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Cranberry Marsh Estates

STORMWATER MANAGEMENT REPORT

Hill Ridge Homes

File 120181 | March 4, 2022

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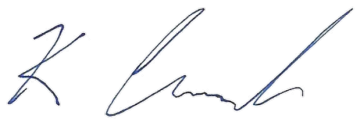	
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Issue	Date	Description
1	March 4, 2022	Draft Plan Submission

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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);
- *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. 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 (DP01) 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%, feeding 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 (DP01) 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). The Cranberry Marsh high water level was determined to be 179.65 m (*Flood Study – Wyldewood Creek* by C.F. Crozier & Associates Inc. Sept. 2020).

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.

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.

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.

There are plans by Reid's Heritage Homes to re-develop Greentrees Nursey & Emporium. Tatham Engineering has been contracted 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.

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 is low sloped. 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

PRE-DEVELOPMENT PEAK FLOW RATE (M^3/SEC)				
STORM EVENT	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. Via 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 (DP02).*

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 m^3/s at 210 mm of depth, which can accommodate the modelled 100-year storm peak flow of 0.200 m^3/s for catchment 203, 204 and 205 that drains towards the ditch. Refer to the Post-Development Drainage Plan (DP02) 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 an enhanced grass ditch before discharging into the Cranberry Marsh. The ditch 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 southern portion of the cul-de-sac and the parking lot. Water quality treatment will be provided via an excavated sediment trap before draining into the Cranberry Marsh.
- **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. Water quality treatment will be provided via an excavated sediment trap before draining as sheet flow towards the Cranberry Marsh.
- **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 flooding 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 ESC01 and ESC02. Detailed erosion and sediment control measures to be implemented during and after construction are summarized as follows:

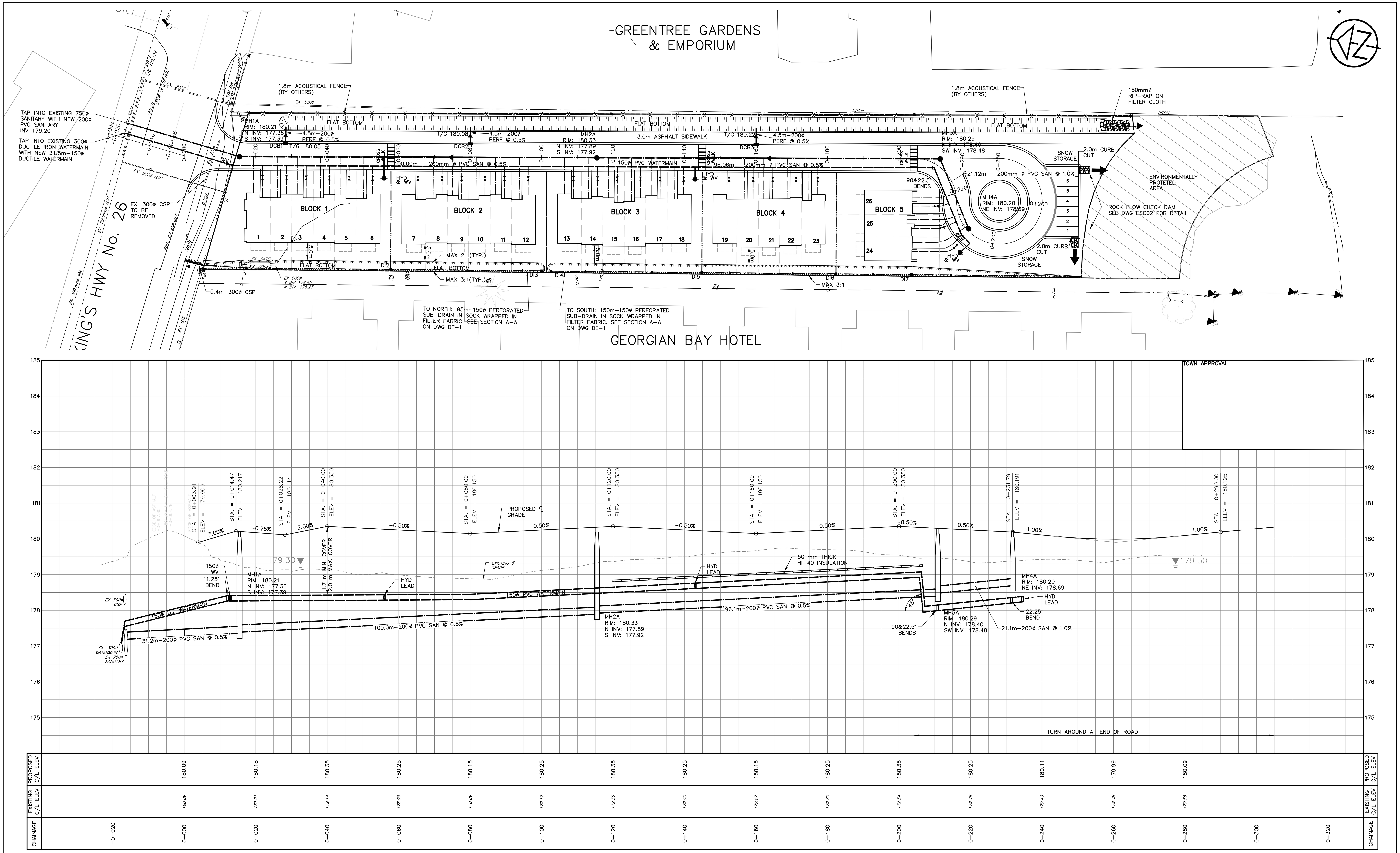
- heavy duty silt fence will be erected before the commencement of any grading operations to control sediment movement;
- a construction vehicle entrance will be constructed and maintained consisting of a stone mud mat to reduce off-site tracking of material;
- regular inspection of control measures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

6 Summary

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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LICENSED PROFESSIONAL ENGINEER 2022.03.04 D. M. CASULLO PROVINCE OF ONTARIO

CRANBERRY MARSH ESTATES

TOWN OF COLLINGWOOD

SITE SERVICING PLAN AND PROFILE

TATHAM ENGINEERING

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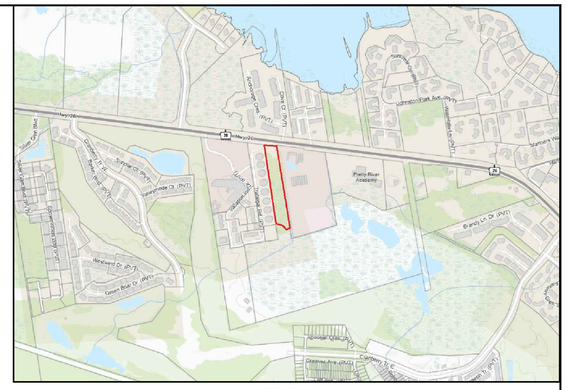

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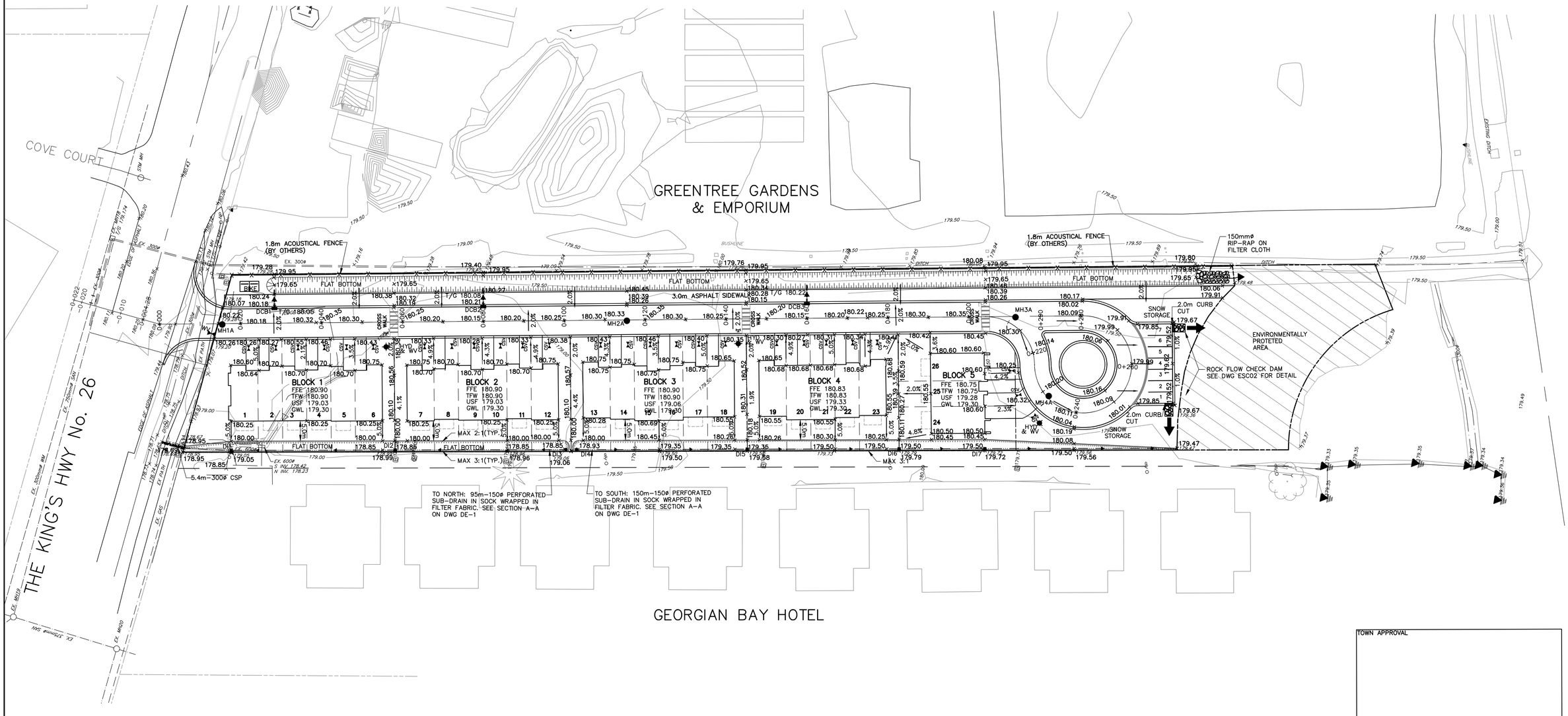

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2022.03.04
D. M. CASULO
PROVINCE OF ONTARIO

CRANBERRY MARSH ESTATES

TOWN OF COLLINGWOOD

TATHAM ENGINEERING

SITE GRADING PLAN

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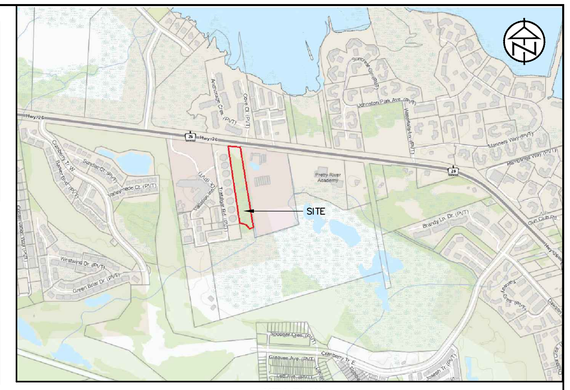
- EXISTING DITCH FLOW DIRECTION

TOWN APPROVAL



KEY PLAN

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CRANBERRY MARSH ESTATES
TOWN OF COLLINGWOOD

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PRE-DEVELOPMENT DRAINAGE PLAN

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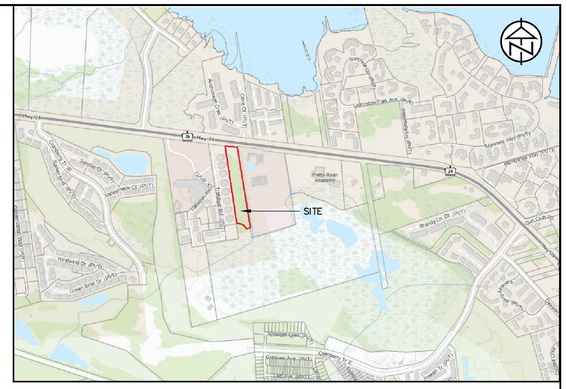

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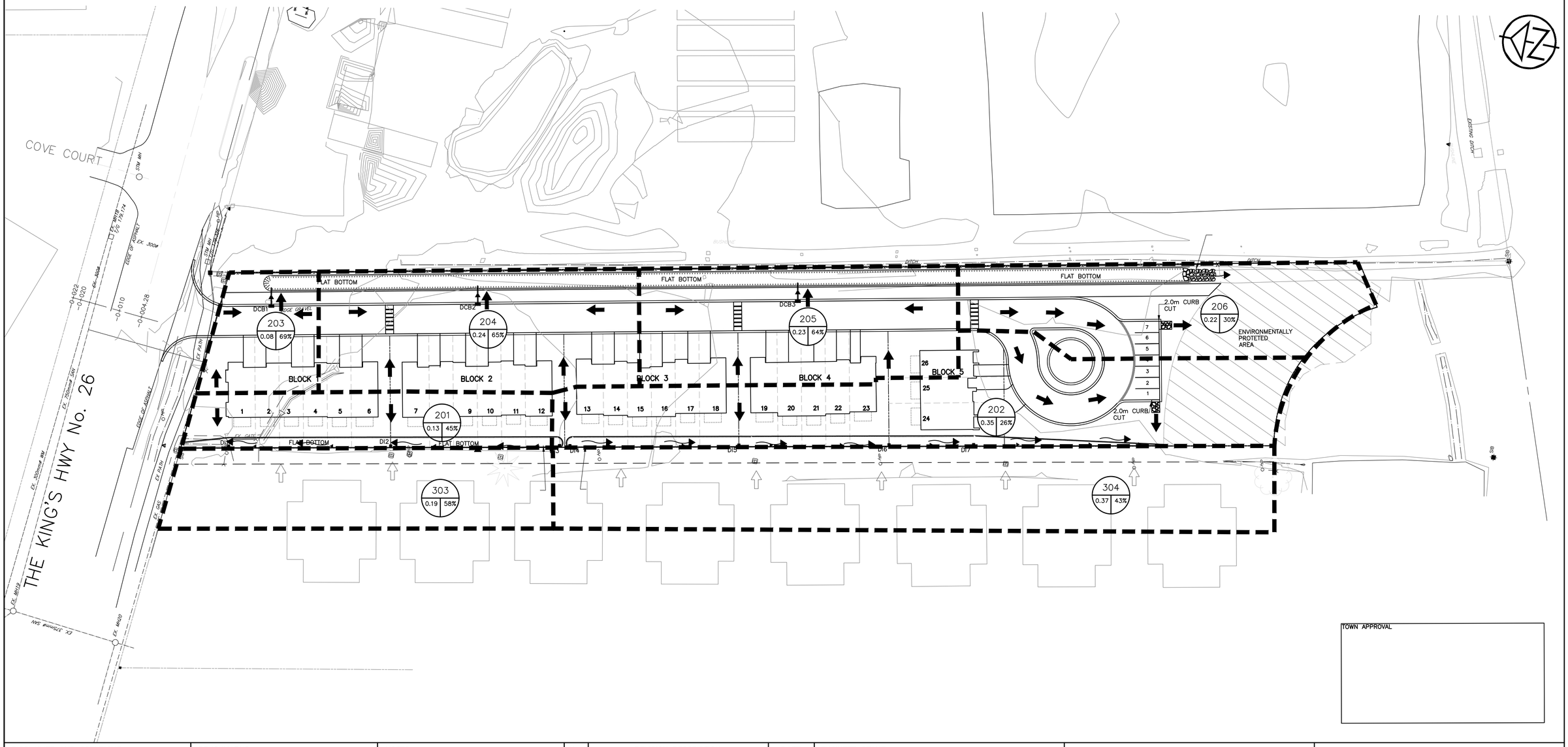

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CRANBERRY MARSH ESTATES
TOWN OF COLLINGWOOD

POST-DEVELOPMENT DRAINAGE PLAN

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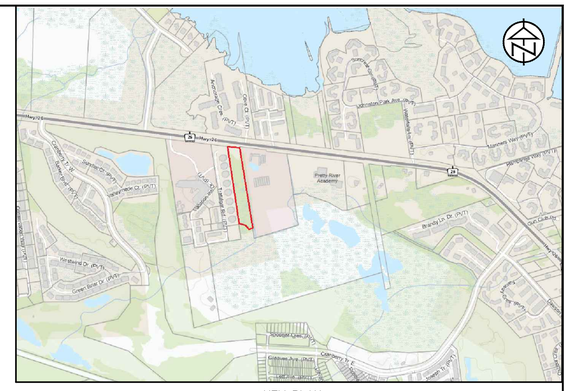
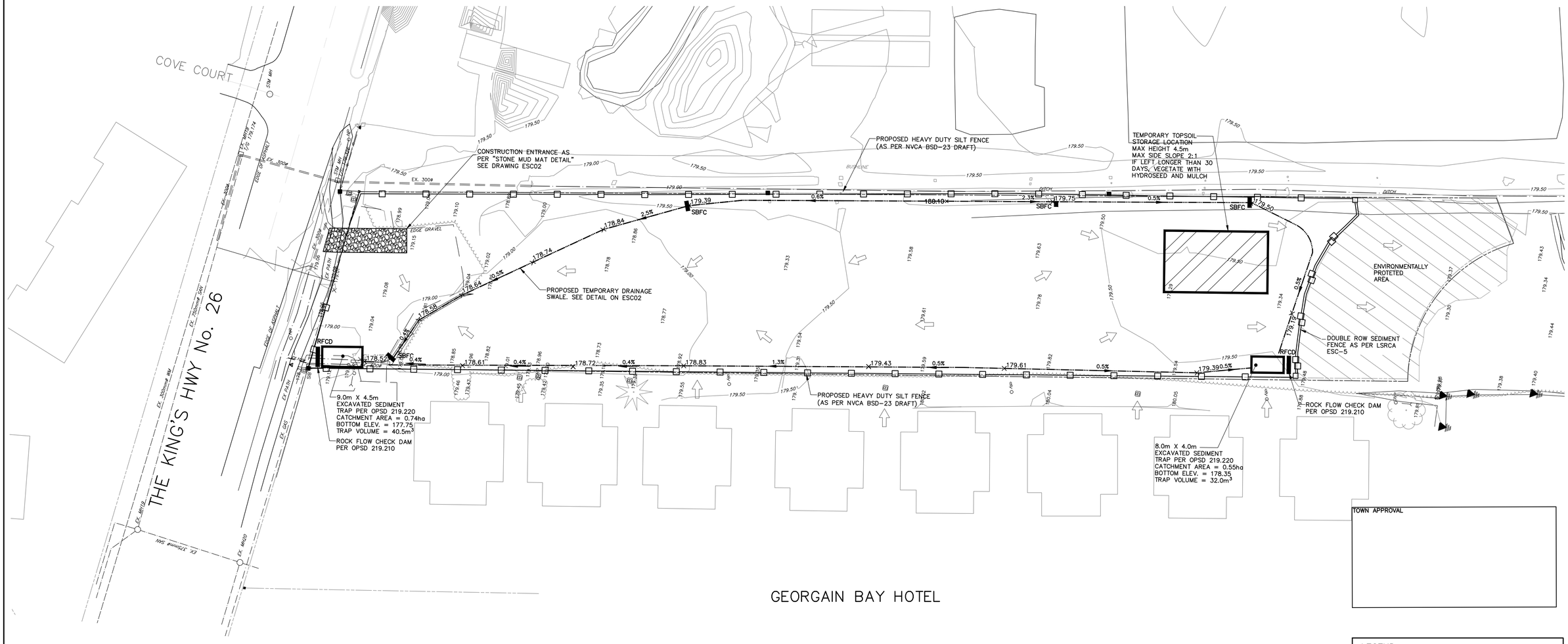
Drawing Name: 120181 – DP02.dwg, Plotted: Mar 04, 2022

GREENTREE GARDENS & EMPORIUM



KEY PLAN



TOWN APPROVAL

LEGEND

- PROPOSED STRAW BALE FLOW CHECK (AS PER OPSD 219.210) — RFCD
- PROPOSED ROCK FLOW CHECK (AS PER OPSD 219.180) — SBFC
- 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.

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 C.C. TATHAM & ASSOCIATES LTD, DATED, 2012 WHICH MAY NOT BE FINAL AND ARE NOT GUARANTEED.

No.	REVISION DESCRIPTION	DATE
1.	1ST SUBMISSION	03/22

ENGINEER STAMP

LICENSED PROFESSIONAL ENGINEER — 2022.03.04 — D. M. CASULO — PROVINCE OF ONTARIO

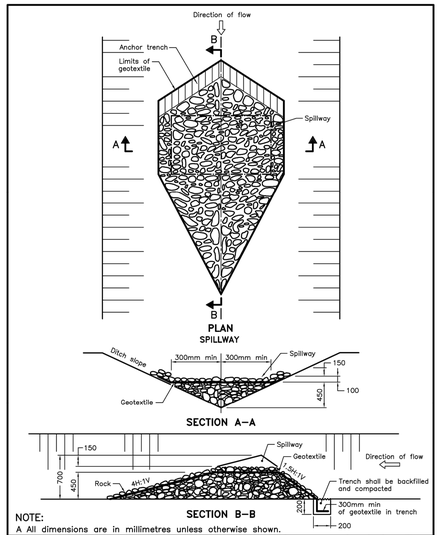
CRANBERRY MARSH ESTATES
TOWN OF COLLINGWOOD

TATHAM ENGINEERING

EROSION AND SEDIMENT CONTROL PLAN

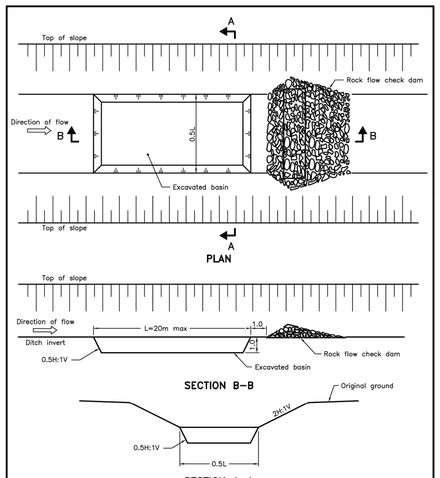
DESIGN: KG	FILE: 120181	DWG:	
DRAWN: KB/SBU	DATE: MAR 2022	**ESC01**	
CHECK: DC	SCALE: 1:500		

Drawing Name: 120181 – ESC01.dwg, Plotted: Mar 04, 2022



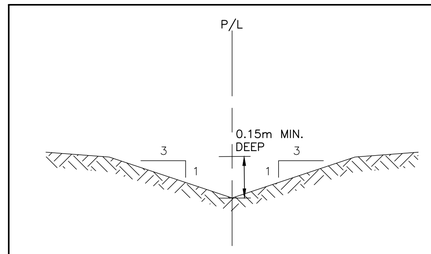
NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 2
TEMPORARY ROCK FLOW CHECK DAM V–DITCH		OPSD 219.210



NOTES:
A Ditch cross–section upstream or downstream of sediment trap may be flat bottom or V–shaped. Flat bottom shown.
B This OPSD shall be read in conjuction with OPSD 219.210 or 219.211.
C All dimensions are in metres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 2
SEDIMENT TRAP IN DITCH		OPSD 219.220



TEMPORARY SWALE DETAIL
NTS

STONE SIZE
THE STONE PAD SHALL BE A MIN. 450mm THICK. USE 50mmø STONE OR RECLAIMED CONCRETE EQUIVALENT FOR FIRST 10m FROM ADJACENT ROAD & 150mmø STONE FOR REMAINDER OF STONE PAD.

LENGTH
AS REQUIRED BUT NOT LESS THAN 20m.

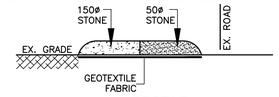
WIDTH
10m MIN. BUT NOT LESS THAN THE WIDTH AT POINTS WHERE INGRESS AND EGRESS OCCURS.

GEOTEXTILE FABRIC
TERRAFIX 270R OR APPROVED EQUIVALENT TO BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE.

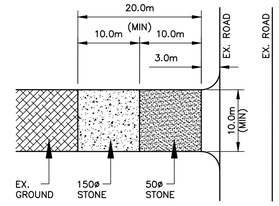
SURFACE WATER
ALL SURFACE WATER FLOWING OR DIRECTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE.

MAINTENANCE
THE CONTRACTOR SHALL MAINTAIN THE ENTRANCE IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT–OF–WAY. THIS MAY REQUIRE PERIODIC DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT–OF–WAY MUST BE REMOVED IMMEDIATELY BY THE CONTRACTOR. UPON OBSERVATION OF CONTINUOUS MUD TRACKING ONTO ADJACENT STREETS, THE STONE MAT IS TO BE FULLY REPLACED. INSPECTION AND REQUIRED MAINTENANCE AFTER EACH RAIN EVENT SHALL BE PROVIDED BY THE CONTRACTOR.

WASHING
WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT–OF–WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.



PROFILE



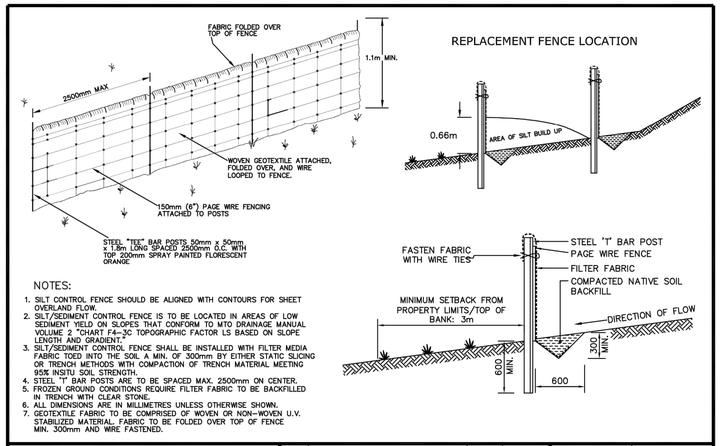
PLAN

STONE MUD MAT DETAIL
NTS

NOTES

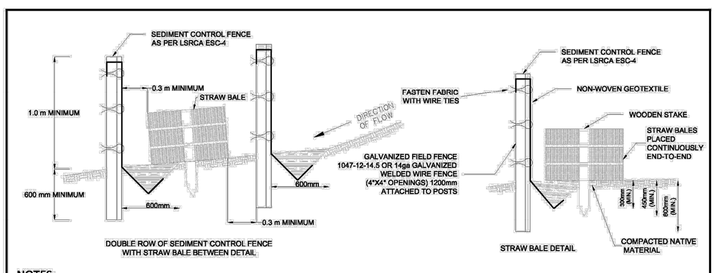
1. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. SEDIMENT AND EROSION CONTROL MEASURES THAT ARE DESIGNED TO CONTROL RUNOFF FROM SPECIFIC AREAS MUST BE INSTALLED PRIOR TO ANY DISTURBANCE OF THAT PART OF THE SITE. THE LOCATION OF ALL SILTATION AND EROSION CONTROL WORKS TO BE REVIEWED ON SITE AND MAY BE REVISED AS DIRECTED BY THE ENGINEER.
2. 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.
3. 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.
4. 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.
5. CONSTRUCTION OF ALL SILTATION AND EROSION CONTROL WORK IS TO BE IN ACCORDANCE WITH THE FOLLOWING STEPS:
   - 5.1. INSTALL NEW OR MAINTAIN EXISTING STONE MUD MAT AS PER DETAIL.
   - 5.2. INSTALL SILT FENCE AS PER NVCA STANDARDS (BSD–23).
   - 5.3. 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.
6. ALL CONSTRUCTION VEHICLES TO ACCESS SITE USING THE DESIGNATED CONSTRUCTION ACCESS POINTS.
7. 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.
8. STOCKPILE LOCATIONS ARE TO BE APPROVED BY THE ENGINEER.
9. PROVIDE FENCE OR APPROVED EQUAL ACROSS ALL CONSTRUCTION ACCESSES DURING PERIODS OF INACTIVITY.
10. 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.

TOWN APPROVAL



NOTES:
1. SILT CONTROL FENCE SHOULD BE ALIGNED WITH CONTOURS FOR SHEET OVERLAND FLOW.
2. SILT/SEDIMENT CONTROL FENCE IS TO BE LOCATED IN AREAS OF LOW SEDIMENT YIELD ON SLOPES THAT CONFORM TO MTO DRAINAGE MANUAL VOLUME 2 "CHART F4–3C TOPOGRAPHIC FACTOR LS BASED ON SLOPE LENGTH AND GRADIENT."
3. SILT/SEDIMENT CONTROL FENCE SHALL BE INSTALLED WITH FILTER MEDIA FABRIC TOED INTO THE SOIL A MIN. OF 300mm BY EITHER STATIC SLICING OR TRENCH METHODS WITH COMPACTION OF TRENCH MATERIAL MEETING 95% INSITU SOIL STRENGTH.
4. STEEL "I" BAR POSTS ARE TO BE SPACED MAX. 2500mm ON CENTER.
5. FROZEN GROUND CONDITIONS REQUIRE FILTER FABRIC TO BE BACKFILLED IN TRENCH WITH CLEAR STONE.
6. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.
7. GEOTEXTILE FABRIC TO BE COMPRISED OF WOVEN OR NON–WOVEN U.V. STABILIZED MATERIAL. FABRIC TO BE FOLDED OVER TOP OF FENCE MIN. 300mm AND WIRE FASTENED.

Nottawasaga Valley Conservation Authority					APR'D:	DATE: 03.03.06
TYPICAL DETAIL OF SILT/SEDIMENT FENCE					DRAWN: A.S.C	SCALE: NTS
	NO.	REVISION	APR'D	DATE	BSD-23 DRAFT	



NOTES:
1. SEDIMENT CONTROL FENCE SHOULD BE ALIGNED WITH CONTOURS FOR SHEET OVERLAND FLOW.
2. SEDIMENT CONTROL FENCE IS TO BE LOCATED IN AREAS OF LOW SEDIMENT YIELD ON SLOPES THAT CONFORM TO MTO DRAINAGE MANUAL VOLUME 2 CHART F4-3C TOPOGRAPHIC FACTOR LS BASED ON SLOPE LENGTH AND GRADIENT.
3. SEDIMENT CONTROL FENCE SHALL BE INSTALLED WITH FILTER MEDIA FABRIC TIED INTO THE SOIL A MINIMUM OF 300 mm BY EITHER STATIC SLICING OR TRENCH METHODS WITH COMPACTION OF TRENCH MATERIAL MEETING 95% STANDARD PROCTOR MAXIMUM DRY DENSITY.
4. STEEL "I" BAR POSTS ARE TO BE SPACED A MAXIMUM DISTANCE OF 2000 mm ON CENTER.
5. STRAW BALES TO BE PLACED END-TO-END CONTINUOUSLY BETWEEN SEDIMENT CONTROL FENCES.
6. FROZEN GROUND CONDITIONS REQUIRE FILTER FABRIC TO BE BACKFILLED IN TRENCH WITH CLEAR STONE.
7. GEOTEXTILE FABRIC TO BE COMPRISED OF NON-WOVEN U.V. STABILIZED MATERIAL FABRIC TO BE FOLDED OVER TOP OF FENCE A MINIMUM OF 300 mm AND WIRE FASTENED.
8. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION IS MINIMIZED.
9. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.

NO.	REVISION	DATE
1	SWM GUIDELINES UPDATE	06.2016

DOUBLE ROW SEDIMENT CONTROL FENCE

DATE: 06.2016
SCALE: NTS
LSRCA ESC-5

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.

BENCHMARKS

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NOTES

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No.	REVISION DESCRIPTION	DATE
1.	1ST SUBMISSION	03/22

ENGINEER STAMP

LICENSED PROFESSIONAL ENGINEER
2022.03.04
D. M. CASULLO
PROVINCE OF ONTARIO

CRANBERRY MARSH ESTATES
TOWN OF COLLINGWOOD

EROSION AND SEDIMENT CONTROL DETAILS

TATHAM ENGINEERING

DESIGN: KG	FILE: 120181	DWG: ESC02
DRAWN: KH/SBU	DATE: MAR 2022	
CHECK: DC	SCALE: 1:500	

Drawing Name: 120181 – ESC01.dwg, Plotted: Mar 04, 2022

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

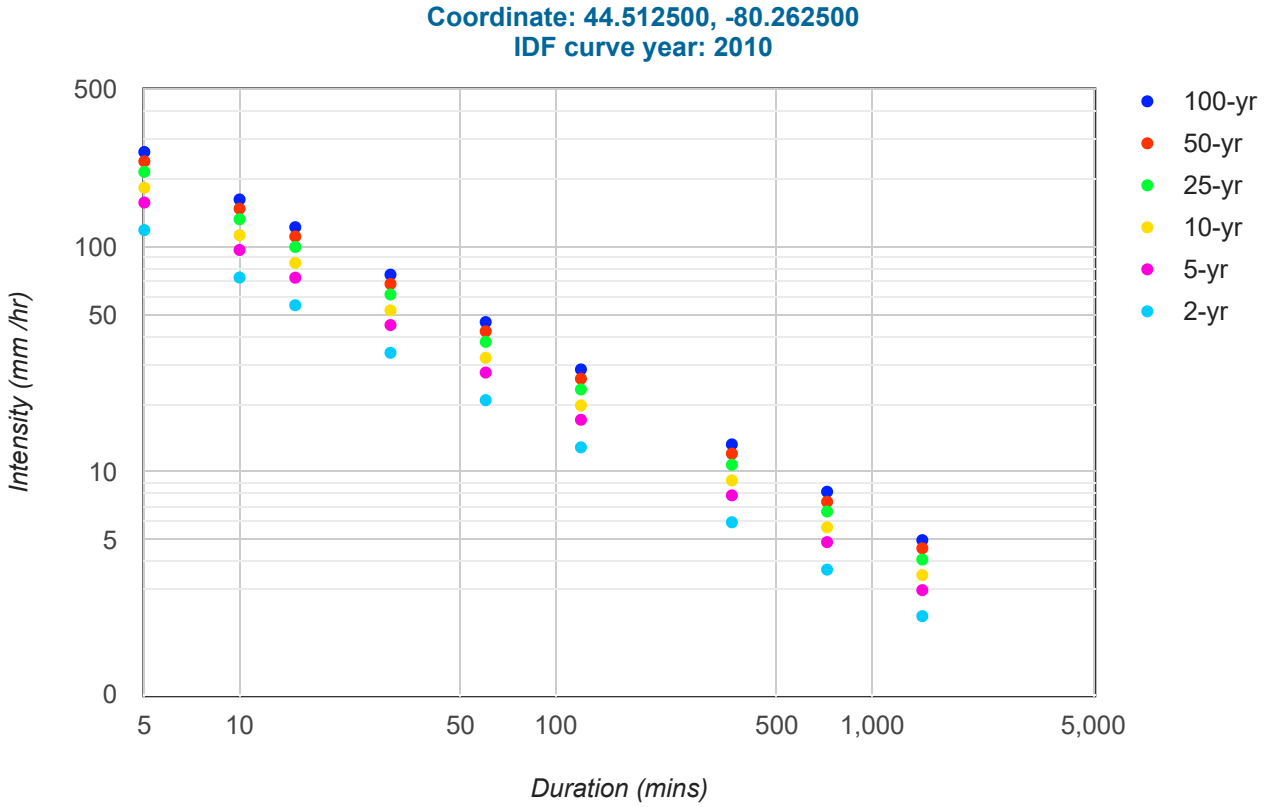
Location summary

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.



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

Terms of Use

CRANBERRY MARSH ESTATES
EXISTING CONDITIONS

1	Nashyd	1	Route Pipe	1	Duhyd
1	Standhyd	1	Route Channel	1	Diverthyd
1	Addhyd	1	Route Reservoir		

TATHAM ENGINEERING

Project:	Cranberry Marsh Estates
File No.:	120181
Subject:	Otthymo Flow Schematic
Date:	Mar-22

TATHAM ENGINEERING

Visual OTTHYMO Model Parameter Calculations (NasHYD)

Project Details

Cranberry Marsh Estates	120181

Prepared By

Kyle Gowanlock	Dec 7, 2021

Data Sources

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

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

TATHAM ENGINEERING

Visual OTTHYMO Model Parameter Calculations (NasHYD)

Project Details

Cranberry Marsh Estates	120181

Prepared By

Kyle Gowanlock	Dec 7, 2021

Data Sources

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

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

TATHAM ENGINEERING

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Cranberry Marsh Estates	120181

Prepared By

Kyle Gowanlock	Feb 2022

Data Sources

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

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

TATHAM ENGINEERING

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Cranberry Marsh Estates	120181

Prepared By

Kyle Gowanlock	Feb 2022

Data Sources

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

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

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

--------------------
|    READ STORM    |    Filename: C:\Users\KGowanlock\AppD
|                  |              ata\Local\Temp\
|                  |              4739c1ad-032a-4cb8-a822-5d0a2ddbd6d9\afe4e812
| Ptotal= 24.97 mm |    Comments: 25MM BARRIE
--------------------
```

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

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| 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

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	1.167	2.75	2.250	10.28	3.33	1.84
0.167	1.03	1.250	3.06	2.333	7.55	3.42	1.74
0.250	1.33	1.333	3.44	2.417	5.95	3.50	1.65
0.333	1.39	1.417	3.93	2.500	4.91	3.58	1.55
0.417	1.46	1.500	4.55	2.583	4.06	3.67	1.48
0.500	1.53	1.583	5.77	2.667	3.59	3.75	1.42
0.583	1.63	1.667	7.44	2.750	3.21	3.83	1.36
0.667	1.73	1.750	10.51	2.833	2.90	3.92	1.31
0.750	1.83	1.833	17.83	2.917	2.65	4.00	1.26
0.833	1.96	1.917	35.45	3.000	2.43	4.08	1.20
0.917	2.10	2.000	72.58	3.083	2.22		
1.000	2.26	2.083	26.96	3.167	2.08		
1.083	2.50	2.167	15.83	3.250	1.95		

```
     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.

--------------------------------------------------------------------------------
**************************************************
** SIMULATION:(2) 2 Year Design Storm - Chicago **
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--------------------
| 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

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

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.76	1.083	12.83	2.083	5.19	3.08	3.02

0.167	2.76	1.167	12.83	2.167	5.19	3.17	3.02
0.250	3.08	1.250	73.13	2.250	4.58	3.25	2.84
0.333	3.08	1.333	73.13	2.333	4.58	3.33	2.84
0.417	3.51	1.417	15.38	2.417	4.12	3.42	2.69
0.500	3.51	1.500	15.38	2.500	4.12	3.50	2.69
0.583	4.13	1.583	9.64	2.583	3.76	3.58	2.56
0.667	4.13	1.667	9.64	2.667	3.76	3.67	2.56
0.750	5.11	1.750	7.34	2.750	3.47	3.75	2.44
0.833	5.11	1.833	7.34	2.833	3.47	3.83	2.44
0.917	6.98	1.917	6.04	2.917	3.23	3.92	2.33
1.000	6.98	2.000	6.04	3.000	3.23	4.00	2.33

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.

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

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	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

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	3.65	1.083	17.00	2.083	6.88	3.08	4.00
0.167	3.65	1.167	17.00	2.167	6.88	3.17	4.00
0.250	4.08	1.250	96.92	2.250	6.07	3.25	3.77
0.333	4.08	1.333	96.92	2.333	6.07	3.33	3.77
0.417	4.65	1.417	20.39	2.417	5.46	3.42	3.57
0.500	4.65	1.500	20.39	2.500	5.46	3.50	3.57
0.583	5.48	1.583	12.78	2.583	4.98	3.58	3.39
0.667	5.48	1.667	12.78	2.667	4.98	3.67	3.39
0.750	6.78	1.750	9.73	2.750	4.60	3.75	3.23
0.833	6.78	1.833	9.73	2.833	4.60	3.83	3.23
0.917	9.25	1.917	8.01	2.917	4.27	3.92	3.09
1.000	9.25	2.000	8.01	3.000	4.27	4.00	3.09

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.

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

CHICAGO STORM	Ptotal= 48.83 mm

IDF curve parameters: A= 563.357
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			
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	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	4.25	1.083	19.77	2.083	8.00	3.08	4.65
0.167	4.25	1.167	19.77	2.167	8.00	3.17	4.65
0.250	4.74	1.250	112.66	2.250	7.06	3.25	4.38
0.333	4.74	1.333	112.66	2.333	7.06	3.33	4.38
0.417	5.41	1.417	23.70	2.417	6.35	3.42	4.15
0.500	5.41	1.500	23.70	2.500	6.35	3.50	4.15
0.583	6.37	1.583	14.86	2.583	5.79	3.58	3.94
0.667	6.37	1.667	14.86	2.667	5.79	3.67	3.94
0.750	7.88	1.750	11.31	2.750	5.34	3.75	3.75
0.833	7.88	1.833	11.31	2.833	5.34	3.83	3.75
0.917	10.75	1.917	9.31	2.917	4.97	3.92	3.59
1.000	10.75	2.000	9.31	3.000	4.97	4.00	3.59

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.

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

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

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

---- TRANSFORMED HYETOGRAPH ----

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

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.

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

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

CALIB	NASHYD (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

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	5.56	1.083	25.91	2.083	10.48	3.08	6.10
0.167	5.56	1.167	25.91	2.167	10.48	3.17	6.10
0.250	6.22	1.250	147.65	2.250	9.25	3.25	5.74
0.333	6.22	1.333	147.65	2.333	9.25	3.33	5.74
0.417	7.09	1.417	31.06	2.417	8.32	3.42	5.43
0.500	7.09	1.500	31.06	2.500	8.32	3.50	5.43
0.583	8.34	1.583	19.47	2.583	7.59	3.58	5.16
0.667	8.34	1.667	19.47	2.667	7.59	3.67	5.16
0.750	10.32	1.750	14.82	2.750	7.00	3.75	4.92
0.833	10.32	1.833	14.82	2.833	7.00	3.83	4.92
0.917	14.09	1.917	12.20	2.917	6.51	3.92	4.71
1.000	14.09	2.000	12.20	3.000	6.51	4.00	4.71

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.

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

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

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.12	1.083	28.48	2.083	11.52	3.08	6.70

0.167	6.12	1.167	28.48	2.167	11.52	3.17	6.70
0.250	6.83	1.250	162.35	2.250	10.17	3.25	6.31
0.333	6.83	1.333	162.35	2.333	10.17	3.33	6.31
0.417	7.80	1.417	34.15	2.417	9.15	3.42	5.97
0.500	7.80	1.500	34.15	2.500	9.15	3.50	5.97
0.583	9.17	1.583	21.41	2.583	8.35	3.58	5.68
0.667	9.17	1.667	21.41	2.667	8.35	3.67	5.68
0.750	11.35	1.750	16.30	2.750	7.70	3.75	5.41
0.833	11.35	1.833	16.30	2.833	7.70	3.83	5.41
0.917	15.49	1.917	13.41	2.917	7.16	3.92	5.17
1.000	15.49	2.000	13.41	3.000	7.16	4.00	5.17

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.

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

READ STORM	Filename: C:\Users\KGowanlock\AppData\Local\Temp\4739c1ad-032a-4cb8-a822-5d0a2ddbd6d9\3c4d485d
Ptotal=193.00 mm	Comments: TIMMINS

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

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	15.00	3.083	3.00	6.083	43.00	9.08	13.00
0.167	15.00	3.167	3.00	6.167	43.00	9.17	13.00
0.250	15.00	3.250	3.00	6.250	43.00	9.25	13.00
0.333	15.00	3.333	3.00	6.333	43.00	9.33	13.00
0.417	15.00	3.417	3.00	6.417	43.00	9.42	13.00
0.500	15.00	3.500	3.00	6.500	43.00	9.50	13.00
0.583	15.00	3.583	3.00	6.583	43.00	9.58	13.00
0.667	15.00	3.667	3.00	6.667	43.00	9.67	13.00
0.750	15.00	3.750	3.00	6.750	43.00	9.75	13.00
0.833	15.00	3.833	3.00	6.833	43.00	9.83	13.00
0.917	15.00	3.917	3.00	6.917	43.00	9.92	13.00
1.000	15.00	4.000	3.00	7.000	43.00	10.00	13.00
1.083	20.00	4.083	5.00	7.083	20.00	10.08	13.00
1.167	20.00	4.167	5.00	7.167	20.00	10.17	13.00
1.250	20.00	4.250	5.00	7.250	20.00	10.25	13.00
1.333	20.00	4.333	5.00	7.333	20.00	10.33	13.00
1.417	20.00	4.417	5.00	7.417	20.00	10.42	13.00
1.500	20.00	4.500	5.00	7.500	20.00	10.50	13.00
1.583	20.00	4.583	5.00	7.583	20.00	10.58	13.00
1.667	20.00	4.667	5.00	7.667	20.00	10.67	13.00
1.750	20.00	4.750	5.00	7.750	20.00	10.75	13.00
1.833	20.00	4.833	5.00	7.833	20.00	10.83	13.00
1.917	20.00	4.917	5.00	7.917	20.00	10.92	13.00
2.000	20.00	5.000	5.00	8.000	20.00	11.00	13.00
2.083	10.00	5.083	20.00	8.083	23.00	11.08	8.00
2.167	10.00	5.167	20.00	8.167	23.00	11.17	8.00
2.250	10.00	5.250	20.00	8.250	23.00	11.25	8.00
2.333	10.00	5.333	20.00	8.333	23.00	11.33	8.00
2.417	10.00	5.417	20.00	8.417	23.00	11.42	8.00
2.500	10.00	5.500	20.00	8.500	23.00	11.50	8.00
2.583	10.00	5.583	20.00	8.583	23.00	11.58	8.00
2.667	10.00	5.667	20.00	8.667	23.00	11.67	8.00
2.750	10.00	5.750	20.00	8.750	23.00	11.75	8.00
2.833	10.00	5.833	20.00	8.833	23.00	11.83	8.00
2.917	10.00	5.917	20.00	8.917	23.00	11.92	8.00
3.000	10.00	6.000	20.00	9.000	23.00	12.00	8.00

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.

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

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


       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   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\7
9addd38-182f-4609-a785-dd4e1f038202\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\7
9addd38-182f-4609-a785-dd4e1f038202\s


DATE: 03-02-2022                          TIME: 10:29:42

USER:


COMMENTS: _____________________________________________________________


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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                   min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 6.0
```

```
    [ Ptot= 24.97 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\6d037df5-75af-427f-801c-f4cb0565dff9\afe4e81
2-5f0d-4280-be60-
    remark: 25MM BARRIE

*
 ** CALIB NASHYD         0101  1  5.0    0.74    0.00  2.50   1.97 0.08   0.000
    [CN=69.7         ]
    [ N = 3.0:Tp 0.39]
*
    READ STORM                  6.0
    [ Ptot= 24.97 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\6d037df5-75af-427f-801c-f4cb0565dff9\afe4e81
2-5f0d-4280-be60-
    remark: 25MM BARRIE

*
 *  CALIB STANDHYD       0301  1  5.0    0.35    0.02  2.08   7.51 0.30   0.000
    [I%= 0.1:S%= 8.00]
*
    ADD [  0101+  0301]  0901  3  5.0    1.09    0.02  2.08   3.75  n/a   0.000
*
    READ STORM                  6.0
    [ Ptot= 24.97 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\6d037df5-75af-427f-801c-f4cb0565dff9\afe4e81
2-5f0d-4280-be60-
    remark: 25MM BARRIE

*
 *  CALIB NASHYD         0102  1  5.0    0.55    0.00  2.75   1.59 0.06   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.52]
*
    READ STORM                  6.0
    [ Ptot= 24.97 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\6d037df5-75af-427f-801c-f4cb0565dff9\afe4e81
2-5f0d-4280-be60-
    remark: 25MM BARRIE

*
 *  CALIB STANDHYD       0302  1  5.0    0.20    0.00  2.17   6.67 0.27   0.000
    [I%= 0.1:S%= 2.00]
*
    ADD [  0102+  0302]  0902  3  5.0    0.75    0.01  2.25   2.95  n/a   0.000
*
================================================================================
```

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


      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   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
      O   O    T      T    H   H   Y Y   MM MM  O   O
      O   O    T      T    H   H    Y    M   M  O   O
       OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\1
9ba2dc5-18e5-4447-bf3f-766e142c5e44\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\1
9ba2dc5-18e5-4447-bf3f-766e142c5e44\s


DATE: 03-02-2022                          TIME: 10:29:42

USER:


COMMENTS: _____________________________________________________________


  ************************************************
  ** SIMULATION : (2) 2 Year Design Storm - Chi **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                   min     ha   '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
   CHIC STORM                10.0
   [ Ptot= 31.69 mm ]
```

```
*
 ** CALIB NASHYD         0101  1  5.0    0.74    0.00  1.92   3.82 0.12   0.000
    [CN=69.7         ]
    [ N = 3.0:Tp 0.39]
*
    CHIC STORM                10.0
    [ Ptot= 31.69 mm ]
*
 *  CALIB STANDHYD       0301  1  5.0    0.35    0.02  1.33  11.55 0.36   0.000
    [I%= 0.1:S%= 8.00]
*
    ADD [  0101+  0301]  0901  3  5.0    1.09    0.02  1.33   6.30  n/a   0.000
*
    CHIC STORM                10.0
    [ Ptot= 31.69 mm ]
*
 *  CALIB NASHYD         0102  1  5.0    0.55    0.00  2.17   3.20 0.10   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.52]
*
    CHIC STORM                10.0
    [ Ptot= 31.69 mm ]
*
 *  CALIB STANDHYD       0302  1  5.0    0.20    0.01  1.50  10.41 0.33   0.000
    [I%= 0.1:S%= 2.00]
*
    ADD [  0102+  0302]  0902  3  5.0    0.75    0.01  1.50   5.12  n/a   0.000
*
================================================================================
=======================


       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   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                 *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\2
51b044f-7e22-4719-bb83-c2a62d1be9d7\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\2
51b044f-7e22-4719-bb83-c2a62d1be9d7\s


DATE: 03-02-2022                          TIME: 10:29:42

USER:


COMMENTS: _____________________________________________________


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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    CHIC STORM                10.0
    [ Ptot= 42.00 mm ]
*
 ** CALIB NASHYD         0101  1  5.0    0.74    0.01  1.83   7.53 0.18   0.000
    [CN=69.7         ]
    [ N = 3.0:Tp 0.39]
*
    CHIC STORM                10.0
    [ Ptot= 42.00 mm ]
*
 *  CALIB STANDHYD       0301  1  5.0    0.35    0.04  1.33  18.56 0.44   0.000
    [I%= 0.1:S%= 8.00]
*
    ADD [  0101+  0301]  0901  3  5.0    1.09    0.04  1.33  11.07  n/a   0.000
*
    CHIC STORM                10.0
    [ Ptot= 42.00 mm ]
*
 *  CALIB NASHYD         0102  1  5.0    0.55    0.00  2.08   6.52 0.16   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.52]
*
    CHIC STORM                10.0
```

```
    [ Ptot= 42.00 mm ]
*
 *  CALIB STANDHYD       0302  1  5.0    0.20    0.01  1.42  17.01 0.41   0.000
    [I%= 0.1:S%= 2.00]
*
    ADD [  0102+  0302]  0902  3  5.0    0.75    0.01  1.42   9.32  n/a   0.000
*
================================================================================
========================


       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   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\2
7d4faf6-7d84-4d75-805b-2d77e3965804\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\2
7d4faf6-7d84-4d75-805b-2d77e3965804\s


DATE: 03-02-2022                          TIME: 10:29:42

USER:


COMMENTS: _____________________________________________________________


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

```
  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                   min     ha   '  cms   hrs     mm          cms


      START @  0.00 hrs
      --------------------
    CHIC STORM                10.0
    [ Ptot= 48.83 mm ]
*
 ** CALIB NASHYD         0101  1  5.0    0.74    0.01  1.83  10.48 0.21   0.000
    [CN=69.7         ]
    [ N = 3.0:Tp 0.39]
*
    CHIC STORM                10.0
    [ Ptot= 48.83 mm ]
*
 *  CALIB STANDHYD       0301  1  5.0    0.35    0.05  1.33  23.60 0.48   0.000
    [I%= 0.1:S%= 8.00]
*
    ADD [  0101+  0301]  0901  3  5.0    1.09    0.06  1.33  14.69  n/a   0.000
*
    CHIC STORM                10.0
    [ Ptot= 48.83 mm ]
*
 *  CALIB NASHYD         0102  1  5.0    0.55    0.01  2.00   9.19 0.19   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.52]
*
    CHIC STORM                10.0
    [ Ptot= 48.83 mm ]
*
 *  CALIB STANDHYD       0302  1  5.0    0.20    0.02  1.42  21.82 0.45   0.000
    [I%= 0.1:S%= 2.00]
*
    ADD [  0102+  0302]  0902  3  5.0    0.75    0.02  1.42  12.56  n/a   0.000
*
================================================================================
========================


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

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***** S U M M A R Y 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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\4a11d840-a946-4f4e-a480-cdda84162dce\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\4a11d840-a946-4f4e-a480-cdda84162dce\s

DATE: 03-02-2022 TIME: 10:29:42

USER:

COMMENTS: _____

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

W/E	COMMAND	HYD ID	DT min	AREA ha	' Qpeak ' cms	Tpeak hrs	R.V. mm	R.C.	Qbase cms
	START @ 0.00 hrs								
	CHIC STORM		10.0						
	[Ptot= 57.47 mm]								
*									
**	CALIB NASHYD	0101	1 5.0	0.74	0.02	1.75	14.70	0.26	0.000
	[CN=69.7]								
	[N = 3.0:Tp 0.39]								
*									
	CHIC STORM		10.0						
	[Ptot= 57.47 mm]								
*									
*	CALIB STANDHYD	0301	1 5.0	0.35	0.07	1.33	30.35	0.53	0.000
	[I%= 0.1:S%= 8.00]								
*									
	ADD [0101+ 0301]	0901	3 5.0	1.09	0.07	1.33	19.72	n/a	0.000
*									
	CHIC STORM		10.0						
	[Ptot= 57.47 mm]								
*									
*	CALIB NASHYD	0102	1 5.0	0.55	0.01	2.00	13.06	0.23	0.000
	[CN=67.0]								
	[N = 3.0:Tp 0.52]								
*									
	CHIC STORM		10.0						
	[Ptot= 57.47 mm]								
*									
*	CALIB STANDHYD	0302	1 5.0	0.20	0.02	1.42	28.28	0.49	0.000
	[I%= 0.1:S%= 2.00]								
*									
	ADD [0102+ 0302]	0902	3 5.0	0.75	0.03	1.42	17.11	n/a	0.000
*									

==========

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 TTTTT TTTTT H H Y Y M M OOO TM
O O T T H H Y Y MM MM O O
O O T T H H Y M M O O
OOO T T H H Y M M OOO

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***** S U M M A R Y 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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\5a8cb67f-9e99-444e-bb98-988a078e4edf\s
Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\5a8cb67f-9e99-444e-bb98-988a078e4edf\s

DATE: 03-02-2022 TIME: 10:29:42

USER:

COMMENTS: _____

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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    CHIC STORM                 10.0
    [ Ptot= 63.99 mm ]
*
 ** CALIB NASHYD         0101  1  5.0    0.74    0.02  1.75  18.18 0.28   0.000
    [CN=69.7         ]
    [ N = 3.0:Tp 0.39]
*
    CHIC STORM                 10.0
    [ Ptot= 63.99 mm ]
*
 *  CALIB STANDHYD       0301  1  5.0    0.35    0.08  1.33  35.64 0.56   0.000
    [I%= 0.1:S%= 8.00]
*
    ADD [  0101+  0301]  0901  3  5.0    1.09    0.09  1.33  23.79  n/a   0.000
*
    CHIC STORM                 10.0
    [ Ptot= 63.99 mm ]
*
 *  CALIB NASHYD         0102  1  5.0    0.55    0.01  2.00  16.27 0.25   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.52]
*
    CHIC STORM                 10.0
    [ Ptot= 63.99 mm ]
*
 *  CALIB STANDHYD       0302  1  5.0    0.20    0.03  1.42  33.37 0.52   0.000
    [I%= 0.1:S%= 2.00]
*
    ADD [  0102+  0302]  0902  3  5.0    0.75    0.03  1.42  20.83  n/a   0.000
*
================================================================================
========================


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



```
                  *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\8
6a49e86-b771-4b46-8895-06e0a67c74ad\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\8
6a49e86-b771-4b46-8895-06e0a67c74ad\s


DATE: 03-02-2022                          TIME: 10:29:42

USER:


COMMENTS: _____________________________________________________________


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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    CHIC STORM                 10.0
    [ Ptot= 70.36 mm ]
*
 ** CALIB NASHYD         0101  1  5.0    0.74    0.03  1.75  21.81 0.31   0.000
    [CN=69.7         ]
    [ N = 3.0:Tp 0.39]
*
```

```
    CHIC STORM                10.0
    [ Ptot= 70.36 mm ]
*
 *  CALIB STANDHYD       0301  1  5.0    0.35    0.10  1.33  40.95 0.58   0.000
    [I%= 0.1:S%= 8.00]
*
    ADD [  0101+  0301]  0901  3  5.0    1.09    0.10  1.33  27.96  n/a   0.000
*
    CHIC STORM                10.0
    [ Ptot= 70.36 mm ]
*
 *  CALIB NASHYD         0102  1  5.0    0.55    0.02  2.00  19.64 0.28   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.52]
*
    CHIC STORM                10.0
    [ Ptot= 70.36 mm ]
*
 *  CALIB STANDHYD       0302  1  5.0    0.20    0.03  1.42  38.50 0.55   0.000
    [I%= 0.1:S%= 2.00]
*
    ADD [  0102+  0302]  0902  3  5.0    0.75    0.04  1.42  24.67  n/a   0.000
*
 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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\3
a3da94d-d18f-42c4-a909-5d1f49244ebc\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\3
a3da94d-d18f-42c4-a909-5d1f49244ebc\s


DATE: 03-02-2022                          TIME: 10:29:42

USER:


COMMENTS: _____________________________________________________________


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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 15.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\6d037df5-75af-427f-801c-f4cb0565dff9\3c4d485
d-67dd-472e-beb1-
    remark: TIMMINS

*
 ** CALIB NASHYD         0101  1  5.0    0.74    0.06  7.08 114.81 0.59   0.000
    [CN=69.7         ]
    [ N = 3.0:Tp 0.39]
*
    READ STORM                 15.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\6d037df5-75af-427f-801c-f4cb0565dff9\3c4d485
d-67dd-472e-beb1-
    remark: TIMMINS

*
 *  CALIB STANDHYD       0301  1  5.0    0.35    0.04  7.00 154.34 0.80   0.000
    [I%= 0.1:S%= 8.00]
*
```

```
    ADD [  0101+  0301]  0901  3  5.0    1.09    0.10  7.00 127.50  n/a   0.000
*
    READ STORM                15.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\6d037df5-75af-427f-801c-f4cb0565dff9\3c4d485
d-67dd-472e-beb1-
    remark: TIMMINS

*
 *  CALIB NASHYD         0102  1  5.0    0.55    0.04  7.17 108.69 0.56   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.52]
*
    READ STORM                15.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\6d037df5-75af-427f-801c-f4cb0565dff9\3c4d485
d-67dd-472e-beb1-
    remark: TIMMINS

*
 *  CALIB STANDHYD       0302  1  5.0    0.20    0.02  7.00 150.00 0.78   0.000
    [I%= 0.1:S%= 2.00]
*
    ADD [  0102+  0302]  0902  3  5.0    0.75    0.06  7.00 119.70  n/a   0.000
*
```

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

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	0.87	12.250	66.59	18.33	0.98
0.167	0.00	6.250	0.87	12.333	7.84	18.42	0.98
0.250	0.00	6.333	0.98	12.417	7.83	18.50	0.98
0.333	0.60	6.417	0.98	12.500	7.83	18.58	0.98
0.417	0.60	6.500	0.98	12.583	7.83	18.67	0.98
0.500	0.60	6.583	0.98	12.667	7.83	18.75	0.98
0.583	0.60	6.667	0.98	12.750	7.83	18.83	0.98
0.667	0.60	6.750	0.98	12.833	4.03	18.92	0.98
0.750	0.60	6.833	0.98	12.917	4.03	19.00	0.98
0.833	0.60	6.917	0.98	13.000	4.03	19.08	0.98
0.917	0.60	7.000	0.98	13.083	4.03	19.17	0.98
1.000	0.60	7.083	0.98	13.167	4.03	19.25	0.98
1.083	0.60	7.167	0.98	13.250	4.03	19.33	0.98
1.167	0.60	7.250	0.98	13.333	2.94	19.42	0.98
1.250	0.60	7.333	1.20	13.417	2.94	19.50	0.98
1.333	0.60	7.417	1.20	13.500	2.94	19.58	0.98
1.417	0.60	7.500	1.20	13.583	2.94	19.67	0.98
1.500	0.60	7.583	1.20	13.667	2.94	19.75	0.98
1.583	0.60	7.667	1.20	13.750	2.94	19.83	0.98
1.667	0.60	7.750	1.20	13.833	2.28	19.92	0.98
1.750	0.60	7.833	1.20	13.917	2.28	20.00	0.98
1.833	0.60	7.917	1.20	14.000	2.28	20.08	0.98
1.917	0.60	8.000	1.20	14.083	2.28	20.17	0.98
2.000	0.60	8.083	1.20	14.167	2.28	20.25	0.98
2.083	0.60	8.167	1.20	14.250	2.28	20.33	0.65
2.167	0.60	8.250	1.20	14.333	1.63	20.42	0.65
2.250	0.60	8.333	1.41	14.417	1.63	20.50	0.65
2.333	0.71	8.417	1.41	14.500	1.63	20.58	0.65
2.417	0.71	8.500	1.41	14.583	1.63	20.67	0.65
2.500	0.71	8.583	1.41	14.667	1.63	20.75	0.65
2.583	0.71	8.667	1.41	14.750	1.63	20.83	0.65
2.667	0.71	8.750	1.41	14.833	1.63	20.92	0.65
2.750	0.71	8.833	1.52	14.917	1.63	21.00	0.65
2.833	0.71	8.917	1.52	15.000	1.63	21.08	0.65
2.917	0.71	9.000	1.52	15.083	1.63	21.17	0.65

3.000	0.71	9.083	1.52	15.167	1.63	21.25	0.65
3.083	0.71	9.167	1.52	15.250	1.63	21.33	0.65
3.167	0.71	9.250	1.52	15.333	1.63	21.42	0.65
3.250	0.71	9.333	1.74	15.417	1.63	21.50	0.65
3.333	0.71	9.417	1.74	15.500	1.63	21.58	0.65
3.417	0.71	9.500	1.74	15.583	1.63	21.67	0.65
3.500	0.71	9.583	1.74	15.667	1.63	21.75	0.65
3.583	0.71	9.667	1.74	15.750	1.63	21.83	0.65
3.667	0.71	9.750	1.74	15.833	1.63	21.92	0.65
3.750	0.71	9.833	1.96	15.917	1.63	22.00	0.65
3.833	0.71	9.917	1.96	16.000	1.63	22.08	0.65
3.917	0.71	10.000	1.96	16.083	1.63	22.17	0.65
4.000	0.71	10.083	1.96	16.167	1.63	22.25	0.65
4.083	0.71	10.167	1.96	16.250	1.63	22.33	0.65
4.167	0.71	10.250	1.96	16.333	0.98	22.42	0.65
4.250	0.71	10.333	2.50	16.417	0.98	22.50	0.65
4.333	0.87	10.417	2.50	16.500	0.98	22.58	0.65
4.417	0.87	10.500	2.50	16.583	0.98	22.67	0.65
4.500	0.87	10.583	2.50	16.667	0.98	22.75	0.65
4.583	0.87	10.667	2.50	16.750	0.98	22.83	0.65
4.667	0.87	10.750	2.50	16.833	0.98	22.92	0.65
4.750	0.87	10.833	3.37	16.917	0.98	23.00	0.65
4.833	0.87	10.917	3.37	17.000	0.98	23.08	0.65
4.917	0.87	11.000	3.37	17.083	0.98	23.17	0.65
5.000	0.87	11.083	3.37	17.167	0.98	23.25	0.65
5.083	0.87	11.167	3.37	17.250	0.98	23.33	0.65
5.167	0.87	11.250	3.37	17.333	0.98	23.42	0.65
5.250	0.87	11.333	5.22	17.417	0.98	23.50	0.65
5.333	0.87	11.417	5.22	17.500	0.98	23.58	0.65
5.417	0.87	11.500	5.22	17.583	0.98	23.67	0.65
5.500	0.87	11.583	5.22	17.667	0.98	23.75	0.65
5.583	0.87	11.667	5.22	17.750	0.98	23.83	0.65
5.667	0.87	11.750	5.22	17.833	0.98	23.92	0.65
5.750	0.87	11.833	16.10	17.917	0.98	24.00	0.65
5.833	0.87	11.917	16.10	18.000	0.98	24.08	0.65
5.917	0.87	12.000	16.10	18.083	0.98	24.17	0.65
6.000	0.87	12.083	66.58	18.167	0.98	24.25	0.65
6.083	0.87	12.167	66.59	18.250	0.98		

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.

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

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

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.15	12.250	88.25	18.33	1.30
0.167	0.00	6.250	1.15	12.333	10.39	18.42	1.30
0.250	0.00	6.333	1.30	12.417	10.38	18.50	1.30
0.333	0.79	6.417	1.30	12.500	10.38	18.58	1.30
0.417	0.79	6.500	1.30	12.583	10.38	18.67	1.30
0.500	0.79	6.583	1.30	12.667	10.38	18.75	1.30
0.583	0.79	6.667	1.30	12.750	10.38	18.83	1.30
0.667	0.79	6.750	1.30	12.833	5.34	18.92	1.30
0.750	0.79	6.833	1.30	12.917	5.34	19.00	1.30
0.833	0.79	6.917	1.30	13.000	5.34	19.08	1.30
0.917	0.79	7.000	1.30	13.083	5.34	19.17	1.30
1.000	0.79	7.083	1.30	13.167	5.34	19.25	1.30
1.083	0.79	7.167	1.30	13.250	5.34	19.33	1.30
1.167	0.79	7.250	1.30	13.333	3.89	19.42	1.30
1.250	0.79	7.333	1.59	13.417	3.89	19.50	1.30
1.333	0.79	7.417	1.59	13.500	3.89	19.58	1.30
1.417	0.79	7.500	1.59	13.583	3.89	19.67	1.30
1.500	0.79	7.583	1.59	13.667	3.89	19.75	1.30
1.583	0.79	7.667	1.59	13.750	3.89	19.83	1.30
1.667	0.79	7.750	1.59	13.833	3.03	19.92	1.30
1.750	0.79	7.833	1.59	13.917	3.03	20.00	1.30
1.833	0.79	7.917	1.59	14.000	3.03	20.08	1.30
1.917	0.79	8.000	1.59	14.083	3.03	20.17	1.30
2.000	0.79	8.083	1.59	14.167	3.03	20.25	1.30
2.083	0.79	8.167	1.59	14.250	3.03	20.33	0.87
2.167	0.79	8.250	1.59	14.333	2.16	20.42	0.87
2.250	0.79	8.333	1.87	14.417	2.16	20.50	0.87
2.333	0.94	8.417	1.87	14.500	2.16	20.58	0.87
2.417	0.94	8.500	1.87	14.583	2.16	20.67	0.87
2.500	0.94	8.583	1.87	14.667	2.16	20.75	0.87
2.583	0.94	8.667	1.87	14.750	2.16	20.83	0.87
2.667	0.94	8.750	1.87	14.833	2.16	20.92	0.87
2.750	0.94	8.833	2.02	14.917	2.16	21.00	0.87
2.833	0.94	8.917	2.02	15.000	2.16	21.08	0.87
2.917	0.94	9.000	2.02	15.083	2.16	21.17	0.87

3.000	0.94	9.083	2.02	15.167	2.16	21.25	0.87
3.083	0.94	9.167	2.02	15.250	2.16	21.33	0.87
3.167	0.94	9.250	2.02	15.333	2.16	21.42	0.87
3.250	0.94	9.333	2.31	15.417	2.16	21.50	0.87
3.333	0.94	9.417	2.31	15.500	2.16	21.58	0.87
3.417	0.94	9.500	2.31	15.583	2.16	21.67	0.87
3.500	0.94	9.583	2.31	15.667	2.16	21.75	0.87
3.583	0.94	9.667	2.31	15.750	2.16	21.83	0.87
3.667	0.94	9.750	2.31	15.833	2.16	21.92	0.87
3.750	0.94	9.833	2.60	15.917	2.16	22.00	0.87
3.833	0.94	9.917	2.60	16.000	2.16	22.08	0.87
3.917	0.94	10.000	2.60	16.083	2.16	22.17	0.87
4.000	0.94	10.083	2.60	16.167	2.16	22.25	0.87
4.083	0.94	10.167	2.60	16.250	2.16	22.33	0.87
4.167	0.94	10.250	2.60	16.333	1.30	22.42	0.87
4.250	0.94	10.333	3.32	16.417	1.30	22.50	0.87
4.333	1.15	10.417	3.32	16.500	1.30	22.58	0.87
4.417	1.15	10.500	3.32	16.583	1.30	22.67	0.87
4.500	1.15	10.583	3.32	16.667	1.30	22.75	0.87
4.583	1.15	10.667	3.32	16.750	1.30	22.83	0.87
4.667	1.15	10.750	3.32	16.833	1.30	22.92	0.87
4.750	1.15	10.833	4.47	16.917	1.30	23.00	0.87
4.833	1.15	10.917	4.47	17.000	1.30	23.08	0.87
4.917	1.15	11.000	4.47	17.083	1.30	23.17	0.87
5.000	1.15	11.083	4.47	17.167	1.30	23.25	0.87
5.083	1.15	11.167	4.47	17.250	1.30	23.33	0.87
5.167	1.15	11.250	4.47	17.333	1.30	23.42	0.87
5.250	1.15	11.333	6.92	17.417	1.30	23.50	0.87
5.333	1.15	11.417	6.92	17.500	1.30	23.58	0.87
5.417	1.15	11.500	6.92	17.583	1.30	23.67	0.87
5.500	1.15	11.583	6.92	17.667	1.30	23.75	0.87
5.583	1.15	11.667	6.92	17.750	1.30	23.83	0.87
5.667	1.15	11.750	6.92	17.833	1.30	23.92	0.87
5.750	1.15	11.833	21.34	17.917	1.30	24.00	0.87
5.833	1.15	11.917	21.34	18.000	1.30	24.08	0.87
5.917	1.15	12.000	21.34	18.083	1.30	24.17	0.87
6.000	1.15	12.083	88.24	18.167	1.30	24.25	0.86
6.083	1.15	12.167	88.25	18.250	1.30		

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.

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

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

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.34	12.250	102.58	18.33	1.51
0.167	0.00	6.250	1.34	12.333	12.08	18.42	1.51
0.250	0.00	6.333	1.51	12.417	12.07	18.50	1.51
0.333	0.92	6.417	1.51	12.500	12.07	18.58	1.51
0.417	0.92	6.500	1.51	12.583	12.07	18.67	1.51
0.500	0.92	6.583	1.51	12.667	12.07	18.75	1.51
0.583	0.92	6.667	1.51	12.750	12.07	18.83	1.51
0.667	0.92	6.750	1.51	12.833	6.20	18.92	1.51
0.750	0.92	6.833	1.51	12.917	6.20	19.00	1.51
0.833	0.92	6.917	1.51	13.000	6.20	19.08	1.51
0.917	0.92	7.000	1.51	13.083	6.20	19.17	1.51
1.000	0.92	7.083	1.51	13.167	6.20	19.25	1.51
1.083	0.92	7.167	1.51	13.250	6.20	19.33	1.51
1.167	0.92	7.250	1.51	13.333	4.53	19.42	1.51
1.250	0.92	7.333	1.84	13.417	4.53	19.50	1.51
1.333	0.92	7.417	1.84	13.500	4.53	19.58	1.51
1.417	0.92	7.500	1.84	13.583	4.53	19.67	1.51
1.500	0.92	7.583	1.84	13.667	4.53	19.75	1.51
1.583	0.92	7.667	1.84	13.750	4.53	19.83	1.51
1.667	0.92	7.750	1.84	13.833	3.52	19.92	1.51
1.750	0.92	7.833	1.84	13.917	3.52	20.00	1.51
1.833	0.92	7.917	1.84	14.000	3.52	20.08	1.51
1.917	0.92	8.000	1.84	14.083	3.52	20.17	1.51
2.000	0.92	8.083	1.84	14.167	3.52	20.25	1.51
2.083	0.92	8.167	1.84	14.250	3.52	20.33	1.01
2.167	0.92	8.250	1.84	14.333	2.51	20.42	1.01
2.250	0.92	8.333	2.18	14.417	2.51	20.50	1.01
2.333	1.09	8.417	2.18	14.500	2.51	20.58	1.01
2.417	1.09	8.500	2.18	14.583	2.51	20.67	1.01
2.500	1.09	8.583	2.18	14.667	2.51	20.75	1.01
2.583	1.09	8.667	2.18	14.750	2.51	20.83	1.01
2.667	1.09	8.750	2.18	14.833	2.51	20.92	1.01
2.750	1.09	8.833	2.35	14.917	2.51	21.00	1.01
2.833	1.09	8.917	2.35	15.000	2.51	21.08	1.01
2.917	1.09	9.000	2.35	15.083	2.51	21.17	1.01

3.000	1.09	9.083	2.35	15.167	2.51	21.25	1.01
3.083	1.09	9.167	2.35	15.250	2.51	21.33	1.01
3.167	1.09	9.250	2.35	15.333	2.51	21.42	1.01
3.250	1.09	9.333	2.68	15.417	2.51	21.50	1.01
3.333	1.09	9.417	2.68	15.500	2.51	21.58	1.01
3.417	1.09	9.500	2.68	15.583	2.51	21.67	1.01
3.500	1.09	9.583	2.68	15.667	2.51	21.75	1.01
3.583	1.09	9.667	2.68	15.750	2.51	21.83	1.01
3.667	1.09	9.750	2.68	15.833	2.51	21.92	1.01
3.750	1.09	9.833	3.02	15.917	2.51	22.00	1.01
3.833	1.09	9.917	3.02	16.000	2.51	22.08	1.01
3.917	1.09	10.000	3.02	16.083	2.51	22.17	1.01
4.000	1.09	10.083	3.02	16.167	2.51	22.25	1.01
4.083	1.09	10.167	3.02	16.250	2.51	22.33	1.01
4.167	1.09	10.250	3.02	16.333	1.51	22.42	1.01
4.250	1.09	10.333	3.86	16.417	1.51	22.50	1.01
4.333	1.34	10.417	3.86	16.500	1.51	22.58	1.01
4.417	1.34	10.500	3.86	16.583	1.51	22.67	1.01
4.500	1.34	10.583	3.86	16.667	1.51	22.75	1.01
4.583	1.34	10.667	3.86	16.750	1.51	22.83	1.01
4.667	1.34	10.750	3.86	16.833	1.51	22.92	1.01
4.750	1.34	10.833	5.20	16.917	1.51	23.00	1.01
4.833	1.34	10.917	5.20	17.000	1.51	23.08	1.01
4.917	1.34	11.000	5.20	17.083	1.51	23.17	1.01
5.000	1.34	11.083	5.20	17.167	1.51	23.25	1.01
5.083	1.34	11.167	5.20	17.250	1.51	23.33	1.01
5.167	1.34	11.250	5.20	17.333	1.51	23.42	1.01
5.250	1.34	11.333	8.05	17.417	1.51	23.50	1.01
5.333	1.34	11.417	8.05	17.500	1.51	23.58	1.01
5.417	1.34	11.500	8.05	17.583	1.51	23.67	1.01
5.500	1.34	11.583	8.05	17.667	1.51	23.75	1.01
5.583	1.34	11.667	8.05	17.750	1.51	23.83	1.01
5.667	1.34	11.750	8.05	17.833	1.51	23.92	1.01
5.750	1.34	11.833	24.81	17.917	1.51	24.00	1.01
5.833	1.34	11.917	24.81	18.000	1.51	24.08	1.01
5.917	1.34	12.000	24.81	18.083	1.51	24.17	1.01
6.000	1.34	12.083	102.57	18.167	1.51	24.25	1.01
6.083	1.34	12.167	102.58	18.250	1.51		

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.

****
** SIMULATION:(4) 25 Year Design Storm - SCS **
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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	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.58	12.250	120.75	18.33	1.78
0.167	0.00	6.250	1.58	12.333	14.22	18.42	1.78
0.250	0.00	6.333	1.78	12.417	14.21	18.50	1.78
0.333	1.09	6.417	1.78	12.500	14.21	18.58	1.78
0.417	1.09	6.500	1.78	12.583	14.21	18.67	1.78
0.500	1.09	6.583	1.78	12.667	14.21	18.75	1.78
0.583	1.09	6.667	1.78	12.750	14.21	18.83	1.78
0.667	1.09	6.750	1.78	12.833	7.30	18.92	1.78
0.750	1.09	6.833	1.78	12.917	7.30	19.00	1.78
0.833	1.09	6.917	1.78	13.000	7.30	19.08	1.78
0.917	1.09	7.000	1.78	13.083	7.30	19.17	1.78
1.000	1.09	7.083	1.78	13.167	7.30	19.25	1.78
1.083	1.09	7.167	1.78	13.250	7.30	19.33	1.78
1.167	1.09	7.250	1.78	13.333	5.33	19.42	1.78
1.250	1.09	7.333	2.17	13.417	5.33	19.50	1.78
1.333	1.09	7.417	2.17	13.500	5.33	19.58	1.78
1.417	1.09	7.500	2.17	13.583	5.33	19.67	1.78
1.500	1.09	7.583	2.17	13.667	5.33	19.75	1.78
1.583	1.09	7.667	2.17	13.750	5.33	19.83	1.78
1.667	1.09	7.750	2.17	13.833	4.14	19.92	1.78
1.750	1.09	7.833	2.17	13.917	4.14	20.00	1.78
1.833	1.09	7.917	2.17	14.000	4.14	20.08	1.78
1.917	1.09	8.000	2.17	14.083	4.14	20.17	1.78
2.000	1.09	8.083	2.17	14.167	4.14	20.25	1.78
2.083	1.09	8.167	2.17	14.250	4.14	20.33	1.18
2.167	1.09	8.250	2.17	14.333	2.96	20.42	1.18
2.250	1.09	8.333	2.56	14.417	2.96	20.50	1.18
2.333	1.28	8.417	2.56	14.500	2.96	20.58	1.18
2.417	1.28	8.500	2.56	14.583	2.96	20.67	1.18
2.500	1.28	8.583	2.56	14.667	2.96	20.75	1.18
2.583	1.28	8.667	2.56	14.750	2.96	20.83	1.18
2.667	1.28	8.750	2.56	14.833	2.96	20.92	1.18
2.750	1.28	8.833	2.76	14.917	2.96	21.00	1.18
2.833	1.28	8.917	2.76	15.000	2.96	21.08	1.18
2.917	1.28	9.000	2.76	15.083	2.96	21.17	1.18

3.000	1.28	9.083	2.76	15.167	2.96	21.25	1.18
3.083	1.28	9.167	2.76	15.250	2.96	21.33	1.18
3.167	1.28	9.250	2.76	15.333	2.96	21.42	1.18
3.250	1.28	9.333	3.16	15.417	2.96	21.50	1.18
3.333	1.28	9.417	3.16	15.500	2.96	21.58	1.18
3.417	1.28	9.500	3.16	15.583	2.96	21.67	1.18
3.500	1.28	9.583	3.16	15.667	2.96	21.75	1.18
3.583	1.28	9.667	3.16	15.750	2.96	21.83	1.18
3.667	1.28	9.750	3.16	15.833	2.96	21.92	1.18
3.750	1.28	9.833	3.55	15.917	2.96	22.00	1.18
3.833	1.28	9.917	3.55	16.000	2.96	22.08	1.18
3.917	1.28	10.000	3.55	16.083	2.96	22.17	1.18
4.000	1.28	10.083	3.55	16.167	2.96	22.25	1.18
4.083	1.28	10.167	3.55	16.250	2.96	22.33	1.18
4.167	1.28	10.250	3.55	16.333	1.78	22.42	1.18
4.250	1.28	10.333	4.54	16.417	1.78	22.50	1.18
4.333	1.58	10.417	4.54	16.500	1.78	22.58	1.18
4.417	1.58	10.500	4.54	16.583	1.78	22.67	1.18
4.500	1.58	10.583	4.54	16.667	1.78	22.75	1.18
4.583	1.58	10.667	4.54	16.750	1.78	22.83	1.18
4.667	1.58	10.750	4.54	16.833	1.78	22.92	1.18
4.750	1.58	10.833	6.12	16.917	1.78	23.00	1.18
4.833	1.58	10.917	6.12	17.000	1.78	23.08	1.18
4.917	1.58	11.000	6.12	17.083	1.78	23.17	1.18
5.000	1.58	11.083	6.12	17.167	1.78	23.25	1.18
5.083	1.58	11.167	6.12	17.250	1.78	23.33	1.18
5.167	1.58	11.250	6.12	17.333	1.78	23.42	1.18
5.250	1.58	11.333	9.47	17.417	1.78	23.50	1.18
5.333	1.58	11.417	9.47	17.500	1.78	23.58	1.18
5.417	1.58	11.500	9.47	17.583	1.78	23.67	1.18
5.500	1.58	11.583	9.47	17.667	1.78	23.75	1.18
5.583	1.58	11.667	9.47	17.750	1.78	23.83	1.18
5.667	1.58	11.750	9.47	17.833	1.78	23.92	1.18
5.750	1.58	11.833	29.20	17.917	1.78	24.00	1.18
5.833	1.58	11.917	29.20	18.000	1.78	24.08	1.18
5.917	1.58	12.000	29.20	18.083	1.78	24.17	1.18
6.000	1.58	12.083	120.74	18.167	1.78	24.25	1.18
6.083	1.58	12.167	120.75	18.250	1.78		

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.

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

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.76	12.250	134.44	18.33	1.98
0.167	0.00	6.250	1.76	12.333	15.83	18.42	1.98
0.250	0.00	6.333	1.98	12.417	15.82	18.50	1.98
0.333	1.21	6.417	1.98	12.500	15.82	18.58	1.98
0.417	1.21	6.500	1.98	12.583	15.82	18.67	1.98
0.500	1.21	6.583	1.98	12.667	15.82	18.75	1.98
0.583	1.21	6.667	1.98	12.750	15.82	18.83	1.98
0.667	1.21	6.750	1.98	12.833	8.13	18.92	1.98
0.750	1.21	6.833	1.98	12.917	8.13	19.00	1.98
0.833	1.21	6.917	1.98	13.000	8.13	19.08	1.98
0.917	1.21	7.000	1.98	13.083	8.13	19.17	1.98
1.000	1.21	7.083	1.98	13.167	8.13	19.25	1.98
1.083	1.21	7.167	1.98	13.250	8.13	19.33	1.98
1.167	1.21	7.250	1.98	13.333	5.93	19.42	1.98
1.250	1.21	7.333	2.42	13.417	5.93	19.50	1.98
1.333	1.21	7.417	2.42	13.500	5.93	19.58	1.98
1.417	1.21	7.500	2.42	13.583	5.93	19.67	1.98
1.500	1.21	7.583	2.42	13.667	5.93	19.75	1.98
1.583	1.21	7.667	2.42	13.750	5.93	19.83	1.98
1.667	1.21	7.750	2.42	13.833	4.61	19.92	1.98
1.750	1.21	7.833	2.42	13.917	4.61	20.00	1.98
1.833	1.21	7.917	2.42	14.000	4.61	20.08	1.98
1.917	1.21	8.000	2.42	14.083	4.61	20.17	1.98
2.000	1.21	8.083	2.42	14.167	4.61	20.25	1.98
2.083	1.21	8.167	2.42	14.250	4.61	20.33	1.32
2.167	1.21	8.250	2.42	14.333	3.30	20.42	1.32
2.250	1.21	8.333	2.86	14.417	3.30	20.50	1.32
2.333	1.43	8.417	2.86	14.500	3.30	20.58	1.32
2.417	1.43	8.500	2.86	14.583	3.30	20.67	1.32
2.500	1.43	8.583	2.86	14.667	3.30	20.75	1.32
2.583	1.43	8.667	2.86	14.750	3.30	20.83	1.32
2.667	1.43	8.750	2.86	14.833	3.30	20.92	1.32
2.750	1.43	8.833	3.08	14.917	3.30	21.00	1.32
2.833	1.43	8.917	3.08	15.000	3.30	21.08	1.32
2.917	1.43	9.000	3.08	15.083	3.30	21.17	1.32

3.000	1.43	9.083	3.08	15.167	3.30	21.25	1.32
3.083	1.43	9.167	3.08	15.250	3.30	21.33	1.32
3.167	1.43	9.250	3.08	15.333	3.30	21.42	1.32
3.250	1.43	9.333	3.51	15.417	3.30	21.50	1.32
3.333	1.43	9.417	3.51	15.500	3.30	21.58	1.32
3.417	1.43	9.500	3.51	15.583	3.30	21.67	1.32
3.500	1.43	9.583	3.51	15.667	3.30	21.75	1.32
3.583	1.43	9.667	3.51	15.750	3.30	21.83	1.32
3.667	1.43	9.750	3.51	15.833	3.30	21.92	1.32
3.750	1.43	9.833	3.95	15.917	3.30	22.00	1.32
3.833	1.43	9.917	3.95	16.000	3.30	22.08	1.32
3.917	1.43	10.000	3.95	16.083	3.30	22.17	1.32
4.000	1.43	10.083	3.95	16.167	3.30	22.25	1.32
4.083	1.43	10.167	3.95	16.250	3.30	22.33	1.32
4.167	1.43	10.250	3.95	16.333	1.98	22.42	1.32
4.250	1.43	10.333	5.05	16.417	1.98	22.50	1.32
4.333	1.76	10.417	5.05	16.500	1.98	22.58	1.32
4.417	1.76	10.500	5.05	16.583	1.98	22.67	1.32
4.500	1.76	10.583	5.05	16.667	1.98	22.75	1.32
4.583	1.76	10.667	5.05	16.750	1.98	22.83	1.32
4.667	1.76	10.750	5.05	16.833	1.98	22.92	1.32
4.750	1.76	10.833	6.81	16.917	1.98	23.00	1.32
4.833	1.76	10.917	6.81	17.000	1.98	23.08	1.32
4.917	1.76	11.000	6.81	17.083	1.98	23.17	1.32
5.000	1.76	11.083	6.81	17.167	1.98	23.25	1.32
5.083	1.76	11.167	6.81	17.250	1.98	23.33	1.32
5.167	1.76	11.250	6.81	17.333	1.98	23.42	1.32
5.250	1.76	11.333	10.54	17.417	1.98	23.50	1.32
5.333	1.76	11.417	10.54	17.500	1.98	23.58	1.32
5.417	1.76	11.500	10.54	17.583	1.98	23.67	1.32
5.500	1.76	11.583	10.54	17.667	1.98	23.75	1.32
5.583	1.76	11.667	10.54	17.750	1.98	23.83	1.32
5.667	1.76	11.750	10.54	17.833	1.98	23.92	1.32
5.750	1.76	11.833	32.51	17.917	1.98	24.00	1.32
5.833	1.76	11.917	32.51	18.000	1.98	24.08	1.32
5.917	1.76	12.000	32.51	18.083	1.98	24.17	1.32
6.000	1.76	12.083	134.43	18.167	1.98	24.25	1.32
6.083	1.76	12.167	134.44	18.250	1.98		

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.

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

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.93	12.250	147.82	18.33	2.17
0.167	0.00	6.250	1.93	12.333	17.41	18.42	2.17
0.250	0.00	6.333	2.17	12.417	17.39	18.50	2.17
0.333	1.33	6.417	2.17	12.500	17.39	18.58	2.17
0.417	1.33	6.500	2.17	12.583	17.39	18.67	2.17
0.500	1.33	6.583	2.17	12.667	17.39	18.75	2.17
0.583	1.33	6.667	2.17	12.750	17.39	18.83	2.17
0.667	1.33	6.750	2.17	12.833	8.94	18.92	2.17
0.750	1.33	6.833	2.17	12.917	8.94	19.00	2.17
0.833	1.33	6.917	2.17	13.000	8.94	19.08	2.17
0.917	1.33	7.000	2.17	13.083	8.94	19.17	2.17
1.000	1.33	7.083	2.17	13.167	8.94	19.25	2.17
1.083	1.33	7.167	2.17	13.250	8.94	19.33	2.17
1.167	1.33	7.250	2.17	13.333	6.52	19.42	2.17
1.250	1.33	7.333	2.66	13.417	6.52	19.50	2.17
1.333	1.33	7.417	2.66	13.500	6.52	19.58	2.17
1.417	1.33	7.500	2.66	13.583	6.52	19.67	2.17
1.500	1.33	7.583	2.66	13.667	6.52	19.75	2.17
1.583	1.33	7.667	2.66	13.750	6.52	19.83	2.17
1.667	1.33	7.750	2.66	13.833	5.07	19.92	2.17
1.750	1.33	7.833	2.66	13.917	5.07	20.00	2.17
1.833	1.33	7.917	2.66	14.000	5.07	20.08	2.17
1.917	1.33	8.000	2.66	14.083	5.07	20.17	2.17
2.000	1.33	8.083	2.66	14.167	5.07	20.25	2.17
2.083	1.33	8.167	2.66	14.250	5.07	20.33	1.45
2.167	1.33	8.250	2.66	14.333	3.62	20.42	1.45
2.250	1.33	8.333	3.14	14.417	3.62	20.50	1.45
2.333	1.57	8.417	3.14	14.500	3.62	20.58	1.45
2.417	1.57	8.500	3.14	14.583	3.62	20.67	1.45
2.500	1.57	8.583	3.14	14.667	3.62	20.75	1.45
2.583	1.57	8.667	3.14	14.750	3.62	20.83	1.45
2.667	1.57	8.750	3.14	14.833	3.62	20.92	1.45
2.750	1.57	8.833	3.38	14.917	3.62	21.00	1.45
2.833	1.57	8.917	3.38	15.000	3.62	21.08	1.45
2.917	1.57	9.000	3.38	15.083	3.62	21.17	1.45

```
              3.000    1.57 | 9.083    3.38 |15.167    3.62 | 21.25    1.45
              3.083    1.57 | 9.167    3.38 |15.250    3.62 | 21.33    1.45
              3.167    1.57 | 9.250    3.38 |15.333    3.62 | 21.42    1.45
              3.250    1.57 | 9.333    3.86 |15.417    3.62 | 21.50    1.45
              3.333    1.57 | 9.417    3.86 |15.500    3.62 | 21.58    1.45
              3.417    1.57 | 9.500    3.86 |15.583    3.62 | 21.67    1.45
              3.500    1.57 | 9.583    3.86 |15.667    3.62 | 21.75    1.45
              3.583    1.57 | 9.667    3.86 |15.750    3.62 | 21.83    1.45
              3.667    1.57 | 9.750    3.86 |15.833    3.62 | 21.92    1.45
              3.750    1.57 | 9.833    4.35 |15.917    3.62 | 22.00    1.45
              3.833    1.57 | 9.917    4.35 |16.000    3.62 | 22.08    1.45
              3.917    1.57 |10.000    4.35 |16.083    3.62 | 22.17    1.45
              4.000    1.57 |10.083    4.35 |16.167    3.62 | 22.25    1.45
              4.083    1.57 |10.167    4.35 |16.250    3.62 | 22.33    1.45
              4.167    1.57 |10.250    4.35 |16.333    2.17 | 22.42    1.45
              4.250    1.57 |10.333    5.56 |16.417    2.17 | 22.50    1.45
              4.333    1.93 |10.417    5.56 |16.500    2.17 | 22.58    1.45
              4.417    1.93 |10.500    5.56 |16.583    2.17 | 22.67    1.45
              4.500    1.93 |10.583    5.56 |16.667    2.17 | 22.75    1.45
              4.583    1.93 |10.667    5.56 |16.750    2.17 | 22.83    1.45
              4.667    1.93 |10.750    5.56 |16.833    2.17 | 22.92    1.45
              4.750    1.93 |10.833    7.49 |16.917    2.17 | 23.00    1.45
              4.833    1.93 |10.917    7.49 |17.000    2.17 | 23.08    1.45
              4.917    1.93 |11.000    7.49 |17.083    2.17 | 23.17    1.45
              5.000    1.93 |11.083    7.49 |17.167    2.17 | 23.25    1.45
              5.083    1.93 |11.167    7.49 |17.250    2.17 | 23.33    1.45
              5.167    1.93 |11.250    7.49 |17.333    2.17 | 23.42    1.45
              5.250    1.93 |11.333   11.59 |17.417    2.17 | 23.50    1.45
              5.333    1.93 |11.417   11.59 |17.500    2.17 | 23.58    1.45
              5.417    1.93 |11.500   11.59 |17.583    2.17 | 23.67    1.45
              5.500    1.93 |11.583   11.59 |17.667    2.17 | 23.75    1.45
              5.583    1.93 |11.667   11.59 |17.750    2.17 | 23.83    1.45
              5.667    1.93 |11.750   11.59 |17.833    2.17 | 23.92    1.45
              5.750    1.93 |11.833   35.75 |17.917    2.17 | 24.00    1.45
              5.833    1.93 |11.917   35.75 |18.000    2.17 | 24.08    1.45
              5.917    1.93 |12.000   35.75 |18.083    2.17 | 24.17    1.45
              6.000    1.93 |12.083  147.81 |18.167    2.17 | 24.25    1.45
              6.083    1.93 |12.167  147.82 |18.250    2.17 |

    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.
```

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


      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   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
      O   O    T      T    H   H   Y Y   MM MM  O   O
      O   O    T      T    H   H    Y    M   M  O   O
       OOO     T      T    H   H    Y    M   M   OOO
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                 *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\0
1eb1316-aea3-48a4-86c8-9b1e1d2e5ca3\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\0
1eb1316-aea3-48a4-86c8-9b1e1d2e5ca3\s


DATE: 03-02-2022                          TIME: 10:32:25

USER:


COMMENTS: _____________________________________________________________


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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
   READ STORM                15.0
```

```
    [ Ptot= 54.40 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\7793d5b
3-e6fa-4c41-9ca8-
    remark: 2yr 24hr 15min SCS

*
 ** CALIB NASHYD         0102  1  5.0    0.55    0.01 12.75  11.63 0.21   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.52]
*
    READ STORM                 15.0
    [ Ptot= 54.40 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\7793d5b
3-e6fa-4c41-9ca8-
    remark: 2yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0302  1  5.0    0.20    0.02 12.25  25.93 0.48   0.000
    [I%= 0.1:S%= 2.00]
*
    ADD [  0102+  0302]  0902  3  5.0    0.75    0.02 12.33  15.44  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot= 54.40 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\7793d5b
3-e6fa-4c41-9ca8-
    remark: 2yr 24hr 15min SCS

*
 *  CALIB NASHYD         0101  1  5.0    0.74    0.01 12.50  13.14 0.24   0.000
    [CN=69.7         ]
    [ N = 3.0:Tp 0.39]
*
    READ STORM                 15.0
    [ Ptot= 54.40 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\7793d5b
3-e6fa-4c41-9ca8-
    remark: 2yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0301  1  5.0    0.35    0.04 12.25  27.91 0.51   0.000
    [I%= 0.1:S%= 8.00]
*
    ADD [  0101+  0301]  0901  3  5.0    1.09    0.05 12.25  17.88  n/a   0.000
*
================================================================================
```

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


       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   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\7
89aebe1-77d2-4b2e-bbb9-2007b1070cfb\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\7
89aebe1-77d2-4b2e-bbb9-2007b1070cfb\s


DATE: 03-02-2022                          TIME: 10:32:25

USER:


COMMENTS: _____________________________________________________________


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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                   min     ha   '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
   READ STORM                15.0
   [ Ptot= 72.10 mm ]
```

```
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\f65a105
d-3d42-4656-91af-
    remark: 5yr 24hr 15min SCS

*
 ** CALIB NASHYD         0102  1  5.0    0.55    0.01 12.67  20.60 0.29   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.52]
*
    READ STORM                 15.0
    [ Ptot= 72.10 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\f65a105
d-3d42-4656-91af-
    remark: 5yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0302  1  5.0    0.20    0.02 12.25  39.90 0.55   0.000
    [I%= 0.1:S%= 2.00]
*
    ADD [  0102+  0302]  0902  3  5.0    0.75    0.03 12.33  25.75  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot= 72.10 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\f65a105
d-3d42-4656-91af-
    remark: 5yr 24hr 15min SCS

*
 *  CALIB NASHYD         0101  1  5.0    0.74    0.03 12.50  22.84 0.32   0.000
    [CN=69.7         ]
    [ N = 3.0:Tp 0.39]
*
    READ STORM                 15.0
    [ Ptot= 72.10 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\f65a105
d-3d42-4656-91af-
    remark: 5yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0301  1  5.0    0.35    0.06 12.25  42.41 0.59   0.000
    [I%= 0.1:S%= 8.00]
*
    ADD [  0101+  0301]  0901  3  5.0    1.09    0.08 12.25  29.12  n/a   0.000
*
================================================================================
========================
```

```
       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   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   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\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: 03-02-2022                          TIME: 10:32:25

USER:


COMMENTS: _____________________________________________________________


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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
   READ STORM                 15.0
   [ Ptot= 83.81 mm ]
   fname :
```

```
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\965a2d5
2-db4e-4b39-909b-
    remark: 10yr 24hr 15min SCS

*
 ** CALIB NASHYD         0102  1  5.0    0.55    0.02 12.67  27.39 0.33   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.52]
*
    READ STORM                 15.0
    [ Ptot= 83.81 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\965a2d5
2-db4e-4b39-909b-
    remark: 10yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0302  1  5.0    0.20    0.03 12.25  49.71 0.59   0.000
    [I%= 0.1:S%= 2.00]
*
    ADD [  0102+  0302]  0902  3  5.0    0.75    0.04 12.33  33.34  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot= 83.81 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\965a2d5
2-db4e-4b39-909b-
    remark: 10yr 24hr 15min SCS

*
 *  CALIB NASHYD         0101  1  5.0    0.74    0.04 12.50  30.10 0.36   0.000
    [CN=69.7         ]
    [ N = 3.0:Tp 0.39]
*
    READ STORM                 15.0
    [ Ptot= 83.81 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\965a2d5
2-db4e-4b39-909b-
    remark: 10yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0301  1  5.0    0.35    0.07 12.25  52.50 0.63   0.000
    [I%= 0.1:S%= 8.00]
*
    ADD [  0101+  0301]  0901  3  5.0    1.09    0.10 12.25  37.29  n/a   0.000
*
================================================================================
========================
```

```
       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   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\e
4d7ddd6-3d51-4ca0-97ae-ba5cfb535653\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\e
4d7ddd6-3d51-4ca0-97ae-ba5cfb535653\s


DATE: 03-02-2022                          TIME: 10:32:25

USER:


COMMENTS: _____________________________________________________________


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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
    READ STORM                15.0
    [ Ptot= 98.65 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\7c77deb
```

```
8-31c2-4b59-9da7-
    remark: 25yr 24hr 15min SCS

*
 ** CALIB NASHYD         0102  1  5.0    0.55    0.03 12.67  36.76 0.37   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.52]
*
    READ STORM                 15.0
    [ Ptot= 98.65 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\7c77deb
8-31c2-4b59-9da7-
    remark: 25yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0302  1  5.0    0.20    0.04 12.25  62.57 0.63   0.000
    [I%= 0.1:S%= 2.00]
*
    ADD [  0102+  0302]  0902  3  5.0    0.75    0.05 12.33  43.64  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot= 98.65 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\7c77deb
8-31c2-4b59-9da7-
    remark: 25yr 24hr 15min SCS

*
 *  CALIB NASHYD         0101  1  5.0    0.74    0.05 12.50  40.04 0.41   0.000
    [CN=69.7         ]
    [ N = 3.0:Tp 0.39]
*
    READ STORM                 15.0
    [ Ptot= 98.65 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\7c77deb
8-31c2-4b59-9da7-
    remark: 25yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0301  1  5.0    0.35    0.09 12.25  65.68 0.67   0.000
    [I%= 0.1:S%= 8.00]
*
    ADD [  0101+  0301]  0901  3  5.0    1.09    0.12 12.25  48.27  n/a   0.000
*
================================================================================
========================
```

```
       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   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\e
fb662b4-1edd-432a-810d-c2eed9babf0a\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\e
fb662b4-1edd-432a-810d-c2eed9babf0a\s


DATE: 03-02-2022                          TIME: 10:32:25

USER:


COMMENTS: _____________________________________________________________


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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
   READ STORM                 15.0
   [ Ptot=109.84 mm ]
   fname :
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\ee65011
5-dab4-4afc-9547-
```

```
    remark: 50yr 24hr 15min SCS

*
 ** CALIB NASHYD         0102  1  5.0    0.55    0.03 12.67  44.31 0.40   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.52]
*
    READ STORM                 15.0
    [ Ptot=109.84 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\ee65011
5-dab4-4afc-9547-
    remark: 50yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0302  1  5.0    0.20    0.05 12.25  72.51 0.66   0.000
    [I%= 0.1:S%= 2.00]
*
    ADD [  0102+  0302]  0902  3  5.0    0.75    0.06 12.33  51.83  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot=109.84 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\ee65011
5-dab4-4afc-9547-
    remark: 50yr 24hr 15min SCS

*
 *  CALIB NASHYD         0101  1  5.0    0.74    0.06 12.50  47.99 0.44   0.000
    [CN=69.7         ]
    [ N = 3.0:Tp 0.39]
*
    READ STORM                 15.0
    [ Ptot=109.84 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\ee65011
5-dab4-4afc-9547-
    remark: 50yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0301  1  5.0    0.35    0.11 12.25  75.82 0.69   0.000
    [I%= 0.1:S%= 8.00]
*
    ADD [  0101+  0301]  0901  3  5.0    1.09    0.14 12.25  56.93  n/a   0.000
*
================================================================================
========================


       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   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M  M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\f
414f2bd-3a31-4910-a0be-4653217bf096\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\f
414f2bd-3a31-4910-a0be-4653217bf096\s


DATE: 03-02-2022                          TIME: 10:32:25

USER:


COMMENTS: _____________________________________________________________


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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 15.0
    [ Ptot=120.77 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\3c054a9
9-fc8e-4c2a-8dcd-
    remark: 100yr 24hr 15min SCS
```

```
*
 ** CALIB NASHYD         0102  1  5.0    0.55    0.04 12.67  52.01 0.43   0.000
    [CN=67.0         ]
    [ N = 3.0:Tp 0.52]
*
    READ STORM                 15.0
    [ Ptot=120.77 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\3c054a9
9-fc8e-4c2a-8dcd-
    remark: 100yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0302  1  5.0    0.20    0.06 12.25  82.38 0.68   0.000
    [I%= 0.1:S%= 2.00]
*
    ADD [  0102+  0302]  0902  3  5.0    0.75    0.07 12.33  60.11  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot=120.77 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\3c054a9
9-fc8e-4c2a-8dcd-
    remark: 100yr 24hr 15min SCS

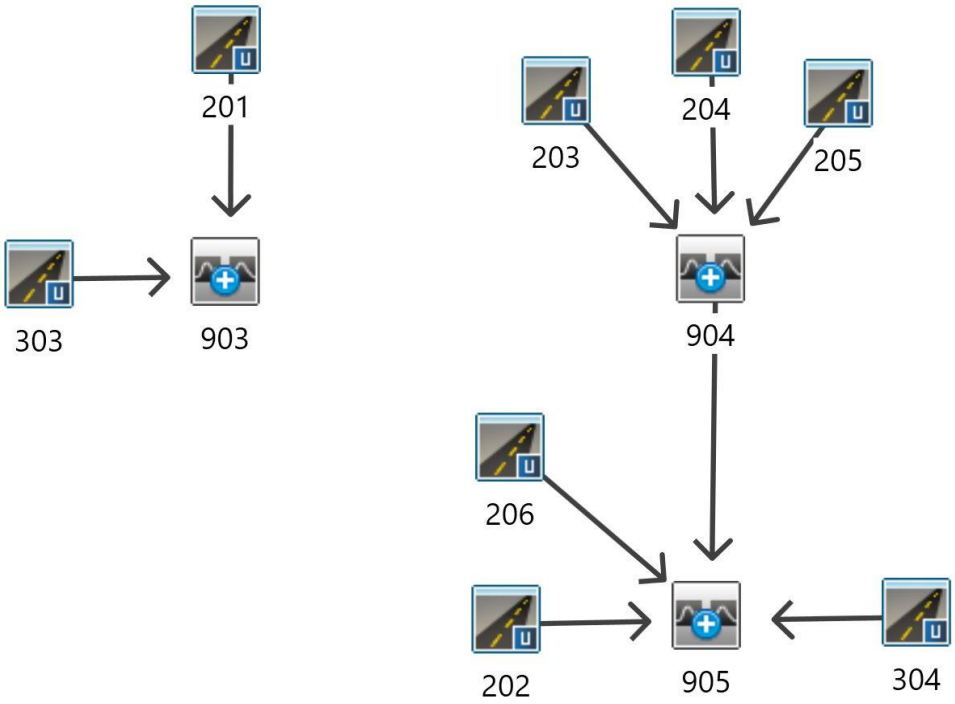
*
 *  CALIB NASHYD         0101  1  5.0    0.74    0.07 12.50  56.08 0.46   0.000
    [CN=69.7         ]
    [ N = 3.0:Tp 0.39]
*
    READ STORM                 15.0
    [ Ptot=120.77 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\8ee04e89-0227-4aa9-abc4-97473788b0e5\3c054a9
9-fc8e-4c2a-8dcd-
    remark: 100yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0301  1  5.0    0.35    0.12 12.25  85.87 0.71   0.000
    [I%= 0.1:S%= 8.00]
*
    ADD [  0101+  0301]  0901  3  5.0    1.09    0.16 12.25  65.64  n/a   0.000
*
 FINISH

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

Appendix B: Post-Development SWM Calculations

CRANBERRY MARSH ESTATES
PROPOSED CONDITIONS



1	Nashyd	1	Route Pipe	1	Duhyd
1	Standhyd	1	Route Channel	1	Diverthyd
1	Addhyd	1	Route Reservoir		

TATHAM ENGINEERING

Project:	Cranberry Marsh Estates
File No.:	120181
Subject:	Otthymo Flow Schematic
Date:	Mar-22

TATHAM ENGINEERING

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Cranberry Marsh Estates	120181

Prepared By

Kyle Gowanlock	Feb 2022

Data Sources

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

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

TATHAM ENGINEERING

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Cranberry Marsh Estates	120181

Prepared By

Kyle Gowanlock	Feb 2022

Data Sources

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

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

TATHAM ENGINEERING

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Cranberry Marsh Estates	120181

Prepared By

Kyle Gowanlock	Feb 2022

Data Sources

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

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

TATHAM ENGINEERING

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Cranberry Marsh Estates	120181

Prepared By

Kyle Gowanlock	Feb 2022

Data Sources

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

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

TATHAM ENGINEERING

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Cranberry Marsh Estates	120181

Prepared By

Kyle Gowanlock	Feb 2022

Data Sources

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

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

TATHAM ENGINEERING

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Cranberry Marsh Estates	120181

Prepared By

Kyle Gowanlock	Feb 2022

Data Sources

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

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

TATHAM ENGINEERING

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Cranberry Marsh Estates	120181

Prepared By

Kyle Gowanlock	Feb 2022

Data Sources

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

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

TATHAM ENGINEERING

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Cranberry Marsh Estates	120181

Prepared By

Kyle Gowanlock	Feb 2022

Data Sources

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

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

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

--------------------
|    READ STORM    |    Filename: C:\Users\KGowanlock\AppD
|                  |              ata\Local\Temp\
|                  |              fb7a2e37-07a6-46b5-addb-42a5f7123511\afe4e812
| Ptotal= 24.97 mm |    Comments: 25MM BARRIE
--------------------
```

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

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	1.167	2.75	2.250	10.28	3.33	1.84
0.167	1.03	1.250	3.06	2.333	7.55	3.42	1.74
0.250	1.33	1.333	3.44	2.417	5.95	3.50	1.65
0.333	1.39	1.417	3.93	2.500	4.91	3.58	1.55
0.417	1.46	1.500	4.55	2.583	4.06	3.67	1.48
0.500	1.53	1.583	5.77	2.667	3.59	3.75	1.42
0.583	1.63	1.667	7.44	2.750	3.21	3.83	1.36
0.667	1.73	1.750	10.51	2.833	2.90	3.92	1.31
0.750	1.83	1.833	17.83	2.917	2.65	4.00	1.26
0.833	1.96	1.917	35.45	3.000	2.43	4.08	1.20
0.917	2.10	2.000	72.58	3.083	2.22		
1.000	2.26	2.083	26.96	3.167	2.08		
1.083	2.50	2.167	15.83	3.250	1.95		

				TOTALS
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	
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.

--------------------------------------------------------------------------------
************************************************
** SIMULATION:(2) 2 Year Design Storm - Chicago **
************************************************
--------------------
| 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			
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

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.76	1.083	12.83	2.083	5.19	3.08	3.02
0.167	2.76	1.167	12.83	2.167	5.19	3.17	3.02
0.250	3.08	1.250	73.13	2.250	4.58	3.25	2.84
0.333	3.08	1.333	73.13	2.333	4.58	3.33	2.84
0.417	3.51	1.417	15.38	2.417	4.12	3.42	2.69
0.500	3.51	1.500	15.38	2.500	4.12	3.50	2.69
0.583	4.13	1.583	9.64	2.583	3.76	3.58	2.56
0.667	4.13	1.667	9.64	2.667	3.76	3.67	2.56
0.750	5.11	1.750	7.34	2.750	3.47	3.75	2.44
0.833	5.11	1.833	7.34	2.833	3.47	3.83	2.44
0.917	6.98	1.917	6.04	2.917	3.23	3.92	2.33
1.000	6.98	2.000	6.04	3.000	3.23	4.00	2.33

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

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

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 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)	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

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	3.65	1.083	17.00	2.083	6.88	3.08	4.00
0.167	3.65	1.167	17.00	2.167	6.88	3.17	4.00
0.250	4.08	1.250	96.92	2.250	6.07	3.25	3.77
0.333	4.08	1.333	96.92	2.333	6.07	3.33	3.77
0.417	4.65	1.417	20.39	2.417	5.46	3.42	3.57
0.500	4.65	1.500	20.39	2.500	5.46	3.50	3.57
0.583	5.48	1.583	12.78	2.583	4.98	3.58	3.39
0.667	5.48	1.667	12.78	2.667	4.98	3.67	3.39
0.750	6.78	1.750	9.73	2.750	4.60	3.75	3.23
0.833	6.78	1.833	9.73	2.833	4.60	3.83	3.23
0.917	9.25	1.917	8.01	2.917	4.27	3.92	3.09
1.000	9.25	2.000	8.01	3.000	4.27	4.00	3.09

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	1.33
RUNOFF VOLUME	(mm)=	40.00	17.43	17.44
TOTAL RAINFALL	(mm)=	42.00	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.

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

CHICAGO STORM
Ptotal= 48.83 mm

IDF curve parameters: A= 563.357
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)
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

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	4.25	1.083	19.77	2.083	8.00	3.08	4.65
0.167	4.25	1.167	19.77	2.167	8.00	3.17	4.65
0.250	4.74	1.250	112.66	2.250	7.06	3.25	4.38
0.333	4.74	1.333	112.66	2.333	7.06	3.33	4.38
0.417	5.41	1.417	23.70	2.417	6.35	3.42	4.15
0.500	5.41	1.500	23.70	2.500	6.35	3.50	4.15
0.583	6.37	1.583	14.86	2.583	5.79	3.58	3.94
0.667	6.37	1.667	14.86	2.667	5.79	3.67	3.94
0.750	7.88	1.750	11.31	2.750	5.34	3.75	3.75
0.833	7.88	1.833	11.31	2.833	5.34	3.83	3.75
0.917	10.75	1.917	9.31	2.917	4.97	3.92	3.59
1.000	10.75	2.000	9.31	3.000	4.97	4.00	3.59

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

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     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.

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** SIMULATION:(5) 25 Year Design Storm - Chicago **
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--------------------
| 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


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| 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

          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       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
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.00         0.03          0.025 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      55.47        28.83          28.85
     TOTAL RAINFALL   (mm)=      57.47        57.47          57.47
     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.

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** SIMULATION:(6) 50 Year Design Storm - Chicago **
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--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 738.312
| Ptotal= 63.99 mm |                          B=   0.000
--------------------                          C=   0.699
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used in: INTENSITY = A / (t + B)^C

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

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

CALIB
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

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	5.56	1.083	25.91	2.083	10.48	3.08	6.10
0.167	5.56	1.167	25.91	2.167	10.48	3.17	6.10
0.250	6.22	1.250	147.65	2.250	9.25	3.25	5.74
0.333	6.22	1.333	147.65	2.333	9.25	3.33	5.74
0.417	7.09	1.417	31.06	2.417	8.32	3.42	5.43
0.500	7.09	1.500	31.06	2.500	8.32	3.50	5.43
0.583	8.34	1.583	19.47	2.583	7.59	3.58	5.16
0.667	8.34	1.667	19.47	2.667	7.59	3.67	5.16
0.750	10.32	1.750	14.82	2.750	7.00	3.75	4.92
0.833	10.32	1.833	14.82	2.833	7.00	3.83	4.92
0.917	14.09	1.917	12.20	2.917	6.51	3.92	4.71
1.000	14.09	2.000	12.20	3.000	6.51	4.00	4.71

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.

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

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
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

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.12	1.083	28.48	2.083	11.52	3.08	6.70
0.167	6.12	1.167	28.48	2.167	11.52	3.17	6.70
0.250	6.83	1.250	162.35	2.250	10.17	3.25	6.31
0.333	6.83	1.333	162.35	2.333	10.17	3.33	6.31
0.417	7.80	1.417	34.15	2.417	9.15	3.42	5.97
0.500	7.80	1.500	34.15	2.500	9.15	3.50	5.97
0.583	9.17	1.583	21.41	2.583	8.35	3.58	5.68
0.667	9.17	1.667	21.41	2.667	8.35	3.67	5.68
0.750	11.35	1.750	16.30	2.750	7.70	3.75	5.41
0.833	11.35	1.833	16.30	2.833	7.70	3.83	5.41
0.917	15.49	1.917	13.41	2.917	7.16	3.92	5.17
1.000	15.49	2.000	13.41	3.000	7.16	4.00	5.17

				TOTALS
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	0.035 (iii)
TIME TO PEAK	(hrs)=	1.33	1.33	1.33
RUNOFF VOLUME	(mm)=	68.36	39.15	39.18
TOTAL RAINFALL	(mm)=	70.36	70.36	70.36
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.

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

READ STORM	Filename: C:\Users\KGowanlock\AppData\Local\Temp\fb7a2e37-07a6-46b5-addb-42a5f7123511\3c4d485d
Ptotal=193.00 mm	Comments: TIMMINS

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

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	15.00	3.083	3.00	6.083	43.00	9.08	13.00
0.167	15.00	3.167	3.00	6.167	43.00	9.17	13.00
0.250	15.00	3.250	3.00	6.250	43.00	9.25	13.00
0.333	15.00	3.333	3.00	6.333	43.00	9.33	13.00
0.417	15.00	3.417	3.00	6.417	43.00	9.42	13.00
0.500	15.00	3.500	3.00	6.500	43.00	9.50	13.00

0.583	15.00	3.583	3.00	6.583	43.00	9.58	13.00
0.667	15.00	3.667	3.00	6.667	43.00	9.67	13.00
0.750	15.00	3.750	3.00	6.750	43.00	9.75	13.00
0.833	15.00	3.833	3.00	6.833	43.00	9.83	13.00
0.917	15.00	3.917	3.00	6.917	43.00	9.92	13.00
1.000	15.00	4.000	3.00	7.000	43.00	10.00	13.00
1.083	20.00	4.083	5.00	7.083	20.00	10.08	13.00
1.167	20.00	4.167	5.00	7.167	20.00	10.17	13.00
1.250	20.00	4.250	5.00	7.250	20.00	10.25	13.00
1.333	20.00	4.333	5.00	7.333	20.00	10.33	13.00
1.417	20.00	4.417	5.00	7.417	20.00	10.42	13.00
1.500	20.00	4.500	5.00	7.500	20.00	10.50	13.00
1.583	20.00	4.583	5.00	7.583	20.00	10.58	13.00
1.667	20.00	4.667	5.00	7.667	20.00	10.67	13.00
1.750	20.00	4.750	5.00	7.750	20.00	10.75	13.00
1.833	20.00	4.833	5.00	7.833	20.00	10.83	13.00
1.917	20.00	4.917	5.00	7.917	20.00	10.92	13.00
2.000	20.00	5.000	5.00	8.000	20.00	11.00	13.00
2.083	10.00	5.083	20.00	8.083	23.00	11.08	8.00
2.167	10.00	5.167	20.00	8.167	23.00	11.17	8.00
2.250	10.00	5.250	20.00	8.250	23.00	11.25	8.00
2.333	10.00	5.333	20.00	8.333	23.00	11.33	8.00
2.417	10.00	5.417	20.00	8.417	23.00	11.42	8.00
2.500	10.00	5.500	20.00	8.500	23.00	11.50	8.00
2.583	10.00	5.583	20.00	8.583	23.00	11.58	8.00
2.667	10.00	5.667	20.00	8.667	23.00	11.67	8.00
2.750	10.00	5.750	20.00	8.750	23.00	11.75	8.00
2.833	10.00	5.833	20.00	8.833	23.00	11.83	8.00
2.917	10.00	5.917	20.00	8.917	23.00	11.92	8.00
3.000	10.00	6.000	20.00	9.000	23.00	12.00	8.00

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		
			TOTALS	
PEAK FLOW (cms)=	0.00	0.01	0.014 (iii)	
TIME TO PEAK (hrs)=	6.25	7.00	7.00	
RUNOFF VOLUME (mm)=	191.00	151.20	151.22	
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.

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


       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   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\5
cae7f1d-05aa-4631-82ae-cced436706ed\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\5
cae7f1d-05aa-4631-82ae-cced436706ed\s


DATE: 03-02-2022                          TIME: 10:38:07

USER:


COMMENTS: _____________________________________________________________


  ************************************************
  ** SIMULATION : (2) 2 Year Design Storm - Chi **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                   min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    CHIC STORM                10.0
                                                  [ Ptot= 31.69 mm ]
*
 *  CALIB STANDHYD       0201  1  5.0    0.13    0.01  1.33  10.73 0.34   0.000
    [I%= 0.1:S%= 5.00]
*
    CHIC STORM                 10.0
    [ Ptot= 31.69 mm ]
*
 *  CALIB STANDHYD       0303  1  5.0    0.19    0.01  1.33  12.07 0.38   0.000
    [I%= 0.1:S%= 8.00]
*
    ADD [  0201+  0303]  0903  3  5.0    0.32    0.02  1.33  11.53  n/a   0.000
*
    CHIC STORM                 10.0
    [ Ptot= 31.69 mm ]
*
 *  CALIB STANDHYD       0202  1  5.0    0.35    0.02  1.33  11.27 0.36   0.000
    [I%=20.0:S%= 5.00]
*
    CHIC STORM                 10.0
    [ Ptot= 31.69 mm ]
*
 *  CALIB STANDHYD       0304  1  5.0    0.37    0.01  1.50   9.86 0.31   0.000
    [I%= 0.1:S%= 2.00]
*
    CHIC STORM                 10.0
    [ Ptot= 31.69 mm ]
*
 *  CALIB STANDHYD       0203  1  5.0    0.08    0.01  1.33  18.41 0.58   0.000
    [I%=38.0:S%= 2.00]
*
    CHIC STORM                 10.0
    [ Ptot= 31.69 mm ]
*
 *  CALIB STANDHYD       0204  1  5.0    0.24    0.03  1.33  17.58 0.55   0.000
    [I%=36.0:S%= 2.00]
*
    CHIC STORM                 10.0
    [ Ptot= 31.69 mm ]
*
 *  CALIB STANDHYD       0205  1  5.0    0.23    0.03  1.33  17.54 0.55   0.000
    [I%=37.0:S%= 2.00]
*
    ADD [  0203+  0204]  0904  3  5.0    0.32    0.04  1.33  17.79  n/a   0.000
*
    ADD [  0904+  0205]  0904  1  5.0    0.55    0.06  1.33  17.68  n/a   0.000
*
    CHIC STORM                 10.0
    [ Ptot= 31.69 mm ]
*
```

```
 *  CALIB STANDHYD       0206  1  5.0    0.22    0.01  1.33  11.71 0.37   0.000
    [I%=21.0:S%= 1.00]
*
    ADD [  0202+  0206]  0905  3  5.0    0.57    0.03  1.33  11.44  n/a   0.000
*
    ADD [  0905+  0304]  0905  1  5.0    0.94    0.03  1.33  10.82  n/a   0.000
*
    ADD [  0905+  0904]  0905  3  5.0    1.49    0.10  1.33  13.35  n/a   0.000
*
================================================================================
========================


       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   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                 *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\d
c16e1ee-eef0-41c8-b0fa-1486c7a1c177\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\d
c16e1ee-eef0-41c8-b0fa-1486c7a1c177\s


DATE: 03-02-2022                          TIME: 10:38:07

USER:


COMMENTS: _____________________________________________________________


  ***********************************************
```

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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                   min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    CHIC STORM                    10.0
    [ Ptot= 42.00 mm ]
*
 *  CALIB STANDHYD       0201  1  5.0    0.13    0.01  1.33  17.44 0.42   0.000
    [I%= 0.1:S%= 5.00]
*
    CHIC STORM                    10.0
    [ Ptot= 42.00 mm ]
*
 *  CALIB STANDHYD       0303  1  5.0    0.19    0.02  1.33  19.26 0.46   0.000
    [I%= 0.1:S%= 8.00]
*
    ADD [  0201+  0303]  0903  3  5.0    0.32    0.04  1.33  18.52  n/a   0.000
*
    CHIC STORM                    10.0
    [ Ptot= 42.00 mm ]
*
 *  CALIB STANDHYD       0202  1  5.0    0.35    0.04  1.33  17.31 0.41   0.000
    [I%=20.0:S%= 5.00]
*
    CHIC STORM                    10.0
    [ Ptot= 42.00 mm ]
*
 *  CALIB STANDHYD       0304  1  5.0    0.37    0.02  1.50  16.24 0.39   0.000
    [I%= 0.1:S%= 2.00]
*
    CHIC STORM                    10.0
    [ Ptot= 42.00 mm ]
*
 *  CALIB STANDHYD       0203  1  5.0    0.08    0.01  1.33  26.67 0.63   0.000
    [I%=38.0:S%= 2.00]
*
    CHIC STORM                    10.0
    [ Ptot= 42.00 mm ]
*
 *  CALIB STANDHYD       0204  1  5.0    0.24    0.04  1.33  25.60 0.61   0.000
    [I%=36.0:S%= 2.00]
*
    CHIC STORM                    10.0
    [ Ptot= 42.00 mm ]
*
 *  CALIB STANDHYD       0205  1  5.0    0.23    0.04  1.33  25.50 0.61   0.000
```

```
    [I%=37.0:S%= 2.00]
*
    ADD [  0203+  0204]  0904  3  5.0    0.32    0.05  1.33  25.86  n/a   0.000
*
    ADD [  0904+  0205]  0904  1  5.0    0.55    0.09  1.33  25.71  n/a   0.000
*
    CHIC STORM                10.0
    [ Ptot= 42.00 mm ]
*
 *  CALIB STANDHYD       0206  1  5.0    0.22    0.02  1.33  17.93 0.43   0.000
    [I%=21.0:S%= 1.00]
*
    ADD [  0202+  0206]  0905  3  5.0    0.57    0.05  1.33  17.55  n/a   0.000
*
    ADD [  0905+  0304]  0905  1  5.0    0.94    0.06  1.33  17.04  n/a   0.000
*
    ADD [  0905+  0904]  0905  3  5.0    1.49    0.15  1.33  20.24  n/a   0.000
*
================================================================================
========================


       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   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\6
d7d4d07-45f6-4fa2-968c-bc30e92634e7\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\6
d7d4d07-45f6-4fa2-968c-bc30e92634e7\s

DATE: 03-02-2022                          TIME: 10:38:07

USER:


COMMENTS: _____________________________________________________________


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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    CHIC STORM                10.0
    [ Ptot= 48.83 mm ]
*
 *  CALIB STANDHYD       0201  1  5.0    0.13    0.02  1.33  22.31 0.46   0.000
    [I%= 0.1:S%= 5.00]
*
    CHIC STORM                10.0
    [ Ptot= 48.83 mm ]
*
 *  CALIB STANDHYD       0303  1  5.0    0.19    0.03  1.33  24.43 0.50   0.000
    [I%= 0.1:S%= 8.00]
*
    ADD [  0201+  0303]  0903  3  5.0    0.32    0.05  1.33  23.57  n/a   0.000
*
    CHIC STORM                10.0
    [ Ptot= 48.83 mm ]
*
 *  CALIB STANDHYD       0202  1  5.0    0.35    0.05  1.33  21.69 0.44   0.000
    [I%=20.0:S%= 5.00]
*
    CHIC STORM                10.0
    [ Ptot= 48.83 mm ]
*
 *  CALIB STANDHYD       0304  1  5.0    0.37    0.03  1.42  20.91 0.43   0.000
    [I%= 0.1:S%= 2.00]
*
    CHIC STORM                10.0
    [ Ptot= 48.83 mm ]
*
 *  CALIB STANDHYD       0203  1  5.0    0.08    0.02  1.33  32.39 0.66   0.000
    [I%=38.0:S%= 2.00]
*
    CHIC STORM                10.0
```

```
    [ Ptot= 48.83 mm ]
*
 *  CALIB STANDHYD       0204  1  5.0    0.24    0.05  1.33  31.17 0.64   0.000
    [I%=36.0:S%= 2.00]
*
    CHIC STORM                10.0
    [ Ptot= 48.83 mm ]
*
 *  CALIB STANDHYD       0205  1  5.0    0.23    0.05  1.33  31.05 0.64   0.000
    [I%=37.0:S%= 2.00]
*
    ADD [  0203+  0204]  0904  3  5.0    0.32    0.07  1.33  31.48  n/a   0.000
*
    ADD [  0904+  0205]  0904  1  5.0    0.55    0.11  1.33  31.30  n/a   0.000
*
    CHIC STORM                10.0
    [ Ptot= 48.83 mm ]
*
 *  CALIB STANDHYD       0206  1  5.0    0.22    0.02  1.33  22.42 0.46   0.000
    [I%=21.0:S%= 1.00]
*
    ADD [  0202+  0206]  0905  3  5.0    0.57    0.07  1.33  21.97  n/a   0.000
*
    ADD [  0905+  0304]  0905  1  5.0    0.94    0.09  1.33  21.55  n/a   0.000
*
    ADD [  0905+  0904]  0905  3  5.0    1.49    0.20  1.33  25.15  n/a   0.000
*
================================================================================
========================


       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   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                 *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\5
1a9f27f-5faa-427e-8da3-cdf9c7bb6fdd\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\5
1a9f27f-5faa-427e-8da3-cdf9c7bb6fdd\s


DATE: 03-02-2022                          TIME: 10:38:07

USER:


COMMENTS: _____________________________________________________________


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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms


      START @  0.00 hrs
      --------------------
    CHIC STORM                10.0
    [ Ptot= 57.47 mm ]
*
 *  CALIB STANDHYD       0201  1  5.0    0.13    0.03  1.33  28.85 0.50   0.000
    [I%= 0.1:S%= 5.00]
*
    CHIC STORM                10.0
    [ Ptot= 57.47 mm ]
*
 *  CALIB STANDHYD       0303  1  5.0    0.19    0.04  1.33  31.30 0.54   0.000
    [I%= 0.1:S%= 8.00]
*
    ADD [  0201+  0303]  0903  3  5.0    0.32    0.06  1.33  30.30  n/a   0.000
*
    CHIC STORM                10.0
    [ Ptot= 57.47 mm ]
*
 *  CALIB STANDHYD       0202  1  5.0    0.35    0.06  1.33  27.59 0.48   0.000
    [I%=20.0:S%= 5.00]
*
    CHIC STORM                10.0
    [ Ptot= 57.47 mm ]
*
 *  CALIB STANDHYD       0304  1  5.0    0.37    0.04  1.42  27.21 0.47   0.000
```

```
    [I%= 0.1:S%= 2.00]
*
    CHIC STORM                10.0
    [ Ptot= 57.47 mm ]
*
 *  CALIB STANDHYD       0203  1  5.0    0.08    0.02  1.33  39.85 0.69   0.000
    [I%=38.0:S%= 2.00]
*
    CHIC STORM                10.0
    [ Ptot= 57.47 mm ]
*
 *  CALIB STANDHYD       0204  1  5.0    0.24    0.06  1.33  38.48 0.67   0.000
    [I%=36.0:S%= 2.00]
*
    CHIC STORM                10.0
    [ Ptot= 57.47 mm ]
*
 *  CALIB STANDHYD       0205  1  5.0    0.23    0.06  1.33  38.31 0.67   0.000
    [I%=37.0:S%= 2.00]
*
    ADD [  0203+  0204]  0904  3  5.0    0.32    0.08  1.33  38.82  n/a   0.000
*
    ADD [  0904+  0205]  0904  1  5.0    0.55    0.14  1.33  38.61  n/a   0.000
*
    CHIC STORM                10.0
    [ Ptot= 57.47 mm ]
*
 *  CALIB STANDHYD       0206  1  5.0    0.22    0.03  1.33  28.45 0.50   0.000
    [I%=21.0:S%= 1.00]
*
    ADD [  0202+  0206]  0905  3  5.0    0.57    0.09  1.33  27.92  n/a   0.000
*
    ADD [  0905+  0304]  0905  1  5.0    0.94    0.12  1.33  27.64  n/a   0.000
*
    ADD [  0905+  0904]  0905  3  5.0    1.49    0.26  1.33  31.69  n/a   0.000
*
================================================================================
========================


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

```
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                  *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\1
c4a4383-2080-417c-be37-f2d1cd5be59d\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\1
c4a4383-2080-417c-be37-f2d1cd5be59d\s


DATE: 03-02-2022                          TIME: 10:38:07

USER:


COMMENTS: _____________________________________________________________


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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    CHIC STORM                10.0
    [ Ptot= 63.99 mm ]
*
 *  CALIB STANDHYD       0201  1  5.0    0.13    0.03  1.33  34.00 0.53   0.000
    [I%= 0.1:S%= 5.00]
*
    CHIC STORM                10.0
    [ Ptot= 63.99 mm ]
*
 *  CALIB STANDHYD       0303  1  5.0    0.19    0.05  1.33  36.68 0.57   0.000
    [I%= 0.1:S%= 8.00]
*
    ADD [  0201+  0303]  0903  3  5.0    0.32    0.08  1.33  35.59  n/a   0.000
*
    CHIC STORM                10.0
```

```
    [ Ptot= 63.99 mm ]
*
 *  CALIB STANDHYD       0202  1  5.0    0.35    0.07  1.33  32.26 0.50   0.000
    [I%=20.0:S%= 5.00]
*
    CHIC STORM                10.0
    [ Ptot= 63.99 mm ]
*
 *  CALIB STANDHYD       0304  1  5.0    0.37    0.05  1.42  32.19 0.50   0.000
    [I%= 0.1:S%= 2.00]
*
    CHIC STORM                10.0
    [ Ptot= 63.99 mm ]
*
 *  CALIB STANDHYD       0203  1  5.0    0.08    0.02  1.33  45.61 0.71   0.000
    [I%=38.0:S%= 2.00]
*
    CHIC STORM                10.0
    [ Ptot= 63.99 mm ]
*
 *  CALIB STANDHYD       0204  1  5.0    0.24    0.07  1.33  44.13 0.69   0.000
    [I%=36.0:S%= 2.00]
*
    CHIC STORM                10.0
    [ Ptot= 63.99 mm ]
*
 *  CALIB STANDHYD       0205  1  5.0    0.23    0.07  1.33  43.92 0.69   0.000
    [I%=37.0:S%= 2.00]
*
    ADD [  0203+  0204]  0904  3  5.0    0.32    0.09  1.33  44.50  n/a   0.000
*
    ADD [  0904+  0205]  0904  1  5.0    0.55    0.16  1.33  44.26  n/a   0.000
*
    CHIC STORM                10.0
    [ Ptot= 63.99 mm ]
*
 *  CALIB STANDHYD       0206  1  5.0    0.22    0.03  1.33  33.22 0.52   0.000
    [I%=21.0:S%= 1.00]
*
    ADD [  0202+  0206]  0905  3  5.0    0.57    0.10  1.33  32.63  n/a   0.000
*
    ADD [  0905+  0304]  0905  1  5.0    0.94    0.15  1.33  32.46  n/a   0.000
*
    ADD [  0905+  0904]  0905  3  5.0    1.49    0.31  1.33  36.81  n/a   0.000
*
================================================================================
========================


       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   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\e
baf9cc5-fbfb-427f-95be-3a80e426bc8e\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\e
baf9cc5-fbfb-427f-95be-3a80e426bc8e\s


DATE: 03-02-2022                          TIME: 10:38:07

USER:


COMMENTS: _____________________________________________________________


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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha    '  cms   hrs     mm          cms


      START @  0.00 hrs
      --------------------
    CHIC STORM                10.0
    [ Ptot= 70.36 mm ]
*
 *  CALIB STANDHYD       0201  1  5.0    0.13    0.04  1.33  39.18 0.56   0.000
    [I%= 0.1:S%= 5.00]
*
```

```
    CHIC STORM                10.0
    [ Ptot= 70.36 mm ]
*
 *  CALIB STANDHYD       0303  1  5.0    0.19    0.05  1.33  42.07 0.60   0.000
    [I%= 0.1:S%= 8.00]
*
    ADD [  0201+  0303]  0903  3  5.0    0.32    0.09  1.33  40.89  n/a   0.000
*
    CHIC STORM                10.0
    [ Ptot= 70.36 mm ]
*
 *  CALIB STANDHYD       0202  1  5.0    0.35    0.08  1.33  36.98 0.53   0.000
    [I%=20.0:S%= 5.00]
*
    CHIC STORM                10.0
    [ Ptot= 70.36 mm ]
*
 *  CALIB STANDHYD       0304  1  5.0    0.37    0.06  1.42  37.22 0.53   0.000
    [I%= 0.1:S%= 2.00]
*
    CHIC STORM                10.0
    [ Ptot= 70.36 mm ]
*
 *  CALIB STANDHYD       0203  1  5.0    0.08    0.03  1.33  51.32 0.73   0.000
    [I%=38.0:S%= 2.00]
*
    CHIC STORM                10.0
    [ Ptot= 70.36 mm ]
*
 *  CALIB STANDHYD       0204  1  5.0    0.24    0.08  1.33  49.74 0.71   0.000
    [I%=36.0:S%= 2.00]
*
    CHIC STORM                10.0
    [ Ptot= 70.36 mm ]
*
 *  CALIB STANDHYD       0205  1  5.0    0.23    0.08  1.33  49.51 0.70   0.000
    [I%=37.0:S%= 2.00]
*
    ADD [  0203+  0204]  0904  3  5.0    0.32    0.11  1.33  50.13  n/a   0.000
*
    ADD [  0904+  0205]  0904  1  5.0    0.55    0.18  1.33  49.87  n/a   0.000
*
    CHIC STORM                10.0
    [ Ptot= 70.36 mm ]
*
 *  CALIB STANDHYD       0206  1  5.0    0.22    0.04  1.33  38.01 0.54   0.000
    [I%=21.0:S%= 1.00]
*
    ADD [  0202+  0206]  0905  3  5.0    0.57    0.12  1.33  37.38  n/a   0.000
*
    ADD [  0905+  0304]  0905  1  5.0    0.94    0.17  1.33  37.31  n/a   0.000
*
    ADD [  0905+  0904]  0905  3  5.0    1.49    0.35  1.33  41.95  n/a   0.000
*
 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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\6
1ebd1a0-8a38-420b-a6fa-4a258a24c646\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\6
1ebd1a0-8a38-420b-a6fa-4a258a24c646\s


DATE: 03-02-2022                          TIME: 10:38:07

USER:


COMMENTS: _____________________________________________________________


  ***********************************************
```

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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '   cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                15.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\5e6e8290-7bdd-4318-b5c5-90b13f76e1e5\3c4d485
d-67dd-472e-beb1-
    remark: TIMMINS

*
 *  CALIB STANDHYD       0201  1  5.0    0.13    0.01  7.00 151.22 0.78   0.000
    [I%= 0.1:S%= 5.00]
*
    READ STORM                15.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\5e6e8290-7bdd-4318-b5c5-90b13f76e1e5\3c4d485
d-67dd-472e-beb1-
    remark: TIMMINS

*
 *  CALIB STANDHYD       0303  1  5.0    0.19    0.02  7.00 156.27 0.81   0.000
    [I%= 0.1:S%= 8.00]
*
    ADD [  0201+  0303]  0903  3  5.0    0.32    0.04  7.00 154.22  n/a   0.000
*
    READ STORM                15.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\5e6e8290-7bdd-4318-b5c5-90b13f76e1e5\3c4d485
d-67dd-472e-beb1-
    remark: TIMMINS

*
 *  CALIB STANDHYD       0202  1  5.0    0.35    0.04  7.00 142.97 0.74   0.000
    [I%=20.0:S%= 5.00]
*
    READ STORM                15.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\5e6e8290-7bdd-4318-b5c5-90b13f76e1e5\3c4d485
d-67dd-472e-beb1-
    remark: TIMMINS

*
 *  CALIB STANDHYD       0304  1  5.0    0.37    0.04  7.00 147.63 0.76   0.000
    [I%= 0.1:S%= 2.00]
*
    READ STORM                15.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\5e6e8290-7bdd-4318-b5c5-90b13f76e1e5\3c4d485
d-67dd-472e-beb1-
    remark: TIMMINS

*
 *  CALIB STANDHYD       0203  1  5.0    0.08    0.01  7.00 168.25 0.87   0.000
    [I%=38.0:S%= 2.00]
*
    READ STORM                15.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\5e6e8290-7bdd-4318-b5c5-90b13f76e1e5\3c4d485
d-67dd-472e-beb1-
    remark: TIMMINS

*
 *  CALIB STANDHYD       0204  1  5.0    0.24    0.03  7.00 165.66 0.86   0.000
    [I%=36.0:S%= 2.00]
*
    READ STORM                15.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\5e6e8290-7bdd-4318-b5c5-90b13f76e1e5\3c4d485
d-67dd-472e-beb1-
    remark: TIMMINS

*
 *  CALIB STANDHYD       0205  1  5.0    0.23    0.03  7.00 165.11 0.86   0.000
    [I%=37.0:S%= 2.00]
*
    ADD [  0203+  0204]  0904  3  5.0    0.32    0.04  7.00 166.31  n/a   0.000
*
    ADD [  0904+  0205]  0904  1  5.0    0.55    0.06  7.00 165.81  n/a   0.000
*
    READ STORM                15.0
    [ Ptot=193.00 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\5e6e8290-7bdd-4318-b5c5-90b13f76e1e5\3c4d485
d-67dd-472e-beb1-
    remark: TIMMINS

*
 *  CALIB STANDHYD       0206  1  5.0    0.22    0.02  7.00 145.04 0.75   0.000
```

```
    [I%=21.0:S%= 1.00]
*
    ADD [  0202+  0206]  0905  3  5.0    0.57    0.06  7.00 143.77  n/a   0.000
*
    ADD [  0905+  0304]  0905  1  5.0    0.94    0.10  7.00 145.29  n/a   0.000
*
    ADD [  0905+  0904]  0905  3  5.0    1.49    0.16  7.00 152.86  n/a   0.000
*
```

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

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	0.87	12.250	66.59	18.33	0.98
0.167	0.00	6.250	0.87	12.333	7.84	18.42	0.98
0.250	0.00	6.333	0.98	12.417	7.83	18.50	0.98
0.333	0.60	6.417	0.98	12.500	7.83	18.58	0.98
0.417	0.60	6.500	0.98	12.583	7.83	18.67	0.98
0.500	0.60	6.583	0.98	12.667	7.83	18.75	0.98
0.583	0.60	6.667	0.98	12.750	7.83	18.83	0.98
0.667	0.60	6.750	0.98	12.833	4.03	18.92	0.98
0.750	0.60	6.833	0.98	12.917	4.03	19.00	0.98
0.833	0.60	6.917	0.98	13.000	4.03	19.08	0.98
0.917	0.60	7.000	0.98	13.083	4.03	19.17	0.98
1.000	0.60	7.083	0.98	13.167	4.03	19.25	0.98
1.083	0.60	7.167	0.98	13.250	4.03	19.33	0.98
1.167	0.60	7.250	0.98	13.333	2.94	19.42	0.98
1.250	0.60	7.333	1.20	13.417	2.94	19.50	0.98
1.333	0.60	7.417	1.20	13.500	2.94	19.58	0.98
1.417	0.60	7.500	1.20	13.583	2.94	19.67	0.98
1.500	0.60	7.583	1.20	13.667	2.94	19.75	0.98
1.583	0.60	7.667	1.20	13.750	2.94	19.83	0.98
1.667	0.60	7.750	1.20	13.833	2.28	19.92	0.98
1.750	0.60	7.833	1.20	13.917	2.28	20.00	0.98
1.833	0.60	7.917	1.20	14.000	2.28	20.08	0.98
1.917	0.60	8.000	1.20	14.083	2.28	20.17	0.98
2.000	0.60	8.083	1.20	14.167	2.28	20.25	0.98
2.083	0.60	8.167	1.20	14.250	2.28	20.33	0.65
2.167	0.60	8.250	1.20	14.333	1.63	20.42	0.65
2.250	0.60	8.333	1.41	14.417	1.63	20.50	0.65
2.333	0.71	8.417	1.41	14.500	1.63	20.58	0.65
2.417	0.71	8.500	1.41	14.583	1.63	20.67	0.65

2.500	0.71	8.583	1.41	14.667	1.63	20.75	0.65
2.583	0.71	8.667	1.41	14.750	1.63	20.83	0.65
2.667	0.71	8.750	1.41	14.833	1.63	20.92	0.65
2.750	0.71	8.833	1.52	14.917	1.63	21.00	0.65
2.833	0.71	8.917	1.52	15.000	1.63	21.08	0.65
2.917	0.71	9.000	1.52	15.083	1.63	21.17	0.65
3.000	0.71	9.083	1.52	15.167	1.63	21.25	0.65
3.083	0.71	9.167	1.52	15.250	1.63	21.33	0.65
3.167	0.71	9.250	1.52	15.333	1.63	21.42	0.65
3.250	0.71	9.333	1.74	15.417	1.63	21.50	0.65
3.333	0.71	9.417	1.74	15.500	1.63	21.58	0.65
3.417	0.71	9.500	1.74	15.583	1.63	21.67	0.65
3.500	0.71	9.583	1.74	15.667	1.63	21.75	0.65
3.583	0.71	9.667	1.74	15.750	1.63	21.83	0.65
3.667	0.71	9.750	1.74	15.833	1.63	21.92	0.65
3.750	0.71	9.833	1.96	15.917	1.63	22.00	0.65
3.833	0.71	9.917	1.96	16.000	1.63	22.08	0.65
3.917	0.71	10.000	1.96	16.083	1.63	22.17	0.65
4.000	0.71	10.083	1.96	16.167	1.63	22.25	0.65
4.083	0.71	10.167	1.96	16.250	1.63	22.33	0.65
4.167	0.71	10.250	1.96	16.333	0.98	22.42	0.65
4.250	0.71	10.333	2.50	16.417	0.98	22.50	0.65
4.333	0.87	10.417	2.50	16.500	0.98	22.58	0.65
4.417	0.87	10.500	2.50	16.583	0.98	22.67	0.65
4.500	0.87	10.583	2.50	16.667	0.98	22.75	0.65
4.583	0.87	10.667	2.50	16.750	0.98	22.83	0.65
4.667	0.87	10.750	2.50	16.833	0.98	22.92	0.65
4.750	0.87	10.833	3.37	16.917	0.98	23.00	0.65
4.833	0.87	10.917	3.37	17.000	0.98	23.08	0.65
4.917	0.87	11.000	3.37	17.083	0.98	23.17	0.65
5.000	0.87	11.083	3.37	17.167	0.98	23.25	0.65
5.083	0.87	11.167	3.37	17.250	0.98	23.33	0.65
5.167	0.87	11.250	3.37	17.333	0.98	23.42	0.65
5.250	0.87	11.333	5.22	17.417	0.98	23.50	0.65
5.333	0.87	11.417	5.22	17.500	0.98	23.58	0.65
5.417	0.87	11.500	5.22	17.583	0.98	23.67	0.65
5.500	0.87	11.583	5.22	17.667	0.98	23.75	0.65
5.583	0.87	11.667	5.22	17.750	0.98	23.83	0.65
5.667	0.87	11.750	5.22	17.833	0.98	23.92	0.65
5.750	0.87	11.833	16.10	17.917	0.98	24.00	0.65
5.833	0.87	11.917	16.10	18.000	0.98	24.08	0.65
5.917	0.87	12.000	16.10	18.083	0.98	24.17	0.65
6.000	0.87	12.083	66.58	18.167	0.98	24.25	0.65
6.083	0.87	12.167	66.59	18.250	0.98		

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.

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

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

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.15	12.250	88.25	18.33	1.30
0.167	0.00	6.250	1.15	12.333	10.39	18.42	1.30
0.250	0.00	6.333	1.30	12.417	10.38	18.50	1.30
0.333	0.79	6.417	1.30	12.500	10.38	18.58	1.30
0.417	0.79	6.500	1.30	12.583	10.38	18.67	1.30
0.500	0.79	6.583	1.30	12.667	10.38	18.75	1.30
0.583	0.79	6.667	1.30	12.750	10.38	18.83	1.30
0.667	0.79	6.750	1.30	12.833	5.34	18.92	1.30
0.750	0.79	6.833	1.30	12.917	5.34	19.00	1.30
0.833	0.79	6.917	1.30	13.000	5.34	19.08	1.30
0.917	0.79	7.000	1.30	13.083	5.34	19.17	1.30

1.000	0.79	7.083	1.30	13.167	5.34	19.25	1.30
1.083	0.79	7.167	1.30	13.250	5.34	19.33	1.30
1.167	0.79	7.250	1.30	13.333	3.89	19.42	1.30
1.250	0.79	7.333	1.59	13.417	3.89	19.50	1.30
1.333	0.79	7.417	1.59	13.500	3.89	19.58	1.30
1.417	0.79	7.500	1.59	13.583	3.89	19.67	1.30
1.500	0.79	7.583	1.59	13.667	3.89	19.75	1.30
1.583	0.79	7.667	1.59	13.750	3.89	19.83	1.30
1.667	0.79	7.750	1.59	13.833	3.03	19.92	1.30
1.750	0.79	7.833	1.59	13.917	3.03	20.00	1.30
1.833	0.79	7.917	1.59	14.000	3.03	20.08	1.30
1.917	0.79	8.000	1.59	14.083	3.03	20.17	1.30
2.000	0.79	8.083	1.59	14.167	3.03	20.25	1.30
2.083	0.79	8.167	1.59	14.250	3.03	20.33	0.87
2.167	0.79	8.250	1.59	14.333	2.16	20.42	0.87
2.250	0.79	8.333	1.87	14.417	2.16	20.50	0.87
2.333	0.94	8.417	1.87	14.500	2.16	20.58	0.87
2.417	0.94	8.500	1.87	14.583	2.16	20.67	0.87
2.500	0.94	8.583	1.87	14.667	2.16	20.75	0.87
2.583	0.94	8.667	1.87	14.750	2.16	20.83	0.87
2.667	0.94	8.750	1.87	14.833	2.16	20.92	0.87
2.750	0.94	8.833	2.02	14.917	2.16	21.00	0.87
2.833	0.94	8.917	2.02	15.000	2.16	21.08	0.87
2.917	0.94	9.000	2.02	15.083	2.16	21.17	0.87
3.000	0.94	9.083	2.02	15.167	2.16	21.25	0.87
3.083	0.94	9.167	2.02	15.250	2.16	21.33	0.87
3.167	0.94	9.250	2.02	15.333	2.16	21.42	0.87
3.250	0.94	9.333	2.31	15.417	2.16	21.50	0.87
3.333	0.94	9.417	2.31	15.500	2.16	21.58	0.87
3.417	0.94	9.500	2.31	15.583	2.16	21.67	0.87
3.500	0.94	9.583	2.31	15.667	2.16	21.75	0.87
3.583	0.94	9.667	2.31	15.750	2.16	21.83	0.87
3.667	0.94	9.750	2.31	15.833	2.16	21.92	0.87
3.750	0.94	9.833	2.60	15.917	2.16	22.00	0.87
3.833	0.94	9.917	2.60	16.000	2.16	22.08	0.87
3.917	0.94	10.000	2.60	16.083	2.16	22.17	0.87
4.000	0.94	10.083	2.60	16.167	2.16	22.25	0.87
4.083	0.94	10.167	2.60	16.250	2.16	22.33	0.87
4.167	0.94	10.250	2.60	16.333	1.30	22.42	0.87
4.250	0.94	10.333	3.32	16.417	1.30	22.50	0.87
4.333	1.15	10.417	3.32	16.500	1.30	22.58	0.87
4.417	1.15	10.500	3.32	16.583	1.30	22.67	0.87
4.500	1.15	10.583	3.32	16.667	1.30	22.75	0.87
4.583	1.15	10.667	3.32	16.750	1.30	22.83	0.87
4.667	1.15	10.750	3.32	16.833	1.30	22.92	0.87
4.750	1.15	10.833	4.47	16.917	1.30	23.00	0.87
4.833	1.15	10.917	4.47	17.000	1.30	23.08	0.87
4.917	1.15	11.000	4.47	17.083	1.30	23.17	0.87
5.000	1.15	11.083	4.47	17.167	1.30	23.25	0.87
5.083	1.15	11.167	4.47	17.250	1.30	23.33	0.87
5.167	1.15	11.250	4.47	17.333	1.30	23.42	0.87
5.250	1.15	11.333	6.92	17.417	1.30	23.50	0.87
5.333	1.15	11.417	6.92	17.500	1.30	23.58	0.87
5.417	1.15	11.500	6.92	17.583	1.30	23.67	0.87
5.500	1.15	11.583	6.92	17.667	1.30	23.75	0.87
5.583	1.15	11.667	6.92	17.750	1.30	23.83	0.87
5.667	1.15	11.750	6.92	17.833	1.30	23.92	0.87
5.750	1.15	11.833	21.34	17.917	1.30	24.00	0.87
5.833	1.15	11.917	21.34	18.000	1.30	24.08	0.87
5.917	1.15	12.000	21.34	18.083	1.30	24.17	0.87
6.000	1.15	12.083	88.24	18.167	1.30	24.25	0.86
6.083	1.15	12.167	88.25	18.250	1.30		

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		
			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.

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

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

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.34	12.250	102.58	18.33	1.51
0.167	0.00	6.250	1.34	12.333	12.08	18.42	1.51
0.250	0.00	6.333	1.51	12.417	12.07	18.50	1.51
0.333	0.92	6.417	1.51	12.500	12.07	18.58	1.51
0.417	0.92	6.500	1.51	12.583	12.07	18.67	1.51
0.500	0.92	6.583	1.51	12.667	12.07	18.75	1.51
0.583	0.92	6.667	1.51	12.750	12.07	18.83	1.51
0.667	0.92	6.750	1.51	12.833	6.20	18.92	1.51
0.750	0.92	6.833	1.51	12.917	6.20	19.00	1.51
0.833	0.92	6.917	1.51	13.000	6.20	19.08	1.51
0.917	0.92	7.000	1.51	13.083	6.20	19.17	1.51
1.000	0.92	7.083	1.51	13.167	6.20	19.25	1.51
1.083	0.92	7.167	1.51	13.250	6.20	19.33	1.51
1.167	0.92	7.250	1.51	13.333	4.53	19.42	1.51
1.250	0.92	7.333	1.84	13.417	4.53	19.50	1.51
1.333	0.92	7.417	1.84	13.500	4.53	19.58	1.51
1.417	0.92	7.500	1.84	13.583	4.53	19.67	1.51
1.500	0.92	7.583	1.84	13.667	4.53	19.75	1.51
1.583	0.92	7.667	1.84	13.750	4.53	19.83	1.51
1.667	0.92	7.750	1.84	13.833	3.52	19.92	1.51
1.750	0.92	7.833	1.84	13.917	3.52	20.00	1.51
1.833	0.92	7.917	1.84	14.000	3.52	20.08	1.51
1.917	0.92	8.000	1.84	14.083	3.52	20.17	1.51
2.000	0.92	8.083	1.84	14.167	3.52	20.25	1.51
2.083	0.92	8.167	1.84	14.250	3.52	20.33	1.01
2.167	0.92	8.250	1.84	14.333	2.51	20.42	1.01
2.250	0.92	8.333	2.18	14.417	2.51	20.50	1.01
2.333	1.09	8.417	2.18	14.500	2.51	20.58	1.01
2.417	1.09	8.500	2.18	14.583	2.51	20.67	1.01
2.500	1.09	8.583	2.18	14.667	2.51	20.75	1.01
2.583	1.09	8.667	2.18	14.750	2.51	20.83	1.01
2.667	1.09	8.750	2.18	14.833	2.51	20.92	1.01
2.750	1.09	8.833	2.35	14.917	2.51	21.00	1.01
2.833	1.09	8.917	2.35	15.000	2.51	21.08	1.01
2.917	1.09	9.000	2.35	15.083	2.51	21.17	1.01
3.000	1.09	9.083	2.35	15.167	2.51	21.25	1.01
3.083	1.09	9.167	2.35	15.250	2.51	21.33	1.01
3.167	1.09	9.250	2.35	15.333	2.51	21.42	1.01
3.250	1.09	9.333	2.68	15.417	2.51	21.50	1.01
3.333	1.09	9.417	2.68	15.500	2.51	21.58	1.01
3.417	1.09	9.500	2.68	15.583	2.51	21.67	1.01
3.500	1.09	9.583	2.68	15.667	2.51	21.75	1.01
3.583	1.09	9.667	2.68	15.750	2.51	21.83	1.01
3.667	1.09	9.750	2.68	15.833	2.51	21.92	1.01
3.750	1.09	9.833	3.02	15.917	2.51	22.00	1.01
3.833	1.09	9.917	3.02	16.000	2.51	22.08	1.01
3.917	1.09	10.000	3.02	16.083	2.51	22.17	1.01
4.000	1.09	10.083	3.02	16.167	2.51	22.25	1.01
4.083	1.09	10.167	3.02	16.250	2.51	22.33	1.01
4.167	1.09	10.250	3.02	16.333	1.51	22.42	1.01
4.250	1.09	10.333	3.86	16.417	1.51	22.50	1.01
4.333	1.34	10.417	3.86	16.500	1.51	22.58	1.01
4.417	1.34	10.500	3.86	16.583	1.51	22.67	1.01
4.500	1.34	10.583	3.86	16.667	1.51	22.75	1.01
4.583	1.34	10.667	3.86	16.750	1.51	22.83	1.01
4.667	1.34	10.750	3.86	16.833	1.51	22.92	1.01
4.750	1.34	10.833	5.20	16.917	1.51	23.00	1.01
4.833	1.34	10.917	5.20	17.000	1.51	23.08	1.01
4.917	1.34	11.000	5.20	17.083	1.51	23.17	1.01
5.000	1.34	11.083	5.20	17.167	1.51	23.25	1.01
5.083	1.34	11.167	5.20	17.250	1.51	23.33	1.01
5.167	1.34	11.250	5.20	17.333	1.51	23.42	1.01
5.250	1.34	11.333	8.05	17.417	1.51	23.50	1.01
5.333	1.34	11.417	8.05	17.500	1.51	23.58	1.01
5.417	1.34	11.500	8.05	17.583	1.51	23.67	1.01
5.500	1.34	11.583	8.05	17.667	1.51	23.75	1.01
5.583	1.34	11.667	8.05	17.750	1.51	23.83	1.01
5.667	1.34	11.750	8.05	17.833	1.51	23.92	1.01
5.750	1.34	11.833	24.81	17.917	1.51	24.00	1.01
5.833	1.34	11.917	24.81	18.000	1.51	24.08	1.01
5.917	1.34	12.000	24.81	18.083	1.51	24.17	1.01
6.000	1.34	12.083	102.57	18.167	1.51	24.25	1.01
6.083	1.34	12.167	102.58	18.250	1.51		

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.

****
** SIMULATION:(4) 25 Year Design Storm - SCS **
****

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

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.58	12.250	120.75	18.33	1.78
0.167	0.00	6.250	1.58	12.333	14.22	18.42	1.78
0.250	0.00	6.333	1.78	12.417	14.21	18.50	1.78
0.333	1.09	6.417	1.78	12.500	14.21	18.58	1.78
0.417	1.09	6.500	1.78	12.583	14.21	18.67	1.78
0.500	1.09	6.583	1.78	12.667	14.21	18.75	1.78
0.583	1.09	6.667	1.78	12.750	14.21	18.83	1.78
0.667	1.09	6.750	1.78	12.833	7.30	18.92	1.78
0.750	1.09	6.833	1.78	12.917	7.30	19.00	1.78
0.833	1.09	6.917	1.78	13.000	7.30	19.08	1.78
0.917	1.09	7.000	1.78	13.083	7.30	19.17	1.78
1.000	1.09	7.083	1.78	13.167	7.30	19.25	1.78
1.083	1.09	7.167	1.78	13.250	7.30	19.33	1.78
1.167	1.09	7.250	1.78	13.333	5.33	19.42	1.78
1.250	1.09	7.333	2.17	13.417	5.33	19.50	1.78
1.333	1.09	7.417	2.17	13.500	5.33	19.58	1.78
1.417	1.09	7.500	2.17	13.583	5.33	19.67	1.78
1.500	1.09	7.583	2.17	13.667	5.33	19.75	1.78
1.583	1.09	7.667	2.17	13.750	5.33	19.83	1.78
1.667	1.09	7.750	2.17	13.833	4.14	19.92	1.78
1.750	1.09	7.833	2.17	13.917	4.14	20.00	1.78
1.833	1.09	7.917	2.17	14.000	4.14	20.08	1.78
1.917	1.09	8.000	2.17	14.083	4.14	20.17	1.78
2.000	1.09	8.083	2.17	14.167	4.14	20.25	1.78
2.083	1.09	8.167	2.17	14.250	4.14	20.33	1.18
2.167	1.09	8.250	2.17	14.333	2.96	20.42	1.18
2.250	1.09	8.333	2.56	14.417	2.96	20.50	1.18
2.333	1.28	8.417	2.56	14.500	2.96	20.58	1.18
2.417	1.28	8.500	2.56	14.583	2.96	20.67	1.18
2.500	1.28	8.583	2.56	14.667	2.96	20.75	1.18
2.583	1.28	8.667	2.56	14.750	2.96	20.83	1.18
2.667	1.28	8.750	2.56	14.833	2.96	20.92	1.18
2.750	1.28	8.833	2.76	14.917	2.96	21.00	1.18
2.833	1.28	8.917	2.76	15.000	2.96	21.08	1.18
2.917	1.28	9.000	2.76	15.083	2.96	21.17	1.18
3.000	1.28	9.083	2.76	15.167	2.96	21.25	1.18
3.083	1.28	9.167	2.76	15.250	2.96	21.33	1.18
3.167	1.28	9.250	2.76	15.333	2.96	21.42	1.18
3.250	1.28	9.333	3.16	15.417	2.96	21.50	1.18
3.333	1.28	9.417	3.16	15.500	2.96	21.58	1.18
3.417	1.28	9.500	3.16	15.583	2.96	21.67	1.18
3.500	1.28	9.583	3.16	15.667	2.96	21.75	1.18
3.583	1.28	9.667	3.16	15.750	2.96	21.83	1.18
3.667	1.28	9.750	3.16	15.833	2.96	21.92	1.18
3.750	1.28	9.833	3.55	15.917	2.96	22.00	1.18
3.833	1.28	9.917	3.55	16.000	2.96	22.08	1.18
3.917	1.28	10.000	3.55	16.083	2.96	22.17	1.18
4.000	1.28	10.083	3.55	16.167	2.96	22.25	1.18
4.083	1.28	10.167	3.55	16.250	2.96	22.33	1.18
4.167	1.28	10.250	3.55	16.333	1.78	22.42	1.18
4.250	1.28	10.333	4.54	16.417	1.78	22.50	1.18
4.333	1.58	10.417	4.54	16.500	1.78	22.58	1.18
4.417	1.58	10.500	4.54	16.583	1.78	22.67	1.18
4.500	1.58	10.583	4.54	16.667	1.78	22.75	1.18
4.583	1.58	10.667	4.54	16.750	1.78	22.83	1.18
4.667	1.58	10.750	4.54	16.833	1.78	22.92	1.18
4.750	1.58	10.833	6.12	16.917	1.78	23.00	1.18
4.833	1.58	10.917	6.12	17.000	1.78	23.08	1.18
4.917	1.58	11.000	6.12	17.083	1.78	23.17	1.18
5.000	1.58	11.083	6.12	17.167	1.78	23.25	1.18
5.083	1.58	11.167	6.12	17.250	1.78	23.33	1.18
5.167	1.58	11.250	6.12	17.333	1.78	23.42	1.18
5.250	1.58	11.333	9.47	17.417	1.78	23.50	1.18
5.333	1.58	11.417	9.47	17.500	1.78	23.58	1.18
5.417	1.58	11.500	9.47	17.583	1.78	23.67	1.18
5.500	1.58	11.583	9.47	17.667	1.78	23.75	1.18
5.583	1.58	11.667	9.47	17.750	1.78	23.83	1.18
5.667	1.58	11.750	9.47	17.833	1.78	23.92	1.18
5.750	1.58	11.833	29.20	17.917	1.78	24.00	1.18
5.833	1.58	11.917	29.20	18.000	1.78	24.08	1.18
5.917	1.58	12.000	29.20	18.083	1.78	24.17	1.18
6.000	1.58	12.083	120.74	18.167	1.78	24.25	1.18
6.083	1.58	12.167	120.75	18.250	1.78		

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.

--------------------------------------------------------------------------------
**********************************************
** SIMULATION:(5) 50 Year Design Storm - SCS **
**********************************************
--------------------
| 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

         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    0.00 | 6.167    1.76 |12.250  134.44 | 18.33    1.98
              0.167    0.00 | 6.250    1.76 |12.333   15.83 | 18.42    1.98
              0.250    0.00 | 6.333    1.98 |12.417   15.82 | 18.50    1.98
              0.333    1.21 | 6.417    1.98 |12.500   15.82 | 18.58    1.98
              0.417    1.21 | 6.500    1.98 |12.583   15.82 | 18.67    1.98
              0.500    1.21 | 6.583    1.98 |12.667   15.82 | 18.75    1.98
              0.583    1.21 | 6.667    1.98 |12.750   15.82 | 18.83    1.98
              0.667    1.21 | 6.750    1.98 |12.833    8.13 | 18.92    1.98
              0.750    1.21 | 6.833    1.98 |12.917    8.13 | 19.00    1.98
              0.833    1.21 | 6.917    1.98 |13.000    8.13 | 19.08    1.98
              0.917    1.21 | 7.000    1.98 |13.083    8.13 | 19.17    1.98
              1.000    1.21 | 7.083    1.98 |13.167    8.13 | 19.25    1.98
              1.083    1.21 | 7.167    1.98 |13.250    8.13 | 19.33    1.98
              1.167    1.21 | 7.250    1.98 |13.333    5.93 | 19.42    1.98
              1.250    1.21 | 7.333    2.42 |13.417    5.93 | 19.50    1.98
              1.333    1.21 | 7.417    2.42 |13.500    5.93 | 19.58    1.98
              1.417    1.21 | 7.500    2.42 |13.583    5.93 | 19.67    1.98
              1.500    1.21 | 7.583    2.42 |13.667    5.93 | 19.75    1.98
              1.583    1.21 | 7.667    2.42 |13.750    5.93 | 19.83    1.98
              1.667    1.21 | 7.750    2.42 |13.833    4.61 | 19.92    1.98
              1.750    1.21 | 7.833    2.42 |13.917    4.61 | 20.00    1.98
              1.833    1.21 | 7.917    2.42 |14.000    4.61 | 20.08    1.98
              1.917    1.21 | 8.000    2.42 |14.083    4.61 | 20.17    1.98
              2.000    1.21 | 8.083    2.42 |14.167    4.61 | 20.25    1.98
              2.083    1.21 | 8.167    2.42 |14.250    4.61 | 20.33    1.32
              2.167    1.21 | 8.250    2.42 |14.333    3.30 | 20.42    1.32
              2.250    1.21 | 8.333    2.86 |14.417    3.30 | 20.50    1.32
              2.333    1.43 | 8.417    2.86 |14.500    3.30 | 20.58    1.32
              2.417    1.43 | 8.500    2.86 |14.583    3.30 | 20.67    1.32
              2.500    1.43 | 8.583    2.86 |14.667    3.30 | 20.75    1.32
              2.583    1.43 | 8.667    2.86 |14.750    3.30 | 20.83    1.32
              2.667    1.43 | 8.750    2.86 |14.833    3.30 | 20.92    1.32
              2.750    1.43 | 8.833    3.08 |14.917    3.30 | 21.00    1.32
              2.833    1.43 | 8.917    3.08 |15.000    3.30 | 21.08    1.32
              2.917    1.43 | 9.000    3.08 |15.083    3.30 | 21.17    1.32
              3.000    1.43 | 9.083    3.08 |15.167    3.30 | 21.25    1.32
              3.083    1.43 | 9.167    3.08 |15.250    3.30 | 21.33    1.32
              3.167    1.43 | 9.250    3.08 |15.333    3.30 | 21.42    1.32
              3.250    1.43 | 9.333    3.51 |15.417    3.30 | 21.50    1.32
              3.333    1.43 | 9.417    3.51 |15.500    3.30 | 21.58    1.32
              3.417    1.43 | 9.500    3.51 |15.583    3.30 | 21.67    1.32
              3.500    1.43 | 9.583    3.51 |15.667    3.30 | 21.75    1.32
              3.583    1.43 | 9.667    3.51 |15.750    3.30 | 21.83    1.32
              3.667    1.43 | 9.750    3.51 |15.833    3.30 | 21.92    1.32
              3.750    1.43 | 9.833    3.95 |15.917    3.30 | 22.00    1.32
              3.833    1.43 | 9.917    3.95 |16.000    3.30 | 22.08    1.32
              3.917    1.43 |10.000    3.95 |16.083    3.30 | 22.17    1.32
              4.000    1.43 |10.083    3.95 |16.167    3.30 | 22.25    1.32
              4.083    1.43 |10.167    3.95 |16.250    3.30 | 22.33    1.32
              4.167    1.43 |10.250    3.95 |16.333    1.98 | 22.42    1.32
              4.250    1.43 |10.333    5.05 |16.417    1.98 | 22.50    1.32
              4.333    1.76 |10.417    5.05 |16.500    1.98 | 22.58    1.32
              4.417    1.76 |10.500    5.05 |16.583    1.98 | 22.67    1.32
              4.500    1.76 |10.583    5.05 |16.667    1.98 | 22.75    1.32
              4.583    1.76 |10.667    5.05 |16.750    1.98 | 22.83    1.32
              4.667    1.76 |10.750    5.05 |16.833    1.98 | 22.92    1.32
              4.750    1.76 |10.833    6.81 |16.917    1.98 | 23.00    1.32
```

4.833	1.76	10.917	6.81	17.000	1.98	23.08	1.32
4.917	1.76	11.000	6.81	17.083	1.98	23.17	1.32
5.000	1.76	11.083	6.81	17.167	1.98	23.25	1.32
5.083	1.76	11.167	6.81	17.250	1.98	23.33	1.32
5.167	1.76	11.250	6.81	17.333	1.98	23.42	1.32
5.250	1.76	11.333	10.54	17.417	1.98	23.50	1.32
5.333	1.76	11.417	10.54	17.500	1.98	23.58	1.32
5.417	1.76	11.500	10.54	17.583	1.98	23.67	1.32
5.500	1.76	11.583	10.54	17.667	1.98	23.75	1.32
5.583	1.76	11.667	10.54	17.750	1.98	23.83	1.32
5.667	1.76	11.750	10.54	17.833	1.98	23.92	1.32
5.750	1.76	11.833	32.51	17.917	1.98	24.00	1.32
5.833	1.76	11.917	32.51	18.000	1.98	24.08	1.32
5.917	1.76	12.000	32.51	18.083	1.98	24.17	1.32
6.000	1.76	12.083	134.43	18.167	1.98	24.25	1.32
6.083	1.76	12.167	134.44	18.250	1.98		

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	
			TOTALS
PEAK FLOW (cms)=	0.00	0.04	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.

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

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

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.93	12.250	147.82	18.33	2.17
0.167	0.00	6.250	1.93	12.333	17.41	18.42	2.17
0.250	0.00	6.333	2.17	12.417	17.39	18.50	2.17
0.333	1.33	6.417	2.17	12.500	17.39	18.58	2.17
0.417	1.33	6.500	2.17	12.583	17.39	18.67	2.17
0.500	1.33	6.583	2.17	12.667	17.39	18.75	2.17
0.583	1.33	6.667	2.17	12.750	17.39	18.83	2.17
0.667	1.33	6.750	2.17	12.833	8.94	18.92	2.17
0.750	1.33	6.833	2.17	12.917	8.94	19.00	2.17
0.833	1.33	6.917	2.17	13.000	8.94	19.08	2.17
0.917	1.33	7.000	2.17	13.083	8.94	19.17	2.17
1.000	1.33	7.083	2.17	13.167	8.94	19.25	2.17
1.083	1.33	7.167	2.17	13.250	8.94	19.33	2.17
1.167	1.33	7.250	2.17	13.333	6.52	19.42	2.17
1.250	1.33	7.333	2.66	13.417	6.52	19.50	2.17
1.333	1.33	7.417	2.66	13.500	6.52	19.58	2.17
1.417	1.33	7.500	2.66	13.583	6.52	19.67	2.17
1.500	1.33	7.583	2.66	13.667	6.52	19.75	2.17
1.583	1.33	7.667	2.66	13.750	6.52	19.83	2.17
1.667	1.33	7.750	2.66	13.833	5.07	19.92	2.17
1.750	1.33	7.833	2.66	13.917	5.07	20.00	2.17
1.833	1.33	7.917	2.66	14.000	5.07	20.08	2.17
1.917	1.33	8.000	2.66	14.083	5.07	20.17	2.17
2.000	1.33	8.083	2.66	14.167	5.07	20.25	2.17
2.083	1.33	8.167	2.66	14.250	5.07	20.33	1.45
2.167	1.33	8.250	2.66	14.333	3.62	20.42	1.45
2.250	1.33	8.333	3.14	14.417	3.62	20.50	1.45
2.333	1.57	8.417	3.14	14.500	3.62	20.58	1.45
2.417	1.57	8.500	3.14	14.583	3.62	20.67	1.45
2.500	1.57	8.583	3.14	14.667	3.62	20.75	1.45
2.583	1.57	8.667	3.14	14.750	3.62	20.83	1.45
2.667	1.57	8.750	3.14	14.833	3.62	20.92	1.45
2.750	1.57	8.833	3.38	14.917	3.62	21.00	1.45
2.833	1.57	8.917	3.38	15.000	3.62	21.08	1.45
2.917	1.57	9.000	3.38	15.083	3.62	21.17	1.45
3.000	1.57	9.083	3.38	15.167	3.62	21.25	1.45
3.083	1.57	9.167	3.38	15.250	3.62	21.33	1.45
3.167	1.57	9.250	3.38	15.333	3.62	21.42	1.45
3.250	1.57	9.333	3.86	15.417	3.62	21.50	1.45

3.333	1.57	9.417	3.86	15.500	3.62	21.58	1.45
3.417	1.57	9.500	3.86	15.583	3.62	21.67	1.45
3.500	1.57	9.583	3.86	15.667	3.62	21.75	1.45
3.583	1.57	9.667	3.86	15.750	3.62	21.83	1.45
3.667	1.57	9.750	3.86	15.833	3.62	21.92	1.45
3.750	1.57	9.833	4.35	15.917	3.62	22.00	1.45
3.833	1.57	9.917	4.35	16.000	3.62	22.08	1.45
3.917	1.57	10.000	4.35	16.083	3.62	22.17	1.45
4.000	1.57	10.083	4.35	16.167	3.62	22.25	1.45
4.083	1.57	10.167	4.35	16.250	3.62	22.33	1.45
4.167	1.57	10.250	4.35	16.333	2.17	22.42	1.45
4.250	1.57	10.333	5.56	16.417	2.17	22.50	1.45
4.333	1.93	10.417	5.56	16.500	2.17	22.58	1.45
4.417	1.93	10.500	5.56	16.583	2.17	22.67	1.45
4.500	1.93	10.583	5.56	16.667	2.17	22.75	1.45
4.583	1.93	10.667	5.56	16.750	2.17	22.83	1.45
4.667	1.93	10.750	5.56	16.833	2.17	22.92	1.45
4.750	1.93	10.833	7.49	16.917	2.17	23.00	1.45
4.833	1.93	10.917	7.49	17.000	2.17	23.08	1.45
4.917	1.93	11.000	7.49	17.083	2.17	23.17	1.45
5.000	1.93	11.083	7.49	17.167	2.17	23.25	1.45
5.083	1.93	11.167	7.49	17.250	2.17	23.33	1.45
5.167	1.93	11.250	7.49	17.333	2.17	23.42	1.45
5.250	1.93	11.333	11.59	17.417	2.17	23.50	1.45
5.333	1.93	11.417	11.59	17.500	2.17	23.58	1.45
5.417	1.93	11.500	11.59	17.583	2.17	23.67	1.45
5.500	1.93	11.583	11.59	17.667	2.17	23.75	1.45
5.583	1.93	11.667	11.59	17.750	2.17	23.83	1.45
5.667	1.93	11.750	11.59	17.833	2.17	23.92	1.45
5.750	1.93	11.833	35.75	17.917	2.17	24.00	1.45
5.833	1.93	11.917	35.75	18.000	2.17	24.08	1.45
5.917	1.93	12.000	35.75	18.083	2.17	24.17	1.45
6.000	1.93	12.083	147.81	18.167	2.17	24.25	1.45
6.083	1.93	12.167	147.82	18.250	2.17		

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 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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       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   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\2
f452204-e56c-4577-85de-83f0f0bffdf6\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\2
f452204-e56c-4577-85de-83f0f0bffdf6\s


DATE: 03-02-2022                          TIME: 10:38:12

USER:


COMMENTS: _____________________________________________________


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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                   min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                15.0
    [ Ptot= 54.40 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\7793d5b
3-e6fa-4c41-9ca8-
    remark: 2yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0303  1  5.0    0.19    0.02 12.25  28.82 0.53   0.000
    [I%= 0.1:S%= 8.00]
*
    READ STORM                15.0
    [ Ptot= 54.40 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\7793d5b
3-e6fa-4c41-9ca8-
    remark: 2yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0201  1  5.0    0.13    0.01 12.25  26.48 0.49   0.000
    [I%= 0.1:S%= 5.00]
*
    ADD [  0201+  0303]  0903  3  5.0    0.32    0.04 12.25  27.87  n/a   0.000
*
    READ STORM                15.0
    [ Ptot= 54.40 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\7793d5b
3-e6fa-4c41-9ca8-
    remark: 2yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0204  1  5.0    0.24    0.03 12.25  35.85 0.66   0.000
    [I%=36.0:S%= 2.00]
*
    READ STORM                15.0
    [ Ptot= 54.40 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\7793d5b
3-e6fa-4c41-9ca8-
    remark: 2yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0205  1  5.0    0.23    0.03 12.25  35.70 0.66   0.000
    [I%=37.0:S%= 2.00]
*
    READ STORM                15.0
    [ Ptot= 54.40 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\7793d5b
3-e6fa-4c41-9ca8-
```

```
    remark: 2yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0203  1  5.0    0.08    0.01 12.25  37.20 0.68   0.000
    [I%=38.0:S%= 2.00]
*
    ADD [  0203+  0204]  0904  3  5.0    0.32    0.04 12.25  36.19  n/a   0.000
*
    ADD [  0904+  0205]  0904  1  5.0    0.55    0.07 12.25  35.98  n/a   0.000
*
    READ STORM                15.0
    [ Ptot= 54.40 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\7793d5b
3-e6fa-4c41-9ca8-
    remark: 2yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0206  1  5.0    0.22    0.02 12.25  26.26 0.48   0.000
    [I%=21.0:S%= 1.00]
*
    READ STORM                15.0
    [ Ptot= 54.40 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\7793d5b
3-e6fa-4c41-9ca8-
    remark: 2yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0202  1  5.0    0.35    0.03 12.25  25.44 0.47   0.000
    [I%=20.0:S%= 5.00]
*
    READ STORM                15.0
    [ Ptot= 54.40 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\7793d5b
3-e6fa-4c41-9ca8-
    remark: 2yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0304  1  5.0    0.37    0.02 12.33  24.92 0.46   0.000
    [I%= 0.1:S%= 2.00]
*
    ADD [  0202+  0206]  0906  3  5.0    0.57    0.05 12.25  25.76  n/a   0.000
*
    ADD [  0906+  0304]  0906  1  5.0    0.94    0.07 12.25  25.43  n/a   0.000
*
    ADD [  0906+  0904]  0906  3  5.0    1.49    0.14 12.25  29.33  n/a   0.000
*
================================================================================
```

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


      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   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
      O   O    T      T    H   H   Y Y   MM MM  O   O
      O   O    T      T    H   H    Y    M   M  O   O
       OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\5
560fa89-e75d-4247-88be-347166d88c20\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\5
560fa89-e75d-4247-88be-347166d88c20\s


DATE: 03-02-2022                          TIME: 10:38:12

USER:


COMMENTS: _____________________________________________________________


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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
    READ STORM                15.0
    [ Ptot= 72.10 mm ]
```

```
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\f65a105
d-3d42-4656-91af-
    remark: 5yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0303  1  5.0    0.19    0.03 12.25  43.55 0.60   0.000
    [I%= 0.1:S%= 8.00]
*
    READ STORM                15.0
    [ Ptot= 72.10 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\f65a105
d-3d42-4656-91af-
    remark: 5yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0201  1  5.0    0.13    0.02 12.25  40.60 0.56   0.000
    [I%= 0.1:S%= 5.00]
*
    ADD [  0201+  0303]  0903  3  5.0    0.32    0.06 12.25  42.35  n/a   0.000
*
    READ STORM                15.0
    [ Ptot= 72.10 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\f65a105
d-3d42-4656-91af-
    remark: 5yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0204  1  5.0    0.24    0.05 12.25  51.28 0.71   0.000
    [I%=36.0:S%= 2.00]
*
    READ STORM                15.0
    [ Ptot= 72.10 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\f65a105
d-3d42-4656-91af-
    remark: 5yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0205  1  5.0    0.23    0.04 12.25  51.04 0.71   0.000
    [I%=37.0:S%= 2.00]
*
    READ STORM                15.0
    [ Ptot= 72.10 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\f65a105
d-3d42-4656-91af-
    remark: 5yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0203  1  5.0    0.08    0.02 12.25  52.92 0.73   0.000
    [I%=38.0:S%= 2.00]
*
    ADD [  0203+  0204]  0904  3  5.0    0.32    0.06 12.25  51.69  n/a   0.000
*
    ADD [  0904+  0205]  0904  1  5.0    0.55    0.11 12.25  51.42  n/a   0.000
*
    READ STORM                15.0
    [ Ptot= 72.10 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\f65a105
d-3d42-4656-91af-
    remark: 5yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0206  1  5.0    0.22    0.03 12.25  39.35 0.55   0.000
    [I%=21.0:S%= 1.00]
*
    READ STORM                15.0
    [ Ptot= 72.10 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\f65a105
d-3d42-4656-91af-
    remark: 5yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0202  1  5.0    0.35    0.05 12.25  38.29 0.53   0.000
    [I%=20.0:S%= 5.00]
*
    READ STORM                15.0
    [ Ptot= 72.10 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\f65a105
d-3d42-4656-91af-
    remark: 5yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0304  1  5.0    0.37    0.04 12.25  38.61 0.54   0.000
    [I%= 0.1:S%= 2.00]
*
    ADD [  0202+  0206]  0906  3  5.0    0.57    0.08 12.25  38.70  n/a   0.000
*
    ADD [  0906+  0304]  0906  1  5.0    0.94    0.12 12.25  38.66  n/a   0.000
*
    ADD [  0906+  0904]  0906  3  5.0    1.49    0.23 12.25  43.37  n/a   0.000
*
================================================================================
========================
```

```
       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   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                 *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\0
902d3c7-e9a5-4a7f-9e41-e48b00185bf5\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\0
902d3c7-e9a5-4a7f-9e41-e48b00185bf5\s


DATE: 03-02-2022                          TIME: 10:38:12

USER:


COMMENTS: _____________________________________________________________


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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
   READ STORM                 15.0
   [ Ptot= 83.81 mm ]
   fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\965a2d5
2-db4e-4b39-909b-
   remark: 10yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0303  1  5.0    0.19    0.04 12.25  53.76 0.64   0.000
   [I%= 0.1:S%= 8.00]
*
   READ STORM                 15.0
   [ Ptot= 83.81 mm ]
   fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\965a2d5
2-db4e-4b39-909b-
   remark: 10yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0201  1  5.0    0.13    0.03 12.25  50.48 0.60   0.000
   [I%= 0.1:S%= 5.00]
*
   ADD [  0201+  0303]  0903  3  5.0    0.32    0.07 12.25  52.43  n/a   0.000
*
   READ STORM                 15.0
   [ Ptot= 83.81 mm ]
   fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\965a2d5
2-db4e-4b39-909b-
   remark: 10yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0204  1  5.0    0.24    0.06 12.25  61.84 0.74   0.000
   [I%=36.0:S%= 2.00]
*
   READ STORM                 15.0
   [ Ptot= 83.81 mm ]
   fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\965a2d5
2-db4e-4b39-909b-
   remark: 10yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0205  1  5.0    0.23    0.05 12.25  61.54 0.73   0.000
   [I%=37.0:S%= 2.00]
*
   READ STORM                 15.0
   [ Ptot= 83.81 mm ]
   fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\965a2d5
2-db4e-4b39-909b-
   remark: 10yr 24hr 15min SCS
```

```
*
 *  CALIB STANDHYD       0203  1  5.0    0.08    0.02 12.25  63.62 0.76   0.000
    [I%=38.0:S%= 2.00]
*
    ADD [  0203+  0204]  0904  3  5.0    0.32    0.08 12.25  62.28  n/a   0.000
*
    ADD [  0904+  0205]  0904  1  5.0    0.55    0.13 12.25  61.97  n/a   0.000
*
    READ STORM                15.0
    [ Ptot= 83.81 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\965a2d5
2-db4e-4b39-909b-
    remark: 10yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0206  1  5.0    0.22    0.03 12.25  48.57 0.58   0.000
    [I%=21.0:S%= 1.00]
*
    READ STORM                15.0
    [ Ptot= 83.81 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\965a2d5
2-db4e-4b39-909b-
    remark: 10yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0202  1  5.0    0.35    0.06 12.25  47.37 0.57   0.000
    [I%=20.0:S%= 5.00]
*
    READ STORM                15.0
    [ Ptot= 83.81 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\965a2d5
2-db4e-4b39-909b-
    remark: 10yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0304  1  5.0    0.37    0.06 12.25  48.24 0.58   0.000
    [I%= 0.1:S%= 2.00]
*
    ADD [  0202+  0206]  0906  3  5.0    0.57    0.10 12.25  47.83  n/a   0.000
*
    ADD [  0906+  0304]  0906  1  5.0    0.94    0.15 12.25  47.99  n/a   0.000
*
    ADD [  0906+  0904]  0906  3  5.0    1.49    0.28 12.25  53.15  n/a   0.000
*
================================================================================
========================
```

```
      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   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
      O   O    T      T    H   H   Y Y   MM MM  O   O
      O   O    T      T    H   H    Y    M   M  O   O
       OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\e
183b551-13a1-42d5-add9-5e84ff3ba926\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\e
183b551-13a1-42d5-add9-5e84ff3ba926\s


DATE: 03-02-2022                          TIME: 10:38:12

USER:


COMMENTS: _____________________________________________________________


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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                15.0
    [ Ptot= 98.65 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\7c77deb
```

```
8-31c2-4b59-9da7-
    remark: 25yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0303  1  5.0    0.19    0.05 12.25  67.07 0.68   0.000
    [I%= 0.1:S%= 8.00]
*
    READ STORM                 15.0
    [ Ptot= 98.65 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\7c77deb
8-31c2-4b59-9da7-
    remark: 25yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0201  1  5.0    0.13    0.03 12.25  63.43 0.64   0.000
    [I%= 0.1:S%= 5.00]
*
    ADD [  0201+  0303]  0903  3  5.0    0.32    0.09 12.25  65.59  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot= 98.65 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\7c77deb
8-31c2-4b59-9da7-
    remark: 25yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0204  1  5.0    0.24    0.07 12.25  75.47 0.77   0.000
    [I%=36.0:S%= 2.00]
*
    READ STORM                 15.0
    [ Ptot= 98.65 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\7c77deb
8-31c2-4b59-9da7-
    remark: 25yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0205  1  5.0    0.23    0.07 12.25  75.14 0.76   0.000
    [I%=37.0:S%= 2.00]
*
    READ STORM                 15.0
    [ Ptot= 98.65 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\7c77deb
8-31c2-4b59-9da7-
    remark: 25yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0203  1  5.0    0.08    0.02 12.25  77.43 0.78   0.000
    [I%=38.0:S%= 2.00]
*
    ADD [  0203+  0204]  0904  3  5.0    0.32    0.09 12.25  75.96  n/a   0.000
*
    ADD [  0904+  0205]  0904  1  5.0    0.55    0.16 12.25  75.62  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot= 98.65 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\7c77deb
8-31c2-4b59-9da7-
    remark: 25yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0206  1  5.0    0.22    0.04 12.25  60.74 0.62   0.000
    [I%=21.0:S%= 1.00]
*
    READ STORM                 15.0
    [ Ptot= 98.65 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\7c77deb
8-31c2-4b59-9da7-
    remark: 25yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0202  1  5.0    0.35    0.08 12.25  59.37 0.60   0.000
    [I%=20.0:S%= 5.00]
*
    READ STORM                 15.0
    [ Ptot= 98.65 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\7c77deb
8-31c2-4b59-9da7-
    remark: 25yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0304  1  5.0    0.37    0.07 12.25  60.92 0.62   0.000
    [I%= 0.1:S%= 2.00]
*
    ADD [  0202+  0206]  0906  3  5.0    0.57    0.12 12.25  59.90  n/a   0.000
*
    ADD [  0906+  0304]  0906  1  5.0    0.94    0.20 12.25  60.30  n/a   0.000
*
    ADD [  0906+  0904]  0906  3  5.0    1.49    0.35 12.25  65.96  n/a   0.000
*
 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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\a
001c6f9-6596-4abb-a521-6deb67e5bc9c\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\a
001c6f9-6596-4abb-a521-6deb67e5bc9c\s


DATE: 03-02-2022                          TIME: 10:38:12

USER:


COMMENTS: _____________________________________________________


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

  W/E COMMAND            HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                 min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                15.0
    [ Ptot=109.84 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\ee65011
5-dab4-4afc-9547-
    remark: 50yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0303  1  5.0    0.19    0.06 12.25  77.31 0.70   0.000
    [I%= 0.1:S%= 8.00]
*
    READ STORM                15.0
    [ Ptot=109.84 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\ee65011
5-dab4-4afc-9547-
    remark: 50yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0201  1  5.0    0.13    0.04 12.25  73.43 0.67   0.000
    [I%= 0.1:S%= 5.00]
*
    ADD [  0201+  0303]  0903  3  5.0    0.32    0.10 12.25  75.73  n/a   0.000
*
    READ STORM                15.0
    [ Ptot=109.84 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\ee65011
5-dab4-4afc-9547-
    remark: 50yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0204  1  5.0    0.24    0.08 12.25  85.91 0.78   0.000
    [I%=36.0:S%= 2.00]
*
    READ STORM                15.0
    [ Ptot=109.84 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\ee65011
5-dab4-4afc-9547-
    remark: 50yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0205  1  5.0    0.23    0.07 12.25  85.54 0.78   0.000
    [I%=37.0:S%= 2.00]
*
    READ STORM                15.0
    [ Ptot=109.84 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\ee65011
```

```
5-dab4-4afc-9547-
    remark: 50yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0203  1  5.0    0.08    0.03 12.25  87.97 0.80   0.000
    [I%=38.0:S%= 2.00]
*
    ADD [  0203+  0204]  0904  3  5.0    0.32    0.10 12.25  86.42  n/a   0.000
*
    ADD [  0904+  0205]  0904  1  5.0    0.55    0.18 12.25  86.05  n/a   0.000
*
    READ STORM               15.0
    [ Ptot=109.84 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\ee65011
5-dab4-4afc-9547-
    remark: 50yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0206  1  5.0    0.22    0.05 12.25  70.20 0.64   0.000
    [I%=21.0:S%= 1.00]
*
    READ STORM               15.0
    [ Ptot=109.84 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\ee65011
5-dab4-4afc-9547-
    remark: 50yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0202  1  5.0    0.35    0.09 12.25  68.72 0.63   0.000
    [I%=20.0:S%= 5.00]
*
    READ STORM               15.0
    [ Ptot=109.84 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\ee65011
5-dab4-4afc-9547-
    remark: 50yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0304  1  5.0    0.37    0.09 12.25  70.73 0.64   0.000
    [I%= 0.1:S%= 2.00]
*
    ADD [  0202+  0206]  0906  3  5.0    0.57    0.14 12.25  69.29  n/a   0.000
*
    ADD [  0906+  0304]  0906  1  5.0    0.94    0.23 12.25  69.86  n/a   0.000
*
    ADD [  0906+  0904]  0906  3  5.0    1.49    0.41 12.25  75.84  n/a   0.000
*
```

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


       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   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   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\VH5\d640becb-967e-4731-b5f6-00a4892452ca\8
7fd64c0-653c-40c0-8d9f-be5f4859c85c\s
  Summary filename:
C:\Users\KGowanlock\AppData\Local\Civica\VH5\d640becb-967e-4731-b5f6-00a4892452ca\8
7fd64c0-653c-40c0-8d9f-be5f4859c85c\s


DATE: 03-02-2022                          TIME: 10:38:12

USER:


COMMENTS: _____________________________________________________________


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

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                15.0
```

```
    [ Ptot=120.77 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\3c054a9
9-fc8e-4c2a-8dcd-
    remark: 100yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0303  1  5.0    0.19    0.07 12.25  87.45 0.72   0.000
    [I%= 0.1:S%= 8.00]
*
    READ STORM                15.0
    [ Ptot=120.77 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\3c054a9
9-fc8e-4c2a-8dcd-
    remark: 100yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0201  1  5.0    0.13    0.04 12.25  83.35 0.69   0.000
    [I%= 0.1:S%= 5.00]
*
    ADD [  0201+  0303]  0903  3  5.0    0.32    0.11 12.25  85.78  n/a   0.000
*
    READ STORM                15.0
    [ Ptot=120.77 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\3c054a9
9-fc8e-4c2a-8dcd-
    remark: 100yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0204  1  5.0    0.24    0.09 12.25  96.20 0.80   0.000
    [I%=36.0:S%= 2.00]
*
    READ STORM                15.0
    [ Ptot=120.77 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\3c054a9
9-fc8e-4c2a-8dcd-
    remark: 100yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0205  1  5.0    0.23    0.08 12.25  95.80 0.79   0.000
    [I%=37.0:S%= 2.00]
*
    READ STORM                15.0
    [ Ptot=120.77 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\3c054a9
9-fc8e-4c2a-8dcd-
    remark: 100yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0203  1  5.0    0.08    0.03 12.25  98.36 0.81   0.000
    [I%=38.0:S%= 2.00]
*
    ADD [  0203+  0204]  0904  3  5.0    0.32    0.12 12.25  96.74  n/a   0.000
*
    ADD [  0904+  0205]  0904  1  5.0    0.55    0.20 12.25  96.34  n/a   0.000
*
    READ STORM                15.0
    [ Ptot=120.77 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\3c054a9
9-fc8e-4c2a-8dcd-
    remark: 100yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0206  1  5.0    0.22    0.06 12.25  79.63 0.66   0.000
    [I%=21.0:S%= 1.00]
*
    READ STORM                15.0
    [ Ptot=120.77 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\3c054a9
9-fc8e-4c2a-8dcd-
    remark: 100yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0202  1  5.0    0.35    0.11 12.25  78.06 0.65   0.000
    [I%=20.0:S%= 5.00]
*
    READ STORM                15.0
    [ Ptot=120.77 mm ]
    fname :
C:\Users\KGowanlock\AppData\Local\Temp\4d698629-6aa8-480b-8b68-f6fae4ddee51\3c054a9
9-fc8e-4c2a-8dcd-
    remark: 100yr 24hr 15min SCS

*
 *  CALIB STANDHYD       0304  1  5.0    0.37    0.10 12.25  80.50 0.67   0.000
    [I%= 0.1:S%= 2.00]
*
    ADD [  0202+  0206]  0906  3  5.0    0.57    0.17 12.25  78.67  n/a   0.000
*
    ADD [  0906+  0304]  0906  1  5.0    0.94    0.27 12.25  79.39  n/a   0.000
*
    ADD [  0906+  0904]  0906  3  5.0    1.49    0.46 12.25  85.65  n/a   0.000
*
```

Appendix C:
Enhanced Ditch Volume, Subdrain & Weir Calculations

PROJECT	Cranberry Marsh Estates	FILE	120181
		DATE	March 2022
SUBJECT	Quality Control Swale Volume	NAME	KG
		PAGE	1 OF 1

ENCHANCED DITCH OUTLET WEIR CALCULATIONS

Target Volume, V_{25mm} = 18 m^3 (VO Output - 25mm Chicago Storm - Catchemnt 203/204/205)

DIMENSIONS

L =	217.00	m	(Length of swale)
w_1 =	2.10	m	(Width of bottom of swale)
w_2 =	3.90	m	(Width of top of swale assuming 3:1)
h =	0.090	m	(Depth of swale)
s =	0.0	%	(Grade of swale)

VOLUME

Assumption: Side slopes of swale are 3:1

$V = Lhw_1 + 3h^2L$ = 46.3 m^3 > V_{25mm} = 18 m^3 (Acceptable)

TATHAM ENGINEERING

PROJECT	Cranberry Marsh Estates	FILE	120181
		DATE	March 2022
SUBJECT	Overflow For Enhanced Grass Ditch	NAME	KG
		PAGE	1 OF 1

ENCHANCED 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 (m^3/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 (m^3/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 (m^3/s) 0.0637

Total Rectangular + Triangular Weir

Stone Porosity 50 %

Q Total Flow (m^3/s) 0.419 x 50% = 0.210 > 0.2

TATHAM ENGINEERING

PROJECT	Cranberry Marsh Estates	FILE	120181
		DATE	March 2022
SUBJECT	Subdrain Calculations - Catchment 201/303	NAME	KG
		PAGE	1 OF 1

SUBDRAIN CALCULATIONS

CATCHMENT 201/303	5-YEAR PEAK FLOW CHI	SCS	
Prop. Catch. =	0.037	0.056	cms

Circular Pipe, Full Flow

Manning's n	0.009	
Slope	0.005	m/m
Diameter	0.25	m
Area	0.0491	m^2
Perimeter	0.7854	m
Hydraulic Radius	0.0625	m
Flow	0.0607	cms

$$Q = \frac{1}{n} \cdot A \cdot R^{2/3} \cdot S^{1/2}$$

5-year Flow	0.056	cms
Flow Provided	0.061	cms

TATHAM ENGINEERING

PROJECT	Cranberry Marsh Estates	FILE	120181
		DATE	March 2022
SUBJECT	Subdrain Calculations - Catchment 202/304	NAME	KG
		PAGE	1 OF 1

SUBDRAIN CALCULATIONS

CATCHMENTS 202/304	5-YEAR PEAK FLOW CHI	SCS	
Prop. Catch. =	0.02+0.036	0.090	cms

Circular Pipe, Full Flow

Manning's n	0.009	
Slope	0.005	m/m
Diameter	0.3	m
Area	0.0707	m^2
Perimeter	0.9425	m
Hydraulic Radius	0.075	m
Flow	0.0988	cms

$$Q = \frac{1}{n} \cdot A \cdot R^{2/3} \cdot S^{1/2}$$

5-year Flow	0.090	cms
Flow Provided	0.099	cms

TATHAM ENGINEERING

PROJECT	Cranberry Marsh Estates	FILE	120181
		DATE	March 2022
SUBJECT	DCB Perforated Drain Calculations	NAME	KG
		PAGE	1 OF 1

SUBDRAIN CALCULATIONS

Target Storm

5-Year Storm Peak Flow For Max of Catchments 203, 204 and 205 = 0.024 cms

Circular Pipe, Full Flow

Manning's n	0.009	
Slope	0.005	m/m
Diameter	0.2	m
Area	0.0314	m^2
Perimeter	0.6283	m
Hydraulic Radius	0.05	m
Flow	0.0335	cms

$$Q = \frac{1}{n} \cdot A \cdot R^{2/3} \cdot S^{1/2}$$

5-year Flow	0.024	cms
Flow Provided	0.033	cms

TATHAM ENGINEERING

PROJECT	Cranberry Marsh Estates	FILE	120181
		DATE	March 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 (m^3/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 (m^3/s) **0.099** **>** 0.060