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Cranberry Marsh Estates

STORMWATER MANAGEMENT REPORT

Hill Ridge Homes

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1 Introduction

Tatham Engineering Limited has prepared this Stormwater Management (SWM) Report in support of a site plan approval application of a residential development located in the Town of Collingwood, County of Simcoe. Specifically, this report has been prepared to address the internal and external servicing requirements related to stormwater management associated with the project.

1.1 OBJECTIVES

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 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 GUIDELINES & BACKGROUND 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);
- Town of Collingwood Development Standards (2007); and
- Nottawasaga Valley Conservation Authority Stormwater Technical Guide (2013).

Additional reports have been prepared in conjunction with this report in support of the proposed residential development and are summarized below.

- *Cranberry Marsh Estates Preliminary Stormwater Management Report* prepared by C.C. Tatham & Associates Ltd. (October 2011);
- Regional Stormwater Management Update & Master SWM Strategy – Tanglewood at Cranberry Trail / Cranberry Creek Watershed – Tanglewood (Sierra Homes) Inc., prepared by Crozier (May 2007);
- *Flood Study – Wyldewood Creek* prepared by C.F. Croziers & Associates Inc. (September 2020); and
- *Regional Stormwater Management Update & Master SWM Strategy* prepared by C.F. Crozier & Associates Inc. (May 2007).



2 Development Site

2.1 SITE LOCATION & DESCRIPTION

The subject property consists of approximately 1.29 ha of undeveloped land located south of Highway 26 in the Town of Collingwood. The site is currently vacant, and primarily tree covered with an environmentally protected marsh area at the south end of the property.

The municipal address of the subject property is 11589 Highway 26. The subject property is bounded by Highway 26 to the north, Georgian Manor Resort to the west, Greentrees Nursery & Emporium to the east, and the Cranberry Marsh to the south. The subject property is zoned as R3-34 (H10) – *Residential Third Density Exception 34*, excluding the southern portion of the site, which is zoned as EP-11 – *Environmental Protection Exception 11*. The subject property is regulated by the Nottawasaga Valley Conservation Authority (NVCA).

2.2 SURFACE CONDITIONS

A topographic survey of the subject property was completed by C.C. Tatham & Associates Ltd. in 2012 and updated based on a recent survey completed by Tatham Engineering in October 2022. The existing grading of the 170 m deep segment of land fronting Highway 26 generally slopes from the south to the north at an average gradient of 0.6%. The remainder of the subject property generally slopes from the north to south at an average slope of 0.3%. The site is currently vacant, and primarily tree covered with an environmentally protected marsh area at the south end of the property.

Refer to the Pre-Development Drainage Plan (DP-1) for details on existing drainage areas.

2.3 SUBSURFACE CONDITIONS

A geotechnical investigation, submitted under separate cover, completed by Peto MacCallum Ltd. dated January 2022. Fieldwork was conducted on November 22, 2021, consisting of four boreholes. The boreholes advanced to auger refusal, 3.4 m to 3.7 m below existing ground surface. Subsurface conditions are as follows:

- 50 mm to 200 mm of surficial topsoil;
- Borehole 1 showed a 650 mm layer of silt that was found to be very moist;
- Boreholes 2 - 4 showed a 0.5 m to 1.3 m layer of loose sand with trace amounts of silt and organics. The sand was found to be wet;
- A major till deposit extends below the silt or sand layers to the termination of the boreholes at 3.4 m for Borehole 3, and 3.7 m for Boreholes 1, 2 and 4. The till matrix varied from a silt



and sand with trace gravel and trace clay to a sandy silt with some gravel and trace clay. The till density was loose to very compact; and

- Auger refusal could have been due to boulders in the till or a shallow bedrock common in the area.

Groundwater was measured in the monitoring wells (Boreholes 1, 3 and 4) one month after installation (December 17, 2021). The geotechnical investigation established that the stabilized groundwater table is within 0.5 m of the ground surface at 179.30 m.

The soil has been classified as Parkhill loam or silt loam (Type BC), as per the *Soil Survey of Simcoe County - Report No. 29 of the Ontario Soil Survey*, completed by the Ontario Department of Agriculture. This soil group has low to moderate infiltration rates when thoroughly wetted.

2.4 PROPOSED DEVELOPMENT

The proposed development features a 7.2 m private road and cul-de-sac, beginning at Highway 26 and extending 220 m towards Cranberry Marsh, followed by a turning circle and 7 parking spots. The development will feature 5 buildings fronting the road and cul-de-sac, which will comprise of 26 townhomes. The majority of lots will have 6 m frontages and are 28 m deep. The proposed development is shown on the Site Grading Plan (SG-1).



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 reports.

3.1 SURFACE DRAINAGE & RUNOFF

3.1.1 Development Site

The existing grade of the northern portion of the subject site (Catchment 101) generally slopes from the south to the north at an average gradient of 0.6%, discharging to an existing ditch conveying water towards the west property line where it enters an existing 600 mm diameter CSP. The CSP outlets into the roadside ditch south of Highway 26. The southern portion of the subject site (Catchment 102) generally slopes from the north to south at an average slope of 0.3%, outletting into the Cranberry Marsh to the south. Refer to the Pre-Development Drainage Plan (DP-1) for details on existing drainage areas.

3.1.2 Cranberry Marsh

The Cranberry Marsh borders the subject property to the south and various other properties described in this report. The Cranberry Marsh has been identified as a Provincially Significant Wetland (PSW). As part of the Tanglewood at Cranberry Trail Development, a regulatory floodplain elevation of 179.65 masl was approved for the Cranberry Marsh. This was based on an additional analysis prepared by C.F. Crozier & Associates Inc. in support for the Tanglewood at Cranberry Trail Development (May 2007).

3.1.3 Greentrees Nursery & Emporium

Surface runoff from the Greentrees Nursery & Emporium property drains overland as sheet flow into perimeter ditches surrounding the property.

The west perimeter ditch (adjacent to the east property line of the subject site) has an average slope of 0.1% to the north and has various high and low points. Runoff from the ditch enters an existing 300 mm diameter CSP culvert that conveys runoff to an existing storm maintenance hole on the south side of Highway 26. This storm maintenance hole is connected to a maintenance hole on the north side of Highway 26 via a 300 mm diameter CSP pipe, discharging into the north Highway 26 roadside ditch opposite the subject property.



The Greentrees Nursery & Emporium south perimeter ditch connects directly to the west perimeter ditch and Cranberry Marsh. Depending on the water level in the Cranberry Marsh, this ditch also surcharges and functions as a storage area.

Under surcharged pipe conditions or elevated Cranberry Marsh water levels, the ditch water levels can rise to a level that causes water to spill over the west bank of the west ditch into the subject property. Runoff then flows northwest overland across the subject property where it eventually discharges into the Highway 26 roadside ditch.

There are plans by Reid's Heritage Homes to re-develop Greentrees Nursey & Emporium. Tatham Engineering has been retained to develop the site grading plan and the stormwater management plan for this new development, presenting a unique opportunity to develop Cranberry Marsh Estates stormwater management plan in conjunction with the future Greentree Development. Modifications to the Greentree site drainage will include replacement of the west ditch that functions with both the Greentree site and the proposed Cranberry Marsh Estates site (existing elevations along the adjoining property line are subject to change).

3.1.4 Georgian Manor Resort

The quadplex residential development immediately adjacent to the west property boundary of the subject site drains east to a 4.0 m utility easement located between the two properties. A high point approximately 175 m from the north property boundary directs flows north to the Highway 26 roadside ditch (from catchment 301) or south to an existing Stormwater Management Facility (SWMF) servicing Georgian Manor Resort (from catchment 302). There is no defined swale or ditch within the bordering properties, as such runoff from the rear of the quadplex units will spill into the Cranberry Marsh Estates property before ultimately draining to Highway 26 roadside ditch or the existing SWMF.

3.1.5 South Highway 26 Roadside Ditch Draining West

The south roadside ditch of Highway 26 draining west has a flat slope of less than 0.5%. As per *Cranberry Marsh Estates Preliminary Stormwater Management Report* prepared by C.C. Tatham & Associates Ltd. (October 2011), the ditch does not provide a sufficient outlet for the flow directed to it under flood spill conditions and as a result can cause additional flooding of adjacent lands between Princeton Shores Boulevard and the Cranberry Marsh Estates property.

3.2 SURFACE DRAINAGE & RUNOFF

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	PRE-DEVELOPMENT PEAK FLOW RATE (M ³ /SEC)			
	CATCH. 101/301 CHICAGO DESIGN STORM	CATCH. 101/301 SCS 24-HOUR STORM	CATCH. 102/302 CHICAGO DESIGN STORM	CATCH. 102/302 SCS 24-HOUR STORM
25mm	0.016	-	0.005	-
2-year	0.023	0.048	0.007	0.019
5-year	0.041	0.076	0.014	0.032
10-year	0.055	0.096	0.019	0.042
25-year	0.074	0.122	0.027	0.055
50-year	0.089	0.142	0.033	0.064
100-year	0.104	0.163	0.039	0.074
Timmins	0.097	-	0.057	-



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 Collingwood and the NVCA. Issues to be addressed and criteria to be met regarding the development of the site are summarized below.

4.1.1 Stormwater Quality Control

Water quality controls must be provided to satisfy the MECP SWM Practices Planning and Design Manual. Georgian Bay is the ultimate receiving waterbody for site drainage to the Highway 26 roadside ditch north of the subject and external sites (Catchment 201/303). The Cranberry Marsh is the receiving waterbody for drainage from subject and external sites to the south (from Catchment 202/203/204/205/206/304). 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.

4.1.2 Stormwater Quantity Control

Proposed condition peak flow rates discharging into the Highway 26 roadside ditch north of the subject site (from Catchment 201) must be controlled to existing condition rates for all storms up to and including the 100-year event to ensure there are no adverse impacts for downstream landowners.

A Regional Stormwater Management Update & Master SWM Strategy prepared by C.F. Crozier & Associates (May 2007) confirmed that increases in the Cranberry Marsh water levels resulting from increased runoff volumes from new developments within the Cranberry watershed north of the Georgian Trail are to be mitigated by hydraulic improvements to Cranberry Creek and the Cranberry Marsh Outlet. As the Cranberry Marsh is the ultimate receiving waterbody for the subject site drainage to the south (Catchment 202/203/204/205/206), pre- to post- quantity control is not required. Safe conveyance to a sufficient outlet must be provided for the Regulatory Storm event.

4.1.3 Siltation and Erosion Control

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



4.2 PROPOSED DRAINAGE CONDITIONS

The proposed Cranberry Marsh Estates Development will include 215m of 7.2m private road terminating north of the Cranberry Marsh with a cul-de-sac. The development will feature 26 townhome units fronting the proposed street.

The east portion of the site (Catchment 203/204/205) will be conveyed via a series of side-yard swales towards the road. A series of catch basins at designated low points along the road, accumulated runoff in the road will drain under the proposed sidewalk and into a proposed enhanced grass ditch near the east property line of the subject site. The enhanced grass ditch accommodates up to and including the 25 mm design storm before spilling into a conveyance ditch at the south end of the site, ultimately flowing into the Cranberry Marsh. The runoff from the rear yards of proposed Block 3, 4 and 5 (Catchment 202), as well as the runoff from the rear yards of the southern six buildings at the Georgian Manor Resort (Catchments 304) will be collected by a swale and conveyed towards the Cranberry Marsh. Catchments 202, 203, 204, 205, 206 and 304 do not require quantity control as per the *Regional Stormwater Management Update & Master SWM Strategy* prepared by C.F. Crozier & Associates (May 2007).

The runoff from the rear yards of proposed Block 1 and 2 (Catchment 201) and the rear yards of the northern two buildings at the Georgian Manor Resort (Catchments 303) will be collected by a swale that will convey the water towards the Highway 26 roadside ditch.

The proposed drainage patterns are shown on the *Post-Development Drainage Plan (DP-2)*.

4.3 WATER QUANTITY

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 compare the peak flow rates to existing condition levels to the proposed stormwater management design. 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

POST-DEVELOPMENT PEAK FLOW RATE (M ³ /SEC)				
STORM EVENT	CATCH. 201/303 CHICAGO DESIGN STORM	CATCH. 201/303 SCS 24-HOUR STORM	CATCH. 202-206/304 CHICAGO DESIGN STORM	CATCH. 202-206/304 SCS 24-HOUR STORM
25mm	0.016 (0.016)	-	0.086 (0.005)	-
2-year	0.022 (0.023)	0.037 (0.048)	0.097 (0.007)	0.143 (0.019)
5-year	0.037 (0.041)	0.056 (0.076)	0.153 (0.014)	0.226 (0.032)
10-year	0.049 (0.055)	0.069 (0.096)	0.203 (0.019)	0.283 (0.042)
25-year	0.065 (0.074)	0.086 (0.122)	0.260 (0.027)	0.355 (0.055)
50-year	0.077 (0.089)	0.098 (0.142)	0.306 (0.033)	0.410 (0.064)
100-year	0.090 (0.104)	0.111 (0.163)	0.352 (0.039)	0.465 (0.074)
Timmins	0.035 (0.097)	-	0.158 (0.057)	-

Note: Values in brackets represent existing condition flows

The results shown in Table 2 confirm that the proposed condition peak flow rates from catchments 201/303 discharging to the Highway 26 ditch are maintained below existing condition levels for storms up to and including the 100-year storm event. Post peak flows to the south (Catchment 202-206 /304) will discharge to the Cranberry Marsh uncontrolled as pre- to post- quantity controls is not required.

Emergency overland flows will spill over the east curb and gutter and be conveyed as sheet flow towards the enhanced grass ditch. The overland flow routes will pond to a maximum depth of 150 mm.

The enhanced grass ditch overflow outlet will allow for peak weir flow of 0.210 m³/s at 210 mm of depth, which can accommodate the modelled 100-year storm peak flow of 0.200 m³/s for catchment 203, 204 and 205 that drains towards the ditch. Refer to the Post-Development Drainage Plan (DP-2) and the (PP-1) Site Servicing Plan and Profile drawings for proposed drainage patterns. Weir flow calculations are detailed in Appendix C.



4.4 WATER QUALITY

Enhanced water quality controls must be provided to satisfy the MECP SWM Practices Planning and Design Manual, requiring in the form of 80% total suspended solids (TSS) removal and treatment of 90% of the surface runoff generated from the contributing drainage area. The details pertaining to the water quality control measures to be implemented are summarized as follows:

- **Catchment 203/204/205** – Runoff from these catchments derives from the road, cul-de-sac and the driveway of 24 units, along with rooftops and lawns. Enhanced water quality controls for this catchment will be provided by a flat-bottom enhanced grass ditch before discharging into the Cranberry Marsh. The ditch conforms to runoff quality treatment in grass swales criteria provided in Section 4.5.9 of the MOE Stormwater Management Planning and Design Manual (March 2003) and has the design capacity to retain the 25 mm design storm or the first flush of major storm events. Water volumes exceeding the ditch capacity will spill through a sediment trap and into a conveyance ditch, ultimately discharging into the Cranberry Marsh. Runoff will enter the ditch through various inlets along the road. The bed of the ditch will consist of a permeable soil layer, filter fabric and a gravel layer with a perforated pipe to provide enhanced water quality treatment.
- **Catchment 206** – The runoff from this catchment derives from the southern portion of the cul-de-sac and parking area. The area is small in size and with limited space, enhanced quality control is not feasible based on the high ground water level in the Cranberry Marsh. A proposed 1.5m grass swale with a rock check dam from the curb cut outlet will provide sediment control for the paved area.
- **Catchments 201/303** – Runoff from these catchments derive from rooftops and lawns before discharging into the Highway 26 roadside ditch and are considered clean runoff. Therefore, no water quality controls are required.
- **Catchment 202** – Majority of the runoff from this catchment derives from rooftops and lawns before discharging into the Cranberry Marsh and is considered clean runoff. However, a portion of the runoff derives from the driveway of two units, along with the cul-de-sac and parking area. The area is small in size and with limited space, enhanced quality control is not feasible based on the high ground water level in the Cranberry Marsh. A proposed 1.5m grass swale with a rock check dam from the curb cut outlet will provide sediment control for the paved area.
- **Catchment 304** – Runoff from this catchment derives from rooftops and lawns before discharging into the Cranberry Marsh and is considered clean runoff. Therefore, no water quality control is required.



4.5 GROUNDWATER

A geotechnical investigation completed by Peto MacCallum Ltd. (dated January 2022) consisting of four exploratory sampled boreholes and three monitoring wells (Boreholes 1, 3 and 4) measured the groundwater one month after installation (December 2021). The geotechnical investigation established that the stabilized groundwater table is within 0.5 m of the groundwater surface at 179.30 m. The invert of the enhanced grass swale is set to 179.65 m, 0.35 m above the measured groundwater level.

4.6 FLOOD PROOFING

The Cranberry Marsh high water level has been established as 179.65 m and all proposed units must be adequately flood proofed to a minimum elevation of 180.00 m (0.35 m above the Marsh high water level). This will be achieved by raising the site through the placement of fill.



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 ESC-1 and ESC-2. 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.



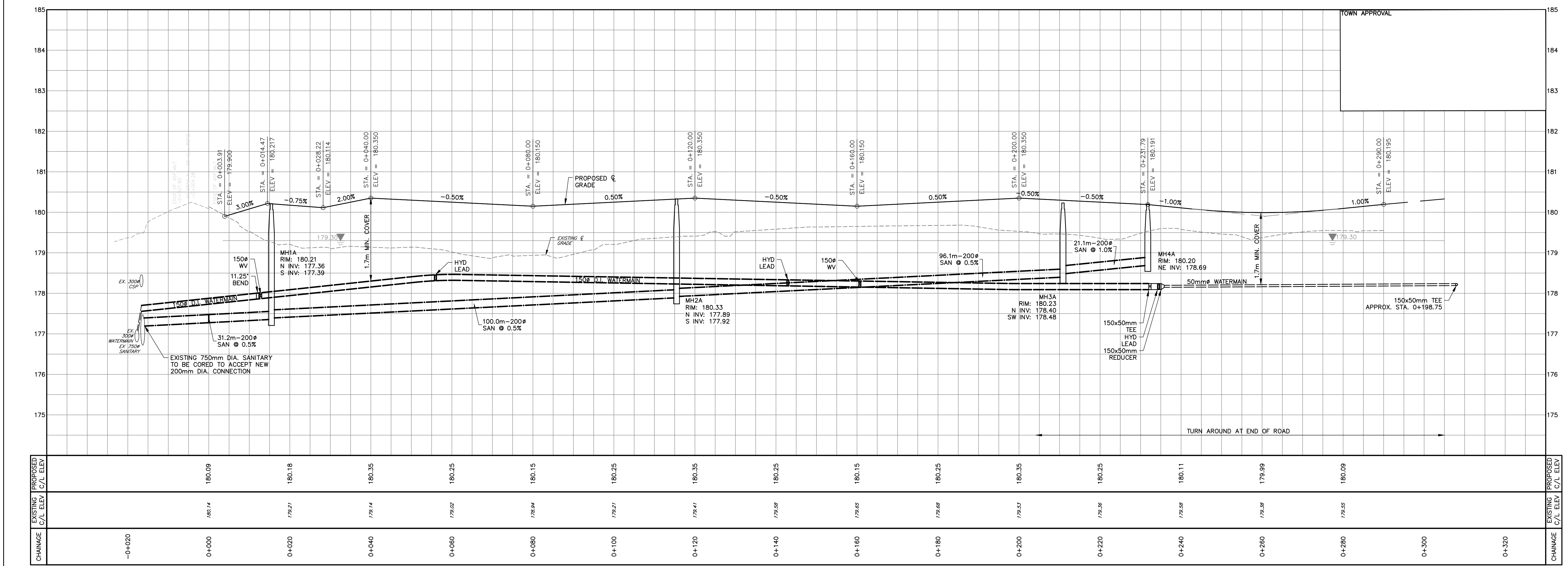
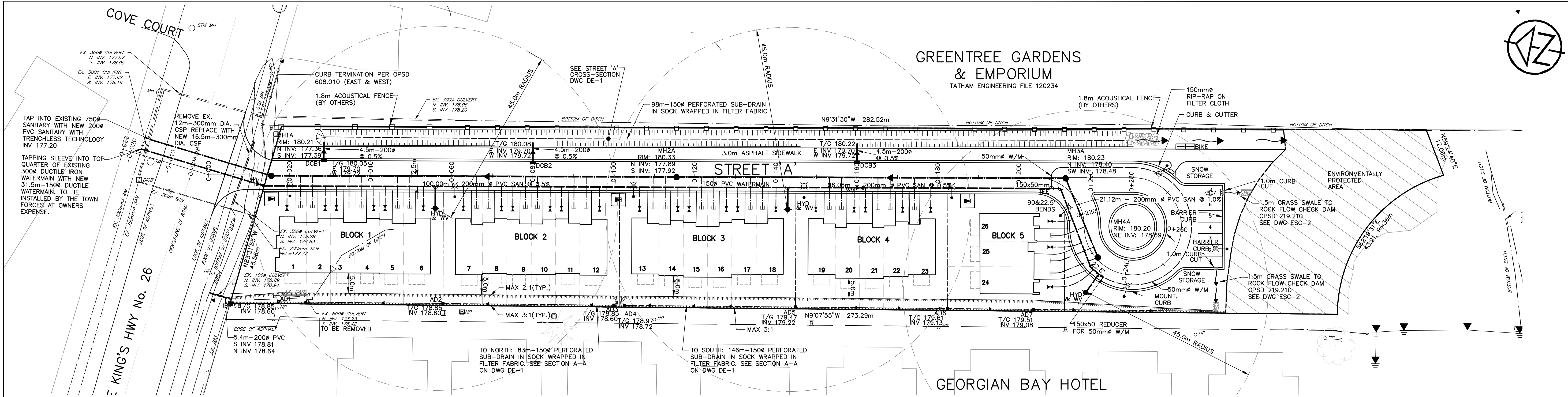
6 Summary

The proposed residential development will consist of 26 townhome units in Collingwood connected by a private road and cul-de-sac.

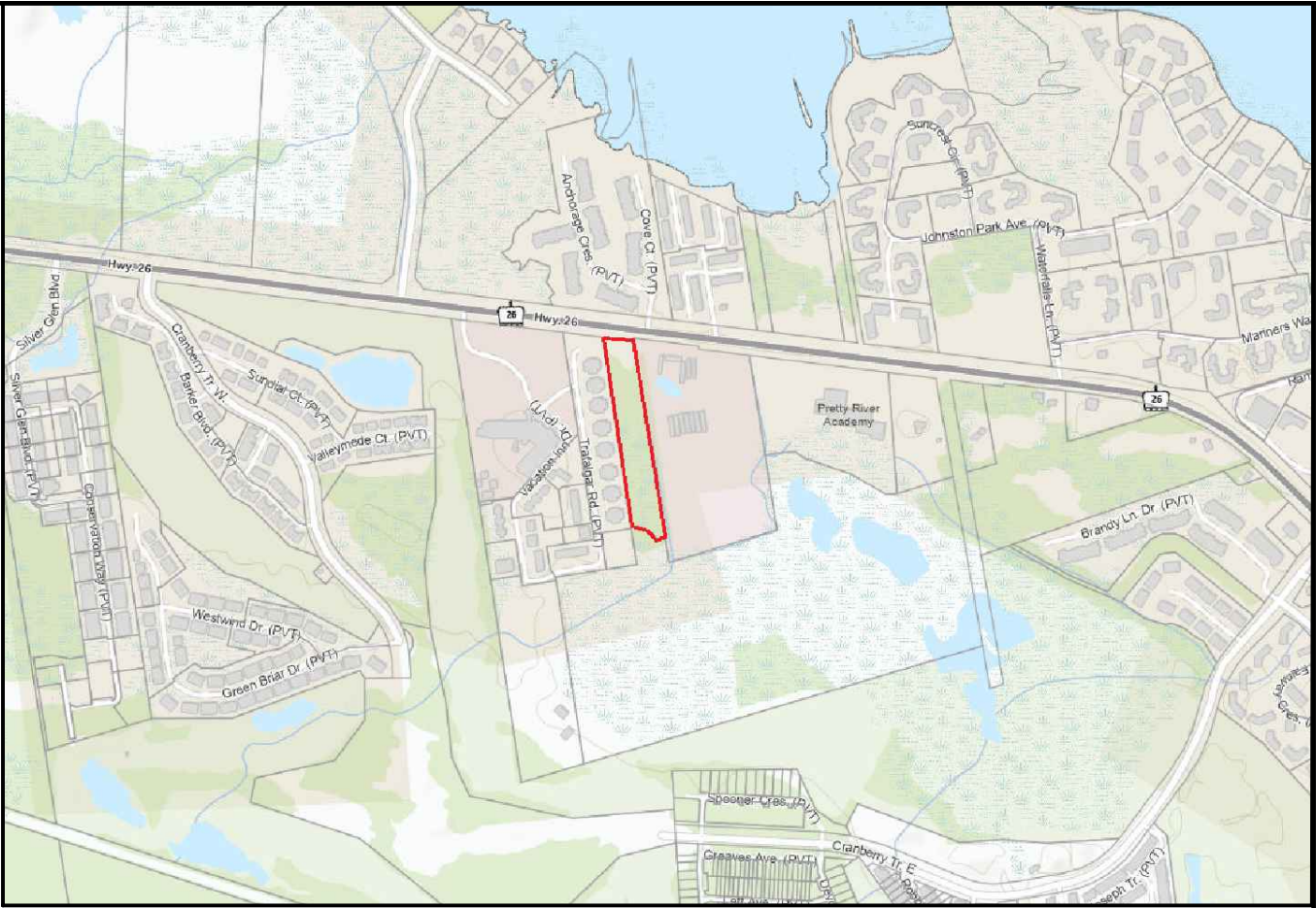
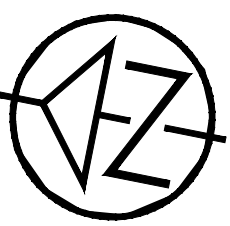
Existing drainage patterns will generally be maintained, with stormwater runoff conveyed via a road network to an enhanced grassed ditch to provide quality control for the site. Surface runoff towards the north will outlet into the Highway 26 roadside ditch, with post-development flow rates matching pre-development flow rates. Surface runoff towards the south will outlet into the Cranberry Marsh with no quantity control.

Siltation and erosion control will be provided with the proper construction mitigation efforts. Long-term erosion control will be enhanced with an effective revegetation strategy.

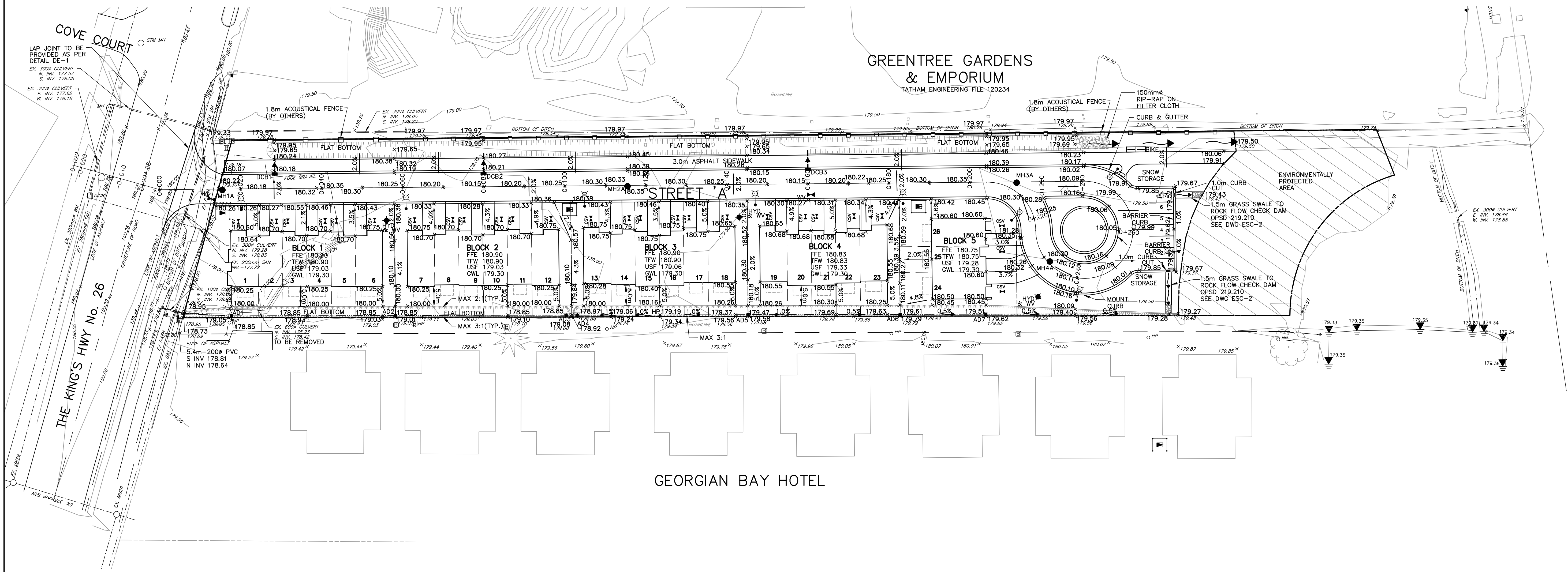




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KEY PLAN



GEORGIAN BAY HOTEL

TOWN APPROVAL

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LEGEND

AREA BOUNDARY

AREA IDENTIFICATION NUMBER

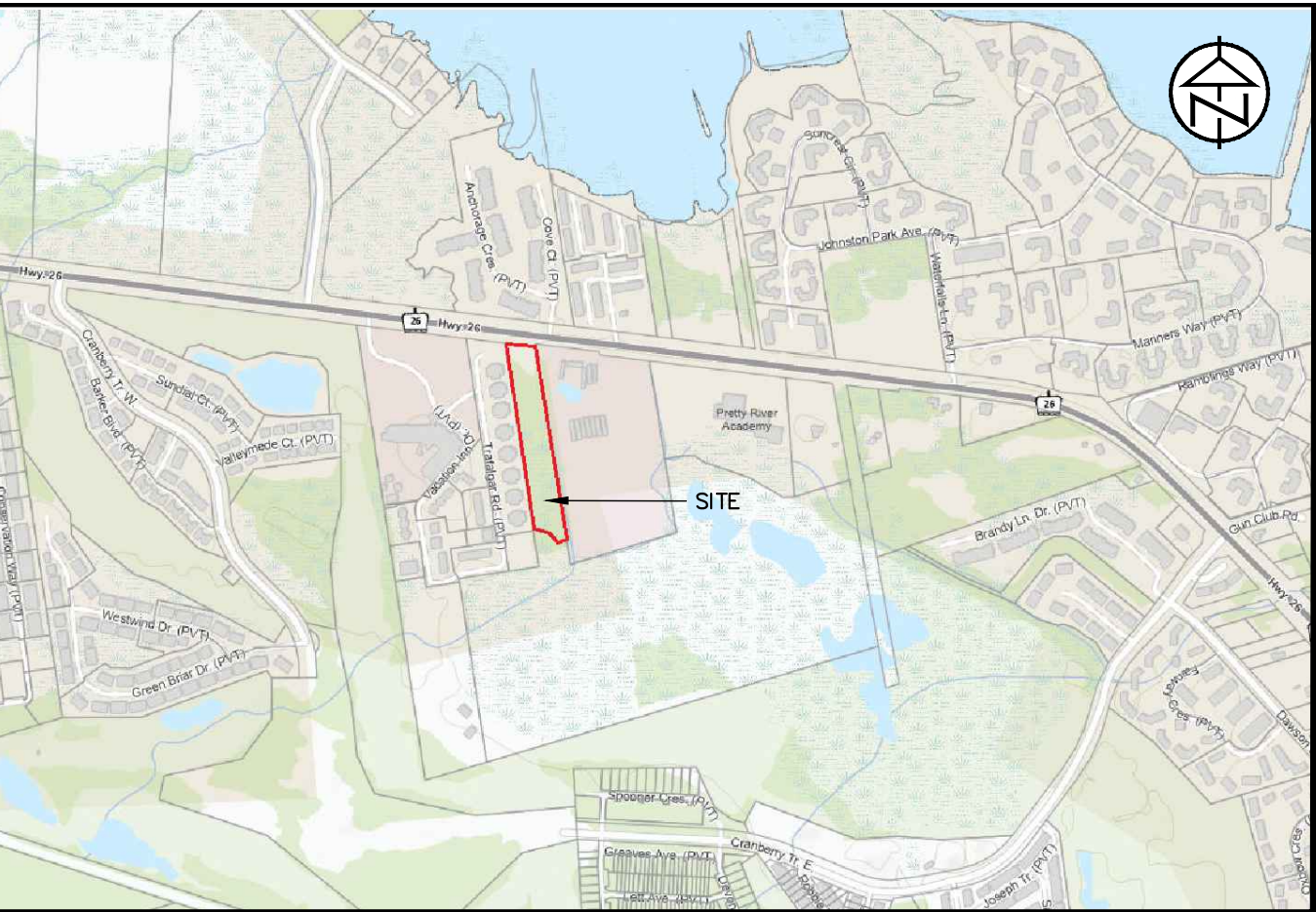
AREA IN HECTARES

RUNOFF COEFFICIENT

EXISTING MAJOR OVERLAND FLOW DIRECTION

EXISTING DITCH FLOW DIRECTION

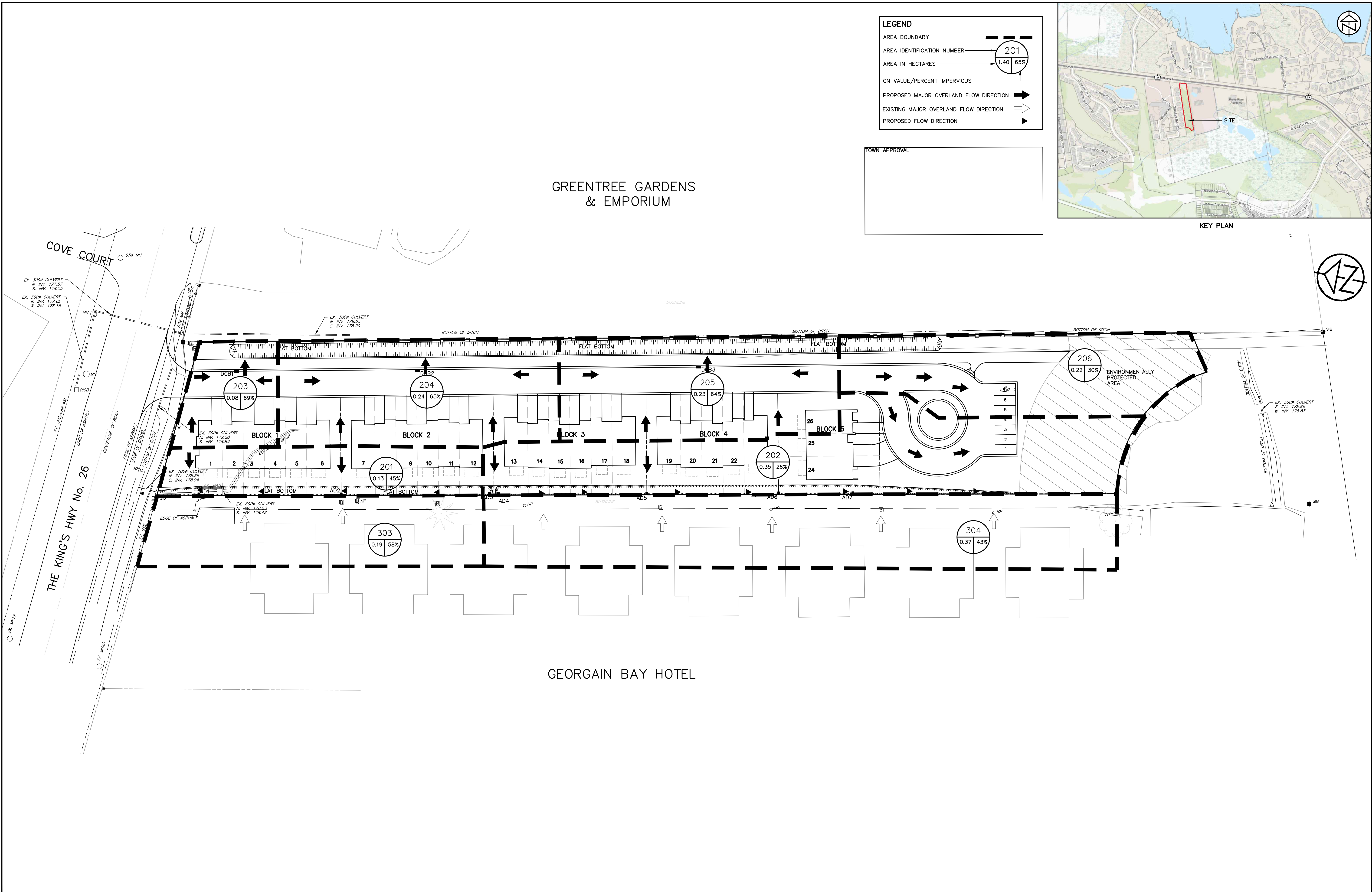
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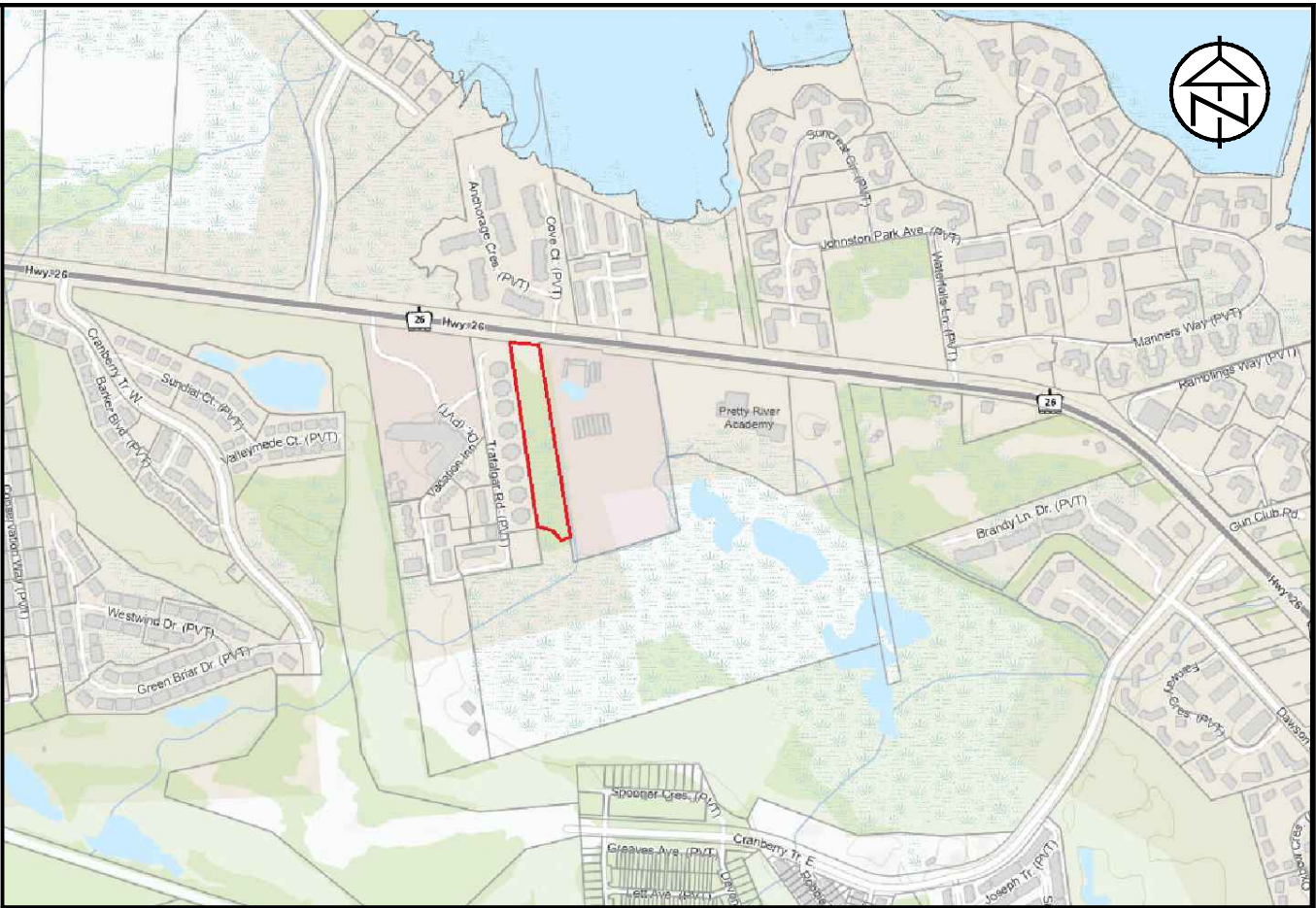


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			2.	2ND SUBMISSION	12/22				CHECK: DC	SCALE: 1:500	



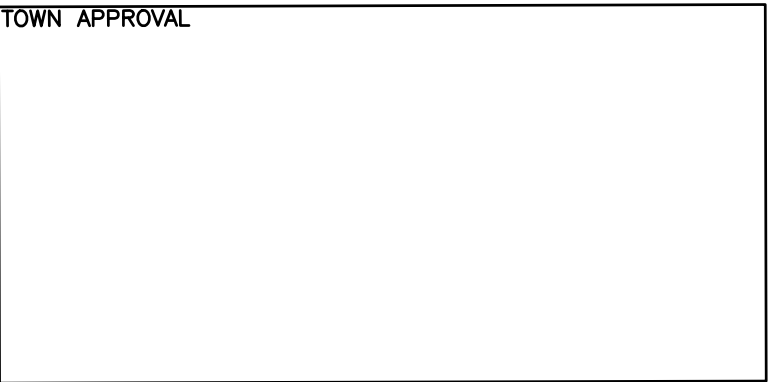
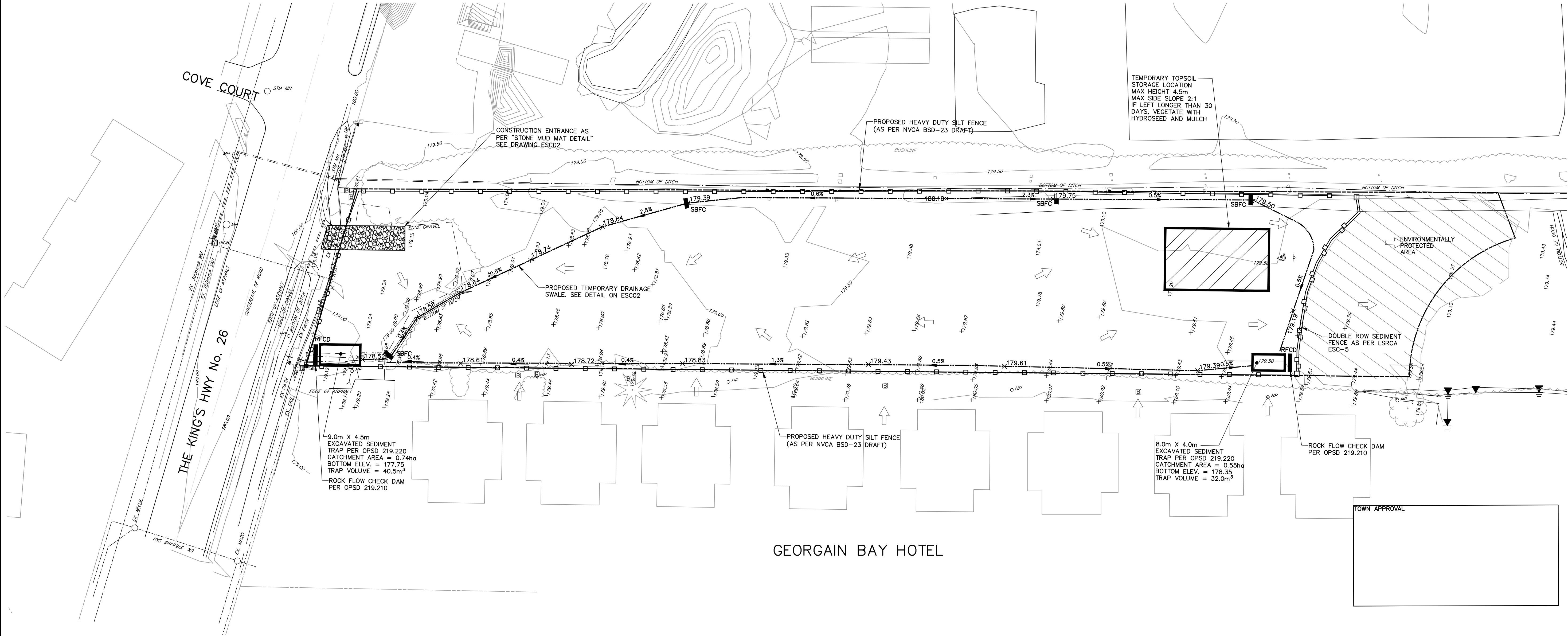
DISCLAIMER AND COPYRIGHT CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED. TATHAM ENGINEERING LIMITED CLAIMS COPYRIGHT TO THIS DRAWING WHICH MAY NOT BE USED FOR ANY PURPOSE OTHER THAN THAT PROVIDED IN THE CONTRACT BETWEEN THE OWNER/CLIENT AND THE ENGINEER WITHOUT THE EXPRESS CONSENT OF TATHAM ENGINEERING LIMITED.	BENCHMARKS ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND ARE DERIVED FROM BENCH MARK No. 0011972U311 HAVING A PUBLISHED ELEVATION OF 181.032 METRES.	NOTES LEGAL SURVEY INFORMATION AND LOT DIMENSIONS SHOWN ON THIS PLAN ARE TAKEN FROM A SURVEY PLAN PREPARED BY PATTEN & THOMSEN LTD, DATED, JANUARY 2, 2012 JOB No. 66-170-6 TOPOGRAPHIC SURVEY COMPLETED BY TATHAM ENGINEERING OCTOBER, 2022.	No.	REVISION DESCRIPTION	DATE	ENGINEER STAMP 	CRANBERRY MARSH ESTATES TOWN OF COLLINGWOOD			
			1.	1ST SUBMISSION	03/22					
			2.	2ND SUBMISSION	12/22					
POST-DEVELOPMENT DRAINAGE PLAN										
							DESIGN: KG	FILE: 120181	DWG:	
							DRAWN: KH/SBU	DATE: FEB 2022	DP-2	
							CHECK: DC	SCALE: 1:500		

GREENTREE GARDENS
& EMPORIUM



KEY PLAN

GEORGAIN BAY HOTEL



LEGEND	
PROPOSED STRAW BALE FLOW CHECK (AS PER OPSD 219.210)	SBFC
PROPOSED ROCK FLOW CHECK (AS PER OPSD 219.180)	RFCD
PROPOSED HEAVY DUTY SILT FENCE (AS PER NVCA BSD-23 DRAFT)	
PROPOSED SWALE / DITCH	0.5%
EXISTING OVERLAND FLOW	

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
ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND ARE DERIVED FROM BENCH MARK No. 00119720311 HAVING A PUBLISHED ELEVATION OF 181.032 METRES.

NOTES
LEGAL SURVEY INFORMATION AND LOT DIMENSIONS SHOWN ON THIS PLAN ARE TAKEN FROM A SURVEY PLAN PREPARED BY PATTEN & THOMSEN LTD, DATED, JANUARY 2, 2012 JOB No. 66-170-6
TOPOGRAPHIC SURVEY COMPLETED BY TATHAM ENGINEERING OCTOBER, 2022.

No.	REVISION DESCRIPTION	DATE
1.	1ST SUBMISSION	03/22
2.	2ND SUBMISSION	12/22

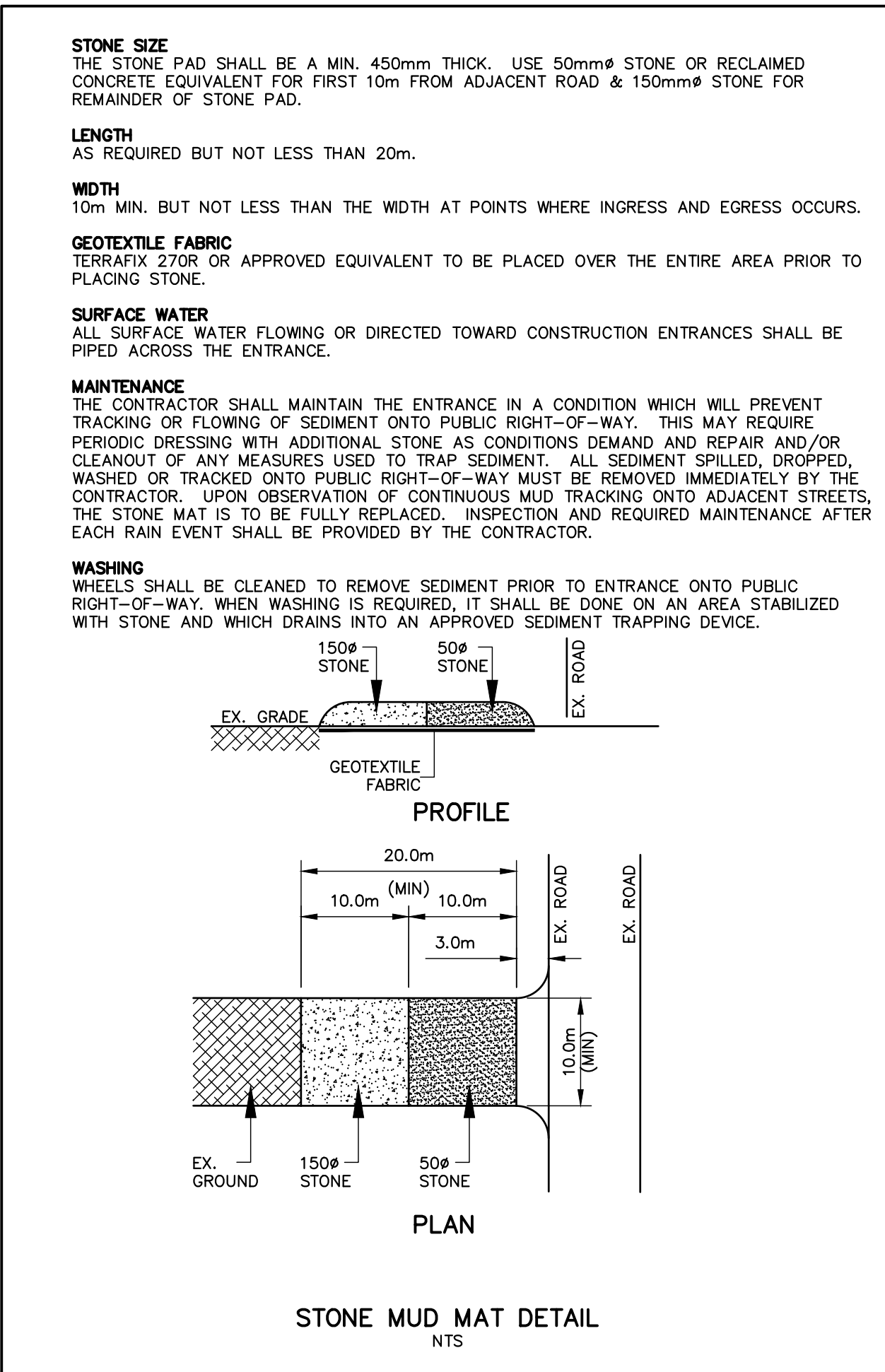
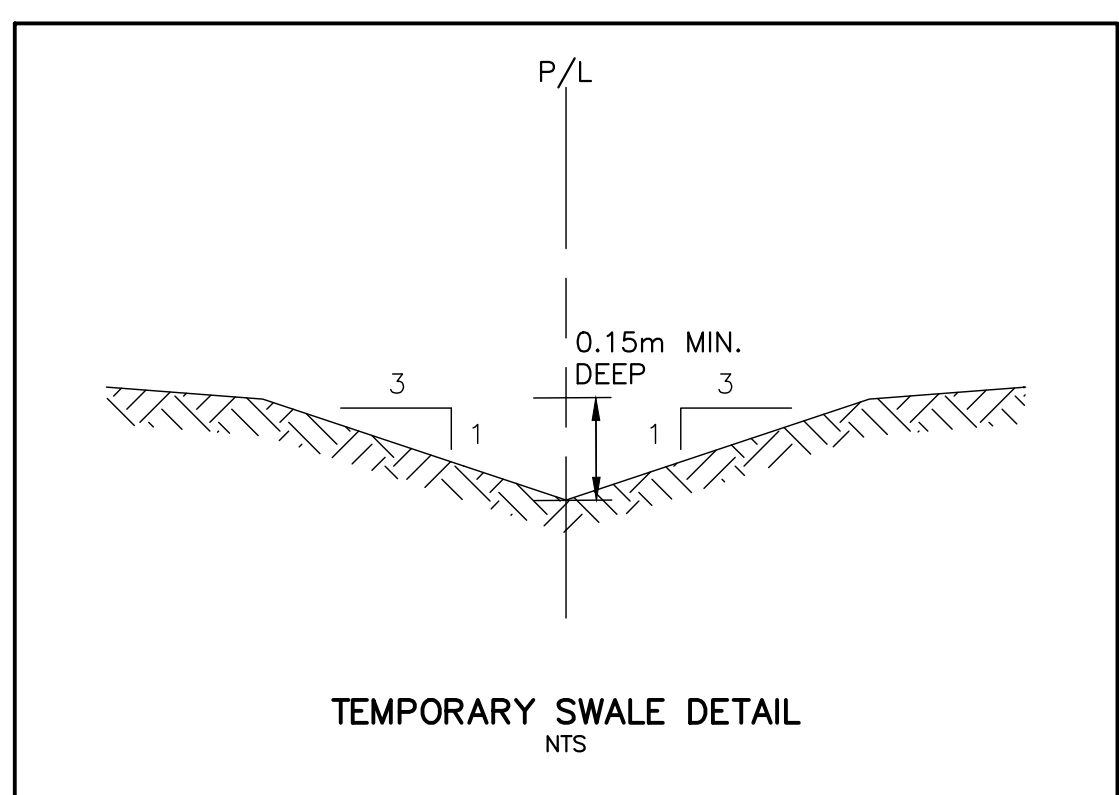
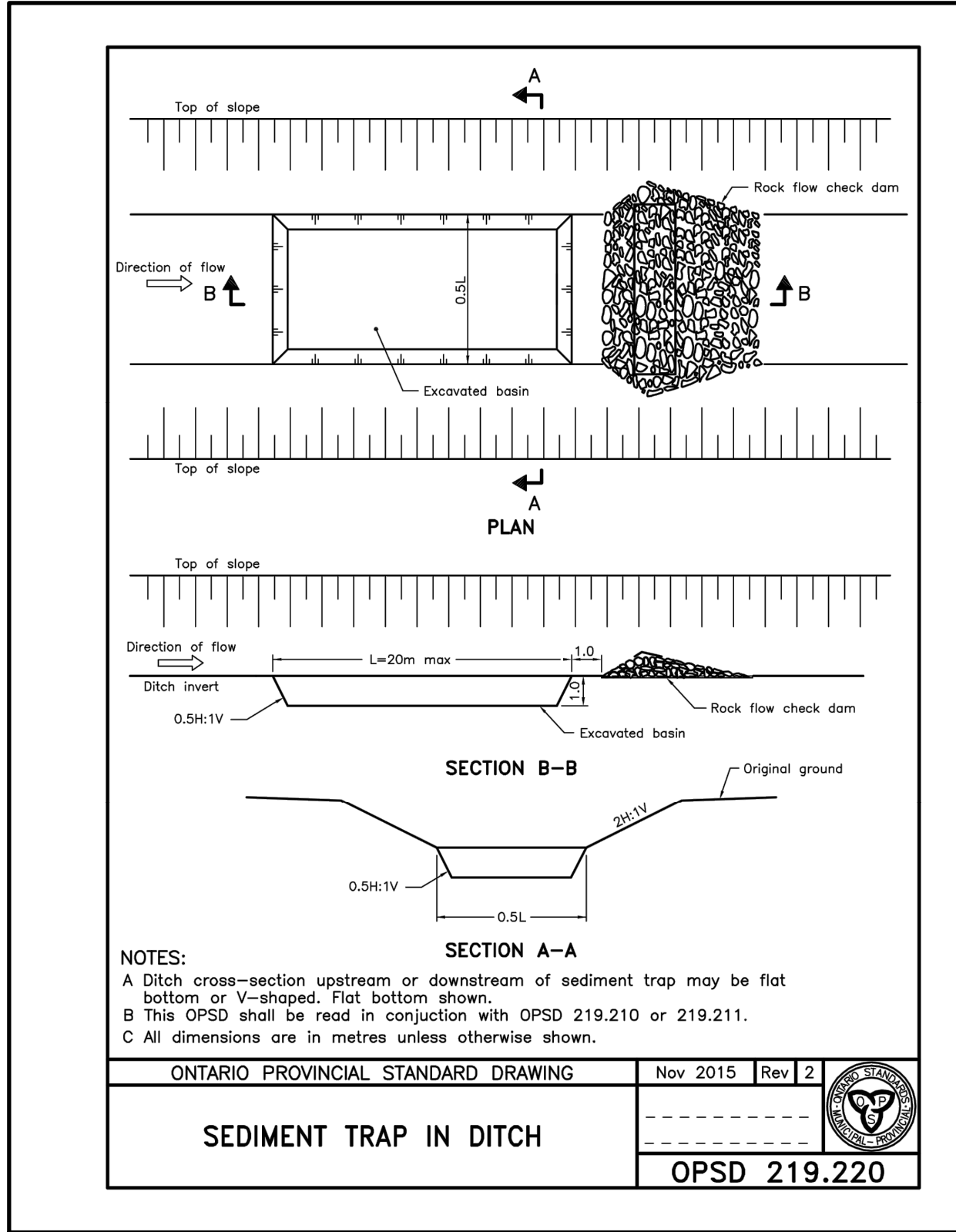
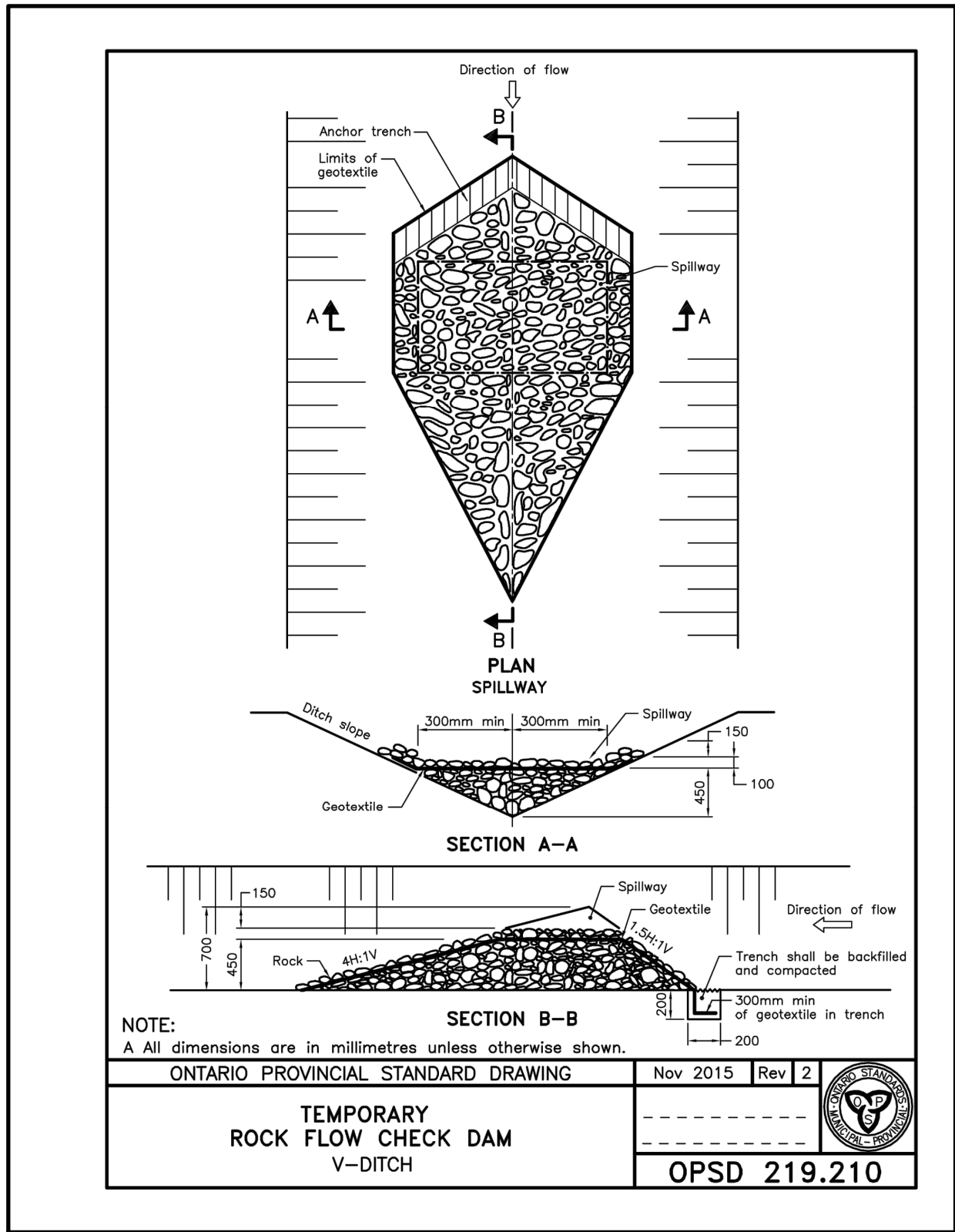
ENGINEER STAMP

CRANBERRY MARSH ESTATES
TOWN OF COLLINGWOOD

EROSION AND SEDIMENT CONTROL PLAN

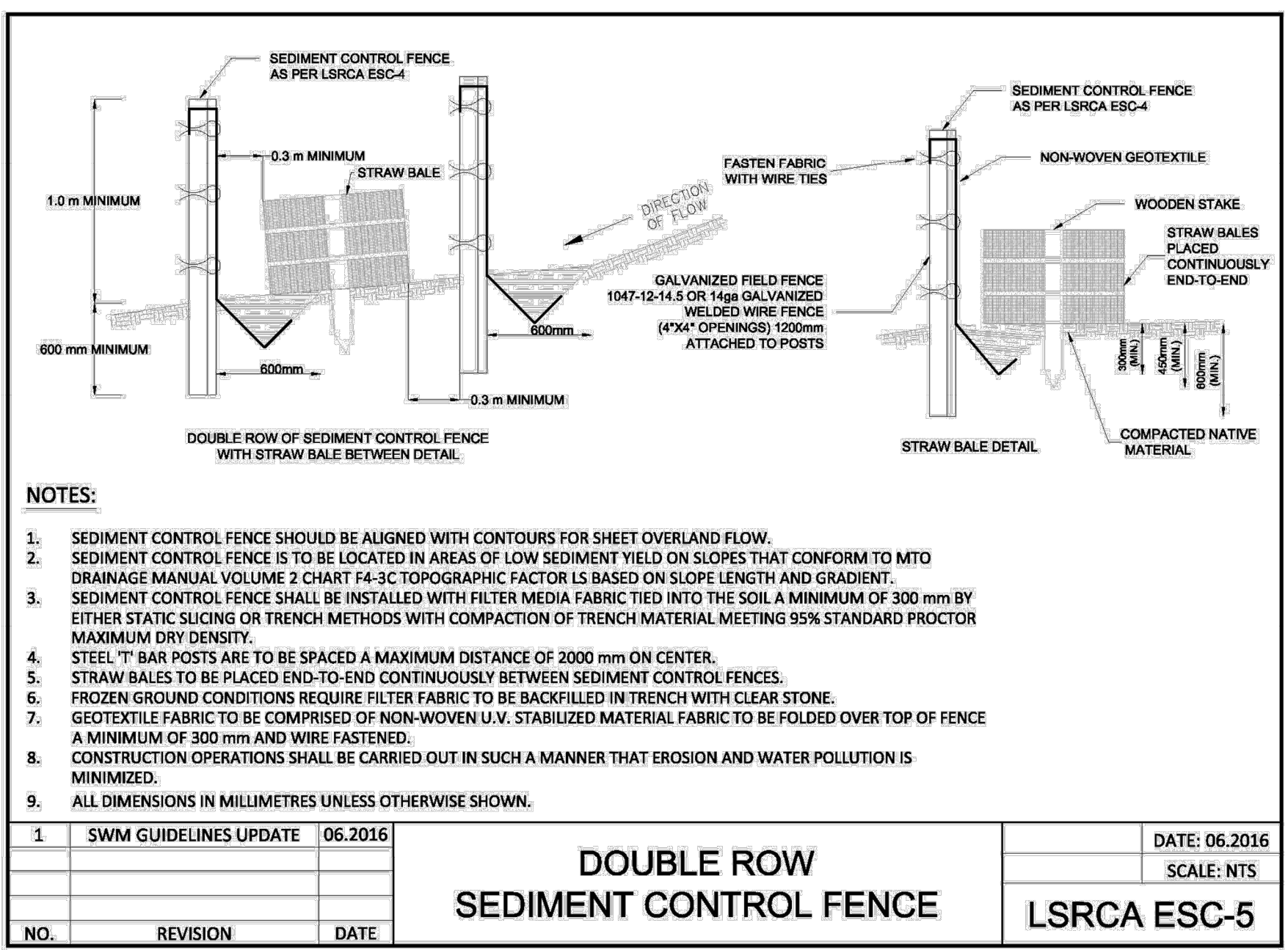
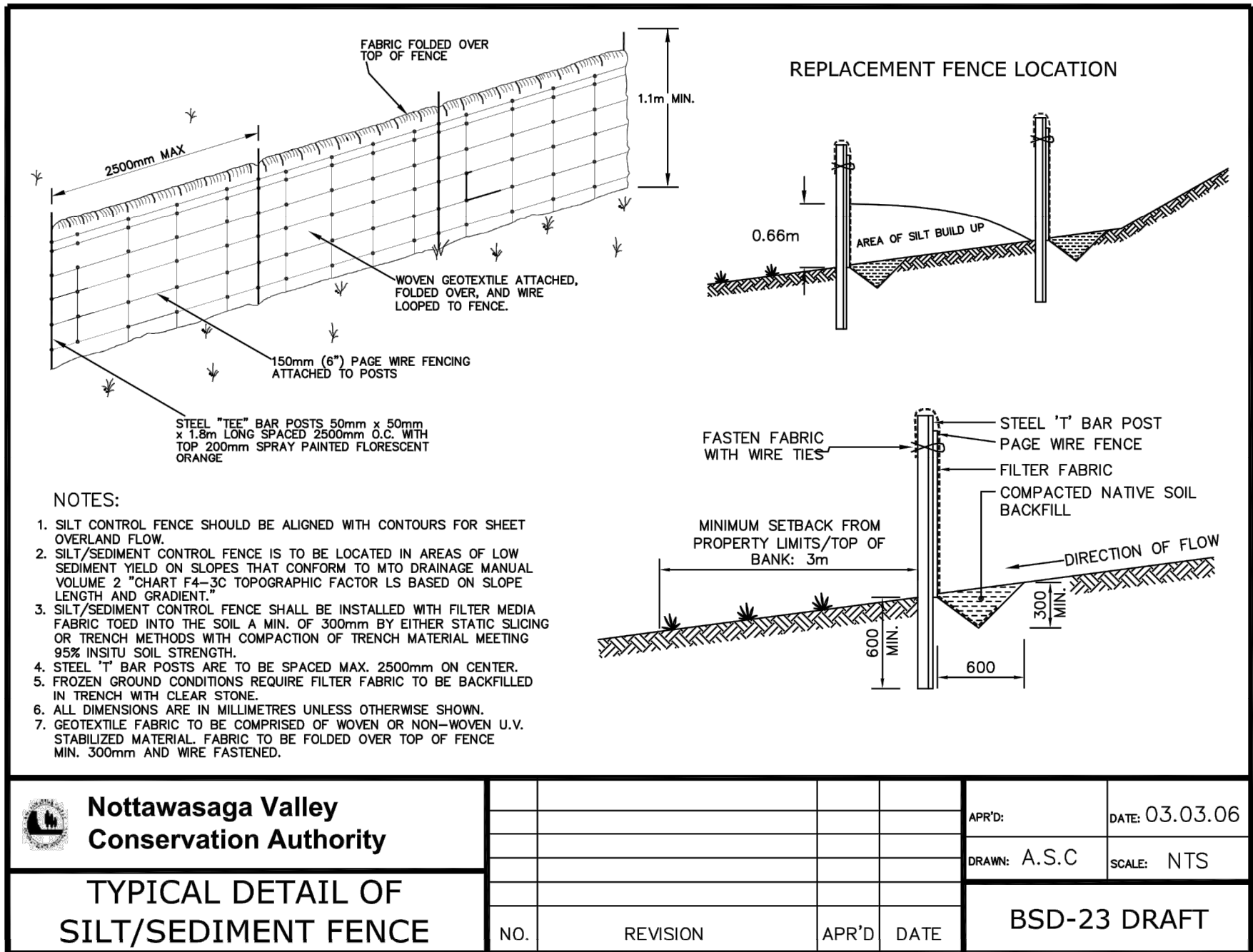
TATHAM ENGINEERING

DESIGN: KG	FILE: 120181	DWG: ESC-1
DRAWN: KB/SBU	DATE: MAR 2022	
CHECK: DC	SCALE: 1:500	



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 OF THE TOWN AND NOTTAWASAGA VALLEY CONSERVATION AUTHORITY.
- 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 NVCA STANDARDS (BSD-23).
 - INSTALL TEMPORARY CATCH BASIN SEDIMENT TRAPS ON ALL NEW AND EXISTING CATCH BASINS. SEDIMENT TRAPS TO BE RECTANGULAR 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 THE NOTTAWASAGA VALLEY CONSERVATION AUTHORITY'S TECHNICAL DESIGN GUIDELINES, STANDARDS AND POLICIES FOR SILTATION AND EROSION CONTROL. CONSTRUCTION CONTROL REQUIREMENTS, NOTES 1, 2 AND 3 AND/OR AS DIRECTED BY THE TOWN. THIS IS TO INCLUDE STOCKPILES OF FILL AND TOPSOIL.



DISCLAIMER AND COPYRIGHT

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BENCHMARKS

ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND ARE DERIVED FROM BENCH MARK No. 00119720311 HAVING A PUBLISHED ELEVATION OF 181.032 METRES.

NOTES

LEGAL SURVEY INFORMATION AND LOT DIMENSIONS SHOWN ON THIS PLAN ARE TAKEN FROM A SURVEY PLAN PREPARED BY PATTEN & THOMSEN LTD, DATED, JANUARY 2, 2012 JOB No. 66-170-6 TOPOGRAPHIC SURVEY COMPLETED BY TATHAM ENGINEERING OCTOBER, 2022.

No.	REVISION DESCRIPTION	DATE	ENGINEER STAMP
1.	1ST SUBMISSION	03/22	
2.	2ND SUBMISSION	12/22	



CRANBERRY MARSH ESTATES
TOWN OF COLLINGWOOD

EROSION AND SEDIMENT CONTROL DETAILS

TATHAM ENGINEERING

DESIGN: KG	FILE: 120181	DWG:
DRAWN: KH/SBU	DATE: MAR 2022	
CHECK: DC	SCALE: N.T.S.	

ESC-2

Appendix A: Pre-Development SWM Calculations

Active coordinate

44° 30' 45" N, 80° 15' 45" W (44.512500,-80.262500)

Retrieved: Wed, 08 Dec 2021 16:31:58 GMT



Location summary

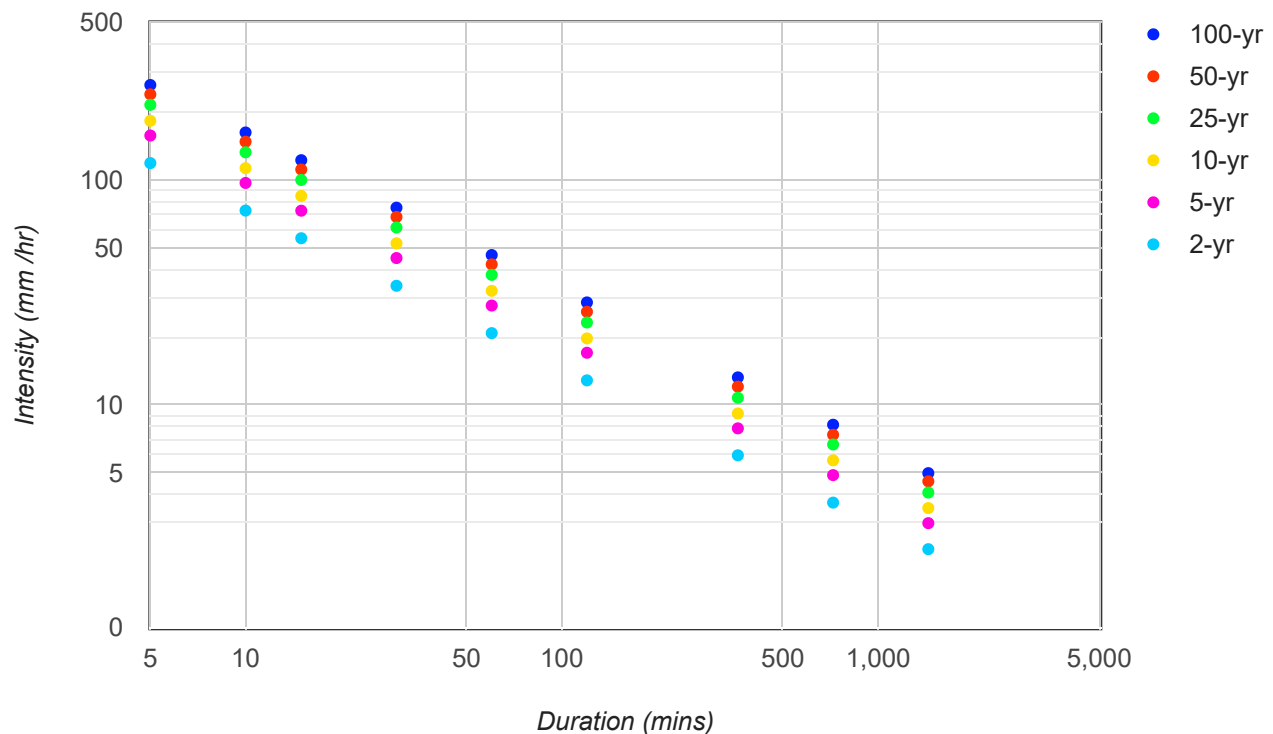
These are the locations in the selection.

IDF Curve: 44° 30' 45" N, 80° 15' 45" W (44.512500,-80.262500)

Results

An IDF curve was found.

Coordinate: 44.512500, -80.262500
IDF curve year: 2010



Coefficient summary

IDF Curve: 44° 30' 45" N, 80° 15' 45" W (44.512500,-80.262500)

Retrieved: Wed, 08 Dec 2021 16:31:58 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	27.7	32.2	37.9	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	157.3	96.9	73.0	45.0	27.7	17.1	7.9	4.9	3.0
10-yr	182.9	112.7	84.9	52.3	32.2	19.8	9.2	5.7	3.5
25-yr	215.3	132.6	99.9	61.5	37.9	23.3	10.8	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	13.1	16.2	18.2	22.5	27.7	34.1	47.5	58.5	72.1
10-yr	15.2	18.8	21.2	26.1	32.2	39.7	55.2	68.0	83.8
25-yr	17.9	22.1	25.0	30.8	37.9	46.7	65.0	80.1	98.6
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

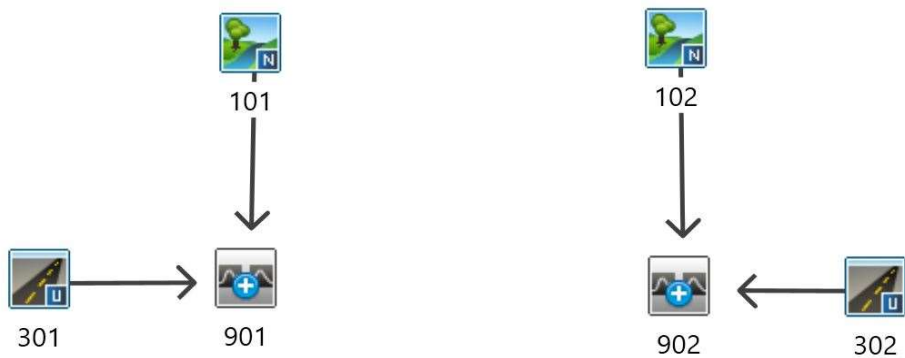
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Last Modified: September 2016

CRANBERRY MARSH ESTATES
EXISTING CONDITIONS



Nashyd



Route Pipe



Duhyd



Standhyd



Route Channel



Diverthyd



Addhyd



Route Reservoir



Project: Cranberry Marsh Estates

File No.: 120181

Subject: Otthymo Flow Schematic

Date: Dec-22

Visual OTTHYMO Model Parameter Calculations (NasHYD)

Project Details

Cranberry Marsh Estates	120181
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Data Sources

Detailed Soil Survey Reports for Ontario, NVCA Stormwater Technical Guide (2013), MTO Drainage Management Manual (1997)

Prepared By

Kyle Gowanlock	Dec 2022
----------------	----------

Pre-Development Condition

Watershed:	NVCA
Catchment ID:	101
Catchment Area (ha):	0.74
Impervious %:	

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

Soil Symbol		Pal											
Soil Series		Parkhill											
Hydrologic Soils Group		BC											
Soil Texture		Loam or Silt Loam											
Runoff Coefficient Type		2											
Area (ha)		0.74											
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	0.09	89	0.27									
Woodland	10	0.65	67	0.25									
Pasture/Lawns	5		74	0.28									
Meadows	8		71	0.27									
Cultivated	7		78	0.35									
Waterbody	12		50	0.05									
Average CN		69.68											
Average C		0.25											
Average IA		9.15											

Time to Peak Calculations

Max. Catchment Elev. (m):	179.75
Min. Catchment Elev. (m):	178.74
Catchment Length (m):	115
Catchment Slope (%):	0.88%
Method:	Airport Method
Time of Concentration (mins):	30.95

Summary

Catchment CN:	69.7
Catchment C:	0.25
Catchment IA (mm):	9.15
Time of Concentration (hrs):	0.52
Catchment Time to Peak (hrs):	0.34
Catchment Time Step (mins):	4.13

Visual OTTHYMO Model Parameter Calculations (NasHYD)

Project Details

Cranberry Marsh Estates	120181
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Data Sources

Detailed Soil Survey Reports for Ontario, NVCA Stormwater Technical Guide (2013), MTO Drainage Management Manual (1997)

Prepared By

Kyle Gowanlock	Dec 2022
----------------	----------

Pre-Development Condition

Watershed:	NVCA
Catchment ID:	102
Catchment Area (ha):	0.55
Impervious %:	

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

Soil Symbol		Pal											
Soil Series		Parkhill											
Hydrologic Soils Group		BC											
Soil Texture		Loam or Silt Loam											
Runoff Coefficient Type		2											
Area (ha)		0.55											
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	0.27									
Woodland	10	0.55	67	0.25									
Pasture/Lawns	5		74	0.28									
Meadows	8		71	0.27									
Cultivated	7		78	0.35									
Waterbody	12		50	0.05									
Average CN		67.00											
Average C		0.25											
Average IA		10.00											

Time to Peak Calculations

Max. Catchment Elev. (m):	179.75
Min. Catchment Elev. (m):	179.37
Catchment Length (m):	128
Catchment Slope (%):	0.30%
Method:	Airport Method
Time of Concentration (mins):	46.80

Summary

Catchment CN:	67.0
Catchment C:	0.25
Catchment IA (mm):	10.00
Time of Concentration (hrs):	0.78
Catchment Time to Peak (hrs):	0.52
Catchment Time Step (mins):	6.24

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Cranberry Marsh Estates	120181
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Data Sources

Detailed Soil Survey Reports for Ontario, NVCA Stormwater Technical Guide (2013), MTO Drainage Management Manual (1997)

Prepared By

Kyle Gowanlock	Dec 2022
----------------	----------

Pre-Development Condition

Watershed:	NVCA
Catchment ID:	301
Catchment Area (ha):	0.35
Impervious %:	53%
Pervious Area (ha):	0.16

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

Soil Symbol	Pal								
Soil Series	Parkhill								
Hydrologic Soils Group	BC								
Soil Texture	Loam or Silt Loam								
Runoff Coefficient Type	2								
Area (ha)	0.16								
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		67						
Pasture/Lawns	5	0.16	74						
Meadows	8		71						
Cultivated	7		78						
Waterbody	12		50						
Average CN	74.00								
Average IA	5.00								

Notes

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

Summary

Catchment CN:	74.0
Catchment IA (mm):	5.00

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Cranberry Marsh Estates	120181
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Data Sources

Detailed Soil Survey Reports for Ontario, NVCA Stormwater Technical Guide (2013), MTO Drainage Management Manual (1997)

Prepared By

Kyle Gowanlock	Dec 2022
----------------	----------

Pre-Development Condition

Watershed:	NVCA
Catchment ID:	302
Catchment Area (ha):	0.20
Impervious %:	43%
Pervious Area (ha):	0.11

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

Soil Symbol	Pal								
Soil Series	Parkhill								
Hydrologic Soils Group	BC								
Soil Texture	Loam or Silt Loam								
Runoff Coefficient Type	2								
Area (ha)	0.11								
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		67						
Pasture/Lawns	5	0.11	74						
Meadows	8		71						
Cultivated	7		78						
Waterbody	12		50						
Average CN	74.00								
Average IA	5.00								

Notes

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

Summary

Catchment CN:	74.0
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 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 *****

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DATE: 02-25-2022

TIME: 04:44:36

USER:

COMMENTS: _____

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| | ata\Local\Temp\

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| 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)= 0.74 Curve Number (CN)= 69.7
| ID= 1 DT= 5.0 min | Ia (mm)= 9.15 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.39

Unit Hyd Qpeak (cms)= 0.072

PEAK FLOW (cms)= 0.003 (i)
TIME TO PEAK (hrs)= 2.500
RUNOFF VOLUME (mm)= 1.975
TOTAL RAINFALL (mm)= 24.951
RUNOFF COEFFICIENT = 0.079

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

| CALIB |
| STANDHYD (0301) | Area (ha)= 0.35
| ID= 1 DT= 5.0 min | Total Imp(%)= 50.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.17	0.17
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	8.00
Length (m)=	48.30	13.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)= 72.58 35.68
over (min) 5.00 10.00
Storage Coeff. (min)= 1.52 (ii) 5.11 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.33 0.16

TOTALS
PEAK FLOW (cms)= 0.00 0.02 0.015 (iii)
TIME TO PEAK (hrs)= 2.00 2.08 2.08
RUNOFF VOLUME (mm)= 22.95 7.51 7.51
TOTAL RAINFALL (mm)= 24.95 24.95 24.95
RUNOFF COEFFICIENT = 0.92 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* = 74.0 Ia = Dep. 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 (0101): AREA (ha) QPEAK (cms) TPEAK (hrs) R.V. (mm)
+ ID2= 2 (0301): 0.74 0.003 2.50 1.97
===== 0.35 0.015 2.08 7.51
ID = 3 (0901): 1.09 0.016 2.08 3.75

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| NASHYD (0102)| Area (ha)= 0.55 Curve Number (CN)= 67.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.52

Unit Hyd Qpeak (cms)= 0.040
PEAK FLOW (cms)= 0.001 (i)
TIME TO PEAK (hrs)= 2.750
RUNOFF VOLUME (mm)= 1.594
TOTAL RAINFALL (mm)= 24.951
RUNOFF COEFFICIENT = 0.064

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

| CALIB |
| STANDHYD (0302)| Area (ha)= 0.20
| ID= 1 DT= 5.0 min | Total Imp(%)= 43.00 Dir. Conn.(%)= 0.10

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.09 0.11
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 36.51 40.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 72.58 22.39
over (min) 5.00 15.00
Storage Coeff. (min)= 1.29 (ii) 14.13 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.33 0.08

TOTALS
PEAK FLOW (cms)= 0.00 0.00 0.005 (iii)
TIME TO PEAK (hrs)= 2.00 2.17 2.17
RUNOFF VOLUME (mm)= 22.95 6.69 6.67
TOTAL RAINFALL (mm)= 24.95 24.95 24.95
RUNOFF COEFFICIENT = 0.92 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* = 74.0 Ia = Dep. 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 (ha) QPEAK (cms) TPEAK (hrs) R.V. (mm)
+ ID2= 2 (0302): 0.55 0.001 2.75 1.59
===== 0.20 0.005 2.17 6.67
ID = 3 (0902): 0.75 0.005 2.25 2.95

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
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DATE: 02-25-2022 TIME: 04:44:36

USER:

COMMENTS: _____

** SIMULATION : (2) 2 Year Design Storm - 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 hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN 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)= 0.74 Curve Number (CN)= 69.7
| ID= 1 DT= 5.0 min | Ia (mm)= 9.15 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.39

Unit Hyd Qpeak (cms)= 0.072

PEAK FLOW (cms)= 0.004 (i)
TIME TO PEAK (hrs)= 1.917
RUNOFF VOLUME (mm)= 3.817
TOTAL RAINFALL (mm)= 31.693
RUNOFF COEFFICIENT = 0.120

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

| CALIB |
| STANDHYD (0301) | Area (ha)= 0.35
| ID= 1 DT= 5.0 min | Total Imp(%)= 50.00 Dir. Conn.(%)= 0.10
|-----|

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.17	0.17
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	8.00
Length (m)=	48.30	13.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)= 73.13 47.30
over (min) 5.00 5.00

Storage Coeff. (min)=	1.52 (ii)	4.72 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.33	0.22	
			TOTALS
PEAK FLOW (cms)=	0.00	0.02	0.023 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.33
RUNOFF VOLUME (mm)=	29.69	11.54	11.55
TOTAL RAINFALL (mm)=	31.69	31.69	31.69
RUNOFF COEFFICIENT =	0.94	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* = 74.0 Ia = Dep. 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 (0101):	0.74	0.004	1.92	3.82
+ ID2= 2 (0301):	0.35	0.023	1.33	11.55
=====				
ID = 3 (0901):	1.09	0.023	1.33	6.30

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0102)	Area (ha)=	0.55	Curve Number (CN)= 67.0
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.52	

Unit Hyd Qpeak (cms)=	0.040
PEAK FLOW (cms)=	0.002 (i)
TIME TO PEAK (hrs)=	2.167
RUNOFF VOLUME (mm)=	3.203
TOTAL RAINFALL (mm)=	31.693
RUNOFF COEFFICIENT =	0.101

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

CALIB			
STANDHYD (0302)	Area (ha)=	0.20	
ID= 1 DT= 5.0 min	Total Imp(%)=	43.00	Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.09	0.11
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	36.51	40.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	73.13	28.26
over (min)	5.00	15.00
Storage Coeff. (min)=	1.28 (ii)	12.98 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.33	0.08

			TOTALS
PEAK FLOW (cms)=	0.00	0.01	0.006 (iii)
TIME TO PEAK (hrs)=	1.33	1.50	1.50
RUNOFF VOLUME (mm)=	29.69	10.43	10.41
TOTAL RAINFALL (mm)=	31.69	31.69	31.69
RUNOFF COEFFICIENT =	0.94	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* = 74.0 Ia = Dep. 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):	0.55	0.002	2.17	3.20
+ ID2= 2 (0302):	0.20	0.006	1.50	10.41
=====				
ID = 3 (0902):	0.75	0.007	1.50	5.12

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

=====

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51b044f-7e22-4719-bb83-c2a62d1be9d7\s

DATE: 02-25-2022 TIME: 04:44:36

USER:

COMMENTS: _____

** SIMULATION : (3) 5 Year Design Storm - Chi **

CHICAGO STORM | IDF curve parameters: A= 484.627
Ptotal= 42.00 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	3.65	1.17	17.00	2.17	6.88	3.17	4.00
0.33	4.08	1.33	96.92	2.33	6.07	3.33	3.77
0.50	4.65	1.50	20.39	2.50	5.46	3.50	3.57
0.67	5.48	1.67	12.78	2.67	4.98	3.67	3.39
0.83	6.78	1.83	9.73	2.83	4.60	3.83	3.23
1.00	9.25	2.00	8.01	3.00	4.27	4.00	3.09

CALIB
NASHYD (0101) | Area (ha)= 0.74 Curve Number (CN)= 69.7
ID= 1 DT= 5.0 min | Ia (mm)= 9.15 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.39

Unit Hyd Qpeak (cms)= 0.072

PEAK FLOW (cms)= 0.009 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 7.527
TOTAL RAINFALL (mm)= 42.005
RUNOFF COEFFICIENT = 0.179

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

CALIB
STANDHYD (0301) | Area (ha)= 0.35
ID= 1 DT= 5.0 min | Total Imp(%)= 50.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.17	0.17
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	8.00
Length (m)=	48.30	13.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)= 96.92 79.45
over (min) 5.00 5.00
Storage Coeff. (min)= 1.36 (ii) 3.96 (ii)
Unit Hyd. Tpeak (min)= 5.00 5.00

Unit Hyd. peak (cms)=	0.33	0.24	
			TOTALS
PEAK FLOW (cms)=	0.00	0.04	0.040 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.33
RUNOFF VOLUME (mm)=	40.00	18.54	18.56
TOTAL RAINFALL (mm)=	42.00	42.00	42.00
RUNOFF COEFFICIENT =	0.95	0.44	0.44

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0101):	0.74	0.009	1.83	7.53
+ ID2= 2 (0301):	0.35	0.040	1.33	18.56
=====				
ID = 3 (0901):	1.09	0.041	1.33	11.07

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0102)	Area (ha)=	0.55	Curve Number (CN)= 67.0
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.52	

Unit Hyd Qpeak (cms)=	0.040
PEAK FLOW (cms)=	0.005 (i)
TIME TO PEAK (hrs)=	2.083
RUNOFF VOLUME (mm)=	6.518
TOTAL RAINFALL (mm)=	42.005
RUNOFF COEFFICIENT =	0.155

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

CALIB	
-------	--

STANDHYD (0302)	Area (ha)=	0.20	
ID= 1 DT= 5.0 min	Total Imp(%)=	43.00	Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.09	0.11
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	36.51	40.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	96.92	62.74
over (min)	5.00	10.00
Storage Coeff. (min)=	1.15 (ii)	9.65 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.34	0.11

			TOTALS
PEAK FLOW (cms)=	0.00	0.01	0.013 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.42
RUNOFF VOLUME (mm)=	40.00	17.02	17.01
TOTAL RAINFALL (mm)=	42.00	42.00	42.00
RUNOFF COEFFICIENT =	0.95	0.41	0.41

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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):	0.55	0.005	2.08	6.52
+ ID2= 2 (0302):	0.20	0.013	1.42	17.01
=====				
ID = 3 (0902):	0.75	0.014	1.42	9.32

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

V V I SS U U AAAAA L
V V I SS U U A A L
VV I SSSS UUUUU A A LLLLL

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

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7d4faf6-7d84-4d75-805b-2d77e3965804\s

DATE: 02-25-2022 TIME: 04:44:36

USER:

COMMENTS: _____

** SIMULATION : (4) 10 Year Design Storm - Ch **

CHICAGO STORM | IDF curve parameters: A= 563.357
| Ptotal= 48.83 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	4.25	1.17	19.77	2.17	8.00	3.17	4.65
0.33	4.74	1.33	112.66	2.33	7.06	3.33	4.38
0.50	5.41	1.50	23.70	2.50	6.35	3.50	4.15
0.67	6.37	1.67	14.86	2.67	5.79	3.67	3.94
0.83	7.88	1.83	11.31	2.83	5.34	3.83	3.75
1.00	10.75	2.00	9.31	3.00	4.97	4.00	3.59

CALIB
NASHYD (0101) | Area (ha)= 0.74 Curve Number (CN)= 69.7
ID= 1 DT= 5.0 min | Ia (mm)= 9.15 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.39

Unit Hyd Qpeak (cms)= 0.072

PEAK FLOW (cms)= 0.013 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 10.479
TOTAL RAINFALL (mm)= 48.829
RUNOFF COEFFICIENT = 0.215

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

CALIB
STANDHYD (0301) | Area (ha)= 0.35
ID= 1 DT= 5.0 min | Total Imp(%)= 50.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.17	0.17
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	8.00
Length (m)=	48.30	13.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	112.66	103.18
over (min)	5.00	5.00
Storage Coeff. (min)=	1.28 (ii)	3.62 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.33	0.25

			TOTALS
PEAK FLOW (cms)=	0.00	0.05	0.052 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.33
RUNOFF VOLUME (mm)=	46.83	23.59	23.60

TOTAL RAINFALL (mm)= 48.83 48.83 48.83
RUNOFF COEFFICIENT = 0.96 0.48 0.48

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 ( 0101): 0.74 0.013 1.83 10.48
+ ID2= 2 ( 0301): 0.35 0.052 1.33 23.60
=====
ID = 3 ( 0901): 1.09 0.055 1.33 14.69
-----
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| CALIB
| NASHYD ( 0102)|
| ID= 1 DT= 5.0 min |
-----
| Area (ha)= 0.55 Curve Number (CN)= 67.0
| Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
| U.H. Tp(hrs)= 0.52
-----
```

Unit Hyd Qpeak (cms)= 0.040

PEAK FLOW (cms)= 0.007 (i)
TIME TO PEAK (hrs)= 2.000
RUNOFF VOLUME (mm)= 9.195
TOTAL RAINFALL (mm)= 48.829
RUNOFF COEFFICIENT = 0.188

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

```
-----
| CALIB
| STANDHYD ( 0302)|
| ID= 1 DT= 5.0 min |
-----
| Area (ha)= 0.20
| Total Imp(%)= 43.00 Dir. Conn.(%)= 0.10
-----
| IMPERVIOUS PERVIOUS (i)
| Surface Area (ha)= 0.09 0.11
-----
```

Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 36.51 40.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 112.66 82.23
over (min) 5.00 10.00
Storage Coeff. (min)= 1.08 (ii) 8.71 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.34 0.12

PEAK FLOW (cms)= 0.00 0.02
TIME TO PEAK (hrs)= 1.33 1.42
RUNOFF VOLUME (mm)= 46.83 21.82
TOTAL RAINFALL (mm)= 48.83 48.83
RUNOFF COEFFICIENT = 0.96 0.45

TOTALS

0.017 (iii)

1.42

21.82

48.83

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* = 74.0 Ia = Dep. 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): 0.55 0.007 2.00 9.19
+ ID2= 2 ( 0302): 0.20 0.017 1.42 21.82
=====
ID = 3 ( 0902): 0.75 0.019 1.42 12.56
-----
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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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
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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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a11d840-a946-4f4e-a480-cdda84162dce\s

DATE: 02-25-2022 TIME: 04:44:36

USER:

COMMENTS: _____

** SIMULATION : (5) 25 Year Design Storm - Ch **

CHICAGO STORM | IDF curve parameters: A= 663.082
| Ptotal= 57.47 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	5.00	1.17	23.27	2.17	9.41	3.17	5.48

0.33	5.58	1.33	132.61	2.33	8.31	3.33	5.16
0.50	6.37	1.50	27.90	2.50	7.48	3.50	4.88
0.67	7.49	1.67	17.49	2.67	6.82	3.67	4.64
0.83	9.27	1.83	13.31	2.83	6.29	3.83	4.42
1.00	12.65	2.00	10.95	3.00	5.85	4.00	4.23

CALIB
NASHYD (0101) | Area (ha)= 0.74 Curve Number (CN)= 69.7
ID= 1 DT= 5.0 min | Ia (mm)= 9.15 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.39

Unit Hyd Qpeak (cms)= 0.072

PEAK FLOW (cms)= 0.019 (i)
TIME TO PEAK (hrs)= 1.750
RUNOFF VOLUME (mm)= 14.697
TOTAL RAINFALL (mm)= 57.473
RUNOFF COEFFICIENT = 0.256

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

CALIB
STANDHYD (0301) | Area (ha)= 0.35
ID= 1 DT= 5.0 min | Total Imp(%)= 50.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.17	0.17
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	8.00
Length (m)=	48.30	13.00
Mannings n	0.013	0.250

Max.Eff.Inten.(mm/hr)=	132.61	135.38
over (min)	5.00	5.00
Storage Coeff. (min)=	1.20 (ii)	3.30 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.33	0.27

			TOTALS
PEAK FLOW (cms)=	0.00	0.07	0.070 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.33
RUNOFF VOLUME (mm)=	55.47	30.33	30.35
TOTAL RAINFALL (mm)=	57.47	57.47	57.47
RUNOFF COEFFICIENT =	0.97	0.53	0.53

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 ( 0101):  0.74  0.019  1.75  14.70
+ ID2= 2 ( 0301):  0.35  0.070  1.33  30.35
=====
ID = 3 ( 0901):  1.09  0.074  1.33  19.72
-----
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| CALIB
| NASHYD ( 0102)|
|ID= 1 DT= 5.0 min |
-----
          Area   (ha)=  0.55   Curve Number (CN)= 67.0
          Ia     (mm)= 10.00   # of Linear Res.(N)= 3.00
          U.H. Tp(hrs)=  0.52
```

Unit Hyd Qpeak (cms)= 0.040

PEAK FLOW (cms)= 0.010 (i)
TIME TO PEAK (hrs)= 2.000
RUNOFF VOLUME (mm)= 13.056
TOTAL RAINFALL (mm)= 57.473
RUNOFF COEFFICIENT = 0.227

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

```
-----
| CALIB
| STANDHYD ( 0302)|
|ID= 1 DT= 5.0 min |
-----
          Area   (ha)=  0.20
          Total Imp(%)= 43.00   Dir. Conn.(%)= 0.10
```

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.09	0.11
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00

Length (m)=	36.51	40.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	132.61	108.92
over (min)	5.00	10.00
Storage Coeff. (min)=	1.01 (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	0.02	0.024 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.42
RUNOFF VOLUME (mm)=	55.47	28.27	28.28
TOTAL RAINFALL (mm)=	57.47	57.47	57.47
RUNOFF COEFFICIENT =	0.97	0.49	0.49

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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):  0.55  0.010  2.00  13.06
+ ID2= 2 ( 0302):  0.20  0.024  1.42  28.28
=====
ID = 3 ( 0902):  0.75  0.027  1.42  17.11
-----
```

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 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:
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a8cb67f-9e99-444e-bb98-988a078e4edf\s

DATE: 02-25-2022

TIME: 04:44:36

USER:

COMMENTS: _____

** SIMULATION : (6) 50 Year Design Storm - Ch **

CHICAGO STORM
Ptotal= 63.99 mm

IDF curve parameters: A= 738.312
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
NASHYD (0101) Area (ha)= 0.74 Curve Number (CN)= 69.7
ID= 1 DT= 5.0 min Ia (mm)= 9.15 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.39

Unit Hyd Qpeak (cms)= 0.072

PEAK FLOW (cms)= 0.024 (i)
TIME TO PEAK (hrs)= 1.750
RUNOFF VOLUME (mm)= 18.185
TOTAL RAINFALL (mm)= 63.993
RUNOFF COEFFICIENT = 0.284

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

CALIB
STANDHYD (0301) Area (ha)= 0.35
ID= 1 DT= 5.0 min Total Imp(%)= 50.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.17	0.17
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	8.00
Length (m)=	48.30	13.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	147.65	160.94
over (min)	5.00	5.00
Storage Coeff. (min)=	1.15 (ii)	3.11 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.27

		TOTALS
PEAK FLOW (cms)=	0.00	0.083 (iii)
TIME TO PEAK (hrs)=	1.33	1.33
RUNOFF VOLUME (mm)=	61.99	35.64
TOTAL RAINFALL (mm)=	63.99	63.99
RUNOFF COEFFICIENT =	0.97	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* = 74.0 Ia = Dep. 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 ( 0101):   AREA   QPEAK   TPEAK   R.V.
                  (ha)   (cms)   (hrs)   (mm)
+ ID2= 2 ( 0301):   0.74   0.024   1.75   18.18
                  0.35   0.083   1.33   35.64
=====
ID = 3 ( 0901):   1.09   0.089   1.33   23.79

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

| CALIB |
| NASHYD ( 0102) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 0.55 Curve Number (CN)= 67.0
Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.52

```

Unit Hyd Qpeak (cms)= 0.040

PEAK FLOW (cms)= 0.013 (i)
TIME TO PEAK (hrs)= 2.000
RUNOFF VOLUME (mm)= 16.274
TOTAL RAINFALL (mm)= 63.993
RUNOFF COEFFICIENT = 0.254

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

```

| CALIB |
| STANDHYD ( 0302) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 0.20
Total Imp(%)= 43.00 Dir. Conn.(%)= 0.10

```

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.09	0.11
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	36.51	40.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	147.65	130.25
over (min)	5.00	10.00

Storage Coeff. (min)=	0.97 (ii)	7.32 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.34	0.13

TOTALS

PEAK FLOW (cms)=	0.00	0.03	0.029 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.42
RUNOFF VOLUME (mm)=	61.99	33.36	33.37
TOTAL RAINFALL (mm)=	63.99	63.99	63.99
RUNOFF COEFFICIENT =	0.97	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* = 74.0 Ia = Dep. 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):   0.55   0.013   2.00   16.27
                  0.20   0.029   1.42   33.37
=====
ID = 3 ( 0902):   0.75   0.033   1.42   20.83

```

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

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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:
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6a49e86-b771-4b46-8895-06e0a67c74ad\s

DATE: 02-25-2022

TIME: 04:44:36

USER:

COMMENTS: _____

** SIMULATION : (7) 100 Year Design Storm - C **

CHICAGO STORM
Ptotal= 70.36 mm

IDF curve parameters: A= 811.794
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	6.12	1.17	28.48	2.17	11.52	3.17	6.70
0.33	6.83	1.33	162.35	2.33	10.17	3.33	6.31
0.50	7.80	1.50	34.15	2.50	9.15	3.50	5.97
0.67	9.17	1.67	21.41	2.67	8.35	3.67	5.68
0.83	11.35	1.83	16.30	2.83	7.70	3.83	5.41
1.00	15.49	2.00	13.41	3.00	7.16	4.00	5.17

CALIB
NASHYD (0101)
ID= 1 DT= 5.0 min

Area (ha)= 0.74 Curve Number (CN)= 69.7
Ia (mm)= 9.15 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.39

Unit Hyd Qpeak (cms)= 0.072

PEAK FLOW (cms)= 0.029 (i)
TIME TO PEAK (hrs)= 1.750
RUNOFF VOLUME (mm)= 21.814
TOTAL RAINFALL (mm)= 70.362
RUNOFF COEFFICIENT = 0.310

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

CALIB
STANDHYD (0301)
ID= 1 DT= 5.0 min

Area (ha)= 0.35
Total Imp(%)= 50.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.17	0.17
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	8.00
Length (m)=	48.30	13.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	162.35	186.77
over (min)	5.00	5.00
Storage Coeff. (min)=	1.10 (ii)	2.95 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.28

			TOTALS
PEAK FLOW (cms)=	0.00	0.10	0.097 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.33
RUNOFF VOLUME (mm)=	68.36	40.92	40.95
TOTAL RAINFALL (mm)=	70.36	70.36	70.36
RUNOFF COEFFICIENT =	0.97	0.58	0.58

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 ( 0101):  0.74  0.029  1.75  21.81
+ ID2= 2 ( 0301):  0.35  0.097  1.33  40.95
=====
ID = 3 ( 0901):  1.09  0.104  1.33  27.96

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB
| NASHYD ( 0102)| Area (ha)= 0.55 Curve Number (CN)= 67.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
|-----
| U.H. Tp(hrs)= 0.52

```

Unit Hyd Qpeak (cms)= 0.040

PEAK FLOW (cms)= 0.016 (i)
 TIME TO PEAK (hrs)= 2.000
 RUNOFF VOLUME (mm)= 19.643
 TOTAL RAINFALL (mm)= 70.362
 RUNOFF COEFFICIENT = 0.279

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

```

-----
| CALIB
| STANDHYD ( 0302)| Area (ha)= 0.20
| ID= 1 DT= 5.0 min | Total Imp(%)= 43.00 Dir. Conn.(%)= 0.10
|-----

```

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.09	0.11
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	36.51	40.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	162.35	151.92
over (min)	5.00	10.00
Storage Coeff. (min)=	0.93 (ii)	6.90 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.34	0.14

PEAK FLOW (cms)=	0.00	0.03	*TOTALS*
			0.034 (iii)

TIME TO PEAK (hrs)=	1.33	1.42	1.42
RUNOFF VOLUME (mm)=	68.36	38.48	38.50
TOTAL RAINFALL (mm)=	70.36	70.36	70.36
RUNOFF COEFFICIENT =	0.97	0.55	0.55

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. 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):  0.55  0.016  2.00  19.64
+ ID2= 2 ( 0302):  0.20  0.034  1.42  38.50
=====
ID = 3 ( 0902):  0.75  0.039  1.42  24.67

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS 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  AAAAA L
V  V  I  SS   U  U  A  A  L
VV   I  SSSS  UUUUU A  A  LLLLL

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

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a3da94d-d18f-42c4-a909-5d1f49244ebc\s

DATE: 02-25-2022

TIME: 04:44:36

USER:

COMMENTS: _____

** SIMULATION : (8) Timmins Design Storm **

READ STORM	Filename: C:\Users\KGowanlock\AppData ata\Local\Temp\ a6086671-b0bf-4fff-b250-a32c0506adc7\3c4d485d
Ptotal=193.00 mm	Comments: TIMMINS

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	' hrs	TIME hrs	RAIN mm/hr	TIME hrs	RAIN 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	Area (ha)=	0.74	Curve Number (CN)=	69.7
NASHYD (0101)	Ia (mm)=	9.15	# of Linear Res.(N)=	3.00
ID= 1 DT= 5.0 min	U.H. Tp(hrs)=	0.39		

Unit Hyd Qpeak (cms)= 0.072

PEAK FLOW (cms)= 0.058 (i)
TIME TO PEAK (hrs)= 7.083
RUNOFF VOLUME (mm)= 114.806
TOTAL RAINFALL (mm)= 193.000
RUNOFF COEFFICIENT = 0.595

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

CALIB	Area (ha)=	0.35		
STANDHYD (0301)	Total Imp(%)=	50.00	Dir. Conn.(%)=	0.10
ID= 1 DT= 5.0 min				

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.17	0.17
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	8.00
Length (m)=	48.30	13.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	43.00	78.74
over (min)	5.00	5.00
Storage Coeff. (min)=	1.88 (ii)	4.49 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.32	0.23

			TOTALS
PEAK FLOW (cms)=	0.00	0.04	0.038 (iii)
TIME TO PEAK (hrs)=	6.50	7.00	7.00
RUNOFF VOLUME (mm)=	191.00	154.31	154.34
TOTAL RAINFALL (mm)=	193.00	193.00	193.00
RUNOFF COEFFICIENT =	0.99	0.80	0.80

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 74.0 Ia = Dep. 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 ( 0101):  0.74  0.058  7.08  114.81
+ ID2= 2 ( 0301):  0.35  0.038  7.00  154.34
=====
ID = 3 ( 0901):  1.09  0.095  7.00  127.50

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

| CALIB
| NASHYD ( 0102)| Area (ha)= 0.55 Curve Number (CN)= 67.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
| U.H. Tp(hrs)= 0.52

```

Unit Hyd Qpeak (cms)= 0.040

PEAK FLOW (cms)= 0.037 (i)
TIME TO PEAK (hrs)= 7.167
RUNOFF VOLUME (mm)= 108.686
TOTAL RAINFALL (mm)= 193.000
RUNOFF COEFFICIENT = 0.563

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

```

| CALIB
| STANDHYD ( 0302)| Area (ha)= 0.20
| ID= 1 DT= 5.0 min | Total Imp(%)= 43.00 Dir. Conn.(%)= 0.10

```

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.09	0.11
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	36.51	40.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	43.00	67.77
over (min)	5.00	10.00

Storage Coeff. (min)=	1.59 (ii)	9.83 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.33	0.11

TOTALS

PEAK FLOW (cms)=	0.00	0.02	0.021 (iii)
TIME TO PEAK (hrs)=	6.25	7.00	7.00
RUNOFF VOLUME (mm)=	191.00	149.98	150.00
TOTAL RAINFALL (mm)=	193.00	193.00	193.00
RUNOFF COEFFICIENT =	0.99	0.78	0.78

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

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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):  0.55  0.037  7.17  108.69
+ ID2= 2 ( 0302):  0.20  0.021  7.00  150.00
=====
ID = 3 ( 0902):  0.75  0.057  7.00  119.70

```

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\d640becb-967e-4731-b5f6-00a4892452ca\0
1eb1316-aea3-48a4-86c8-9b1e1d2e5ca3\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\d640becb-967e-4731-b5f6-00a4892452ca\0
1eb1316-aea3-48a4-86c8-9b1e1d2e5ca3\s

DATE: 02-25-2022

TIME: 10:42:09

USER:

COMMENTS: _____

** SIMULATION : (1) 2 Year Design Storm - SCS **

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

| 9c1599e0-5705-4571-9428-977ab3d9d9a7\7793d5b3
| Ptotal= 54.40 mm | Comments: 2yr 24hr 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	6.50	0.98	12.75	7.83	19.00	0.98	
0.50	0.60	6.75	0.98	13.00	4.03	19.25	0.98	
0.75	0.60	7.00	0.98	13.25	4.03	19.50	0.98	
1.00	0.60	7.25	0.98	13.50	2.94	19.75	0.98	
1.25	0.60	7.50	1.20	13.75	2.94	20.00	0.98	
1.50	0.60	7.75	1.20	14.00	2.28	20.25	0.98	
1.75	0.60	8.00	1.20	14.25	2.28	20.50	0.65	
2.00	0.60	8.25	1.20	14.50	1.63	20.75	0.65	
2.25	0.60	8.50	1.41	14.75	1.63	21.00	0.65	
2.50	0.71	8.75	1.41	15.00	1.63	21.25	0.65	
2.75	0.71	9.00	1.52	15.25	1.63	21.50	0.65	
3.00	0.71	9.25	1.52	15.50	1.63	21.75	0.65	
3.25	0.71	9.50	1.74	15.75	1.63	22.00	0.65	
3.50	0.71	9.75	1.74	16.00	1.63	22.25	0.65	
3.75	0.71	10.00	1.96	16.25	1.63	22.50	0.65	
4.00	0.71	10.25	1.96	16.50	0.98	22.75	0.65	
4.25	0.71	10.50	2.50	16.75	0.98	23.00	0.65	
4.50	0.87	10.75	2.50	17.00	0.98	23.25	0.65	
4.75	0.87	11.00	3.37	17.25	0.98	23.50	0.65	
5.00	0.87	11.25	3.37	17.50	0.98	23.75	0.65	
5.25	0.87	11.50	5.22	17.75	0.98	24.00	0.65	
5.50	0.87	11.75	5.22	18.00	0.98	24.25	0.65	
5.75	0.87	12.00	16.10	18.25	0.98			
6.00	0.87	12.25	66.59	18.50	0.98			
6.25	0.87	12.50	7.83	18.75	0.98			

| CALIB |
| NASHYD (0102) | Area (ha)= 0.55 Curve Number (CN)= 67.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.52

Unit Hyd Qpeak (cms)= 0.040

PEAK FLOW (cms)= 0.008 (i)
TIME TO PEAK (hrs)= 12.750
RUNOFF VOLUME (mm)= 11.627
TOTAL RAINFALL (mm)= 54.400
RUNOFF COEFFICIENT = 0.214

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

```

-----
| CALIB |
| STANDHYD ( 0302) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 0.20
Total Imp(%)= 43.00 Dir. Conn.(%)= 0.10

IMPervIOUS PERVIOUS (i)
Surface Area (ha)= 0.09 0.11
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 36.51 40.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 66.59 67.46
over (min) 5.00 10.00
Storage Coeff. (min)= 1.33 (ii) 9.60 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.33 0.11

*TOTALS*
PEAK FLOW (cms)= 0.00 0.02 0.015 (iii)
TIME TO PEAK (hrs)= 12.25 12.25 12.25
RUNOFF VOLUME (mm)= 52.40 25.93 25.93
TOTAL RAINFALL (mm)= 54.40 54.40 54.40
RUNOFF COEFFICIENT = 0.96 0.48 0.48

```

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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): 0.55 0.008 12.75 11.63
+ ID2= 2 ( 0302): 0.20 0.015 12.25 25.93
=====
ID = 3 ( 0902): 0.75 0.019 12.33 15.44

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| STANDHYD ( 0301) |
-----
Area (ha)= 0.35

```

```

| ID= 1 DT= 5.0 min | Total Imp(%)= 50.00 Dir. Conn.(%)= 0.10
-----

```

```

IMPervIOUS PERVIOUS (i)
Surface Area (ha)= 0.17 0.17
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 8.00
Length (m)= 48.30 13.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 66.59 82.50
over (min) 5.00 5.00
Storage Coeff. (min)= 1.58 (ii) 4.14 (ii)
Unit Hyd. Tpeak (min)= 5.00 5.00
Unit Hyd. peak (cms)= 0.33 0.24

*TOTALS*
PEAK FLOW (cms)= 0.00 0.04 0.040 (iii)
TIME TO PEAK (hrs)= 12.25 12.25 12.25
RUNOFF VOLUME (mm)= 52.40 27.89 27.91
TOTAL RAINFALL (mm)= 54.40 54.40 54.40
RUNOFF COEFFICIENT = 0.96 0.51 0.51

```

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 |
| NASHYD ( 0101) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 0.74 Curve Number (CN)= 69.7
Ia (mm)= 9.15 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.39

```

```

Unit Hyd Qpeak (cms)= 0.072

PEAK FLOW (cms)= 0.015 (i)
TIME TO PEAK (hrs)= 12.500
RUNOFF VOLUME (mm)= 13.141
TOTAL RAINFALL (mm)= 54.400
RUNOFF COEFFICIENT = 0.242

```

- (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):  0.74  0.015  12.50  13.14
+ ID2= 2 ( 0301):  0.35  0.040  12.25  27.91
=====
ID = 3 ( 0901):  1.09  0.048  12.25  17.88
-----
```

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
```

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

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

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

Output filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\d640becb-967e-4731-b5f6-00a4892452ca\7
89aeb1-77d2-4b2e-bbb9-2007b1070cfb\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\d640becb-967e-4731-b5f6-00a4892452ca\7
89aeb1-77d2-4b2e-bbb9-2007b1070cfb\s

DATE: 02-25-2022

TIME: 10:42:09

USER:

COMMENTS: _____

** SIMULATION : (2) 5 Year Design Storm - SCS **

```
-----
| READ STORM |
|            |
| Ptotal= 72.10 mm |
|            |
-----
```

Filename: C:\Users\KGowanlock\AppData\Local\Temp\9c1599e0-5705-4571-9428-977ab3d9d9a7\65a105d
Comments: 5yr 24hr 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	6.50	1.30	12.75	10.38	19.00	1.30
0.50	0.79	6.75	1.30	13.00	5.34	19.25	1.30
0.75	0.79	7.00	1.30	13.25	5.34	19.50	1.30
1.00	0.79	7.25	1.30	13.50	3.89	19.75	1.30
1.25	0.79	7.50	1.59	13.75	3.89	20.00	1.30
1.50	0.79	7.75	1.59	14.00	3.03	20.25	1.30
1.75	0.79	8.00	1.59	14.25	3.03	20.50	0.87
2.00	0.79	8.25	1.59	14.50	2.16	20.75	0.87
2.25	0.79	8.50	1.87	14.75	2.16	21.00	0.87
2.50	0.94	8.75	1.87	15.00	2.16	21.25	0.87
2.75	0.94	9.00	2.02	15.25	2.16	21.50	0.87
3.00	0.94	9.25	2.02	15.50	2.16	21.75	0.87
3.25	0.94	9.50	2.31	15.75	2.16	22.00	0.87
3.50	0.94	9.75	2.31	16.00	2.16	22.25	0.87
3.75	0.94	10.00	2.60	16.25	2.16	22.50	0.87
4.00	0.94	10.25	2.60	16.50	1.30	22.75	0.87
4.25	0.94	10.50	3.32	16.75	1.30	23.00	0.87
4.50	1.15	10.75	3.32	17.00	1.30	23.25	0.87
4.75	1.15	11.00	4.47	17.25	1.30	23.50	0.87
5.00	1.15	11.25	4.47	17.50	1.30	23.75	0.87
5.25	1.15	11.50	6.92	17.75	1.30	24.00	0.87
5.50	1.15	11.75	6.92	18.00	1.30	24.25	0.87
5.75	1.15	12.00	21.34	18.25	1.30		
6.00	1.15	12.25	88.25	18.50	1.30		
6.25	1.15	12.50	10.38	18.75	1.30		

```
-----
| CALIB |
| NASHYD ( 0102) |
| ID= 1 DT= 5.0 min |
|-----|
Area (ha)= 0.55 Curve Number (CN)= 67.0
Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.52
```

Unit Hyd Qpeak (cms)= 0.040

PEAK FLOW (cms)= 0.014 (i)
TIME TO PEAK (hrs)= 12.667
RUNOFF VOLUME (mm)= 20.597
TOTAL RAINFALL (mm)= 72.100
RUNOFF COEFFICIENT = 0.286

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

CALIB		STANDHYD (0302)		ID= 1 DT= 5.0 min	
Area (ha)=	0.20	Total Imp(%)=	43.00	Dir. Conn.(%)=	0.10
IMPERVIOUS PERVIOUS (i)					
Surface Area (ha)=	0.09	0.11			
Dep. Storage (mm)=	2.00	5.00			
Average Slope (%)=	2.00	2.00			
Length (m)=	36.51	40.00			
Mannings n =	0.013	0.250			
Max.Eff.Inten.(mm/hr)=	88.25	103.13			
over (min)	5.00	10.00			
Storage Coeff. (min)=	1.19 (ii)	8.16 (ii)			
Unit Hyd. Tpeak (min)=	5.00	10.00			
Unit Hyd. peak (cms)=	0.33	0.13			
TOTALS					
PEAK FLOW (cms)=	0.00	0.02	0.025 (iii)		
TIME TO PEAK (hrs)=	12.25	12.25	12.25		
RUNOFF VOLUME (mm)=	70.10	39.90	39.90		
TOTAL RAINFALL (mm)=	72.10	72.10	72.10		
RUNOFF COEFFICIENT =	0.97	0.55	0.55		

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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):	0.55	0.014	12.67	20.60
+ ID2= 2 (0302):	0.20	0.025	12.25	39.90
=====				
ID = 3 (0902):	0.75	0.032	12.33	25.75

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB		STANDHYD (0301)		ID= 1 DT= 5.0 min	
Area (ha)=	0.35	Total Imp(%)=	50.00	Dir. Conn.(%)=	0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.17	0.17
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	8.00
Length (m)=	48.30	13.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	88.25	124.37
over (min)	5.00	5.00
Storage Coeff. (min)=	1.41 (ii)	3.58 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.33	0.26

		TOTALS	
PEAK FLOW (cms)=	0.00	0.06	0.061 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	70.10	42.39	42.41
TOTAL RAINFALL (mm)=	72.10	72.10	72.10
RUNOFF COEFFICIENT =	0.97	0.59	0.59

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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		NASHYD (0101)		ID= 1 DT= 5.0 min	
Area (ha)=	0.74	Curve Number (CN)=	69.7		
Ia (mm)=	9.15	# of Linear Res.(N)=	3.00		
U.H. Tp(hrs)=	0.39				

Unit Hyd Qpeak (cms)= 0.072

PEAK FLOW (cms)= 0.026 (i)
TIME TO PEAK (hrs)= 12.500
RUNOFF VOLUME (mm)= 22.839
TOTAL RAINFALL (mm)= 72.100
RUNOFF COEFFICIENT = 0.317

(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):    0.74   0.026   12.50   22.84
                   0.35   0.061   12.25   42.41
=====
ID = 3 ( 0901):    1.09   0.076   12.25   29.12
=====
```

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  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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\3
a0ce9c2-c0a9-47c9-b4bd-09c4327b5106\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\3

a0ce9c2-c0a9-47c9-b4bd-09c4327b5106\s

DATE: 02-25-2022

TIME: 10:42:09

USER:

COMMENTS: _____

** SIMULATION : (3) 10 Year Design Storm - SC **

```
-----
| READ STORM |
|            |
| Ptotal= 83.81 mm |
-----
Filename: C:\Users\KGowanlock\AppData\Local\Temp\
          9c1599e0-5705-4571-9428-977ab3d9d9a7\965a2d52
Comments: 10yr 24hr 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	6.50	1.51	12.75	12.07	19.00	1.51
0.50	0.92	6.75	1.51	13.00	6.20	19.25	1.51
0.75	0.92	7.00	1.51	13.25	6.20	19.50	1.51
1.00	0.92	7.25	1.51	13.50	4.53	19.75	1.51
1.25	0.92	7.50	1.84	13.75	4.53	20.00	1.51
1.50	0.92	7.75	1.84	14.00	3.52	20.25	1.51
1.75	0.92	8.00	1.84	14.25	3.52	20.50	1.01
2.00	0.92	8.25	1.84	14.50	2.51	20.75	1.01
2.25	0.92	8.50	2.18	14.75	2.51	21.00	1.01
2.50	1.09	8.75	2.18	15.00	2.51	21.25	1.01
2.75	1.09	9.00	2.35	15.25	2.51	21.50	1.01
3.00	1.09	9.25	2.35	15.50	2.51	21.75	1.01
3.25	1.09	9.50	2.68	15.75	2.51	22.00	1.01
3.50	1.09	9.75	2.68	16.00	2.51	22.25	1.01
3.75	1.09	10.00	3.02	16.25	2.51	22.50	1.01
4.00	1.09	10.25	3.02	16.50	1.51	22.75	1.01
4.25	1.09	10.50	3.86	16.75	1.51	23.00	1.01
4.50	1.34	10.75	3.86	17.00	1.51	23.25	1.01
4.75	1.34	11.00	5.20	17.25	1.51	23.50	1.01
5.00	1.34	11.25	5.20	17.50	1.51	23.75	1.01
5.25	1.34	11.50	8.05	17.75	1.51	24.00	1.01
5.50	1.34	11.75	8.05	18.00	1.51	24.25	1.01
5.75	1.34	12.00	24.81	18.25	1.51		

6.00	1.34	12.25	102.58	18.50	1.51
6.25	1.34	12.50	12.07	18.75	1.51

CALIB			
NASHYD (0102)	Area (ha)=	0.55	Curve Number (CN)= 67.0
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.52	

Unit Hyd Qpeak (cms)= 0.040

PEAK FLOW (cms)= 0.019 (i)
 TIME TO PEAK (hrs)= 12.667
 RUNOFF VOLUME (mm)= 27.385
 TOTAL RAINFALL (mm)= 83.810
 RUNOFF COEFFICIENT = 0.327

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

CALIB			
STANDHYD (0302)	Area (ha)=	0.20	
ID= 1 DT= 5.0 min	Total Imp(%)=	43.00	Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.09	0.11
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	36.51	40.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	102.58	127.81
over (min)	5.00	10.00
Storage Coeff. (min)=	1.12 (ii)	7.52 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.34	0.13

PEAK FLOW (cms)=	0.00	0.03	*TOTALS*
TIME TO PEAK (hrs)=	12.25	12.25	0.032 (iii)
RUNOFF VOLUME (mm)=	81.81	49.70	12.25
TOTAL RAINFALL (mm)=	83.81	83.81	49.71
RUNOFF COEFFICIENT =	0.98	0.59	83.81
			0.59

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. 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):	0.55	0.019	12.67	27.39
+ ID2= 2 (0302):	0.20	0.032	12.25	49.71
ID = 3 (0902):	0.75	0.042	12.33	33.34

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0301)	Area (ha)=	0.35	
ID= 1 DT= 5.0 min	Total Imp(%)=	50.00	Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.17	0.17
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	8.00
Length (m)=	48.30	13.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	102.58	153.07
over (min)	5.00	5.00
Storage Coeff. (min)=	1.33 (ii)	3.33 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.33	0.26

PEAK FLOW (cms)=	0.00	0.07	*TOTALS*
TIME TO PEAK (hrs)=	12.25	12.25	0.075 (iii)
RUNOFF VOLUME (mm)=	81.81	52.48	12.25
TOTAL RAINFALL (mm)=	83.81	83.81	52.50
RUNOFF COEFFICIENT =	0.98	0.63	83.81
			0.63

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. 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 |
| NASHYD ( 0101) | Area (ha)= 0.74 Curve Number (CN)= 69.7
| ID= 1 DT= 5.0 min | Ia (mm)= 9.15 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.39
```

Unit Hyd Qpeak (cms)= 0.072

PEAK FLOW (cms)= 0.035 (i)
TIME TO PEAK (hrs)= 12.500
RUNOFF VOLUME (mm)= 30.095
TOTAL RAINFALL (mm)= 83.810
RUNOFF COEFFICIENT = 0.359

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

```
-----
| ADD HYD ( 0901) |
| 1 + 2 = 3 |
|-----|
ID1= 1 ( 0101): 0.74 0.035 12.50 30.10
+ ID2= 2 ( 0301): 0.35 0.075 12.25 52.50
=====
ID = 3 ( 0901): 1.09 0.096 12.25 37.29
```

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 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 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:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\d640becb-967e-4731-b5f6-00a4892452ca\4d7ddd6-3d51-4ca0-97ae-ba5cfb535653\s

Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\d640becb-967e-4731-b5f6-00a4892452ca\4d7ddd6-3d51-4ca0-97ae-ba5cfb535653\s

DATE: 02-25-2022

TIME: 10:42:09

USER:

COMMENTS: _____

```
-----
*****
** SIMULATION : (4) 25 Year Design Storm - SC **
*****
```

```
-----
| READ STORM | Filename: C:\Users\KGowanlock\AppData\Local\Temp\
| | 9c1599e0-5705-4571-9428-977ab3d9d9a7\7c77deb8
| Ptotal= 98.65 mm | Comments: 25yr 24hr 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	6.50	1.78	12.75	14.21	19.00	1.78
0.50	1.09	6.75	1.78	13.00	7.30	19.25	1.78
0.75	1.09	7.00	1.78	13.25	7.30	19.50	1.78
1.00	1.09	7.25	1.78	13.50	5.33	19.75	1.78
1.25	1.09	7.50	2.17	13.75	5.33	20.00	1.78
1.50	1.09	7.75	2.17	14.00	4.14	20.25	1.78
1.75	1.09	8.00	2.17	14.25	4.14	20.50	1.18
2.00	1.09	8.25	2.17	14.50	2.96	20.75	1.18
2.25	1.09	8.50	2.56	14.75	2.96	21.00	1.18
2.50	1.28	8.75	2.56	15.00	2.96	21.25	1.18
2.75	1.28	9.00	2.76	15.25	2.96	21.50	1.18
3.00	1.28	9.25	2.76	15.50	2.96	21.75	1.18

3.25	1.28	9.50	3.16	15.75	2.96	22.00	1.18
3.50	1.28	9.75	3.16	16.00	2.96	22.25	1.18
3.75	1.28	10.00	3.55	16.25	2.96	22.50	1.18
4.00	1.28	10.25	3.55	16.50	1.78	22.75	1.18
4.25	1.28	10.50	4.54	16.75	1.78	23.00	1.18
4.50	1.58	10.75	4.54	17.00	1.78	23.25	1.18
4.75	1.58	11.00	6.12	17.25	1.78	23.50	1.18
5.00	1.58	11.25	6.12	17.50	1.78	23.75	1.18
5.25	1.58	11.50	9.47	17.75	1.78	24.00	1.18
5.50	1.58	11.75	9.47	18.00	1.78	24.25	1.18
5.75	1.58	12.00	29.20	18.25	1.78		
6.00	1.58	12.25	120.75	18.50	1.78		
6.25	1.58	12.50	14.21	18.75	1.78		

CALIB			
NASHYD (0102)			
ID= 1 DT= 5.0 min		Area (ha)= 0.55	Curve Number (CN)= 67.0
		Ia (mm)= 10.00	# of Linear Res.(N)= 3.00
		U.H. Tp(hrs)= 0.52	

Unit Hyd Qpeak (cms)= 0.040

PEAK FLOW (cms)= 0.026 (i)
TIME TO PEAK (hrs)= 12.667
RUNOFF VOLUME (mm)= 36.762
TOTAL RAINFALL (mm)= 98.650
RUNOFF COEFFICIENT = 0.373

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

CALIB			
STANDHYD (0302)			
ID= 1 DT= 5.0 min		Area (ha)= 0.20	
		Total Imp(%)= 43.00	Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.09	0.11
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	36.51	40.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	120.75	159.82
over (min)	5.00	10.00
Storage Coeff. (min)=	1.05 (ii)	6.90 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.34	0.14

TOTALS			
PEAK FLOW (cms)=	0.00	0.04	0.041 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	96.65	62.55	62.57
TOTAL RAINFALL (mm)=	98.65	98.65	98.65
RUNOFF COEFFICIENT =	0.98	0.63	0.63

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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):		0.55	0.026	12.67
+ ID2= 2 (0302):		0.20	0.041	12.25
				62.57
=====				
ID = 3 (0902):		0.75	0.055	12.33
				43.64

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0301)			
ID= 1 DT= 5.0 min		Area (ha)= 0.35	
		Total Imp(%)= 50.00	Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.17	0.17
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	8.00
Length (m)=	48.30	13.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	120.75	190.08
over (min)	5.00	5.00
Storage Coeff. (min)=	1.24 (ii)	3.08 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.33	0.27

TOTALS			
PEAK FLOW (cms)=	0.00	0.09	0.093 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25

RUNOFF VOLUME (mm)= 96.65 65.65 65.68
TOTAL RAINFALL (mm)= 98.65 98.65 98.65
RUNOFF COEFFICIENT = 0.98 0.67 0.67

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 |
| NASHYD (0101) | Area (ha)= 0.74 Curve Number (CN)= 69.7
| ID= 1 DT= 5.0 min | Ia (mm)= 9.15 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.39

Unit Hyd Qpeak (cms)= 0.072

PEAK FLOW (cms)= 0.048 (i)
TIME TO PEAK (hrs)= 12.500
RUNOFF VOLUME (mm)= 40.040
TOTAL RAINFALL (mm)= 98.650
RUNOFF COEFFICIENT = 0.406

(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): 0.74 0.048 12.50 40.04
+ ID2= 2 (0301): 0.35 0.093 12.25 65.68
=====

ID = 3 (0901): 1.09 0.122 12.25 48.27

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

=====

V	V	I	SSSSS	U	U	A	L	
V	V	I	SS	U	U	A	A	L
V	V	I	SS	U	U	AAAAA	L	

(v 6.1.2001)

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\d640becb-967e-4731-b5f6-00a4892452ca\efb662b4-1edd-432a-810d-c2eed9babf0a\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\d640becb-967e-4731-b5f6-00a4892452ca\efb662b4-1edd-432a-810d-c2eed9babf0a\s

DATE: 02-25-2022

TIME: 10:42:09

USER:

COMMENTS: _____

** SIMULATION : (5) 50 Year Design Storm - SC **

| READ STORM | Filename: C:\Users\KGowanlock\AppData\Local\Temp\
| | 9c1599e0-5705-4571-9428-977ab3d9d9a7\ee650115
| Ptotal=109.84 mm | Comments: 50yr 24hr 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	6.50	1.98	12.75	15.82	19.00	1.98

0.50	1.21	6.75	1.98	13.00	8.13	19.25	1.98
0.75	1.21	7.00	1.98	13.25	8.13	19.50	1.98
1.00	1.21	7.25	1.98	13.50	5.93	19.75	1.98
1.25	1.21	7.50	2.42	13.75	5.93	20.00	1.98
1.50	1.21	7.75	2.42	14.00	4.61	20.25	1.98
1.75	1.21	8.00	2.42	14.25	4.61	20.50	1.32
2.00	1.21	8.25	2.42	14.50	3.30	20.75	1.32
2.25	1.21	8.50	2.86	14.75	3.30	21.00	1.32
2.50	1.43	8.75	2.86	15.00	3.30	21.25	1.32
2.75	1.43	9.00	3.08	15.25	3.30	21.50	1.32
3.00	1.43	9.25	3.08	15.50	3.30	21.75	1.32
3.25	1.43	9.50	3.51	15.75	3.30	22.00	1.32
3.50	1.43	9.75	3.51	16.00	3.30	22.25	1.32
3.75	1.43	10.00	3.95	16.25	3.30	22.50	1.32
4.00	1.43	10.25	3.95	16.50	1.98	22.75	1.32
4.25	1.43	10.50	5.05	16.75	1.98	23.00	1.32
4.50	1.76	10.75	5.05	17.00	1.98	23.25	1.32
4.75	1.76	11.00	6.81	17.25	1.98	23.50	1.32
5.00	1.76	11.25	6.81	17.50	1.98	23.75	1.32
5.25	1.76	11.50	10.54	17.75	1.98	24.00	1.32
5.50	1.76	11.75	10.54	18.00	1.98	24.25	1.32
5.75	1.76	12.00	32.51	18.25	1.98		
6.00	1.76	12.25	134.44	18.50	1.98		
6.25	1.76	12.50	15.82	18.75	1.98		

CALIB			
NASHYD (0102)	Area (ha)= 0.55	Curve Number (CN)= 67.0	
ID= 1 DT= 5.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.52		

Unit Hyd Qpeak (cms)= 0.040

PEAK FLOW (cms)= 0.032 (i)
TIME TO PEAK (hrs)= 12.667
RUNOFF VOLUME (mm)= 44.310
TOTAL RAINFALL (mm)= 109.840
RUNOFF COEFFICIENT = 0.403

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

CALIB			
STANDHYD (0302)	Area (ha)= 0.20		
ID= 1 DT= 5.0 min	Total Imp(%)= 43.00	Dir. Conn.(%)= 0.10	

IMPERVIOUS PERVIOUS (i)

Surface Area (ha)=	0.09	0.11
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	36.51	40.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	134.44	184.31
over (min)	5.00	10.00
Storage Coeff. (min)=	1.01 (ii)	6.53 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.34	0.14
PEAK FLOW (cms)=	0.00	0.05
TIME TO PEAK (hrs)=	12.25	12.25
RUNOFF VOLUME (mm)=	107.84	72.49
TOTAL RAINFALL (mm)=	109.84	109.84
RUNOFF COEFFICIENT =	0.98	0.66

TOTALS

0.049 (iii)
12.25
72.51
109.84
0.66

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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):	0.55	0.032	12.67	44.31
+ ID2= 2 (0302):	0.20	0.049	12.25	72.51
ID = 3 (0902):	0.75	0.064	12.33	51.83

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0301)	Area (ha)= 0.35		
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00	Dir. Conn.(%)= 0.10	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.17	0.17
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	8.00

Length (m)= 48.30 13.00
Mannings n = 0.013 0.250
Max.Eff.Inten.(mm/hr)= 134.44 218.28
over (min) 5.00 5.00
Storage Coeff. (min)= 1.19 (ii) 2.93 (ii)
Unit Hyd. Tpeak (min)= 5.00 5.00
Unit Hyd. peak (cms)= 0.33 0.28
TOTALS
PEAK FLOW (cms)= 0.00 0.11 0.107 (iii)
TIME TO PEAK (hrs)= 12.25 12.25 12.25
RUNOFF VOLUME (mm)= 107.84 75.80 75.82
TOTAL RAINFALL (mm)= 109.84 109.84 109.84
RUNOFF COEFFICIENT = 0.98 0.69 0.69

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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
NASHYD (0101) | Area (ha)= 0.74 Curve Number (CN)= 69.7
ID= 1 DT= 5.0 min | Ia (mm)= 9.15 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.39

Unit Hyd Qpeak (cms)= 0.072

PEAK FLOW (cms)= 0.057 (i)
TIME TO PEAK (hrs)= 12.500
RUNOFF VOLUME (mm)= 47.994
TOTAL RAINFALL (mm)= 109.840
RUNOFF COEFFICIENT = 0.437

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

ADD HYD (0901) |
1 + 2 = 3 |
ID1= 1 (0101): 0.74 0.057 12.50 47.99
+ ID2= 2 (0301): 0.35 0.107 12.25 75.82

=====

ID = 3 (0901): 1.09 0.142 12.25 56.93

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 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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414f2bd-3a31-4910-a0be-4653217bf096\s

DATE: 02-25-2022

TIME: 10:42:09

USER:

COMMENTS: _____

** SIMULATION : (6) 100 Year Design Storm - S **

READ STORM
 Ptotal=120.77 mm
 Filename: C:\Users\KGowanlock\AppData\Local\Temp\9c1599e0-5705-4571-9428-977ab3d9d9a7\3c054a99
 Comments: 100yr 24hr 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	6.50	2.17	12.75	17.39	19.00	2.17
0.50	1.33	6.75	2.17	13.00	8.94	19.25	2.17
0.75	1.33	7.00	2.17	13.25	8.94	19.50	2.17
1.00	1.33	7.25	2.17	13.50	6.52	19.75	2.17
1.25	1.33	7.50	2.66	13.75	6.52	20.00	2.17
1.50	1.33	7.75	2.66	14.00	5.07	20.25	2.17
1.75	1.33	8.00	2.66	14.25	5.07	20.50	1.45
2.00	1.33	8.25	2.66	14.50	3.62	20.75	1.45
2.25	1.33	8.50	3.14	14.75	3.62	21.00	1.45
2.50	1.57	8.75	3.14	15.00	3.62	21.25	1.45
2.75	1.57	9.00	3.38	15.25	3.62	21.50	1.45
3.00	1.57	9.25	3.38	15.50	3.62	21.75	1.45
3.25	1.57	9.50	3.86	15.75	3.62	22.00	1.45
3.50	1.57	9.75	3.86	16.00	3.62	22.25	1.45
3.75	1.57	10.00	4.35	16.25	3.62	22.50	1.45
4.00	1.57	10.25	4.35	16.50	2.17	22.75	1.45
4.25	1.57	10.50	5.56	16.75	2.17	23.00	1.45
4.50	1.93	10.75	5.56	17.00	2.17	23.25	1.45
4.75	1.93	11.00	7.49	17.25	2.17	23.50	1.45
5.00	1.93	11.25	7.49	17.50	2.17	23.75	1.45
5.25	1.93	11.50	11.59	17.75	2.17	24.00	1.45
5.50	1.93	11.75	11.59	18.00	2.17	24.25	1.45
5.75	1.93	12.00	35.75	18.25	2.17		
6.00	1.93	12.25	147.82	18.50	2.17		
6.25	1.93	12.50	17.39	18.75	2.17		

CALIB
 NASHYD (0102)
 ID= 1 DT= 5.0 min
 Area (ha)= 0.55
 Curve Number (CN)= 67.0
 Ia (mm)= 10.00
 # of Linear Res.(N)= 3.00
 U.H. Tp(hrs)= 0.52

Unit Hyd Qpeak (cms)= 0.040
 PEAK FLOW (cms)= 0.037 (i)
 TIME TO PEAK (hrs)= 12.667
 RUNOFF VOLUME (mm)= 52.015
 TOTAL RAINFALL (mm)= 120.770

RUNOFF COEFFICIENT = 0.431

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

CALIB
 STANDHYD (0302)
 ID= 1 DT= 5.0 min
 Area (ha)= 0.20
 Total Imp(%)= 43.00
 Dir. Conn.(%)= 0.10

IMPERVIOUS
 Surface Area (ha)= 0.09
 Dep. Storage (mm)= 2.00
 Average Slope (%)= 2.00
 Length (m)= 36.51
 Mannings n = 0.013
 PERVIOUS (i)
 0.11
 5.00
 2.00
 40.00
 0.250

Max.Eff.Inten.(mm/hr)= 147.82
 over (min)= 5.00
 Storage Coeff. (min)= 0.97 (ii)
 Unit Hyd. Tpeak (min)= 5.00
 Unit Hyd. peak (cms)= 0.34
 208.43
 10.00
 6.23 (ii)
 10.00
 0.15

TOTALS
 PEAK FLOW (cms)= 0.00
 TIME TO PEAK (hrs)= 12.25
 RUNOFF VOLUME (mm)= 118.77
 TOTAL RAINFALL (mm)= 120.77
 RUNOFF COEFFICIENT = 0.98
 0.06
 12.25
 82.35
 120.77
 0.68
 0.056 (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* = 74.0 Ia = Dep. 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): 0.55 0.037 12.67 52.01
 + ID2= 2 (0302): 0.20 0.056 12.25 82.38
 ID = 3 (0902): 0.75 0.074 12.33 60.11

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| CALIB |
| STANDHYD ( 0301) | Area (ha)= 0.35
| ID= 1 DT= 5.0 min | Total Imp(%)= 50.00 Dir. Conn.(%)= 0.10
-----

          IMPERVIOUS    PERVIOUS (i)
Surface Area (ha)=      0.17      0.17
Dep. Storage (mm)=      2.00      5.00
Average Slope (%)=      2.00      8.00
Length (m)=      48.30      13.00
Mannings n =      0.013      0.250

Max.Eff.Inten.(mm/hr)= 147.82      245.96
over (min) =      5.00      5.00
Storage Coeff. (min)= 1.15 (ii)      2.80 (ii)
Unit Hyd. Tpeak (min)= 5.00      5.00
Unit Hyd. peak (cms)= 0.34      0.28

          *TOTALS*
PEAK FLOW (cms)=      0.00      0.12      0.121 (iii)
TIME TO PEAK (hrs)= 12.25      12.25      12.25
RUNOFF VOLUME (mm)= 118.77      85.85      85.87
TOTAL RAINFALL (mm)= 120.77      120.77      120.77
RUNOFF COEFFICIENT = 0.98      0.71      0.71
```

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

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 74.0 Ia = Dep. 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 |
| NASHYD ( 0101) | Area (ha)= 0.74 Curve Number (CN)= 69.7
| ID= 1 DT= 5.0 min | Ia (mm)= 9.15 # of Linear Res.(N)= 3.00
-----
U.H. Tp(hrs)= 0.39
```

Unit Hyd Qpeak (cms)= 0.072

PEAK FLOW (cms)= 0.067 (i)

TIME TO PEAK (hrs)= 12.500

RUNOFF VOLUME (mm)= 56.076

TOTAL RAINFALL (mm)= 120.770

RUNOFF COEFFICIENT = 0.464

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

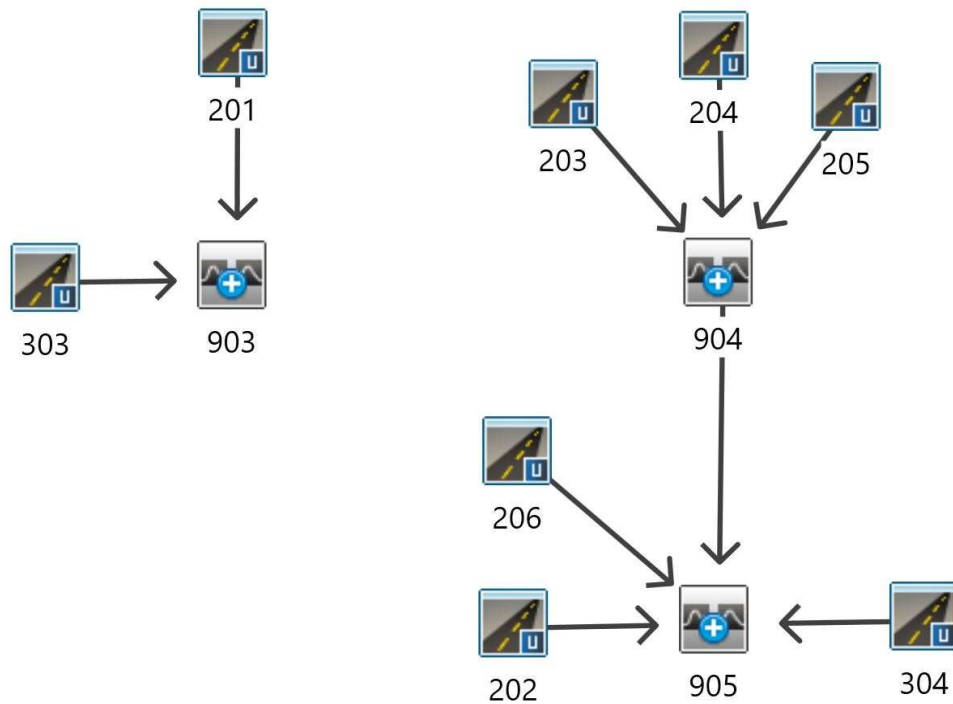
```
-----
| ADD HYD ( 0901) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
----- (ha) (cms) (hrs) (mm)
ID1= 1 ( 0101): 0.74 0.067 12.50 56.08
+ ID2= 2 ( 0301): 0.35 0.121 12.25 85.87
=====
ID = 3 ( 0901): 1.09 0.163 12.25 65.64
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

FINISH

Appendix B: Post-Development SWM Calculations

CRANBERRY MARSH ESTATES
PROPOSED CONDITIONS



Nashyd



Route Pipe



Duhyd



Standhyd



Route Channel



Diverthyd



Addhyd



Route Reservoir



Project: Cranberry Marsh Estates

File No.: 120181

Subject: Otthymo Flow Schematic

Date: Dec-22

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Cranberry Marsh Estates	120181
-------------------------	--------

Data Sources

Detailed Soil Survey Reports for Ontario, NVCA Stormwater Technical Guide (2013), MTO Drainage Management Manual (1997)

Prepared By

Kyle Gowanlock	Dec 2022
----------------	----------

Post Development Condition

Watershed:	NVCA
Catchment ID:	201
Catchment Area (ha):	0.13
Impervious %:	45%
Pervious Area (ha):	0.07

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

Soil Symbol	Pal								
Soil Series	Parkhill								
Hydrologic Soils Group	BC								
Soil Texture	Loam or Silt Loam								
Runoff Coefficient Type	2								
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		67						
Pasture/Lawns	5	0.07	74						
Meadows	8		71						
Cultivated	7		78						
Waterbody	12		50						
Average CN	74.00								
Average IA	5.00								

Notes

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

Summary

Catchment CN:	74.0
Catchment IA (mm):	5.00

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Cranberry Marsh Estates	120181
-------------------------	--------

Data Sources

Detailed Soil Survey Reports for Ontario, NVCA Stormwater Technical Guide (2013), MTO Drainage Management Manual (1997)

Prepared By

Kyle Gowanlock	Dec 2022
----------------	----------

Post Development Condition

Watershed:	NVCA
Catchment ID:	202
Catchment Area (ha):	0.35
Impervious %:	26%
Pervious Area (ha):	0.26

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

Soil Symbol	Pal								
Soil Series	Parkhill								
Hydrologic Soils Group	BC								
Soil Texture	Loam or Silt Loam								
Runoff Coefficient Type	2								
Area (ha)	0.26								
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		67						
Pasture/Lawns	5	0.26	74						
Meadows	8		71						
Cultivated	7		78						
Waterbody	12		50						
Average CN	74.00								
Average IA	5.00								

Notes

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

Summary

Catchment CN:	74.0
Catchment IA (mm):	5.00

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Cranberry Marsh Estates	120181
-------------------------	--------

Data Sources

Detailed Soil Survey Reports for Ontario, NVCA Stormwater Technical Guide (2013), MTO Drainage Management Manual (1997)

Prepared By

Kyle Gowanlock	Dec 2022
----------------	----------

Post Development Condition

Watershed:	NVCA
Catchment ID:	203
Catchment Area (ha):	0.08
Impervious %:	69%
Pervious Area (ha):	0.02

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

Soil Symbol	Pal								
Soil Series	Parkhill								
Hydrologic Soils Group	BC								
Soil Texture	Loam or Silt Loam								
Runoff Coefficient Type	2								
Area (ha)	0.02								
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		67						
Pasture/Lawns	5	0.02	74						
Meadows	8		71						
Cultivated	7		78						
Waterbody	12		50						
Average CN	74.00								
Average IA	5.00								

Notes

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

Summary

Catchment CN:	74.0
Catchment IA (mm):	5.00

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Cranberry Marsh Estates	120181
-------------------------	--------

Data Sources

Detailed Soil Survey Reports for Ontario, NVCA Stormwater Technical Guide (2013), MTO Drainage Management Manual (1997)

Prepared By

Kyle Gowanlock	Dec 2022
----------------	----------

Post Development Condition

Watershed:	NVCA
Catchment ID:	204
Catchment Area (ha):	0.24
Impervious %:	65%
Pervious Area (ha):	0.08

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

Soil Symbol	Pal								
Soil Series	Parkhill								
Hydrologic Soils Group	BC								
Soil Texture	Loam or Silt Loam								
Runoff Coefficient Type	2								
Area (ha)	0.08								
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		67						
Pasture/Lawns	5	0.08	74						
Meadows	8		71						
Cultivated	7		78						
Waterbody	12		50						
Average CN	74.00								
Average IA	5.00								

Notes

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

Summary

Catchment CN:	74.0
Catchment IA (mm):	5.00

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Cranberry Marsh Estates	120181
-------------------------	--------

Data Sources

Detailed Soil Survey Reports for Ontario, NVCA Stormwater Technical Guide (2013), MTO Drainage Management Manual (1997)

Prepared By

Kyle Gowanlock	Dec 2022
----------------	----------

Post Development Condition

Watershed:	NVCA
Catchment ID:	205
Catchment Area (ha):	0.23
Impervious %:	64%
Pervious Area (ha):	0.08

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

Soil Symbol	Pal								
Soil Series	Parkhill								
Hydrologic Soils Group	BC								
Soil Texture	Loam or Silt Loam								
Runoff Coefficient Type	2								
Area (ha)	0.08								
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		67						
Pasture/Lawns	5	0.08	74						
Meadows	8		71						
Cultivated	7		78						
Waterbody	12		50						
Average CN	74.00								
Average IA	5.00								

Notes

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

Summary

Catchment CN:	74.0
Catchment IA (mm):	5.00

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Cranberry Marsh Estates	120181
-------------------------	--------

Data Sources

Detailed Soil Survey Reports for Ontario, NVCA Stormwater Technical Guide (2013), MTO Drainage Management Manual (1997)

Prepared By

Kyle Gowanlock	Dec 2022
----------------	----------

Post Development Condition

Watershed:	NVCA
Catchment ID:	206
Catchment Area (ha):	0.22
Impervious %:	30%
Pervious Area (ha):	0.15

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

Soil Symbol	Pal								
Soil Series	Parkhill								
Hydrologic Soils Group	BC								
Soil Texture	Loam or Silt Loam								
Runoff Coefficient Type	2								
Area (ha)	0.15								
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		67						
Pasture/Lawns	5	0.15	74						
Meadows	8		71						
Cultivated	7		78						
Waterbody	12		50						
Average CN	74.00								
Average IA	5.00								

Notes

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

Summary

Catchment CN:	74.0
Catchment IA (mm):	5.00

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Cranberry Marsh Estates	120181
-------------------------	--------

Data Sources

Detailed Soil Survey Reports for Ontario, NVCA Stormwater Technical Guide (2013), MTO Drainage Management Manual (1997)

Prepared By

Kyle Gowanlock	Dec 2022
----------------	----------

Post Development Condition

Watershed:	NVCA
Catchment ID:	303
Catchment Area (ha):	0.19
Impervious %:	58%
Pervious Area (ha):	0.08

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

Soil Symbol	Pal								
Soil Series	Parkhill								
Hydrologic Soils Group	BC								
Soil Texture	Loam or Silt Loam								
Runoff Coefficient Type	2								
Area (ha)	0.08								
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		67						
Pasture/Lawns	5	0.08	74						
Meadows	8		71						
Cultivated	7		78						
Waterbody	12		50						
Average CN	74.00								
Average IA	5.00								

Notes

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

Summary

Catchment CN:	74.0
Catchment IA (mm):	5.00

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Cranberry Marsh Estates	120181
-------------------------	--------

Data Sources

Detailed Soil Survey Reports for Ontario, NVCA Stormwater Technical Guide (2013), MTO Drainage Management Manual (1997)

Prepared By

Kyle Gowanlock	Dec 2022
----------------	----------

Post Development Condition

Watershed:	NVCA
Catchment ID:	304
Catchment Area (ha):	0.37
Impervious %:	43%
Pervious Area (ha):	0.21

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

Soil Symbol	Pal								
Soil Series	Parkhill								
Hydrologic Soils Group	BC								
Soil Texture	Loam or Silt Loam								
Runoff Coefficient Type	2								
Area (ha)	0.21								
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		67						
Pasture/Lawns	5	0.21	74						
Meadows	8		71						
Cultivated	7		78						
Waterbody	12		50						
Average CN	74.00								
Average IA	5.00								

Notes

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

Summary

Catchment CN:	74.0
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 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 *****

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Summary filename:
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DATE: 03-01-2022 TIME: 09:50:44

USER:

COMMENTS: _____

** SIMULATION : (1) 25mm Design Storm **

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| 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 |
| STANDHYD (0201) | Area (ha)= 0.13
| ID= 1 DT= 5.0 min | Total Imp(%)= 45.00 Dir. Conn.(%)= 0.10

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.06 0.07
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 5.00
Length (m)= 29.44 8.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 72.58 29.80
over (min) 5.00 5.00
Storage Coeff. (min)= 1.13 (ii) 4.45 (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 0.006 (iii)
TIME TO PEAK (hrs)= 2.00 2.00 2.00
RUNOFF VOLUME (mm)= 22.95 6.91 6.90
TOTAL RAINFALL (mm)= 24.95 24.95 24.95
RUNOFF COEFFICIENT = 0.92 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* = 74.0 Ia = Dep. 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)= 0.19		
ID= 1 DT= 5.0 min	Total Imp(%)= 53.00	Dir. Conn.(%)= 0.10	
	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	0.10	0.09	
Dep. Storage (mm)=	2.00	5.00	
Average Slope (%)=	2.00	8.00	
Length (m)=	35.59	13.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	72.58	40.00	
over (min)	5.00	5.00	
Storage Coeff. (min)=	1.27 (ii)	4.69 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.33	0.22	
			TOTALS
PEAK FLOW (cms)=	0.00	0.01	0.010 (iii)
TIME TO PEAK (hrs)=	2.00	2.00	2.00
RUNOFF VOLUME (mm)=	22.95	7.91	7.91
TOTAL RAINFALL (mm)=	24.95	24.95	24.95
RUNOFF COEFFICIENT =	0.92	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* = 74.0 Ia = Dep. 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 (0201):	0.13	0.006	2.00	6.90
+ ID2= 2 (0303):	0.19	0.010	2.00	7.91
ID = 3 (0903):	0.32	0.016	2.00	7.50

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0206)	Area (ha)= 0.22		
ID= 1 DT= 5.0 min	Total Imp(%)= 30.00	Dir. Conn.(%)= 21.00	

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	0.07	0.15	
Dep. Storage (mm)=	2.00	5.00	
Average Slope (%)=	2.00	1.00	
Length (m)=	38.30	20.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	72.58	9.10	
over (min)	5.00	20.00	
Storage Coeff. (min)=	1.33 (ii)	16.28 (ii)	
Unit Hyd. Tpeak (min)=	5.00	20.00	
Unit Hyd. peak (cms)=	0.33	0.06	
			TOTALS
PEAK FLOW (cms)=	0.01	0.00	0.010 (iii)
TIME TO PEAK (hrs)=	2.00	2.33	2.00
RUNOFF VOLUME (mm)=	22.95	4.23	8.11
TOTAL RAINFALL (mm)=	24.95	24.95	24.95
RUNOFF COEFFICIENT =	0.92	0.17	0.33

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0202)	Area (ha)= 0.35		
ID= 1 DT= 5.0 min	Total Imp(%)= 26.00	Dir. Conn.(%)= 20.00	

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	0.09	0.26	
Dep. Storage (mm)=	2.00	5.00	
Average Slope (%)=	2.00	5.00	
Length (m)=	48.30	8.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	72.58	10.11	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.52 (ii)	5.44 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	

Unit Hyd. peak (cms)=	0.33	0.16	
PEAK FLOW (cms)=	0.01	0.01	*TOTALS*
TIME TO PEAK (hrs)=	2.00	2.08	0.017 (iii)
RUNOFF VOLUME (mm)=	22.95	4.02	2.00
TOTAL RAINFALL (mm)=	24.95	24.95	7.80
RUNOFF COEFFICIENT =	0.92	0.16	24.95
			0.31

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. 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 (0304)	Area (ha)= 0.37		
ID= 1 DT= 5.0 min	Total Imp(%)= 39.00	Dir. Conn.(%)= 0.10	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.14	0.23
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	49.67	40.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	72.58	19.65
over (min)	5.00	20.00
Storage Coeff. (min)=	1.55 (ii)	15.08 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.33	0.07

PEAK FLOW (cms)=	0.00	0.01	*TOTALS*
TIME TO PEAK (hrs)=	2.00	2.25	0.008 (iii)
RUNOFF VOLUME (mm)=	22.95	6.28	2.25
TOTAL RAINFALL (mm)=	24.95	24.95	6.27
RUNOFF COEFFICIENT =	0.92	0.25	24.95
			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* = 74.0 Ia = Dep. 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)= 0.08		
ID= 1 DT= 5.0 min	Total Imp(%)= 69.00	Dir. Conn.(%)= 38.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.06	0.02
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	23.09	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	72.58	35.74
over (min)	5.00	5.00
Storage Coeff. (min)=	0.98 (ii)	3.79 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.25

PEAK FLOW (cms)=	0.01	0.00	*TOTALS*
TIME TO PEAK (hrs)=	2.00	2.00	0.009 (iii)
RUNOFF VOLUME (mm)=	22.95	7.51	2.00
TOTAL RAINFALL (mm)=	24.95	24.95	13.37
RUNOFF COEFFICIENT =	0.92	0.30	24.95
			0.54

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. 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 (0204)	Area (ha)= 0.24		
ID= 1 DT= 5.0 min	Total Imp(%)= 65.00	Dir. Conn.(%)= 36.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.16	0.08
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	40.00	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	72.58	30.18
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over (min)	5.00	5.00
Storage Coeff. (min)=	1.36 (ii)	4.38 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.33	0.23

TOTALS			
PEAK FLOW (cms)=	0.02	0.01	0.024 (iii)
TIME TO PEAK (hrs)=	2.00	2.00	2.00
RUNOFF VOLUME (mm)=	22.95	6.95	12.69
TOTAL RAINFALL (mm)=	24.95	24.95	24.95
RUNOFF COEFFICIENT =	0.92	0.28	0.51

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0205)	Area (ha)= 0.23		
ID= 1 DT= 5.0 min	Total Imp(%)= 64.00	Dir. Conn.(%)= 37.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.15	0.08
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	39.16	8.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	72.58	27.73
over (min)	5.00	5.00
Storage Coeff. (min)=	1.34 (ii)	4.37 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.33	0.23

TOTALS			
PEAK FLOW (cms)=	0.02	0.01	0.023 (iii)
TIME TO PEAK (hrs)=	2.00	2.00	2.00
RUNOFF VOLUME (mm)=	22.95	6.68	12.68
TOTAL RAINFALL (mm)=	24.95	24.95	24.95
RUNOFF COEFFICIENT =	0.92	0.27	0.51

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0904)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0203):	0.08	0.009	2.00	13.37
+ ID2= 2 (0204):	0.24	0.024	2.00	12.69
=====				
ID = 3 (0904):	0.32	0.033	2.00	12.86

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0904)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0904):	0.32	0.033	2.00	12.86
+ ID2= 2 (0205):	0.23	0.023	2.00	12.68
=====				
ID = 1 (0904):	0.55	0.057	2.00	12.79

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0905)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0202):	0.35	0.017	2.00	7.80
+ ID2= 2 (0206):	0.22	0.010	2.00	8.11
=====				
ID = 3 (0905):	0.57	0.027	2.00	7.92

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0905)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0905):	0.57	0.027	2.00	7.92
+ ID2= 2 (0304):	0.37	0.008	2.25	6.27
=====				
ID = 1 (0905):	0.94	0.029	2.00	7.27

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0905)|
| 1 + 2 = 3 |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0905):	0.94	0.029	2.00	7.27
+ ID2= 2 (0904):	0.55	0.057	2.00	12.79
=====				
ID = 3 (0905):	1.49	0.086	2.00	9.31

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

=====

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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			
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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\d640becb-967e-4731-b5f6-00a4892452ca\5cae7f1d-05aa-4631-82ae-cced436706ed\s

Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\d640becb-967e-4731-b5f6-00a4892452ca\5cae7f1d-05aa-4631-82ae-cced436706ed\s

DATE: 03-01-2022 TIME: 09:50:44

USER:

COMMENTS: _____

** SIMULATION : (2) 2 Year Design Storm - 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	
STANDHYD (0201)	Area (ha)= 0.13
ID= 1 DT= 5.0 min	Total Imp(%)= 45.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.06	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	5.00
Length (m)=	29.44	8.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	73.13	39.31
over (min)	5.00	5.00
Storage Coeff. (min)=	1.13 (ii)	4.09 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.24

PEAK FLOW (cms)=	0.00	0.01	*TOTALS*
TIME TO PEAK (hrs)=	1.33	1.33	0.008 (iii)
			1.33

RUNOFF VOLUME (mm)=	29.69	10.73	10.73
TOTAL RAINFALL (mm)=	31.69	31.69	31.69
RUNOFF COEFFICIENT =	0.94	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* = 74.0 Ia = Dep. 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)= 0.19		
ID= 1 DT= 5.0 min	Total Imp(%)= 53.00	Dir. Conn.(%)= 0.10	

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	0.10	0.09	
Dep. Storage (mm)=	2.00	5.00	
Average Slope (%)=	2.00	8.00	
Length (m)=	35.59	13.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	73.13	53.20	
over (min)	5.00	5.00	
Storage Coeff. (min)=	1.27 (ii)	4.32 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.33	0.23	
			TOTALS
PEAK FLOW (cms)=	0.00	0.01	0.013 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.33
RUNOFF VOLUME (mm)=	29.69	12.07	12.07
TOTAL RAINFALL (mm)=	31.69	31.69	31.69
RUNOFF COEFFICIENT =	0.94	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* = 74.0 Ia = Dep. 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 (0201):	0.13	0.008	1.33	10.73
+ ID2= 2 (0303):	0.19	0.013	1.33	12.07
ID = 3 (0903):	0.32	0.022	1.33	11.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0206)	Area (ha)= 0.22		
ID= 1 DT= 5.0 min	Total Imp(%)= 30.00	Dir. Conn.(%)= 21.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.07	0.15
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	1.00
Length (m)=	38.30	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	73.13	11.17
over (min)	5.00	20.00
Storage Coeff. (min)=	1.32 (ii)	15.10 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.33	0.07

			TOTALS
PEAK FLOW (cms)=	0.01	0.00	0.010 (iii)
TIME TO PEAK (hrs)=	1.33	1.58	1.33
RUNOFF VOLUME (mm)=	29.69	6.99	11.71
TOTAL RAINFALL (mm)=	31.69	31.69	31.69
RUNOFF COEFFICIENT =	0.94	0.22	0.37

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. 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 (0202)	Area (ha)= 0.35		
ID= 1 DT= 5.0 min	Total Imp(%)= 26.00	Dir. Conn.(%)= 20.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.09	0.26
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	2.00	5.00
Length	(m)=	48.30	8.00
Mannings n	=	0.013	0.250

Max.Eff.Inten.(mm/hr)=	73.13	12.86
over (min)	5.00	10.00
Storage Coeff. (min)=	1.52 (ii)	5.42 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.33	0.16

PEAK FLOW	(cms)=	0.01	0.01	*TOTALS*
TIME TO PEAK	(hrs)=	1.33	1.42	0.020 (iii)
RUNOFF VOLUME	(mm)=	29.69	6.68	1.33
TOTAL RAINFALL	(mm)=	31.69	31.69	11.27
RUNOFF COEFFICIENT	=	0.94	0.21	31.69
				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* = 74.0 Ia = Dep. 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 (0304)	Area (ha)= 0.37
ID= 1 DT= 5.0 min	Total Imp(%)= 39.00 Dir. Conn.(%)= 0.10

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.14	0.23
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	2.00	2.00
Length	(m)=	49.67	40.00
Mannings n	=	0.013	0.250

Max.Eff.Inten.(mm/hr)=	73.13	24.71
over (min)	5.00	15.00
Storage Coeff. (min)=	1.55 (ii)	13.89 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.33	0.08

PEAK FLOW	(cms)=	0.00	0.01	*TOTALS*
TIME TO PEAK	(hrs)=	1.33	1.50	0.010 (iii)
				1.50

RUNOFF VOLUME	(mm)=	29.69	9.87	9.86
TOTAL RAINFALL	(mm)=	31.69	31.69	31.69
RUNOFF COEFFICIENT	=	0.94	0.31	0.31

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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)= 0.08
ID= 1 DT= 5.0 min	Total Imp(%)= 69.00 Dir. Conn.(%)= 38.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.06	0.02
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	2.00	2.00
Length	(m)=	23.09	8.00
Mannings n	=	0.013	0.250

Max.Eff.Inten.(mm/hr)=	73.13	47.40
over (min)	5.00	5.00
Storage Coeff. (min)=	0.98 (ii)	3.78 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.25

PEAK FLOW	(cms)=	0.01	0.00	*TOTALS*
TIME TO PEAK	(hrs)=	1.33	1.33	0.010 (iii)
RUNOFF VOLUME	(mm)=	29.69	11.55	1.33
TOTAL RAINFALL	(mm)=	31.69	31.69	18.41
RUNOFF COEFFICIENT	=	0.94	0.36	31.69
				0.58

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0204) | Area (ha)= 0.24
| ID= 1 DT= 5.0 min | Total Imp(%)= 65.00 Dir. Conn.(%)= 36.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.16 0.08
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 40.00 8.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 73.13 39.84
over (min) 5.00 5.00
Storage Coeff. (min)= 1.36 (ii) 4.37 (ii)
Unit Hyd. Tpeak (min)= 5.00 5.00
Unit Hyd. peak (cms)= 0.33 0.23

TOTALS
PEAK FLOW (cms)= 0.02 0.01 0.027 (iii)
TIME TO PEAK (hrs)= 1.33 1.33 1.33
RUNOFF VOLUME (mm)= 29.69 10.78 17.58
TOTAL RAINFALL (mm)= 31.69 31.69 31.69
RUNOFF COEFFICIENT = 0.94 0.34 0.55

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0205) | Area (ha)= 0.23
| ID= 1 DT= 5.0 min | Total Imp(%)= 64.00 Dir. Conn.(%)= 37.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.15 0.08
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 39.16 8.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 73.13 36.52
over (min) 5.00 5.00
Storage Coeff. (min)= 1.34 (ii) 4.35 (ii)
Unit Hyd. Tpeak (min)= 5.00 5.00
Unit Hyd. peak (cms)= 0.33 0.23

TOTALS
PEAK FLOW (cms)= 0.02 0.01 0.026 (iii)

TIME TO PEAK (hrs)= 1.33 1.33 1.33
RUNOFF VOLUME (mm)= 29.69 10.42 17.54
TOTAL RAINFALL (mm)= 31.69 31.69 31.69
RUNOFF COEFFICIENT = 0.94 0.33 0.55

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0904) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0203): 0.08 0.010 1.33 18.41
+ ID2= 2 (0204): 0.24 0.027 1.33 17.58
=====

ID = 3 (0904): 0.32 0.037 1.33 17.79

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0904) |
| 3 + 2 = 1 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 3 (0904): 0.32 0.037 1.33 17.79
+ ID2= 2 (0205): 0.23 0.026 1.33 17.54
=====

ID = 1 (0904): 0.55 0.063 1.33 17.68

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0905) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0202): 0.35 0.020 1.33 11.27
+ ID2= 2 (0206): 0.22 0.010 1.33 11.71
=====

ID = 3 (0905): 0.57 0.030 1.33 11.44

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| ADD HYD ( 0905)|
| 3 + 2 = 1 |
-----
ID1= 3 ( 0905): 0.57 0.030 1.33 11.44
+ ID2= 2 ( 0304): 0.37 0.010 1.50 9.86
=====
ID = 1 ( 0905): 0.94 0.035 1.33 10.82
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| ADD HYD ( 0905)|
| 1 + 2 = 3 |
-----
ID1= 1 ( 0905): 0.94 0.035 1.33 10.82
+ ID2= 2 ( 0904): 0.55 0.063 1.33 17.68
=====
ID = 3 ( 0905): 1.49 0.097 1.33 13.35
```

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 A A A A L
V V I SS U U A A L
VV I SSSSS UUUU A A LLLLL
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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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c16e1ee-eef0-41c8-b0fa-1486c7a1c177\s

Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\d640becb-967e-4731-b5f6-00a4892452ca\d
c16e1ee-eef0-41c8-b0fa-1486c7a1c177\s

DATE: 03-01-2022

TIME: 09:50:44

USER:

COMMENTS: _____

```
-----
*****
** SIMULATION : (3) 5 Year Design Storm - Chi **
*****
```

```
-----
| CHICAGO STORM |
| Ptotal= 42.00 mm |
-----
```

IDF curve parameters: A= 484.627
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	3.65	1.17	17.00	2.17	6.88	3.17	4.00
0.33	4.08	1.33	96.92	2.33	6.07	3.33	3.77
0.50	4.65	1.50	20.39	2.50	5.46	3.50	3.57
0.67	5.48	1.67	12.78	2.67	4.98	3.67	3.39
0.83	6.78	1.83	9.73	2.83	4.60	3.83	3.23
1.00	9.25	2.00	8.01	3.00	4.27	4.00	3.09

```
-----
| CALIB |
| STANDHYD ( 0201)|
| ID= 1 DT= 5.0 min |
-----
```

Area (ha)= 0.13
Total Imp(%)= 45.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.06	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	5.00

Length	(m)=	29.44	8.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		96.92	66.96
over (min)		5.00	5.00
Storage Coeff. (min)=		1.01 (ii)	3.41 (ii)
Unit Hyd. Tpeak (min)=		5.00	5.00
Unit Hyd. peak (cms)=		0.34	0.26
TOTALS			
PEAK FLOW	(cms)=	0.00	0.01 0.014 (iii)
TIME TO PEAK	(hrs)=	1.33	1.33
RUNOFF VOLUME	(mm)=	40.00	17.44
TOTAL RAINFALL	(mm)=	42.00	42.00
RUNOFF COEFFICIENT	=	0.95	0.41 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* = 74.0 Ia = Dep. 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)=	0.19	
ID= 1 DT= 5.0 min	Total Imp(%)=	53.00	Dir. Conn.(%)= 0.10
	IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.10	0.09
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	2.00	8.00
Length	(m)=	35.59	13.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		96.92	88.57
over (min)		5.00	5.00
Storage Coeff. (min)=		1.13 (ii)	3.62 (ii)
Unit Hyd. Tpeak (min)=		5.00	5.00
Unit Hyd. peak (cms)=		0.34	0.25
TOTALS			
PEAK FLOW	(cms)=	0.00	0.02 0.023 (iii)
TIME TO PEAK	(hrs)=	1.33	1.33
RUNOFF VOLUME	(mm)=	40.00	19.26
TOTAL RAINFALL	(mm)=	42.00	42.00
RUNOFF COEFFICIENT	=	0.95	0.46 0.46

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. 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 (0201):	0.13	0.014	1.33	17.44
+ ID2= 2 (0303):	0.19	0.023	1.33	19.26
ID = 3 (0903):	0.32	0.037	1.33	18.52

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0206)	Area (ha)=	0.22	
ID= 1 DT= 5.0 min	Total Imp(%)=	30.00	Dir. Conn.(%)= 21.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.07 0.15
Dep. Storage	(mm)=	2.00 5.00
Average Slope	(%)=	2.00 1.00
Length	(m)=	38.30 20.00
Mannings n	=	0.013 0.250

Max.Eff.Inten.(mm/hr)=		96.92	26.51
over (min)		5.00	15.00
Storage Coeff. (min)=		1.18 (ii)	10.93 (ii)
Unit Hyd. Tpeak (min)=		5.00	15.00
Unit Hyd. peak (cms)=		0.33	0.09

TOTALS			
PEAK FLOW	(cms)=	0.01	0.01 0.015 (iii)
TIME TO PEAK	(hrs)=	1.33	1.33
RUNOFF VOLUME	(mm)=	40.00	12.10 17.93
TOTAL RAINFALL	(mm)=	42.00	42.00
RUNOFF COEFFICIENT	=	0.95	0.29 0.43

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 74.0 Ia = Dep. 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 (0202) | Area (ha)= 0.35
| ID= 1 DT= 5.0 min | Total Imp(%)= 26.00 Dir. Conn.(%)= 20.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.09	0.26
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	5.00
Length (m)=	48.30	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	96.92	24.21
over (min)	5.00	5.00
Storage Coeff. (min)=	1.36 (ii)	4.85 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.33	0.22

			TOTALS
PEAK FLOW (cms)=	0.02	0.02	0.036 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.33
RUNOFF VOLUME (mm)=	40.00	11.65	17.31
TOTAL RAINFALL (mm)=	42.00	42.00	42.00
RUNOFF COEFFICIENT =	0.95	0.28	0.41

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0304) | Area (ha)= 0.37
| ID= 1 DT= 5.0 min | Total Imp(%)= 39.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.14	0.23
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00

Length (m)=	49.67	40.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	96.92	55.33
over (min)	5.00	15.00
Storage Coeff. (min)=	1.38 (ii)	10.32 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.33	0.09

			TOTALS
PEAK FLOW (cms)=	0.00	0.02	0.020 (iii)
TIME TO PEAK (hrs)=	1.33	1.50	1.50
RUNOFF VOLUME (mm)=	40.00	16.24	16.24
TOTAL RAINFALL (mm)=	42.00	42.00	42.00
RUNOFF COEFFICIENT =	0.95	0.39	0.39

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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)= 0.08
| ID= 1 DT= 5.0 min | Total Imp(%)= 69.00 Dir. Conn.(%)= 38.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.06	0.02
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	23.09	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	96.92	79.59
over (min)	5.00	5.00
Storage Coeff. (min)=	0.87 (ii)	3.38 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.26

			TOTALS
PEAK FLOW (cms)=	0.01	0.01	0.014 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.33
RUNOFF VOLUME (mm)=	40.01	18.55	26.67
TOTAL RAINFALL (mm)=	42.00	42.00	42.00
RUNOFF COEFFICIENT =	0.95	0.44	0.63

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0204) | Area (ha)= 0.24
| ID= 1 DT= 5.0 min | Total Imp(%)= 65.00 Dir. Conn.(%)= 36.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.16	0.08
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	40.00	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	96.92	67.78
over (min)	5.00	5.00
Storage Coeff. (min)=	1.21 (ii)	3.90 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.33	0.25

			TOTALS
PEAK FLOW (cms)=	0.02	0.02	0.040 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.33
RUNOFF VOLUME (mm)=	40.00	17.51	25.60
TOTAL RAINFALL (mm)=	42.00	42.00	42.00
RUNOFF COEFFICIENT =	0.95	0.42	0.61

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0205) | Area (ha)= 0.23
| ID= 1 DT= 5.0 min | Total Imp(%)= 64.00 Dir. Conn.(%)= 37.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.15	0.08
Dep. Storage (mm)=	2.00	5.00

Average Slope (%)=	2.00	2.00
Length (m)=	39.16	8.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	96.92	62.56
over (min)	5.00	5.00
Storage Coeff. (min)=	1.20 (ii)	3.89 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.33	0.25

			TOTALS
PEAK FLOW (cms)=	0.02	0.01	0.038 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.33
RUNOFF VOLUME (mm)=	40.00	17.00	25.50
TOTAL RAINFALL (mm)=	42.00	42.00	42.00
RUNOFF COEFFICIENT =	0.95	0.40	0.61

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0904) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)

ID1= 1 (0203): 0.08 0.014 1.33 26.67
+ ID2= 2 (0204): 0.24 0.040 1.33 25.60
=====

ID = 3 (0904): 0.32 0.054 1.33 25.86

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0904) |
| 3 + 2 = 1 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)

ID1= 3 (0904): 0.32 0.054 1.33 25.86
+ ID2= 2 (0205): 0.23 0.038 1.33 25.50
=====

ID = 1 (0904): 0.55 0.092 1.33 25.71

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0905)|
| 1 + 2 = 3 |
-----
ID1= 1 ( 0202):  0.35  0.036  1.33  17.31
+ ID2= 2 ( 0206):  0.22  0.015  1.33  17.93
=====
ID = 3 ( 0905):  0.57  0.052  1.33  17.55

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0905)|
| 3 + 2 = 1 |
-----
ID1= 3 ( 0905):  0.57  0.052  1.33  17.55
+ ID2= 2 ( 0304):  0.37  0.020  1.50  16.24
=====
ID = 1 ( 0905):  0.94  0.062  1.33  17.04

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0905)|
| 1 + 2 = 3 |
-----
ID1= 1 ( 0905):  0.94  0.062  1.33  17.04
+ ID2= 2 ( 0904):  0.55  0.092  1.33  25.71
=====
ID = 3 ( 0905):  1.49  0.153  1.33  20.24

```

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 AAAAA L
V V I SS U U A A L
VV I SSSS UUUU 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:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\d640becb-967e-4731-b5f6-00a4892452ca\6
d7d4d07-45f6-4fa2-968c-bc30e92634e7\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\d640becb-967e-4731-b5f6-00a4892452ca\6
d7d4d07-45f6-4fa2-968c-bc30e92634e7\s

DATE: 03-01-2022

TIME: 09:50:44

USER:

COMMENTS: _____

```

-----
*****
** SIMULATION : (4) 10 Year Design Storm - Ch **
*****

```

```

-----
| CHICAGO STORM | IDF curve parameters: A= 563.357
| Ptotal= 48.83 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	4.25	1.17	19.77	2.17	8.00	3.17	4.65
0.33	4.74	1.33	112.66	2.33	7.06	3.33	4.38
0.50	5.41	1.50	23.70	2.50	6.35	3.50	4.15
0.67	6.37	1.67	14.86	2.67	5.79	3.67	3.94
0.83	7.88	1.83	11.31	2.83	5.34	3.83	3.75
1.00	10.75	2.00	9.31	3.00	4.97	4.00	3.59

```

-----
| CALIB |
| STANDHYD ( 0201) | Area (ha)= 0.13
| ID= 1 DT= 5.0 min | Total Imp(%)= 45.00 Dir. Conn.(%)= 0.10
-----

```

```

                IMPERVIOUS    PERVIOUS (i)
Surface Area    (ha)=      0.06      0.07
Dep. Storage    (mm)=      2.00      5.00
Average Slope    (%)=      2.00      5.00
Length          (m)=     29.44      8.00
Mannings n      =      0.013      0.250

```

```

Max.Eff.Inten.(mm/hr)= 112.66      87.55
                    over (min)      5.00      5.00
Storage Coeff. (min)= 0.95 (ii)    3.10 (ii)
Unit Hyd. Tpeak (min)= 5.00      5.00
Unit Hyd. peak (cms)= 0.34      0.27

```

```

                *TOTALS*
PEAK FLOW (cms)= 0.00      0.02      0.019 (iii)
TIME TO PEAK (hrs)= 1.33      1.33      1.33
RUNOFF VOLUME (mm)= 46.83      22.30      22.31
TOTAL RAINFALL (mm)= 48.83      48.83      48.83
RUNOFF COEFFICIENT = 0.96      0.46      0.46

```

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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)= 0.19
| ID= 1 DT= 5.0 min | Total Imp(%)= 53.00 Dir. Conn.(%)= 0.10
-----

```

```

                IMPERVIOUS    PERVIOUS (i)
Surface Area    (ha)=      0.10      0.09
Dep. Storage    (mm)=      2.00      5.00
Average Slope    (%)=      2.00      8.00
Length          (m)=     35.59     13.00
Mannings n      =      0.013      0.250

```

```

Max.Eff.Inten.(mm/hr)= 112.66      114.54

```

```

                    over (min)      5.00      5.00
Storage Coeff. (min)= 1.06 (ii)    3.31 (ii)
Unit Hyd. Tpeak (min)= 5.00      5.00
Unit Hyd. peak (cms)= 0.34      0.26

```

TOTALS

```

PEAK FLOW (cms)= 0.00      0.03      0.030 (iii)
TIME TO PEAK (hrs)= 1.33      1.33      1.33
RUNOFF VOLUME (mm)= 46.83      24.42      24.43
TOTAL RAINFALL (mm)= 48.83      48.83      48.83
RUNOFF COEFFICIENT = 0.96      0.50      0.50

```

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 ( 0201): 0.13    0.019    1.33    22.31
+ ID2= 2 ( 0303): 0.19    0.030    1.33    24.43
=====
ID = 3 ( 0903): 0.32    0.049    1.33    23.57

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| STANDHYD ( 0206) | Area (ha)= 0.22
| ID= 1 DT= 5.0 min | Total Imp(%)= 30.00 Dir. Conn.(%)= 21.00
-----

```

```

                IMPERVIOUS    PERVIOUS (i)
Surface Area    (ha)=      0.07      0.15
Dep. Storage    (mm)=      2.00      5.00
Average Slope    (%)=      2.00      1.00
Length          (m)=     38.30     20.00
Mannings n      =      0.013      0.250

```

```

Max.Eff.Inten.(mm/hr)= 112.66      36.05
                    over (min)      5.00     10.00
Storage Coeff. (min)= 1.11 (ii)    9.73 (ii)
Unit Hyd. Tpeak (min)= 5.00      10.00

```

Unit Hyd. peak (cms)=	0.34	0.11	
TOTALS			
PEAK FLOW (cms)=	0.01	0.01	0.022 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.33
RUNOFF VOLUME (mm)=	46.83	15.96	22.42
TOTAL RAINFALL (mm)=	48.83	48.83	48.83
RUNOFF COEFFICIENT =	0.96	0.33	0.46

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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	Area (ha)=	0.35	
STANDHYD (0202)	Total Imp(%)=	26.00	Dir. Conn.(%)= 20.00
ID= 1 DT= 5.0 min			

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.09	0.26
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	5.00
Length (m)=	48.30	8.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	112.66	33.07
over (min)	5.00	5.00
Storage Coeff. (min)=	1.28 (ii)	4.56 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.33	0.23
TOTALS		
PEAK FLOW (cms)=	0.02	0.02
TIME TO PEAK (hrs)=	1.33	1.33
RUNOFF VOLUME (mm)=	46.83	15.42
TOTAL RAINFALL (mm)=	48.83	48.83
RUNOFF COEFFICIENT =	0.96	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* = 74.0 Ia = Dep. 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	Area (ha)=	0.37	
STANDHYD (0304)	Total Imp(%)=	39.00	Dir. Conn.(%)= 0.10
ID= 1 DT= 5.0 min			

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.14	0.23
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	49.67	40.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	112.66	72.89
over (min)	5.00	10.00
Storage Coeff. (min)=	1.30 (ii)	9.31 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.33	0.12

TOTALS		
PEAK FLOW (cms)=	0.00	0.03
TIME TO PEAK (hrs)=	1.33	1.42
RUNOFF VOLUME (mm)=	46.83	20.90
TOTAL RAINFALL (mm)=	48.83	48.83
RUNOFF COEFFICIENT =	0.96	0.43

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

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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	Area (ha)=	0.08	
STANDHYD (0203)	Total Imp(%)=	69.00	Dir. Conn.(%)= 38.00
ID= 1 DT= 5.0 min			

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.06	0.02
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	23.09	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	112.66	103.35
------------------------	--------	--------

over (min)	5.00	5.00
Storage Coeff. (min)=	0.82 (ii)	3.18 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.27

			TOTALS
PEAK FLOW (cms)=	0.01	0.01	0.017 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.33
RUNOFF VOLUME (mm)=	46.83	23.60	32.39
TOTAL RAINFALL (mm)=	48.83	48.83	48.83
RUNOFF COEFFICIENT =	0.96	0.48	0.66

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0204)	Area (ha)= 0.24	
ID= 1 DT= 5.0 min	Total Imp(%)= 65.00	Dir. Conn.(%)= 36.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.16	0.08
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	40.00	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	112.66	88.58
over (min)	5.00	5.00
Storage Coeff. (min)=	1.14 (ii)	3.67 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.25

			TOTALS
PEAK FLOW (cms)=	0.03	0.02	0.049 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.33
RUNOFF VOLUME (mm)=	46.83	22.39	31.17
TOTAL RAINFALL (mm)=	48.83	48.83	48.83
RUNOFF COEFFICIENT =	0.96	0.46	0.64

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0205)	Area (ha)= 0.23		
ID= 1 DT= 5.0 min	Total Imp(%)= 64.00	Dir. Conn.(%)= 37.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.15	0.08
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	39.16	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	112.66	82.01
over (min)	5.00	5.00
Storage Coeff. (min)=	1.13 (ii)	3.66 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.25

			TOTALS
PEAK FLOW (cms)=	0.03	0.02	0.046 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.33
RUNOFF VOLUME (mm)=	46.83	21.79	31.05
TOTAL RAINFALL (mm)=	48.83	48.83	48.83
RUNOFF COEFFICIENT =	0.96	0.45	0.64

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0904)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0203):	0.08	0.017	1.33	32.39
+ ID2= 2 (0204):	0.24	0.049	1.33	31.17
ID = 3 (0904):	0.32	0.066	1.33	31.48

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| ADD HYD ( 0904)|
| 3 + 2 = 1 |      AREA   QPEAK   TPEAK   R.V.
----- (ha)   (cms)   (hrs)   (mm)
ID1= 3 ( 0904):    0.32   0.066   1.33   31.48
+ ID2= 2 ( 0205):    0.23   0.046   1.33   31.05
=====
ID = 1 ( 0904):    0.55   0.112   1.33   31.30
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| ADD HYD ( 0905)|
| 1 + 2 = 3 |      AREA   QPEAK   TPEAK   R.V.
----- (ha)   (cms)   (hrs)   (mm)
ID1= 1 ( 0202):    0.35   0.046   1.33   21.69
+ ID2= 2 ( 0206):    0.22   0.022   1.33   22.42
=====
ID = 3 ( 0905):    0.57   0.068   1.33   21.97
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| ADD HYD ( 0905)|
| 3 + 2 = 1 |      AREA   QPEAK   TPEAK   R.V.
----- (ha)   (cms)   (hrs)   (mm)
ID1= 3 ( 0905):    0.57   0.068   1.33   21.97
+ ID2= 2 ( 0304):    0.37   0.029   1.42   20.91
=====
ID = 1 ( 0905):    0.94   0.091   1.33   21.55
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| ADD HYD ( 0905)|
| 1 + 2 = 3 |      AREA   QPEAK   TPEAK   R.V.
----- (ha)   (cms)   (hrs)   (mm)
ID1= 1 ( 0905):    0.94   0.091   1.33   21.55
+ ID2= 2 ( 0904):    0.55   0.112   1.33   31.30
=====
ID = 3 ( 0905):    1.49   0.203   1.33   25.15
```

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   TTTT   TTTT   H   H   Y   Y   M   M   000   TM
O   O   T   T   T   H   H   Y   Y   MM MM   O   O
O   O   T   T   T   H   H   Y   Y   M   M   O   O
000   T   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:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\d640becb-967e-4731-b5f6-00a4892452ca\5
1a9f27f-5faa-427e-8da3-cdf9c7bb6fdd\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\d640becb-967e-4731-b5f6-00a4892452ca\5
1a9f27f-5faa-427e-8da3-cdf9c7bb6fdd\s

DATE: 03-01-2022

TIME: 09:50:44

USER:

COMMENTS: _____

```
*****
** SIMULATION : (5) 25 Year Design Storm - Ch **
*****
```

```
-----
| CHICAGO STORM |      IDF curve parameters: A= 663.082
| Ptotal= 57.47 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	5.00	1.17	23.27	2.17	9.41	3.17	5.48
0.33	5.58	1.33	132.61	2.33	8.31	3.33	5.16
0.50	6.37	1.50	27.90	2.50	7.48	3.50	4.88
0.67	7.49	1.67	17.49	2.67	6.82	3.67	4.64
0.83	9.27	1.83	13.31	2.83	6.29	3.83	4.42
1.00	12.65	2.00	10.95	3.00	5.85	4.00	4.23

CALIB
STANDHYD (0201) | Area (ha)= 0.13
ID= 1 DT= 5.0 min | Total Imp(%)= 45.00 Dir. Conn.(%)= 0.10

Surface Area	(ha)=	0.06	0.07
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	2.00	5.00
Length	(m)=	29.44	8.00
Mannings n	=	0.013	0.250

Max.Eff.Inten.(mm/hr)=	132.61	115.65
over (min)	5.00	5.00
Storage Coeff. (min)=	0.89 (ii)	2.82 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.28

PEAK FLOW	(cms)=	0.00	0.03	*TOTALS*
TIME TO PEAK	(hrs)=	1.33	1.33	0.025 (iii)
RUNOFF VOLUME	(mm)=	55.47	28.83	1.33
TOTAL RAINFALL	(mm)=	57.47	57.47	31.30
RUNOFF COEFFICIENT	=	0.97	0.50	57.47

***** 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* = 74.0 Ia = Dep. 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)= 0.19
ID= 1 DT= 5.0 min | Total Imp(%)= 53.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)= 0.10	0.09
Dep. Storage	(mm)= 2.00	5.00
Average Slope	(%)= 2.00	8.00
Length	(m)= 35.59	13.00
Mannings n	= 0.013	0.250
Max.Eff.Inten.(mm/hr)=	132.61	149.64
over (min)	5.00	5.00
Storage Coeff. (min)=	1.00 (ii)	3.02 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.28

PEAK FLOW	(cms)=	0.00	0.04	*TOTALS*
TIME TO PEAK	(hrs)=	1.33	1.33	0.040 (iii)
RUNOFF VOLUME	(mm)=	55.47	31.29	1.33
TOTAL RAINFALL	(mm)=	57.47	57.47	31.30
RUNOFF COEFFICIENT	=	0.97	0.54	57.47

***** 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* = 74.0 Ia = Dep. 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 (0201):	0.13	0.025	1.33	28.85
+ ID2= 2 (0303):	0.19	0.040	1.33	31.30
ID = 3 (0903):	0.32	0.065	1.33	30.30

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0206) | Area (ha)= 0.22
ID= 1 DT= 5.0 min | Total Imp(%)= 30.00 Dir. Conn.(%)= 21.00

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	0.07	0.15	
Dep. Storage (mm)=	2.00	5.00	
Average Slope (%)=	2.00	1.00	
Length (m)=	38.30	20.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	132.61	49.52	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.04 (ii)	8.64 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.34	0.12	
PEAK FLOW (cms)=	0.02	0.01	*TOTALS*
TIME TO PEAK (hrs)=	1.33	1.42	0.028 (iii)
RUNOFF VOLUME (mm)=	55.47	21.30	1.33
TOTAL RAINFALL (mm)=	57.47	57.47	28.45
RUNOFF COEFFICIENT =	0.97	0.37	57.47
			0.50

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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	Area (ha)=	0.35	
STANDHYD (0202)	Total Imp(%)=	26.00	Dir. Conn.(%)= 20.00
ID= 1 DT= 5.0 min			

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	0.09	0.26	
Dep. Storage (mm)=	2.00	5.00	
Average Slope (%)=	2.00	5.00	
Length (m)=	48.30	8.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	132.61	45.61	
over (min)	5.00	5.00	
Storage Coeff. (min)=	1.20 (ii)	4.27 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.33	0.23	
PEAK FLOW (cms)=	0.03	0.03	*TOTALS*
TIME TO PEAK (hrs)=	1.33	1.33	0.059 (iii)
RUNOFF VOLUME (mm)=	55.47	20.63	1.33
TOTAL RAINFALL (mm)=	57.47	57.47	27.59
			57.47

RUNOFF COEFFICIENT = 0.97 0.36 0.48

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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	Area (ha)=	0.37	
STANDHYD (0304)	Total Imp(%)=	39.00	Dir. Conn.(%)= 0.10
ID= 1 DT= 5.0 min			

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	0.14	0.23	
Dep. Storage (mm)=	2.00	5.00	
Average Slope (%)=	2.00	2.00	
Length (m)=	49.67	40.00	
Mannings n =	0.013	0.250	

Max.Eff.Inten.(mm/hr)=	132.61	97.04
over (min)	5.00	10.00
Storage Coeff. (min)=	1.22 (ii)	8.36 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.33	0.12

PEAK FLOW (cms)=	0.00	0.04	*TOTALS*
TIME TO PEAK (hrs)=	1.33	1.42	0.041 (iii)
RUNOFF VOLUME (mm)=	55.47	27.19	1.42
TOTAL RAINFALL (mm)=	57.47	57.47	27.21
RUNOFF COEFFICIENT =	0.97	0.47	57.47
			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* = 74.0 Ia = Dep. 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)= 0.08
| ID= 1 DT= 5.0 min | Total Imp(%)= 69.00 Dir. Conn.(%)= 38.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.06	0.02
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	23.09	8.00
Mannings n =	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	5.00	1.083	23.27	2.083	9.41	3.08	5.48
0.167	5.00	1.167	23.27	2.167	9.41	3.17	5.48
0.250	5.58	1.250	132.61	2.250	8.31	3.25	5.16
0.333	5.58	1.333	132.61	2.333	8.31	3.33	5.16
0.417	6.37	1.417	27.90	2.417	7.48	3.42	4.88
0.500	6.37	1.500	27.90	2.500	7.48	3.50	4.88
0.583	7.49	1.583	17.49	2.583	6.82	3.58	4.64
0.667	7.49	1.667	17.49	2.667	6.82	3.67	4.64
0.750	9.27	1.750	13.31	2.750	6.29	3.75	4.42
0.833	9.27	1.833	13.31	2.833	6.29	3.83	4.42
0.917	12.65	1.917	10.95	2.917	5.85	3.92	4.23
1.000	12.65	2.000	10.95	3.000	5.85	4.00	4.23

Max.Eff.Inten.(mm/hr)=	132.61	135.60
over (min)	5.00	5.00
Storage Coeff. (min)=	0.77 (ii)	2.98 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.28

PEAK FLOW (cms)=	0.01	0.01	0.021 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.33
RUNOFF VOLUME (mm)=	55.47	30.34	39.85
TOTAL RAINFALL (mm)=	57.47	57.47	57.47
RUNOFF COEFFICIENT =	0.97	0.53	0.69

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0204) | Area (ha)= 0.24
| ID= 1 DT= 5.0 min | Total Imp(%)= 65.00 Dir. Conn.(%)= 36.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.16	0.08
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	40.00	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	132.61	116.96
over (min)	5.00	5.00
Storage Coeff. (min)=	1.07 (ii)	3.44 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.26

PEAK FLOW (cms)=	0.03	0.03	*TOTALS*
TIME TO PEAK (hrs)=	1.33	1.33	0.061 (iii)
RUNOFF VOLUME (mm)=	55.47	28.94	1.33
TOTAL RAINFALL (mm)=	57.47	57.47	38.48
RUNOFF COEFFICIENT =	0.97	0.50	57.47
			0.67

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0205) | Area (ha)= 0.23
| ID= 1 DT= 5.0 min | Total Imp(%)= 64.00 Dir. Conn.(%)= 37.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.15	0.08
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	39.16	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	132.61	108.64
over (min)	5.00	5.00
Storage Coeff. (min)=	1.06 (ii)	3.43 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.26

PEAK FLOW	(cms)=	0.03	0.03	0.058 (iii)
TIME TO PEAK	(hrs)=	1.33	1.33	1.33
RUNOFF VOLUME	(mm)=	55.47	28.24	38.31
TOTAL RAINFALL	(mm)=	57.47	57.47	57.47
RUNOFF COEFFICIENT	=	0.97	0.49	0.67

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0904)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0203):	0.08	0.021	1.33	39.85
+ ID2= 2 (0204):	0.24	0.061	1.33	38.48
=====				
ID = 3 (0904):	0.32	0.082	1.33	38.82

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0904)				
3 + 2 = 1				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0904):	0.32	0.082	1.33	38.82
+ ID2= 2 (0205):	0.23	0.058	1.33	38.31
=====				
ID = 1 (0904):	0.55	0.139	1.33	38.61

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0905)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0202):	0.35	0.059	1.33	27.59
+ ID2= 2 (0206):	0.22	0.028	1.33	28.45
=====				
ID = 3 (0905):	0.57	0.087	1.33	27.92

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0905)				
3 + 2 = 1				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0905):	0.57	0.087	1.33	27.92
+ ID2= 2 (0304):	0.37	0.041	1.42	27.21
=====				
ID = 1 (0905):	0.94	0.121	1.33	27.64

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0905)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0905):	0.94	0.121	1.33	27.64
+ ID2= 2 (0904):	0.55	0.139	1.33	38.61
=====				
ID = 3 (0905):	1.49	0.260	1.33	31.69

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\V02\voin.dat
Output filename:

C:\Users\KGowanlock\AppData\Local\Civica\XH5\d640becb-967e-4731-b5f6-00a4892452ca\1
c4a4383-2080-417c-be37-f2d1cd5be59d\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\d640becb-967e-4731-b5f6-00a4892452ca\1
c4a4383-2080-417c-be37-f2d1cd5be59d\s

DATE: 03-01-2022

TIME: 09:50:44

USER:

COMMENTS: _____

** SIMULATION : (6) 50 Year Design Storm - Ch **

| 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 |
| STANDHYD (0201) | Area (ha)= 0.13
| ID= 1 DT= 5.0 min | Total Imp(%)= 45.00 Dir. Conn.(%)= 0.10

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.06 0.07

Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	5.00
Length (m)=	29.44	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	147.65	138.08
over (min)	5.00	5.00
Storage Coeff. (min)=	0.85 (ii)	2.65 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.29

TOTALS

PEAK FLOW (cms)=	0.00	0.03	0.030 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.33
RUNOFF VOLUME (mm)=	61.99	33.98	34.00
TOTAL RAINFALL (mm)=	63.99	63.99	63.99
RUNOFF COEFFICIENT =	0.97	0.53	0.53

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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)= 0.19
| ID= 1 DT= 5.0 min | Total Imp(%)= 53.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.10	0.09
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	8.00
Length (m)=	35.59	13.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	147.65	177.42
over (min)	5.00	5.00
Storage Coeff. (min)=	0.96 (ii)	2.84 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.28

TOTALS

PEAK FLOW (cms)=	0.00	0.05	0.047 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.33
RUNOFF VOLUME (mm)=	61.99	36.67	36.68
TOTAL RAINFALL (mm)=	63.99	63.99	63.99

RUNOFF COEFFICIENT = 0.97 0.57 0.57

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

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 ( 0201): AREA QPEAK TPEAK R.V.
                  (ha) (cms) (hrs) (mm)
+ ID2= 2 ( 0303): 0.13 0.030 1.33 34.00
+ ID2= 2 ( 0303): 0.19 0.047 1.33 36.68
=====
ID = 3 ( 0903): 0.32 0.077 1.33 35.59
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| CALIB
| STANDHYD ( 0206)|
| ID= 1 DT= 5.0 min|
-----
Area (ha)= 0.22
Total Imp(%)= 30.00 Dir. Conn.(%)= 21.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.07 0.15
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 1.00
Length (m)= 38.30 20.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 147.65 60.56
over (min) 5.00 10.00
Storage Coeff. (min)= 1.00 (ii) 8.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.34 0.13

PEAK FLOW (cms)= 0.02 0.02 *TOTALS*
TIME TO PEAK (hrs)= 1.33 1.42 0.033 (iii)
RUNOFF VOLUME (mm)= 61.99 25.59 33.22
TOTAL RAINFALL (mm)= 63.99 63.99 63.99
RUNOFF COEFFICIENT = 0.97 0.40 0.52
```

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 ( 0202)|
| ID= 1 DT= 5.0 min|
-----
Area (ha)= 0.35
Total Imp(%)= 26.00 Dir. Conn.(%)= 20.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.09 0.26
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 5.00
Length (m)= 48.30 8.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 147.65 55.92
over (min) 5.00 5.00
Storage Coeff. (min)= 1.15 (ii) 4.10 (ii)
Unit Hyd. Tpeak (min)= 5.00 5.00
Unit Hyd. peak (cms)= 0.34 0.24

PEAK FLOW (cms)= 0.03 0.04 *TOTALS*
TIME TO PEAK (hrs)= 1.33 1.33 0.070 (iii)
RUNOFF VOLUME (mm)= 61.99 24.84 32.26
TOTAL RAINFALL (mm)= 63.99 63.99 63.99
RUNOFF COEFFICIENT = 0.97 0.39 0.50
```

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

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 ( 0304)|
| ID= 1 DT= 5.0 min|
-----
Area (ha)= 0.37
Total Imp(%)= 39.00 Dir. Conn.(%)= 0.10

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.14 0.23
```

Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 49.67 40.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 147.65 116.42
over (min) 5.00 10.00
Storage Coeff. (min)= 1.17 (ii) 7.81 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.34 0.13

TOTALS
PEAK FLOW (cms)= 0.00 0.05 0.050 (iii)
TIME TO PEAK (hrs)= 1.33 1.42 1.42
RUNOFF VOLUME (mm)= 61.99 32.17 32.19
TOTAL RAINFALL (mm)= 63.99 63.99 63.99
RUNOFF COEFFICIENT = 0.97 0.50 0.50

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

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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)= 0.08
| ID= 1 DT= 5.0 min | Total Imp(%)= 69.00 Dir. Conn.(%)= 38.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.06 0.02
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 23.09 8.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 147.65 161.20
over (min) 5.00 5.00
Storage Coeff. (min)= 0.74 (ii) 2.86 (ii)
Unit Hyd. Tpeak (min)= 5.00 5.00
Unit Hyd. peak (cms)= 0.34 0.28

TOTALS
PEAK FLOW (cms)= 0.01 0.01 0.024 (iii)
TIME TO PEAK (hrs)= 1.33 1.33 1.33
RUNOFF VOLUME (mm)= 61.99 35.64 45.61
TOTAL RAINFALL (mm)= 63.99 63.99 63.99

RUNOFF COEFFICIENT = 0.97 0.56 0.71

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0204) | Area (ha)= 0.24
| ID= 1 DT= 5.0 min | Total Imp(%)= 65.00 Dir. Conn.(%)= 36.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.16 0.08
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 40.00 8.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 147.65 139.59
over (min) 5.00 5.00
Storage Coeff. (min)= 1.02 (ii) 3.30 (ii)
Unit Hyd. Tpeak (min)= 5.00 5.00
Unit Hyd. peak (cms)= 0.34 0.27

TOTALS
PEAK FLOW (cms)= 0.04 0.03 0.070 (iii)
TIME TO PEAK (hrs)= 1.33 1.33 1.33
RUNOFF VOLUME (mm)= 61.99 34.09 44.13
TOTAL RAINFALL (mm)= 63.99 63.99 63.99
RUNOFF COEFFICIENT = 0.97 0.53 0.69

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0205) | Area (ha)= 0.23
| ID= 1 DT= 5.0 min | Total Imp(%)= 64.00 Dir. Conn.(%)= 37.00

IMPERVIOUS PERVIOUS (i)

Surface Area	(ha)=	0.15	0.08
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	2.00	2.00
Length	(m)=	39.16	8.00
Mannings n	=	0.013	0.250

Max.Eff.Inten.(mm/hr)=	147.65	129.93
over (min)	5.00	5.00
Storage Coeff. (min)=	1.01 (ii)	3.29 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.27

PEAK FLOW	(cms)=	0.03	0.03	*TOTALS*
TIME TO PEAK	(hrs)=	1.33	1.33	0.067 (iii)
RUNOFF VOLUME	(mm)=	61.99	33.33	43.92
TOTAL RAINFALL	(mm)=	63.99	63.99	63.99
RUNOFF COEFFICIENT	=	0.97	0.52	0.69

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0904)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0203):	0.08	0.024	1.33	45.61
+ ID2= 2 (0204):	0.24	0.070	1.33	44.13
=====				
ID = 3 (0904):	0.32	0.094	1.33	44.50

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0904)				
3 + 2 = 1				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0904):	0.32	0.094	1.33	44.50
+ ID2= 2 (0205):	0.23	0.067	1.33	43.92
=====				
ID = 1 (0904):	0.55	0.161	1.33	44.26

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0905)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0202):	0.35	0.070	1.33	32.26
+ ID2= 2 (0206):	0.22	0.033	1.33	33.22
=====				
ID = 3 (0905):	0.57	0.103	1.33	32.63

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0905)				
3 + 2 = 1				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0905):	0.57	0.103	1.33	32.63
+ ID2= 2 (0304):	0.37	0.050	1.42	32.19
=====				
ID = 1 (0905):	0.94	0.145	1.33	32.46

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0905)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0905):	0.94	0.145	1.33	32.46
+ ID2= 2 (0904):	0.55	0.161	1.33	44.26
=====				
ID = 3 (0905):	1.49	0.306	1.33	36.81

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

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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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DATE: 03-01-2022 TIME: 09:50:44
USER:

COMMENTS: _____

** SIMULATION : (7) 100 Year Design Storm - C **

CHICAGO STORM | IDF curve parameters: A= 811.794
Ptotal= 70.36 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	6.12	1.17	28.48	2.17	11.52	3.17	6.70
0.33	6.83	1.33	162.35	2.33	10.17	3.33	6.31
0.50	7.80	1.50	34.15	2.50	9.15	3.50	5.97
0.67	9.17	1.67	21.41	2.67	8.35	3.67	5.68
0.83	11.35	1.83	16.30	2.83	7.70	3.83	5.41

1.00 15.49 | 2.00 13.41 | 3.00 7.16 | 4.00 5.17

CALIB
STANDHYD (0201)
ID= 1 DT= 5.0 min | Area (ha)= 0.13
Total Imp(%)= 45.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.06	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	5.00
Length (m)=	29.44	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	162.35	160.83
over (min)	5.00	5.00
Storage Coeff. (min)=	0.82 (ii)	2.51 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.29

PEAK FLOW (cms)=	0.00	0.04	*TOTALS*
TIME TO PEAK (hrs)=	1.33	1.33	0.035 (iii)
RUNOFF VOLUME (mm)=	68.36	39.15	1.33
TOTAL RAINFALL (mm)=	70.36	70.36	39.18
RUNOFF COEFFICIENT =	0.97	0.56	70.36
			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* = 74.0 Ia = Dep. 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)= 0.19
Total Imp(%)= 53.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.10	0.09
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	8.00
Length (m)=	35.59	13.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	162.35	205.42	
over (min)	5.00	5.00	
Storage Coeff. (min)=	0.92 (ii)	2.70 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.34	0.29	
TOTALS			
PEAK FLOW (cms)=	0.00	0.05	0.055 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.33
RUNOFF VOLUME (mm)=	68.36	42.05	42.07
TOTAL RAINFALL (mm)=	70.36	70.36	70.36
RUNOFF COEFFICIENT =	0.97	0.60	0.60

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. 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 (0201):	0.13	0.035	1.33	39.18
+ ID2= 2 (0303):	0.19	0.055	1.33	42.07
=====				
ID = 3 (0903):	0.32	0.090	1.33	40.89

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0206)	Area (ha)= 0.22		
ID= 1 DT= 5.0 min	Total Imp(%)= 30.00	Dir. Conn.(%)= 21.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.07	0.15
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	1.00
Length (m)=	38.30	20.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	162.35	71.98
over (min)	5.00	10.00

Storage Coeff. (min)=	0.96 (ii)	7.50 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.34	0.13

TOTALS

PEAK FLOW (cms)=	0.02	0.02	0.038 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.33
RUNOFF VOLUME (mm)=	68.36	29.98	38.01
TOTAL RAINFALL (mm)=	70.36	70.36	70.36
RUNOFF COEFFICIENT =	0.97	0.43	0.54

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. 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 (0202)	Area (ha)= 0.35		
ID= 1 DT= 5.0 min	Total Imp(%)= 26.00	Dir. Conn.(%)= 20.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.09	0.26
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	5.00
Length (m)=	48.30	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	162.35	66.60
over (min)	5.00	5.00
Storage Coeff. (min)=	1.10 (ii)	3.94 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.24

TOTALS

PEAK FLOW (cms)=	0.03	0.05	0.081 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.33
RUNOFF VOLUME (mm)=	68.36	29.14	36.98
TOTAL RAINFALL (mm)=	70.36	70.36	70.36
RUNOFF COEFFICIENT =	0.97	0.41	0.53

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. 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 (0304) | Area (ha)= 0.37
| ID= 1 DT= 5.0 min | Total Imp(%)= 39.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.14	0.23
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	49.67	40.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	162.35	136.15
over (min)	5.00	10.00
Storage Coeff. (min)=	1.12 (ii)	7.36 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.34	0.13

			TOTALS
PEAK FLOW (cms)=	0.00	0.06	0.060 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.42
RUNOFF VOLUME (mm)=	68.36	37.20	37.22
TOTAL RAINFALL (mm)=	70.36	70.36	70.36
RUNOFF COEFFICIENT =	0.97	0.53	0.53

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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)= 0.08
| ID= 1 DT= 5.0 min | Total Imp(%)= 69.00 Dir. Conn.(%)= 38.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.06	0.02
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	23.09	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	162.35	187.06
over (min)	5.00	5.00
Storage Coeff. (min)=	0.71 (ii)	2.75 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.28

			TOTALS
PEAK FLOW (cms)=	0.01	0.01	0.028 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.33
RUNOFF VOLUME (mm)=	68.36	40.94	51.32
TOTAL RAINFALL (mm)=	70.36	70.36	70.36
RUNOFF COEFFICIENT =	0.97	0.58	0.73

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0204) | Area (ha)= 0.24
| ID= 1 DT= 5.0 min | Total Imp(%)= 65.00 Dir. Conn.(%)= 36.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.16	0.08
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	40.00	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	162.35	162.55
over (min)	5.00	5.00
Storage Coeff. (min)=	0.99 (ii)	3.18 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.27

			TOTALS
PEAK FLOW (cms)=	0.04	0.04	0.079 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.33
RUNOFF VOLUME (mm)=	68.36	39.28	49.74
TOTAL RAINFALL (mm)=	70.36	70.36	70.36
RUNOFF COEFFICIENT =	0.97	0.56	0.71

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0205) | Area (ha)= 0.23
| ID= 1 DT= 5.0 min | Total Imp(%)= 64.00 Dir. Conn.(%)= 37.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.15	0.08
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	39.16	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	162.35	151.56
over (min)	5.00	5.00
Storage Coeff. (min)=	0.97 (ii)	3.16 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.27

PEAK FLOW (cms)=	0.04	0.04	*TOTALS*
TIME TO PEAK (hrs)=	1.33	1.33	0.075 (iii)
RUNOFF VOLUME (mm)=	68.36	38.45	1.33
TOTAL RAINFALL (mm)=	70.36	70.36	49.51
RUNOFF COEFFICIENT =	0.97	0.55	70.36
			0.70

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0904) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0203): 0.08 0.028 1.33 51.32
+ ID2= 2 (0204): 0.24 0.079 1.33 49.74
=====

ID = 3 (0904): 0.32 0.107 1.33 50.13

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0904) |
| 3 + 2 = 1 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 3 (0904): 0.32 0.107 1.33 50.13
+ ID2= 2 (0205): 0.23 0.075 1.33 49.51
=====

ID = 1 (0904): 0.55 0.182 1.33 49.87

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0905) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0202): 0.35 0.081 1.33 36.98
+ ID2= 2 (0206): 0.22 0.038 1.33 38.01
=====

ID = 3 (0905): 0.57 0.120 1.33 37.38

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0905) |
| 3 + 2 = 1 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 3 (0905): 0.57 0.120 1.33 37.38
+ ID2= 2 (0304): 0.37 0.060 1.42 37.22
=====

ID = 1 (0905): 0.94 0.170 1.33 37.31

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0905) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0905): 0.94 0.170 1.33 37.31
+ ID2= 2 (0904): 0.55 0.182 1.33 49.87
=====

ID = 3 (0905): 1.49 0.352 1.33 41.95

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

FINISH

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

V V I SS U U A A L

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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:

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DATE: 03-01-2022 TIME: 09:50:44

USER:

COMMENTS: _____

** SIMULATION : (8) Timmins Design Storm **

READ STORM	Filename: C:\Users\KGowanlock\AppData\Local\Temp\24dcab7e-2bf9-46d7-a00d-63a33a304e18\3c4d485d
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	Area (ha)= 0.13
STANDHYD (0201)	Total Imp(%)= 45.00 Dir. Conn.(%)= 0.10
ID= 1 DT= 5.0 min	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.06	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	5.00
Length (m)=	29.44	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	43.00	70.62
over (min)	5.00	5.00
Storage Coeff. (min)=	1.40 (ii)	3.74 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.33	0.25

PEAK FLOW (cms)=	0.00	0.01	*TOTALS*
TIME TO PEAK (hrs)=	6.25	7.00	0.014 (iii)
RUNOFF VOLUME (mm)=	191.00	151.20	7.00
TOTAL RAINFALL (mm)=	193.00	193.00	151.22
RUNOFF COEFFICIENT =	0.99	0.78	193.00

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

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB
| STANDHYD ( 0303) | Area (ha)= 0.19
| ID= 1 DT= 5.0 min | Total Imp(%)= 53.00 Dir. Conn.(%)= 0.10
-----

          IMPERVIOUS    PERVIOUS (i)
Surface Area (ha)=      0.10      0.09
Dep. Storage (mm)=      2.00      5.00
Average Slope (%)=      2.00      8.00
Length (m)=      35.59      13.00
Mannings n    =      0.013      0.250

Max.Eff.Inten.(mm/hr)= 43.00      84.42
over (min)          5.00      5.00
Storage Coeff. (min)= 1.56 (ii)  4.10 (ii)
Unit Hyd. Tpeak (min)= 5.00      5.00
Unit Hyd. peak (cms)= 0.33      0.24

          *TOTALS*
PEAK FLOW (cms)=      0.00      0.02      0.021 (iii)
TIME TO PEAK (hrs)= 6.25      7.00      7.00
RUNOFF VOLUME (mm)= 191.00     156.24     156.27
TOTAL RAINFALL (mm)= 193.00     193.00     193.00
RUNOFF COEFFICIENT =      0.99      0.81      0.81

```

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 ( 0201): 0.13  0.014  7.00  151.22
+ ID2= 2 ( 0303): 0.19  0.021  7.00  156.27

```

```

=====
ID = 3 ( 0903):      0.32  0.035  7.00  154.22

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB
| STANDHYD ( 0206) | Area (ha)= 0.22
| ID= 1 DT= 5.0 min | Total Imp(%)= 30.00 Dir. Conn.(%)= 21.00
-----

```

```

          IMPERVIOUS    PERVIOUS (i)
Surface Area (ha)=      0.07      0.15
Dep. Storage (mm)=      2.00      5.00
Average Slope (%)=      2.00      1.00
Length (m)=      38.30      20.00
Mannings n    =      0.013      0.250

Max.Eff.Inten.(mm/hr)= 43.00      39.85
over (min)          5.00      10.00
Storage Coeff. (min)= 1.64 (ii)  9.92 (ii)
Unit Hyd. Tpeak (min)= 5.00      10.00
Unit Hyd. peak (cms)= 0.32      0.11

          *TOTALS*
PEAK FLOW (cms)=      0.01      0.02      0.022 (iii)
TIME TO PEAK (hrs)= 6.50      7.00      7.00
RUNOFF VOLUME (mm)= 191.00     132.86     145.04
TOTAL RAINFALL (mm)= 193.00     193.00     193.00
RUNOFF COEFFICIENT =      0.99      0.69      0.75

```

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 ( 0202) | Area (ha)= 0.35
| ID= 1 DT= 5.0 min | Total Imp(%)= 26.00 Dir. Conn.(%)= 20.00
-----

```

```

          IMPERVIOUS    PERVIOUS (i)
Surface Area (ha)=      0.09      0.26
Dep. Storage (mm)=      2.00      5.00
Average Slope (%)=      2.00      5.00
Length (m)=      48.30      8.00
Mannings n    =      0.013      0.250

```

Max.Eff.Inten.(mm/hr)= 43.00 37.74
over (min) 5.00 10.00
Storage Coeff. (min)= 1.88 (ii) 6.71 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.32 0.14

TOTALS
PEAK FLOW (cms)= 0.01 0.03 0.035 (iii)
TIME TO PEAK (hrs)= 6.50 7.00 7.00
RUNOFF VOLUME (mm)= 191.00 130.98 142.97
TOTAL RAINFALL (mm)= 193.00 193.00 193.00
RUNOFF COEFFICIENT = 0.99 0.68 0.74

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0304) | Area (ha)= 0.37
| ID= 1 DT= 5.0 min | Total Imp(%)= 39.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.14	0.23
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	49.67	40.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)= 43.00 62.63
over (min) 5.00 15.00
Storage Coeff. (min)= 1.91 (ii) 10.42 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.31 0.09

TOTALS
PEAK FLOW (cms)= 0.00 0.04 0.039 (iii)
TIME TO PEAK (hrs)= 6.50 7.00 7.00
RUNOFF VOLUME (mm)= 191.00 147.60 147.63
TOTAL RAINFALL (mm)= 193.00 193.00 193.00
RUNOFF COEFFICIENT = 0.99 0.76 0.76

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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)= 0.08
| ID= 1 DT= 5.0 min | Total Imp(%)= 69.00 Dir. Conn.(%)= 38.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.06	0.02
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	23.09	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)= 43.00 78.83
over (min) 5.00 5.00
Storage Coeff. (min)= 1.21 (ii) 4.68 (ii)
Unit Hyd. Tpeak (min)= 5.00 5.00
Unit Hyd. peak (cms)= 0.33 0.22

TOTALS
PEAK FLOW (cms)= 0.00 0.01 0.009 (iii)
TIME TO PEAK (hrs)= 6.50 7.00 7.00
RUNOFF VOLUME (mm)= 191.00 154.35 168.25
TOTAL RAINFALL (mm)= 193.00 193.00 193.00
RUNOFF COEFFICIENT = 0.99 0.80 0.87

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0204) | Area (ha)= 0.24
| ID= 1 DT= 5.0 min | Total Imp(%)= 65.00 Dir. Conn.(%)= 36.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.16	0.08
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00

Length (m)= 40.00 8.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 43.00 71.17
over (min) 5.00 10.00
Storage Coeff. (min)= 1.68 (ii) 5.40 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.32 0.16

TOTALS
PEAK FLOW (cms)= 0.01 0.02 0.027 (iii)
TIME TO PEAK (hrs)= 6.50 7.00 7.00
RUNOFF VOLUME (mm)= 191.00 151.42 165.66
TOTAL RAINFALL (mm)= 193.00 193.00 193.00
RUNOFF COEFFICIENT = 0.99 0.78 0.86

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0205) | Area (ha)= 0.23
| ID= 1 DT= 5.0 min | Total Imp(%)= 64.00 Dir. Conn.(%)= 37.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.15 0.08
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 39.16 8.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 43.00 67.65
over (min) 5.00 10.00
Storage Coeff. (min)= 1.66 (ii) 5.38 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.32 0.16

TOTALS
PEAK FLOW (cms)= 0.01 0.02 0.026 (iii)
TIME TO PEAK (hrs)= 6.50 7.00 7.00
RUNOFF VOLUME (mm)= 191.00 149.93 165.11
TOTAL RAINFALL (mm)= 193.00 193.00 193.00
RUNOFF COEFFICIENT = 0.99 0.78 0.86

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0904) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0203): 0.08 0.009 7.00 168.25
+ ID2= 2 (0204): 0.24 0.027 7.00 165.66
=====

ID = 3 (0904): 0.32 0.036 7.00 166.31

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0904) |
| 3 + 2 = 1 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 3 (0904): 0.32 0.036 7.00 166.31
+ ID2= 2 (0205): 0.23 0.026 7.00 165.11
=====

ID = 1 (0904): 0.55 0.062 7.00 165.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0905) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0202): 0.35 0.035 7.00 142.97
+ ID2= 2 (0206): 0.22 0.022 7.00 145.04
=====

ID = 3 (0905): 0.57 0.058 7.00 143.77

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0905) |
| 3 + 2 = 1 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 3 (0905): 0.57 0.058 7.00 143.77
+ ID2= 2 (0304): 0.37 0.039 7.00 147.63

=====
ID = 1 (0905): 0.94 0.096 7.00 145.29

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0905)|
1 + 2 = 3
AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0905): 0.94 0.096 7.00 145.29
+ ID2= 2 (0904): 0.55 0.062 7.00 165.81
=====
ID = 3 (0905): 1.49 0.158 7.00 152.86

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
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O O T T H H Y M M O O
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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\d640becb-967e-4731-b5f6-00a4892452ca\2
f452204-e56c-4577-85de-83f0f0bffd6\s

Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\d640becb-967e-4731-b5f6-00a4892452ca\2
f452204-e56c-4577-85de-83f0f0bffd6\s

DATE: 03-01-2022

TIME: 09:50:39

USER:

COMMENTS: _____

** SIMULATION : (1) 2 Year Design Storm - SCS **

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

e32e46ea-a2d3-4b1d-84ac-6bc28317a757\7793d5b3
Ptotal= 54.40 mm | Comments: 2yr 24hr 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	6.50	0.98	12.75	7.83	19.00	0.98
0.50	0.60	6.75	0.98	13.00	4.03	19.25	0.98
0.75	0.60	7.00	0.98	13.25	4.03	19.50	0.98
1.00	0.60	7.25	0.98	13.50	2.94	19.75	0.98
1.25	0.60	7.50	1.20	13.75	2.94	20.00	0.98
1.50	0.60	7.75	1.20	14.00	2.28	20.25	0.98
1.75	0.60	8.00	1.20	14.25	2.28	20.50	0.65
2.00	0.60	8.25	1.20	14.50	1.63	20.75	0.65
2.25	0.60	8.50	1.41	14.75	1.63	21.00	0.65
2.50	0.71	8.75	1.41	15.00	1.63	21.25	0.65
2.75	0.71	9.00	1.52	15.25	1.63	21.50	0.65
3.00	0.71	9.25	1.52	15.50	1.63	21.75	0.65
3.25	0.71	9.50	1.74	15.75	1.63	22.00	0.65
3.50	0.71	9.75	1.74	16.00	1.63	22.25	0.65
3.75	0.71	10.00	1.96	16.25	1.63	22.50	0.65
4.00	0.71	10.25	1.96	16.50	0.98	22.75	0.65
4.25	0.71	10.50	2.50	16.75	0.98	23.00	0.65
4.50	0.87	10.75	2.50	17.00	0.98	23.25	0.65
4.75	0.87	11.00	3.37	17.25	0.98	23.50	0.65
5.00	0.87	11.25	3.37	17.50	0.98	23.75	0.65
5.25	0.87	11.50	5.22	17.75	0.98	24.00	0.65
5.50	0.87	11.75	5.22	18.00	0.98	24.25	0.65
5.75	0.87	12.00	16.10	18.25	0.98		
6.00	0.87	12.25	66.59	18.50	0.98		
6.25	0.87	12.50	7.83	18.75	0.98		

CALIB
STANDHYD (0303) | Area (ha)= 0.19
ID= 1 DT= 5.0 min | Total Imp(%)= 53.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.10	0.09
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	8.00
Length (m)=	35.59	13.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	66.59	90.51
over (min)	5.00	5.00
Storage Coeff. (min)=	1.31 (ii)	3.78 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.33	0.25

TOTALS
PEAK FLOW (cms)= 0.00 0.02 0.022 (iii)
TIME TO PEAK (hrs)= 12.25 12.25 12.25
RUNOFF VOLUME (mm)= 52.40 28.81 28.82
TOTAL RAINFALL (mm)= 54.40 54.40 54.40
RUNOFF COEFFICIENT = 0.96 0.53 0.53

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0201) | Area (ha)= 0.13
ID= 1 DT= 5.0 min | Total Imp(%)= 45.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.06	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	5.00
Length (m)=	29.44	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	66.59	71.31
over (min)	5.00	5.00
Storage Coeff. (min)=	1.17 (ii)	3.51 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.26

TOTALS
PEAK FLOW (cms)= 0.00 0.01 0.014 (iii)
TIME TO PEAK (hrs)= 12.25 12.25 12.25
RUNOFF VOLUME (mm)= 52.40 26.47 26.48
TOTAL RAINFALL (mm)= 54.40 54.40 54.40
RUNOFF COEFFICIENT = 0.96 0.49 0.49

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 ( 0201): 0.13 0.014 12.25 26.48
+ ID2= 2 ( 0303): 0.19 0.022 12.25 28.82
=====
ID = 3 ( 0903): 0.32 0.037 12.25 27.87
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| CALIB |
| STANDHYD ( 0206) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 0.22
Total Imp(%)= 30.00 Dir. Conn.(%)= 21.00
```

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.07	0.15
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	1.00
Length (m)=	38.30	20.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	66.59	32.54
over (min)	5.00	15.00
Storage Coeff. (min)=	1.37 (ii)	10.36 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.33	0.09

			TOTALS
PEAK FLOW (cms)=	0.01	0.01	0.016 (iii)
TIME TO PEAK (hrs)=	12.25	12.33	12.25
RUNOFF VOLUME (mm)=	52.40	19.35	26.26
TOTAL RAINFALL (mm)=	54.40	54.40	54.40
RUNOFF COEFFICIENT =	0.96	0.36	0.48

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 ( 0202) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 0.35
Total Imp(%)= 26.00 Dir. Conn.(%)= 20.00
```

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.09	0.26
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	5.00
Length (m)=	48.30	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	66.59	30.16
over (min)	5.00	10.00
Storage Coeff. (min)=	1.58 (ii)	5.63 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.33	0.15

			TOTALS
PEAK FLOW (cms)=	0.01	0.02	0.031 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	52.40	18.72	25.44
TOTAL RAINFALL (mm)=	54.40	54.40	54.40
RUNOFF COEFFICIENT =	0.96	0.34	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* = 74.0 Ia = Dep. 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 ( 0304) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 0.37
Total Imp(%)= 39.00 Dir. Conn.(%)= 0.10
```

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.14	0.23
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	49.67	40.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	66.59	60.62
over (min)	5.00	15.00
Storage Coeff. (min)=	1.60 (ii)	10.23 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.32	0.09

				TOTALS
PEAK FLOW	(cms)=	0.00	0.02	0.025 (iii)
TIME TO PEAK	(hrs)=	12.25	12.33	12.33
RUNOFF VOLUME	(mm)=	52.40	24.91	24.92
TOTAL RAINFALL	(mm)=	54.40	54.40	54.40
RUNOFF COEFFICIENT	=	0.96	0.46	0.46

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. 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 (0204)	Area (ha)=	0.24	
ID= 1 DT= 5.0 min	Total Imp(%)=	65.00	Dir. Conn.(%)= 36.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.16	0.08
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	2.00	2.00
Length	(m)=	40.00	8.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		66.59	72.05
over (min)		5.00	5.00
Storage Coeff. (min)=		1.41 (ii)	4.54 (ii)
Unit Hyd. Tpeak (min)=		5.00	5.00
Unit Hyd. peak (cms)=		0.33	0.23

				TOTALS
PEAK FLOW	(cms)=	0.02	0.02	0.032 (iii)
TIME TO PEAK	(hrs)=	12.25	12.25	12.25
RUNOFF VOLUME	(mm)=	52.40	26.57	35.85
TOTAL RAINFALL	(mm)=	54.40	54.40	54.40
RUNOFF COEFFICIENT	=	0.96	0.49	0.66

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. 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 (0205)	Area (ha)=	0.23	
ID= 1 DT= 5.0 min	Total Imp(%)=	64.00	Dir. Conn.(%)= 37.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.15	0.08
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	2.00	2.00
Length	(m)=	39.16	8.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		66.59	67.30
over (min)		5.00	5.00
Storage Coeff. (min)=		1.39 (ii)	4.52 (ii)
Unit Hyd. Tpeak (min)=		5.00	5.00
Unit Hyd. peak (cms)=		0.33	0.23

				TOTALS
PEAK FLOW	(cms)=	0.02	0.02	0.031 (iii)
TIME TO PEAK	(hrs)=	12.25	12.25	12.25
RUNOFF VOLUME	(mm)=	52.40	25.91	35.70
TOTAL RAINFALL	(mm)=	54.40	54.40	54.40
RUNOFF COEFFICIENT	=	0.96	0.48	0.66

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. 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)=	0.08	
ID= 1 DT= 5.0 min	Total Imp(%)=	69.00	Dir. Conn.(%)= 38.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.06	0.02
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	2.00	2.00
Length	(m)=	23.09	8.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		66.59	82.62
over (min)		5.00	5.00
Storage Coeff. (min)=		1.01 (ii)	3.93 (ii)
Unit Hyd. Tpeak (min)=		5.00	5.00

Unit Hyd. peak (cms)=	0.34	0.24	
			TOTALS
PEAK FLOW (cms)=	0.01	0.01	0.011 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	52.40	27.91	37.20
TOTAL RAINFALL (mm)=	54.40	54.40	54.40
RUNOFF COEFFICIENT =	0.96	0.51	0.68

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0904)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0203):	0.08	0.011	12.25	37.20
+ ID2= 2 (0204):	0.24	0.032	12.25	35.85
=====				
ID = 3 (0904):	0.32	0.044	12.25	36.19

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0904)				
3 + 2 = 1				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0904):	0.32	0.044	12.25	36.19
+ ID2= 2 (0205):	0.23	0.031	12.25	35.70
=====				
ID = 1 (0904):	0.55	0.075	12.25	35.98

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0906)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0202):	0.35	0.031	12.25	25.44
+ ID2= 2 (0206):	0.22	0.016	12.25	26.26
=====				
ID = 3 (0906):	0.57	0.047	12.25	25.76

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0906)				
3 + 2 = 1				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0906):	0.57	0.047	12.25	25.76
+ ID2= 2 (0304):	0.37	0.025	12.33	24.92
=====				
ID = 1 (0906):	0.94	0.068	12.25	25.43

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0906)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0906):	0.94	0.068	12.25	25.43
+ ID2= 2 (0904):	0.55	0.075	12.25	35.98
=====				
ID = 3 (0906):	1.49	0.143	12.25	29.33

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

V	V	I	SSSS	U	U	A	L	
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	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\d640becb-967e-4731-b5f6-00a4892452ca\5
560fa89-e75d-4247-88be-347166d88c20\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\d640becb-967e-4731-b5f6-00a4892452ca\5
560fa89-e75d-4247-88be-347166d88c20\s

DATE: 03-01-2022

TIME: 09:50:39

USER:

COMMENTS: _____

** SIMULATION : (2) 5 Year Design Storm - SCS **

READ STORM	Filename: C:\Users\KGowanlock\AppData\Local\Temp\
	e32e46ea-a2d3-4b1d-84ac-6bc28317a757\f65a105d
Ptotal= 72.10 mm	Comments: 5yr 24hr 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	6.50	1.30	12.75	10.38	19.00	1.30
0.50	0.79	6.75	1.30	13.00	5.34	19.25	1.30
0.75	0.79	7.00	1.30	13.25	5.34	19.50	1.30
1.00	0.79	7.25	1.30	13.50	3.89	19.75	1.30
1.25	0.79	7.50	1.59	13.75	3.89	20.00	1.30
1.50	0.79	7.75	1.59	14.00	3.03	20.25	1.30
1.75	0.79	8.00	1.59	14.25	3.03	20.50	0.87
2.00	0.79	8.25	1.59	14.50	2.16	20.75	0.87
2.25	0.79	8.50	1.87	14.75	2.16	21.00	0.87
2.50	0.94	8.75	1.87	15.00	2.16	21.25	0.87
2.75	0.94	9.00	2.02	15.25	2.16	21.50	0.87
3.00	0.94	9.25	2.02	15.50	2.16	21.75	0.87
3.25	0.94	9.50	2.31	15.75	2.16	22.00	0.87
3.50	0.94	9.75	2.31	16.00	2.16	22.25	0.87
3.75	0.94	10.00	2.60	16.25	2.16	22.50	0.87
4.00	0.94	10.25	2.60	16.50	1.30	22.75	0.87
4.25	0.94	10.50	3.32	16.75	1.30	23.00	0.87
4.50	1.15	10.75	3.32	17.00	1.30	23.25	0.87

4.75	1.15	11.00	4.47	17.25	1.30	23.50	0.87
5.00	1.15	11.25	4.47	17.50	1.30	23.75	0.87
5.25	1.15	11.50	6.92	17.75	1.30	24.00	0.87
5.50	1.15	11.75	6.92	18.00	1.30	24.25	0.87
5.75	1.15	12.00	21.34	18.25	1.30		
6.00	1.15	12.25	88.25	18.50	1.30		
6.25	1.15	12.50	10.38	18.75	1.30		

CALIB	Area (ha)= 0.19
STANDHYD (0303)	Total Imp(%)= 53.00 Dir. Conn.(%)= 0.10
ID= 1 DT= 5.0 min	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.10	0.09
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	8.00
Length (m)=	35.59	13.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	88.25	135.58
over (min)	5.00	5.00
Storage Coeff. (min)=	1.17 (ii)	3.27 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.27

PEAK FLOW (cms)=	0.00	0.03	*TOTALS*
TIME TO PEAK (hrs)=	12.25	12.25	0.034 (iii)
RUNOFF VOLUME (mm)=	70.10	43.54	12.25
TOTAL RAINFALL (mm)=	72.10	72.10	43.55
RUNOFF COEFFICIENT =	0.97	0.60	72.10

***** 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* = 74.0 Ia = Dep. 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	Area (ha)= 0.13
STANDHYD (0201)	Total Imp(%)= 45.00 Dir. Conn.(%)= 0.10
ID= 1 DT= 5.0 min	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.06	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	5.00
Length (m)=	29.44	8.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	88.25	108.60
over (min)	5.00	5.00
Storage Coeff. (min)=	1.05 (ii)	3.02 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.27
PEAK FLOW (cms)=	0.00	0.02
TIME TO PEAK (hrs)=	12.25	12.25
RUNOFF VOLUME (mm)=	70.10	40.59
TOTAL RAINFALL (mm)=	72.10	72.10
RUNOFF COEFFICIENT =	0.97	0.56

TOTALS

PEAK FLOW (cms)= 0.00 0.02 0.022 (iii)

TIME TO PEAK (hrs)= 12.25 12.25 12.25

RUNOFF VOLUME (mm)= 70.10 40.59 40.60

TOTAL RAINFALL (mm)= 72.10 72.10 72.10

RUNOFF COEFFICIENT = 0.97 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* = 74.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0201):	0.13	0.022	12.25	40.60
+ ID2= 2 (0303):	0.19	0.034	12.25	43.55
ID = 3 (0903):	0.32	0.056	12.25	42.35

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

	Area (ha)=	Total Imp(%)=	Dir. Conn.(%)=
CALIB	0.22	30.00	21.00
STANDHYD (0206)			
ID= 1 DT= 5.0 min			

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.07	0.15
Dep. Storage (mm)=	2.00	5.00

Average Slope (%)=	2.00	1.00
Length (m)=	38.30	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	88.25	52.39
over (min)	5.00	10.00
Storage Coeff. (min)=	1.23 (ii)	8.65 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.33	0.12

TOTALS

PEAK FLOW (cms)=	0.01	0.02	0.028 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	70.10	31.20	39.35
TOTAL RAINFALL (mm)=	72.10	72.10	72.10
RUNOFF COEFFICIENT =	0.97	0.43	0.55

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

	Area (ha)=	Total Imp(%)=	Dir. Conn.(%)=
CALIB	0.35	26.00	20.00
STANDHYD (0202)			
ID= 1 DT= 5.0 min			

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.09	0.26
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	5.00
Length (m)=	48.30	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	88.25	48.83
over (min)	5.00	10.00
Storage Coeff. (min)=	1.41 (ii)	5.03 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.33	0.16

TOTALS

PEAK FLOW (cms)=	0.02	0.03	0.047 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	70.10	30.35	38.29
TOTAL RAINFALL (mm)=	72.10	72.10	72.10
RUNOFF COEFFICIENT =	0.97	0.42	0.53

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

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0304) | Area (ha)= 0.37
| ID= 1 DT= 5.0 min | Total Imp(%)= 39.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.14	0.23
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	49.67	40.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	88.25	93.37
over (min)	5.00	10.00
Storage Coeff. (min)=	1.43 (ii)	8.69 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.33	0.12

			TOTALS
PEAK FLOW (cms)=	0.00	0.04	0.043 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	70.10	38.59	38.61
TOTAL RAINFALL (mm)=	72.10	72.10	72.10
RUNOFF COEFFICIENT =	0.97	0.54	0.54

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0204) | Area (ha)= 0.24
| ID= 1 DT= 5.0 min | Total Imp(%)= 65.00 Dir. Conn.(%)= 36.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.16	0.08
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	40.00	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	88.25	109.65
over (min)	5.00	5.00
Storage Coeff. (min)=	1.26 (ii)	4.05 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.33	0.24

			TOTALS
PEAK FLOW (cms)=	0.02	0.03	0.047 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	70.10	40.72	51.28
TOTAL RAINFALL (mm)=	72.10	72.10	72.10
RUNOFF COEFFICIENT =	0.97	0.56	0.71

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0205) | Area (ha)= 0.23
| ID= 1 DT= 5.0 min | Total Imp(%)= 64.00 Dir. Conn.(%)= 37.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.15	0.08
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	39.16	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	88.25	102.90
over (min)	5.00	5.00
Storage Coeff. (min)=	1.24 (ii)	4.04 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.33	0.24

			TOTALS
PEAK FLOW (cms)=	0.02	0.02	0.044 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	70.10	39.88	51.04
TOTAL RAINFALL (mm)=	72.10	72.10	72.10

RUNOFF COEFFICIENT = 0.97 0.55 0.71

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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)= 0.08
| ID= 1 DT= 5.0 min | Total Imp(%)= 69.00 Dir. Conn.(%)= 38.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.06	0.02
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	23.09	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	88.25	124.54
over (min)	5.00	5.00
Storage Coeff. (min)=	0.91 (ii)	3.51 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.26

PEAK FLOW (cms)=	0.01	0.01	0.016 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	70.10	42.41	52.92
TOTAL RAINFALL (mm)=	72.10	72.10	72.10
RUNOFF COEFFICIENT =	0.97	0.59	0.73

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0904) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
----- (ha) (cms) (hrs) (mm)
ID1= 1 (0203): 0.08 0.016 12.25 52.92

+ ID2= 2 (0204): 0.24 0.047 12.25 51.28
=====

ID = 3 (0904): 0.32 0.063 12.25 51.69

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0904) |
| 3 + 2 = 1 | AREA QPEAK TPEAK R.V.
----- (ha) (cms) (hrs) (mm)
ID1= 3 (0904): 0.32 0.063 12.25 51.69
+ ID2= 2 (0205): 0.23 0.044 12.25 51.04
=====

ID = 1 (0904): 0.55 0.107 12.25 51.42

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0906) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
----- (ha) (cms) (hrs) (mm)
ID1= 1 (0202): 0.35 0.047 12.25 38.29
+ ID2= 2 (0206): 0.22 0.028 12.25 39.35
=====

ID = 3 (0906): 0.57 0.075 12.25 38.70

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0906) |
| 3 + 2 = 1 | AREA QPEAK TPEAK R.V.
----- (ha) (cms) (hrs) (mm)
ID1= 3 (0906): 0.57 0.075 12.25 38.70
+ ID2= 2 (0304): 0.37 0.043 12.25 38.61
=====

ID = 1 (0906): 0.94 0.119 12.25 38.66

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0906) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
----- (ha) (cms) (hrs) (mm)
ID1= 1 (0906): 0.94 0.119 12.25 38.66
+ ID2= 2 (0904): 0.55 0.107 12.25 51.42
=====

ID = 3 (0906): 1.49 0.226 12.25 43.37

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

=====

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

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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\d640becb-967e-4731-b5f6-00a4892452ca\0
902d3c7-e9a5-4a7f-9e41-e48b00185bf5\s
Summary filename:
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902d3c7-e9a5-4a7f-9e41-e48b00185bf5\s

DATE: 03-01-2022 TIME: 09:50:39

USER:

COMMENTS: _____

** SIMULATION : (3) 10 Year Design Storm - SC **

| READ STORM |
Ptotal= 83.81 mm

Filename: C:\Users\KGowanlock\AppData\Local\Temp\
e32e46ea-a2d3-4b1d-84ac-6bc28317a757\965a2d52
Comments: 10yr 24hr 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	6.50	1.51	12.75	12.07	19.00	1.51	
0.50	0.92	6.75	1.51	13.00	6.20	19.25	1.51	
0.75	0.92	7.00	1.51	13.25	6.20	19.50	1.51	
1.00	0.92	7.25	1.51	13.50	4.53	19.75	1.51	
1.25	0.92	7.50	1.84	13.75	4.53	20.00	1.51	
1.50	0.92	7.75	1.84	14.00	3.52	20.25	1.51	
1.75	0.92	8.00	1.84	14.25	3.52	20.50	1.01	
2.00	0.92	8.25	1.84	14.50	2.51	20.75	1.01	
2.25	0.92	8.50	2.18	14.75	2.51	21.00	1.01	
2.50	1.09	8.75	2.18	15.00	2.51	21.25	1.01	
2.75	1.09	9.00	2.35	15.25	2.51	21.50	1.01	
3.00	1.09	9.25	2.35	15.50	2.51	21.75	1.01	
3.25	1.09	9.50	2.68	15.75	2.51	22.00	1.01	
3.50	1.09	9.75	2.68	16.00	2.51	22.25	1.01	
3.75	1.09	10.00	3.02	16.25	2.51	22.50	1.01	
4.00	1.09	10.25	3.02	16.50	1.51	22.75	1.01	
4.25	1.09	10.50	3.86	16.75	1.51	23.00	1.01	
4.50	1.34	10.75	3.86	17.00	1.51	23.25	1.01	
4.75	1.34	11.00	5.20	17.25	1.51	23.50	1.01	
5.00	1.34	11.25	5.20	17.50	1.51	23.75	1.01	
5.25	1.34	11.50	8.05	17.75	1.51	24.00	1.01	
5.50	1.34	11.75	8.05	18.00	1.51	24.25	1.01	
5.75	1.34	12.00	24.81	18.25	1.51			
6.00	1.34	12.25	102.58	18.50	1.51			
6.25	1.34	12.50	12.07	18.75	1.51			

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

Area (ha)= 0.19
Total Imp(%)= 53.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.10	0.09
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	8.00
Length (m)=	35.59	13.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	102.58	166.35

over (min)	5.00	5.00
Storage Coeff. (min)=	1.11 (ii)	3.04 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.27

			TOTALS
PEAK FLOW (cms)=	0.00	0.04	0.042 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	81.81	53.75	53.76
TOTAL RAINFALL (mm)=	83.81	83.81	83.81
RUNOFF COEFFICIENT =	0.98	0.64	0.64

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

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0201)	Area (ha)= 0.13	
ID= 1 DT= 5.0 min	Total Imp(%)= 45.00	Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.06	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	5.00
Length (m)=	29.44	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	102.58	134.33
over (min)	5.00	5.00
Storage Coeff. (min)=	0.99 (ii)	2.80 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.28

			TOTALS
PEAK FLOW (cms)=	0.00	0.03	0.027 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	81.81	50.47	50.48
TOTAL RAINFALL (mm)=	83.81	83.81	83.81
RUNOFF COEFFICIENT =	0.98	0.60	0.60

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

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0201):	0.13	0.027	12.25	50.48
+ ID2= 2 (0303):	0.19	0.042	12.25	53.76
ID = 3 (0903):	0.32	0.069	12.25	52.43

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB		
STANDHYD (0206)	Area (ha)= 0.22	
ID= 1 DT= 5.0 min	Total Imp(%)= 30.00	Dir. Conn.(%)= 21.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.07	0.15
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	1.00
Length (m)=	38.30	20.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	102.58	66.62
over (min)	5.00	10.00
Storage Coeff. (min)=	1.15 (ii)	7.90 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.34	0.13

			TOTALS
PEAK FLOW (cms)=	0.01	0.02	0.035 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	81.81	39.77	48.57
TOTAL RAINFALL (mm)=	83.81	83.81	83.81
RUNOFF COEFFICIENT =	0.98	0.47	0.58

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB |
| STANDHYD ( 0202) | Area (ha)= 0.35
| ID= 1 DT= 5.0 min | Total Imp(%)= 26.00 Dir. Conn.(%)= 20.00
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	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.09	0.26
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	5.00
Length (m)=	48.30	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	102.58	62.26
over (min)	5.00	5.00
Storage Coeff. (min)=	1.33 (ii)	4.74 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.33	0.22

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*TOTALS*
PEAK FLOW (cms)= 0.02 0.04 0.064 (iii)
TIME TO PEAK (hrs)= 12.25 12.25 12.25
RUNOFF VOLUME (mm)= 81.81 38.77 47.37
TOTAL RAINFALL (mm)= 83.81 83.81 83.81
RUNOFF COEFFICIENT = 0.98 0.46 0.57

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB |
| STANDHYD ( 0304) | Area (ha)= 0.37
| ID= 1 DT= 5.0 min | Total Imp(%)= 39.00 Dir. Conn.(%)= 0.10
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	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.14	0.23
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	49.67	40.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	102.58	116.15
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over (min)	5.00	10.00
Storage Coeff. (min)=	1.35 (ii)	8.00 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.33	0.13

TOTALS

PEAK FLOW (cms)=	0.00	0.06	0.056 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	81.81	48.22	48.24
TOTAL RAINFALL (mm)=	83.81	83.81	83.81
RUNOFF COEFFICIENT =	0.98	0.58	0.58

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB |
| STANDHYD ( 0204) | Area (ha)= 0.24
| ID= 1 DT= 5.0 min | Total Imp(%)= 65.00 Dir. Conn.(%)= 36.00
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	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.16	0.08
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	40.00	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	102.58	135.58
over (min)	5.00	5.00
Storage Coeff. (min)=	1.19 (ii)	3.82 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.33	0.25

TOTALS

PEAK FLOW (cms)=	0.02	0.03	0.056 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	81.81	50.61	61.84
TOTAL RAINFALL (mm)=	83.81	83.81	83.81
RUNOFF COEFFICIENT =	0.98	0.60	0.74

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. 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 (0205) | Area (ha)= 0.23
| ID= 1 DT= 5.0 min | Total Imp(%)= 64.00 Dir. Conn.(%)= 37.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.15	0.08
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	39.16	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	102.58	127.54
over (min)	5.00	5.00
Storage Coeff. (min)=	1.17 (ii)	3.80 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.25

			TOTALS
PEAK FLOW (cms)=	0.02	0.03	0.053 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	81.81	49.67	61.54
TOTAL RAINFALL (mm)=	83.81	83.81	83.81
RUNOFF COEFFICIENT =	0.98	0.59	0.73

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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)= 0.08
| ID= 1 DT= 5.0 min | Total Imp(%)= 69.00 Dir. Conn.(%)= 38.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.06	0.02
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	23.09	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	102.58	153.28
over (min)	5.00	5.00
Storage Coeff. (min)=	0.85 (ii)	3.30 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.26

			TOTALS
PEAK FLOW (cms)=	0.01	0.01	0.019 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	81.81	52.50	63.62
TOTAL RAINFALL (mm)=	83.81	83.81	83.81
RUNOFF COEFFICIENT =	0.98	0.63	0.76

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0904) |
1 + 2 = 3
ID1= 1 (0203): AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
+ ID2= 2 (0204): 0.08 0.019 12.25 63.62
0.24 0.056 12.25 61.84
=====

ID = 3 (0904): 0.32 0.075 12.25 62.28

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0904) |
3 + 2 = 1
ID1= 3 (0904): AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
+ ID2= 2 (0205): 0.32 0.075 12.25 62.28
0.23 0.053 12.25 61.54
=====

ID = 1 (0904): 0.55 0.129 12.25 61.97

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0906) |
1 + 2 = 3
AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)

ID1= 1 (0202): 0.35 0.064 12.25 47.37
+ ID2= 2 (0206): 0.22 0.035 12.25 48.57
=====

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0906) |
3 + 2 = 1
ID1= 3 (0906): 0.57 0.098 12.25 47.83
+ ID2= 2 (0304): 0.37 0.056 12.25 48.24
=====

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0906) |
1 + 2 = 3
ID1= 1 (0906): 0.94 0.154 12.25 47.99
+ ID2= 2 (0904): 0.55 0.129 12.25 61.97
=====

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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V V I SSSSS U U A L (v 6.1.2001)
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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\d640becb-967e-4731-b5f6-00a4892452ca\183b551-13a1-42d5-add9-5e84ff3ba926\s

DATE: 03-01-2022

TIME: 09:50:40

USER:

COMMENTS: _____

** SIMULATION : (4) 25 Year Design Storm - SC **

| READ STORM | Filename: C:\Users\KGowanlock\AppData\Local\Temp\
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| Ptotal= 98.65 mm | Comments: 25yr 24hr 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	6.50	1.78	12.75	14.21	19.00	1.78
0.50	1.09	6.75	1.78	13.00	7.30	19.25	1.78
0.75	1.09	7.00	1.78	13.25	7.30	19.50	1.78
1.00	1.09	7.25	1.78	13.50	5.33	19.75	1.78
1.25	1.09	7.50	2.17	13.75	5.33	20.00	1.78
1.50	1.09	7.75	2.17	14.00	4.14	20.25	1.78
1.75	1.09	8.00	2.17	14.25	4.14	20.50	1.18
2.00	1.09	8.25	2.17	14.50	2.96	20.75	1.18
2.25	1.09	8.50	2.56	14.75	2.96	21.00	1.18
2.50	1.28	8.75	2.56	15.00	2.96	21.25	1.18
2.75	1.28	9.00	2.76	15.25	2.96	21.50	1.18
3.00	1.28	9.25	2.76	15.50	2.96	21.75	1.18
3.25	1.28	9.50	3.16	15.75	2.96	22.00	1.18
3.50	1.28	9.75	3.16	16.00	2.96	22.25	1.18

3.75	1.28	10.00	3.55	16.25	2.96	22.50	1.18
4.00	1.28	10.25	3.55	16.50	1.78	22.75	1.18
4.25	1.28	10.50	4.54	16.75	1.78	23.00	1.18
4.50	1.58	10.75	4.54	17.00	1.78	23.25	1.18
4.75	1.58	11.00	6.12	17.25	1.78	23.50	1.18
5.00	1.58	11.25	6.12	17.50	1.78	23.75	1.18
5.25	1.58	11.50	9.47	17.75	1.78	24.00	1.18
5.50	1.58	11.75	9.47	18.00	1.78	24.25	1.18
5.75	1.58	12.00	29.20	18.25	1.78		
6.00	1.58	12.25	120.75	18.50	1.78		
6.25	1.58	12.50	14.21	18.75	1.78		

CALIB	
STANDHYD (0303)	Area (ha)= 0.19
ID= 1 DT= 5.0 min	Total Imp(%)= 53.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.10	0.09
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	8.00
Length (m)=	35.59	13.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	120.75	205.93
over (min)	5.00	5.00
Storage Coeff. (min)=	1.04 (ii)	2.81 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.28

TOTALS
PEAK FLOW (cms)= 0.00 0.05 0.052 (iii)
TIME TO PEAK (hrs)= 12.25 12.25 12.25
RUNOFF VOLUME (mm)= 96.65 67.06 67.07
TOTAL RAINFALL (mm)= 98.65 98.65 98.65
RUNOFF COEFFICIENT = 0.98 0.68 0.68

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0201)	Area (ha)= 0.13
ID= 1 DT= 5.0 min	Total Imp(%)= 45.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.06	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	5.00
Length (m)=	29.44	8.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	120.75	167.65
over (min)	5.00	5.00
Storage Coeff. (min)=	0.92 (ii)	2.58 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.29

TOTALS
PEAK FLOW (cms)= 0.00 0.03 0.034 (iii)
TIME TO PEAK (hrs)= 12.25 12.25 12.25
RUNOFF VOLUME (mm)= 96.65 63.41 63.43
TOTAL RAINFALL (mm)= 98.65 98.65 98.65
RUNOFF COEFFICIENT = 0.98 0.64 0.64

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0201):	0.13	0.034	12.25	63.43
+ ID2= 2 (0303):	0.19	0.052	12.25	67.07
=====				
ID = 3 (0903):	0.32	0.086	12.25	65.59

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	
STANDHYD (0206)	Area (ha)= 0.22
ID= 1 DT= 5.0 min	Total Imp(%)= 30.00 Dir. Conn.(%)= 21.00

```

-----
                IMPERVIOUS    PERVIOUS (i)
Surface Area    (ha)=      0.07      0.15
Dep. Storage    (mm)=      2.00      5.00
Average Slope    (%)=      2.00      1.00
Length          (m)=     38.30     20.00
Mannings n      =      0.013     0.250

Max.Eff.Inten.(mm/hr)= 120.75     85.54
                    over (min)    5.00     10.00
Storage Coeff. (min)=  1.08 (ii)  7.18 (ii)
Unit Hyd. Tpeak (min)=  5.00     10.00
Unit Hyd. peak  (cms)=  0.34      0.14

                *TOTALS*
PEAK FLOW      (cms)=      0.02      0.03      0.044 (iii)
TIME TO PEAK   (hrs)=     12.25     12.25     12.25
RUNOFF VOLUME  (mm)=     96.65     51.23     60.74
TOTAL RAINFALL (mm)=     98.65     98.65     98.65
RUNOFF COEFFICIENT =      0.98      0.52      0.62

```

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 ( 0202) |
| ID= 1 DT= 5.0 min |
|-----|
                IMPERVIOUS    PERVIOUS (i)
Surface Area    (ha)=      0.09      0.26
Dep. Storage    (mm)=      2.00      5.00
Average Slope    (%)=      2.00      5.00
Length          (m)=     48.30      8.00
Mannings n      =      0.013     0.250

Max.Eff.Inten.(mm/hr)= 120.75     80.16
                    over (min)    5.00      5.00
Storage Coeff. (min)=  1.24 (ii)  4.44 (ii)
Unit Hyd. Tpeak (min)=  5.00      5.00
Unit Hyd. peak  (cms)=  0.33      0.23

                *TOTALS*
PEAK FLOW      (cms)=      0.02      0.06      0.080 (iii)
TIME TO PEAK   (hrs)=     12.25     12.25     12.25
RUNOFF VOLUME  (mm)=     96.65     50.07     59.37

```

```

TOTAL RAINFALL (mm)= 98.65     98.65     98.65
RUNOFF COEFFICIENT =  0.98      0.51      0.60

```

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 ( 0304) |
| ID= 1 DT= 5.0 min |
|-----|
                Area (ha)= 0.37
                Total Imp(%)= 39.00 Dir. Conn.(%)= 0.10

```

```

                IMPERVIOUS    PERVIOUS (i)
Surface Area    (ha)=      0.14      0.23
Dep. Storage    (mm)=      2.00      5.00
Average Slope    (%)=      2.00      2.00
Length          (m)=     49.67     40.00
Mannings n      =      0.013     0.250

```

```

Max.Eff.Inten.(mm/hr)= 120.75     145.79
                    over (min)    5.00     10.00
Storage Coeff. (min)=  1.26 (ii)  7.33 (ii)
Unit Hyd. Tpeak (min)=  5.00     10.00
Unit Hyd. peak  (cms)=  0.33      0.13

```

```

                *TOTALS*
PEAK FLOW      (cms)=      0.00      0.07      0.073 (iii)
TIME TO PEAK   (hrs)=     12.25     12.25     12.25
RUNOFF VOLUME  (mm)=     96.65     60.89     60.92
TOTAL RAINFALL (mm)=     98.65     98.65     98.65
RUNOFF COEFFICIENT =      0.98      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* = 74.0 Ia = Dep. 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 (0204)	Area (ha)= 0.24		
ID= 1 DT= 5.0 min	Total Imp(%)= 65.00	Dir. Conn.(%)= 36.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.16	0.08
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	40.00	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	120.75	169.15
over (min)	5.00	5.00
Storage Coeff. (min)=	1.11 (ii)	3.57 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.26

TOTALS

PEAK FLOW (cms)=	0.03	0.04	0.065 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	96.65	63.57	75.47
TOTAL RAINFALL (mm)=	98.65	98.65	98.65
RUNOFF COEFFICIENT =	0.98	0.64	0.77

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0205)	Area (ha)= 0.23		
ID= 1 DT= 5.0 min	Total Imp(%)= 64.00	Dir. Conn.(%)= 37.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.15	0.08
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	39.16	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	120.75	159.50
over (min)	5.00	5.00
Storage Coeff. (min)=	1.10 (ii)	3.56 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.26

TOTALS

PEAK FLOW (cms)=	0.03	0.04	0.065 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	96.65	62.51	75.14
TOTAL RAINFALL (mm)=	98.65	98.65	98.65
RUNOFF COEFFICIENT =	0.98	0.63	0.76

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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)= 0.08		
ID= 1 DT= 5.0 min	Total Imp(%)= 69.00	Dir. Conn.(%)= 38.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.06	0.02
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	23.09	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	120.75	190.33
over (min)	5.00	5.00
Storage Coeff. (min)=	0.80 (ii)	3.10 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.27

TOTALS

PEAK FLOW (cms)=	0.01	0.01	0.023 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	96.65	65.67	77.43
TOTAL RAINFALL (mm)=	98.65	98.65	98.65
RUNOFF COEFFICIENT =	0.98	0.67	0.78

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 ( 0904)|
| 1 + 2 = 3 |
-----
ID1= 1 ( 0203):    AREA    QPEAK    TPEAK    R.V.
                   (ha)      (cms)    (hrs)    (mm)
+ ID2= 2 ( 0204):    0.08    0.023    12.25    77.43
                   0.24    0.068    12.25    75.47
=====
ID = 3 ( 0904):    0.32    0.092    12.25    75.96

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

| ADD HYD ( 0904)|
| 3 + 2 = 1 |
-----
ID1= 3 ( 0904):    AREA    QPEAK    TPEAK    R.V.
                   (ha)      (cms)    (hrs)    (mm)
+ ID2= 2 ( 0205):    0.23    0.065    12.25    75.14
=====
ID = 1 ( 0904):    0.55    0.157    12.25    75.62

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

| ADD HYD ( 0906)|
| 1 + 2 = 3 |
-----
ID1= 1 ( 0202):    AREA    QPEAK    TPEAK    R.V.
                   (ha)      (cms)    (hrs)    (mm)
+ ID2= 2 ( 0206):    0.35    0.080    12.25    59.37
                   0.22    0.044    12.25    60.74
=====
ID = 3 ( 0906):    0.57    0.125    12.25    59.90

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

| ADD HYD ( 0906)|
| 3 + 2 = 1 |
-----
ID1= 3 ( 0906):    AREA    QPEAK    TPEAK    R.V.
                   (ha)      (cms)    (hrs)    (mm)
+ ID2= 2 ( 0304):    0.57    0.125    12.25    59.90
                   0.37    0.073    12.25    60.92
=====
ID = 1 ( 0906):    0.94    0.198    12.25    60.30

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

| ADD HYD ( 0906)|
| 1 + 2 = 3 |
-----
ID1= 1 ( 0202):    AREA    QPEAK    TPEAK    R.V.
                   (ha)      (cms)    (hrs)    (mm)
+ ID2= 2 ( 0206):    0.35    0.080    12.25    59.37
                   0.22    0.044    12.25    60.74
=====
ID = 3 ( 0906):    0.57    0.125    12.25    59.90

```

```

-----
                   (ha)      (cms)    (hrs)    (mm)
ID1= 1 ( 0906):    0.94    0.198    12.25    60.30
+ ID2= 2 ( 0904):    0.55    0.157    12.25    75.62
=====
ID = 3 ( 0906):    1.49    0.355    12.25    65.96

```

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  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  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:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\d640becb-967e-4731-b5f6-00a4892452ca\001c6f9-6596-4abb-a521-6deb67e5bc9c\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\d640becb-967e-4731-b5f6-00a4892452ca\001c6f9-6596-4abb-a521-6deb67e5bc9c\s

DATE: 03-01-2022

TIME: 09:50:40

USER:

COMMENTS: _____

** SIMULATION : (5) 50 Year Design Storm - SC **

READ STORM	Filename: C:\Users\KGowanlock\AppData\Local\Temp\
	e32e46ea-a2d3-4b1d-84ac-6bc28317a757\ee650115
Ptotal=109.84 mm	Comments: 50yr 24hr 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	6.50	1.98	12.75	15.82	19.00	1.98
0.50	1.21	6.75	1.98	13.00	8.13	19.25	1.98
0.75	1.21	7.00	1.98	13.25	8.13	19.50	1.98
1.00	1.21	7.25	1.98	13.50	5.93	19.75	1.98
1.25	1.21	7.50	2.42	13.75	5.93	20.00	1.98
1.50	1.21	7.75	2.42	14.00	4.61	20.25	1.98
1.75	1.21	8.00	2.42	14.25	4.61	20.50	1.32
2.00	1.21	8.25	2.42	14.50	3.30	20.75	1.32
2.25	1.21	8.50	2.86	14.75	3.30	21.00	1.32
2.50	1.43	8.75	2.86	15.00	3.30	21.25	1.32
2.75	1.43	9.00	3.08	15.25	3.30	21.50	1.32
3.00	1.43	9.25	3.08	15.50	3.30	21.75	1.32
3.25	1.43	9.50	3.51	15.75	3.30	22.00	1.32
3.50	1.43	9.75	3.51	16.00	3.30	22.25	1.32
3.75	1.43	10.00	3.95	16.25	3.30	22.50	1.32
4.00	1.43	10.25	3.95	16.50	1.98	22.75	1.32
4.25	1.43	10.50	5.05	16.75	1.98	23.00	1.32
4.50	1.76	10.75	5.05	17.00	1.98	23.25	1.32
4.75	1.76	11.00	6.81	17.25	1.98	23.50	1.32
5.00	1.76	11.25	6.81	17.50	1.98	23.75	1.32
5.25	1.76	11.50	10.54	17.75	1.98	24.00	1.32
5.50	1.76	11.75	10.54	18.00	1.98	24.25	1.32
5.75	1.76	12.00	32.51	18.25	1.98		
6.00	1.76	12.25	134.44	18.50	1.98		
6.25	1.76	12.50	15.82	18.75	1.98		

CALIB	Area (ha)= 0.19
STANDHYD (0303)	Total Imp(%)= 53.00 Dir. Conn.(%)= 0.10
ID= 1 DT= 5.0 min	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.10	0.09
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	8.00
Length (m)=	35.59	13.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	134.44	236.02
over (min)	5.00	5.00
Storage Coeff. (min)=	0.99 (ii)	2.67 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.29
PEAK FLOW (cms)=	0.00	0.06
TIME TO PEAK (hrs)=	12.25	12.25
RUNOFF VOLUME (mm)=	107.84	77.30
TOTAL RAINFALL (mm)=	109.84	109.84
RUNOFF COEFFICIENT =	0.98	0.70

TOTALS
0.059 (iii)
12.25
77.31
109.84
0.70

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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	Area (ha)= 0.13
STANDHYD (0201)	Total Imp(%)= 45.00 Dir. Conn.(%)= 0.10
ID= 1 DT= 5.0 min	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.06	0.07
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	5.00
Length (m)=	29.44	8.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	134.44	193.11
over (min)	5.00	5.00
Storage Coeff. (min)=	0.89 (ii)	2.45 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.30
PEAK FLOW (cms)=	0.00	0.04

TOTALS
0.039 (iii)

TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	107.84	73.41	73.43
TOTAL RAINFALL (mm)=	109.84	109.84	109.84
RUNOFF COEFFICIENT =	0.98	0.67	0.67

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. 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 (0201):	0.13	0.039	12.25	73.43
+ ID2= 2 (0303):	0.19	0.059	12.25	77.31
=====				
ID = 3 (0903):	0.32	0.098	12.25	75.73

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	Area (ha)=	0.22
STANDHYD (0206)	Total Imp(%)=	30.00
ID= 1 DT= 5.0 min	Dir. Conn.(%)=	21.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.07	0.15
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	1.00
Length (m)=	38.30	20.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	134.44	100.29
over (min)	5.00	10.00
Storage Coeff. (min)=	1.04 (ii)	6.76 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.34	0.14

		TOTALS
PEAK FLOW (cms)=	0.02	0.052 (iii)
TIME TO PEAK (hrs)=	12.25	12.25
RUNOFF VOLUME (mm)=	107.84	60.23
TOTAL RAINFALL (mm)=	109.84	109.84

RUNOFF COEFFICIENT =	0.98	0.55	0.64
----------------------	------	------	------

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. 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	Area (ha)=	0.35
STANDHYD (0202)	Total Imp(%)=	26.00
ID= 1 DT= 5.0 min	Dir. Conn.(%)=	20.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.09	0.26
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	5.00
Length (m)=	48.30	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	134.44	94.15
over (min)	5.00	5.00
Storage Coeff. (min)=	1.19 (ii)	4.25 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.33	0.23

		TOTALS
PEAK FLOW (cms)=	0.03	0.07
TIME TO PEAK (hrs)=	12.25	12.25
RUNOFF VOLUME (mm)=	107.84	58.96
TOTAL RAINFALL (mm)=	109.84	109.84
RUNOFF COEFFICIENT =	0.98	0.54

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. 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	Area (ha)=	0.37
STANDHYD (0304)	Total Imp(%)=	39.00
ID= 1 DT= 5.0 min	Dir. Conn.(%)=	0.10

```

-----
                IMPERVIOUS    PERVIOUS (i)
Surface Area    (ha)=         0.14         0.23
Dep. Storage    (mm)=         2.00         5.00
Average Slope    (%)=         2.00         2.00
Length          (m)=         49.67         40.00
Mannings n      =         0.013         0.250

Max.Eff.Inten.(mm/hr)= 134.44         168.52
                        over (min)         5.00         10.00
Storage Coeff. (min)= 1.21 (ii)         6.94 (ii)
Unit Hyd. Tpeak (min)= 5.00         10.00
Unit Hyd. peak (cms)= 0.33         0.14

                *TOTALS*
PEAK FLOW      (cms)=         0.00         0.09         0.086 (iii)
TIME TO PEAK   (hrs)=         12.25         12.25         12.25
RUNOFF VOLUME  (mm)=        107.84         70.71         70.73
TOTAL RAINFALL (mm)=        109.84         109.84        109.84
RUNOFF COEFFICIENT =         0.98         0.64         0.64

```

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

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 ( 0204) | Area (ha)= 0.24
| ID= 1 DT= 5.0 min | Total Imp(%)= 65.00 Dir. Conn.(%)= 36.00
-----

```

```

                IMPERVIOUS    PERVIOUS (i)
Surface Area    (ha)=         0.16         0.08
Dep. Storage    (mm)=         2.00         5.00
Average Slope    (%)=         2.00         2.00
Length          (m)=         40.00         8.00
Mannings n      =         0.013         0.250

Max.Eff.Inten.(mm/hr)= 134.44         194.79
                        over (min)         5.00         5.00
Storage Coeff. (min)= 1.06 (ii)         3.42 (ii)
Unit Hyd. Tpeak (min)= 5.00         5.00
Unit Hyd. peak (cms)= 0.34         0.26

                *TOTALS*
PEAK FLOW      (cms)=         0.03         0.05         0.078 (iii)

```

```

TIME TO PEAK    (hrs)=         12.25         12.25         12.25
RUNOFF VOLUME    (mm)=        107.84         73.58         85.91
TOTAL RAINFALL   (mm)=        109.84         109.84        109.84
RUNOFF COEFFICIENT =         0.98         0.67         0.78

```

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 ( 0205) | Area (ha)= 0.23
| ID= 1 DT= 5.0 min | Total Imp(%)= 64.00 Dir. Conn.(%)= 37.00
-----

```

```

                IMPERVIOUS    PERVIOUS (i)
Surface Area    (ha)=         0.15         0.08
Dep. Storage    (mm)=         2.00         5.00
Average Slope    (%)=         2.00         2.00
Length          (m)=         39.16         8.00
Mannings n      =         0.013         0.250

```

```

Max.Eff.Inten.(mm/hr)= 134.44         183.95
                        over (min)         5.00         5.00
Storage Coeff. (min)= 1.05 (ii)         3.41 (ii)
Unit Hyd. Tpeak (min)= 5.00         5.00
Unit Hyd. peak (cms)= 0.34         0.26

```

```

                *TOTALS*
PEAK FLOW      (cms)=         0.03         0.04         0.074 (iii)
TIME TO PEAK   (hrs)=         12.25         12.25         12.25
RUNOFF VOLUME  (mm)=        107.84         72.45         85.54
TOTAL RAINFALL (mm)=        109.84         109.84        109.84
RUNOFF COEFFICIENT =         0.98         0.66         0.78

```

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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)= 0.08
-----

```

|ID= 1 DT= 5.0 min | Total Imp(%)= 69.00 Dir. Conn.(%)= 38.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.06	0.02
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	23.09	8.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	134.44	218.55
over (min)	5.00	5.00
Storage Coeff. (min)=	0.77 (ii)	2.97 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.28

		TOTALS
PEAK FLOW (cms)=	0.01	0.02
TIME TO PEAK (hrs)=	12.25	12.25
RUNOFF VOLUME (mm)=	107.84	87.97
TOTAL RAINFALL (mm)=	109.84	109.84
RUNOFF COEFFICIENT =	0.98	0.80

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

	AREA	QPEAK	TPEAK	R.V.
ID1= 1 (0203):	0.08	0.027	12.25	87.97
+ ID2= 2 (0204):	0.24	0.078	12.25	85.91
ID = 3 (0904):	0.32	0.104	12.25	86.42

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

	AREA	QPEAK	TPEAK	R.V.
ID1= 3 (0904):	0.32	0.104	12.25	86.42
+ ID2= 2 (0205):	0.23	0.074	12.25	85.54

ID = 1 (0904): 0.55 0.179 12.25 86.05

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

	AREA	QPEAK	TPEAK	R.V.
ID1= 1 (0202):	0.35	0.093	12.25	68.72
+ ID2= 2 (0206):	0.22	0.052	12.25	70.20
ID = 3 (0906):	0.57	0.145	12.25	69.29

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

	AREA	QPEAK	TPEAK	R.V.
ID1= 3 (0906):	0.57	0.145	12.25	69.29
+ ID2= 2 (0304):	0.37	0.086	12.25	70.73
ID = 1 (0906):	0.94	0.231	12.25	69.86

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

	AREA	QPEAK	TPEAK	R.V.
ID1= 1 (0906):	0.94	0.231	12.25	69.86
+ ID2= 2 (0904):	0.55	0.179	12.25	86.05
ID = 3 (0906):	1.49	0.410	12.25	75.84

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 UUUU A A LLLLL
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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\d640becb-967e-4731-b5f6-00a4892452ca\8
7fd64c0-653c-40c0-8d9f-be5f4859c85c\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\XH5\d640becb-967e-4731-b5f6-00a4892452ca\8
7fd64c0-653c-40c0-8d9f-be5f4859c85c\s

DATE: 03-01-2022

TIME: 09:50:39

USER:

COMMENTS: _____

** SIMULATION : (6) 100 Year Design Storm - S **

| READ STORM | Filename: C:\Users\KGowanlock\AppData
| | ata\Local\Temp\
| | e32e46ea-a2d3-4b1d-84ac-6bc28317a757\3c054a99
| Ptotal=120.77 mm | Comments: 100yr 24hr 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	6.50	2.17	12.75	17.39	19.00	2.17	
0.50	1.33	6.75	2.17	13.00	8.94	19.25	2.17	
0.75	1.33	7.00	2.17	13.25	8.94	19.50	2.17	
1.00	1.33	7.25	2.17	13.50	6.52	19.75	2.17	
1.25	1.33	7.50	2.66	13.75	6.52	20.00	2.17	

1.50	1.33	7.75	2.66	14.00	5.07	20.25	2.17
1.75	1.33	8.00	2.66	14.25	5.07	20.50	1.45
2.00	1.33	8.25	2.66	14.50	3.62	20.75	1.45
2.25	1.33	8.50	3.14	14.75	3.62	21.00	1.45
2.50	1.57	8.75	3.14	15.00	3.62	21.25	1.45
2.75	1.57	9.00	3.38	15.25	3.62	21.50	1.45
3.00	1.57	9.25	3.38	15.50	3.62	21.75	1.45
3.25	1.57	9.50	3.86	15.75	3.62	22.00	1.45
3.50	1.57	9.75	3.86	16.00	3.62	22.25	1.45
3.75	1.57	10.00	4.35	16.25	3.62	22.50	1.45
4.00	1.57	10.25	4.35	16.50	2.17	22.75	1.45
4.25	1.57	10.50	5.56	16.75	2.17	23.00	1.45
4.50	1.93	10.75	5.56	17.00	2.17	23.25	1.45
4.75	1.93	11.00	7.49	17.25	2.17	23.50	1.45
5.00	1.93	11.25	7.49	17.50	2.17	23.75	1.45
5.25	1.93	11.50	11.59	17.75	2.17	24.00	1.45
5.50	1.93	11.75	11.59	18.00	2.17	24.25	1.45
5.75	1.93	12.00	35.75	18.25	2.17		
6.00	1.93	12.25	147.82	18.50	2.17		
6.25	1.93	12.50	17.39	18.75	2.17		

| CALIB |
| STANDHYD (0303) | Area (ha)= 0.19
| ID= 1 DT= 5.0 min | Total Imp(%)= 53.00 Dir. Conn.(%)= 0.10

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.10	0.09
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	8.00
Length (m)=	35.59	13.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	147.82	265.53
over (min)	5.00	5.00
Storage Coeff. (min)=	0.95 (ii)	2.56 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.29

TOTALS

PEAK FLOW (cms)=	0.00	0.07	0.067 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	118.77	87.42	87.45
TOTAL RAINFALL (mm)=	120.77	120.77	120.77
RUNOFF COEFFICIENT =	0.98	0.72	0.72

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 ( 0201)|
|ID= 1 DT= 5.0 min |
-----
Area (ha)= 0.13
Total Imp(%)= 45.00 Dir. Conn.(%)= 0.10

IMPVIOUS PERVIOUS (i)
Surface Area (ha)= 0.06 0.07
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 5.00
Length (m)= 29.44 8.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 147.82 218.15
over (min) 5.00 5.00
Storage Coeff. (min)= 0.85 (ii) 2.35 (ii)
Unit Hyd. Tpeak (min)= 5.00 5.00
Unit Hyd. peak (cms)= 0.34 0.30

*TOTALS*
PEAK FLOW (cms)= 0.00 0.04 0.044 (iii)
TIME TO PEAK (hrs)= 12.25 12.25 12.25
RUNOFF VOLUME (mm)= 118.77 83.33 83.35
TOTAL RAINFALL (mm)= 120.77 120.77 120.77
RUNOFF COEFFICIENT = 0.98 0.69 0.69

```

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 ( 0201): 0.13 0.044 12.25 83.35
+ ID2= 2 ( 0303): 0.19 0.067 12.25 87.45

```

```

=====
ID = 3 ( 0903): 0.32 0.111 12.25 85.78

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB
| STANDHYD ( 0206)|
|ID= 1 DT= 5.0 min |
-----
Area (ha)= 0.22
Total Imp(%)= 30.00 Dir. Conn.(%)= 21.00

IMPVIOUS PERVIOUS (i)
Surface Area (ha)= 0.07 0.15
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 1.00
Length (m)= 38.30 20.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 147.82 114.99
over (min) 5.00 10.00
Storage Coeff. (min)= 1.00 (ii) 6.42 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.34 0.14

*TOTALS*
PEAK FLOW (cms)= 0.02 0.04 0.060 (iii)
TIME TO PEAK (hrs)= 12.25 12.25 12.25
RUNOFF VOLUME (mm)= 118.77 69.26 79.63
TOTAL RAINFALL (mm)= 120.77 120.77 120.77
RUNOFF COEFFICIENT = 0.98 0.57 0.66

```

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 ( 0202)|
|ID= 1 DT= 5.0 min |
-----
Area (ha)= 0.35
Total Imp(%)= 26.00 Dir. Conn.(%)= 20.00

IMPVIOUS PERVIOUS (i)
Surface Area (ha)= 0.09 0.26
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 5.00
Length (m)= 48.30 8.00
Mannings n = 0.013 0.250

```

Max.Eff.Inten.(mm/hr)= 147.82 108.12
over (min) 5.00 5.00
Storage Coeff. (min)= 1.15 (ii) 4.09 (ii)
Unit Hyd. Tpeak (min)= 5.00 5.00
Unit Hyd. peak (cms)= 0.34 0.24

PEAK FLOW (cms)= 0.03 0.08
TIME TO PEAK (hrs)= 12.25 12.25
RUNOFF VOLUME (mm)= 118.77 67.89
TOTAL RAINFALL (mm)= 120.77 120.77
RUNOFF COEFFICIENT = 0.98 0.56

TOTALS
0.106 (iii)
12.25
78.06
120.77
0.65

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0304)
ID= 1 DT= 5.0 min
Area (ha)= 0.37
Total Imp(%)= 39.00 Dir. Conn.(%)= 0.10

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.14 0.23
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 49.67 40.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 147.82 190.94
over (min) 5.00 10.00
Storage Coeff. (min)= 1.17 (ii) 6.62 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.34 0.14

PEAK FLOW (cms)= 0.00 0.10
TIME TO PEAK (hrs)= 12.25 12.25
RUNOFF VOLUME (mm)= 118.77 80.47
TOTAL RAINFALL (mm)= 120.77 120.77
RUNOFF COEFFICIENT = 0.98 0.67

TOTALS
0.100 (iii)
12.25
80.50
120.77
0.67

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0204)
ID= 1 DT= 5.0 min
Area (ha)= 0.24
Total Imp(%)= 65.00 Dir. Conn.(%)= 36.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.16 0.08
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 40.00 8.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 147.82 220.02
over (min) 5.00 5.00
Storage Coeff. (min)= 1.02 (ii) 3.30 (ii)
Unit Hyd. Tpeak (min)= 5.00 5.00
Unit Hyd. peak (cms)= 0.34 0.27

PEAK FLOW (cms)= 0.04 0.05
TIME TO PEAK (hrs)= 12.25 12.25
RUNOFF VOLUME (mm)= 118.77 83.51
TOTAL RAINFALL (mm)= 120.77 120.77
RUNOFF COEFFICIENT = 0.98 0.69

TOTALS
0.087 (iii)
12.25
96.20
120.77
0.80

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0205)
ID= 1 DT= 5.0 min
Area (ha)= 0.23
Total Imp(%)= 64.00 Dir. Conn.(%)= 37.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.15 0.08
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 2.00

Length (m)= 39.16 8.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 147.82 208.03
over (min) 5.00 5.00
Storage Coeff. (min)= 1.01 (ii) 3.28 (ii)
Unit Hyd. Tpeak (min)= 5.00 5.00
Unit Hyd. peak (cms)= 0.34 0.27

TOTALS
PEAK FLOW (cms)= 0.03 0.05 0.083 (iii)
TIME TO PEAK (hrs)= 12.25 12.25 12.25
RUNOFF VOLUME (mm)= 118.77 82.31 95.80
TOTAL RAINFALL (mm)= 120.77 120.77 120.77
RUNOFF COEFFICIENT = 0.98 0.68 0.79

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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)= 0.08
| ID= 1 DT= 5.0 min | Total Imp(%)= 69.00 Dir. Conn.(%)= 38.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.06 0.02
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 23.09 8.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 147.82 246.26
over (min) 5.00 5.00
Storage Coeff. (min)= 0.74 (ii) 2.85 (ii)
Unit Hyd. Tpeak (min)= 5.00 5.00
Unit Hyd. peak (cms)= 0.34 0.28

TOTALS
PEAK FLOW (cms)= 0.01 0.02 0.030 (iii)
TIME TO PEAK (hrs)= 12.25 12.25 12.25
RUNOFF VOLUME (mm)= 118.77 85.87 98.36
TOTAL RAINFALL (mm)= 120.77 120.77 120.77
RUNOFF COEFFICIENT = 0.98 0.71 0.81

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. 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 (0904) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0203): 0.08 0.030 12.25 98.36
+ ID2= 2 (0204): 0.24 0.087 12.25 96.20
=====

ID = 3 (0904): 0.32 0.117 12.25 96.74

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0904) |
| 3 + 2 = 1 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 3 (0904): 0.32 0.117 12.25 96.74
+ ID2= 2 (0205): 0.23 0.083 12.25 95.80
=====

ID = 1 (0904): 0.55 0.200 12.25 96.34

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0906) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0202): 0.35 0.106 12.25 78.06
+ ID2= 2 (0206): 0.22 0.060 12.25 79.63
=====

ID = 3 (0906): 0.57 0.165 12.25 78.67

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0906) |
| 3 + 2 = 1 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 3 (0906): 0.57 0.165 12.25 78.67
+ ID2= 2 (0304): 0.37 0.100 12.25 80.50

=====

ID = 1 (0906):	0.94	0.265	12.25	79.39
-----------------	------	-------	-------	-------

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0906)
1 + 2 = 3

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0906):	0.94	0.265	12.25	79.39
+ ID2= 2 (0904):	0.55	0.200	12.25	96.34
=====				
ID = 3 (0906):	1.49	0.465	12.25	85.65

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

Appendix C: Weir Calculations

PROJECT	Cranberry Marsh Estates	FILE	120181	
		DATE	November 2022	
SUBJECT	Quality Control Swale Volume	NAME	KG	
		PAGE	1	OF 1

ENHANCED DITCH OUTLET WEIR CALCULATIONS

Target Volume, $V_{25mm} = 18 \text{ m}^3$ (VO Output - 25mm Chicago Storm - Catchment 203/204/205)

DIMENSIONS

$L = 198.00 \text{ m}$ (Length of swale)
 $w_1 = 2.10 \text{ m}$ (Width of bottom of swale)
 $w_2 = 3.90 \text{ m}$ (Width of top of swale assuming 3:1)
 $h = 0.090 \text{ m}$ (Depth of swale)
 $s = 0.0 \%$ (Grade of swale)

VOLUME

Assumption: Side slopes of swale are 3:1

$V = Lhw_1 + 3h^2L = 42.2 \text{ m}^3 > V_{25mm} = 18 \text{ m}^3$ (Acceptable)

PROJECT	Cranberry Marsh Estates	FILE	120181
		DATE	November 2022
SUBJECT	Overflow For Enhanced Grass Ditch	NAME	KG
		PAGE	1 OF 1

ENHANCED DITCH OUTLET WEIR CALCULATIONS

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

100 -Year Storm Peak Flow For Catchments 203, 204 and 205 (m³/s) = 0.200

W	Weir Bottom Width (m)	2.6
H	Head (m)	0.210
L	Weir Downstream Length (m)	10
S	Side Slope (horizontal):1	3

RECTANGULAR WEIR

$$Q = CWH^{3/2}$$

H/L	0.021
C	1.4

Result

Q Rectangular Weir Flow (m³/s) 0.356

TRIANGULAR WEIR

$$Q = CH^{5/2} \tan(\theta/2)$$

Notch Angle (one side)	71.6	degrees
Notch Angle (one side)	1.25	radians

$$\tan(\theta/2) = 3.00$$

Triangular H/L	0.021
C	1.05

Result

Q Triangular Weir Flow (m³/s) 0.0637

Total Rectangular + Triangular Weir

Stone Porosity 50 %

$$Q \text{ Total Flow (m}^3\text{/s)} = 0.419 \times 50\% = 0.210 > 0.2$$

PROJECT	Cranberry Marsh Estates	FILE	120181	
		DATE	November 2022	
SUBJECT	Curb Cut Weir Calculations	NAME	KG	
		PAGE	1	OF 1

CURB CUT WEIR CALCULATIONS

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

100 -Year Storm Peak Flow For Catchments 206 (m³/s) = 0.060

W	Weir Bottom Width (m)	1.000
H	Head (m)	0.150
L	Weir Downstream Length (m)	0.15
S	Side Slope (horizontal):1	0

Rectangular Weir

$$Q = CWH^{3/2}$$

H/L	1
C	1.7

Result

Q Rectangular Weir Flow (m³/s) **0.099** > 0.060

PROJECT	Cranberry Marsh Estates		FILE	120181
			DATE	November 2022
SUBJECT	Culvert - Catchment 201/303		NAME	KG
			PAGE	1 OF 1

NORTHWEST CULVERT CALCULATIONS

CATCHMENT	5-YEAR PEAK FLOW		
201/303	CHI	SCS	
Prop. Catch. =	0.037	0.056	cms

Circular Pipe, Full Flow

Manning's Coeff, n	0.013		
Slope, S	0.03	m/m	
Diameter, D	0.200	m	
Area, A	0.0314	m ²	
Perimeter, P	0.6283	m	
Hydraulic Radius, R	0.05	m	
Flow, Q	0.057	cms	> Q _{peak} = 0.056 cms (Acceptable)

$$Q = \frac{1}{n} \cdot A \cdot R^{2/3} \cdot S^{1/2}$$