.52 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.009 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 6.197
TOTAL RAINFALL (mm)= 42.157
RUNOFF COEFFICIENT = 0.147

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

ADD HYD (0901) |
1 + 2 = 3 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0101): 0.38 0.002 1.75 2.60
+ ID2= 2 (0301): 0.53 0.009 1.50 6.20
=====

ID = 3 (0901): 0.91 0.010 1.50 4.69

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB |
NASHYD (0102) | Area (ha)= 0.71 Curve Number (CN)= 41.1
ID= 1 DT= 5.0 min | Ia (mm)= 7.60 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.25

Unit Hyd Qpeak (cms)= 0.108

PEAK FLOW (cms)= 0.004 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 2.991
TOTAL RAINFALL (mm)= 42.157
RUNOFF COEFFICIENT = 0.071

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

```
-----
| CALIB |
| STANDHYD ( 0303) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 0.11
Total Imp(%)= 37.00 Dir. Conn.(%)= 0.10

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.04 0.07
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 1.00
Length (m)= 27.08 20.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 97.27 17.03
over (min) 5.00 15.00
Storage Coeff. (min)= 0.96 (ii) 12.60 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.34 0.08

*TOTALS*
PEAK FLOW (cms)= 0.00 0.00 0.002 (iii)
TIME TO PEAK (hrs)= 1.33 1.50 1.50
RUNOFF VOLUME (mm)= 40.16 7.39 7.36
TOTAL RAINFALL (mm)= 42.16 42.16 42.16
RUNOFF COEFFICIENT = 0.95 0.18 0.17
```

***** 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* = 49.0 Ia = Dep. 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 ( 0302) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 0.50
Total Imp(%)= 22.00 Dir. Conn.(%)= 0.10

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.11 0.39
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 3.00
Length (m)= 57.74 75.00
Mannings n = 0.013 0.250
```

```
Max.Eff.Inten.(mm/hr)= 97.27 8.18
over (min) 5.00 30.00
Storage Coeff. (min)= 1.51 (ii) 26.31 (ii)
Unit Hyd. Tpeak (min)= 5.00 30.00
Unit Hyd. peak (cms)= 0.33 0.04
```

TOTALS

```
PEAK FLOW (cms)= 0.00 0.00 0.005 (iii)
TIME TO PEAK (hrs)= 1.33 1.75 1.75
RUNOFF VOLUME (mm)= 40.16 5.98 5.98
TOTAL RAINFALL (mm)= 42.16 42.16 42.16
RUNOFF COEFFICIENT = 0.95 0.14 0.14
```

***** 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* = 49.0 Ia = Dep. 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 ( 0902) |
| 1 + 2 = 3 |
-----
AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 ( 0102): 0.71 0.004 1.58 2.99
+ ID2= 2 ( 0302): 0.50 0.005 1.75 5.98
=====
ID = 3 ( 0902): 1.21 0.009 1.75 4.23
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| ADD HYD ( 0902) |
| 3 + 2 = 1 |
-----
AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 3 ( 0902): 1.21 0.009 1.75 4.23
+ ID2= 2 ( 0303): 0.11 0.002 1.50 7.36
=====
ID = 1 ( 0902): 1.32 0.010 1.67 4.49
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.


```
| ADD HYD ( 0903)|
| 1 + 2 = 3 |
-----
ID1= 1 ( 0901):      AREA   QPEAK   TPEAK   R.V.
                   (ha)   (cms)   (hrs)   (mm)
+ ID2= 2 ( 0902):      0.91   0.010   1.50   4.69
                   1.32   0.010   1.67   4.49
=====
ID = 3 ( 0903):      2.23   0.019   1.58   4.57
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

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

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\V02\voin.dat

Output filename:
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Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\2a675ca-f9d0-4c1c-94db-5d2695eb7c93\s

DATE: 05-26-2022 TIME: 10:06:17

USER:

COMMENTS: _____

```
-----
*****
** SIMULATION : 4.10yr - Chicago **
*****
```

```
-----
| CHICAGO STORM |
| Ptotal= 48.98 mm |
-----
```

IDF curve parameters: A= 565.106
B= 0.000
C= 0.699

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

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.35

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.17	4.26	1.17	19.83	2.17	8.02	3.17	4.67
0.33	4.76	1.33	113.01	2.33	7.08	3.33	4.39
0.50	5.43	1.50	23.78	2.50	6.37	3.50	4.16
0.67	6.39	1.67	14.90	2.67	5.81	3.67	3.95
0.83	7.90	1.83	11.34	2.83	5.36	3.83	3.77
1.00	10.78	2.00	9.34	3.00	4.98	4.00	3.60

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

Area (ha)= 0.38 Curve Number (CN)= 38.0
Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.35

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.002 (i)
TIME TO PEAK (hrs)= 1.750
RUNOFF VOLUME (mm)= 3.685
TOTAL RAINFALL (mm)= 48.980
RUNOFF COEFFICIENT = 0.075

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

```
-----
| CALIB |
| NASHYD ( 0301)|
| ID= 1 DT= 5.0 min |
-----
```

Area (ha)= 0.53 Curve Number (CN)= 57.2
Ia (mm)= 4.52 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.012 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 8.397
TOTAL RAINFALL (mm)= 48.980
RUNOFF COEFFICIENT = 0.171

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

```
-----
| ADD HYD ( 0901) |
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 ( 0101):  0.38  0.002   1.75   3.69
+ ID2= 2 ( 0301):  0.53  0.012   1.50   8.40
=====
ID = 3 ( 0901):  0.91  0.014   1.50   6.43
-----
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| CALIB
| NASHYD ( 0102) | Area (ha)= 0.71 Curve Number (CN)= 41.1
| ID= 1 DT= 5.0 min | Ia (mm)= 7.60 # of Linear Res.(N)= 3.00
| U.H. Tp(hrs)= 0.25
-----
```

Unit Hyd Qpeak (cms)= 0.108

PEAK FLOW (cms)= 0.006 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 4.217
TOTAL RAINFALL (mm)= 48.980
RUNOFF COEFFICIENT = 0.086

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

```
-----
| CALIB
| STANDHYD ( 0303) | Area (ha)= 0.11
| ID= 1 DT= 5.0 min | Total Imp(%)= 37.00 Dir. Conn.(%)= 0.10
-----
          IMPERVIOUS   PERVIOUS (i)
Surface Area (ha)= 0.04 0.07
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 1.00
Length (m)= 27.08 20.00
```

Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 113.01 29.87
over (min) 5.00 15.00
Storage Coeff. (min)= 0.90 (ii) 10.20 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.34 0.09

TOTALS

PEAK FLOW (cms)= 0.00 0.00 0.003 (iii)
TIME TO PEAK (hrs)= 1.33 1.50 1.50
RUNOFF VOLUME (mm)= 46.98 9.88 9.87
TOTAL RAINFALL (mm)= 48.98 48.98 48.98
RUNOFF COEFFICIENT = 0.96 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.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 ( 0302) | Area (ha)= 0.50
| ID= 1 DT= 5.0 min | Total Imp(%)= 22.00 Dir. Conn.(%)= 0.10
-----
```

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.11 0.39
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 3.00
Length (m)= 57.74 75.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 113.01 11.20
over (min) 5.00 25.00
Storage Coeff. (min)= 1.42 (ii) 23.29 (ii)
Unit Hyd. Tpeak (min)= 5.00 25.00
Unit Hyd. peak (cms)= 0.33 0.05

TOTALS

PEAK FLOW (cms)= 0.00 0.01 0.007 (iii)
TIME TO PEAK (hrs)= 1.33 1.67 1.67
RUNOFF VOLUME (mm)= 46.98 8.08 8.09
TOTAL RAINFALL (mm)= 48.98 48.98 48.98
RUNOFF COEFFICIENT = 0.96 0.16 0.17

***** 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* = 49.0 Ia = Dep. 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 (0902)				
1 + 2 = 3				

ID1= 1 (0102):	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
+ ID2= 2 (0302):	0.71	0.006	1.58	4.22
	0.50	0.007	1.67	8.09
=====				
ID = 3 (0902):	1.21	0.013	1.67	5.82

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0902)				
3 + 2 = 1				

ID1= 3 (0902):	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
+ ID2= 2 (0303):	1.21	0.013	1.67	5.82
	0.11	0.003	1.50	9.87
=====				
ID = 1 (0902):	1.32	0.016	1.67	6.15

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0903)				
1 + 2 = 3				

ID1= 1 (0901):	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
+ ID2= 2 (0902):	0.91	0.014	1.50	6.43
	1.32	0.016	1.67	6.15
=====				
ID = 3 (0903):	2.23	0.029	1.58	6.27

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

=====

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

V V I SS U U A A L
V V I SS U U A A A A L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

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

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\VO2\voin.dat

Output filename:
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3ec07cb-d79d-473b-973d-4dcb0e8f9441\s

DATE: 05-26-2022 TIME: 10:06:17

USER:

COMMENTS: _____

** SIMULATION : 5. 25yr - Chicago **

CHICAGO STORM	IDF curve parameters: A= 664.831
Ptotal= 57.62 mm	B= 0.000
	C= 0.699

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

Duration of storm = 4.00 hrs
Storm time step = 10.00 min

Time to peak ratio = 0.35

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.17	5.01	1.17	23.33	2.17	9.44	3.17	5.49
0.33	5.60	1.33	132.96	2.33	8.33	3.33	5.17
0.50	6.39	1.50	27.97	2.50	7.49	3.50	4.89
0.67	7.51	1.67	17.53	2.67	6.84	3.67	4.65
0.83	9.30	1.83	13.35	2.83	6.31	3.83	4.43
1.00	12.69	2.00	10.98	3.00	5.86	4.00	4.24

CALIB
NASHYD (0101) | Area (ha)= 0.38 Curve Number (CN)= 38.0
ID= 1 DT= 5.0 min | Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.35

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.004 (i)
TIME TO PEAK (hrs)= 1.750
RUNOFF VOLUME (mm)= 5.303
TOTAL RAINFALL (mm)= 57.624
RUNOFF COEFFICIENT = 0.092

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

CALIB
NASHYD (0301) | Area (ha)= 0.53 Curve Number (CN)= 57.2
ID= 1 DT= 5.0 min | Ia (mm)= 4.52 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.017 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 11.555
TOTAL RAINFALL (mm)= 57.624
RUNOFF COEFFICIENT = 0.201

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

ADD HYD (0901)

1 + 2 = 3 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0101): 0.38 0.004 1.75 5.30
+ ID2= 2 (0301): 0.53 0.017 1.50 11.56
=====

ID = 3 (0901): 0.91 0.020 1.50 8.94

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
NASHYD (0102) | Area (ha)= 0.71 Curve Number (CN)= 41.1
ID= 1 DT= 5.0 min | Ia (mm)= 7.60 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.25

Unit Hyd Qpeak (cms)= 0.108

PEAK FLOW (cms)= 0.009 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 6.034
TOTAL RAINFALL (mm)= 57.624
RUNOFF COEFFICIENT = 0.105

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

CALIB
STANDHYD (0303) | Area (ha)= 0.11
ID= 1 DT= 5.0 min | Total Imp(%)= 37.00 Dir. Conn.(%)= 0.10

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.04 0.07
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 1.00
Length (m)= 27.08 20.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 132.96 41.36
over (min) 5.00 10.00
Storage Coeff. (min)= 0.85 (ii) 9.01 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.34 0.12

TOTALS

PEAK FLOW (cms)= 0.00 0.01 0.005 (iii)
TIME TO PEAK (hrs)= 1.33 1.42 1.42
RUNOFF VOLUME (mm)= 55.62 13.41 13.40
TOTAL RAINFALL (mm)= 57.62 57.62 57.62
RUNOFF COEFFICIENT = 0.97 0.23 0.23

***** 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* = 49.0 Ia = Dep. 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 ( 0302) | Area (ha)= 0.50
| ID= 1 DT= 5.0 min | Total Imp(%)= 22.00 Dir. Conn.(%)= 0.10
-----
  
```

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.11	0.39
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	57.74	75.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	132.96	17.97
over (min)	5.00	20.00
Storage Coeff. (min)=	1.33 (ii)	19.44 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.33	0.06

TOTALS

PEAK FLOW (cms)=	0.00	0.01	0.012 (iii)
TIME TO PEAK (hrs)=	1.33	1.58	1.58
RUNOFF VOLUME (mm)=	55.62	11.09	11.12
TOTAL RAINFALL (mm)=	57.62	57.62	57.62
RUNOFF COEFFICIENT =	0.97	0.19	0.19

***** 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* = 49.0 Ia = Dep. 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 ( 0902) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
-----
  
```

```

-----
              (ha) (cms) (hrs) (mm)
ID1= 1 ( 0102): 0.71 0.009 1.58 6.03
+ ID2= 2 ( 0302): 0.50 0.012 1.58 11.12
=====
ID = 3 ( 0902): 1.21 0.021 1.58 8.13
-----
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0902) |
| 3 + 2 = 1 | AREA QPEAK TPEAK R.V.
              (ha) (cms) (hrs) (mm)
ID1= 3 ( 0902): 1.21 0.021 1.58 8.13
+ ID2= 2 ( 0303): 0.11 0.005 1.42 13.40
=====
ID = 1 ( 0902): 1.32 0.024 1.58 8.57
-----
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0903) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
              (ha) (cms) (hrs) (mm)
ID1= 1 ( 0901): 0.91 0.020 1.50 8.94
+ ID2= 2 ( 0902): 1.32 0.024 1.58 8.57
=====
ID = 3 ( 0903): 2.23 0.043 1.50 8.72
-----
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

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

```

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

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\VO2\voin.dat

Output filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\f
94b1a15-22d6-4a1d-8918-cd272d257101\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\f
94b1a15-22d6-4a1d-8918-cd272d257101\s

DATE: 05-26-2022

TIME: 10:06:18

USER:

COMMENTS: _____

** SIMULATION : 6. 50yr - Chicago **

CHICAGO STORM | IDF curve parameters: A= 738.312
| Ptotal= 63.99 mm | B= 0.000
C= 0.699
used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.35

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.17	5.56	1.17	25.91	2.17	10.48	3.17	6.10
0.33	6.22	1.33	147.65	2.33	9.25	3.33	5.74
0.50	7.09	1.50	31.06	2.50	8.32	3.50	5.43
0.67	8.34	1.67	19.47	2.67	7.59	3.67	5.16
0.83	10.32	1.83	14.82	2.83	7.00	3.83	4.92
1.00	14.09	2.00	12.20	3.00	6.51	4.00	4.71

CALIB	Area	(ha)	Curve Number	(CN)=
NASHYD (0101)	Ia	(mm)=	8.00	# of Linear Res.(N)= 3.00
ID= 1 DT= 5.0 min	U.H. Tp(hrs)=	0.35		

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.004 (i)
TIME TO PEAK (hrs)= 1.750
RUNOFF VOLUME (mm)= 6.661
TOTAL RAINFALL (mm)= 63.993
RUNOFF COEFFICIENT = 0.104

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

CALIB	Area	(ha)	Curve Number	(CN)=
NASHYD (0301)	Ia	(mm)=	4.52	# of Linear Res.(N)= 3.00
ID= 1 DT= 5.0 min	U.H. Tp(hrs)=	0.19		

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.021 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 14.124
TOTAL RAINFALL (mm)= 63.993
RUNOFF COEFFICIENT = 0.221

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

ADD HYD (0901)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0101):	0.38	0.004	1.75	6.66
+ ID2= 2 (0301):	0.53	0.021	1.50	14.12
ID = 3 (0901):	0.91	0.025	1.50	11.01

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	Area	(ha)	Curve Number	(CN)=
NASHYD (0102)	Ia	(mm)=	7.60	# of Linear Res.(N)= 3.00
ID= 1 DT= 5.0 min	U.H. Tp(hrs)=	0.25		

Unit Hyd Qpeak (cms)= 0.108

PEAK FLOW (cms)= 0.012 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 7.552
TOTAL RAINFALL (mm)= 63.993
RUNOFF COEFFICIENT = 0.118

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

| CALIB |
| STANDHYD (0303) | Area (ha)= 0.11
| ID= 1 DT= 5.0 min | Total Imp(%)= 37.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.04	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	1.00
Length (m)=	27.08	20.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	147.65	50.77
over (min)	5.00	10.00
Storage Coeff. (min)=	0.81 (ii)	8.33 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.34	0.13

			TOTALS
PEAK FLOW (cms)=	0.00	0.01	0.007 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.42
RUNOFF VOLUME (mm)=	61.99	16.27	16.26
TOTAL RAINFALL (mm)=	63.99	63.99	63.99
RUNOFF COEFFICIENT =	0.97	0.25	0.25

***** 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* = 49.0 Ia = Dep. 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 (0302) | Area (ha)= 0.50
| ID= 1 DT= 5.0 min | Total Imp(%)= 22.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.11	0.39
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	57.74	75.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	147.65	22.14
over (min)	5.00	20.00
Storage Coeff. (min)=	1.28 (ii)	17.93 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.33	0.06

			TOTALS
PEAK FLOW (cms)=	0.00	0.02	0.015 (iii)
TIME TO PEAK (hrs)=	1.33	1.58	1.58
RUNOFF VOLUME (mm)=	61.99	13.55	13.57
TOTAL RAINFALL (mm)=	63.99	63.99	63.99
RUNOFF COEFFICIENT =	0.97	0.21	0.21

***** 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* = 49.0 Ia = Dep. 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 (0902) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0102): 0.71 0.012 1.58 7.55
+ ID2= 2 (0302): 0.50 0.015 1.58 13.57
=====

ID = 3 (0902): 1.21 0.027 1.58 10.04

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0902) |
| 3 + 2 = 1 | AREA QPEAK TPEAK R.V.

PEAK FLOW (cms)= 0.006 (i)
TIME TO PEAK (hrs)= 1.750
RUNOFF VOLUME (mm)= 8.153
TOTAL RAINFALL (mm)= 70.362
RUNOFF COEFFICIENT = 0.116

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

CALIB
NASHYD (0301) | Area (ha)= 0.53 Curve Number (CN)= 57.2
ID= 1 DT= 5.0 min | Ia (mm)= 4.52 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.026 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 16.880
TOTAL RAINFALL (mm)= 70.362
RUNOFF COEFFICIENT = 0.240

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

ADD HYD (0901) |
1 + 2 = 3 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0101): 0.38 0.006 1.75 8.15
+ ID2= 2 (0301): 0.53 0.026 1.50 16.88
=====

ID = 3 (0901): 0.91 0.030 1.50 13.24

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
NASHYD (0102) | Area (ha)= 0.71 Curve Number (CN)= 41.1
ID= 1 DT= 5.0 min | Ia (mm)= 7.60 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.25

Unit Hyd Qpeak (cms)= 0.108

PEAK FLOW (cms)= 0.015 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 9.216
TOTAL RAINFALL (mm)= 70.362

RUNOFF COEFFICIENT = 0.131

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

CALIB
STANDHYD (0303) | Area (ha)= 0.11
ID= 1 DT= 5.0 min | Total Imp(%)= 37.00 Dir. Conn.(%)= 0.10

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.04 0.07
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 1.00
Length (m)= 27.08 20.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 162.35 60.93
over (min) 5.00 10.00
Storage Coeff. (min)= 0.78 (ii) 7.77 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.34 0.13

TOTALS

PEAK FLOW (cms)= 0.00 0.01 0.008 (iii)
TIME TO PEAK (hrs)= 1.33 1.42 1.42
RUNOFF VOLUME (mm)= 68.36 19.31 19.31
TOTAL RAINFALL (mm)= 70.36 70.36 70.36
RUNOFF COEFFICIENT = 0.97 0.27 0.27

***** 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* = 49.0 Ia = Dep. 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 (0302) | Area (ha)= 0.50
ID= 1 DT= 5.0 min | Total Imp(%)= 22.00 Dir. Conn.(%)= 0.10

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.11 0.39
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 3.00
Length (m)= 57.74 75.00

Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 162.35 31.07
over (min) 5.00 20.00

Storage Coeff. (min)= 1.23 (ii) 15.77 (ii)

Unit Hyd. Tpeak (min)= 5.00 20.00

Unit Hyd. peak (cms)= 0.33 0.07

TOTALS

PEAK FLOW (cms)= 0.00 0.02 0.020 (iii)

TIME TO PEAK (hrs)= 1.33 1.58 1.58

RUNOFF VOLUME (mm)= 68.36 16.19 16.22

TOTAL RAINFALL (mm)= 70.36 70.36 70.36

RUNOFF COEFFICIENT = 0.97 0.23 0.23

***** 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* = 49.0 Ia = Dep. 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 (0902)|
| 1 + 2 = 3 |

ID1= 1 (0102): 0.71 0.015 1.58 9.22
+ ID2= 2 (0302): 0.50 0.020 1.58 16.22
=====

ID = 3 (0902): 1.21 0.034 1.58 12.11

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0902)|
| 3 + 2 = 1 |

ID1= 3 (0902): 1.21 0.034 1.58 12.11
+ ID2= 2 (0303): 0.11 0.008 1.42 19.31
=====

ID = 1 (0902): 1.32 0.039 1.58 12.71

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0903)|
| 1 + 2 = 3 |

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

ID1= 1 (0901): 0.91 0.030 1.50 13.24
+ ID2= 2 (0902): 1.32 0.039 1.58 12.71
=====

ID = 3 (0903): 2.23 0.067 1.50 12.92

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

V V I SSSS U U A L (v 6.1.2001)
V V I SS U U A A L
V V I SS U U A A A L
V V I SS U U A A L
VV I SSSS UUUU A A LLLL

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

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\V02\voin.dat

Output filename:
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Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\4e5b6a4-f3c5-4631-829b-d0911fc64b5e\s

DATE: 05-26-2022

TIME: 10:06:18

USER:

COMMENTS: _____

** SIMULATION : 8. Timmins **

READ STORM Filename: C:\Users\KGowanlock\AppData
 ata\Local\Temp\
 c5c57d6c-128b-4dfd-88fd-24d73e0f5134\b4fa48b7
Ptotal=193.00 mm Comments: TIMMINS

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

CALIB
NASHYD (0101) | Area (ha)= 0.38 Curve Number (CN)= 38.0
ID= 1 DT= 5.0 min | Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.35

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.014 (i)
TIME TO PEAK (hrs)= 7.083
RUNOFF VOLUME (mm)= 57.082
TOTAL RAINFALL (mm)= 193.000
RUNOFF COEFFICIENT = 0.296

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

CALIB

NASHYD (0301) | Area (ha)= 0.53 Curve Number (CN)= 57.2
ID= 1 DT= 5.0 min | Ia (mm)= 4.52 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.036 (i)
TIME TO PEAK (hrs)= 7.000
RUNOFF VOLUME (mm)= 93.552
TOTAL RAINFALL (mm)= 193.000
RUNOFF COEFFICIENT = 0.485

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

ADD HYD (0901) |
1 + 2 = 3 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0101): 0.38 0.014 7.08 57.08
+ ID2= 2 (0301): 0.53 0.036 7.00 93.55
=====

ID = 3 (0901): 0.91 0.050 7.00 78.32

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
NASHYD (0102) | Area (ha)= 0.71 Curve Number (CN)= 41.1
ID= 1 DT= 5.0 min | Ia (mm)= 7.60 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.25

Unit Hyd Qpeak (cms)= 0.108

PEAK FLOW (cms)= 0.031 (i)
TIME TO PEAK (hrs)= 7.000
RUNOFF VOLUME (mm)= 62.480
TOTAL RAINFALL (mm)= 193.000
RUNOFF COEFFICIENT = 0.324

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

CALIB
STANDHYD (0303) | Area (ha)= 0.11
ID= 1 DT= 5.0 min | Total Imp(%)= 37.00 Dir. Conn.(%)= 0.10

IMPERVIOUS PERVIOUS (i)

Surface Area	(ha)=	0.04	0.07
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	2.00	1.00
Length	(m)=	27.08	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		43.00	43.30
over (min)		5.00	10.00
Storage Coeff. (min)=	1.33 (ii)	9.34 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.33	0.12	
PEAK FLOW (cms)=	0.00	0.01	
TIME TO PEAK (hrs)=	6.25	7.00	
RUNOFF VOLUME (mm)=	191.00	101.08	
TOTAL RAINFALL (mm)=	193.00	193.00	
RUNOFF COEFFICIENT =	0.99	0.52	

TOTALS

0.008 (iii)
7.00
101.13
193.00
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* = 49.0 Ia = Dep. 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 (0302)	Area (ha)=	0.50	
ID= 1 DT= 5.0 min	Total Imp(%)=	22.00	Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.11	0.39
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	57.74	75.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	43.00	31.14
over (min)	5.00	20.00
Storage Coeff. (min)=	2.09 (ii)	16.62 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.31	0.06

TOTALS

0.031 (iii)
7.00
90.41
191.00

TOTAL RAINFALL (mm)=	193.00	193.00	193.00
RUNOFF COEFFICIENT =	0.99	0.47	0.47

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 49.0 Ia = Dep. 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 (0902)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0102):	0.71	0.031	7.00	62.48
+ ID2= 2 (0302):	0.50	0.031	7.00	90.49
ID = 3 (0902):	1.21	0.062	7.00	74.05

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0902)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0902):	1.21	0.062	7.00	74.05
+ ID2= 2 (0303):	0.11	0.008	7.00	101.13
ID = 1 (0902):	1.32	0.070	7.00	76.31

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0903)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0901):	0.91	0.050	7.00	78.32
+ ID2= 2 (0902):	1.32	0.070	7.00	76.31
ID = 3 (0903):	2.23	0.120	7.00	77.13

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

=====

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

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

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\V02\voin.dat

Output filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\ac11df48-558b-42c7-bbe9-798edb1eac42\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\ac11df48-558b-42c7-bbe9-798edb1eac42\s

DATE: 05-26-2022 TIME: 10:08:19

USER:

COMMENTS: _____

** SIMULATION : 1. 2yr - SCS **

| READ STORM | Filename: C:\Users\KGowanlock\AppData\Local\Temp\
|

f3ed7778-9cb3-4f5f-ba44-5cc5049c23cd\8114af7a
| Ptotal= 44.15 mm | Comments: 2yr 12hr 15min SCS

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.25	0.00	3.50	1.77	6.75	7.95	10.00	1.55
0.50	1.10	3.75	1.77	7.00	3.53	10.25	1.55
0.75	1.10	4.00	1.77	7.25	3.53	10.50	0.88
1.00	1.10	4.25	1.77	7.50	2.65	10.75	0.88
1.25	1.10	4.50	2.65	7.75	2.65	11.00	0.88
1.50	1.10	4.75	2.65	8.00	2.65	11.25	0.88
1.75	1.10	5.00	3.53	8.25	2.65	11.50	0.88
2.00	1.10	5.25	3.53	8.50	1.55	11.75	0.88
2.25	1.10	5.50	5.30	8.75	1.55	12.00	0.88
2.50	1.32	5.75	5.30	9.00	1.55	12.25	0.88
2.75	1.32	6.00	21.19	9.25	1.55		
3.00	1.32	6.25	58.28	9.50	1.55		
3.25	1.32	6.50	7.95	9.75	1.55		

| CALIB |
| NASHYD (0101) | Area (ha)= 0.38 Curve Number (CN)= 38.0
| ID= 1 DT= 5.0 min | Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
| U.H. Tp(hrs)= 0.35

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.002 (i)
TIME TO PEAK (hrs)= 6.500
RUNOFF VOLUME (mm)= 2.897
TOTAL RAINFALL (mm)= 44.150
RUNOFF COEFFICIENT = 0.066

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

| CALIB |
| NASHYD (0301) | Area (ha)= 0.53 Curve Number (CN)= 57.2
| ID= 1 DT= 5.0 min | Ia (mm)= 4.52 # of Linear Res.(N)= 3.00
| U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.010 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 6.812
TOTAL RAINFALL (mm)= 44.150

RUNOFF COEFFICIENT = 0.154

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

```
-----
| ADD HYD ( 0901)|
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 ( 0101):  0.38  0.002  6.50  2.90
+ ID2= 2 ( 0301):  0.53  0.010  6.33  6.81
=====
ID = 3 ( 0901):  0.91  0.012  6.33  5.18
-----
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| CALIB
| NASHYD ( 0102)| Area (ha)= 0.71 Curve Number (CN)= 41.1
| ID= 1 DT= 5.0 min | Ia (mm)= 7.60 # of Linear Res.(N)= 3.00
|-----
| U.H. Tp(hrs)= 0.25
|-----
```

Unit Hyd Qpeak (cms)= 0.108

PEAK FLOW (cms)= 0.005 (i)
TIME TO PEAK (hrs)= 6.417
RUNOFF VOLUME (mm)= 3.329
TOTAL RAINFALL (mm)= 44.150
RUNOFF COEFFICIENT = 0.075

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

```
-----
| CALIB
| STANDHYD ( 0303)| Area (ha)= 0.11
| ID= 1 DT= 5.0 min | Total Imp(%)= 37.00 Dir. Conn.(%)= 28.00
|-----
```

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.04	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	1.00
Length (m)=	27.08	20.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	58.28	9.79
over (min)	5.00	20.00
Storage Coeff. (min)=	1.18 (ii)	15.70 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00

Unit Hyd. peak (cms)=	0.33	0.07	
			TOTALS
PEAK FLOW (cms)=	0.00	0.00	0.006 (iii)
TIME TO PEAK (hrs)=	6.25	6.42	6.25
RUNOFF VOLUME (mm)=	42.15	5.84	15.94
TOTAL RAINFALL (mm)=	44.15	44.15	44.15
RUNOFF COEFFICIENT =	0.95	0.13	0.36

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 ( 0302)| Area (ha)= 0.50
| ID= 1 DT= 5.0 min | Total Imp(%)= 22.00 Dir. Conn.(%)= 0.10
|-----
```

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.11	0.39
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	57.74	75.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	58.28	8.47
over (min)	5.00	30.00
Storage Coeff. (min)=	1.85 (ii)	26.31 (ii)
Unit Hyd. Tpeak (min)=	5.00	30.00
Unit Hyd. peak (cms)=	0.32	0.04

			TOTALS
PEAK FLOW (cms)=	0.00	0.01	0.005 (iii)
TIME TO PEAK (hrs)=	6.25	6.67	6.67
RUNOFF VOLUME (mm)=	42.15	6.57	6.57
TOTAL RAINFALL (mm)=	44.15	44.15	44.15
RUNOFF COEFFICIENT =	0.95	0.15	0.15

***** 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* = 49.0 Ia = Dep. 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 (0902)|
1 + 2 = 3
ID1= 1 (0102): 0.71 0.005 6.42 3.33
+ ID2= 2 (0302): 0.50 0.005 6.67 6.57
=====

ID = 3 (0902): 1.21 0.010 6.50 4.67

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0902)|
3 + 2 = 1
ID1= 3 (0902): 1.21 0.010 6.50 4.67
+ ID2= 2 (0303): 0.11 0.006 6.25 15.94
=====

ID = 1 (0902): 1.32 0.012 6.25 5.61

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0903)|
1 + 2 = 3
ID1= 1 (0901): 0.91 0.012 6.33 5.18
+ ID2= 2 (0902): 1.32 0.012 6.25 5.61
=====

ID = 3 (0903): 2.23 0.023 6.25 5.43

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

=====

V	V	I	SSSS	U	U	A	L		(v 6.1.2001)
V	V	I	SS	U	U	A	A	L	
V	V	I	SS	U	U	AAAA	L		
V	V	I	SS	U	U	A	A	L	
V	V	I	SSSS	UUUU	A	A	LLLL		
000	TTTT	TTTT	H	H	Y	Y	M	M	000
O	O	T	T	H	H	Y	Y	MM	MM
O	O	T	T	H	H	Y	M	M	O

000 T T H H Y M M 000
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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\V02\voin.dat

Output filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\7
fb09a8f-0a90-4782-9986-32f655603750\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\7
fb09a8f-0a90-4782-9986-32f655603750\s

DATE: 05-26-2022

TIME: 10:08:19

USER:

COMMENTS: _____

** SIMULATION : 2.5yr - SCS **

| READ STORM |
| |
Ptotal= 58.73 mm

Filename: C:\Users\KGowanlock\AppData\Local\Temp\	
f3ed7778-9cb3-4f5f-ba44-5cc5049c23cd\87569dd0	
Comments: 5yr 12hr 15min SCS	

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.25	0.00	3.50	2.35	6.75	10.57	10.00	2.06
0.50	1.47	3.75	2.35	7.00	4.70	10.25	2.06
0.75	1.47	4.00	2.35	7.25	4.70	10.50	1.17
1.00	1.47	4.25	2.35	7.50	3.52	10.75	1.17
1.25	1.47	4.50	3.52	7.75	3.52	11.00	1.17
1.50	1.47	4.75	3.52	8.00	3.52	11.25	1.17
1.75	1.47	5.00	4.70	8.25	3.52	11.50	1.17

2.00	1.47	5.25	4.70	8.50	2.06	11.75	1.17
2.25	1.47	5.50	7.05	8.75	2.06	12.00	1.17
2.50	1.76	5.75	7.05	9.00	2.06	12.25	1.17
2.75	1.76	6.00	28.19	9.25	2.06		
3.00	1.76	6.25	77.52	9.50	2.06		
3.25	1.76	6.50	10.57	9.75	2.06		

CALIB							
NASHYD (0101)	Area (ha)=	0.38	Curve Number (CN)=	38.0			
ID= 1 DT= 5.0 min	Ia (mm)=	8.00	# of Linear Res.(N)=	3.00			
	U.H. Tp(hrs)=	0.35					

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.004 (i)
TIME TO PEAK (hrs)= 6.500
RUNOFF VOLUME (mm)= 5.529
TOTAL RAINFALL (mm)= 58.730
RUNOFF COEFFICIENT = 0.094

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

CALIB							
NASHYD (0301)	Area (ha)=	0.53	Curve Number (CN)=	57.2			
ID= 1 DT= 5.0 min	Ia (mm)=	4.52	# of Linear Res.(N)=	3.00			
	U.H. Tp(hrs)=	0.19					

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.018 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 11.987
TOTAL RAINFALL (mm)= 58.730
RUNOFF COEFFICIENT = 0.204

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

ADD HYD (0901)							
1 + 2 = 3							
ID1= 1 (0101):	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)			
+ ID2= 2 (0301):	0.38	0.004	6.50	5.53			
	0.53	0.018	6.33	11.99			

=====

ID = 3 (0901): 0.91 0.022 6.33 9.29

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB							
NASHYD (0102)	Area (ha)=	0.71	Curve Number (CN)=	41.1			
ID= 1 DT= 5.0 min	Ia (mm)=	7.60	# of Linear Res.(N)=	3.00			
	U.H. Tp(hrs)=	0.25					

Unit Hyd Qpeak (cms)= 0.108

PEAK FLOW (cms)= 0.010 (i)
TIME TO PEAK (hrs)= 6.417
RUNOFF VOLUME (mm)= 6.287
TOTAL RAINFALL (mm)= 58.730
RUNOFF COEFFICIENT = 0.107

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

CALIB							
STANDHYD (0303)	Area (ha)=	0.11					
ID= 1 DT= 5.0 min	Total Imp(%)=	37.00	Dir. Conn.(%)=	28.00			

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.04	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	1.00
Length (m)=	27.08	20.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)= 77.52 17.48
over (min) 5.00 15.00
Storage Coeff. (min)= 1.05 (ii) 12.57 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.34 0.08

			TOTALS
PEAK FLOW (cms)=	0.01	0.00	0.008 (iii)
TIME TO PEAK (hrs)=	6.25	6.33	6.25
RUNOFF VOLUME (mm)=	56.73	10.34	23.25
TOTAL RAINFALL (mm)=	58.73	58.73	58.73
RUNOFF COEFFICIENT =	0.97	0.18	0.40

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 ( 0302) | Area (ha)= 0.50
| ID= 1 DT= 5.0 min | Total Imp(%)= 22.00 Dir. Conn.(%)= 0.10
=====
                IMPERVIOUS    PERVIOUS (i)
Surface Area (ha)= 0.11 0.39
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 3.00
Length (m)= 57.74 75.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 77.52 17.69
over (min) 5.00 20.00
Storage Coeff. (min)= 1.65 (ii) 19.87 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.32 0.06

                *TOTALS*
PEAK FLOW (cms)= 0.00 0.01 0.012 (iii)
TIME TO PEAK (hrs)= 6.25 6.42 6.42
RUNOFF VOLUME (mm)= 56.73 11.51 11.53
TOTAL RAINFALL (mm)= 58.73 58.73 58.73
RUNOFF COEFFICIENT = 0.97 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.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 ( 0902) |
| 1 + 2 = 3 |
=====
                AREA    QPEAK    TPEAK    R.V.
                (ha)    (cms)    (hrs)    (mm)
ID1= 1 ( 0102): 0.71 0.010 6.42 6.29
+ ID2= 2 ( 0302): 0.50 0.012 6.42 11.53
=====
ID = 3 ( 0902): 1.21 0.022 6.42 8.45

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

| ADD HYD ( 0902) |
| 3 + 2 = 1 |
=====
                AREA    QPEAK    TPEAK    R.V.
                (ha)    (cms)    (hrs)    (mm)
ID1= 3 ( 0902): 1.21 0.022 6.42 8.45
+ ID2= 2 ( 0303): 0.11 0.008 6.25 23.25
=====
ID = 1 ( 0902): 1.32 0.025 6.42 9.69

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

| ADD HYD ( 0903) |
| 1 + 2 = 3 |
=====
                AREA    QPEAK    TPEAK    R.V.
                (ha)    (cms)    (hrs)    (mm)
ID1= 1 ( 0901): 0.91 0.022 6.33 9.29
+ ID2= 2 ( 0902): 1.32 0.025 6.42 9.69
=====
ID = 3 ( 0903): 2.23 0.046 6.33 9.53

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

V V I SSSS U U A L (v 6.1.2001)
V V I SS U U A A L
V V I SS U U A A A A L
V V I SS U U A A L
VV I SSSS UUUU A A LLLL

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

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\V02\voin.dat
Output filename:

C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\1575b38-1348-4a1e-b168-50d64c276ef5\s

Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\1575b38-1348-4a1e-b168-50d64c276ef5\s

DATE: 05-26-2022

TIME: 10:08:19

USER:

COMMENTS: _____

** SIMULATION : 3. 10yr - SCS **

READ STORM	Filename: C:\Users\KGowanlock\AppData\Local\Temp\
	f3ed7778-9cb3-4f5f-ba44-5cc5049c23cd\1d8da1b4
Ptotal= 68.24 mm	Comments: 10yr 12hr 15min SCS

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.25	0.00	3.50	2.73	6.75	12.28	10.00	2.39
0.50	1.71	3.75	2.73	7.00	5.46	10.25	2.39
0.75	1.71	4.00	2.73	7.25	5.46	10.50	1.36
1.00	1.71	4.25	2.73	7.50	4.09	10.75	1.36
1.25	1.71	4.50	4.09	7.75	4.09	11.00	1.36
1.50	1.71	4.75	4.09	8.00	4.09	11.25	1.36
1.75	1.71	5.00	5.46	8.25	4.09	11.50	1.36
2.00	1.71	5.25	5.46	8.50	2.39	11.75	1.36
2.25	1.71	5.50	8.19	8.75	2.39	12.00	1.36
2.50	2.05	5.75	8.19	9.00	2.39	12.25	1.36
2.75	2.05	6.00	32.76	9.25	2.39		
3.00	2.05	6.25	90.08	9.50	2.39		
3.25	2.05	6.50	12.28	9.75	2.39		

CALIB	
NASHYD (0101)	Area (ha)= 0.38 Curve Number (CN)= 38.0

ID= 1 DT= 5.0 min	Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.35	

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW	(cms)= 0.005 (i)
TIME TO PEAK	(hrs)= 6.500
RUNOFF VOLUME	(mm)= 7.642
TOTAL RAINFALL	(mm)= 68.240
RUNOFF COEFFICIENT	= 0.112

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

CALIB	
NASHYD (0301)	Area (ha)= 0.53 Curve Number (CN)= 57.2
ID= 1 DT= 5.0 min	Ia (mm)= 4.52 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.19	

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW	(cms)= 0.025 (i)
TIME TO PEAK	(hrs)= 6.333
RUNOFF VOLUME	(mm)= 15.942
TOTAL RAINFALL	(mm)= 68.240
RUNOFF COEFFICIENT	= 0.234

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

ADD HYD (0901)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0101):	0.38	0.005	6.50	7.64
+ ID2= 2 (0301):	0.53	0.025	6.33	15.94
=====				
ID = 3 (0901):	0.91	0.029	6.33	12.48

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	
NASHYD (0102)	Area (ha)= 0.71 Curve Number (CN)= 41.1
ID= 1 DT= 5.0 min	Ia (mm)= 7.60 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.25	

Unit Hyd Qpeak (cms)= 0.108

PEAK FLOW (cms)= 0.014 (i)
TIME TO PEAK (hrs)= 6.417
RUNOFF VOLUME (mm)= 8.646
TOTAL RAINFALL (mm)= 68.240
RUNOFF COEFFICIENT = 0.127

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

| CALIB |
| STANDHYD (0303) | Area (ha)= 0.11
| ID= 1 DT= 5.0 min | Total Imp(%)= 37.00 Dir. Conn.(%)= 28.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.04	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	1.00
Length (m)=	27.08	20.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	90.08	25.73
over (min)	5.00	15.00
Storage Coeff. (min)=	0.99 (ii)	10.85 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.34	0.09

			TOTALS
PEAK FLOW (cms)=	0.01	0.00	0.010 (iii)
TIME TO PEAK (hrs)=	6.25	6.33	6.25
RUNOFF VOLUME (mm)=	66.24	13.82	28.43
TOTAL RAINFALL (mm)=	68.24	68.24	68.24
RUNOFF COEFFICIENT =	0.97	0.20	0.42

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 (0302) | Area (ha)= 0.50
| ID= 1 DT= 5.0 min | Total Imp(%)= 22.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.11	0.39

Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	57.74	75.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	90.08	29.14
over (min)	5.00	20.00
Storage Coeff. (min)=	1.56 (ii)	16.48 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.33	0.06

			TOTALS
PEAK FLOW (cms)=	0.00	0.02	0.017 (iii)
TIME TO PEAK (hrs)=	6.25	6.42	6.42
RUNOFF VOLUME (mm)=	66.24	15.29	15.32
TOTAL RAINFALL (mm)=	68.24	68.24	68.24
RUNOFF COEFFICIENT =	0.97	0.22	0.22

***** 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* = 49.0 Ia = Dep. 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 (0902) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0102): 0.71 0.014 6.42 8.65
+ ID2= 2 (0302): 0.50 0.017 6.42 15.32
=====

ID = 3 (0902): 1.21 0.032 6.42 11.40

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0902) |
| 3 + 2 = 1 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 3 (0902): 1.21 0.032 6.42 11.40
+ ID2= 2 (0303): 0.11 0.010 6.25 28.43
=====

ID = 1 (0902): 1.32 0.036 6.42 12.82

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| ADD HYD ( 0903)|
| 1 + 2 = 3 |
-----
          AREA    QPEAK    TPEAK    R.V.
          (ha)    (cms)    (hrs)    (mm)
ID1= 1 ( 0901):    0.91    0.029    6.33    12.48
+ ID2= 2 ( 0902):    1.32    0.036    6.42    12.82
=====
ID = 3 ( 0903):    2.23    0.063    6.33    12.68
=====
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

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

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\V02\voin.dat

Output filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\8
2ed77ee-5d1d-4345-a363-72144dbc5baf\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\8
2ed77ee-5d1d-4345-a363-72144dbc5baf\s

DATE: 05-26-2022

TIME: 10:08:19

USER:

COMMENTS: _____

```
-----
*****
** SIMULATION : 4. 25yr - SCS          **
*****
```

```
-----
| READ STORM |      Filename: C:\Users\KGowanlock\AppData
|             |      ata\Local\Temp\
|             |      f3ed7778-9cb3-4f5f-ba44-5cc5049c23cd\3eee5f99
| Ptotal= 80.28 mm |      Comments: 25yr 12hr 15min SCS
|             |
|             |
```

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr		hrs	mm/hr	hrs	mm/hr
0.25	0.00	3.50	3.21		6.75	14.45	10.00	2.81
0.50	2.01	3.75	3.21		7.00	6.42	10.25	2.81
0.75	2.01	4.00	3.21		7.25	6.42	10.50	1.61
1.00	2.01	4.25	3.21		7.50	4.82	10.75	1.61
1.25	2.01	4.50	4.82		7.75	4.82	11.00	1.61
1.50	2.01	4.75	4.82		8.00	4.82	11.25	1.61
1.75	2.01	5.00	6.42		8.25	4.82	11.50	1.61
2.00	2.01	5.25	6.42		8.50	2.81	11.75	1.61
2.25	2.01	5.50	9.63		8.75	2.81	12.00	1.61
2.50	2.41	5.75	9.63		9.00	2.81	12.25	1.61
2.75	2.41	6.00	38.53		9.25	2.81		
3.00	2.41	6.25	105.97		9.50	2.81		
3.25	2.41	6.50	14.45		9.75	2.81		

```
-----
| CALIB |
| NASHYD ( 0101) |      Area (ha)= 0.38 Curve Number (CN)= 38.0
| ID= 1 DT= 5.0 min |      Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
|             |      U.H. Tp(hrs)= 0.35
|             |
```

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.008 (i)
TIME TO PEAK (hrs)= 6.500
RUNOFF VOLUME (mm)= 10.730
TOTAL RAINFALL (mm)= 80.280
RUNOFF COEFFICIENT = 0.134

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

```

-----
| CALIB |
| NASHYD ( 0301) | Area (ha)= 0.53 Curve Number (CN)= 57.2
| ID= 1 DT= 5.0 min | Ia (mm)= 4.52 # of Linear Res.(N)= 3.00
-----
U.H. Tp(hrs)= 0.19

```

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.033 (i)
 TIME TO PEAK (hrs)= 6.333
 RUNOFF VOLUME (mm)= 21.516
 TOTAL RAINFALL (mm)= 80.280
 RUNOFF COEFFICIENT = 0.268

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

```

-----
| ADD HYD ( 0901) |
| 1 + 2 = 3 |
-----
ID1= 1 ( 0101): AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
+ ID2= 2 ( 0301): 0.38 0.008 6.50 10.73
0.53 0.033 6.33 21.52
=====
ID = 3 ( 0901): 0.91 0.040 6.33 17.01

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD ( 0102) | Area (ha)= 0.71 Curve Number (CN)= 41.1
| ID= 1 DT= 5.0 min | Ia (mm)= 7.60 # of Linear Res.(N)= 3.00
-----
U.H. Tp(hrs)= 0.25

```

Unit Hyd Qpeak (cms)= 0.108

PEAK FLOW (cms)= 0.020 (i)
 TIME TO PEAK (hrs)= 6.333
 RUNOFF VOLUME (mm)= 12.078
 TOTAL RAINFALL (mm)= 80.280
 RUNOFF COEFFICIENT = 0.150

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

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-----
| CALIB |

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```

| STANDHYD ( 0303) | Area (ha)= 0.11
| ID= 1 DT= 5.0 min | Total Imp(%)= 37.00 Dir. Conn.(%)= 28.00
-----

```

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.04	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	1.00
Length (m)=	27.08	20.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	105.97	34.90
over (min)	5.00	10.00
Storage Coeff. (min)=	0.93 (ii)	9.66 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.34	0.11

TOTALS

PEAK FLOW (cms)=	0.01	0.00	0.014 (iii)
TIME TO PEAK (hrs)=	6.17	6.33	6.25
RUNOFF VOLUME (mm)=	78.28	18.75	35.37
TOTAL RAINFALL (mm)=	80.28	80.28	80.28
RUNOFF COEFFICIENT =	0.98	0.23	0.44

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 ( 0302) | Area (ha)= 0.50
| ID= 1 DT= 5.0 min | Total Imp(%)= 22.00 Dir. Conn.(%)= 0.10
-----

```

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.11	0.39
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	57.74	75.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	105.97	39.46
over (min)	5.00	15.00
Storage Coeff. (min)=	1.46 (ii)	14.68 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.33	0.08

TOTALS

PEAK FLOW (cms)=	0.00	0.03	0.026 (iii)
------------------	------	------	-------------

TIME TO PEAK (hrs)=	6.25	6.33	6.33
RUNOFF VOLUME (mm)=	78.28	20.63	20.67
TOTAL RAINFALL (mm)=	80.28	80.28	80.28
RUNOFF COEFFICIENT =	0.98	0.26	0.26

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 (0902)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0102):	0.71	0.020	6.33	12.08
+ ID2= 2 (0302):	0.50	0.026	6.33	20.67
=====				
ID = 3 (0902):	1.21	0.046	6.33	15.63

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0902)	AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0902):	1.21	0.046	6.33	15.63
+ ID2= 2 (0303):	0.11	0.014	6.25	35.37
=====				
ID = 1 (0902):	1.32	0.052	6.25	17.27

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0903)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0901):	0.91	0.040	6.33	17.01
+ ID2= 2 (0902):	1.32	0.052	6.25	17.27
=====				
ID = 3 (0903):	2.23	0.092	6.33	17.17

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

V	V	I	SSSS	U	U	A	L	(v 6.1.2001)
V	V	I	SS	U	U	A	A	L
V	V	I	SS	U	U	AAAA	L	
V	V	I	SS	U	U	A	A	L
VV	I	SSSS	UUUU	A	A	LLLL		

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

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\VO2\voin.dat

Output filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\fd7859d-d6cc-4cbc-ab4c-44d4328a15a7\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\fd7859d-d6cc-4cbc-ab4c-44d4328a15a7\s

DATE: 05-26-2022

TIME: 10:08:19

USER:

COMMENTS: _____

** SIMULATION : 5. 50yr - SCS **

READ STORM	Filename: C:\Users\KGowanlock\AppData\Local\Temp\
	f3ed7778-9cb3-4f5f-ba44-5cc5049c23cd\8208f145
Ptotal= 89.16 mm	Comments: 50yr 12hr 15min SCS

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	0.00	3.50	3.57	6.75	16.05	10.00	3.12
0.50	2.23	3.75	3.57	7.00	7.13	10.25	3.12
0.75	2.23	4.00	3.57	7.25	7.13	10.50	1.78
1.00	2.23	4.25	3.57	7.50	5.35	10.75	1.78
1.25	2.23	4.50	5.35	7.75	5.35	11.00	1.78
1.50	2.23	4.75	5.35	8.00	5.35	11.25	1.78
1.75	2.23	5.00	7.13	8.25	5.35	11.50	1.78
2.00	2.23	5.25	7.13	8.50	3.12	11.75	1.78
2.25	2.23	5.50	10.70	8.75	3.12	12.00	1.78
2.50	2.67	5.75	10.70	9.00	3.12	12.25	1.78
2.75	2.67	6.00	42.80	9.25	3.12		
3.00	2.67	6.25	117.69	9.50	3.12		
3.25	2.67	6.50	16.05	9.75	3.12		

CALIB			
NASHYD (0101)	Area (ha)= 0.38	Curve Number (CN)= 38.0	
ID= 1 DT= 5.0 min	Ia (mm)= 8.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.35		

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.010 (i)
 TIME TO PEAK (hrs)= 6.500
 RUNOFF VOLUME (mm)= 13.286
 TOTAL RAINFALL (mm)= 89.160
 RUNOFF COEFFICIENT = 0.149

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

CALIB			
NASHYD (0301)	Area (ha)= 0.53	Curve Number (CN)= 57.2	
ID= 1 DT= 5.0 min	Ia (mm)= 4.52	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.19		

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.040 (i)
 TIME TO PEAK (hrs)= 6.333

RUNOFF VOLUME (mm)= 25.989
 TOTAL RAINFALL (mm)= 89.160
 RUNOFF COEFFICIENT = 0.291

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

ADD HYD (0901)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0101):	0.38	0.010	6.50	13.29
+ ID2= 2 (0301):	0.53	0.040	6.33	25.99
=====				
ID = 3 (0901):	0.91	0.049	6.33	20.68

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0102)	Area (ha)= 0.71	Curve Number (CN)= 41.1	
ID= 1 DT= 5.0 min	Ia (mm)= 7.60	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.25		

Unit Hyd Qpeak (cms)= 0.108

PEAK FLOW (cms)= 0.025 (i)
 TIME TO PEAK (hrs)= 6.333
 RUNOFF VOLUME (mm)= 14.907
 TOTAL RAINFALL (mm)= 89.160
 RUNOFF COEFFICIENT = 0.167

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

CALIB			
STANDHYD (0303)	Area (ha)= 0.11		
ID= 1 DT= 5.0 min	Total Imp(%)= 37.00	Dir. Conn.(%)= 28.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.04	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	1.00
Length (m)=	27.08	20.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)= 117.69
 over (min) 5.00 10.00

Storage Coeff. (min)=	0.89 (ii)	8.98 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.34	0.12	
			TOTALS
PEAK FLOW (cms)=	0.01	0.01	0.016 (iii)
TIME TO PEAK (hrs)=	6.17	6.25	6.25
RUNOFF VOLUME (mm)=	87.16	22.74	40.72
TOTAL RAINFALL (mm)=	89.16	89.16	89.16
RUNOFF COEFFICIENT =	0.98	0.26	0.46

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 (0302)	Area (ha)= 0.50		
ID= 1 DT= 5.0 min	Total Imp(%)= 22.00	Dir. Conn.(%)= 0.10	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.11	0.39
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	57.74	75.00
Mannings n =	0.013	0.250

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

Max.Eff.Inten.(mm/hr)=	117.69	47.79
over (min)	5.00	15.00
Storage Coeff. (min)=	1.40 (ii)	13.64 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.33	0.08
		TOTALS
PEAK FLOW (cms)=	0.00	0.03 0.033 (iii)
TIME TO PEAK (hrs)=	6.25	6.33
RUNOFF VOLUME (mm)=	87.16	24.92 24.97
TOTAL RAINFALL (mm)=	89.16	89.16
RUNOFF COEFFICIENT =	0.98	0.28 0.28

***** 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* = 49.0 Ia = Dep. 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 (0902)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0102):	0.71	0.025	6.33	14.91
+ ID2= 2 (0302):	0.50	0.033	6.33	24.97
ID = 3 (0902):	1.21	0.058	6.33	19.06

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0902)				
3 + 2 = 1	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0902):	1.21	0.058	6.33	19.06
+ ID2= 2 (0303):	0.11	0.016	6.25	40.72
ID = 1 (0902):	1.32	0.065	6.33	20.87

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0903)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0901):	0.91	0.049	6.33	20.68
+ ID2= 2 (0902):	1.32	0.065	6.33	20.87
ID = 3 (0903):	2.23	0.113	6.33	20.79

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

FINISH

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

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

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\V02\voin.dat

Output filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\7
4a8e7cf-1b39-465c-b563-4ee7feb2781f\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\7
4a8e7cf-1b39-465c-b563-4ee7feb2781f\s

DATE: 05-26-2022

TIME: 10:08:19

USER:

COMMENTS: _____

** SIMULATION : 6. 100yr - SCS **

READ STORM	Filename: C:\Users\KGowanlock\AppData\Local\Temp\
	f3ed7778-9cb3-4f5f-ba44-5cc5049c23cd\38e9fe9a
Ptotal= 98.03 mm	Comments: 100yr 12hr 15min SCS

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.25	0.00	3.50	3.92	6.75	17.65	10.00	3.43
0.50	2.45	3.75	3.92	7.00	7.84	10.25	3.43
0.75	2.45	4.00	3.92	7.25	7.84	10.50	1.96
1.00	2.45	4.25	3.92	7.50	5.88	10.75	1.96
1.25	2.45	4.50	5.88	7.75	5.88	11.00	1.96
1.50	2.45	4.75	5.88	8.00	5.88	11.25	1.96
1.75	2.45	5.00	7.84	8.25	5.88	11.50	1.96
2.00	2.45	5.25	7.84	8.50	3.43	11.75	1.96
2.25	2.45	5.50	11.76	8.75	3.43	12.00	1.96
2.50	2.94	5.75	11.76	9.00	3.43	12.25	1.96
2.75	2.94	6.00	47.05	9.25	3.43		
3.00	2.94	6.25	129.40	9.50	3.43		
3.25	2.94	6.50	17.65	9.75	3.43		

CALIB			
NASHYD (0101)	Area (ha)= 0.38	Curve Number (CN)= 38.0	
ID= 1 DT= 5.0 min	Ia (mm)= 8.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.35		

Unit Hyd Qpeak (cms)= 0.041

PEAK FLOW (cms)= 0.012 (i)
TIME TO PEAK (hrs)= 6.500
RUNOFF VOLUME (mm)= 16.063
TOTAL RAINFALL (mm)= 98.030
RUNOFF COEFFICIENT = 0.164

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

CALIB			
NASHYD (0301)	Area (ha)= 0.53	Curve Number (CN)= 57.2	
ID= 1 DT= 5.0 min	Ia (mm)= 4.52	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.19		

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.048 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 30.730
TOTAL RAINFALL (mm)= 98.030
RUNOFF COEFFICIENT = 0.313

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

```

-----
| ADD HYD ( 0901)|
| 1 + 2 = 3 |
-----
ID1= 1 ( 0101):   0.38   0.012   6.50   16.06
+ ID2= 2 ( 0301):   0.53   0.048   6.33   30.73
=====
ID = 3 ( 0901):   0.91   0.058   6.33   24.61

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB
| NASHYD ( 0102)| Area (ha)= 0.71 Curve Number (CN)= 41.1
|ID= 1 DT= 5.0 min| Ia (mm)= 7.60 # of Linear Res.(N)= 3.00
|-----
| U.H. Tp(hrs)= 0.25

```

Unit Hyd Qpeak (cms)= 0.108

PEAK FLOW (cms)= 0.030 (i)
 TIME TO PEAK (hrs)= 6.333
 RUNOFF VOLUME (mm)= 17.968
 TOTAL RAINFALL (mm)= 98.030
 RUNOFF COEFFICIENT = 0.183

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

```

-----
| CALIB
| STANDHYD ( 0303)| Area (ha)= 0.11
|ID= 1 DT= 5.0 min| Total Imp(%)= 37.00 Dir. Conn.(%)= 28.00
|-----

```

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.04	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	1.00
Length (m)=	27.08	20.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	129.40	50.17
over (min)	5.00	10.00
Storage Coeff. (min)=	0.85 (ii)	8.41 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.34	0.12

	TOTALS	
PEAK FLOW (cms)=	0.01	0.01
	0.018 (iii)	

TIME TO PEAK (hrs)=	6.17	6.25	6.25
RUNOFF VOLUME (mm)=	96.03	26.99	46.26
TOTAL RAINFALL (mm)=	98.03	98.03	98.03
RUNOFF COEFFICIENT =	0.98	0.28	0.47

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 ( 0302)| Area (ha)= 0.50
|ID= 1 DT= 5.0 min| Total Imp(%)= 22.00 Dir. Conn.(%)= 0.10
|-----

```

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.11	0.39
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	57.74	75.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	129.40	56.66
over (min)	5.00	15.00
Storage Coeff. (min)=	1.35 (ii)	12.78 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.33	0.08

	TOTALS	
PEAK FLOW (cms)=	0.00	0.04
TIME TO PEAK (hrs)=	6.25	6.33
RUNOFF VOLUME (mm)=	96.03	29.48
TOTAL RAINFALL (mm)=	98.03	98.03
RUNOFF COEFFICIENT =	0.98	0.30
	0.30	

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

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 ( 0902)|
| 1 + 2 = 3 |
-----
      ID1= 1 ( 0102):    0.71    0.030    6.33    17.97
+ ID2= 2 ( 0302):    0.50    0.040    6.33    29.53
=====
      ID = 3 ( 0902):    1.21    0.070    6.33    22.75

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0902)|
| 3 + 2 = 1 |
-----
      ID1= 3 ( 0902):    1.21    0.070    6.33    22.75
+ ID2= 2 ( 0303):    0.11    0.018    6.25    46.26
=====
      ID = 1 ( 0902):    1.32    0.079    6.33    24.71

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

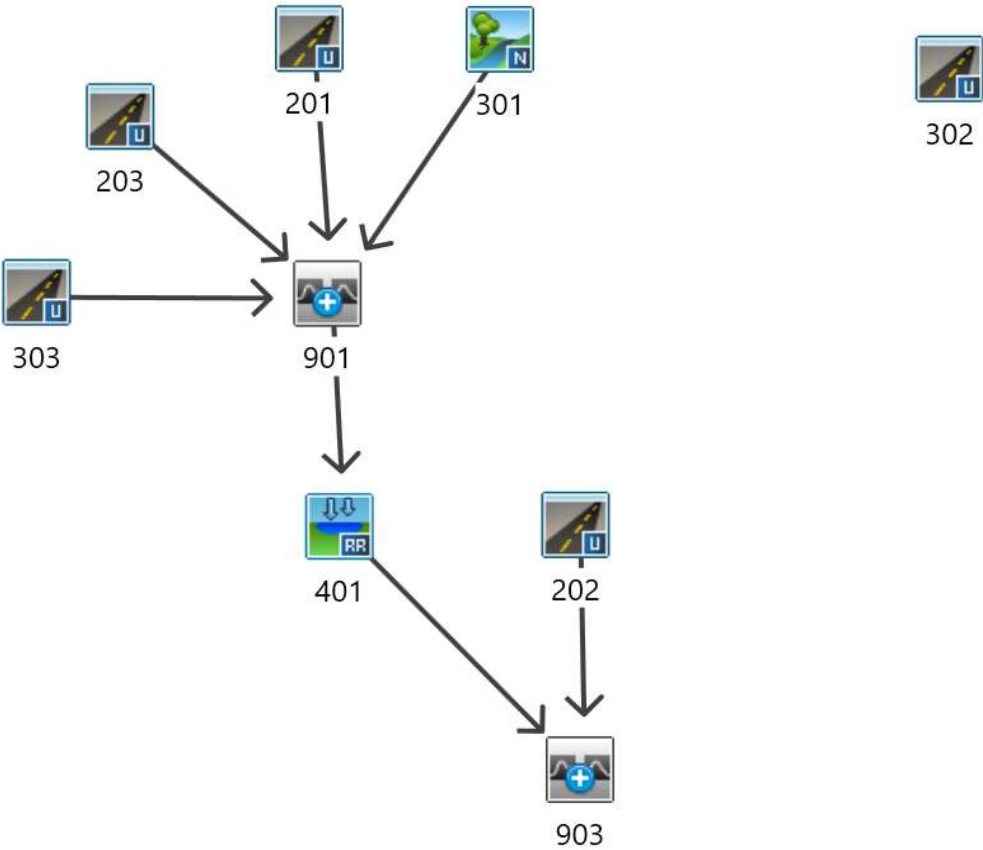
-----
| ADD HYD ( 0903)|
| 1 + 2 = 3 |
-----
      ID1= 1 ( 0901):    0.91    0.058    6.33    24.61
+ ID2= 2 ( 0902):    1.32    0.079    6.33    24.71
=====
      ID = 3 ( 0903):    2.23    0.137    6.33    24.67

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

Appendix B: Post-Development SWM Calculations

**24 ALFRED STREET DEVELOPMENT
PROPOSED CONDITIONS**



Nashyd



Route Pipe



Duhyd



Standhyd



Route Channel



Diverthyd



Addhyd



Route Reservoir



Project: 24 Alfred Street Development

File No.: 121108

Subject: Otthymo Flow Schematic

Date: May-22

Site Area (Catchment 201) = 8,350 sq.m

LOT NO	MAX. LOT COVERAGE	LOT AREA (m ²)	MAX. BUILDING FOOTPRINT (m ²)	MIN. SETBACK REQUIREMENT (m)	6m/12m WIDE DRIVEWAY AREA (m ²)	TOTAL IMPERVIOUS AREA (m ²)
1	-	840	375	6	72	447
2	-	704	350	6	72	422
3	30%	558	167	7.5	45	212
4*	30%	558	167	7.5	45	129
5*	30%	558	167	7.5	45	129
6*	30%	636	191	7.5	45	140
7*	30%	580	174	7.5	45	132
8**	30%	663	199	7.5	45	144
9**	30%	606	182	7.5	45	136
10**	30%	606	182	7.5	45	136
11**	30%	583	175	7.5	45	132
12**	-	700	375	6	72	260
13	-	751	375	6	72	447
ROAD						1800

* Only half of rooftop considered - other half part of Catchment 202

** Only half of rooftop considered - other half part of Catchment 203

Impervious Area = 4,666 sq.m (Roadway, Driveways & Rooftop)

Pervious Area = 3,684 sq.m

Directly Connected Area = 2,493 sq.m (Roadway and Driveways)

% Impervious = 56 (Use StandHyd)

% Directly Connected = 30

Site Area (Catchment 202) = 1,175 sq.m

Impervious Area = 530 sq.m (Rooftop)

Pervious Area = 645 sq.m

Directly Connected Area = 0 sq.m

% Impervious = 45 (Use StandHyd)

% Directly Connected = 0

Site Area (Catchment 203) = 1,425 sq.m

Impervious Area = 808 sq.m (Rooftop)

Pervious Area = 617 sq.m

Directly Connected Area = 0 sq.m

% Impervious = 57 (Use StandHyd)

% Directly Connected = 0

Site Area (Catchment 301) = 5,300 sq.m

LOT NO	BUILDING FOOTPRINT (m ²)	SETBACK (m)	6m WIDE DRIVEWAY AREA (m ²)	TOTAL IMPERVIOUS AREA (m ²)
22 Alfred St. W.	161	10	60	221
14 Alfred St. W.	124	22	132	256
85 Bruce St. S.	85			85
100 Bruce Street S.	357			357

Impervious Area = 919 sq.m (Driveways & Rooftops)

Pervious Area = 4,381 sq.m

Directly Connected Area = 0 sq.m

% Impervious = 17 (Use NasHyd)

% Directly Connected = 0

Site Area (Catchment 302) = 5,000 sq.m

LOT NO	BUILDING FOOTPRINT (m ²)	SETBACK (m)	6m WIDE DRIVEWAY AREA (m ²)	TOTAL IMPERVIOUS AREA (m ²)
84 Bruce Street S.	93	7	42	135
80 Bruce Street S.	450			450
78 Bruce Street S.	184	8.6	51.6	236
74 Bruce Street S.	82	14.5	87	169
9 Alice St. W	96			96

Impervious Area = 1,086 sq.m (Rooftop)

Pervious Area = 3,914 sq.m

Directly Connected Area = 0 sq.m

% Impervious = 22 (Use StandHyd)

% Directly Connected = 0

Site Area (Catchment 303) = 1,100 sq.m

LOT NO	BUILDING FOOTPRINT (m ²)	SETBACK (m)	6m WIDE DRIVEWAY AREA (m ²)	TOTAL IMPERVIOUS AREA (m ²)
15 Alice St. W	245	11.3	67.8	313
17 Alice St. W	48	8.3	49.8	98

Impervious Area = 411 sq.m (Rooftop)

Pervious Area = 689 sq.m

Directly Connected Area = 0 sq.m

% Impervious = 37 (Use StandHyd)

% Directly Connected = 0

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

24 Alfred Street	121108
------------------	--------

Data Sources

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

Prepared By

Kyle Gowanlock	May 25, 2022
----------------	--------------

Post Development Condition

Watershed:	GSCA
Catchment ID:	201
Catchment Area (ha):	0.84
Impervious %:	56%
Pervious Area (ha):	0.37

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

Soil Symbol		Brs							
Soil Series		Brighton							
Hydrologic Soils Group		A							
Soil Texture		Sand							
Runoff Coefficient Type		1							
Area (ha)		0.37							
Percentage of Catchment		100%							
Land Cover Category	IA	A (ha)	CN	A (ha)	CN	A (ha)	CN	A (ha)	CN
Impervious	2		100						
Gravel	3		89						
Woodland	10		32						
Pasture/Lawns	5	0.37	49						
Meadows	8		38						
Cultivated	7		62						
Waterbody	12		50						
Average CN		49.00							
Average IA		5.00							

Notes

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

Summary

Catchment CN:	49.0
Catchment IA (mm):	5.00

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

24 Alfred Street	121108
------------------	--------

Data Sources

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

Prepared By

Kyle Gowanlock	May 25, 2022
----------------	--------------

Post Development Condition

Watershed:	GSCA
Catchment ID:	202
Catchment Area (ha):	0.12
Impervious %:	45%
Pervious Area (ha):	0.07

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

Soil Symbol		Brs							
Soil Series		Brighton							
Hydrologic Soils Group		A							
Soil Texture		Sand							
Runoff Coefficient Type		1							
Area (ha)		0.07							
Percentage of Catchment		100%							
Land Cover Category	IA	A (ha)	CN	A (ha)	CN	A (ha)	CN	A (ha)	CN
Impervious	2		100						
Gravel	3		89						
Woodland	10		32						
Pasture/Lawns	5	0.07	49						
Meadows	8		38						
Cultivated	7		62						
Waterbody	12		50						
Average CN		49.00							
Average IA		5.00							

Notes

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

Summary

Catchment CN:	49.0
Catchment IA (mm):	5.00

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

24 Alfred Street	121108
------------------	--------

Data Sources

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

Prepared By

Kyle Gowanlock	May 25, 2022
----------------	--------------

Post Development Condition

Watershed:	GSCA
Catchment ID:	203
Catchment Area (ha):	0.14
Impervious %:	57%
Pervious Area (ha):	0.06

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

Soil Symbol		Brs							
Soil Series		Brighton							
Hydrologic Soils Group		A							
Soil Texture		Sand							
Runoff Coefficient Type		1							
Area (ha)		0.06							
Percentage of Catchment		100%							
Land Cover Category	IA	A (ha)	CN	A (ha)	CN	A (ha)	CN	A (ha)	CN
Impervious	2		100						
Gravel	3		89						
Woodland	10		32						
Pasture/Lawns	5	0.06	49						
Meadows	8		38						
Cultivated	7		62						
Waterbody	12		50						
Average CN		49.00							
Average IA		5.00							

Notes

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

Summary

Catchment CN:	49.0
Catchment IA (mm):	5.00

						PROJECT 24 Alfred Street				FILE 121108	
						SUBJECT Pipe Storage Volumes				DATE May 2022	
										NAME KG	
										PAGE 1	
Pipe Des.	Upstream Maintenance Hole	Downstream Maintenance Hole	Start Invert Elevation	End Invert Elevation	Max. Storage Elevation	Check (Max. Ponding Elev. > Pipe Inv. Elev.)	Effective Sewer Length (m)	Sewer Slope (%)	Sewer Diameter (mm)	Full Volume (cu.m)	Full Volume (ha-m)
Pipe A	CBMH5B	CBMH4B	196.34	195.71	196.66	OK	79.1	0.8%	450	12.58	0.0013
Pipe B	CB4B	CBMH4B	195.77	195.74	196.66	OK	6.5	1.0%	300	0.46	0.0000
Pipe C	CBMH4B	MH3B	195.66	195.52	196.66	OK	22.1	0.7%	525	4.78	0.0005

TOTAL	0.0018	ha-m
--------------	---------------	-------------

PIPE VOLUME STAGE STORAGE

Water Level (m)	Head* (m)			Cumulative Volume (ha-m)			
	Pipe A	Pipe B	Pipe C	Pipe A	Pipe B	Pipe C	TOTAL
195.430	0.00	0.00	0.00	0.0000	0.0000	0.0000	0.0000
195.455	0.00	0.00	0.00	0.0000	0.0000	0.0000	0.0000
195.480	0.00	0.00	0.00	0.0000	0.0000	0.0000	0.0000
195.505	0.00	0.00	0.00	0.0000	0.0000	0.0000	0.0000
195.530	0.00	0.00	0.00	0.0000	0.0000	0.0000	0.0000
195.555	0.00	0.00	0.00	0.0000	0.0000	0.0000	0.0000
195.580	0.00	0.00	0.00	0.0000	0.0000	0.0000	0.0000
195.605	0.00	0.00	0.02	0.0000	0.0000	0.0000	0.0000
195.630	0.00	0.00	0.04	0.0000	0.0000	0.0000	0.0000
195.655	0.00	0.00	0.07	0.0000	0.0000	0.0000	0.0000
195.680	0.00	0.00	0.09	0.0000	0.0000	0.0001	0.0001
195.705	0.00	0.00	0.12	0.0000	0.0000	0.0001	0.0001
195.730	0.00	0.00	0.14	0.0000	0.0000	0.0001	0.0001
195.755	0.00	0.00	0.17	0.0000	0.0000	0.0001	0.0001
195.780	0.00	0.03	0.19	0.0000	0.0000	0.0002	0.0002
195.805	0.00	0.05	0.22	0.0000	0.0000	0.0002	0.0002
195.830	0.00	0.08	0.24	0.0000	0.0000	0.0002	0.0002
195.855	0.00	0.10	0.27	0.0000	0.0000	0.0002	0.0003
195.880	0.00	0.13	0.29	0.0000	0.0000	0.0003	0.0003
195.905	0.00	0.15	0.32	0.0000	0.0000	0.0003	0.0003
195.930	0.00	0.18	0.34	0.0000	0.0000	0.0003	0.0004
195.955	0.00	0.20	0.37	0.0000	0.0000	0.0004	0.0004
195.980	0.00	0.23	0.39	0.0000	0.0000	0.0004	0.0004
196.005	0.00	0.25	0.42	0.0000	0.0000	0.0004	0.0004
196.030	0.01	0.28	0.44	0.0000	0.0000	0.0004	0.0005
196.055	0.03	0.30	0.47	0.0000	0.0000	0.0004	0.0005
196.080	0.06	0.33	0.49	0.0001	0.0000	0.0005	0.0006
196.105	0.08	0.35	0.52	0.0002	0.0000	0.0005	0.0007
196.130	0.11	0.38	0.54	0.0002	0.0000	0.0005	0.0007
196.155	0.13	0.40	0.57	0.0003	0.0000	0.0005	0.0008
196.180	0.16	0.43	0.59	0.0004	0.0000	0.0005	0.0009
196.205	0.18	0.45	0.62	0.0005	0.0000	0.0005	0.0010
196.230	0.21	0.48	0.64	0.0006	0.0000	0.0005	0.0011
196.255	0.23	0.50	0.67	0.0006	0.0000	0.0005	0.0012
196.280	0.26	0.53	0.69	0.0007	0.0000	0.0005	0.0013
196.305	0.28	0.55	0.72	0.0008	0.0000	0.0005	0.0013
196.330	0.31	0.58	0.74	0.0009	0.0000	0.0005	0.0014
196.355	0.33	0.60	0.77	0.0010	0.0000	0.0005	0.0015
196.380	0.36	0.63	0.79	0.0011	0.0000	0.0005	0.0016
196.405	0.38	0.65	0.82	0.0011	0.0000	0.0005	0.0017
196.430	0.41	0.68	0.84	0.0012	0.0000	0.0005	0.0017
196.455	0.43	0.70	0.87	0.0012	0.0000	0.0005	0.0018
196.480	0.46	0.73	0.89	0.0013	0.0000	0.0005	0.0018
196.505	0.48	0.75	0.92	0.0013	0.0000	0.0005	0.0018
196.530	0.51	0.78	0.94	0.0013	0.0000	0.0005	0.0018
196.555	0.53	0.80	0.97	0.0013	0.0000	0.0005	0.0018
196.580	0.56	0.83	0.99	0.0013	0.0000	0.0005	0.0018
196.605	0.58	0.85	1.02	0.0013	0.0000	0.0005	0.0018
196.630	0.61	0.88	1.04	0.0013	0.0000	0.0005	0.0018
196.655	0.63	0.90	1.07	0.0013	0.0000	0.0005	0.0018

*Head calculated using average depth of pipe

	Project:	24 Alfred Street
	Date:	2022-05-27
	File No.:	121108
	Designed By:	KG
	Checked By:	DC
	Subject:	Pond Discharge Table

ORIFICE CONTROL

	Orifice 1	Outlet Pipe
Orifice/Pipe Size (mm)	213	300
Cross-sectional Area (sq.m)	0.036	0.071
Orifice Coefficient	0.63	0.80
Invert Elevation (m)	195.43	195.43

WEIR CONTROL

	Overflow
Weir Width (m)	6.5
Sill elevation (m)	197.20
Weir Coefficient	1.65
Weir Side Slopes (H:V)	1
Weir Length (m)	1

U/G STORAGE PARAMETERS

Box Depth (m)	1.219
Box Width (m)	2.438
Available Length (m)	31.00
Volume (cu.m/m)	2.86
No. of Connected Systems	2
Total Length (m)	62
Volume (cu.m.)	177.32
Avg. Footprint (sq.m)	145

CONTROL STRUCTURE CONFIGURATION

Water Level	Outlet Structure				Overflow Weir		Total Discharge	Total Live Storage
	Orifice		Outlet Pipe					
	1		1		Head	Discharge		
(m)	(m)	(cms)	(m)	(cms)	(m)	(cms)	(cms)	(ha-m)
195.43	0.000	0.0000	0.000	0.0000	0.000	0.0000	0.0000	0.000
195.46	0.025	0.0006	0.025	0.0007	0.000	0.0000	0.0006	0.000
195.48	0.050	0.0024	0.050	0.0029	0.000	0.0000	0.0024	0.001
195.51	0.075	0.0051	0.075	0.0062	0.000	0.0000	0.0051	0.001
195.53	0.100	0.0086	0.100	0.0108	0.000	0.0000	0.0086	0.001
195.56	0.019	0.0135	0.125	0.0163	0.000	0.0000	0.0135	0.002
195.58	0.044	0.0207	0.150	0.0226	0.000	0.0000	0.0207	0.002
195.61	0.069	0.0260	0.025	0.0396	0.000	0.0000	0.0260	0.003
195.63	0.094	0.0304	0.050	0.0560	0.000	0.0000	0.0304	0.003
195.66	0.119	0.0342	0.075	0.0686	0.000	0.0000	0.0342	0.003
195.68	0.144	0.0377	0.100	0.0792	0.000	0.0000	0.0377	0.004
195.71	0.169	0.0408	0.125	0.0886	0.000	0.0000	0.0408	0.004
195.73	0.194	0.0437	0.150	0.0970	0.000	0.0000	0.0437	0.004
195.76	0.219	0.0465	0.175	0.1048	0.000	0.0000	0.0465	0.005
195.78	0.244	0.0491	0.200	0.1120	0.000	0.0000	0.0491	0.005
195.81	0.269	0.0515	0.225	0.1188	0.000	0.0000	0.0515	0.006
195.83	0.294	0.0539	0.250	0.1252	0.000	0.0000	0.0539	0.006
195.86	0.319	0.0561	0.275	0.1314	0.000	0.0000	0.0561	0.006
195.88	0.344	0.0583	0.300	0.1372	0.000	0.0000	0.0583	0.007
195.91	0.369	0.0604	0.325	0.1428	0.000	0.0000	0.0604	0.007
195.93	0.394	0.0624	0.350	0.1482	0.000	0.0000	0.0624	0.008
195.96	0.419	0.0643	0.375	0.1534	0.000	0.0000	0.0643	0.008
195.98	0.444	0.0662	0.400	0.1584	0.000	0.0000	0.0662	0.008
196.01	0.469	0.0681	0.425	0.1633	0.000	0.0000	0.0681	0.009
196.03	0.494	0.0699	0.450	0.1680	0.000	0.0000	0.0699	0.009
196.06	0.519	0.0716	0.475	0.1726	0.000	0.0000	0.0716	0.010
196.08	0.544	0.0733	0.500	0.1771	0.000	0.0000	0.0733	0.010
196.11	0.569	0.0750	0.525	0.1815	0.000	0.0000	0.0750	0.010
196.13	0.594	0.0766	0.550	0.1858	0.000	0.0000	0.0766	0.011
196.16	0.619	0.0782	0.575	0.1899	0.000	0.0000	0.0782	0.011
196.18	0.644	0.0798	0.600	0.1940	0.000	0.0000	0.0798	0.012
196.21	0.669	0.0813	0.625	0.1980	0.000	0.0000	0.0813	0.012
196.23	0.694	0.0828	0.650	0.2020	0.000	0.0000	0.0828	0.013
196.26	0.719	0.0843	0.675	0.2058	0.000	0.0000	0.0843	0.013
196.28	0.744	0.0857	0.700	0.2096	0.000	0.0000	0.0857	0.014
196.31	0.769	0.0872	0.725	0.2133	0.000	0.0000	0.0872	0.014
196.33	0.794	0.0886	0.750	0.2169	0.000	0.0000	0.0886	0.015
196.36	0.819	0.0900	0.775	0.2205	0.000	0.0000	0.0900	0.015
196.38	0.844	0.0913	0.800	0.2240	0.000	0.0000	0.0913	0.015
196.41	0.869	0.0927	0.825	0.2275	0.000	0.0000	0.0927	0.016
196.43	0.894	0.0940	0.850	0.2309	0.000	0.0000	0.0940	0.016
196.46	0.919	0.0953	0.875	0.2343	0.000	0.0000	0.0953	0.017
196.48	0.944	0.0966	0.900	0.2376	0.000	0.0000	0.0966	0.017
196.51	0.969	0.0979	0.925	0.2409	0.000	0.0000	0.0979	0.017
196.53	0.994	0.0991	0.950	0.2442	0.000	0.0000	0.0991	0.018
196.56	1.019	0.1004	0.975	0.2473	0.000	0.0000	0.1004	0.018
196.58	1.044	0.1016	1.000	0.2505	0.000	0.0000	0.1016	0.019
196.61	1.069	0.1028	1.025	0.2536	0.000	0.0000	0.1028	0.019
196.63	1.094	0.1040	1.050	0.2567	0.000	0.0000	0.1040	0.019
196.66	1.119	0.1052	1.075	0.2597	0.000	0.0000	0.1052	0.020

Additional Notes:

NVCA Weir Flow Calculation Applied For Weir Flow Below Circular Orifi

$$Q_w = 1.65([(\pi*(D^2)/4)(2*\cos^{-1}[\frac{((D/2)-d)}{(D/2))}*(180/\pi)]/360)-((D/2-d)(Dd-d^2)^{0.5})/d)^{1.5}$$

Where:
Q_w is weir flow (m³/s)
D is orifice diameter (m)
d is depth of flow above the invert (m)

=====

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

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

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\V02\voin.dat

Output filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\8
4fbc0d6-63de-4089-8cf1-1a4d1cee36c1\s

Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\8
4fbc0d6-63de-4089-8cf1-1a4d1cee36c1\s

DATE: 05-26-2022

TIME: 05:09:02

USER:

COMMENTS: _____

** SIMULATION : 1. 25mm **

| READ STORM | Filename: C:\Users\KGowanlock\AppData\Local\Temp\
|

| b11eae0-7f77-40e5-99d6-b27f50ac2c65\593644d
| Ptotal= 24.97 mm | Comments: 25MM BARRIE

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.10	0.00	1.20	2.81	2.30	8.44	3.40	1.76
0.20	1.29	1.30	3.22	2.40	6.21	3.50	1.65
0.30	1.36	1.40	3.77	2.50	4.91	3.60	1.55
0.40	1.44	1.50	4.55	2.60	4.06	3.70	1.46
0.50	1.53	1.60	5.77	2.70	3.47	3.80	1.39
0.60	1.63	1.70	7.86	2.80	3.03	3.90	1.32
0.70	1.75	1.80	12.27	2.90	2.70	4.00	1.26
0.80	1.89	1.90	26.17	3.00	2.43	4.10	1.20
0.90	2.06	2.00	72.58	3.10	2.22		
1.00	2.26	2.10	26.96	3.20	2.04		
1.10	2.50	2.20	13.05	3.30	1.89		

| CALIB |
| NASHYD (0301) | Area (ha)= 0.53 Curve Number (CN)= 57.7
| ID= 1 DT= 5.0 min | Ia (mm)= 4.49 # of Linear Res.(N)= 3.00
| U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.004 (i)
TIME TO PEAK (hrs)= 2.167
RUNOFF VOLUME (mm)= 2.017
TOTAL RAINFALL (mm)= 24.951
RUNOFF COEFFICIENT = 0.081

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

| CALIB |
| STANDHYD (0201) | Area (ha)= 0.84
| ID= 1 DT= 5.0 min | Total Imp(%)= 56.00 Dir. Conn.(%)= 30.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.47	0.37
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	1.00	2.50
Length (m)=	74.83	30.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)= 72.58 6.43
over (min) 5.00 20.00

Storage Coeff. (min)= 2.44 (ii) 19.08 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.30 0.06

TOTALS
PEAK FLOW (cms)= 0.05 0.00 0.048 (iii)
TIME TO PEAK (hrs)= 2.00 2.33 2.00
RUNOFF VOLUME (mm)= 22.95 2.53 8.64
TOTAL RAINFALL (mm)= 24.95 24.95 24.95
RUNOFF COEFFICIENT = 0.92 0.10 0.35

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 (0203) | Area (ha)= 0.14
| ID= 1 DT= 5.0 min | Total Imp(%)= 57.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.08	0.06
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	30.55	15.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	72.58	20.33
over (min)	5.00	10.00
Storage Coeff. (min)=	1.16 (ii)	7.72 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.34	0.13

TOTALS
PEAK FLOW (cms)= 0.00 0.00 0.003 (iii)
TIME TO PEAK (hrs)= 2.00 2.08 2.08
RUNOFF VOLUME (mm)= 22.95 3.81 3.80
TOTAL RAINFALL (mm)= 24.95 24.95 24.95
RUNOFF COEFFICIENT = 0.92 0.15 0.15

***** 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* = 49.0 Ia = Dep. 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 (0303) | Area (ha)= 0.11
| ID= 1 DT= 5.0 min | Total Imp(%)= 37.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.04	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	1.00
Length (m)=	27.08	20.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	72.58	6.39
over (min)	5.00	20.00
Storage Coeff. (min)=	1.08 (ii)	18.31 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.34	0.06

TOTALS
PEAK FLOW (cms)= 0.00 0.00 0.001 (iii)
TIME TO PEAK (hrs)= 2.00 2.33 2.33
RUNOFF VOLUME (mm)= 22.95 2.52 2.41
TOTAL RAINFALL (mm)= 24.95 24.95 24.95
RUNOFF COEFFICIENT = 0.92 0.10 0.10

***** 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* = 49.0 Ia = Dep. 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 (0901) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)

ID1= 1 (0201): 0.84 0.048 2.00 8.64
+ ID2= 2 (0203): 0.14 0.003 2.08 3.80
=====

ID = 3 (0901): 0.98 0.050 2.00 7.95

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0901)				
3 + 2 = 1				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0901):	0.98	0.050	2.00	7.95
+ ID2= 2 (0301):	0.53	0.004	2.17	2.02
=====				
ID = 1 (0901):	1.51	0.052	2.00	5.87
NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.				

ADD HYD (0901)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0901):	1.51	0.052	2.00	5.87
+ ID2= 2 (0303):	0.11	0.001	2.33	2.41
=====				
ID = 3 (0901):	1.62	0.052	2.00	5.63
NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.				

RESERVOIR(0401)				
IN= 2---> OUT= 1				
DT= 5.0 min				

	OVERFLOW IS OFF			
	OUTFLOW	STORAGE	OUTFLOW	STORAGE
	(cms)	(ha.m.)	(cms)	(ha.m.)
	0.0000	0.0000	0.0750	0.0105
	0.0051	0.0011	0.0798	0.0118
	0.0207	0.0022	0.0843	0.0132
	0.0342	0.0033	0.0886	0.0145
	0.0437	0.0045	0.0927	0.0158
	0.0515	0.0056	0.0966	0.0171
	0.0583	0.0068	0.1004	0.0181
	0.0643	0.0080	0.1052	0.0195
	0.0699	0.0092	0.0000	0.0000
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0901)	1.620	0.052	2.00	5.63
OUTFLOW: ID= 1 (0401)	1.620	0.025	2.17	5.60
PEAK FLOW REDUCTION [Qout/Qin](%)= 48.94				
TIME SHIFT OF PEAK FLOW (min)= 10.00				
MAXIMUM STORAGE USED (ha.m.)= 0.0026				

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

	Area	(ha)=	0.12	
	Total Imp(%)=	45.00	Dir. Conn.(%)=	0.10

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.05	0.07	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	28.28	15.00	
Mannings n	=	0.013	0.250	

Max.Eff.Inten.(mm/hr)=	72.58	12.22		
over (min)	5.00	15.00		
Storage Coeff. (min)=	1.11 (ii)	10.19 (ii)		
Unit Hyd. Tpeak (min)=	5.00	15.00		
Unit Hyd. peak (cms)=	0.34	0.09		

				TOTALS
PEAK FLOW	(cms)=	0.00	0.00	0.001 (iii)
TIME TO PEAK	(hrs)=	2.00	2.17	2.17
RUNOFF VOLUME	(mm)=	22.95	2.94	2.88
TOTAL RAINFALL	(mm)=	24.95	24.95	24.95
RUNOFF COEFFICIENT	=	0.92	0.12	0.12

***** 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* = 49.0 Ia = Dep. 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 (0903)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0202):	0.12	0.001	2.17	2.88
+ ID2= 2 (0401):	1.62	0.025	2.17	5.60
=====				
ID = 3 (0903):	1.74	0.027	2.17	5.42
NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.				

CALIB				
STANDHYD (0302)				
	Area	(ha)=	0.50	

|ID= 1 DT= 5.0 min | Total Imp(%)= 22.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.11	0.39
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	57.74	75.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	72.58	2.62
over (min)	5.00	45.00
Storage Coeff. (min)=	1.70 (ii)	40.79 (ii)
Unit Hyd. Tpeak (min)=	5.00	45.00
Unit Hyd. peak (cms)=	0.32	0.03
PEAK FLOW (cms)=	0.00	0.00
TIME TO PEAK (hrs)=	2.00	2.75
RUNOFF VOLUME (mm)=	22.95	1.95
TOTAL RAINFALL (mm)=	24.95	24.95
RUNOFF COEFFICIENT =	0.92	0.08

TOTALS
0.002 (iii)

***** 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* = 49.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

V V I SSSS U U A L (v 6.1.2001)
V V I SS U U A A L
V V I SS U U A A A A L
V V I SS U U A A L
VV I SSSS UUUU A A LLLL

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

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\V02\voin.dat

Output filename:
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Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\7
0eb3fbf-681e-4056-8d4b-525fdeb166ce\s

DATE: 05-26-2022

TIME: 05:09:02

USER:

COMMENTS: _____

** SIMULATION : 2. 2yr - CHI **

CHICAGO STORM | IDF curve parameters: A= 365.657
| Ptotal= 31.69 mm | B= 0.000
C= 0.699
used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.35

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.17	2.76	1.17	12.83	2.17	5.19	3.17	3.02
0.33	3.08	1.33	73.13	2.33	4.58	3.33	2.84
0.50	3.51	1.50	15.38	2.50	4.12	3.50	2.69
0.67	4.13	1.67	9.64	2.67	3.76	3.67	2.56
0.83	5.11	1.83	7.34	2.83	3.47	3.83	2.44
1.00	6.98	2.00	6.04	3.00	3.23	4.00	2.33

CALIB			
NASHYD (0301)	Area (ha)=	0.53	Curve Number (CN)= 57.7
ID= 1 DT= 5.0 min	Ia (mm)=	4.49	# of Linear Res.(N)= 3.00
-----	U.H. Tp(hrs)=	0.19	

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.005 (i)
 TIME TO PEAK (hrs)= 1.500
 RUNOFF VOLUME (mm)= 3.454
 TOTAL RAINFALL (mm)= 31.693
 RUNOFF COEFFICIENT = 0.109

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

CALIB			
STANDHYD (0201)	Area (ha)=	0.84	
ID= 1 DT= 5.0 min	Total Imp(%)=	56.00	Dir. Conn.(%)= 30.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.47	0.37
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	1.00	2.50
Length (m)=	74.83	30.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	73.13	9.34
over (min)	5.00	20.00
Storage Coeff. (min)=	2.43 (ii)	16.77 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.30	0.06

			TOTALS
PEAK FLOW (cms)=	0.05	0.01	0.052 (iii)
TIME TO PEAK (hrs)=	1.33	1.58	1.33
RUNOFF VOLUME (mm)=	29.69	4.19	11.82
TOTAL RAINFALL (mm)=	31.69	31.69	31.69
RUNOFF COEFFICIENT =	0.94	0.13	0.37

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 49.0 Ia = Dep. 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 (0203)	Area (ha)=	0.14	
ID= 1 DT= 5.0 min	Total Imp(%)=	57.00	Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.08	0.06
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	30.55	15.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	73.13	26.78
over (min)	5.00	10.00
Storage Coeff. (min)=	1.15 (ii)	7.03 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.34	0.14

			TOTALS
PEAK FLOW (cms)=	0.00	0.00	0.003 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.42
RUNOFF VOLUME (mm)=	29.69	6.09	6.08
TOTAL RAINFALL (mm)=	31.69	31.69	31.69
RUNOFF COEFFICIENT =	0.94	0.19	0.19

***** 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* = 49.0 Ia = Dep. 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 (0303)	Area (ha)=	0.11	
ID= 1 DT= 5.0 min	Total Imp(%)=	37.00	Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.04	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	1.00
Length (m)=	27.08	20.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	73.13	9.27
over (min)	5.00	20.00
Storage Coeff. (min)=	1.07 (ii)	15.92 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00

Unit Hyd. peak (cms)=	0.34	0.07	
			TOTALS
PEAK FLOW (cms)=	0.00	0.00	0.001 (iii)
TIME TO PEAK (hrs)=	1.33	1.58	1.58
RUNOFF VOLUME (mm)=	29.69	4.17	4.12
TOTAL RAINFALL (mm)=	31.69	31.69	31.69
RUNOFF COEFFICIENT =	0.94	0.13	0.13

***** 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* = 49.0 Ia = Dep. 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 (0901)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0201):	0.84	0.052	1.33	11.82
+ ID2= 2 (0203):	0.14	0.003	1.42	6.08
=====				
ID = 3 (0901):	0.98	0.055	1.33	11.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0901)				
3 + 2 = 1				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0901):	0.98	0.055	1.33	11.00
+ ID2= 2 (0301):	0.53	0.005	1.50	3.45
=====				
ID = 1 (0901):	1.51	0.058	1.33	8.35

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0901)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0901):	1.51	0.058	1.33	8.35
+ ID2= 2 (0303):	0.11	0.001	1.58	4.12

=====

ID = 3 (0901):	1.62	0.058	1.33	8.07
-----------------	------	-------	------	------

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0401)		OVERFLOW IS OFF	
IN= 2---> OUT= 1			
DT= 5.0 min			
	OUTFLOW	STORAGE	OUTFLOW STORAGE
	(cms)	(ha.m.)	(cms) (ha.m.)
	0.0000	0.0000	0.0750 0.0105
	0.0051	0.0011	0.0798 0.0118
	0.0207	0.0022	0.0843 0.0132
	0.0342	0.0033	0.0886 0.0145
	0.0437	0.0045	0.0927 0.0158
	0.0515	0.0056	0.0966 0.0171
	0.0583	0.0068	0.1004 0.0181
	0.0643	0.0080	0.1052 0.0195
	0.0699	0.0092	0.0000 0.0000

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0901)	1.620	0.058	1.33	8.07
OUTFLOW: ID= 1 (0401)	1.620	0.030	1.42	8.04

PEAK FLOW REDUCTION [Qout/Qin](%)= 51.34
 TIME SHIFT OF PEAK FLOW (min)= 5.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0030

CALIB			
STANDHYD (0202)		Area (ha)=	0.12
ID= 1 DT= 5.0 min		Total Imp(%)=	45.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.05	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	28.28	15.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	73.13	15.96
over (min)	5.00	10.00
Storage Coeff. (min)=	1.10 (ii)	9.27 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.34	0.12

			TOTALS
PEAK FLOW (cms)=	0.00	0.00	0.002 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.42

RUNOFF VOLUME (mm)= 29.69 4.80 4.78
TOTAL RAINFALL (mm)= 31.69 31.69 31.69
RUNOFF COEFFICIENT = 0.94 0.15 0.15

***** 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* = 49.0 Ia = Dep. 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 (0903) |
1 + 2 = 3
ID1= 1 (0202): 0.12 0.002 1.42 4.78
+ ID2= 2 (0401): 1.62 0.030 1.42 8.04
=====

ID = 3 (0903): 1.74 0.032 1.42 7.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| STANDHYD (0302) | Area (ha)= 0.50
| ID= 1 DT= 5.0 min | Total Imp(%)= 22.00 Dir. Conn.(%)= 0.10

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.11 0.39
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 3.00
Length (m)= 57.74 75.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 73.13 3.62
over (min) 5.00 40.00
Storage Coeff. (min)= 1.69 (ii) 36.07 (ii)
Unit Hyd. Tpeak (min)= 5.00 40.00
Unit Hyd. peak (cms)= 0.32 0.03

TOTALS

PEAK FLOW (cms)= 0.00 0.00 0.002 (iii)
TIME TO PEAK (hrs)= 1.33 2.00 2.00
RUNOFF VOLUME (mm)= 29.69 3.30 3.28
TOTAL RAINFALL (mm)= 31.69 31.69 31.69
RUNOFF COEFFICIENT = 0.94 0.10 0.10

***** 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* = 49.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

=====

V V I SSSS U U A L (v 6.1.2001)
V V I SS U U A A L
V V I SS U U A A A A L
V V I SS U U A A L
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000 TTTT TTTT H H Y Y M M 000 TM
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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\V02\voin.dat

Output filename:

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aac7ac7-bc2c-46d5-b362-1404fc0eb15d\s

Summary filename:

C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\9
aac7ac7-bc2c-46d5-b362-1404fc0eb15d\s

DATE: 05-26-2022

TIME: 05:09:02

USER:

COMMENTS: _____

** SIMULATION : 3.5yr - CHI **

CHICAGO STORM
Ptotal= 42.16 mm

IDF curve parameters: A= 486.376
B= 0.000
C= 0.699
used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.35

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.17	3.67	1.17	17.07	2.17	6.90	3.17	4.02
0.33	4.09	1.33	97.27	2.33	6.09	3.33	3.78
0.50	4.67	1.50	20.46	2.50	5.48	3.50	3.58
0.67	5.50	1.67	12.83	2.67	5.00	3.67	3.40
0.83	6.80	1.83	9.76	2.83	4.61	3.83	3.24
1.00	9.28	2.00	8.04	3.00	4.29	4.00	3.10

CALIB
NASHYD (0301) | Area (ha)= 0.53 Curve Number (CN)= 57.7
ID= 1 DT= 5.0 min | Ia (mm)= 4.49 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.009 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 6.313
TOTAL RAINFALL (mm)= 42.157
RUNOFF COEFFICIENT = 0.150

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

CALIB
STANDHYD (0201) | Area (ha)= 0.84
ID= 1 DT= 5.0 min | Total Imp(%)= 56.00 Dir. Conn.(%)= 30.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.47 0.37
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 1.00 2.50
Length (m)= 74.83 30.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 97.27 17.14
over (min) 5.00 15.00
Storage Coeff. (min)= 2.17 (ii) 13.42 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.31 0.08

TOTALS
PEAK FLOW (cms)= 0.07 0.01 0.073 (iii)
TIME TO PEAK (hrs)= 1.33 1.50 1.33
RUNOFF VOLUME (mm)= 40.16 7.42 17.23
TOTAL RAINFALL (mm)= 42.16 42.16 42.16
RUNOFF COEFFICIENT = 0.95 0.18 0.41

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 (0203) | Area (ha)= 0.14
ID= 1 DT= 5.0 min | Total Imp(%)= 57.00 Dir. Conn.(%)= 0.10

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.08 0.06
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 3.00
Length (m)= 30.55 15.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 97.27 47.39
over (min) 5.00 10.00
Storage Coeff. (min)= 1.03 (ii) 5.71 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.34 0.15

TOTALS
PEAK FLOW (cms)= 0.00 0.01 0.006 (iii)
TIME TO PEAK (hrs)= 1.33 1.42 1.42
RUNOFF VOLUME (mm)= 40.16 10.41 10.41

TOTAL RAINFALL (mm)= 42.16 42.16 42.16
RUNOFF COEFFICIENT = 0.95 0.25 0.25

***** 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* = 49.0 Ia = Dep. 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 (0303)
ID= 1 DT= 5.0 min
Area (ha)= 0.11
Total Imp(%)= 37.00 Dir. Conn.(%)= 0.10

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.04 0.07
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 1.00
Length (m)= 27.08 20.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 97.27 17.03
over (min) 5.00 15.00
Storage Coeff. (min)= 0.96 (ii) 12.60 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.34 0.08

PEAK FLOW (cms)= 0.00 0.00 0.002 (iii)
TIME TO PEAK (hrs)= 1.33 1.50 1.50
RUNOFF VOLUME (mm)= 40.16 7.39 7.36
TOTAL RAINFALL (mm)= 42.16 42.16 42.16
RUNOFF COEFFICIENT = 0.95 0.18 0.17

***** 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* = 49.0 Ia = Dep. 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 (0901)
1 + 2 = 3
AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0201): 0.84 0.073 1.33 17.23
+ ID2= 2 (0203): 0.14 0.006 1.42 10.41
ID = 3 (0901): 0.98 0.078 1.33 16.26

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0901)
3 + 2 = 1
AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 3 (0901): 0.98 0.078 1.33 16.26
+ ID2= 2 (0301): 0.53 0.009 1.50 6.31
ID = 1 (0901): 1.51 0.084 1.33 12.77

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0901)
1 + 2 = 3
AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0901): 1.51 0.084 1.33 12.77
+ ID2= 2 (0303): 0.11 0.002 1.50 7.36
ID = 3 (0901): 1.62 0.085 1.33 12.40

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0401)
IN= 2---> OUT= 1
DT= 5.0 min
OVERFLOW IS OFF
OUTFLOW STORAGE | OUTFLOW STORAGE
(cms) (ha.m.) | (cms) (ha.m.)
0.0000 0.0000 | 0.0750 0.0105
0.0051 0.0011 | 0.0798 0.0118
0.0207 0.0022 | 0.0843 0.0132
0.0342 0.0033 | 0.0886 0.0145
0.0437 0.0045 | 0.0927 0.0158
0.0515 0.0056 | 0.0966 0.0171
0.0583 0.0068 | 0.1004 0.0181
0.0643 0.0080 | 0.1052 0.0195
0.0699 0.0092 | 0.0000 0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0901)	1.620	0.085	1.33	12.40
OUTFLOW: ID= 1 (0401)	1.620	0.042	1.50	12.37

PEAK FLOW REDUCTION [Qout/Qin](%)= 49.51
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0043

CALIB	STANDHYD (0202)	Area (ha)= 0.12	Total Imp(%)= 45.00	Dir. Conn.(%)= 0.10
ID= 1 DT= 5.0 min				

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.05	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	28.28	15.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	97.27	29.02
over (min)	5.00	10.00
Storage Coeff. (min)=	0.98 (ii)	7.41 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.34	0.13

PEAK FLOW (cms)=	0.00	0.00	*TOTALS*
TIME TO PEAK (hrs)=	1.33	1.42	0.004 (iii)
RUNOFF VOLUME (mm)=	40.16	8.39	8.38
TOTAL RAINFALL (mm)=	42.16	42.16	42.16
RUNOFF COEFFICIENT =	0.95	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.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 (0903)	1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
-----------------	-----------	--------------	----------------	----------------	--------------

ID1= 1 (0202):	0.12	0.004	1.42	8.38
+ ID2= 2 (0401):	1.62	0.042	1.50	12.37
=====				
ID = 3 (0903):	1.74	0.046	1.42	12.09

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	STANDHYD (0302)	Area (ha)= 0.50	Total Imp(%)= 22.00	Dir. Conn.(%)= 0.10
ID= 1 DT= 5.0 min				

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.11	0.39
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	57.74	75.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	97.27	8.18
over (min)	5.00	30.00
Storage Coeff. (min)=	1.51 (ii)	26.31 (ii)
Unit Hyd. Tpeak (min)=	5.00	30.00
Unit Hyd. peak (cms)=	0.33	0.04

PEAK FLOW (cms)=	0.00	0.00	*TOTALS*
TIME TO PEAK (hrs)=	1.33	1.75	0.005 (iii)
RUNOFF VOLUME (mm)=	40.16	5.98	5.98
TOTAL RAINFALL (mm)=	42.16	42.16	42.16
RUNOFF COEFFICIENT =	0.95	0.14	0.14

***** 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* = 49.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

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

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\V02\voin.dat

Output filename:
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6ffd511-22e5-40fc-902c-e8ab9cc96306\s

DATE: 05-26-2022 TIME: 05:09:02

USER:

COMMENTS: _____

** SIMULATION : 4. 10yr - CHI **

CHICAGO STORM | IDF curve parameters: A= 565.106
| Ptotal= 48.98 mm | B= 0.000
C= 0.699
used in: INTENSITY = A / (t + B)^C
Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.35

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

0.17	4.26	1.17	19.83	2.17	8.02	3.17	4.67
0.33	4.76	1.33	113.01	2.33	7.08	3.33	4.39
0.50	5.43	1.50	23.78	2.50	6.37	3.50	4.16
0.67	6.39	1.67	14.90	2.67	5.81	3.67	3.95
0.83	7.90	1.83	11.34	2.83	5.36	3.83	3.77
1.00	10.78	2.00	9.34	3.00	4.98	4.00	3.60

CALIB	Area	(ha)=	0.53	Curve Number	(CN)=	57.7
NASHYD (0301)	Ia	(mm)=	4.49	# of Linear Res.	(N)=	3.00
ID= 1 DT= 5.0 min	U.H. Tp	(hrs)=	0.19			

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.012 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 8.548
TOTAL RAINFALL (mm)= 48.980
RUNOFF COEFFICIENT = 0.175

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

CALIB	Area	(ha)=	0.84			
STANDHYD (0201)	Total Imp	(%)=	56.00	Dir. Conn.	(%)=	30.00
ID= 1 DT= 5.0 min						

	IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)= 0.47	0.37
Dep. Storage	(mm)= 2.00	5.00
Average Slope	(%)= 1.00	2.50
Length	(m)= 74.83	30.00
Mannings n	= 0.013	0.250

Max.Eff.Inten.(mm/hr)=	113.01	30.07
over (min)	5.00	15.00
Storage Coeff. (min)=	2.04 (ii)	11.03 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.31	0.09

			TOTALS
PEAK FLOW	(cms)=	0.08	0.02
TIME TO PEAK	(hrs)=	1.33	1.50
RUNOFF VOLUME	(mm)=	46.98	9.91
TOTAL RAINFALL	(mm)=	48.98	48.98
RUNOFF COEFFICIENT	=	0.96	0.20
			0.43

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 ( 0203)|
|ID= 1 DT= 5.0 min|
-----
Area (ha)= 0.14
Total Imp(%)= 57.00 Dir. Conn.(%)= 0.10

      IMPERVIOUS    PERVIOUS (i)
Surface Area (ha)= 0.08 0.06
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 3.00
Length (m)= 30.55 15.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 113.01 63.26
over (min) 5.00 10.00
Storage Coeff. (min)= 0.97 (ii) 5.14 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.34 0.16

      *TOTALS*
PEAK FLOW (cms)= 0.00 0.01 0.008 (iii)
TIME TO PEAK (hrs)= 1.33 1.42 1.42
RUNOFF VOLUME (mm)= 46.98 13.65 13.66
TOTAL RAINFALL (mm)= 48.98 48.98 48.98
RUNOFF COEFFICIENT = 0.96 0.28 0.28
```

***** 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* = 49.0 Ia = Dep. 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 ( 0303)|
|ID= 1 DT= 5.0 min|
-----
Area (ha)= 0.11
Total Imp(%)= 37.00 Dir. Conn.(%)= 0.10

      IMPERVIOUS    PERVIOUS (i)
```

```
Surface Area (ha)= 0.04 0.07
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 1.00
Length (m)= 27.08 20.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 113.01 29.87
over (min) 5.00 15.00
Storage Coeff. (min)= 0.90 (ii) 10.20 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.34 0.09

      *TOTALS*
PEAK FLOW (cms)= 0.00 0.00 0.003 (iii)
TIME TO PEAK (hrs)= 1.33 1.50 1.50
RUNOFF VOLUME (mm)= 46.98 9.88 9.87
TOTAL RAINFALL (mm)= 48.98 48.98 48.98
RUNOFF COEFFICIENT = 0.96 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.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 ( 0901)|
| 1 + 2 = 3 |
-----
      AREA    QPEAK    TPEAK    R.V.
      (ha)    (cms)    (hrs)    (mm)
ID1= 1 ( 0201): 0.84 0.087 1.33 21.02
+ ID2= 2 ( 0203): 0.14 0.008 1.42 13.66
=====
ID = 3 ( 0901): 0.98 0.094 1.33 19.97
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| ADD HYD ( 0901)|
| 3 + 2 = 1 |
-----
      AREA    QPEAK    TPEAK    R.V.
      (ha)    (cms)    (hrs)    (mm)
ID1= 3 ( 0901): 0.98 0.094 1.33 19.97
+ ID2= 2 ( 0301): 0.53 0.012 1.50 8.55
=====
ID = 1 ( 0901): 1.51 0.103 1.33 15.96
```


NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0901)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0901):	1.51	0.103	1.33	15.96
+ ID2= 2 (0303):	0.11	0.003	1.50	9.87
=====				
ID = 3 (0901):	1.62	0.105	1.33	15.55

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0401)				
IN= 2---> OUT= 1				
DT= 5.0 min				

OVERFLOW IS OFF				
	OUTFLOW	STORAGE	OUTFLOW	STORAGE
	(cms)	(ha.m.)	(cms)	(ha.m.)
	0.0000	0.0000	0.0750	0.0105
	0.0051	0.0011	0.0798	0.0118
	0.0207	0.0022	0.0843	0.0132
	0.0342	0.0033	0.0886	0.0145
	0.0437	0.0045	0.0927	0.0158
	0.0515	0.0056	0.0966	0.0171
	0.0583	0.0068	0.1004	0.0181
	0.0643	0.0080	0.1052	0.0195
	0.0699	0.0092	0.0000	0.0000
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0901)	1.620	0.105	1.33	15.55
OUTFLOW: ID= 1 (0401)	1.620	0.051	1.50	15.52

PEAK FLOW REDUCTION [Qout/Qin](%)= 48.56
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0056

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

	Area	(ha)=	0.12
	Total Imp(%)=	45.00	Dir. Conn.(%)= 0.10
	IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.05	0.07
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	2.00	2.00
Length	(m)=	28.28	15.00

Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=	113.01	39.23	
over (min)	5.00	10.00	
Storage Coeff. (min)=	0.93 (ii)	6.62 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.34	0.14	

TOTALS			
PEAK FLOW (cms)=	0.00	0.01	0.005 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.42
RUNOFF VOLUME (mm)=	46.98	11.14	11.14
TOTAL RAINFALL (mm)=	48.98	48.98	48.98
RUNOFF COEFFICIENT =	0.96	0.23	0.23

***** 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* = 49.0 Ia = Dep. 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 (0903)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0202):	0.12	0.005	1.42	11.14
+ ID2= 2 (0401):	1.62	0.051	1.50	15.52
=====				
ID = 3 (0903):	1.74	0.055	1.50	15.22

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0302)			
ID= 1 DT= 5.0 min			

	Area	(ha)=	0.50
	Total Imp(%)=	22.00	Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.11
Dep. Storage	(mm)=	2.00
Average Slope	(%)=	2.00
Length	(m)=	57.74
Mannings n	=	0.013
Max.Eff.Inten.(mm/hr)=	113.01	11.20

over (min)	5.00	25.00	
Storage Coeff. (min)=	1.42 (ii)	23.29 (ii)	
Unit Hyd. Tpeak (min)=	5.00	25.00	
Unit Hyd. peak (cms)=	0.33	0.05	
			TOTALS
PEAK FLOW (cms)=	0.00	0.01	0.007 (iii)
TIME TO PEAK (hrs)=	1.33	1.67	1.67
RUNOFF VOLUME (mm)=	46.98	8.08	8.09
TOTAL RAINFALL (mm)=	48.98	48.98	48.98
RUNOFF COEFFICIENT =	0.96	0.16	0.17

***** 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* = 49.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

=====

V	V	I	SSSS	U	U	A	L		(v 6.1.2001)
V	V	I	SS	U	U	A	A	L	
V	V	I	SS	U	U	AAAA	L		
V	V	I	SS	U	U	A	A	L	
VV	I	SSSS	UUUU	A	A	LLLL			

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

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\V02\voin.dat

Output filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\5
e8f0e29-9d75-4181-b554-844123c7bcf8\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\5

e8f0e29-9d75-4181-b554-844123c7bcf8\s

DATE: 05-26-2022

TIME: 05:09:02

USER:

COMMENTS: _____

** SIMULATION : 5. 25yr - CHI **

| CHICAGO STORM |
Ptotal= 57.62 mm

IDF curve parameters: A= 664.831
B= 0.000
C= 0.699

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

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.35

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.17	5.01	1.17	23.33	2.17	9.44	3.17	5.49
0.33	5.60	1.33	132.96	2.33	8.33	3.33	5.17
0.50	6.39	1.50	27.97	2.50	7.49	3.50	4.89
0.67	7.51	1.67	17.53	2.67	6.84	3.67	4.65
0.83	9.30	1.83	13.35	2.83	6.31	3.83	4.43
1.00	12.69	2.00	10.98	3.00	5.86	4.00	4.24

| CALIB |
| NASHYD (0301) |
ID= 1 DT= 5.0 min

Area (ha)= 0.53 Curve Number (CN)= 57.7
Ia (mm)= 4.49 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.017 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 11.753

TOTAL RAINFALL (mm)= 57.624
RUNOFF COEFFICIENT = 0.204

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

| CALIB |
| STANDHYD (0201) | Area (ha)= 0.84
| ID= 1 DT= 5.0 min | Total Imp(%)= 56.00 Dir. Conn.(%)= 30.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.47	0.37
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	1.00	2.50
Length (m)=	74.83	30.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	132.96	41.62
over (min)	5.00	10.00
Storage Coeff. (min)=	1.92 (ii)	9.80 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.31	0.11

			TOTALS
PEAK FLOW (cms)=	0.09	0.03	0.113 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.33
RUNOFF VOLUME (mm)=	55.62	13.45	26.10
TOTAL RAINFALL (mm)=	57.62	57.62	57.62
RUNOFF COEFFICIENT =	0.97	0.23	0.45

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 (0203) | Area (ha)= 0.14
| ID= 1 DT= 5.0 min | Total Imp(%)= 57.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.08	0.06
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	30.55	15.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	132.96	85.80
over (min)	5.00	5.00
Storage Coeff. (min)=	0.91 (ii)	4.60 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.23

			TOTALS
PEAK FLOW (cms)=	0.00	0.01	0.014 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.33
RUNOFF VOLUME (mm)=	55.62	18.18	18.21
TOTAL RAINFALL (mm)=	57.62	57.62	57.62
RUNOFF COEFFICIENT =	0.97	0.32	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* = 49.0 Ia = Dep. 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 (0303) | Area (ha)= 0.11
| ID= 1 DT= 5.0 min | Total Imp(%)= 37.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.04	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	1.00
Length (m)=	27.08	20.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	132.96	41.36
over (min)	5.00	10.00
Storage Coeff. (min)=	0.85 (ii)	9.01 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.34	0.12

			TOTALS
PEAK FLOW (cms)=	0.00	0.01	0.005 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.42
RUNOFF VOLUME (mm)=	55.62	13.41	13.40
TOTAL RAINFALL (mm)=	57.62	57.62	57.62
RUNOFF COEFFICIENT =	0.97	0.23	0.23

***** 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* = 49.0 Ia = Dep. 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 (0901)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0201):	0.84	0.113	1.33	26.10
+ ID2= 2 (0203):	0.14	0.014	1.33	18.21
=====				
ID = 3 (0901):	0.98	0.128	1.33	24.97

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0901)				
3 + 2 = 1				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0901):	0.98	0.128	1.33	24.97
+ ID2= 2 (0301):	0.53	0.017	1.50	11.75
=====				
ID = 1 (0901):	1.51	0.140	1.33	20.33

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0901)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0901):	1.51	0.140	1.33	20.33
+ ID2= 2 (0303):	0.11	0.005	1.42	13.40
=====				
ID = 3 (0901):	1.62	0.144	1.33	19.86

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0401)				
IN= 2---> OUT= 1				
DT= 5.0 min				

OVERFLOW IS OFF				
	OUTFLOW	STORAGE	OUTFLOW	STORAGE
	(cms)	(ha.m.)	(cms)	(ha.m.)

0.0000	0.0000	0.0750	0.0105
0.0051	0.0011	0.0798	0.0118
0.0207	0.0022	0.0843	0.0132
0.0342	0.0033	0.0886	0.0145
0.0437	0.0045	0.0927	0.0158
0.0515	0.0056	0.0966	0.0171
0.0583	0.0068	0.1004	0.0181
0.0643	0.0080	0.1052	0.0195
0.0699	0.0092	0.0000	0.0000

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0901)	1.620	0.144	1.33	19.86
OUTFLOW: ID= 1 (0401)	1.620	0.062	1.50	19.83

PEAK FLOW REDUCTION [Qout/Qin](%)= 43.28
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0077

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

	Area (ha)=	0.12	
	Total Imp(%)=	45.00	Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.05	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	28.28	15.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	132.96	53.90
over (min)	5.00	10.00
Storage Coeff. (min)=	0.87 (ii)	5.88 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.34	0.15

TOTALS			
PEAK FLOW (cms)=	0.00	0.01	0.008 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.42
RUNOFF VOLUME (mm)=	55.62	15.02	15.02
TOTAL RAINFALL (mm)=	57.62	57.62	57.62
RUNOFF COEFFICIENT =	0.97	0.26	0.26

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 ( 0903)|
| 1 + 2 = 3 |
-----
          AREA    QPEAK    TPEAK    R.V.
          (ha)    (cms)    (hrs)    (mm)
ID1= 1 ( 0202):    0.12    0.008    1.42    15.02
+ ID2= 2 ( 0401):    1.62    0.062    1.50    19.83
=====
ID = 3 ( 0903):    1.74    0.068    1.42    19.50
-----
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| CALIB          |
| STANDHYD ( 0302)|
| ID= 1 DT= 5.0 min |
-----
          Area (ha)= 0.50
          Total Imp(%)= 22.00 Dir. Conn.(%)= 0.10
-----
```

```

          IMPERVIOUS    PERVIOUS (i)
Surface Area (ha)= 0.11    0.39
Dep. Storage (mm)= 2.00    5.00
Average Slope (%)= 2.00    3.00
Length (m)= 57.74    75.00
Mannings n = 0.013    0.250

Max.Eff.Inten.(mm/hr)= 132.96    17.97
over (min) = 5.00    20.00
Storage Coeff. (min)= 1.33 (ii)    19.44 (ii)
Unit Hyd. Tpeak (min)= 5.00    20.00
Unit Hyd. peak (cms)= 0.33    0.06
```

```

          *TOTALS*
PEAK FLOW (cms)= 0.00    0.01    0.012 (iii)
TIME TO PEAK (hrs)= 1.33    1.58    1.58
RUNOFF VOLUME (mm)= 55.62    11.09    11.12
TOTAL RAINFALL (mm)= 57.62    57.62    57.62
RUNOFF COEFFICIENT = 0.97    0.19    0.19
```

***** 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* = 49.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
-----
=====
=====
```

```

V V I SSSS U U A L (v 6.1.2001)
V V I SS U U A A L
V V I SS U U A A A L
V V I SS U U A A L
VV I SSSS UUUU A A LLLL
```

```

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

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\VO2\voin.dat

Output filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\7
c05299e-0f24-4bfd-a7d5-825c68ea131b\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\7
c05299e-0f24-4bfd-a7d5-825c68ea131b\s

DATE: 05-26-2022

TIME: 05:09:02

USER:

COMMENTS: _____

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

```
*****
** SIMULATION : 6. 50yr - CHI **
*****
```

```
-----
| CHICAGO STORM | IDF curve parameters: A= 738.312
```

| Ptotal= 63.99 mm |

B= 0.000

C= 0.699

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

Duration of storm = 4.00 hrs

Storm time step = 10.00 min

Time to peak ratio = 0.35

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.17	5.56	1.17	25.91	2.17	10.48	3.17	6.10
0.33	6.22	1.33	147.65	2.33	9.25	3.33	5.74
0.50	7.09	1.50	31.06	2.50	8.32	3.50	5.43
0.67	8.34	1.67	19.47	2.67	7.59	3.67	5.16
0.83	10.32	1.83	14.82	2.83	7.00	3.83	4.92
1.00	14.09	2.00	12.20	3.00	6.51	4.00	4.71

| CALIB

| NASHYD (0301)

| ID= 1 DT= 5.0 min |

Area (ha)= 0.53

Ia (mm)= 4.49

U.H. Tp(hrs)= 0.19

Curve Number (CN)= 57.7

of Linear Res.(N)= 3.00

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.022 (i)

TIME TO PEAK (hrs)= 1.500

RUNOFF VOLUME (mm)= 14.358

TOTAL RAINFALL (mm)= 63.993

RUNOFF COEFFICIENT = 0.224

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

| CALIB

| STANDHYD (0201)

| ID= 1 DT= 5.0 min |

Area (ha)= 0.84

Total Imp(%)= 56.00

Dir. Conn.(%)= 30.00

IMPERVIOUS PERVIOUS (i)

Surface Area (ha)= 0.47 0.37

Dep. Storage (mm)= 2.00 5.00

Average Slope (%)= 1.00 2.50

Length (m)= 74.83 30.00

Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 147.65 51.09

over (min) 5.00 10.00

Storage Coeff. (min)= 1.84 (ii) 9.10 (ii)

Unit Hyd. Tpeak (min)= 5.00 10.00

Unit Hyd. peak (cms)= 0.32 0.12

TOTALS

PEAK FLOW (cms)= 0.10 0.03 0.130 (iii)

TIME TO PEAK (hrs)= 1.33 1.42 1.33

RUNOFF VOLUME (mm)= 61.99 16.31 30.01

TOTAL RAINFALL (mm)= 63.99 63.99 63.99

RUNOFF COEFFICIENT = 0.97 0.25 0.47

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 49.0 Ia = Dep. 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 (0203)

| ID= 1 DT= 5.0 min |

Area (ha)= 0.14

Total Imp(%)= 57.00

Dir. Conn.(%)= 0.10

IMPERVIOUS PERVIOUS (i)

Surface Area (ha)= 0.08 0.06

Dep. Storage (mm)= 2.00 5.00

Average Slope (%)= 2.00 3.00

Length (m)= 30.55 15.00

Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 147.65 103.98

over (min) 5.00 5.00

Storage Coeff. (min)= 0.87 (ii) 4.29 (ii)

Unit Hyd. Tpeak (min)= 5.00 5.00

Unit Hyd. peak (cms)= 0.34 0.23

TOTALS

PEAK FLOW (cms)= 0.00 0.02 0.018 (iii)

TIME TO PEAK (hrs)= 1.33 1.33 1.33

RUNOFF VOLUME (mm)= 61.99 21.77 21.80

TOTAL RAINFALL (mm)= 63.99 63.99 63.99

RUNOFF COEFFICIENT = 0.97 0.34 0.34

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

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 49.0 Ia = Dep. 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 ( 0303) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 0.11
Total Imp(%)= 37.00 Dir. Conn.(%)= 0.10

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.04 0.07
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 1.00
Length (m)= 27.08 20.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 147.65 50.77
over (min) 5.00 10.00
Storage Coeff. (min)= 0.81 (ii) 8.33 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.34 0.13

*TOTALS*
PEAK FLOW (cms)= 0.00 0.01 0.007 (iii)
TIME TO PEAK (hrs)= 1.33 1.42 1.42
RUNOFF VOLUME (mm)= 61.99 16.27 16.26
TOTAL RAINFALL (mm)= 63.99 63.99 63.99
RUNOFF COEFFICIENT = 0.97 0.25 0.25
```

***** 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* = 49.0 Ia = Dep. 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 ( 0901) |
| 1 + 2 = 3 |
-----
AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 ( 0201): 0.84 0.130 1.33 30.01
+ ID2= 2 ( 0203): 0.14 0.018 1.33 21.80
=====
ID = 3 ( 0901): 0.98 0.147 1.33 28.84
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| ADD HYD ( 0901) |
| 3 + 2 = 1 |
-----
AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 3 ( 0901): 0.98 0.147 1.33 28.84
+ ID2= 2 ( 0301): 0.53 0.022 1.50 14.36
=====
ID = 1 ( 0901): 1.51 0.163 1.33 23.76
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| ADD HYD ( 0901) |
| 1 + 2 = 3 |
-----
AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 ( 0901): 1.51 0.163 1.33 23.76
+ ID2= 2 ( 0303): 0.11 0.007 1.42 16.26
=====
ID = 3 ( 0901): 1.62 0.168 1.33 23.25
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| RESERVOIR( 0401) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
-----
OVERFLOW IS OFF

OUTFLOW STORAGE | OUTFLOW STORAGE
(cms) (ha.m.) | (cms) (ha.m.)
0.0000 0.0000 | 0.0750 0.0105
0.0051 0.0011 | 0.0798 0.0118
0.0207 0.0022 | 0.0843 0.0132
0.0342 0.0033 | 0.0886 0.0145
0.0437 0.0045 | 0.0927 0.0158
0.0515 0.0056 | 0.0966 0.0171
0.0583 0.0068 | 0.1004 0.0181
0.0643 0.0080 | 0.1052 0.0195
0.0699 0.0092 | 0.0000 0.0000
```

```
AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
INFLOW : ID= 2 ( 0901) 1.620 0.168 1.33 23.25
OUTFLOW: ID= 1 ( 0401) 1.620 0.070 1.58 23.22
```

PEAK FLOW REDUCTION [Qout/Qin](%)= 41.64
TIME SHIFT OF PEAK FLOW (min)= 15.00
MAXIMUM STORAGE USED (ha.m.)= 0.0093

```

-----
| CALIB |
| STANDHYD ( 0202) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 0.12
Total Imp(%)= 45.00 Dir. Conn.(%)= 0.10

IMPervIOUS PERVIOUS (i)
Surface Area (ha)= 0.05 0.07
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 28.28 15.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 147.65 65.86
over (min) 5.00 10.00
Storage Coeff. (min)= 0.83 (ii) 5.46 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.34 0.16

PEAK FLOW (cms)= 0.00 0.01
TIME TO PEAK (hrs)= 1.33 1.42
RUNOFF VOLUME (mm)= 61.99 18.14
TOTAL RAINFALL (mm)= 63.99 63.99
RUNOFF COEFFICIENT = 0.97 0.28

*TOTALS*
0.010 (iii)

```

***** 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* = 49.0 Ia = Dep. 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 ( 0903) |
| 1 + 2 = 3 |
-----
AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 ( 0202): 0.12 0.010 1.42 18.14
+ ID2= 2 ( 0401): 1.62 0.070 1.58 23.22
=====
ID = 3 ( 0903): 1.74 0.076 1.42 22.87

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| STANDHYD ( 0302) |
Area (ha)= 0.50

```

```

|ID= 1 DT= 5.0 min | Total Imp(%)= 22.00 Dir. Conn.(%)= 0.10
-----

```

```

IMPervIOUS PERVIOUS (i)
Surface Area (ha)= 0.11 0.39
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 3.00
Length (m)= 57.74 75.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 147.65 22.14
over (min) 5.00 20.00
Storage Coeff. (min)= 1.28 (ii) 17.93 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.33 0.06

PEAK FLOW (cms)= 0.00 0.02
TIME TO PEAK (hrs)= 1.33 1.58
RUNOFF VOLUME (mm)= 61.99 13.55
TOTAL RAINFALL (mm)= 63.99 63.99
RUNOFF COEFFICIENT = 0.97 0.21

*TOTALS*
0.015 (iii)

```

***** 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* = 49.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

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

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

```

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```

| CALIB
| STANDHYD ( 0203) | Area (ha)= 0.14
| ID= 1 DT= 5.0 min | Total Imp(%)= 57.00 Dir. Conn.(%)= 0.10
-----

```

```

                IMPERVIOUS    PERVIOUS (i)
Surface Area (ha)= 0.08      0.06
Dep. Storage (mm)= 2.00      5.00
Average Slope (%)= 2.00      3.00
Length (m)= 30.55      15.00
Mannings n = 0.013      0.250

```

```

Max.Eff.Inten.(mm/hr)= 162.35      123.37
                    over (min) 5.00      5.00
Storage Coeff. (min)= 0.84 (ii) 4.03 (ii)
Unit Hyd. Tpeak (min)= 5.00      5.00
Unit Hyd. peak (cms)= 0.34      0.24

```

```

                *TOTALS*
PEAK FLOW (cms)= 0.00      0.02      0.021 (iii)
TIME TO PEAK (hrs)= 1.33      1.33      1.33
RUNOFF VOLUME (mm)= 68.36      25.56      25.60
TOTAL RAINFALL (mm)= 70.36      70.36      70.36
RUNOFF COEFFICIENT = 0.97      0.36      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* = 49.0 Ia = Dep. 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 ( 0303) | Area (ha)= 0.11
| ID= 1 DT= 5.0 min | Total Imp(%)= 37.00 Dir. Conn.(%)= 0.10
-----

```

```

                IMPERVIOUS    PERVIOUS (i)
Surface Area (ha)= 0.04      0.07
Dep. Storage (mm)= 2.00      5.00
Average Slope (%)= 2.00      1.00
Length (m)= 27.08      20.00
Mannings n = 0.013      0.250

```

```

Max.Eff.Inten.(mm/hr)= 162.35      60.93
                    over (min) 5.00      10.00
Storage Coeff. (min)= 0.78 (ii) 7.77 (ii)
Unit Hyd. Tpeak (min)= 5.00      10.00

```

```

Unit Hyd. peak (cms)= 0.34      0.13
                *TOTALS*
PEAK FLOW (cms)= 0.00      0.01      0.008 (iii)
TIME TO PEAK (hrs)= 1.33      1.42      1.42
RUNOFF VOLUME (mm)= 68.36      19.31      19.31
TOTAL RAINFALL (mm)= 70.36      70.36      70.36
RUNOFF COEFFICIENT = 0.97      0.27      0.27

```

***** 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* = 49.0 Ia = Dep. 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 ( 0901) |
| 1 + 2 = 3 |
-----
                AREA    QPEAK    TPEAK    R.V.
                (ha)    (cms)    (hrs)    (mm)
ID1= 1 ( 0201): 0.84    0.147    1.33    34.06
+ ID2= 2 ( 0203): 0.14    0.021    1.33    25.60
=====
ID = 3 ( 0901): 0.98    0.168    1.33    32.85

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0901) |
| 3 + 2 = 1 |
-----
                AREA    QPEAK    TPEAK    R.V.
                (ha)    (cms)    (hrs)    (mm)
ID1= 3 ( 0901): 0.98    0.168    1.33    32.85
+ ID2= 2 ( 0301): 0.53    0.026    1.50    17.15
=====
ID = 1 ( 0901): 1.51    0.186    1.33    27.34

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0901) |
| 1 + 2 = 3 |
-----
                AREA    QPEAK    TPEAK    R.V.
                (ha)    (cms)    (hrs)    (mm)
ID1= 1 ( 0901): 1.51    0.186    1.33    27.34
+ ID2= 2 ( 0303): 0.11    0.008    1.42    19.31

```

=====
ID = 3 (0901): 1.62 0.193 1.33 26.79

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0401) | OVERFLOW IS OFF
IN= 2---> OUT= 1 |
DT= 5.0 min |
OUTFLOW STORAGE | OUTFLOW STORAGE
(cms) (ha.m.) | (cms) (ha.m.)
0.0000 0.0000 | 0.0750 0.0105
0.0051 0.0011 | 0.0798 0.0118
0.0207 0.0022 | 0.0843 0.0132
0.0342 0.0033 | 0.0886 0.0145
0.0437 0.0045 | 0.0927 0.0158
0.0515 0.0056 | 0.0966 0.0171
0.0583 0.0068 | 0.1004 0.0181
0.0643 0.0080 | 0.1052 0.0195
0.0699 0.0092 | 0.0000 0.0000
AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
INFLOW : ID= 2 (0901) 1.620 0.193 1.33 26.79
OUTFLOW: ID= 1 (0401) 1.620 0.077 1.58 26.76

PEAK FLOW REDUCTION [Qout/Qin](%)= 39.83
TIME SHIFT OF PEAK FLOW (min)= 15.00
MAXIMUM STORAGE USED (ha.m.)= 0.0111

CALIB
STANDHYD (0202) | Area (ha)= 0.12
ID= 1 DT= 5.0 min | Total Imp(%)= 45.00 Dir. Conn.(%)= 0.10
IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.05 0.07
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 28.28 15.00
Mannings n = 0.013 0.250
Max.Eff.Inten.(mm/hr)= 162.35 78.72
over (min) 5.00 10.00
Storage Coeff. (min)= 0.80 (ii) 5.11 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.34 0.16
TOTALS
PEAK FLOW (cms)= 0.00 0.01 0.012 (iii)
TIME TO PEAK (hrs)= 1.33 1.42 1.42

RUNOFF VOLUME (mm)= 68.36 21.44 21.45
TOTAL RAINFALL (mm)= 70.36 70.36 70.36
RUNOFF COEFFICIENT = 0.97 0.30 0.30

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 (0903) |
1 + 2 = 3 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0202): 0.12 0.012 1.42 21.45
+ ID2= 2 (0401): 1.62 0.077 1.58 26.76
ID = 3 (0903): 1.74 0.084 1.42 26.40

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0302) | Area (ha)= 0.50
ID= 1 DT= 5.0 min | Total Imp(%)= 22.00 Dir. Conn.(%)= 0.10

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.11 0.39
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 3.00
Length (m)= 57.74 75.00
Mannings n = 0.013 0.250
Max.Eff.Inten.(mm/hr)= 162.35 31.07
over (min) 5.00 20.00
Storage Coeff. (min)= 1.23 (ii) 15.77 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.33 0.07
TOTALS
PEAK FLOW (cms)= 0.00 0.02 0.020 (iii)
TIME TO PEAK (hrs)= 1.33 1.58 1.58
RUNOFF VOLUME (mm)= 68.36 16.19 16.22
TOTAL RAINFALL (mm)= 70.36 70.36 70.36
RUNOFF COEFFICIENT = 0.97 0.23 0.23

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

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

***** D E T A I L E D O U T P U T *****

COMMENTS:

READ STORM	Filename: C:\Users\KGowanlock\AppData\Local\Temp\
Ptotal=193.00 mm	b11eae0-7f77-40e5-99d6-b27f50ac2c65\b4fa48b7
	Comments: TIMMINS

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

CALIB			
NASHYD (0301)	Area (ha)=	0.53	Curve Number (CN)= 57.7
ID= 1 DT= 5.0 min	Ia (mm)=	4.49	# of Linear Res.(N)= 3.00
-----	U.H. Tp(hrs)=	0.19	

```

PEAK FLOW      (cms)=   0.037 (i)
TIME TO PEAK   (hrs)=   7.000
RUNOFF VOLUME   (mm)=  94.536
TOTAL RAINFALL  (mm)= 193.000
RUNOFF COEFFICIENT = 0.490

```

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

CALIB			
STANDHYD (0201)	Area (ha)= 0.84		
ID= 1 DT= 5.0 min	Total Imp(%)= 56.00	Dir. Conn.(%)= 30.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.47	0.37
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	1.00	2.50
Length (m)=	74.83	30.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	43.00	43.51
over (min)	5.00	15.00
Storage Coeff. (min)=	3.01 (ii)	10.76 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.28	0.09

TOTALS

PEAK FLOW (cms)=	0.03	0.04	0.073 (iii)
TIME TO PEAK (hrs)=	6.75	7.00	7.00
RUNOFF VOLUME (mm)=	191.00	101.24	128.16
TOTAL RAINFALL (mm)=	193.00	193.00	193.00
RUNOFF COEFFICIENT =	0.99	0.52	0.66

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 (0203)	Area (ha)= 0.14		
ID= 1 DT= 5.0 min	Total Imp(%)= 57.00	Dir. Conn.(%)= 0.10	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.08	0.06
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	30.55	15.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	43.00	74.13
over (min)	5.00	10.00
Storage Coeff. (min)=	1.43 (ii)	5.34 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.33	0.16

TOTALS

PEAK FLOW (cms)=	0.00	0.01	0.012 (iii)
TIME TO PEAK (hrs)=	6.25	7.00	7.00
RUNOFF VOLUME (mm)=	191.00	119.56	119.62
TOTAL RAINFALL (mm)=	193.00	193.00	193.00
RUNOFF COEFFICIENT =	0.99	0.62	0.62

***** 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* = 49.0 Ia = Dep. 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 (0303)	Area (ha)= 0.11		
ID= 1 DT= 5.0 min	Total Imp(%)= 37.00	Dir. Conn.(%)= 0.10	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.04	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	1.00
Length (m)=	27.08	20.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	43.00	43.30
over (min)	5.00	10.00
Storage Coeff. (min)=	1.33 (ii)	9.34 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.33	0.12

TOTALS

PEAK FLOW (cms)=	0.00	0.01	0.008 (iii)
TIME TO PEAK (hrs)=	6.25	7.00	7.00
RUNOFF VOLUME (mm)=	191.00	101.08	101.13
TOTAL RAINFALL (mm)=	193.00	193.00	193.00
RUNOFF COEFFICIENT =	0.99	0.52	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* = 49.0 Ia = Dep. 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 ( 0901)|
| 1 + 2 = 3 |
-----
ID1= 1 ( 0201):   AREA   QPEAK   TPEAK   R.V.
                  (ha)    (cms)   (hrs)   (mm)
+ ID2= 2 ( 0203):   0.84   0.073   7.00   128.16
=====
ID = 3 ( 0901):   0.14   0.012   7.00   119.62
=====
ID = 3 ( 0901):   0.98   0.085   7.00   126.94

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0901)|
| 3 + 2 = 1 |
-----
ID1= 3 ( 0901):   AREA   QPEAK   TPEAK   R.V.
                  (ha)    (cms)   (hrs)   (mm)
+ ID2= 2 ( 0301):   0.98   0.085   7.00   126.94
=====
ID = 1 ( 0901):   0.53   0.037   7.00   94.54
=====
ID = 1 ( 0901):   1.51   0.122   7.00   115.57

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0901)|
| 1 + 2 = 3 |
-----
ID1= 1 ( 0901):   AREA   QPEAK   TPEAK   R.V.
                  (ha)    (cms)   (hrs)   (mm)
+ ID2= 2 ( 0303):   1.51   0.122   7.00   115.57
=====
ID = 3 ( 0901):   0.11   0.008   7.00   101.13
=====
ID = 3 ( 0901):   1.62   0.130   7.00   114.59

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| RESERVOIR( 0401)|
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
-----
OVERFLOW IS OFF
OUTFLOW   STORAGE   |   OUTFLOW   STORAGE
(cms)     (ha.m.)   |   (cms)     (ha.m.)
0.0000    0.0000    |   0.0750    0.0105
0.0051    0.0011    |   0.0798    0.0118
0.0207    0.0022    |   0.0843    0.0132
0.0342    0.0033    |   0.0886    0.0145
0.0437    0.0045    |   0.0927    0.0158
0.0515    0.0056    |   0.0966    0.0171
0.0583    0.0068    |   0.1004    0.0181

```

```

0.0643   0.0080 | 0.1052   0.0195
0.0699   0.0092 | 0.0000   0.0000

```

```

AREA   QPEAK   TPEAK   R.V.
(ha)    (cms)   (hrs)   (mm)
INFLOW : ID= 2 ( 0901) 1.620   0.130   7.00   114.59
OUTFLOW: ID= 1 ( 0401) 1.620   0.100   7.17   114.56

```

```

PEAK FLOW REDUCTION [Qout/Qin](%)= 76.88
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0180

```

```

-----
| CALIB |
| STANDHYD ( 0202)|
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 0.12
Total Imp(%)= 45.00 Dir. Conn.(%)= 0.10

```

```

IMPERVIOUS   PERVIOUS (i)
Surface Area (ha)= 0.05   0.07
Dep. Storage (mm)= 2.00   5.00
Average Slope (%)= 2.00   2.00
Length (m)= 28.28   15.00
Mannings n = 0.013   0.250

```

```

Max.Eff.Inten.(mm/hr)= 43.00   52.70
over (min) 5.00   10.00
Storage Coeff. (min)= 1.36 (ii) 6.43 (ii)
Unit Hyd. Tpeak (min)= 5.00   10.00
Unit Hyd. peak (cms)= 0.33   0.14

```

```

*TOTALS*
PEAK FLOW (cms)= 0.00   0.01   0.010 (iii)
TIME TO PEAK (hrs)= 6.25   7.00   7.00
RUNOFF VOLUME (mm)= 191.00  107.79  107.83
TOTAL RAINFALL (mm)= 193.00  193.00  193.00
RUNOFF COEFFICIENT = 0.99   0.56   0.56

```

***** 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* = 49.0 Ia = Dep. 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 ( 0903)|
| 1 + 2 = 3 |
-----
ID1= 1 ( 0202):    AREA   QPEAK   TPEAK   R.V.
                   (ha)   (cms)   (hrs)   (mm)
+ ID2= 2 ( 0401):    0.12   0.010   7.00   107.83
                   1.62   0.100   7.17   114.56
=====
ID = 3 ( 0903):    1.74   0.108   7.08   114.09

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| STANDHYD ( 0302)|
| ID= 1 DT= 5.0 min |
-----

```

```

                   IMPERVIOUS   PERVIOUS (i)
Surface Area   (ha)=    0.11    0.39
Dep. Storage   (mm)=    2.00    5.00
Average Slope  (%)=    2.00    3.00
Length         (m)=   57.74   75.00
Mannings n     =    0.013   0.250

```

```

Max.Eff.Inten.(mm/hr)=   43.00    31.14
over (min)           5.00    20.00
Storage Coeff. (min)=   2.09 (ii)  16.62 (ii)
Unit Hyd. Tpeak (min)=   5.00    20.00
Unit Hyd. peak (cms)=   0.31    0.06

```

```

                   *TOTALS*
PEAK FLOW      (cms)=    0.00    0.03    0.031 (iii)
TIME TO PEAK   (hrs)=    6.50    7.00    7.00
RUNOFF VOLUME  (mm)=   191.00   90.41   90.49
TOTAL RAINFALL (mm)=   193.00   193.00  193.00
RUNOFF COEFFICIENT =    0.99    0.47    0.47

```

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

FINISH

```

=====
=====

```

** SIMULATION:1. 25mm **

| RESERVOIR(0401)|
| IN= 2---> OUT= 1 |
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0750	0.0105
0.0051	0.0011	0.0798	0.0118
0.0207	0.0022	0.0843	0.0132
0.0342	0.0033	0.0886	0.0145
0.0437	0.0045	0.0927	0.0158
0.0515	0.0056	0.0966	0.0171
0.0583	0.0068	0.1004	0.0181
0.0643	0.0080	0.1052	0.0195
0.0699	0.0092	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0901)	1.620	0.052	2.00	5.63
OUTFLOW: ID= 1 (0401)	1.620	0.025	2.17	5.60

PEAK FLOW REDUCTION [Qout/Qin](%)= 48.94
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0026

** SIMULATION:2. 2yr - CHI **

| RESERVOIR(0401)|
| IN= 2---> OUT= 1 |
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0750	0.0105
0.0051	0.0011	0.0798	0.0118
0.0207	0.0022	0.0843	0.0132
0.0342	0.0033	0.0886	0.0145
0.0437	0.0045	0.0927	0.0158
0.0515	0.0056	0.0966	0.0171
0.0583	0.0068	0.1004	0.0181
0.0643	0.0080	0.1052	0.0195
0.0699	0.0092	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0901)	1.620	0.058	1.33	8.07
OUTFLOW: ID= 1 (0401)	1.620	0.030	1.42	8.04

PEAK FLOW REDUCTION [Qout/Qin](%)= 51.34
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0030

** SIMULATION:3. 5yr - CHI **

| RESERVOIR(0401)|
| IN= 2---> OUT= 1 |
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0750	0.0105
0.0051	0.0011	0.0798	0.0118
0.0207	0.0022	0.0843	0.0132
0.0342	0.0033	0.0886	0.0145
0.0437	0.0045	0.0927	0.0158
0.0515	0.0056	0.0966	0.0171
0.0583	0.0068	0.1004	0.0181
0.0643	0.0080	0.1052	0.0195
0.0699	0.0092	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0901)	1.620	0.085	1.33	12.40
OUTFLOW: ID= 1 (0401)	1.620	0.042	1.50	12.37

PEAK FLOW REDUCTION [Qout/Qin](%)= 49.51
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0043

** SIMULATION:4. 10yr - CHI **

| RESERVOIR(0401)|
| IN= 2---> OUT= 1 |
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0750	0.0105
0.0051	0.0011	0.0798	0.0118
0.0207	0.0022	0.0843	0.0132
0.0342	0.0033	0.0886	0.0145
0.0437	0.0045	0.0927	0.0158
0.0515	0.0056	0.0966	0.0171
0.0583	0.0068	0.1004	0.0181
0.0643	0.0080	0.1052	0.0195


```
0.0699    0.0092 | 0.0000    0.0000

          AREA    QPEAK    TPEAK    R.V.
          (ha)    (cms)    (hrs)    (mm)
INFLOW : ID= 2 ( 0901) 1.620    0.105    1.33    15.55
OUTFLOW: ID= 1 ( 0401) 1.620    0.051    1.50    15.52
```

```
PEAK FLOW REDUCTION [Qout/Qin](%)= 48.56
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0056
```

```
*****
** SIMULATION:5. 25yr - CHI **
*****
```

```
| RESERVOIR( 0401)|
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
|-----|
```

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0750	0.0105
0.0051	0.0011	0.0798	0.0118
0.0207	0.0022	0.0843	0.0132
0.0342	0.0033	0.0886	0.0145
0.0437	0.0045	0.0927	0.0158
0.0515	0.0056	0.0966	0.0171
0.0583	0.0068	0.1004	0.0181
0.0643	0.0080	0.1052	0.0195
0.0699	0.0092	0.0000	0.0000

```
          AREA    QPEAK    TPEAK    R.V.
          (ha)    (cms)    (hrs)    (mm)
INFLOW : ID= 2 ( 0901) 1.620    0.144    1.33    19.86
OUTFLOW: ID= 1 ( 0401) 1.620    0.062    1.50    19.83
```

```
PEAK FLOW REDUCTION [Qout/Qin](%)= 43.28
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0077
```

```
*****
** SIMULATION:6. 50yr - CHI **
*****
```

```
| RESERVOIR( 0401)|
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
|-----|
```

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0750	0.0105
0.0051	0.0011	0.0798	0.0118

```
0.0207    0.0022 | 0.0843    0.0132
0.0342    0.0033 | 0.0886    0.0145
0.0437    0.0045 | 0.0927    0.0158
0.0515    0.0056 | 0.0966    0.0171
0.0583    0.0068 | 0.1004    0.0181
0.0643    0.0080 | 0.1052    0.0195
0.0699    0.0092 | 0.0000    0.0000
```

```
          AREA    QPEAK    TPEAK    R.V.
          (ha)    (cms)    (hrs)    (mm)
INFLOW : ID= 2 ( 0901) 1.620    0.168    1.33    23.25
OUTFLOW: ID= 1 ( 0401) 1.620    0.070    1.58    23.22
```

```
PEAK FLOW REDUCTION [Qout/Qin](%)= 41.64
TIME SHIFT OF PEAK FLOW (min)= 15.00
MAXIMUM STORAGE USED (ha.m.)= 0.0093
```

```
*****
** SIMULATION:7. 100yr - CHI **
*****
```

```
| RESERVOIR( 0401)|
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
|-----|
```

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0750	0.0105
0.0051	0.0011	0.0798	0.0118
0.0207	0.0022	0.0843	0.0132
0.0342	0.0033	0.0886	0.0145
0.0437	0.0045	0.0927	0.0158
0.0515	0.0056	0.0966	0.0171
0.0583	0.0068	0.1004	0.0181
0.0643	0.0080	0.1052	0.0195
0.0699	0.0092	0.0000	0.0000

```
          AREA    QPEAK    TPEAK    R.V.
          (ha)    (cms)    (hrs)    (mm)
INFLOW : ID= 2 ( 0901) 1.620    0.193    1.33    26.79
OUTFLOW: ID= 1 ( 0401) 1.620    0.077    1.58    26.76
```

```
PEAK FLOW REDUCTION [Qout/Qin](%)= 39.83
TIME SHIFT OF PEAK FLOW (min)= 15.00
MAXIMUM STORAGE USED (ha.m.)= 0.0111
```

```
*****
** SIMULATION:8. Timmins **
*****
```

| RESERVOIR(0401)|
| IN= 2---> OUT= 1 |
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW	STORAGE	OUTFLOW	STORAGE
(cms)	(ha.m.)	(cms)	(ha.m.)
0.0000	0.0000	0.0750	0.0105
0.0051	0.0011	0.0798	0.0118
0.0207	0.0022	0.0843	0.0132
0.0342	0.0033	0.0886	0.0145
0.0437	0.0045	0.0927	0.0158
0.0515	0.0056	0.0966	0.0171
0.0583	0.0068	0.1004	0.0181
0.0643	0.0080	0.1052	0.0195
0.0699	0.0092	0.0000	0.0000

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0901)	1.620	0.130	7.00	114.59
OUTFLOW: ID= 1 (0401)	1.620	0.100	7.17	114.56

PEAK FLOW REDUCTION [Qout/Qin](%)= 76.88
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0180

=====

V V I SSSSS U U A L (v 6.1.2001)
V V I SS U U A A L
V V I SS U U A A A A L
V V I SS U U A A L
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000 TTTT TTTT H H Y Y M M 000 TM
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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\V02\voin.dat

Output filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\8
c761e36-b532-40c5-a97c-1ac6093135cf\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\8
c761e36-b532-40c5-a97c-1ac6093135cf\s

DATE: 05-26-2022 TIME: 05:15:30

USER:

COMMENTS: _____

** SIMULATION : 1.2yr - SCS **

| READ STORM | Filename: C:\Users\KGowanlock\AppData\Local\Temp\
|

| bc9f4689-2b38-481e-93cd-c1d5b7c0da4b\8114af7a
| Ptotal= 44.15 mm | Comments: 2yr 12hr 15min SCS

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr
0.25	0.00	3.50	1.77		6.75	7.95	10.00	1.55
0.50	1.10	3.75	1.77		7.00	3.53	10.25	1.55
0.75	1.10	4.00	1.77		7.25	3.53	10.50	0.88
1.00	1.10	4.25	1.77		7.50	2.65	10.75	0.88
1.25	1.10	4.50	2.65		7.75	2.65	11.00	0.88
1.50	1.10	4.75	2.65		8.00	2.65	11.25	0.88
1.75	1.10	5.00	3.53		8.25	2.65	11.50	0.88
2.00	1.10	5.25	3.53		8.50	1.55	11.75	0.88
2.25	1.10	5.50	5.30		8.75	1.55	12.00	0.88
2.50	1.32	5.75	5.30		9.00	1.55	12.25	0.88
2.75	1.32	6.00	21.19		9.25	1.55		
3.00	1.32	6.25	58.28		9.50	1.55		
3.25	1.32	6.50	7.95		9.75	1.55		

| CALIB
| NASHYD (0301) | Area (ha)= 0.53 Curve Number (CN)= 57.7
| ID= 1 DT= 5.0 min | Ia (mm)= 4.49 # of Linear Res.(N)= 3.00
| U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.011 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 6.937
TOTAL RAINFALL (mm)= 44.150
RUNOFF COEFFICIENT = 0.157

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

| CALIB
| STANDHYD (0201) | Area (ha)= 0.84
| ID= 1 DT= 5.0 min | Total Imp(%)= 56.00 Dir. Conn.(%)= 30.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.47	0.37
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	1.00	2.50
Length (m)=	74.83	30.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)= 58.28 19.12
over (min) 5.00 15.00
Storage Coeff. (min)= 2.66 (ii) 13.43 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.29 0.08

PEAK FLOW (cms)= 0.04 0.01 0.051 (iii)
TIME TO PEAK (hrs)= 6.25 6.33 6.25
RUNOFF VOLUME (mm)= 42.15 8.12 18.32
TOTAL RAINFALL (mm)= 44.15 44.15 44.15
RUNOFF COEFFICIENT = 0.95 0.18 0.41

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 (0203) | Area (ha)= 0.14
| ID= 1 DT= 5.0 min | Total Imp(%)= 57.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.08	0.06
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	30.55	15.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)= 58.28 42.80
over (min) 5.00 10.00
Storage Coeff. (min)= 1.26 (ii) 6.14 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.33 0.15

PEAK FLOW (cms)= 0.00 0.01 0.006 (iii)
TIME TO PEAK (hrs)= 6.17 6.25 6.25
RUNOFF VOLUME (mm)= 42.15 11.32 11.33
TOTAL RAINFALL (mm)= 44.15 44.15 44.15
RUNOFF COEFFICIENT = 0.95 0.26 0.26

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

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 (0303) | Area (ha)= 0.11
| ID= 1 DT= 5.0 min | Total Imp(%)= 37.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.04	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	1.00
Length (m)=	27.08	20.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)= 58.28 18.99
over (min) 5.00 15.00
Storage Coeff. (min)= 1.18 (ii) 12.32 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.34 0.09

PEAK FLOW (cms)= 0.00 0.00 0.002 (iii)
TIME TO PEAK (hrs)= 6.17 6.33 6.33
RUNOFF VOLUME (mm)= 42.15 8.09 7.60
TOTAL RAINFALL (mm)= 44.15 44.15 44.15
RUNOFF COEFFICIENT = 0.95 0.18 0.17

***** 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* = 49.0 Ia = Dep. 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 (0901) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0201): 0.84 0.051 6.25 18.32
+ ID2= 2 (0203): 0.14 0.006 6.25 11.33
=====

ID = 3 (0901): 0.98 0.057 6.25 17.32

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| ADD HYD ( 0901)|
| 3 + 2 = 1 |
-----
          AREA    QPEAK    TPEAK    R.V.
          (ha)    (cms)    (hrs)    (mm)
ID1= 3 ( 0901): 0.98 0.057 6.25 17.32
+ ID2= 2 ( 0301): 0.53 0.011 6.33 6.94
=====
ID = 1 ( 0901): 1.51 0.067 6.25 13.67
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| ADD HYD ( 0901)|
| 1 + 2 = 3 |
-----
          AREA    QPEAK    TPEAK    R.V.
          (ha)    (cms)    (hrs)    (mm)
ID1= 1 ( 0901): 1.51 0.067 6.25 13.67
+ ID2= 2 ( 0303): 0.11 0.002 6.33 7.60
=====
ID = 3 ( 0901): 1.62 0.069 6.25 13.26
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| RESERVOIR( 0401)|
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
-----
          OVERFLOW IS OFF
          OUTFLOW    STORAGE    OUTFLOW    STORAGE
          (cms)    (ha.m.)    (cms)    (ha.m.)
0.0000 0.0000 | 0.0750 0.0105
0.0051 0.0011 | 0.0798 0.0118
0.0207 0.0022 | 0.0843 0.0132
0.0342 0.0033 | 0.0886 0.0145
0.0437 0.0045 | 0.0927 0.0158
0.0515 0.0056 | 0.0966 0.0171
0.0583 0.0068 | 0.1004 0.0181
0.0643 0.0080 | 0.1052 0.0195
0.0699 0.0092 | 0.0000 0.0000
          AREA    QPEAK    TPEAK    R.V.
          (ha)    (cms)    (hrs)    (mm)
INFLOW : ID= 2 ( 0901) 1.620 0.069 6.25 13.26
OUTFLOW: ID= 1 ( 0401) 1.620 0.042 6.33 13.23
```

PEAK FLOW REDUCTION [Qout/Qin](%)= 61.25
TIME SHIFT OF PEAK FLOW (min)= 5.00

MAXIMUM STORAGE USED (ha.m.)= 0.0043

```
-----
| CALIB
| STANDHYD ( 0202)|
| ID= 1 DT= 5.0 min |
-----
          Area (ha)= 0.12
          Total Imp(%)= 45.00 Dir. Conn.(%)= 0.10
```

```
-----
          IMPERVIOUS    PERVIOUS (i)
Surface Area (ha)= 0.05 0.07
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 28.28 15.00
Mannings n = 0.013 0.250
```

```
Max.Eff.Inten.(mm/hr)= 58.28 27.13
over (min) 5.00 10.00
Storage Coeff. (min)= 1.21 (ii) 7.81 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.33 0.13
```

```
-----
          *TOTALS*
PEAK FLOW (cms)= 0.00 0.00 0.004 (iii)
TIME TO PEAK (hrs)= 6.17 6.25 6.25
RUNOFF VOLUME (mm)= 42.15 9.17 9.15
TOTAL RAINFALL (mm)= 44.15 44.15 44.15
RUNOFF COEFFICIENT = 0.95 0.21 0.21
```

***** 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* = 49.0 Ia = Dep. 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 ( 0903)|
| 1 + 2 = 3 |
-----
          AREA    QPEAK    TPEAK    R.V.
          (ha)    (cms)    (hrs)    (mm)
ID1= 1 ( 0202): 0.12 0.004 6.25 9.15
+ ID2= 2 ( 0401): 1.62 0.042 6.33 13.23
=====
ID = 3 ( 0903): 1.74 0.046 6.33 12.95
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| STANDHYD (0302) | Area (ha)= 0.50
| ID= 1 DT= 5.0 min | Total Imp(%)= 22.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	0.11	0.39	
Dep. Storage (mm)=	2.00	5.00	
Average Slope (%)=	2.00	3.00	
Length (m)=	57.74	75.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	58.28	8.47	
over (min)	5.00	30.00	
Storage Coeff. (min)=	1.85 (ii)	26.31 (ii)	
Unit Hyd. Tpeak (min)=	5.00	30.00	
Unit Hyd. peak (cms)=	0.32	0.04	
			TOTALS
PEAK FLOW (cms)=	0.00	0.01	0.005 (iii)
TIME TO PEAK (hrs)=	6.25	6.67	6.67
RUNOFF VOLUME (mm)=	42.15	6.57	6.57
TOTAL RAINFALL (mm)=	44.15	44.15	44.15
RUNOFF COEFFICIENT =	0.95	0.15	0.15

***** 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* = 49.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

=====

V	V	I	SSSS	U	U	A	L		(v 6.1.2001)
V	V	I	SS	U	U	A	A	L	
V	V	I	SS	U	U	AAAA	L		
V	V	I	SS	U	U	A	A	L	
VV	I	SSSS	UUUU	A	A	LLLL			

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

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\V02\voin.dat

Output filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\b
bafdfb1-868a-4e07-8dbd-57df403d0a1f\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\b
bafdfb1-868a-4e07-8dbd-57df403d0a1f\s

DATE: 05-26-2022 TIME: 05:15:30

USER:

COMMENTS: _____

** SIMULATION : 2.5yr - SCS **

READ STORM	Filename: C:\Users\KGowanlock\AppData\Local\Temp\bc9f4689-2b38-481e-93cd-c1d5b7c0da4b\87569dd0
Ptotal= 58.73 mm	Comments: 5yr 12hr 15min SCS

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.25	0.00	3.50	2.35	6.75	10.57	10.00	2.06
0.50	1.47	3.75	2.35	7.00	4.70	10.25	2.06
0.75	1.47	4.00	2.35	7.25	4.70	10.50	1.17
1.00	1.47	4.25	2.35	7.50	3.52	10.75	1.17
1.25	1.47	4.50	3.52	7.75	3.52	11.00	1.17
1.50	1.47	4.75	3.52	8.00	3.52	11.25	1.17
1.75	1.47	5.00	4.70	8.25	3.52	11.50	1.17
2.00	1.47	5.25	4.70	8.50	2.06	11.75	1.17
2.25	1.47	5.50	7.05	8.75	2.06	12.00	1.17
2.50	1.76	5.75	7.05	9.00	2.06	12.25	1.17

2.75	1.76	6.00	28.19	9.25	2.06
3.00	1.76	6.25	77.52	9.50	2.06
3.25	1.76	6.50	10.57	9.75	2.06

CALIB			
NASHYD (0301)	Area (ha)=	0.53	Curve Number (CN)= 57.7
ID= 1 DT= 5.0 min	Ia (mm)=	4.49	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.19	

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.019 (i)
 TIME TO PEAK (hrs)= 6.333
 RUNOFF VOLUME (mm)= 12.191
 TOTAL RAINFALL (mm)= 58.730
 RUNOFF COEFFICIENT = 0.208

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

CALIB			
STANDHYD (0201)	Area (ha)=	0.84	
ID= 1 DT= 5.0 min	Total Imp(%)=	56.00	Dir. Conn.(%)= 30.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.47	0.37
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	1.00	2.50
Length (m)=	74.83	30.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	77.52	36.09
over (min)	5.00	15.00
Storage Coeff. (min)=	2.38 (ii)	10.73 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.30	0.09

	TOTALS
PEAK FLOW (cms)=	0.05 0.02 0.074 (iii)
TIME TO PEAK (hrs)=	6.25 6.33 6.25
RUNOFF VOLUME (mm)=	56.73 13.93 26.76
TOTAL RAINFALL (mm)=	58.73 58.73 58.73
RUNOFF COEFFICIENT =	0.97 0.24 0.46

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 49.0 Ia = Dep. 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 (0203)	Area (ha)=	0.14	
ID= 1 DT= 5.0 min	Total Imp(%)=	57.00	Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.08	0.06
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	30.55	15.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	77.52	70.92
over (min)	5.00	10.00
Storage Coeff. (min)=	1.13 (ii)	5.11 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.34	0.16

	TOTALS
PEAK FLOW (cms)=	0.00 0.01 0.010 (iii)
TIME TO PEAK (hrs)=	6.17 6.25 6.25
RUNOFF VOLUME (mm)=	56.73 18.79 18.80
TOTAL RAINFALL (mm)=	58.73 58.73 58.73
RUNOFF COEFFICIENT =	0.97 0.32 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* = 49.0 Ia = Dep. 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 (0303)	Area (ha)=	0.11	
ID= 1 DT= 5.0 min	Total Imp(%)=	37.00	Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.04	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	1.00

```

Length          (m)=    27.08    20.00
Mannings n      =    0.013    0.250

Max.Eff.Inten.(mm/hr)=    77.52    35.87
over (min)      =    5.00    10.00
Storage Coeff. (min)=    1.05 (ii)  9.69 (ii)
Unit Hyd. Tpeak (min)=    5.00    10.00
Unit Hyd. peak  (cms)=    0.34    0.11

                                     *TOTALS*
PEAK FLOW       (cms)=    0.00    0.00    0.005 (iii)
TIME TO PEAK    (hrs)=    6.17    6.33    6.25
RUNOFF VOLUME   (mm)=    56.73    13.89    13.89
TOTAL RAINFALL  (mm)=    58.73    58.73    58.73
RUNOFF COEFFICIENT =    0.97    0.24    0.24

```

***** 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* = 49.0 Ia = Dep. 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 ( 0901)|
| 1 + 2 = 3 |
-----
ID1= 1 ( 0201):    AREA    QPEAK    TPEAK    R.V.
                  (ha)    (cms)    (hrs)    (mm)
+ ID2= 2 ( 0203):    0.84    0.074    6.25    26.76
=====
ID = 3 ( 0901):    0.14    0.010    6.25    18.80
=====
ID = 3 ( 0901):    0.98    0.084    6.25    25.63

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0901)|
| 3 + 2 = 1 |
-----
ID1= 3 ( 0901):    AREA    QPEAK    TPEAK    R.V.
                  (ha)    (cms)    (hrs)    (mm)
+ ID2= 2 ( 0301):    0.98    0.084    6.25    25.63
=====
ID = 1 ( 0901):    0.53    0.019    6.33    12.19
=====
ID = 1 ( 0901):    1.51    0.102    6.25    20.91

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0901)|
| 1 + 2 = 3 |
-----
ID1= 1 ( 0901):    AREA    QPEAK    TPEAK    R.V.
                  (ha)    (cms)    (hrs)    (mm)
+ ID2= 2 ( 0303):    0.11    0.005    6.25    13.89
=====
ID = 3 ( 0901):    1.62    0.107    6.25    20.43

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| RESERVOIR( 0401)|
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
-----
OVERFLOW IS OFF

OUTFLOW    STORAGE    |    OUTFLOW    STORAGE
(cms)      (ha.m.)    |    (cms)      (ha.m.)
0.0000     0.0000    |    0.0750     0.0105
0.0051     0.0011    |    0.0798     0.0118
0.0207     0.0022    |    0.0843     0.0132
0.0342     0.0033    |    0.0886     0.0145
0.0437     0.0045    |    0.0927     0.0158
0.0515     0.0056    |    0.0966     0.0171
0.0583     0.0068    |    0.1004     0.0181
0.0643     0.0080    |    0.1052     0.0195
0.0699     0.0092    |    0.0000     0.0000

```

```

AREA    QPEAK    TPEAK    R.V.
(ha)    (cms)    (hrs)    (mm)
INFLOW : ID= 2 ( 0901)    1.620    0.107    6.25    20.43
OUTFLOW: ID= 1 ( 0401)    1.620    0.059    6.42    20.40

```

PEAK FLOW REDUCTION [Qout/Qin](%)= 54.88
 TIME SHIFT OF PEAK FLOW (min)= 10.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0069

```

-----
| CALIB
| STANDHYD ( 0202)|
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 0.12
Total Imp(%)= 45.00 Dir. Conn.(%)= 0.10

```

```

IMPERVIOUS    PERVIOUS (i)
Surface Area (ha)= 0.05    0.07
Dep. Storage (mm)= 2.00    5.00
Average Slope (%)= 2.00    2.00
Length (m)= 28.28    15.00
Mannings n = 0.013    0.250

Max.Eff.Inten.(mm/hr)= 77.52    45.95

```


over (min)	5.00	10.00	
Storage Coeff. (min)=	1.08 (ii)	6.42 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.34	0.14	
			TOTALS
PEAK FLOW (cms)=	0.00	0.01	0.007 (iii)
TIME TO PEAK (hrs)=	6.17	6.25	6.25
RUNOFF VOLUME (mm)=	56.73	15.55	15.56
TOTAL RAINFALL (mm)=	58.73	58.73	58.73
RUNOFF COEFFICIENT =	0.97	0.26	0.26

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 (0903)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0202):	0.12	0.007	6.25	15.56
+ ID2= 2 (0401):	1.62	0.059	6.42	20.40
=====				
ID = 3 (0903):	1.74	0.064	6.33	20.07

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	Area (ha)=	0.50
STANDHYD (0302)	Total Imp(%)=	22.00
ID= 1 DT= 5.0 min	Dir. Conn.(%)=	0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.11	0.39
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	57.74	75.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	77.52	17.69
over (min)	5.00	20.00
Storage Coeff. (min)=	1.65 (ii)	19.87 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00

Unit Hyd. peak (cms)=	0.32	0.06	
			TOTALS
PEAK FLOW (cms)=	0.00	0.01	0.012 (iii)
TIME TO PEAK (hrs)=	6.25	6.42	6.42
RUNOFF VOLUME (mm)=	56.73	11.51	11.53
TOTAL RAINFALL (mm)=	58.73	58.73	58.73
RUNOFF COEFFICIENT =	0.97	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.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

V V I SSSS U U A L (v 6.1.2001)
V V I SS U U A A L
V V I SS U U AAAAA L
V V I SS U U A A L
VV I SSSS UUUU A A LLLL

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

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\VO2\voin.dat

Output filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\3
864a390-f7c6-4a82-9880-e7b8f36ac57a\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\3
864a390-f7c6-4a82-9880-e7b8f36ac57a\s

DATE: 05-26-2022

TIME: 05:15:30

USER:

COMMENTS: _____

** SIMULATION : 3. 10yr - SCS **

| READ STORM | Filename: C:\Users\KGowanlock\AppData
| | ata\Local\Temp\
| | bc9f4689-2b38-481e-93cd-c1d5b7c0da4b\1d8da1b4
| Ptotal= 68.24 mm | Comments: 10yr 12hr 15min SCS

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.25	0.00	3.50	2.73	6.75	12.28	10.00	2.39
0.50	1.71	3.75	2.73	7.00	5.46	10.25	2.39
0.75	1.71	4.00	2.73	7.25	5.46	10.50	1.36
1.00	1.71	4.25	2.73	7.50	4.09	10.75	1.36
1.25	1.71	4.50	4.09	7.75	4.09	11.00	1.36
1.50	1.71	4.75	4.09	8.00	4.09	11.25	1.36
1.75	1.71	5.00	5.46	8.25	4.09	11.50	1.36
2.00	1.71	5.25	5.46	8.50	2.39	11.75	1.36
2.25	1.71	5.50	8.19	8.75	2.39	12.00	1.36
2.50	2.05	5.75	8.19	9.00	2.39	12.25	1.36
2.75	2.05	6.00	32.76	9.25	2.39		
3.00	2.05	6.25	90.08	9.50	2.39		
3.25	2.05	6.50	12.28	9.75	2.39		

| CALIB |
| NASHYD (0301) | Area (ha)= 0.53 Curve Number (CN)= 57.7
| ID= 1 DT= 5.0 min | Ia (mm)= 4.49 # of Linear Res.(N)= 3.00
| | U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.025 (i)
TIME TO PEAK (hrs)= 6.333

RUNOFF VOLUME (mm)= 16.200
TOTAL RAINFALL (mm)= 68.240
RUNOFF COEFFICIENT = 0.237

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

| CALIB |
| STANDHYD (0201) | Area (ha)= 0.84
| ID= 1 DT= 5.0 min | Total Imp(%)= 56.00 Dir. Conn.(%)= 30.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.47	0.37
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	1.00	2.50
Length (m)=	74.83	30.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	90.08	47.42
over (min)	5.00	10.00
Storage Coeff. (min)=	2.24 (ii)	9.72 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.30	0.11

TOTALS
PEAK FLOW (cms)= 0.06 0.03 0.097 (iii)
TIME TO PEAK (hrs)= 6.25 6.25 6.25
RUNOFF VOLUME (mm)= 66.24 18.32 32.69
TOTAL RAINFALL (mm)= 68.24 68.24 68.24
RUNOFF COEFFICIENT = 0.97 0.27 0.48

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 (0203) | Area (ha)= 0.14
| ID= 1 DT= 5.0 min | Total Imp(%)= 57.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.08	0.06
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	30.55	15.00

Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		90.08	91.54	
over (min)		5.00	5.00	
Storage Coeff. (min)=		1.06 (ii)	4.66 (ii)	
Unit Hyd. Tpeak (min)=		5.00	5.00	
Unit Hyd. peak (cms)=		0.34	0.22	
				TOTALS
PEAK FLOW (cms)=		0.00	0.02	0.015 (iii)
TIME TO PEAK (hrs)=		6.17	6.25	6.25
RUNOFF VOLUME (mm)=		66.24	24.28	24.31
TOTAL RAINFALL (mm)=		68.24	68.24	68.24
RUNOFF COEFFICIENT =		0.97	0.36	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* = 49.0 Ia = Dep. 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 (0303)	Area (ha)=	0.11	
ID= 1 DT= 5.0 min	Total Imp(%)=	37.00	Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.04	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	1.00
Length (m)=	27.08	20.00
Mannings n	=	0.013 0.250

Max.Eff.Inten.(mm/hr)=		90.08	47.14	
over (min)		5.00	10.00	
Storage Coeff. (min)=		0.99 (ii)	8.73 (ii)	
Unit Hyd. Tpeak (min)=		5.00	10.00	
Unit Hyd. peak (cms)=		0.34	0.12	
				TOTALS
PEAK FLOW (cms)=		0.00	0.01	0.007 (iii)
TIME TO PEAK (hrs)=		6.17	6.25	6.25
RUNOFF VOLUME (mm)=		66.24	18.28	18.27
TOTAL RAINFALL (mm)=		68.24	68.24	68.24
RUNOFF COEFFICIENT =		0.97	0.27	0.27

***** 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* = 49.0 Ia = Dep. 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 (0901)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0201):	0.84	0.097	6.25	32.69
+ ID2= 2 (0203):	0.14	0.015	6.25	24.31
				=====
ID = 3 (0901):	0.98	0.112	6.25	31.49

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0901)				
3 + 2 = 1	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0901):	0.98	0.112	6.25	31.49
+ ID2= 2 (0301):	0.53	0.025	6.33	16.20
				=====
ID = 1 (0901):	1.51	0.135	6.25	26.13

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0901)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0901):	1.51	0.135	6.25	26.13
+ ID2= 2 (0303):	0.11	0.007	6.25	18.27
				=====
ID = 3 (0901):	1.62	0.142	6.25	25.59

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0401)	OVERFLOW IS OFF
IN= 2---> OUT= 1	
DT= 5.0 min	OUTFLOW STORAGE OUTFLOW STORAGE

```

-----
      (cms)      (ha.m.) |      (cms)      (ha.m.)
0.0000      0.0000 | 0.0750      0.0105
0.0051      0.0011 | 0.0798      0.0118
0.0207      0.0022 | 0.0843      0.0132
0.0342      0.0033 | 0.0886      0.0145
0.0437      0.0045 | 0.0927      0.0158
0.0515      0.0056 | 0.0966      0.0171
0.0583      0.0068 | 0.1004      0.0181
0.0643      0.0080 | 0.1052      0.0195
0.0699      0.0092 | 0.0000      0.0000

      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0901) 1.620      0.142      6.25      25.59
OUTFLOW: ID= 1 ( 0401) 1.620      0.070      6.42      25.56

```

PEAK FLOW REDUCTION [Qout/Qin](%)= 49.54
 TIME SHIFT OF PEAK FLOW (min)= 10.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0094

```

-----
| CALIB |
| STANDHYD ( 0202) |
| ID= 1 DT= 5.0 min |
|-----|
| Area (ha)= 0.12 |
| Total Imp(%)= 45.00 |
| Dir. Conn.(%)= 0.10 |

      IMPERVIOUS      PERVIOUS (i)
Surface Area (ha)= 0.05      0.07
Dep. Storage (mm)= 2.00      5.00
Average Slope (%)= 2.00      2.00
Length (m)= 28.28      15.00
Mannings n = 0.013      0.250

Max.Eff.Inten.(mm/hr)= 90.08      60.01
over (min) 5.00      10.00
Storage Coeff. (min)= 1.01 (ii)      5.82 (ii)
Unit Hyd. Tpeak (min)= 5.00      10.00
Unit Hyd. peak (cms)= 0.34      0.15

      *TOTALS*
PEAK FLOW (cms)= 0.00      0.01      0.009 (iii)
TIME TO PEAK (hrs)= 6.17      6.25
RUNOFF VOLUME (mm)= 66.24      20.32      20.33
TOTAL RAINFALL (mm)= 68.24      68.24      68.24
RUNOFF COEFFICIENT = 0.97      0.30

```

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 49.0 Ia = Dep. 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 ( 0903) |
| 1 + 2 = 3 |
|-----|
      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
ID1= 1 ( 0202): 0.12      0.009      6.25      20.33
+ ID2= 2 ( 0401): 1.62      0.070      6.42      25.56
=====
ID = 3 ( 0903): 1.74      0.078      6.33      25.20

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| STANDHYD ( 0302) |
| ID= 1 DT= 5.0 min |
|-----|
| Area (ha)= 0.50 |
| Total Imp(%)= 22.00 |
| Dir. Conn.(%)= 0.10 |

```

```

      IMPERVIOUS      PERVIOUS (i)
Surface Area (ha)= 0.11      0.39
Dep. Storage (mm)= 2.00      5.00
Average Slope (%)= 2.00      3.00
Length (m)= 57.74      75.00
Mannings n = 0.013      0.250

Max.Eff.Inten.(mm/hr)= 90.08      29.14
over (min) 5.00      20.00
Storage Coeff. (min)= 1.56 (ii)      16.48 (ii)
Unit Hyd. Tpeak (min)= 5.00      20.00
Unit Hyd. peak (cms)= 0.33      0.06

      *TOTALS*
PEAK FLOW (cms)= 0.00      0.02      0.017 (iii)
TIME TO PEAK (hrs)= 6.25      6.42      6.42
RUNOFF VOLUME (mm)= 66.24      15.29      15.32
TOTAL RAINFALL (mm)= 68.24      68.24      68.24
RUNOFF COEFFICIENT = 0.97      0.22      0.22

```

***** 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* = 49.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.

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

=====

V V I SSSS U U A L (v 6.1.2001)
V V I SS U U A A L
V V I SS U U A A A A L
V V I SS U U A A L
V V I SSSS U U U U A A L L L L

000 TTTT TTTT H H Y Y M M 000 TM
O 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 000

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\V02\voin.dat

Output filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\1
33296f2-7af7-4c44-96fd-eb4d9d99c570\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\1
33296f2-7af7-4c44-96fd-eb4d9d99c570\s

DATE: 05-26-2022

TIME: 05:15:30

USER:

COMMENTS: _____

** SIMULATION : 4. 25yr - SCS **

| READ STORM | Filename: C:\Users\KGowanlock\AppData
| | ata\Local\Temp\
| | bc9f4689-2b38-481e-93cd-c1d5b7c0da4b\3eee5f99
| Ptotal= 80.28 mm | Comments: 25yr 12hr 15min SCS

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr
0.25	0.00	3.50	3.21		6.75	14.45	10.00	2.81
0.50	2.01	3.75	3.21		7.00	6.42	10.25	2.81
0.75	2.01	4.00	3.21		7.25	6.42	10.50	1.61
1.00	2.01	4.25	3.21		7.50	4.82	10.75	1.61
1.25	2.01	4.50	4.82		7.75	4.82	11.00	1.61
1.50	2.01	4.75	4.82		8.00	4.82	11.25	1.61
1.75	2.01	5.00	6.42		8.25	4.82	11.50	1.61
2.00	2.01	5.25	6.42		8.50	2.81	11.75	1.61
2.25	2.01	5.50	9.63		8.75	2.81	12.00	1.61
2.50	2.41	5.75	9.63		9.00	2.81	12.25	1.61
2.75	2.41	6.00	38.53		9.25	2.81		
3.00	2.41	6.25	105.97		9.50	2.81		
3.25	2.41	6.50	14.45		9.75	2.81		

| CALIB |
| NASHYD (0301) | Area (ha)= 0.53 Curve Number (CN)= 57.7
| ID= 1 DT= 5.0 min | Ia (mm)= 4.49 # of Linear Res.(N)= 3.00
| | U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.034 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 21.847
TOTAL RAINFALL (mm)= 80.280
RUNOFF COEFFICIENT = 0.272

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

| CALIB |
| STANDHYD (0201) | Area (ha)= 0.84
| ID= 1 DT= 5.0 min | Total Imp(%)= 56.00 Dir. Conn.(%)= 30.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.47	0.37
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	1.00	2.50

Length (m)= 74.83 30.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 105.97 63.24
over (min) 5.00 10.00
Storage Coeff. (min)= 2.10 (ii) 8.77 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.31 0.12

TOTALS
PEAK FLOW (cms)= 0.07 0.05 0.121 (iii)
TIME TO PEAK (hrs)= 6.25 6.25 6.25
RUNOFF VOLUME (mm)= 78.28 24.45 40.60
TOTAL RAINFALL (mm)= 80.28 80.28 80.28
RUNOFF COEFFICIENT = 0.98 0.30 0.51

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 (0203) | Area (ha)= 0.14
| ID= 1 DT= 5.0 min | Total Imp(%)= 57.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.08	0.06
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	30.55	15.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)= 105.97 119.71
over (min) 5.00 5.00
Storage Coeff. (min)= 1.00 (ii) 4.22 (ii)
Unit Hyd. Tpeak (min)= 5.00 5.00
Unit Hyd. peak (cms)= 0.34 0.24

TOTALS
PEAK FLOW (cms)= 0.00 0.02 0.020 (iii)
TIME TO PEAK (hrs)= 6.17 6.25 6.25
RUNOFF VOLUME (mm)= 78.28 31.80 31.84
TOTAL RAINFALL (mm)= 80.28 80.28 80.28
RUNOFF COEFFICIENT = 0.98 0.40 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* = 49.0 Ia = Dep. 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 (0303) | Area (ha)= 0.11
| ID= 1 DT= 5.0 min | Total Imp(%)= 37.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.04	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	1.00
Length (m)=	27.08	20.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)= 105.97 62.88
over (min) 5.00 10.00
Storage Coeff. (min)= 0.93 (ii) 7.83 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.34 0.13

TOTALS
PEAK FLOW (cms)= 0.00 0.01 0.009 (iii)
TIME TO PEAK (hrs)= 6.17 6.25 6.25
RUNOFF VOLUME (mm)= 78.28 24.39 24.41
TOTAL RAINFALL (mm)= 80.28 80.28 80.28
RUNOFF COEFFICIENT = 0.98 0.30 0.30

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 (0901) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
| | (ha) (cms) (hrs) (mm)
ID1= 1 (0201): 0.84 0.121 6.25 40.60

```

+ ID2= 2 ( 0203):    0.14    0.020    6.25    31.84
=====
ID = 3 ( 0901):    0.98    0.141    6.25    39.35

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

| ADD HYD ( 0901)|
| 3 + 2 = 1 |
=====
ID1= 3 ( 0901):    0.98    0.141    6.25    39.35
+ ID2= 2 ( 0301):    0.53    0.034    6.33    21.85
=====
ID = 1 ( 0901):    1.51    0.173    6.25    33.20

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

| ADD HYD ( 0901)|
| 1 + 2 = 3 |
=====
ID1= 1 ( 0901):    1.51    0.173    6.25    33.20
+ ID2= 2 ( 0303):    0.11    0.009    6.25    24.41
=====
ID = 3 ( 0901):    1.62    0.182    6.25    32.61

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

| RESERVOIR( 0401)|
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
=====
OVERFLOW IS OFF
=====
OUTFLOW STORAGE | OUTFLOW STORAGE
(cms) (ha.m.) | (cms) (ha.m.)
0.0000 0.0000 | 0.0750 0.0105
0.0051 0.0011 | 0.0798 0.0118
0.0207 0.0022 | 0.0843 0.0132
0.0342 0.0033 | 0.0886 0.0145
0.0437 0.0045 | 0.0927 0.0158
0.0515 0.0056 | 0.0966 0.0171
0.0583 0.0068 | 0.1004 0.0181
0.0643 0.0080 | 0.1052 0.0195
0.0699 0.0092 | 0.0000 0.0000
=====
AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
INFLOW : ID= 2 ( 0901) 1.620 0.182 6.25 32.61
OUTFLOW: ID= 1 ( 0401) 1.620 0.083 6.42 32.58

```

```

PEAK FLOW REDUCTION [Qout/Qin](%)= 45.24
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0127

```

```

| CALIB
| STANDHYD ( 0202)|
| ID= 1 DT= 5.0 min |
=====
Area (ha)= 0.12
Total Imp(%)= 45.00 Dir. Conn.(%)= 0.10

```

```

=====
IMPVIOUS PERVIOUS (i)
Surface Area (ha)= 0.05 0.07
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 28.28 15.00
Mannings n = 0.013 0.250

```

```

Max.Eff.Inten.(mm/hr)= 105.97 79.47
over (min) 5.00 10.00
Storage Coeff. (min)= 0.95 (ii) 5.25 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.34 0.16

```

TOTALS

```

PEAK FLOW (cms)= 0.00 0.01 0.013 (iii)
TIME TO PEAK (hrs)= 6.17 6.25 6.25
RUNOFF VOLUME (mm)= 78.28 26.94 26.96
TOTAL RAINFALL (mm)= 80.28 80.28 80.28
RUNOFF COEFFICIENT = 0.98 0.34 0.34

```

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 ( 0903)|
| 1 + 2 = 3 |
=====
AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 ( 0202):    0.12    0.013    6.25    26.96
+ ID2= 2 ( 0401):    1.62    0.083    6.42    32.58
=====
ID = 3 ( 0903):    1.74    0.092    6.33    32.19

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0302)
ID= 1 DT= 5.0 min

Area (ha)= 0.50
Total Imp(%)= 22.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	0.11	0.39	
Dep. Storage (mm)=	2.00	5.00	
Average Slope (%)=	2.00	3.00	
Length (m)=	57.74	75.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	105.97	39.46	
over (min)	5.00	15.00	
Storage Coeff. (min)=	1.46 (ii)	14.68 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.33	0.08	
		TOTALS	
PEAK FLOW (cms)=	0.00	0.03	0.026 (iii)
TIME TO PEAK (hrs)=	6.25	6.33	6.33
RUNOFF VOLUME (mm)=	78.28	20.63	20.67
TOTAL RAINFALL (mm)=	80.28	80.28	80.28
RUNOFF COEFFICIENT =	0.98	0.26	0.26

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

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

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\V02\voin.dat

Output filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\625af28-62b3-4ea3-a455-aaca397777e3\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\625af28-62b3-4ea3-a455-aaca397777e3\s

DATE: 05-26-2022 TIME: 05:15:30

USER:

COMMENTS:

** SIMULATION : 5. 50yr - SCS **

READ STORM
Filename: C:\Users\KGowanlock\AppData\Local\Temp\bc9f4689-2b38-481e-93cd-c1d5b7c0da4b\8208f145
Ptotal= 89.16 mm
Comments: 50yr 12hr 15min SCS

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.25	0.00	3.50	3.57	6.75	16.05	10.00	3.12
0.50	2.23	3.75	3.57	7.00	7.13	10.25	3.12
0.75	2.23	4.00	3.57	7.25	7.13	10.50	1.78
1.00	2.23	4.25	3.57	7.50	5.35	10.75	1.78
1.25	2.23	4.50	5.35	7.75	5.35	11.00	1.78
1.50	2.23	4.75	5.35	8.00	5.35	11.25	1.78
1.75	2.23	5.00	7.13	8.25	5.35	11.50	1.78
2.00	2.23	5.25	7.13	8.50	3.12	11.75	1.78

2.25	2.23	5.50	10.70	8.75	3.12	12.00	1.78
2.50	2.67	5.75	10.70	9.00	3.12	12.25	1.78
2.75	2.67	6.00	42.80	9.25	3.12		
3.00	2.67	6.25	117.69	9.50	3.12		
3.25	2.67	6.50	16.05	9.75	3.12		

CALIB							
NASHYD (0301)	Area (ha)=	0.53	Curve Number (CN)=	57.7			
ID= 1 DT= 5.0 min	Ia (mm)=	4.49	# of Linear Res.(N)=	3.00			
	U.H. Tp(hrs)=	0.19					

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.041 (i)
 TIME TO PEAK (hrs)= 6.333
 RUNOFF VOLUME (mm)= 26.374
 TOTAL RAINFALL (mm)= 89.160
 RUNOFF COEFFICIENT = 0.296

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

CALIB							
STANDHYD (0201)	Area (ha)=	0.84					
ID= 1 DT= 5.0 min	Total Imp(%)=	56.00	Dir. Conn.(%)=	30.00			

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.47	0.37
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	1.00	2.50
Length (m)=	74.83	30.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	117.69	75.81
over (min)	5.00	10.00
Storage Coeff. (min)=	2.01 (ii)	8.22 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.31	0.13

			TOTALS
PEAK FLOW (cms)=	0.08	0.06	0.141 (iii)
TIME TO PEAK (hrs)=	6.25	6.25	6.25
RUNOFF VOLUME (mm)=	87.16	29.34	46.68
TOTAL RAINFALL (mm)=	89.16	89.16	89.16
RUNOFF COEFFICIENT =	0.98	0.33	0.52

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 (0203)	Area (ha)=	0.14					
ID= 1 DT= 5.0 min	Total Imp(%)=	57.00	Dir. Conn.(%)=	0.10			

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.08	0.06
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	30.55	15.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	117.69	141.71
over (min)	5.00	5.00
Storage Coeff. (min)=	0.95 (ii)	3.97 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.24

			TOTALS
PEAK FLOW (cms)=	0.00	0.02	0.024 (iii)
TIME TO PEAK (hrs)=	6.17	6.25	6.25
RUNOFF VOLUME (mm)=	87.16	37.70	37.74
TOTAL RAINFALL (mm)=	89.16	89.16	89.16
RUNOFF COEFFICIENT =	0.98	0.42	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* = 49.0 Ia = Dep. 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 (0303)	Area (ha)=	0.11					
ID= 1 DT= 5.0 min	Total Imp(%)=	37.00	Dir. Conn.(%)=	0.10			

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.04	0.07

Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	2.00	1.00
Length	(m)=	27.08	20.00
Mannings n	=	0.013	0.250

Max.Eff.Inten.(mm/hr)=	117.69	75.39
over (min)	5.00	10.00
Storage Coeff. (min)=	0.89 (ii)	7.31 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.34	0.13

TOTALS

PEAK FLOW	(cms)=	0.00	0.01	0.011 (iii)
TIME TO PEAK	(hrs)=	6.17	6.25	6.25
RUNOFF VOLUME	(mm)=	87.16	29.27	29.29
TOTAL RAINFALL	(mm)=	89.16	89.16	89.16
RUNOFF COEFFICIENT	=	0.98	0.33	0.33

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 49.0 Ia = Dep. 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 (0901)				
1 + 2 = 3				

ID1= 1 (0201):	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
+ ID2= 2 (0203):	0.84	0.141	6.25	46.68
	0.14	0.024	6.25	37.74
=====				
ID = 3 (0901):	0.98	0.164	6.25	45.40

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0901)				
3 + 2 = 1				

ID1= 3 (0901):	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
+ ID2= 2 (0301):	0.98	0.164	6.25	45.40
	0.53	0.041	6.33	26.37
=====				
ID = 1 (0901):	1.51	0.203	6.25	38.72

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0901)				
1 + 2 = 3				

ID1= 1 (0901):	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
+ ID2= 2 (0303):	1.51	0.203	6.25	38.72
	0.11	0.011	6.25	29.29
=====				
ID = 3 (0901):	1.62	0.214	6.25	38.08

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0401)				
IN= 2---> OUT= 1				
DT= 5.0 min				

OVERFLOW IS OFF				
OUTFLOW	STORAGE	OUTFLOW	STORAGE	
(cms)	(ha.m.)	(cms)	(ha.m.)	
0.0000	0.0000	0.0750	0.0105	
0.0051	0.0011	0.0798	0.0118	
0.0207	0.0022	0.0843	0.0132	
0.0342	0.0033	0.0886	0.0145	
0.0437	0.0045	0.0927	0.0158	
0.0515	0.0056	0.0966	0.0171	
0.0583	0.0068	0.1004	0.0181	
0.0643	0.0080	0.1052	0.0195	
0.0699	0.0092	0.0000	0.0000	

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0901)	1.620	0.214	6.25	38.08
OUTFLOW: ID= 1 (0401)	1.620	0.091	6.42	38.05

PEAK FLOW REDUCTION [Qout/Qin](%)= 42.66
 TIME SHIFT OF PEAK FLOW (min)= 10.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0155

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

Area	(ha)=	0.12	
Total Imp(%)=	45.00	Dir. Conn.(%)=	0.10

	IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.05	0.07
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	2.00	2.00
Length	(m)=	28.28	15.00
Mannings n	=	0.013	0.250

Max.Eff.Inten.(mm/hr)=	117.69	94.86	
over (min)	5.00	5.00	
Storage Coeff. (min)=	0.91 (ii)	4.91 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.34	0.22	
PEAK FLOW (cms)=	0.00	0.02	0.017 (iii)
TIME TO PEAK (hrs)=	6.17	6.25	6.25
RUNOFF VOLUME (mm)=	87.16	32.19	32.22
TOTAL RAINFALL (mm)=	89.16	89.16	89.16
RUNOFF COEFFICIENT =	0.98	0.36	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* = 49.0 Ia = Dep. 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 (0903)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0202):	0.12	0.017	6.25	32.22
+ ID2= 2 (0401):	1.62	0.091	6.42	38.05
ID = 3 (0903):	1.74	0.097	6.25	37.65

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	Area (ha)=	0.50
STANDHYD (0302)	Total Imp(%)=	22.00
ID= 1 DT= 5.0 min	Dir. Conn.(%)=	0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.11	0.39
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	57.74	75.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	117.69	47.79
over (min)	5.00	15.00

Storage Coeff. (min)=	1.40 (ii)	13.64 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.33	0.08	
PEAK FLOW (cms)=	0.00	0.03	0.033 (iii)
TIME TO PEAK (hrs)=	6.25	6.33	6.33
RUNOFF VOLUME (mm)=	87.16	24.92	24.97
TOTAL RAINFALL (mm)=	89.16	89.16	89.16
RUNOFF COEFFICIENT =	0.98	0.28	0.28

***** 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* = 49.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

FINISH

V	V	I	SSSS	U	U	A	L	(v 6.1.2001)
V	V	I	SS	U	U	A	A	L
V	V	I	SS	U	U	AAAA	L	
V	V	I	SS	U	U	A	A	L
VV	I	SSSS	UUUU	A	A	LLLL		

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

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\V02\voin.dat
 Output filename:

C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\b
5ac21e8-94b8-451f-a5d9-179eac74748c\s

Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\2c82a674-7dbe-4ff9-a174-9e37ec52cdac\b
5ac21e8-94b8-451f-a5d9-179eac74748c\s

DATE: 05-26-2022

TIME: 05:15:30

USER:

COMMENTS: _____

** SIMULATION : 6. 100yr - SCS **

READ STORM	Filename: C:\Users\KGowanlock\AppData
	ata\Local\Temp\
	bc9f4689-2b38-481e-93cd-c1d5b7c0da4b\38e9fe9a
Ptotal= 98.03 mm	Comments: 100yr 12hr 15min SCS

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.25	0.00	3.50	3.92	6.75	17.65	10.00	3.43
0.50	2.45	3.75	3.92	7.00	7.84	10.25	3.43
0.75	2.45	4.00	3.92	7.25	7.84	10.50	1.96
1.00	2.45	4.25	3.92	7.50	5.88	10.75	1.96
1.25	2.45	4.50	5.88	7.75	5.88	11.00	1.96
1.50	2.45	4.75	5.88	8.00	5.88	11.25	1.96
1.75	2.45	5.00	7.84	8.25	5.88	11.50	1.96
2.00	2.45	5.25	7.84	8.50	3.43	11.75	1.96
2.25	2.45	5.50	11.76	8.75	3.43	12.00	1.96
2.50	2.94	5.75	11.76	9.00	3.43	12.25	1.96
2.75	2.94	6.00	47.05	9.25	3.43		
3.00	2.94	6.25	129.40	9.50	3.43		
3.25	2.94	6.50	17.65	9.75	3.43		

CALIB	
NASHYD (0301)	Area (ha)= 0.53 Curve Number (CN)= 57.7

ID= 1 DT= 5.0 min	Ia (mm)= 4.49	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.19	

Unit Hyd Qpeak (cms)= 0.107

PEAK FLOW (cms)= 0.049 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 31.170
TOTAL RAINFALL (mm)= 98.030
RUNOFF COEFFICIENT = 0.318

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

CALIB	
STANDHYD (0201)	Area (ha)= 0.84
ID= 1 DT= 5.0 min	Total Imp(%)= 56.00 Dir. Conn.(%)= 30.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.47	0.37
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	1.00	2.50
Length (m)=	74.83	30.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	129.40	89.05
over (min)	5.00	10.00
Storage Coeff. (min)=	1.94 (ii)	7.75 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.31	0.13

		TOTALS
PEAK FLOW (cms)=	0.09	0.07 0.161 (iii)
TIME TO PEAK (hrs)=	6.25	6.25
RUNOFF VOLUME (mm)=	96.03	34.49 52.95
TOTAL RAINFALL (mm)=	98.03	98.03 98.03
RUNOFF COEFFICIENT =	0.98	0.35 0.54

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 (0203)	Area (ha)= 0.14

|ID= 1 DT= 5.0 min | Total Imp(%)= 57.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.08	0.06
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	30.55	15.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	129.40	164.55
over (min)	5.00	5.00
Storage Coeff. (min)=	0.92 (ii)	3.76 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.25

		TOTALS
PEAK FLOW (cms)=	0.00	0.03
TIME TO PEAK (hrs)=	6.17	6.25
RUNOFF VOLUME (mm)=	96.03	43.88
TOTAL RAINFALL (mm)=	98.03	98.03
RUNOFF COEFFICIENT =	0.98	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* = 49.0 Ia = Dep. 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 (0303) | Area (ha)= 0.11
|ID= 1 DT= 5.0 min | Total Imp(%)= 37.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.04	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	1.00
Length (m)=	27.08	20.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	129.40	88.57
over (min)	5.00	10.00
Storage Coeff. (min)=	0.85 (ii)	6.87 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.34	0.14

TOTALS

PEAK FLOW (cms)=	0.00	0.01	0.014 (iii)
TIME TO PEAK (hrs)=	6.17	6.25	6.25
RUNOFF VOLUME (mm)=	96.03	34.41	34.44
TOTAL RAINFALL (mm)=	98.03	98.03	98.03
RUNOFF COEFFICIENT =	0.98	0.35	0.35

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. 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 (0901)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				
ID1= 1 (0201):	0.84	0.161	6.25	52.95
+ ID2= 2 (0203):	0.14	0.028	6.25	43.88
ID = 3 (0901):	0.98	0.188	6.25	51.65

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0901)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
3 + 2 = 1				
ID1= 3 (0901):	0.98	0.188	6.25	51.65
+ ID2= 2 (0301):	0.53	0.049	6.33	31.17
ID = 1 (0901):	1.51	0.234	6.25	44.46

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0901)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				
ID1= 1 (0901):	1.51	0.234	6.25	44.46
+ ID2= 2 (0303):	0.11	0.014	6.25	34.44
ID = 3 (0901):	1.62	0.248	6.25	43.78

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0401)
IN= 2---> OUT= 1
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0750	0.0105
0.0051	0.0011	0.0798	0.0118
0.0207	0.0022	0.0843	0.0132
0.0342	0.0033	0.0886	0.0145
0.0437	0.0045	0.0927	0.0158
0.0515	0.0056	0.0966	0.0171
0.0583	0.0068	0.1004	0.0181
0.0643	0.0080	0.1052	0.0195
0.0699	0.0092	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0901)	1.620	0.248	6.25	43.78
OUTFLOW: ID= 1 (0401)	1.620	0.101	6.42	43.75

PEAK FLOW REDUCTION [Qout/Qin](%)= 40.87
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0185

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

Area (ha)= 0.12
Total Imp(%)= 45.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.05	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	28.28	15.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	129.40	110.98
over (min)	5.00	5.00
Storage Coeff. (min)=	0.88 (ii)	4.64 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.22

			TOTALS
PEAK FLOW (cms)=	0.00	0.02	0.020 (iii)
TIME TO PEAK (hrs)=	6.17	6.25	6.25
RUNOFF VOLUME (mm)=	96.03	37.69	37.73
TOTAL RAINFALL (mm)=	98.03	98.03	98.03

RUNOFF COEFFICIENT = 0.98 0.38 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* = 49.0 Ia = Dep. 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 (0903)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0202):	0.12	0.020	6.25	37.73
+ ID2= 2 (0401):	1.62	0.101	6.42	43.75
=====				
ID = 3 (0903):	1.74	0.107	6.25	43.34

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0302)
ID= 1 DT= 5.0 min

Area (ha)= 0.50
Total Imp(%)= 22.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.11	0.39
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	3.00
Length (m)=	57.74	75.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	129.40	56.66
over (min)	5.00	15.00
Storage Coeff. (min)=	1.35 (ii)	12.78 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.33	0.08

			TOTALS
PEAK FLOW (cms)=	0.00	0.04	0.040 (iii)
TIME TO PEAK (hrs)=	6.25	6.33	6.33
RUNOFF VOLUME (mm)=	96.03	29.48	29.53
TOTAL RAINFALL (mm)=	98.03	98.03	98.03
RUNOFF COEFFICIENT =	0.98	0.30	0.30

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 49.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

** SIMULATION:1. 2yr - SCS **

RESERVOIR(0401)		OVERFLOW IS OFF			
IN= 2---> OUT= 1					
DT= 5.0 min					

		OUTFLOW	STORAGE	OUTFLOW	STORAGE
		(cms)	(ha.m.)	(cms)	(ha.m.)
		0.0000	0.0000	0.0750	0.0105
		0.0051	0.0011	0.0798	0.0118
		0.0207	0.0022	0.0843	0.0132
		0.0342	0.0033	0.0886	0.0145
		0.0437	0.0045	0.0927	0.0158
		0.0515	0.0056	0.0966	0.0171
		0.0583	0.0068	0.1004	0.0181
		0.0643	0.0080	0.1052	0.0195
		0.0699	0.0092	0.0000	0.0000
		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0901)		1.620	0.069	6.25	13.26
OUTFLOW: ID= 1 (0401)		1.620	0.042	6.33	13.23
PEAK FLOW REDUCTION [Qout/Qin](%)= 61.25					
TIME SHIFT OF PEAK FLOW (min)= 5.00					
MAXIMUM STORAGE USED (ha.m.)= 0.0043					

** SIMULATION:2. 5yr - SCS **

RESERVOIR(0401)		OVERFLOW IS OFF			
IN= 2---> OUT= 1					
DT= 5.0 min					

		OUTFLOW	STORAGE	OUTFLOW	STORAGE
		(cms)	(ha.m.)	(cms)	(ha.m.)
		0.0000	0.0000	0.0750	0.0105
		0.0051	0.0011	0.0798	0.0118
		0.0207	0.0022	0.0843	0.0132
		0.0342	0.0033	0.0886	0.0145
		0.0437	0.0045	0.0927	0.0158
		0.0515	0.0056	0.0966	0.0171
		0.0583	0.0068	0.1004	0.0181
		0.0643	0.0080	0.1052	0.0195
		0.0699	0.0092	0.0000	0.0000
		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0901)		1.620	0.107	6.25	20.43
OUTFLOW: ID= 1 (0401)		1.620	0.059	6.42	20.40

PEAK FLOW REDUCTION [Qout/Qin](%)= 54.88
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0069

** SIMULATION:3. 10yr - SCS **

| RESERVOIR(0401)| OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
DT= 5.0 min
OUTFLOW STORAGE | OUTFLOW STORAGE
(cms) (ha.m.) | (cms) (ha.m.)
0.0000 0.0000 | 0.0750 0.0105
0.0051 0.0011 | 0.0798 0.0118
0.0207 0.0022 | 0.0843 0.0132
0.0342 0.0033 | 0.0886 0.0145
0.0437 0.0045 | 0.0927 0.0158
0.0515 0.0056 | 0.0966 0.0171
0.0583 0.0068 | 0.1004 0.0181
0.0643 0.0080 | 0.1052 0.0195
0.0699 0.0092 | 0.0000 0.0000

AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
INFLOW : ID= 2 (0901) 1.620 0.142 6.25 25.59
OUTFLOW: ID= 1 (0401) 1.620 0.070 6.42 25.56

PEAK FLOW REDUCTION [Qout/Qin](%)= 49.54
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0094

** SIMULATION:4. 25yr - SCS **

| RESERVOIR(0401)| OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
DT= 5.0 min
OUTFLOW STORAGE | OUTFLOW STORAGE
(cms) (ha.m.) | (cms) (ha.m.)
0.0000 0.0000 | 0.0750 0.0105
0.0051 0.0011 | 0.0798 0.0118
0.0207 0.0022 | 0.0843 0.0132
0.0342 0.0033 | 0.0886 0.0145
0.0437 0.0045 | 0.0927 0.0158
0.0515 0.0056 | 0.0966 0.0171
0.0583 0.0068 | 0.1004 0.0181
0.0643 0.0080 | 0.1052 0.0195

0.0699 0.0092 | 0.0000 0.0000

AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
INFLOW : ID= 2 (0901) 1.620 0.182 6.25 32.61
OUTFLOW: ID= 1 (0401) 1.620 0.083 6.42 32.58

PEAK FLOW REDUCTION [Qout/Qin](%)= 45.24
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0127

** SIMULATION:5. 50yr - SCS **

| RESERVOIR(0401)| OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
DT= 5.0 min
OUTFLOW STORAGE | OUTFLOW STORAGE
(cms) (ha.m.) | (cms) (ha.m.)
0.0000 0.0000 | 0.0750 0.0105
0.0051 0.0011 | 0.0798 0.0118
0.0207 0.0022 | 0.0843 0.0132
0.0342 0.0033 | 0.0886 0.0145
0.0437 0.0045 | 0.0927 0.0158
0.0515 0.0056 | 0.0966 0.0171
0.0583 0.0068 | 0.1004 0.0181
0.0643 0.0080 | 0.1052 0.0195
0.0699 0.0092 | 0.0000 0.0000

AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
INFLOW : ID= 2 (0901) 1.620 0.214 6.25 38.08
OUTFLOW: ID= 1 (0401) 1.620 0.091 6.42 38.05

PEAK FLOW REDUCTION [Qout/Qin](%)= 42.66
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0155

** SIMULATION:6. 100yr - SCS **

| RESERVOIR(0401)| OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
DT= 5.0 min
OUTFLOW STORAGE | OUTFLOW STORAGE
(cms) (ha.m.) | (cms) (ha.m.)
0.0000 0.0000 | 0.0750 0.0105
0.0051 0.0011 | 0.0798 0.0118

0.0207	0.0022		0.0843	0.0132
0.0342	0.0033		0.0886	0.0145
0.0437	0.0045		0.0927	0.0158
0.0515	0.0056		0.0966	0.0171
0.0583	0.0068		0.1004	0.0181
0.0643	0.0080		0.1052	0.0195
0.0699	0.0092		0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0901)	1.620	0.248	6.25	43.78
OUTFLOW: ID= 1 (0401)	1.620	0.101	6.42	43.75

PEAK FLOW REDUCTION [Qout/Qin](%)= 40.87
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0185

Appendix C: Emergency Overflow Weir Calculations

PROJECT	24 Alfred Street	FILE	121108
		DATE	May 27, 2022
SUBJECT	Emergency Overflow For Regional Storm	NAME	KG
		PAGE	1 OF 1

Trapezoidal Broad Crested Weir

Source: Hydraulic Structures, C.D.Smith, University of Saskatchewan

Trapezoidal Weir

The trapezoidal weir is a combination of the rectangular weir and the triangular weir

Target Storm

50% of 100-year Storm Peak Flow For Catchments 201, 203, 301 and 303 (m³/s) = 0.124

W	Weir Bottom Width (m)	8.2
H	Head (m)	0.05
L	Weir Downstream Length (m)	5.0
S	Side Slope (horizontal):1	0

Rectangular Weir

$$Q = CWH^{3/2}$$

H/L	0.01
C	1.4

Result

Q Rectangular Weir Flow (m³/s) 0.128 > 0.124

Appendix D: Tailwater Analysis

Crossing - 24 Alfred, Design Discharge - 0.10 cms

Culvert - Culvert 1, Culvert Discharge - 0.10 cms

Summary of Flows at Crossing - 24 Alfred

Headwater Elevation (m)	Total Discharge (cms)	Culvert 1 Discharge (cms)	Roadway Discharge (cms)	Iterations
196.00	0.00	0.00	0.00	1
196.02	0.01	0.01	0.00	1
196.06	0.02	0.02	0.00	1
196.14	0.04	0.04	0.00	1
196.24	0.05	0.05	0.00	1
196.38	0.06	0.06	0.00	1
196.54	0.07	0.07	0.00	1
196.74	0.08	0.08	0.00	1
196.96	0.10	0.10	0.00	1
197.04	0.10	0.10	0.00	1
197.30	0.12	0.11	0.01	12
197.28	0.11	0.11	0.00	Overtopping

Display

☒ Crossing Summary Table

☐ Culvert Summary Table

☐ Water Surface Profiles

☐ Tapered Inlet Table

☐ Customized Table

Culvert 1

Options...

Geometry

Inlet Elevation: 195.43 m

Outlet Elevation: 195.42 m

Culvert Length: 2.90 m

Culvert Slope: 0.0034

Inlet Crest: 0.00 m

Inlet Throat: 0.00 m

Plot

Crossing Rating Curve

Culvert Performance Curve

Selected Water Profile

Water Surface Profile Data

Outlet Control: Profiles

Help

Flow Types...

Edit Input Data...

Energy Dissipation...

AOP...

Low Flow...

Export Report

Adobe PDF (*.pdf)

Close

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.060 cms

Design Flow: 0.076 cms

Maximum Flow: 0.100 cms

Table 1 - Summary of Culvert Flows at Crossing: 24 Alfred

Headwater Elevation (m)	Total Discharge (cms)	Culvert 1 Discharge (cms)	Roadway Discharge (cms)	Iterations
196.01	0.06	0.06	0.00	1
196.02	0.06	0.06	0.00	1
196.03	0.07	0.07	0.00	1
196.05	0.07	0.07	0.00	1
196.06	0.08	0.08	0.00	1
196.08	0.08	0.08	0.00	1
196.09	0.08	0.08	0.00	1
196.11	0.09	0.09	0.00	1
196.13	0.09	0.09	0.00	1
196.15	0.10	0.10	0.00	1
196.17	0.10	0.10	0.00	1
197.30	0.24	0.24	0.00	Overtopping

Rating Curve Plot for Crossing: 24 Alfred

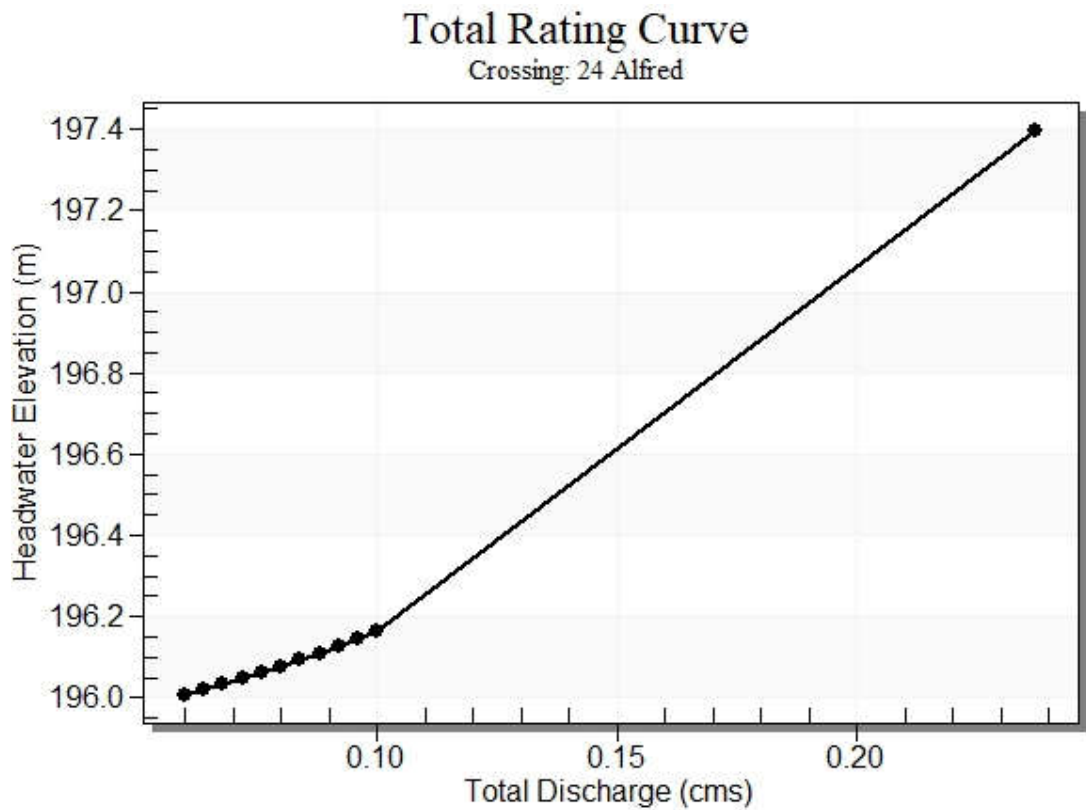


Table 2 - Culvert Summary Table: Culvert 1

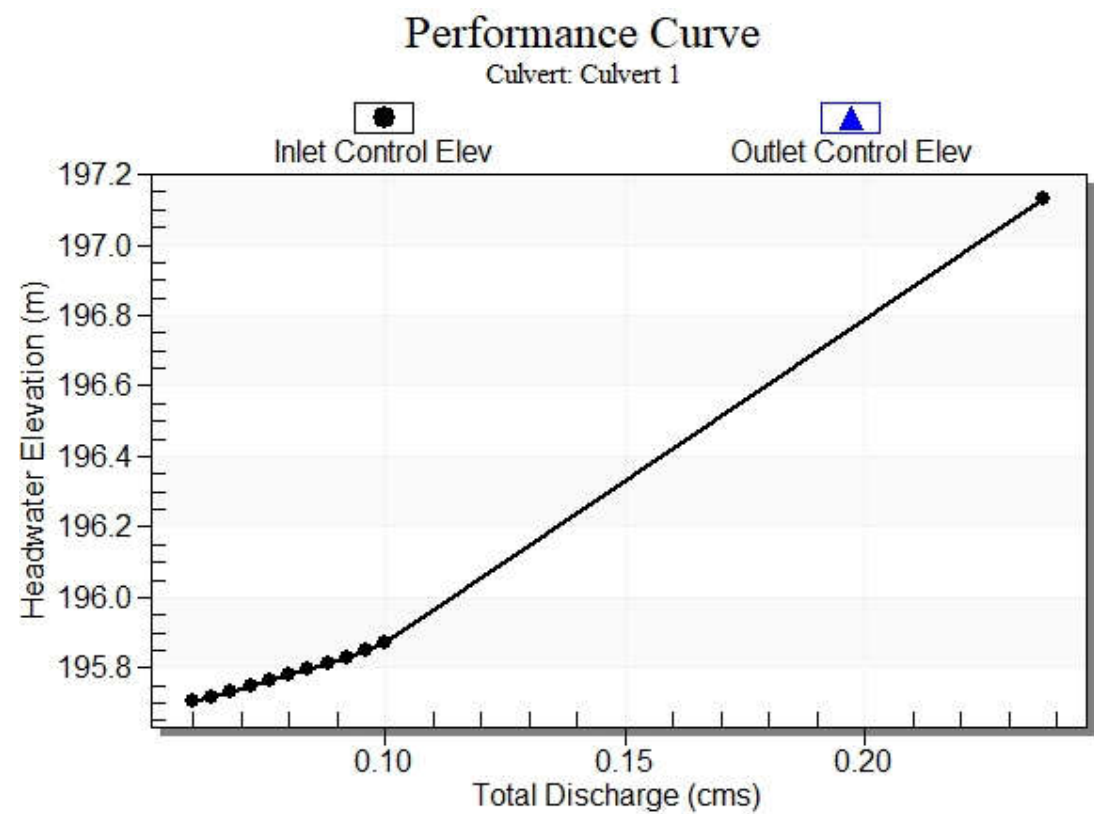
Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.06	0.06	196.01	0.295	0.598	4-FFf	0.220	0.189	0.300	0.530	0.849	0.000
0.06	0.06	196.02	0.309	0.611	4-FFf	0.233	0.196	0.300	0.530	0.905	0.000
0.07	0.07	196.03	0.323	0.623	4-FFf	0.300	0.202	0.300	0.530	0.962	0.000
0.07	0.07	196.05	0.338	0.637	4-FFf	0.300	0.209	0.300	0.530	1.019	0.000
0.08	0.08	196.06	0.353	0.652	4-FFf	0.300	0.214	0.300	0.530	1.075	0.000
0.08	0.08	196.08	0.369	0.667	4-FFf	0.300	0.220	0.300	0.530	1.132	0.000
0.08	0.08	196.09	0.385	0.683	4-FFf	0.300	0.225	0.300	0.530	1.188	0.000
0.09	0.09	196.11	0.403	0.700	4-FFf	0.300	0.230	0.300	0.530	1.245	0.000
0.09	0.09	196.13	0.421	0.718	4-FFf	0.300	0.235	0.300	0.530	1.302	0.000
0.10	0.10	196.15	0.440	0.736	4-FFf	0.300	0.240	0.300	0.530	1.358	0.000
0.10	0.10	196.17	0.460	0.755	4-FFf	0.300	0.244	0.300	0.530	1.415	0.000

Straight Culvert

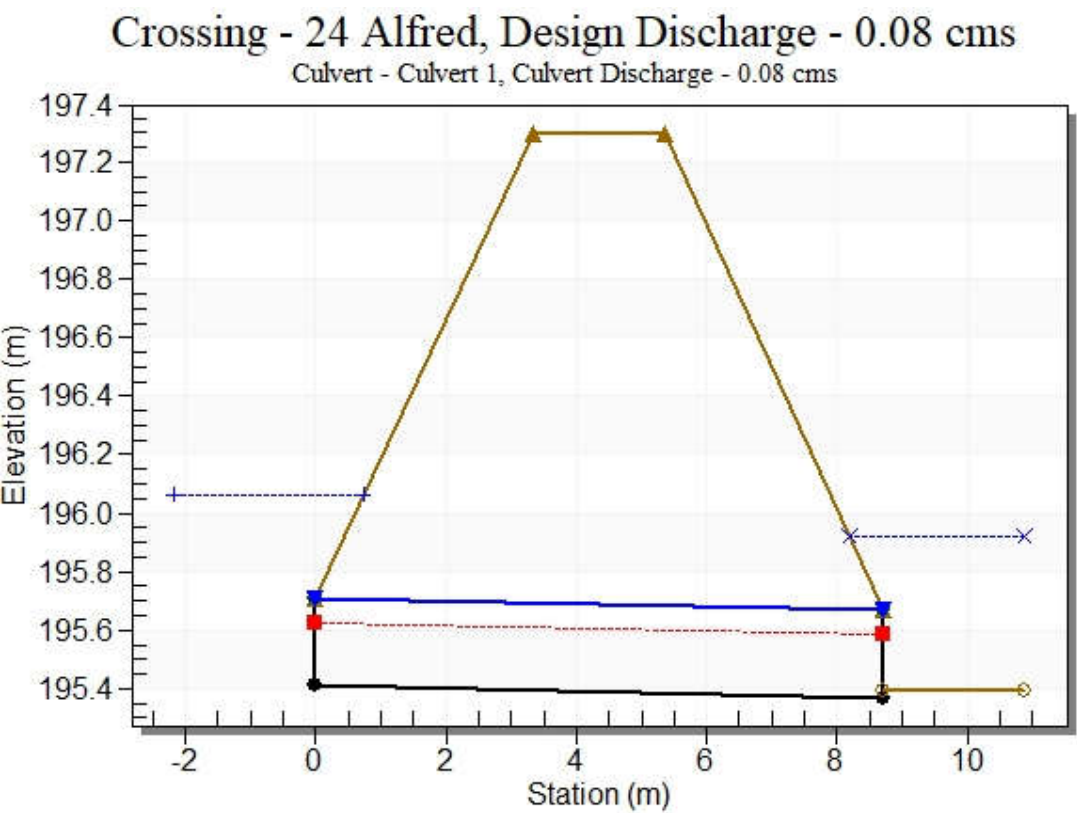
Inlet Elevation (invert): 195.41 m, Outlet Elevation (invert): 195.37 m

Culvert Length: 8.70 m, Culvert Slope: 0.0046

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 195.41 m

Outlet Station: 8.70 m

Outlet Elevation: 195.37 m

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Circular

Barrel Diameter: 300.00 mm

Barrel Material: Smooth HDPE

Embedment: 0.00 mm

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Tailwater Channel Data - 24 Alfred

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 195.92 m

Roadway Data for Crossing: 24 Alfred

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2.00 m

Crest Elevation: 197.30 m

Roadway Surface: Paved

Roadway Top Width: 2.00 m

PCSWMM Report

24 Alfred Street

Model 24 Alfred Tailwater Analysis.inp

Tatham Engineering

February 7, 2022

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Summary 1: Runoff quantity continuity

Name	24 Alfred Tailwater Analysis
Initial LID storage (mm)	n/a
Initial snow cover (mm)	n/a
Total precipitation (mm)	71.271
Outfall runoff (mm)	n/a
Evaporation loss (mm)	0.000
Infiltration loss (mm)	43.381
Surface runoff (mm)	27.436
LID drainage (mm)	n/a
Snow removed (mm)	n/a
Final snow cover (mm)	n/a
Final storage (mm)	0.657
Continuity error (%)	-0.285

Summary 2: Flow routing continuity

Name	24 Alfred Tailwater Analysis
Dry weather inflow (ML)	0.000
Wet weather inflow (ML)	4.095
Groundwater inflow (ML)	0.000
RDII inflow (ML)	0.000
External inflow (ML)	0.000
External outflow (ML)	4.093
Flooding loss (ML)	0.000
Evaporation loss (ML)	0.000
Exfiltration loss (ML)	0.000
Initial stored volume (ML)	0.003
Final stored volume (ML)	0.005
Continuity error (%)	0.018

Summary 3: Results statistics

Name	24 Alfred Tailwater Analysis
Max. subcatchment total runoff (ML)	0.49
Max. subcatchment peak runoff (m ³ /s)	0.44
Max. subcatchment runoff coefficient	0.925
Max. subcatchment total precip (mm)	71.27
Min. subcatchment total precip (mm)	71.27
Max. node depth (m)	2.75
Num. nodes surcharged	5
Max. node surcharge duration (hours)	0.79
Max. node height above crown (m)	0.684
Min. node depth below rim (m)	0
Num. nodes flooded	0
Max. node flooding duration (hours)	0
Max. node flood volume (ML)	0
Max. node ponded volume or depth (ha-mm/1000 m ³ /m)	0
Max. storage volume (1000 m ³)	0.196
Max. storage percent full (%)	100
Max. outfall flow frequency (%)	82.86
Max. outfall peak flow (m ³ /s)	1.242
Max. outfall total volume (ML)	4.093
Total outfall volume (ML)	4.093
Max. link peak flow (m ³ /s)	4.719
Max. link peak velocity (m/s)	6.43
Min. link peak velocity (m/s)	0
Num. conduits surcharged	26
Max. conduit surcharge duration (hours)	1.2
Max. conduit capacity limited duration (hours)	0.79

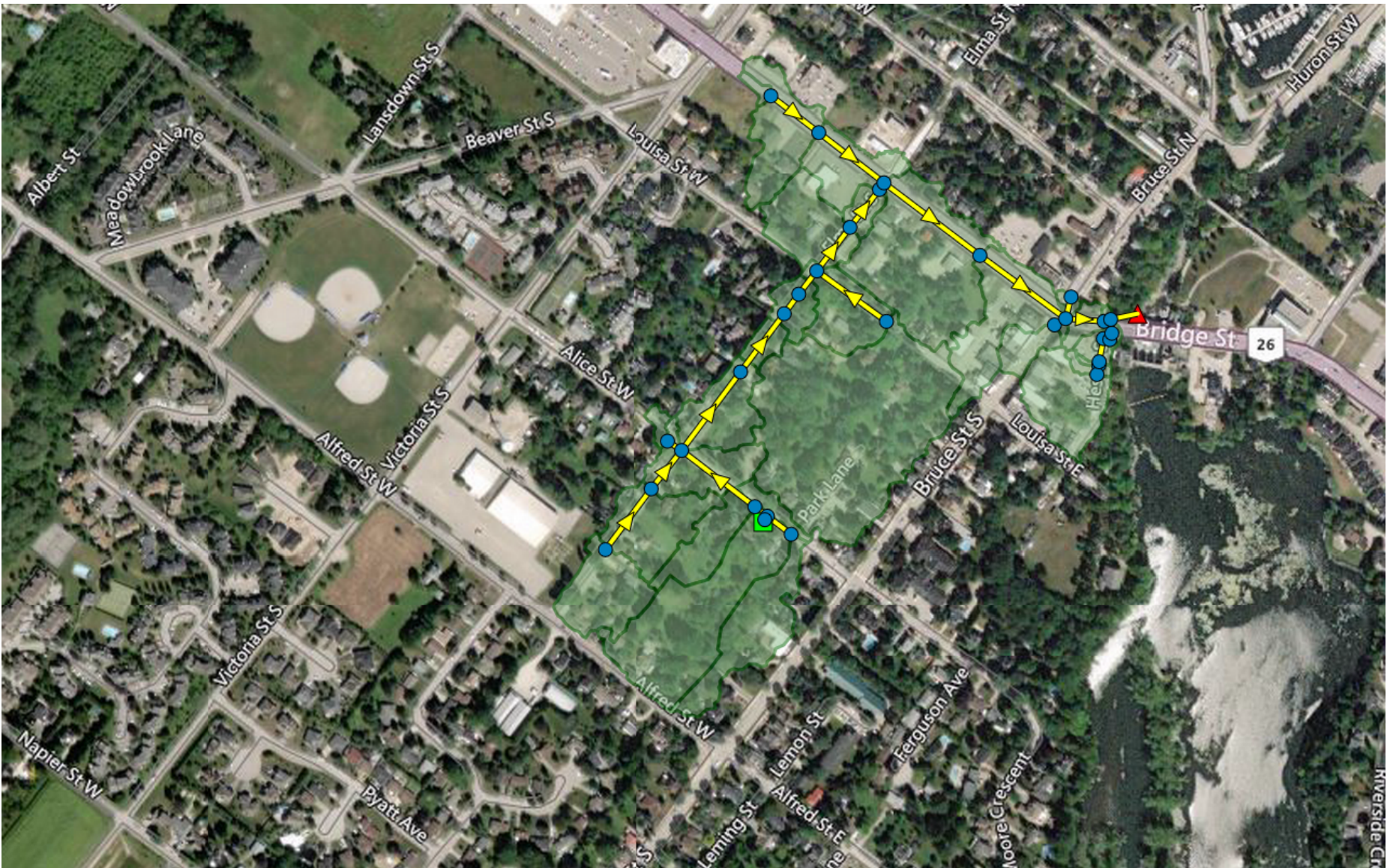


Figure 1: 24 Alfred Street

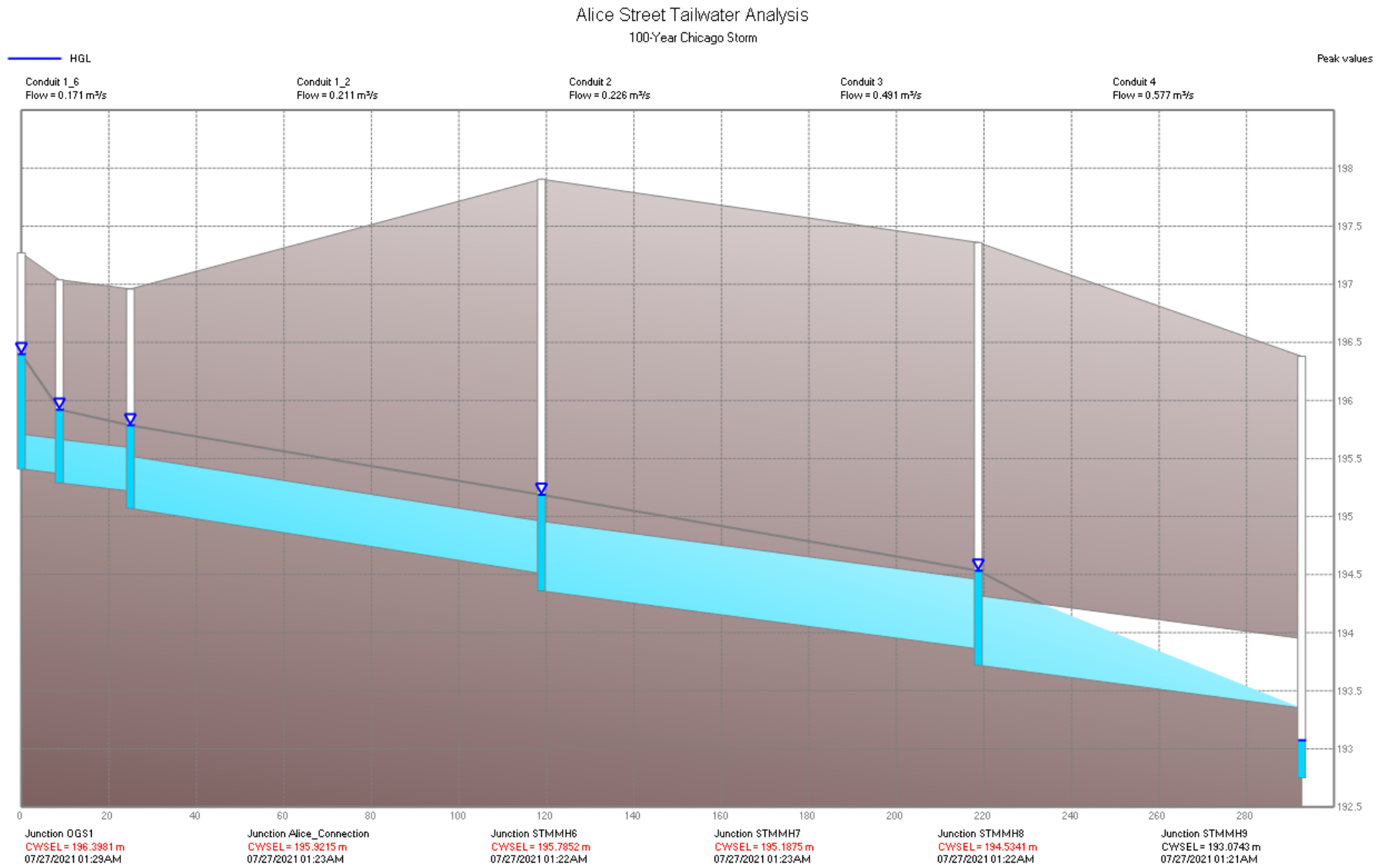


Figure 2: Alice Street Connection

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.070 cms

Design Flow: 0.101 cms

Maximum Flow: 0.180 cms

Table 1 - Summary of Culvert Flows at Crossing: 24 Alfred Street

Headwater Elevation (m)	Total Discharge (cms)	Culvert 1 Discharge (cms)	Roadway Discharge (cms)	Iterations
195.86	0.07	0.07	0.00	1
195.90	0.08	0.08	0.00	1
195.95	0.09	0.09	0.00	1
195.99	0.10	0.10	0.00	1
196.06	0.11	0.11	0.00	1
196.12	0.13	0.13	0.00	1
196.19	0.14	0.14	0.00	1
196.27	0.15	0.15	0.00	1
196.35	0.16	0.16	0.00	1
196.44	0.17	0.17	0.00	1
196.54	0.18	0.18	0.00	1
197.30	0.25	0.25	0.00	Overtopping

Rating Curve Plot for Crossing: 24 Alfred Street

Total Rating Curve

Crossing: 24 Alfred

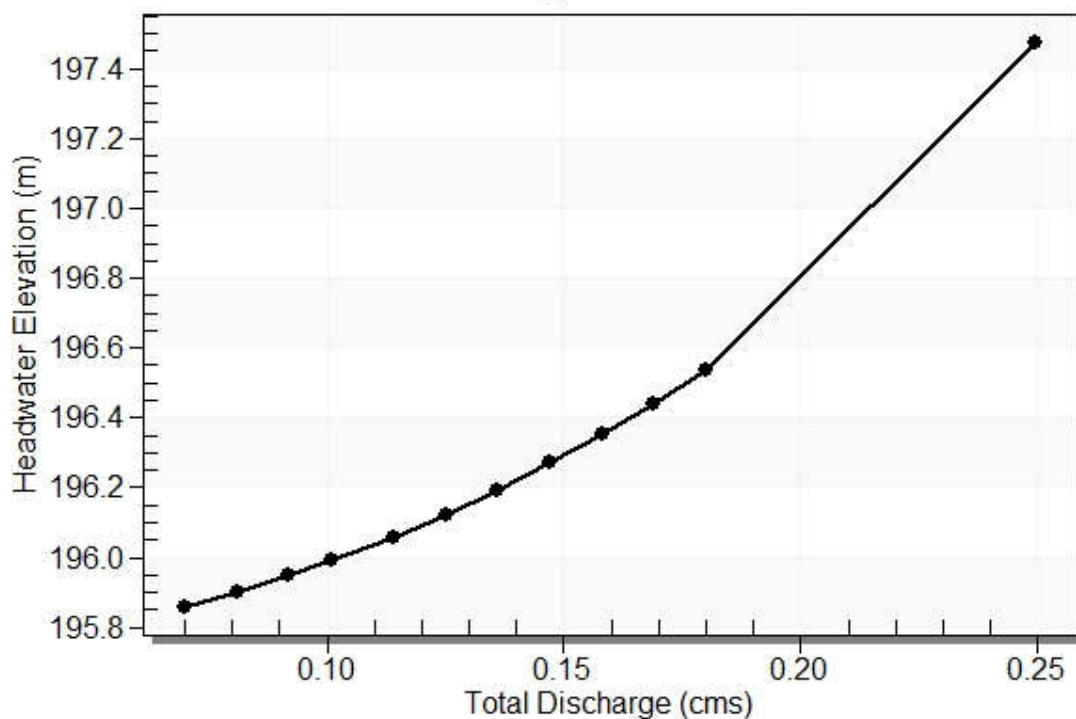


Table 2 - Culvert Summary Table: Culvert 1

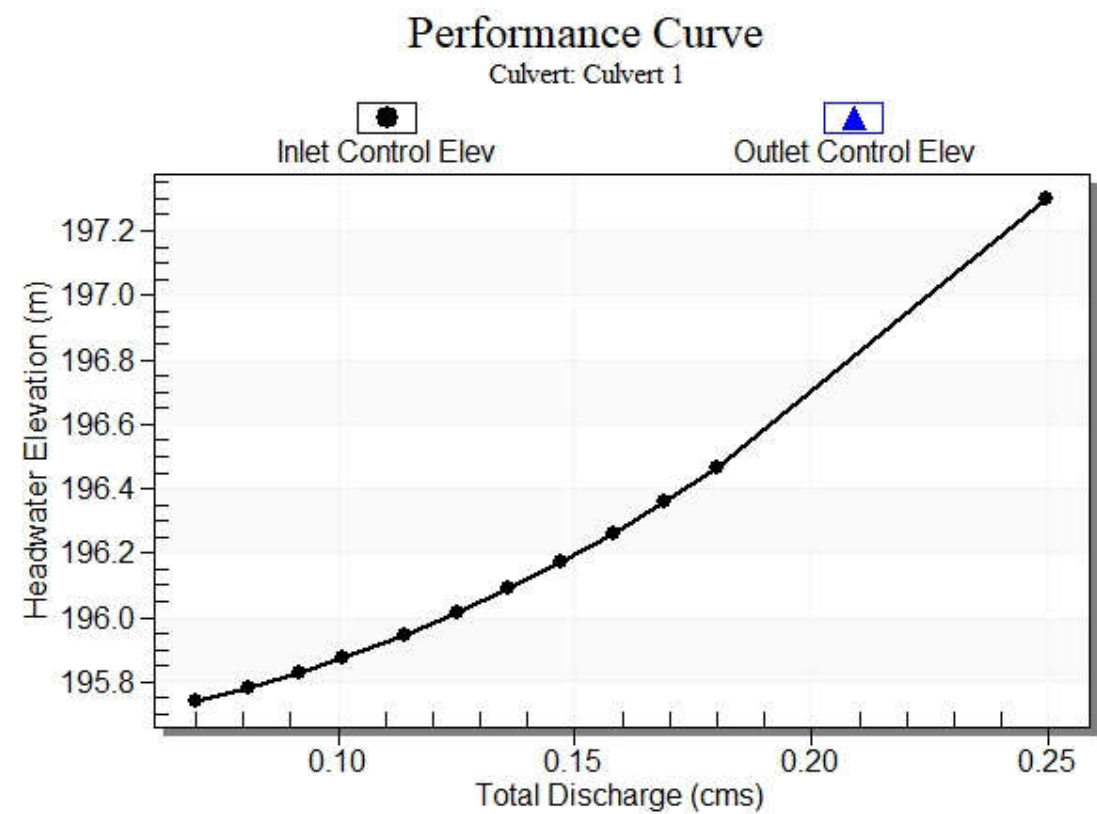
Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.07	0.07	195.86	0.330	0.450	4-FFf	0.300	0.205	0.300	0.350	0.990	0.000
0.08	0.08	195.90	0.373	0.491	4-FFf	0.300	0.221	0.300	0.350	1.146	0.000
0.09	0.09	195.95	0.421	0.538	4-FFf	0.300	0.235	0.300	0.350	1.302	0.000
0.10	0.10	195.99	0.465	0.580	4-FFf	0.300	0.245	0.300	0.350	1.429	0.000
0.11	0.11	196.06	0.537	0.649	4-FFf	0.300	0.259	0.300	0.350	1.613	0.000
0.13	0.13	196.12	0.605	0.714	4-FFf	0.300	0.268	0.300	0.350	1.768	0.000
0.14	0.14	196.19	0.681	0.784	4-FFf	0.300	0.275	0.300	0.350	1.924	0.000
0.15	0.15	196.27	0.763	0.860	4-FFf	0.300	0.280	0.300	0.350	2.080	0.000
0.16	0.16	196.35	0.851	0.943	4-FFf	0.300	0.286	0.300	0.350	2.235	0.000
0.17	0.17	196.44	0.949	1.031	4-FFf	0.300	0.276	0.300	0.350	2.391	0.000
0.18	0.18	196.54	1.056	1.125	4-FFf	0.300	0.290	0.300	0.350	2.546	0.000

Straight Culvert

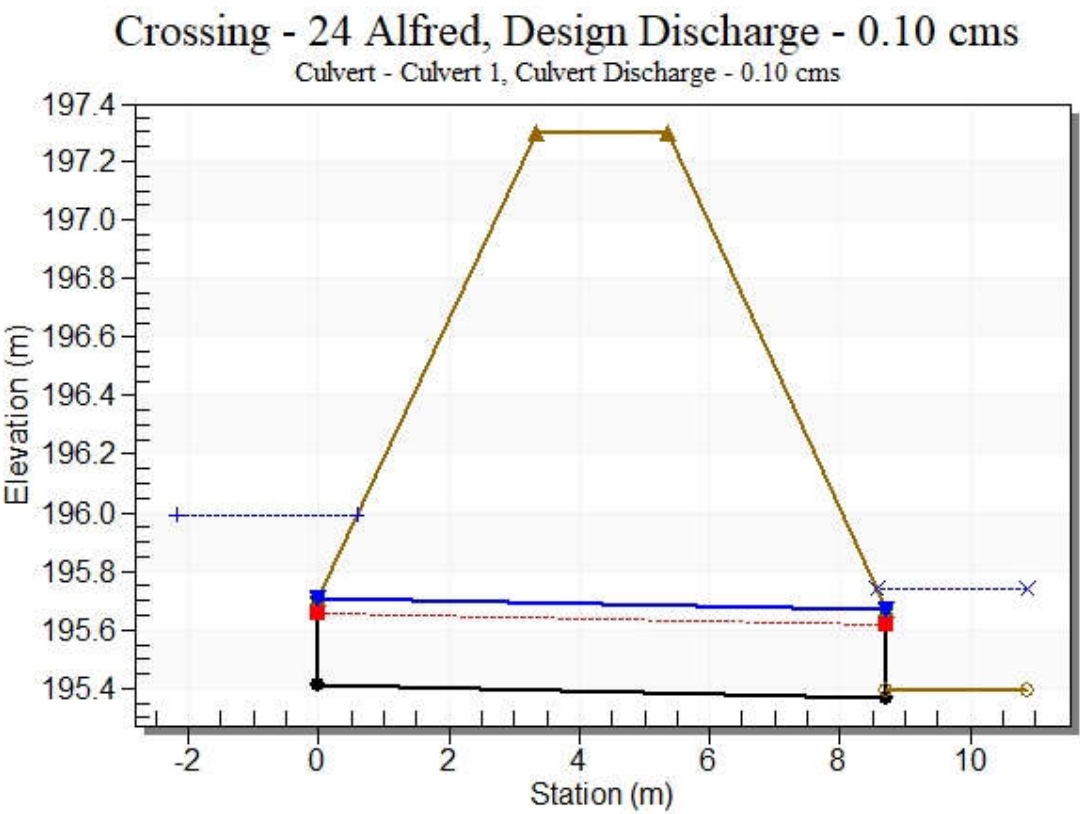
Inlet Elevation (invert): 195.41 m, Outlet Elevation (invert): 195.37 m

Culvert Length: 8.70 m, Culvert Slope: 0.0046

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 195.41 m

Outlet Station: 8.70 m

Outlet Elevation: 195.37 m

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Circular

Barrel Diameter: 300.00 mm

Barrel Material: Smooth HDPE

Embedment: 0.00 mm

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Tailwater Channel Data - 24 Alfred Street

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 195.74 m

Roadway Data for Crossing: 24 Alfred Street

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2.00 m

Crest Elevation: 197.30 m

Roadway Surface: Paved

Roadway Top Width: 2.00 m

PCSWMM Report

24 Alfred Street

Model 24 Alfred Tailwater Analysis.inp

Tatham Engineering

February 7, 2022

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Summary 1: Runoff quantity continuity

Name	24 Alfred Tailwater Analysis
Initial LID storage (mm)	n/a
Initial snow cover (mm)	n/a
Total precipitation (mm)	109.680
Outfall runoff (mm)	n/a
Evaporation loss (mm)	0.000
Infiltration loss (mm)	66.898
Surface runoff (mm)	42.290
LID drainage (mm)	n/a
Snow removed (mm)	n/a
Final snow cover (mm)	n/a
Final storage (mm)	0.690
Continuity error (%)	-0.180

Summary 2: Flow routing continuity

Name	24 Alfred Tailwater Analysis
Dry weather inflow (ML)	0.000
Wet weather inflow (ML)	6.308
Groundwater inflow (ML)	0.000
RDII inflow (ML)	0.000
External inflow (ML)	0.000
External outflow (ML)	6.296
Flooding loss (ML)	0.000
Evaporation loss (ML)	0.000
Exfiltration loss (ML)	0.000
Initial stored volume (ML)	0.003
Final stored volume (ML)	0.015
Continuity error (%)	-0.003

Summary 3: Results statistics

Name	24 Alfred Tailwater Analysis
Max. subcatchment total runoff (ML)	0.76
Max. subcatchment peak runoff (m ³ /s)	0.26
Max. subcatchment runoff coefficient	0.93
Max. subcatchment total precip (mm)	109.68
Min. subcatchment total precip (mm)	109.68
Max. node depth (m)	2.74
Num. nodes surcharged	3
Max. node surcharge duration (hours)	0.7
Max. node height above crown (m)	0.301
Min. node depth below rim (m)	0
Num. nodes flooded	0
Max. node flooding duration (hours)	0
Max. node flood volume (ML)	0
Max. node ponded volume or depth (ha-mm/1000 m ³ /m)	0
Max. storage volume (1000 m ³)	0.182
Max. storage percent full (%)	93
Max. outfall flow frequency (%)	99.86
Max. outfall peak flow (m ³ /s)	1.164
Max. outfall total volume (ML)	6.296
Total outfall volume (ML)	6.296
Max. link peak flow (m ³ /s)	4.729
Max. link peak velocity (m/s)	5.56
Min. link peak velocity (m/s)	0
Num. conduits surcharged	25
Max. conduit surcharge duration (hours)	1.18
Max. conduit capacity limited duration (hours)	0.83

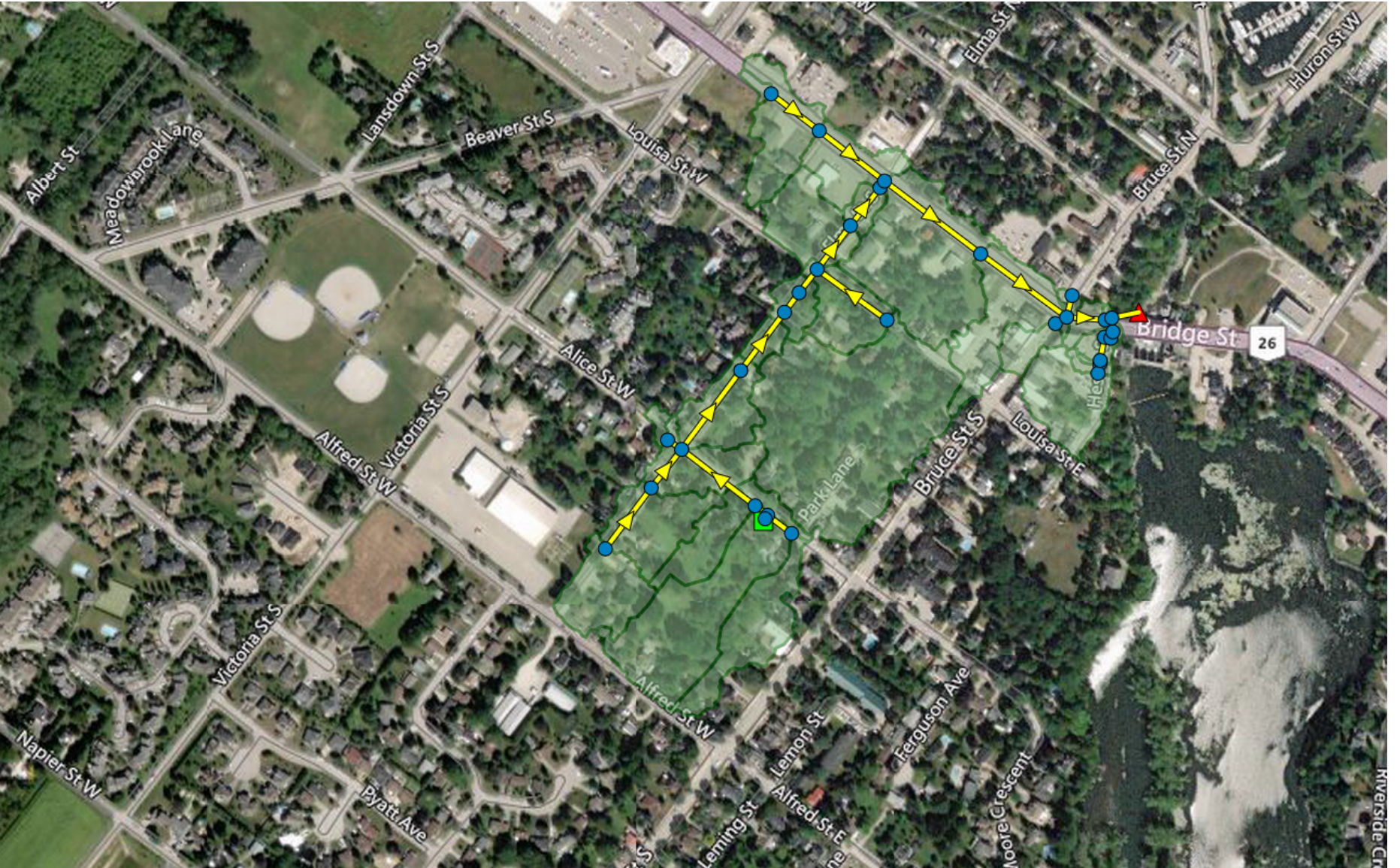


Figure 1: 24 Alfred Street

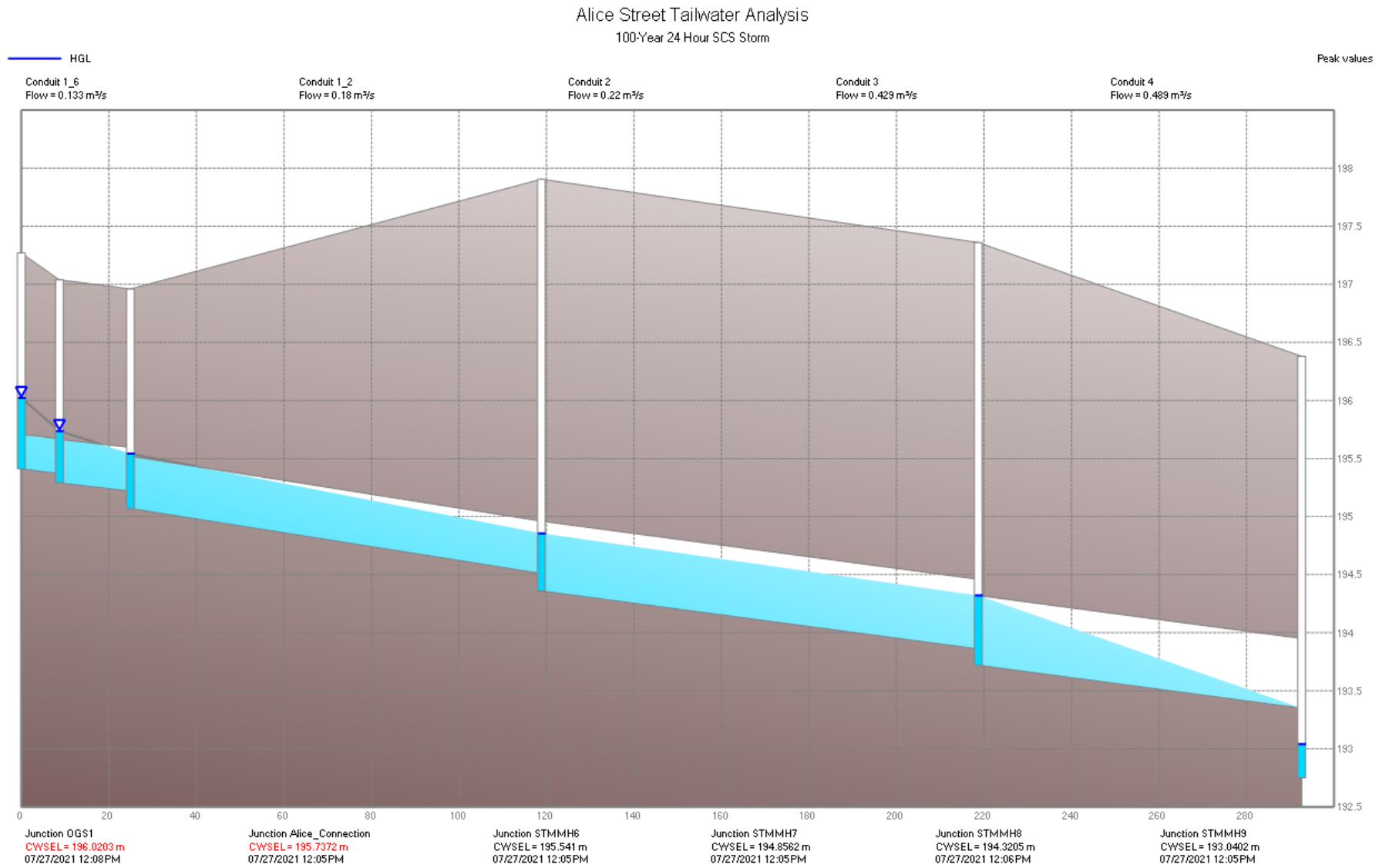
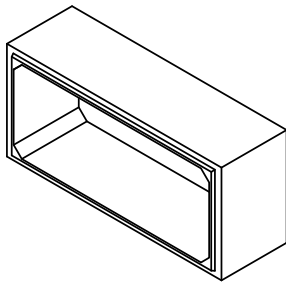
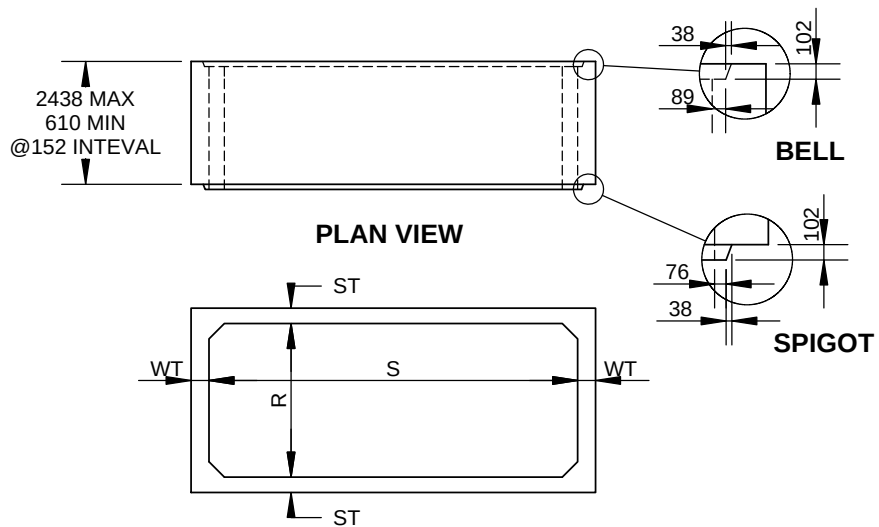


Figure 2: Alice Street Connection

Appendix E: Underground Storage & OGS Details



ISOMETRIC VIEW



TYPICAL SECTION

SPAN (S) = 1219, 1524, 1829, 2438							
S X R	ST	WT	HC	L (m)	kg/m	kg/pc	
1219 X 1219	203	203	0	2.438	2867	6990	
1524 X 1219	203	203	0	3.438	3174	10914	
1829 X 1524	203	203	305	4.438	4250	18860	
1829 X 1829	203	203	305	4.438	4557	20223	
2438 X 1219	203	203	305	4.438	4557	20223	
2438 X 2134	203	203	305	4.438	5478	24313	
2438 X 2438	254	254	305	4.438	7245	32152	

SPAN (S) = 2743, 3048, 3353, 3648							
S X R	ST	WT	HC	L (m)	kg/m	kg/pc	
2743 X 1219	254	254	305	2.4384	6093	14857	
2743 X 1524	254	254	305	2.4384	6477	15793	
2743 X 1829	254	254	305	2.4384	6861	16729	
2743 X 2134	254	254	305	2.4384	7245	17666	
3048 X 1219	254	254	305	2.4384	6477	15793	
3048 X 2743	254	254	305	2.4384	8397	20475	
3048 X 3048	254	254	305	2.4384	8781	21411	
3353 X 1219	305	305	305	2.4384	8294	20225	
3353 X 1524	305	305	305	2.4384	8755	21349	
3353 X 1829	305	305	305	2.4384	9216	22472	
3353 X 2134	305	305	305	2.4384	9677	23596	
3353 X 2438	305	305	305	2.4384	10138	24719	
3658 X 1219	305	305	305	2.4384	8755	21349	
3658 X 1524	305	305	305	2.4384	9216	22472	
3658 X 1829	305	305	305	2.4384	9677	23596	
3658 X 2134	305	305	305	2.4384	10138	24719	
3658 X 2438	305	305	305	2.4384	10598	25843	
3658 X 2743	305	305	305	2.4384	11059	26967	
3658 X 3048	305	305	305	2.4384	11520	28090	

SPAN (S) = 3962, 4267, 4877							
S X R	ST	WT	HC	L (m)	kg/m	kg/pc	
3962 X 1524	305	305	305	2.4384	9677	23596	
3962 X 1829	305	305	305	2.4384	10138	24719	
3962 X 2134	305	305	305	2.4384	10598	25843	
3962 X 2438	305	305	305	2.4384	11059	26967	
3962 X 2743	305	305	305	2.4384	11520	28090	
3962 X 3048	305	305	305	2.4384	11981	29214	
4267 X 1829	305	305	305	2.4384	10598	25843	
4267 X 2134	305	305	305	2.4384	11059	26967	
4267 X 2438	305	305	305	2.4384	11520	28090	
4267 X 2743	305	305	305	2.4384	11981	29214	
4267 X 3048	305	305	305	2.4384	12442	30338	
4877 X 1829	305	305	305	2.4384	11520	28090	
4877 X 2134	305	305	305	2.4384	11981	29214	
4877 X 2438	305	305	305	2.4384	12442	30338	
4877 X 2743	305	305	305	2.4384	12902	31461	
4877 X 3048	305	305	305	2.4384	13363	32585	

SPAN (S) = 5486, 6096, 6401							
S X R	ST	WT	HC	L (m)	kg/m	kg/pc	
5486 X 1524	305	305	305	2.4384	11981	29214	
5486 X 1829	305	305	305	2.4384	12442	30338	
5486 X 2134	305	305	305	2.4384	12902	31461	
5486 X 2438	305	305	305	2.4384	13363	32585	
5486 X 2743	305	305	305	2.4384	13824	33708	
5486 X 3048	305	305	305	2.4384	14285	34832	
6096 X 1524	305	305	305	2.4384	12902	31461	
6096 X 1829	305	305	305	2.4384	13363	32585	
6096 X 2134	406	406	305	2.1336	18688	39873	
6096 X 2438	406	406	305	1.9812	19302	38242	
6096 X 2743	406	406	305	1.9812	19917	39459	
6096 X 3048	406	406	305	1.8288	20531	37547	
6401 X 1524	406	406	305	2.1336	18074	38562	
6401 X 1829	406	406	305	2.1336	18688	39873	
6401 X 2134	406	406	305	1.9812	19302	38242	
6401 X 2438	406	406	305	1.9812	19917	39459	

GENERAL NOTES:

- (1) CUSTOM SIZE NOT IN THE TABLE SHOWN IS AVAILABLE. S AND R ARE PREFERRED TO HAVE 152 mm (6") INTERVAL. 51 mm (2") INTERVAL IS AVAILABLE UPON REQUEST.
- (2) WALL (WT) AND SLAB THICKNESS (ST) HAVE INTERVAL OF 52 (2") BETWEEN 152 mm (6") - 610 mm (24")
- (3) 406 mm (14") HC IS AVAILABLE. OTHER SIZE OF HANUCH IS AVAILABLE UPON REQUEST.
- (4) WALL AND SLAB THICKNESS IN THE TABLE ARE TYPICAL FOR CHBDC CL625-ONT LOADING WITH EARTH COVER BETWEEN 0 - 3.6m.
- (5) MASS IS APPROXIMATE BASED ON 2480 kg/m³ DENSITY OF CONCRETE.
- (6) SHIPPING CAPACITY GOVERNS MAXIMUM SIZE AND LAY LENGTH
- (7) LIFTING DEVICES ARE DAYTON SWIFT LIFT ANCHOR OR EQUIVALENT
- (8) LONGER LAY LENGTH (L UPTO 3658) IS AVAILABLE UPON REQUEST
- (9) WHEN THE HEIGHT (R+2ST) IS LARGER THAN 2540, BOX UNIT WILL BE SHIPPED FLOWER POT AND TO BE ROTATED ON THE JOB SITE.
- (9) CHAMFER EDGE IS AVAILABLE UPON REQUEST

ALL DIMENSIONS ARE IN mm UNLESS SPECIFIED TOLERANCES TO CSA A23.4-09
DRAWINGS ARE NOT TO SCALE

CON CAST PIPE (CCP) STANDARD DRAWING

STD. CCP ENG GUIDE B 6.1.3. PART BA-SIZEGUIDE

TITLE PRECAST BOX CULVERT
SIZE GUIDE

1	INITIAL RELEASE	SW	14JUL14
REV.	DESCRIPTION	ENG.	DATE

DRAWN BY	CHECKED BY	DATE	FILE	PAGE
SW	AP	19/OCT/2011	Box Size Guide.SLDDRW	1 OF 1



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Stormceptor®EF Sizing Report

STORMCEPTOR®

ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

01/25/2022

Province:	Ontario	Project Name:	24 Alfred Street
City:	Town of The Blue Mountains	Project Number:	121108
Nearest Rainfall Station:	OWEN SOUND MOE	Designer Name:	Kyle Gowanlock
Climate Station Id:	6116132	Designer Company:	Tatham Engineering Ltd.
Years of Rainfall Data:	40	Designer Email:	kgowanlock@tathameng.com
		Designer Phone:	705-444-2565
Site Name:	24 Alfred Street	EOR Name:	
		EOR Company:	
Drainage Area (ha):	1.47	EOR Email:	
% Imperviousness:	38.00	EOR Phone:	

Runoff Coefficient 'c': 0.52

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

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	32.62
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	Yes
Upstream Orifice Control Flow Rate to Stormceptor (L/s):	88.00
Peak Conveyance (maximum) Flow Rate (L/s):	
Site Sediment Transport Rate (kg/ha/yr):	

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	68
EFO6	80
EFO8	87
EFO10	92
EFO12	95

Recommended Stormceptor EFO Model: **EFO6**
 Estimated Net Annual Sediment (TSS) Load Reduction (%): **80**
 Water Quality Runoff Volume Capture (%): **> 90**

Stormceptor® EF Sizing Report

THIRD-PARTY TESTING AND VERIFICATION

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

PERFORMANCE

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

PARTICLE SIZE DISTRIBUTION (PSD)

► The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

Stormceptor®EF Sizing Report

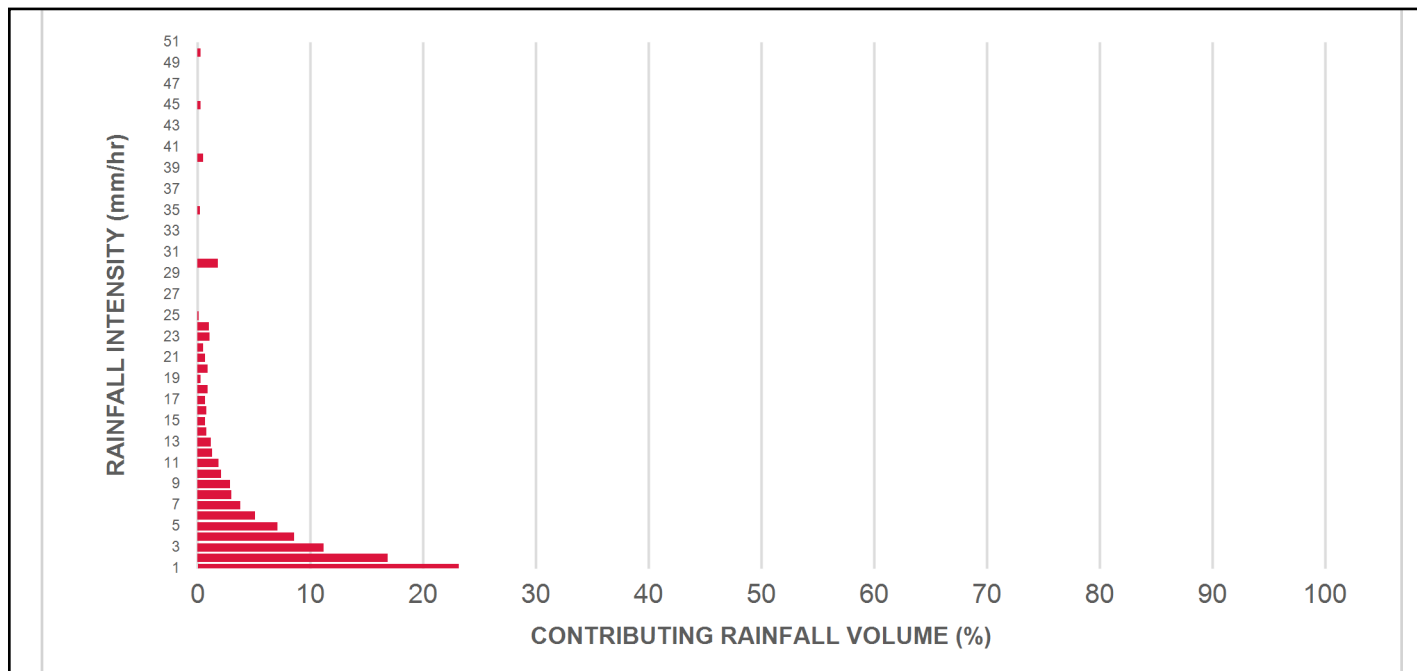
Upstream Flow Controlled Results

Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
1	23.2	23.2	2.16	129.0	49.0	98	22.8	22.8
2	16.9	40.0	4.32	259.0	98.0	90	15.2	38.0
3	11.2	51.3	6.47	388.0	148.0	84	9.5	47.5
4	8.6	59.9	8.63	518.0	197.0	78	6.8	54.2
5	7.1	67.0	10.79	647.0	246.0	75	5.4	59.6
6	5.1	72.2	12.95	777.0	295.0	73	3.8	63.4
7	3.8	76.0	15.10	906.0	345.0	71	2.7	66.1
8	3.0	79.0	17.26	1036.0	394.0	69	2.1	68.2
9	2.9	81.9	19.42	1165.0	443.0	67	1.9	70.1
10	2.1	83.9	21.58	1295.0	492.0	65	1.3	71.4
11	1.9	85.8	23.73	1424.0	541.0	63	1.2	72.6
12	1.3	87.1	25.89	1554.0	591.0	60	0.8	73.4
13	1.2	88.4	28.05	1683.0	640.0	60	0.7	74.1
14	0.8	89.2	30.21	1812.0	689.0	59	0.5	74.6
15	0.7	89.9	32.37	1942.0	738.0	59	0.4	75.0
16	0.8	90.7	34.52	2071.0	788.0	59	0.4	75.5
17	0.7	91.4	36.68	2201.0	837.0	58	0.4	75.9
18	0.9	92.2	38.84	2330.0	886.0	58	0.5	76.4
19	0.3	92.6	41.00	2460.0	935.0	58	0.2	76.6
20	0.9	93.5	43.15	2589.0	985.0	57	0.5	77.1
21	0.7	94.3	45.31	2719.0	1034.0	57	0.4	77.6
22	0.5	94.8	47.47	2848.0	1083.0	55	0.3	77.8
23	1.1	95.9	49.63	2978.0	1132.0	54	0.6	78.4
24	1.0	96.9	51.79	3107.0	1181.0	53	0.5	79.0
25	0.1	97.0	53.94	3237.0	1231.0	52	0.1	79.0
30	1.8	98.8	64.73	3884.0	1477.0	46	0.8	79.9
35	0.2	99.0	75.52	4531.0	1723.0	40	0.1	79.9
40	1.0	100.0	86.31	5179.0	1969.0	35	0.4	80.3
45	0.0	100.0	88.00	5280.0	2008.0	34	0.0	80.3
50	0.0	100.0	88.00	5280.0	2008.0	34	0.0	80.3
Estimated Net Annual Sediment (TSS) Load Reduction =								80 %

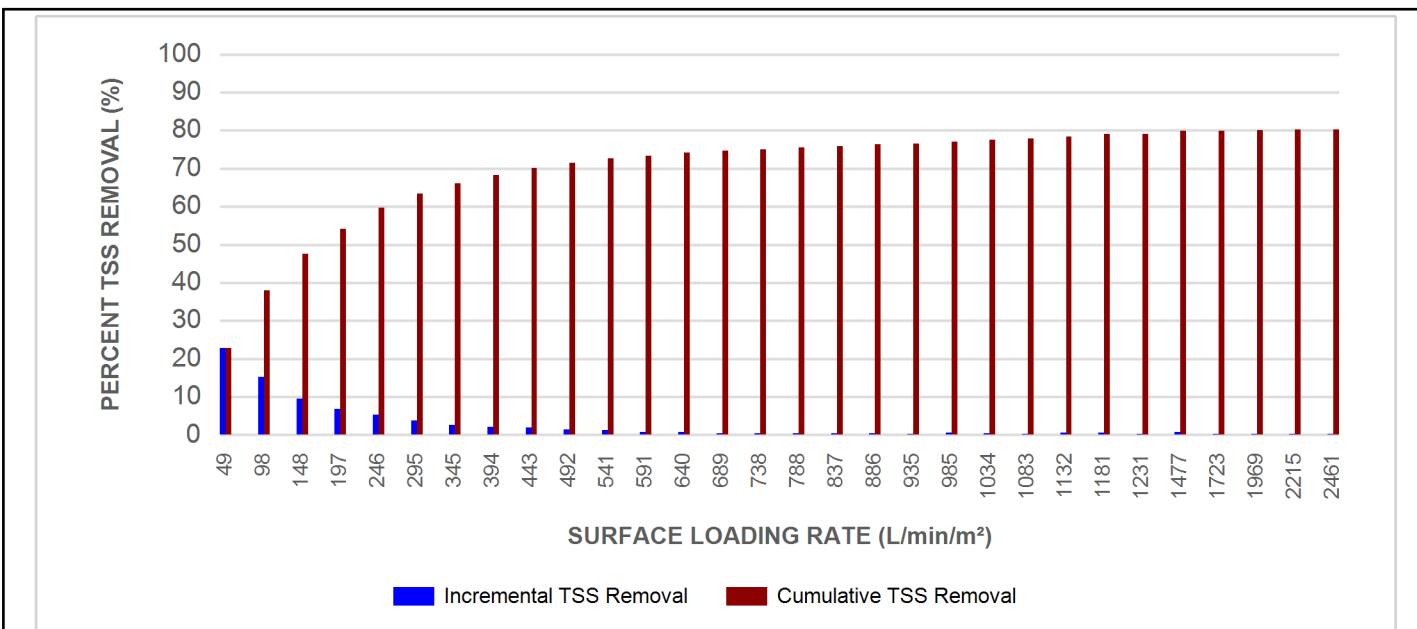
Climate Station ID: 6116132 Years of Rainfall Data: 40

Stormceptor®EF Sizing Report

RAINFALL DATA FROM OWEN SOUND MOE RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Stormceptor® EF Sizing Report

Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

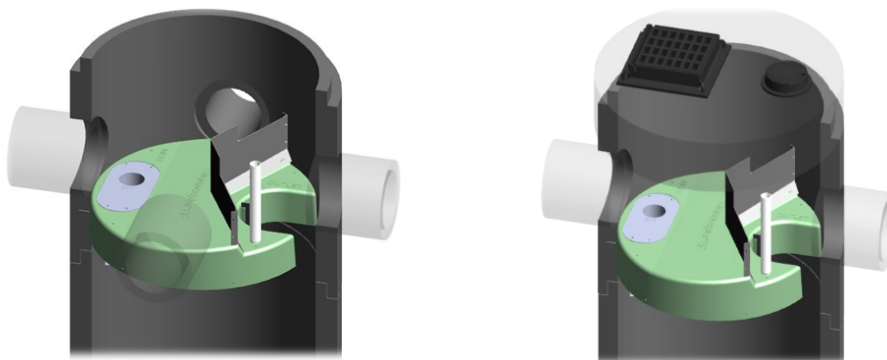
► **Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

DESIGN FLEXIBILITY

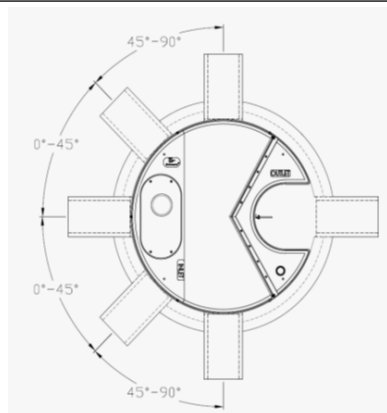
► **Stormceptor® EF and EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend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

OIL CAPTURE AND RETENTION

► While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, **Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.



Stormceptor® EF Sizing Report



INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1.

For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft³)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity

** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft³)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

Stormceptor®EF Sizing Report

STANDARD PERFORMANCE SPECIFICATION FOR “OIL GRIT SEPARATOR” (OGS) STORMWATER QUALITY TREATMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit Separators**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m ³ sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m ³ sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m ³ sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m ³ sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m ³ sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall

Stormceptor®EF Sizing Report

remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing shall be determined using historical rainfall data and a sediment removal performance curve derived from the actual third-party verified laboratory testing data. The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**.

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m².

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators**, with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to assess whether light liquids captured after a spill are effectively retained at high flow rates.

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

Appendix F: Storm Sewer Design Sheet

Version Number: 1

Version Date: May 27, 2022

Project Information

24 Alfred Street	121108
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Drawing Reference

STM01	May 27-22
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Prepared By

Kyle Gowanlock	May 27-22
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Reviewed By

Doris Casullo	May 27-22
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Municipality

Town of The Blue Mountains

Runoff Coefficient Adjustment

Year	A	B
10	0.80	0.20
25	0.70	0.30
50	0.60	0.40
100	0.50	0.50

Manning's Coefficient

Pipe	Value
CSP	0.024
Concrete	0.013
PVC	0.009

Time of Concentration

15 mins

IDF Curve Coefficients

Year	A	B	C
2	807.44	6.75	0.83
5	1135.40	7.50	0.84
10	1387.00	7.97	0.85
25	1676.20	8.30	0.86
50	1973.10	9.00	0.87
100	2193.10	9.04	0.87

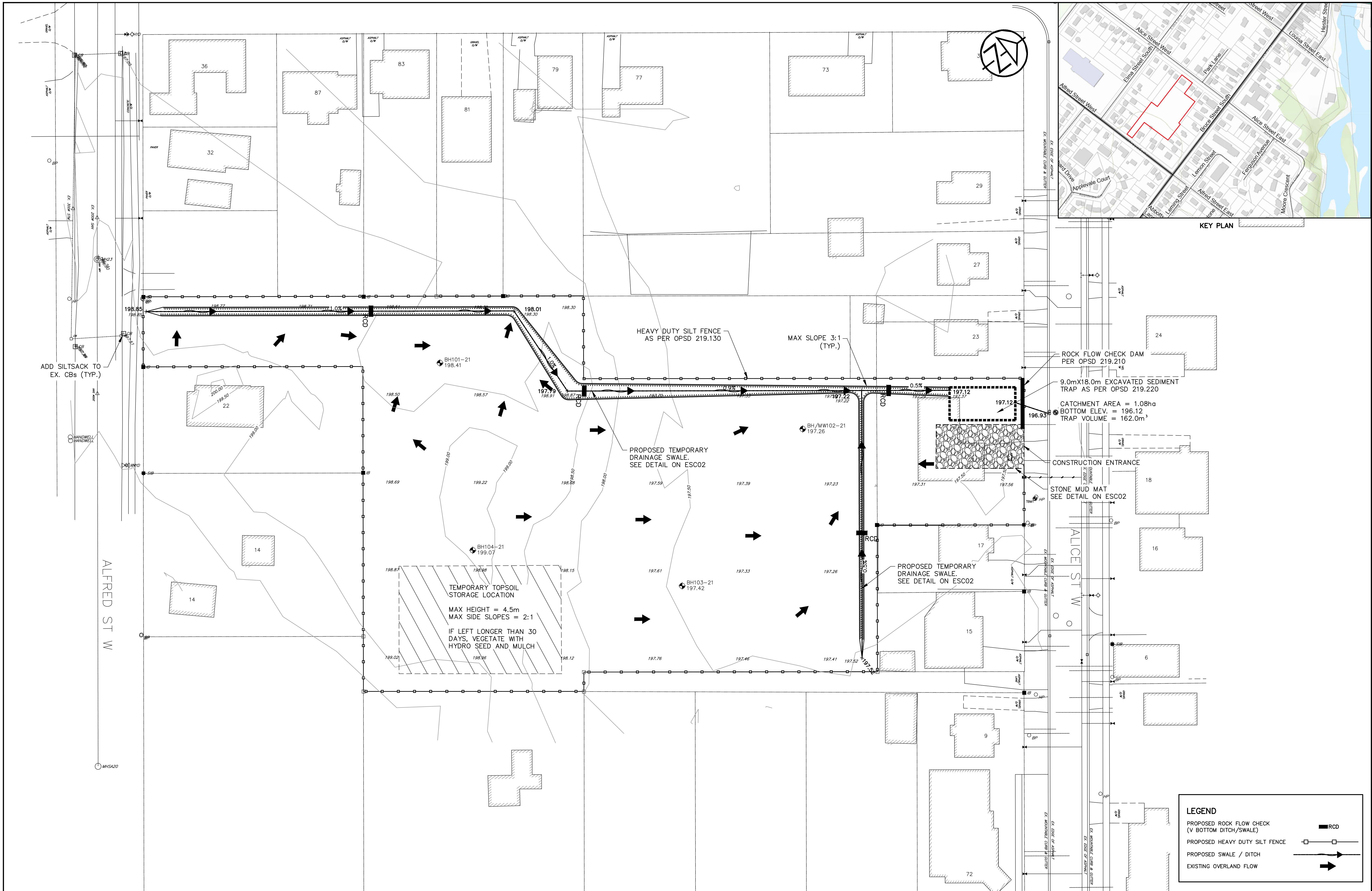
Engineer Stamp

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Street Name	Area ID / Label	Upstream Maintenance Hole	Downstream Maintenance Hole	Area (ha)	5 Year Runoff Coefficient (C)	Design Storm (Year)	Adjusted Runoff Coefficient (C)	Area x Runoff Coefficient	Cumulative Area (ha)	Cumulative Area x Adjusted Runoff Coefficient	Time of Concentration (min)	Rainfall Intensity (mm/hr)	Peak Flow (m ³ /s)	Manning's Roughness Coefficient	Sewer Length (m)	Sewer Slope (%)	Actual Sewer Diameter (mm)	Full Flow Velocity (m/s)	Full Flow Capacity (m ³ /s)	Actual Velocity (m/s)	Travel Time (min)	Calculated Sewer Diameter (mm)	Percentage of Full Flow Capacity (%)	Total Time of Travel (min)
Street A	101	CBMH8B	MH7B	0.15	0.44	100	0.72	0.11	0.15	0.11	15.00	137.49	0.041	0.013	8.8	0.8%	300	1.22	0.086	1.13	0.13	227	47.7%	15.13
Street A	-	MH7B	MH6B	-	-	100	-	-	0.15	0.11	15.13	136.84	0.041	0.013	34.1	0.8%	300	1.22	0.086	1.13	0.50	227	47.5%	15.63
Street A	-	MH6B	CBMH5B	-	-	100	-	-	0.15	0.11	15.63	134.41	0.040	0.013	14.9	0.8%	300	1.22	0.086	1.12	0.22	225	46.6%	15.86
Street A	102	CBMH5B	CBMH4B	0.64	0.31	100	0.66	0.42	0.79	0.53	15.86	133.36	0.195	0.013	79.1	0.8%	450	1.60	0.255	1.60	0.82	407	76.6%	16.68
Street A	103	CBMH4B	MH3B	0.20	0.44	100	0.72	0.14	0.99	0.67	16.68	129.64	0.242	0.013	22.1	0.7%	525	1.66	0.360	1.66	0.22	452	67.2%	16.90
Street A	105	DICB3C	MH3B	0.23	0.40	100	0.70	0.16	0.23	0.16	15.00	137.49	0.061	0.013	6.4	3.0%	300	2.37	0.167	2.05	0.05	206	36.7%	15.05
Street A	-	MH3B	UG Storage	-	-	100	-	-	1.22	0.83	16.90	128.68	0.297	0.013	1.9	2.1%	525	2.88	0.623	2.67	0.01	398	47.7%	16.91
Street A	104	DCBMH2B	UG Storage	0.20	0.44	100	0.72	0.14	0.20	0.14	15.00	137.49	0.055	0.013	1.2	1.0%	300	1.37	0.097	1.32	0.02	243	56.9%	15.02
Street A**	-	UG Storage	OGS1	-	-	5	-	-	1.42	0.98	16.91	77.30	0.101	0.013	1.6	0.5%	375	1.12	0.124	1.12	0.02	347	81.5%	16.93
Street A	-	OGS1	MH1B	-	-	5	-	-	1.42	0.98	16.93	77.24	0.101	0.013	8.7	0.5%	375	1.12	0.124	1.12	0.13	347	81.5%	17.06
Park Lane*	305	FUT CB5A	FUT MH5	0.16	0.60	5	0.60	0.10	0.16	0.10	15.00	82.79	0.022	0.013	60.2	0.5%	300	0.97	0.068	0.80	1.25	196	32.3%	16.25
Alice Street*	-	FUT MH5	MH1B	-	-	5	-	-	0.16	0.10	16.25	79.10	0.021	0.013	30.1	0.5%	300	0.97	0.068	0.79	0.63	193	30.8%	16.89
Alice Street	-	MH1B	FUT MH6	-	-	5	-	-	1.58	1.07	17.06	76.90	0.122	0.013	16.3	0.5%	375	1.12	0.124	1.12	0.24	373	98.5%	17.31

*Area and Runoff Coeff. obtained from area 305 of Thornbury West Reconstruction Project-119105
** Runoff Coeff. based on 100-yr peak flow output of the UGS control of 0.101cu.m/s

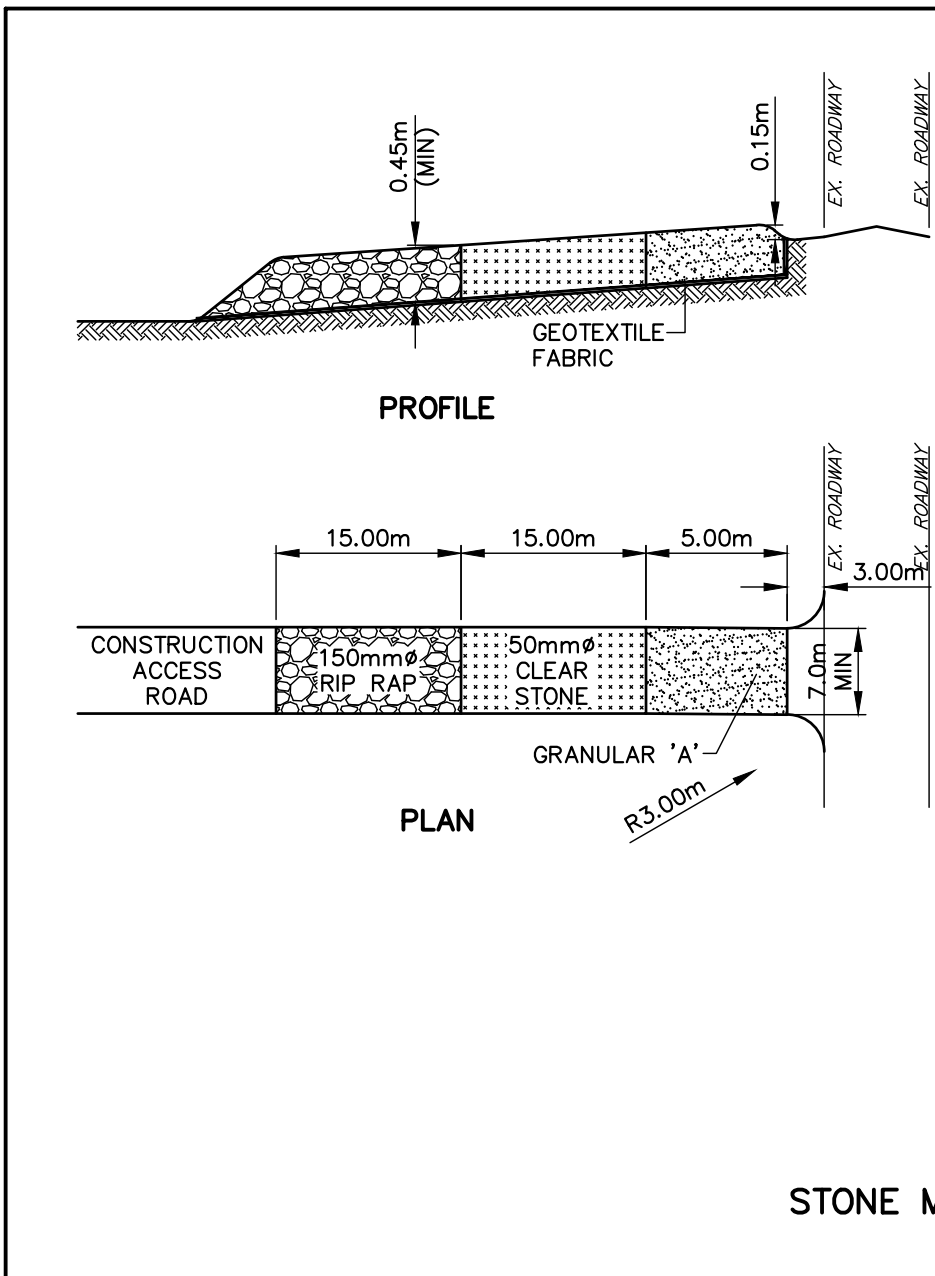
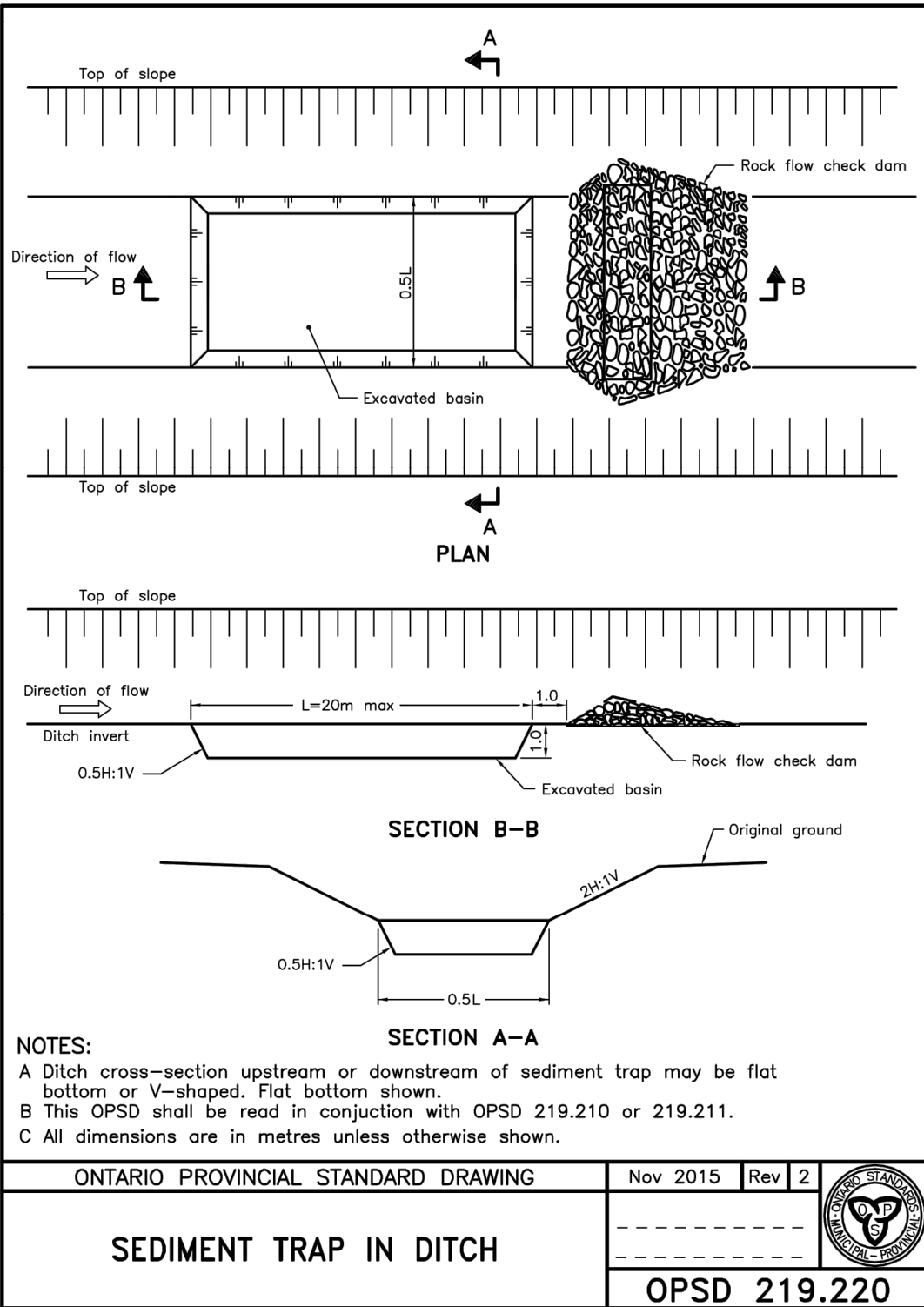
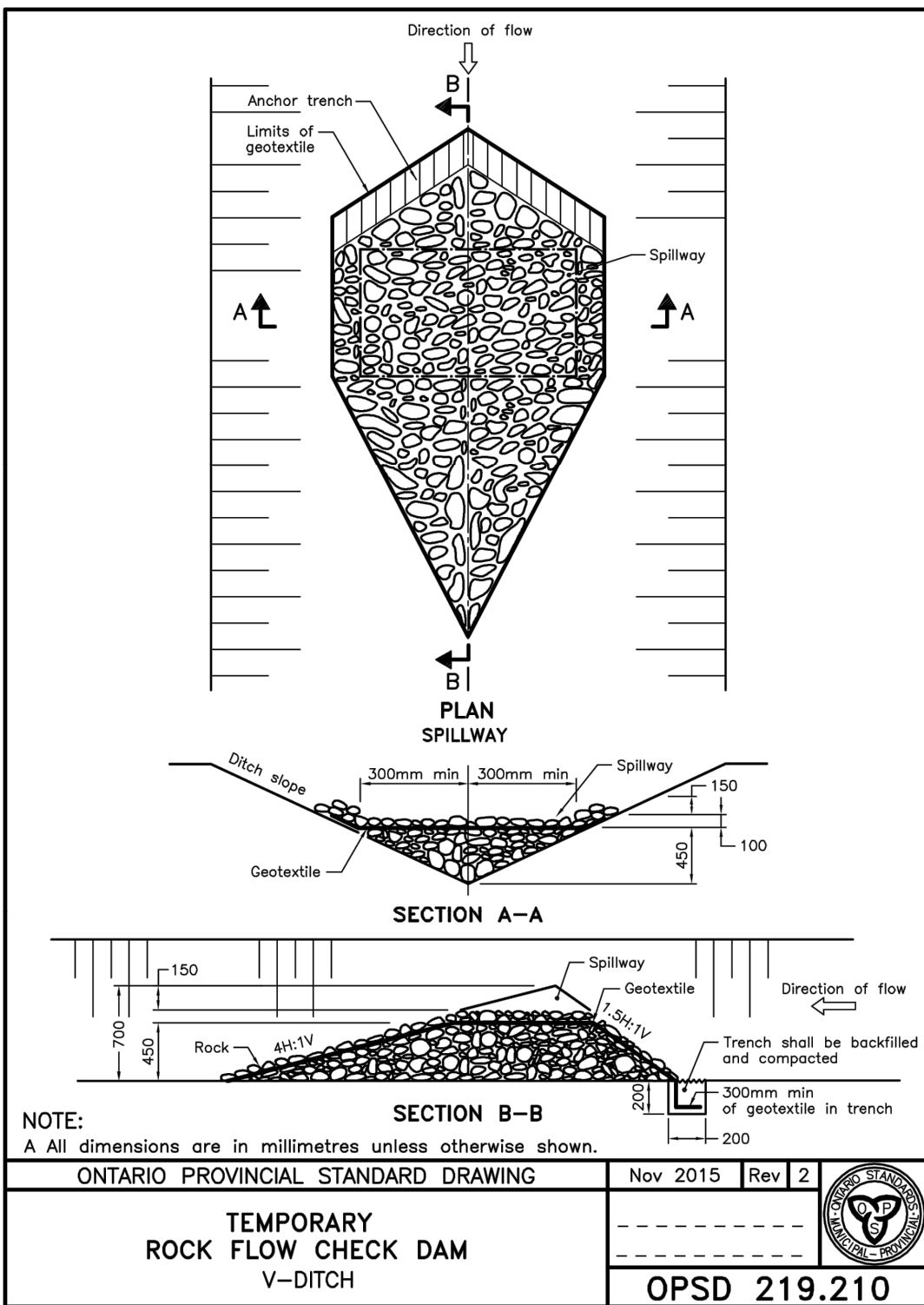
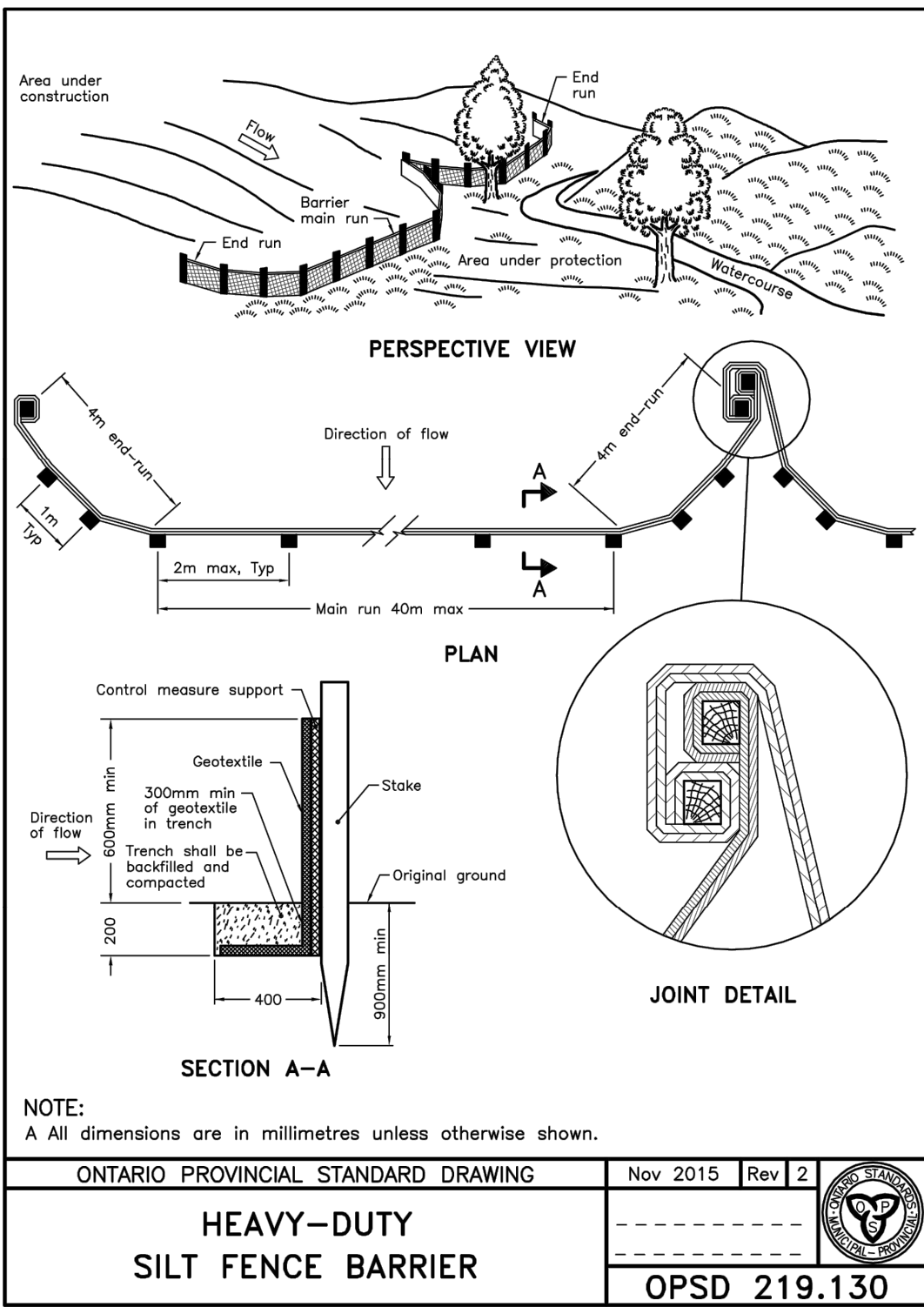
Engineering Drawings



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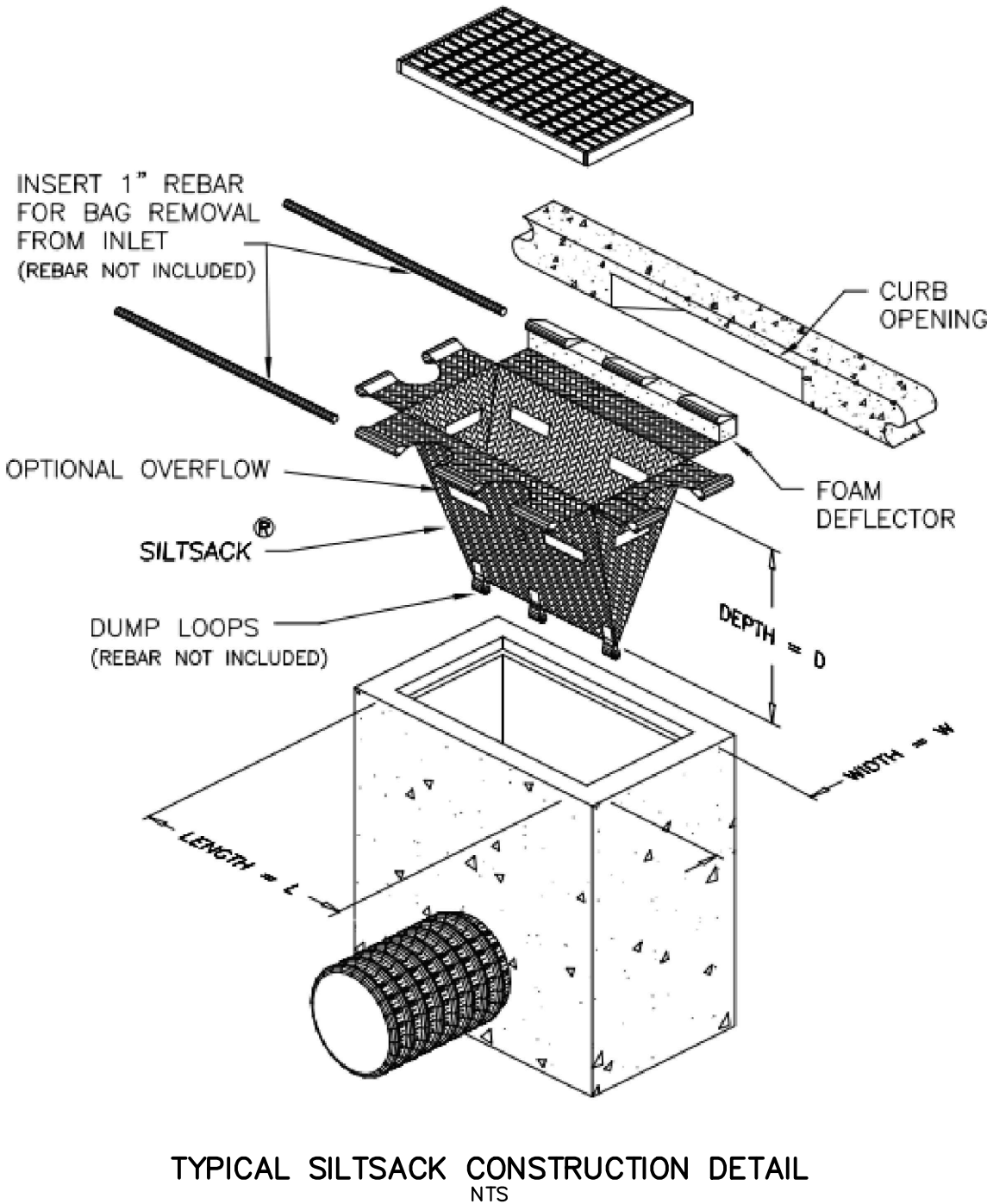
NOTES

- ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. SEDIMENT AND EROSION CONTROL MEASURES THAT ARE DESIGNED TO CONTROL RUNOFF FROM SPECIFIC AREAS MUST BE INSTALLED PRIOR TO ANY DISTURBANCE OF THAT PART OF THE SITE. THE LOCATION OF ALL SILTATION AND EROSION CONTROL WORKS TO BE REVIEWED ON SITE AND MAY BE REVISED AS DIRECTED BY THE ENGINEER.
- THE CONTRACTOR MAY CONSIDER ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES. SUCH MEASURES MUST BE PRESENTED IN WRITING TO THE ENGINEER FOR APPROVAL BY THE TOWN OF THE BLUE MOUNTAINS.
- THE CONTRACTOR SHALL HAVE MATERIALS AVAILABLE ON SITE TO REPAIR SEDIMENT AND EROSION CONTROL MEASURES IN THE EVENT OF UNFORESEEN CONDITIONS SUCH AS HIGH WATER, EXTREME RAINFALL EVENTS, ETC.
- ALL EROSION AND SEDIMENT CONTROL MEASURES MUST BE INSPECTED, CLEANED AND MAINTAINED BY THE CONTRACTOR AFTER EACH STORM EVENT. ALL WORKS WILL BE INSPECTED BY THE ENGINEER BI-WEEKLY AND AFTER EACH MAJOR STORM EVENT.
- CONSTRUCTION OF ALL SILTATION AND EROSION CONTROL WORK IS TO BE IN ACCORDANCE WITH THE FOLLOWING STEPS:
 - INSTALL NEW OR MAINTAIN EXISTING STONE MUD MAT AS PER DETAIL.
 - INSTALL SILT FENCE AS PER TOWN OF THE BLUE MOUNTAINS STANDARDS (OPSD 219.130)
 - INSTALL TEMPORARY CATCH BASIN SEDIMENT TRAPS ON ALL NEW AND EXISTING CATCH BASINS. SEDIMENT TRAPS TO BE RECTANGULAR CBST BY LAYFIELD OR APPROVED EQUAL. ALL CATCH BASINS TO REMAIN SCREENED UNTIL BASE COURSE ASPHALT IS PLACED AND LOT GRADING IS COMPLETE.
- ALL CONSTRUCTION VEHICLES TO ACCESS SITE USING THE DESIGNATED CONSTRUCTION ACCESS POINTS.
- EROSION AND SEDIMENT CONTROL MEASURES TO BE REMOVED BY THE CONTRACTOR ONCE GROUND COVER IS ESTABLISHED AND LANDSCAPING IS COMPLETE AND APPROVED BY THE ENGINEER.
- STOCKPILE LOCATIONS ARE TO BE APPROVED BY THE ENGINEER.
- PROVIDE FENCE OR APPROVED EQUAL ACROSS ALL CONSTRUCTION ACCESSES DURING PERIODS OF INACTIVITY.
- CONSTRUCTION AREAS THAT EXCEED 30 DAYS OF INACTIVITY SHALL BE STABILIZED BY SEEDING IN ACCORDANCE WITH TOWN STANDARDS. THIS IS TO INCLUDE STOCKPILES OF FILL AND TOPSOIL.



NOTES

- STONE SIZE — THE STONE PAD SHALL BE A MIN. 450 mm THICK. USE GRANULAR 'A' FOR THE FIRST 5 m FROM THE PROPERTY LINE, 50 mm ϕ CLEAR STONE FOR NEXT 15 m AND 150 mm ϕ RIP RAP FOR THE REMAINING 15 m.
- LENGTH — AS REQUIRED BUT NOT LESS THAN 35 m.
- WIDTH — 7.0 m MIN. BUT NOT LESS THAN THE WIDTH AT POINTS WHERE INGRESS AND EGRESS OCCURS.
- GEOTEXTILE FABRIC — TERRAFIX 270R OR APPROVED EQUAL TO BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE.
- SURFACE WATER — ALL SURFACE WATER FLOWING OR DIRECTED TOWARD CONSTRUCTION ACCESS SHALL BE DIRECTED ACROSS THE ACCESS THROUGH A TEMPORARY CULVERT.
- MAINTENANCE — THE CONTRACTOR SHALL MAINTAIN THE MUD MAT IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO THE PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO THE PUBLIC RIGHT-OF-WAY MUST BE REMOVED IMMEDIATELY BY THE CONTRACTOR.
- WASHING — WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ACCESS ONTO THE PUBLIC RIGHT-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
- INSPECTION & MAINTENANCE — REQUIRED MAINTENANCE AFTER EACH RAIN EVENT SHALL BE PROVIDED BY THE CONTRACTOR.
- REMOVAL — STONE MUD MAT TO REMAIN IN PLACE UNTIL COMMENCEMENT OF ROAD CONSTRUCTION



DISCLAIMER AND COPYRIGHT

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

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BENCHMARKS

TBM1 — ELEVATION 197.30
BASE OF SIB ON WEST SIDE OF ALICE ST W

TBM2 — ELEVATION 197.28
TOP OF LID OF MHSAT5 ON ALICE ST W

NOTES

LEGAL SURVEY INFORMATION AND LOT DIMENSIONS SHOWN ON THIS PLAN ARE TAKEN FROM A SURVEY PLAN PREPARED BY ZUBEK, EMO, PATTEN & THOMSEN LIMITED, DATED APRIL 3, 2012 WHICH MAY NOT BE FINAL AND ARE NOT GUARANTEED. THE FINAL REGISTERED PLAN OF SUBDIVISION SHALL BE REFERRED TO FOR CONFIRMATION OF THE DATA.

TOPOGRAPHIC INFORMATION SHOWN ON THIS PLAN FROM SURVEY PREPARED BY GM BLUEPLAN ENGINEERING LIMITED DATED JUNE 5, 2018 AND DECEMBER 5, 2011.

No.	REVISION DESCRIPTION	DATE
1.	1ST SUBMISSION	2022-02-09
2.	REVISED AS PER DRC COMMENTS	2022-05-27

ENGINEER STAMP



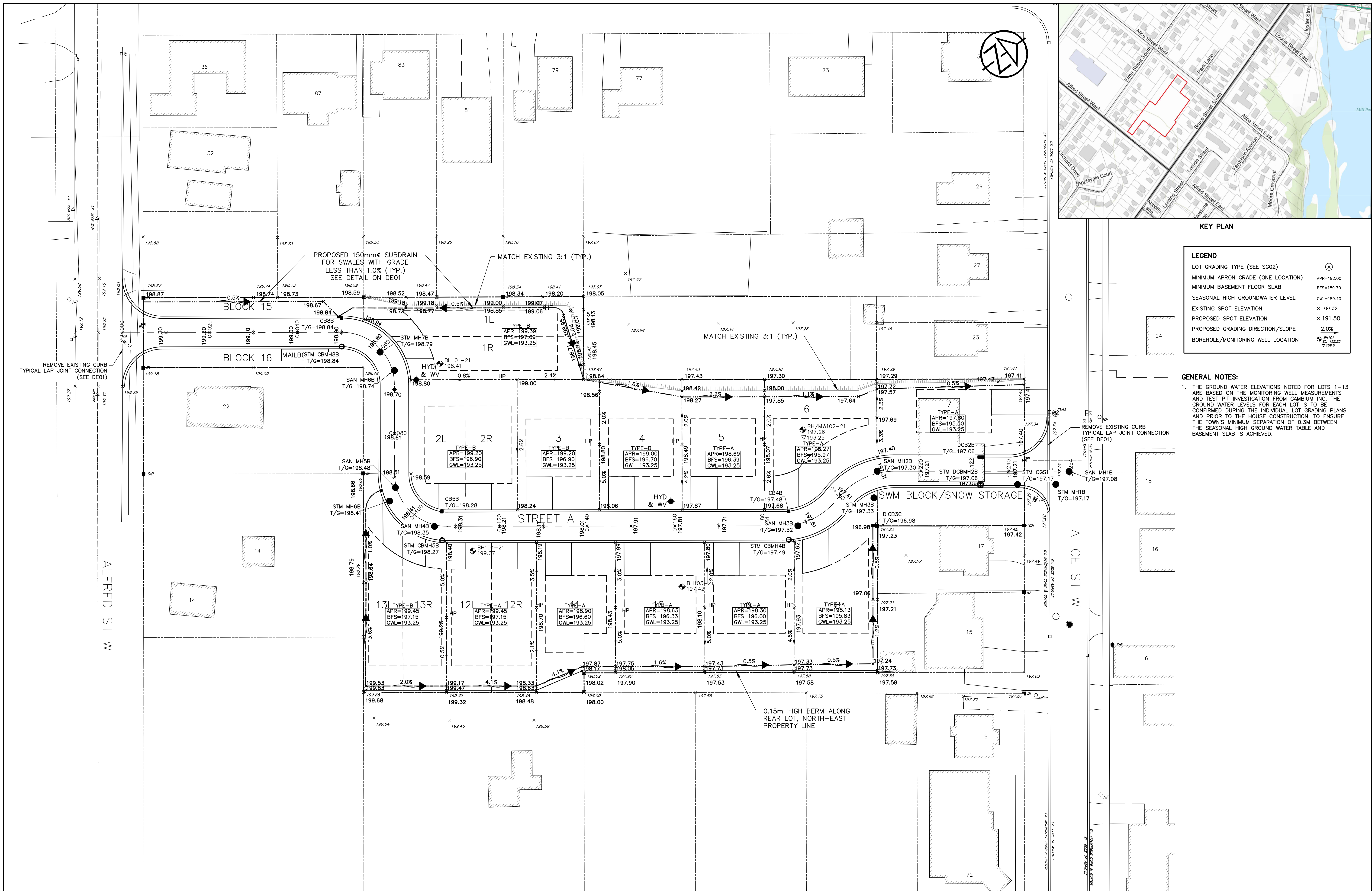
24 ALFRED STREET
TOWN OF THE BLUE MOUNTAINS

EROSION AND SEDIMENT CONTROL DETAILS

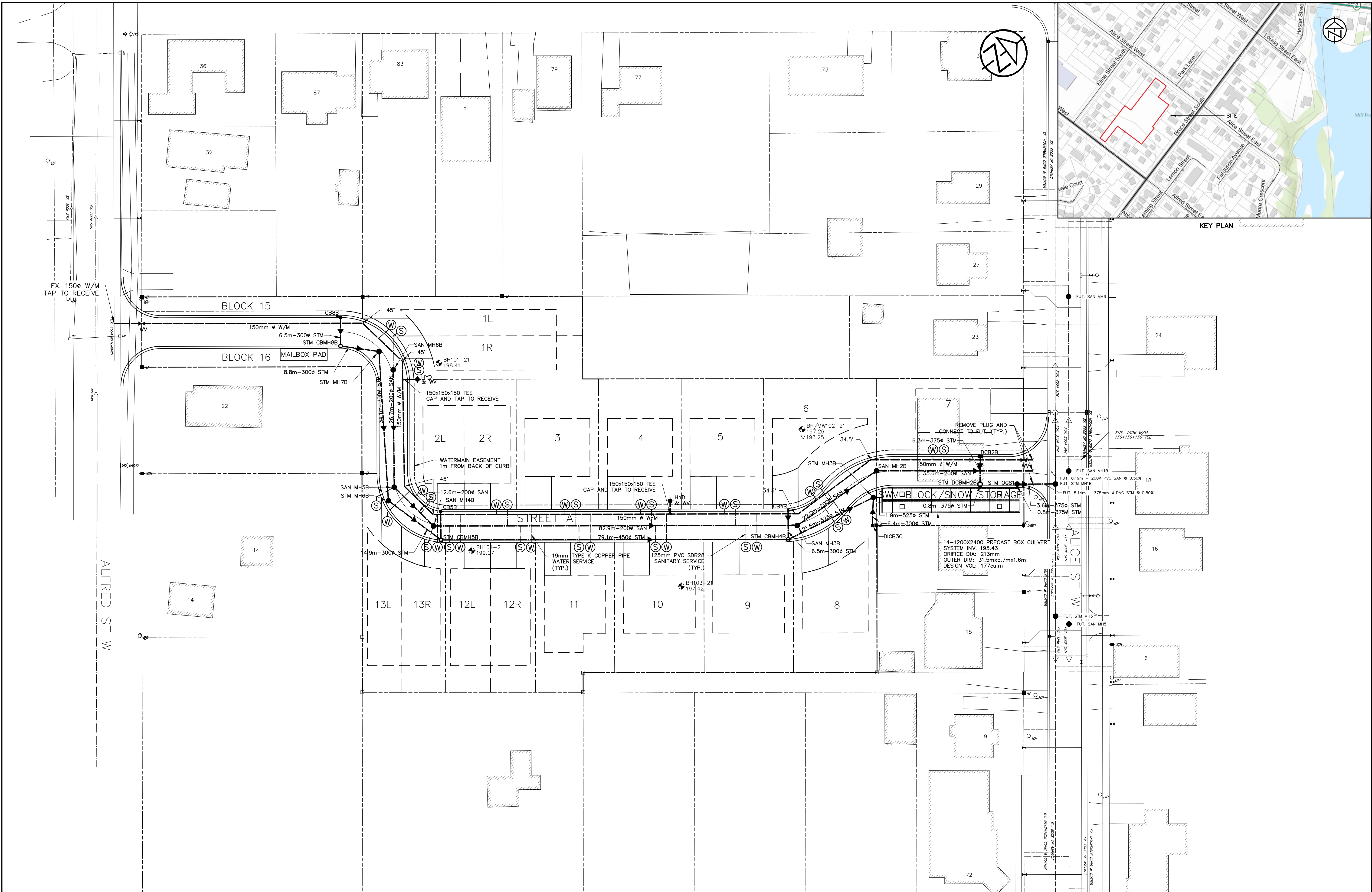


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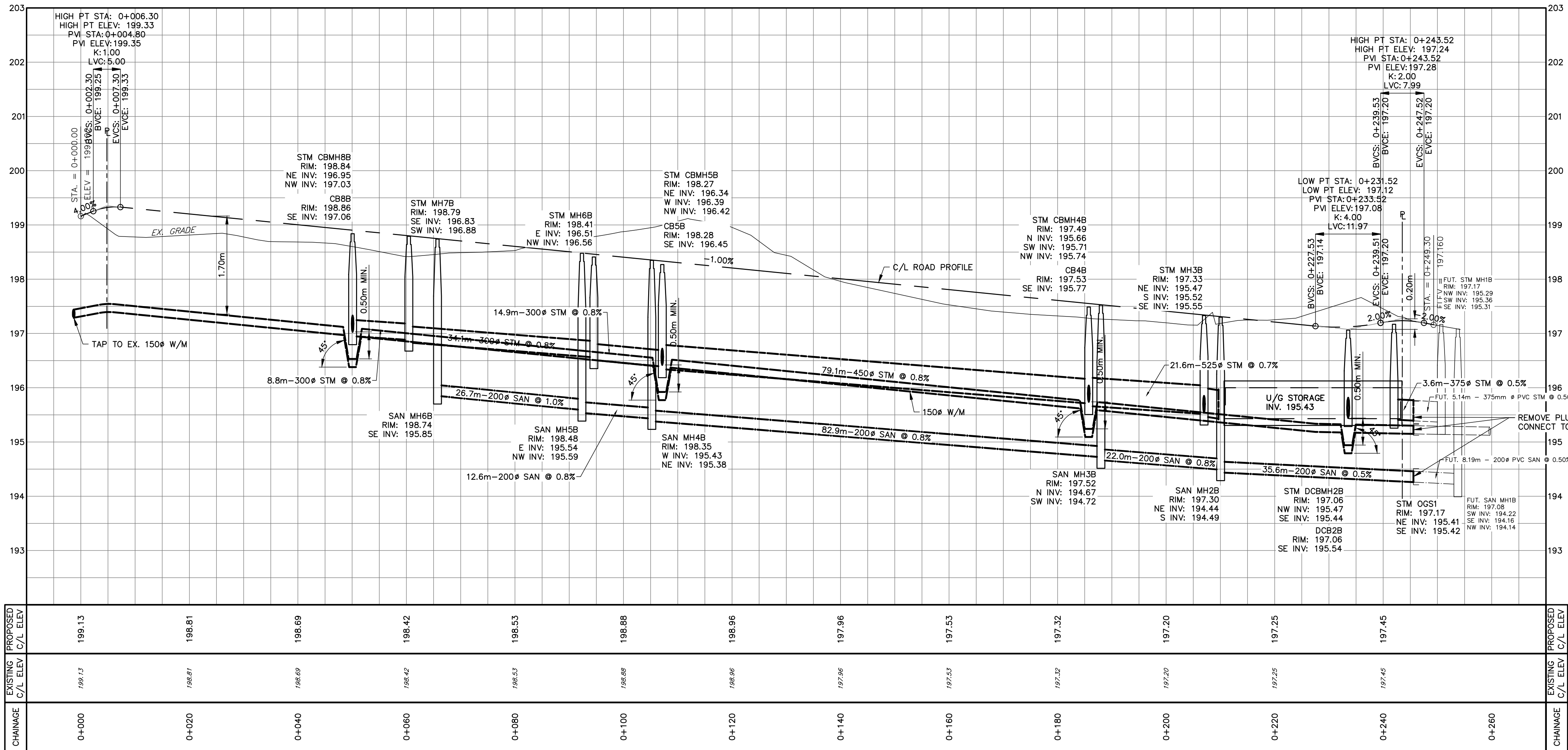
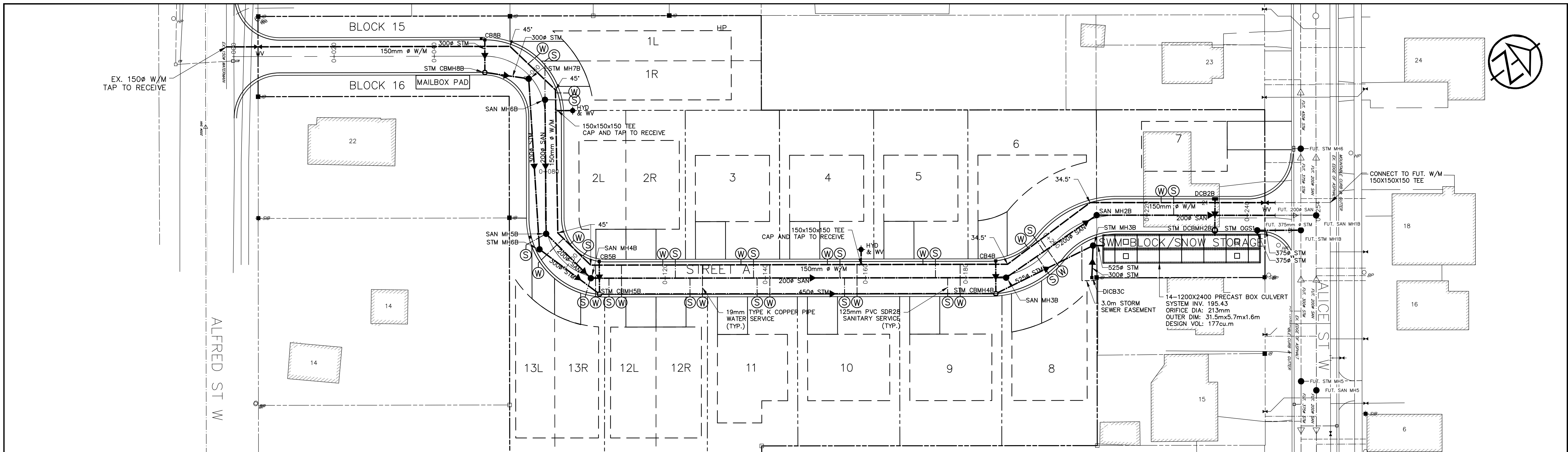
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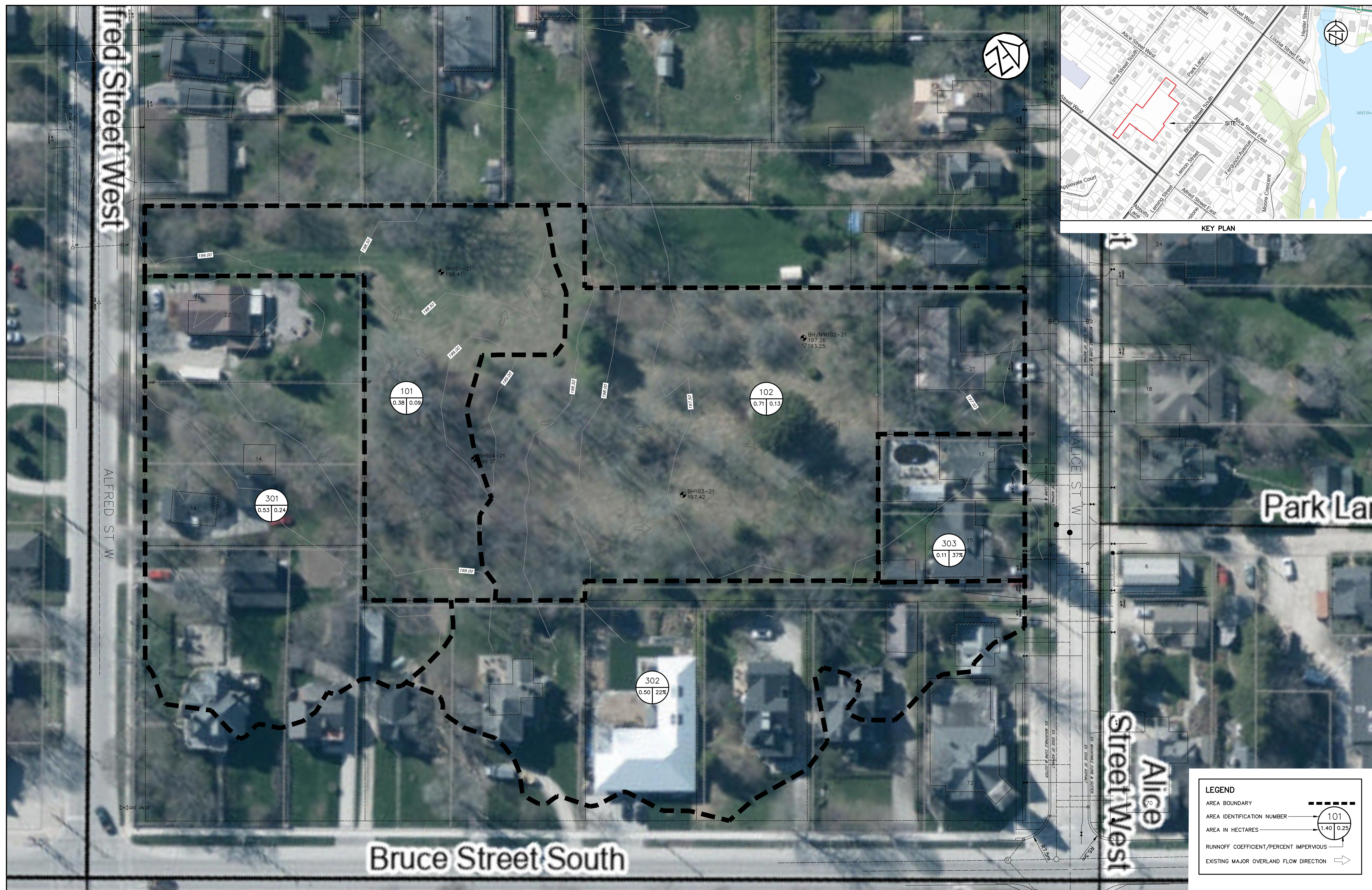
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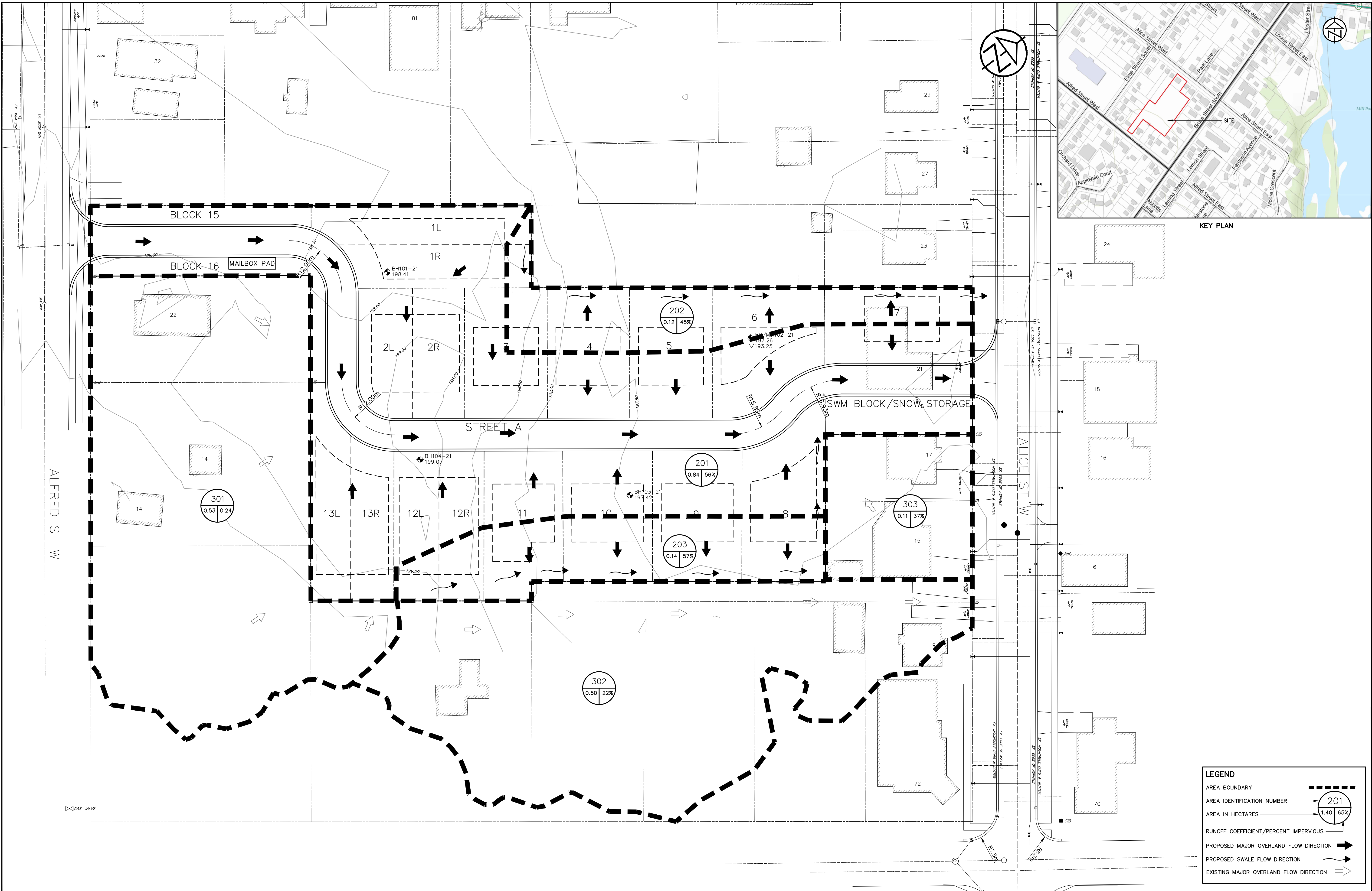


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