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Stones Lake Spa, Township of Greater Madawaska

**FUNCTIONAL SERVICING AND PRELIMINARY STORMWATER
MANAGEMENT REPORT**

Rick Rump

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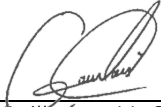
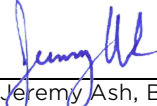
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1 Introduction

Tatham Engineering Limited was retained by Rick Rump to prepare a Functional Servicing and Preliminary Stormwater Management report in support of the proposed Stones Lake Resort and Spa development located on a portion of 11728 Lanark Road in the Township of Greater Madawaska. The subject site is legally described as Part of Lots 11 & 12, Concession 9, Township of Greater Madawaska, County of Renfrew.

The purpose of this report is to demonstrate the feasibility of the proposed development as it relates to servicing and stormwater management (SWM) in context with the local municipal and provincial design guidelines and criteria.

1.1 SITE DESCRIPTION

The total site area consists of approximately 105 ha with shoreline frontages on Stones Lake on the north, west and south sides. The overall site consists primarily of densely forested and wetland areas.

The area proposed for development, herein referred to as the site, consists of approximately 18 ha.

The site location is illustrated on the key plan of the drawings attached at the back of this report.

1.2 PROPOSED DEVELOPMENT

The proposed development consists of approximately 18 ha of land, on which a 200-unit hotel, a wine bank & underground storage and service building, an entertainment and distillery complex, retail store, staff housing, 10 cabins, hiking trails, spa exterior buildings, retail store, treatment centre, 2 parking lots, and approximately 2,300 m of paved internal road having a rural cross section, are proposed for development.

Domestic water for use within the site will be supplied via a combination of drilled wells and a surface water intake in Stones Lake. The drilled wells will provide water supply to a water system servicing 10 cabins in the northern-most area proposed for development. Water supply to the balance of the site will be provided from a separate water system that will be supplied from a surface water intake in Stones Lakes.

Sewage from the overall site development will be collected and conveyed to a centralized wastewater treatment facility, via gravity sanitary sewers. The wastewater treatment facility will discharge to a subsurface leaching bed.



The future condition land cover will be a combination of trees, grass and impervious areas (buildings, driveways, and roadways) as well as natural forested and wetland areas, which will remain undisturbed.

The Site Plan which was prepared by O2 Architecture and is included at the back of this report.

1.3 GUIDELINES AND BACKGROUND REPORTS

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

- Provincial Planning Statement (Ministry of Municipal Affairs and Housing, 2024);
- Ontario Building Code (Ministry of Municipal Affairs and Housing, 2024);
- Low Impact Development Stormwater Management Planning and Design Guide (CVC and TRCA, 2010);
- Design Guidelines for Sewage Works (MECP, 2008);
- Design Guidelines for Drinking-Water Systems (MECP, 2008);
- The Ministry of Environment (MOE) Stormwater Management Practices Planning and Design Manual (2003); and
- MTO Drainage Management Manual (Ministry of Transportation, 1997).

The following background reports pertaining to the site have also been referenced in the preparation of this report:

- Due Diligence Hydrogeological Investigation and Terrain Analysis 11728 Lanark Road (GEMTECH July 2025); and
- Preliminary Constraints Assessment (GEMTEC, June 2025).



2 Hydrogeological Investigation

2.1 HYDROGEOLOGICAL INVESTIATION

A Due Diligence Hydrogeological Investigation and Terrain Analysis for the site was completed by GEMTECH and documented in their report dated July 23, 2025.

The hydrogeological report confirms the water supply aquifer underlying the site is hydrogeologically sensitive due to thin overburden soils. The available groundwater supply consists of fractures in precambrian bedrock and well yield is anticipated to be highly variable across the site. Water samples taken from the monitoring wells on the subject site to assess water quality were found to be safe for consumption based on the absence of persistent health-related exceedances. However, water treatment for aesthetic parameters may be considered on an individual well basis.

In addition, there are no anticipated negative impacts to the bedrock aquifer resulting from the onsite treatment system proposed for the development.

Additional details related to the hydrogeological investigation including conclusions and recommendations can be found in the above report which has been submitted under separate cover.



3 Internal Roadway and Transportation

Accesses to the site will be provided from Lanark Road and Wilson Farm Road. The internal roads will be privately owned and maintained and will provide access to the proposed facilities within the site. The internal roads are proposed with a 6.5 m wide asphalt surface, 1.0 m wide granular shoulders and open grassed ditches, as shown on Drawing SG-1, included at the back of this report.

The recommended pavement structure design will be provided by a geotechnical engineer at the detailed design stage in support of Site Plan Approval.



4 Grading

A preliminary road design was developed to match the existing drainage patterns within the site to the extent possible. The preliminary grades reduce earth cut and fill and rock excavation to the extent possible while matching into the existing municipal roads at the access locations. The minimum ditch depth will be determined in the future based on providing 0.3 m of vertical separation between the granular road subbase layer and the bottom of the ditches on either side of the road and in order to contain runoff within the road ditches while minimizing earthworks and rock removal throughout the site.

Site grading will be focused on the areas proposed for development only, to good engineering standards (minimum 2.0% away from the future buildings), thus allowing the majority of the overall site area to remain undisturbed and reducing the need for large earthworks, rock removal and tree clearing operations.

The proposed development will be graded in a manner which will satisfy the following goals:

- Minimum road and ditch grade: 0.5%;
- Maximum road and ditch grade: 8.0%;
- Minimum site grading around the future buildings: 2.0%;
- Maximum site grading around future buildings: 7.0%;
- Minimize rock excavation; and
- Minimize the volume of earth to be moved and balance cut with fill on the site.

The preliminary site grading is shown on the Preliminary Site Grading and Drainage plan, Drawing SG-1, included at the back of this report.



5 Sewage Collection, Treatment, and Disposal

Wastewater from the proposed building facilities will be collected and conveyed to a privately owned and operated wastewater treatment facility via gravity sanitary sewers. The wastewater treatment facility will be centrally located west of each of the development areas and down gradient of the groundwater flow direction. The facility will be designed by Newterra and will discharge to a subsurface leaching bed.

The wastewater collection system and wastewater treatment facility are conceptually shown on the Preliminary site servicing drawing, Drawing SS-1 included at the back of this report.

As the total sewage effluent flows within the site will be greater than 10,000 L/day, the sanitary sewage collection, treatment and disposal system will require an MECP ECA. Pre-consultation with the MECP is planned for the near future to introduce the project and confirm the MECP's design criteria.

The sewage collection, treatment and disposal system will be designed in accordance with the following guidelines:

- Design Guidelines for Sewage Works (MECP, 2008);
- Design Criteria for Sanitary Sewers, Storm Sewers and Force mains for Alterations Authorized under an Environmental Compliance Approval (MECP, 2023); and
- The Ontario Building Code (2024).

5.1 SEWAGE DESIGN FLOW

The preliminary sewage design flow for the overall site was estimated using the Type of Establishment Method from Section 8 of the OBC and includes a peak extraneous flow allowance of 0.28 L/s/ha per the City of Ottawa's guidelines.

The sewage design flow for the proposed development was calculated based on sewage generation from the following facilities:

- Resort Hotel (200 units);
- Wine Bank & Underground Storage and Service Building (12 WC);
- Entertainment Building – Commercial Leisure Space;
- Retail;



- Staff Housing Building (above retail);
- Distillery/Restaurant;
- Cabin buildings (10 detached units); and
- Spa Exterior Buildings.

The combined sewage design flow for the above facilities, including a peak extraneous flow allowance, is 2.9 L/s (251,000 L/day).

Further design details for each component of the sewage collection, treatment and disposal system, including the individual building services, gravity sewers, wastewater treatment facility and leaching bed will be provided at the Site Plan Approval stage.

The sewage treatment facility is being prepared by others (Newterra). Details related to the facility can be found in Appendix A.

The sewage design flow calculations are included in Appendix A.



6 Water Supply and Treatment

Domestic water supply to the proposed buildings will be provided via two independent water treatment and distribution systems connected to separate groundwater and surface water supplies.

Two drilled wells are proposed on either end of the proposed ten (10) cabins which are located in the northern portion of the site. The wells will be connected to a privately owned and maintained water system building for water treatment (for aesthetic parameters) and disinfection prior to entering a water distribution system. The water system building will also be designed to house pressure tanks for maintaining water system pressure. The proposed water supply wells will be drilled in the near future in order to confirm the available groundwater supply and groundwater quality.

A separate water supply for the balance of the development is proposed via a surface water intake in Stones Lake. Water drawn from the lake will be treated and disinfected within a privately owned and operated water treatment facility prior to entering the water distribution system. The water treatment facility will be designed by Newterra. Water sampling at the future water intake location will be conducted in the near future for analysis by Newterra as part of the water treatment facility design.

Consultation with the MECP, regarding both water supply and treatment systems will be completed with the MECP in the near future.

Water supply for fire protection is proposed from a standalone system consisting of a surface water intake from Stones Lake and a dry hydrant.

The water supply, treatment and distribution systems will be designed in accordance with the following guidelines:

- Design Guidelines for Drinking-Water Systems (MECP, 2008); and
- The Ontario Building Code (2024).

6.1 DOMESTIC WATER DEMANDS

Water demand calculations for the proposed uses within the site have been completed using the Type of Establishment Method from Section 8 of the OBC.

The water demand calculations for the proposed ten (10) cabin building resulted in a daily water demand of 0.06 L/s (5,000 L/day). The calculated demand corresponds with typical water



consumption observed in the daily operation of a similar use and does not include allowances for additional demands including fire fighting, irrigation, etc.

As noted above, the available groundwater supply and groundwater quality will be confirmed in the near future, to demonstrate that the wells can provide water supply in excess of the demand and to demonstrate compliance with the provincial water quality requirements. In the case where the domestic water supply and/or water quality are insufficient, recommendations will be provided by the hydrogeological consultant.

The water demand for the balance of the site was calculated based on demands from the following buildings:

- Resort Hotel (200 units);
- Wine Bank & Underground Storage and Service Building (12 WC);
- Entertainment Building – Commercial Leisure Space;
- Retail;
- Staff Housing Building (above retail);
- Distillery/Restaurant;
- Cabin buildings (10 detached units); and
- Spa Exterior Buildings.

The water demand calculations for the above facilities resulted in a daily water demand of 2.3 L/s (199,000 L/day). The calculated demand corresponds with typical water consumption observed in the daily operation of similar uses and does not include allowances for additional demands including fire fighting, irrigation, etc. As noted above, the water supply for the above facilities is proposed to be from the Stones Lake. Additional analysis will be completed at the detailed design stage to confirm potential impacts of the proposed surface water intake on the lake however based on the total surface area of the lake (which is estimated to be approximately 86 ha) immeasurable impacts on lake level are anticipated.

The above water demands will be re-confirmed at the Site Plan Approval stage, once building design details and drawings, are further advanced.

The water demand calculations are included in Appendix B.

6.2 FIRE PROTECTION

The fire flow demand for the site was determined assuming a worst-case scenario and as per the Office of the Fire Marshal (OFM) Fire Protection Water Supply Guideline for Part 3 in the



OBC. This method is based on building occupancy, size, construction, and exposures, as well as minimum fire flow duration requirements. Based on this assessment, the maximum fire flow demand for the site is 9,000 L/min, requiring a minimum combined storage volume of 270,000 L. Stones Lake provides a significant fire protection storage volume that will be accessed via a stand-alone dry hydrant which will be accessible to fire services via a pumper truck. In accordance with NFPA 1142 – A.8.3.3 the lift of a dry hydrant is not to exceed 3.7 m and the total head loss is not to exceed 6.6 m to achieve the minimum flow rate. The dry hydrant is shown conceptually on Drawing SS-1, where the required lift, measured from the normal lake level (approximately 172 masl) to the elevation of the dry hydrant connection is approximately 3.5 m. Additionally, the dry hydrant is to be situated a minimum of 30 m from any structure.

The dry hydrant, piping and intake at Stones Lake will be designed at the detailed design stage to provide a minimum fire protection flow rate of 9,000 L/min, for an indefinite period.

6.3 WATER SYSTEM INFRASTRUCTURE DESIGN

The watermain and individual building services will be designed at the Site Plan Approval stage once building design details and drawings are further advanced.



7 Stormwater Management

The primary objective of the preliminary SWM plan is to demonstrate that the proposed development will not adversely impact the hydrologic cycle and surface water runoff characteristics of the area. This will be accomplished by evaluating the effect of the proposed development on local drainage conditions. Where necessary, solutions will be provided to mitigate any adverse impacts. Issues to be addressed and criteria to be met regarding drainage and SWM are summarized as follows:

- The site will be developed in accordance with all relevant municipal and provincial SWM criteria;
- MECP 'Enhanced' treatment level water quality treatment will be provided, to mitigate potential impacts from the proposed development on the downstream receivers, including Stones Lake, local wetlands and Calabogie Lake;
- All post development peak flows directed to each existing surface water outlet will be reduced at or below existing condition peak flow rates during the 2-100-year design storm events based on the 4-hour Chicago and 24-hour SCS Type II design storms;
- Runoff from all storms up to and including the 100-year storm event will be safely conveyed through the site to the intended outlet; and
- Erosion and sediment control measures will be implemented during and following construction up until the ultimate build-out of the site, to minimize erosion and sediment transport off-site.

7.1 EXISTING SITE DRAINAGE CONDITIONS

The existing topography, ground cover, and drainage patterns were obtained through a review of relevant background studies, available plans, the latest Land Information Ontario (LIO) LIDAR data set (2013) and a detailed topographic survey completed by Adam Kasprzak Surveying Ltd. on July 22, 2025. Tatham also completed a site visit on September 12, 2025 to verify the existing drainage patterns and features within the site.

Four surface water outlets from the site, which receive runoff from the area proposed for development, were delineated and each are described in the sections below.

Outlet 1

Located in the north and western portion of the site, Catchment 101 (24.8 ha) drains overland from northeast to southwest through two wetland communities at an average grade of 0.5%, and



discharges from the site onto a private residential property at Outlet 1 and the Lanark Road right-of-way. Runoff is conveyed across Lanark Road from east to west via an existing CSP culvert and eventually discharges into Calabogie Lake.

Outlet 2

Located south of the western portion of Catchment 101, Catchment 102 (4.5 ha) drains from northeast to southwest at an average grade of 1.1%, and discharges to the Lanark Road right-of-way at Outlet 2. Runoff is conveyed across Lanark Road from east to west via an existing CSP culvert and eventually discharges into Calabogie Lake.

Outlet 3

Located in the central portion of the site, Catchment 103 (18.8 ha) drains from northeast to southwest at an average grade of 1.0%, and discharges from the site into an adjacent property at Outlet 3 prior to re-entering the site and combining with outflow from Stones Lake on the upstream side of Lanark Road. The combined runoff from Catchment 103 and the Stones Lake outflow discharges across Lanark Road via an existing CSP culvert and eventually discharges into Calabogie Lake.

Outlet 4

Located east of Catchment 103, Catchment 104 (10.6 ha) generally drains to from northwest to southeast at an average grade of 0.9% and discharges directly into Stones Lake at Outlet 4. As described above, outflow from Stones Lake combines with runoff from Catchment 103 on the upstream side of Lanark Road and discharges across Lanark Road via an existing CSP culvert, eventually discharging into Calabogie Lake.

The existing conditions drainage patterns and outlets are illustrated on the Existing Condition Drainage Plan, Drawing DP-1, included at the back of this report.

7.2 EXTERNAL DRAINAGE CONDITIONS

External drainage conditions were evaluated using contour data from the LIO LIDAR dataset. Northeast of the site, a 11.6 ha drainage area conveys runoff into the site from east to west and into the wetlands within Catchment 101. The external drainage area (Catchment EXT-1) consists of densely forested area and drains at an average grade of 1.2%.

There are no other external drainage areas draining into the site.

The external drainage patterns are illustrated on the External Drainage Plan, Drawing EXT-1, included at the back of this report.



7.3 EXISTING CONDITION HYDROLOGIC ANALYSIS

A hydrologic analysis of the existing condition was completed utilizing the single event Visual Otthymo Hydrologic Model Version 6 (VO6). Peak flow rates for storms up to and including the 100-year storm were calculated for the 4-hour Chicago and 24-hour SCS Type II design storms generated using historic rainfall data from the MTO's online IDF Curve Lookup Tool, which is attached in Appendix C.

The catchment delineations were completed based on the site area proposed for development, property boundaries, existing ground contour information and the established environmental constraint boundaries. Land uses were established based on field reconnaissance and a review of available mapping. The land uses and soil information taken from the Soil Map of Renfrew County (Soil Survey Report No. 37) were used to establish the curve numbers (CN) and other catchment parameters used in the hydrologic model. The time to peak values for the catchment areas were calculated using the Bransby Williams and Airport Methods for runoff coefficients 'C' greater than and less than 0.4 respectively.

A summary of all catchment parameters established for the existing condition hydrologic model have been included in Appendix A.

Detailed calculations and Visual Otthymo modeling output are included in Appendix A with the results summarized below in Tables 1-4.

Table 1: Existing Condition Peak Flow Summary - Outlet 1

DESIGN STORM	CATCHMENT 101 24.8 ha (m ³ /s)		CATCHMENT EXT-1 11.6 ha (m ³ /s)		TOTAL OUTLET 1 36.4 ha (m ³ /s)	
	4-hr CHI	24-hr SCS Type II	4-hr CHI	24-hr SCS Type II	4-hr CHI	24-hr SCS Type II
25mm	0.019	-	0.018	-	0.031	-
2-Year	0.035	0.098	0.029	0.108	0.053	0.171
5-Year	0.075	0.192	0.066	0.206	0.116	0.331
10-Year	0.108	0.266	0.097	0.282	0.168	0.457
25-Year	0.158	0.370	0.144	0.389	0.246	0.634
50-Year	0.200	0.457	0.184	0.477	0.313	0.782
100-Year	0.246	0.547	0.228	0.569	0.385	0.934



Table 2: Existing Condition Peak Flow Summary - Outlet 2

DESIGN STORM	CATCHMENT 102 4.5 ha (m ³ /s)	
	4-hr CHI	24-hr SCS Type II
25mm	0.007	-
2-Year	0.011	0.039
5-Year	0.024	0.074
10-Year	0.036	0.102
25-Year	0.053	0.140
50-Year	0.067	0.172
100-Year	0.083	0.205

Table 3: Existing Condition Peak Flow Summary - Outlet 3

DESIGN STORM	CATCHMENT 103 18.8 ha (m ³ /s)	
	4-hr CHI	24-hr SCS Type II
25mm	0.021	-
2-Year	0.035	0.111
5-Year	0.076	0.212
10-Year	0.111	0.291
25-Year	0.162	0.402
50-Year	0.206	0.493
100-Year	0.253	0.588



Table 4: Existing Condition Peak Flow Summary – Outlet 4

DESIGN STORM	CATCHMENT 104 10.6 ha (m ³ /s)	
	4-hr CHI	24-hr SCS Type II
25mm	0.012	-
2-Year	0.020	0.073
5-Year	0.046	0.141
10-Year	0.068	0.195
25-Year	0.102	0.271
50-Year	0.130	0.334
100-Year	0.161	0.400

7.4 STORMWATER MANAGEMENT ALTERNATIVES

The preliminary SWM plan is subject to the review and approval of the Township and County. For intensive development SWM practices to provide both quantity and quality control of stormwater runoff are required. The MECP SWM design guidelines recommends using the following methods for stormwater management:

Lot Level Source Controls

Lot level controls include measures such as roof leader soak away pits, rear yard ponding areas, reduced grading, rear and side yard swales and other localized site grading. Other methods of at-source stormwater management controls include Low impact development (LID) practices including rainwater harvesting, green roofs, roof downspout disconnection, infiltration trenches and chambers, vegetated filter strips and permeable pavement. These methods of stormwater control are beneficial since they reduce runoff close to the source. However, the above practices are site specific based on the existing soil, groundwater and bedrock conditions and require regular maintenance to be effective. Use of these practices is recommended but only to an extent that is achievable without requiring any additional rock removal and excessive maintenance.



Conveyance Controls

Infiltration trenches and perforated pipes are two examples of conveyance controls. Typically, these controls attempt to reduce runoff volume and attenuate peak flows on route to the downstream watershed by allowing stormwater runoff to infiltrate into the existing soil. These methods of controlling stormwater are only effective if the native soil has good drainage capabilities and groundwater and bedrock conditions allow for them to be implemented in an effective and practical manner. Poor construction practices also reduce the effectiveness of these stormwater management controls. Conveyance controls are not recommended due to the high bedrock conditions throughout the site.

End-of-Pipe Facilities

End-of-pipe facilities are typically wet ponds, dry ponds or wetlands that control stormwater runoff from larger development areas. These facilities allow stormwater to be retained and released at a controlled rate and can provide effective quality and quantity control during and following storm events. The major negative attributes of these facilities are that they require significant land area to provide the treatment controls thus the larger the development the greater the required pond size.

7.5 STORMWATER MANAGEMENT PLAN

The preliminary SWM plan has been developed recognizing the overall SWM criteria for the site. The proposed internal roads and overall site grading will be constructed to follow the existing topography of the land as much as possible to maintain the existing condition drainage patterns, while still directing major flows overland to the proposed SWM facilities and the existing surface water outlets. The internal road design will also be constructed to a typical road cross section standard with all minor and major system flows from the road draining to the road ditches. The individual development sites will be graded immediately around the buildings and parking areas thus allowing a large portion of the overall property to remain undisturbed and reducing the need for unnecessarily large earthworks, rock removal and tree clearing operations.

The proposed condition catchment delineations within the site were completed utilizing the Site Plan and the preliminary site grading design in combination with the topographic survey.

The proposed condition drainage patterns and outlets are illustrated on the Proposed Condition Drainage Plan, Drawing DP-2, included at the back of this report.

Separate SWM plans have been developed for each outlet and are described in the sections below.



Outlet 1

The proposed development within Catchment 201 (23.2 ha) includes approximately 252 m of internal road, the entrance to the site from Wilson Farm Road and the wastewater treatment facility. The balance of Catchment 201 consists of existing natural areas which are to remain undisturbed. Runoff from the total Catchment 201 area discharges from the site into a private residential property at Outlet 1 and Lanark Road, unchanged from the existing condition. The Proposed development and corresponding grading and drainage design will reduce the overall drainage area and peak flows to Outlet 1 during all storms up to and including the 100-year storm event. On this basis, water quantity controls are not required within Outlet 1. The road ditches are proposed as enhanced grassed swales consisting of 0.5 m wide flat bottoms and having minimum ditch slopes thereby encouraging filtering and settling of sediment and pollutants along the conveyance route in order to achieve MECP enhanced level water quality treatment of runoff.

Outlet 2

The proposed development within Catchment 202 (4.5 ha) includes approximately 254 m of internal road and the entrance to the site from Lanark Road. The balance of Catchment 202 consists of existing natural areas which are to remain undisturbed. Runoff from the total Catchment 202 area discharges from the site into the Lanark Road right-of-way. The drainage area of Catchment 202 is generally unchanged from Catchment 102 however with the addition of the impervious road surface in the proposed condition, water quantity control is required upstream of the proposed outlet to the Lanark Road right-of-way, in order to reduce post development peak flow rates at or below existing conditions, during all design storm events up to and including the 100-year storm. A SWM facility (SWMF1) is proposed on the south side of the Lanark Road access into the site and will be designed as a dry SWM facility providing MECP basic level water quality treatment and quantity control. Same as the proposed road ditches in Catchment 201, the road ditches in Catchment 202 are proposed as enhanced grassed swales consisting of 0.5 m wide flat bottoms and having minimum ditch slopes thereby encouraging filtering and settling of sediment and pollutants along the conveyance route in order to achieve MECP enhanced level water quality treatment of runoff.

Outlet 3

The proposed development within Catchment 203A (16.7 ha) includes approximately 1,448 m of internal road, the main parking area, the entertainment, distillery and wine bank complex, and ten (10) dispersed sleeping cabins. The balance of Catchment 203A consists of existing natural areas which are to remain undisturbed. Runoff from Catchment 203A and Catchment 203B (which will remain completely undisturbed in the proposed development condition) discharges from the site into an adjacent property at Outlet 3 prior to re-entering the site and combining



with outflow from Stones Lake on the upstream side of Lanark Road. With the addition of a significant impervious area within Catchment 203A, water quantity control is required, upstream of the proposed outlet location, in order to reduce post development peak flow rates at or below existing conditions, during all design storm events up to and including the 100-year storm. A SWM facility (SWMF2) is proposed in the south portion of Catchment 203A and will be designed as a dry SWM facility providing MECP basic level water quality treatment and quantity control. Same as the proposed road ditches in Catchments 201 and 202, the road ditches in Catchment 203A are proposed as enhanced grassed swales consisting of 0.5 m wide flat bottoms and having minimum ditch slopes thereby encouraging filtering and settling of sediment and pollutants along the conveyance route in order to achieve MECP enhanced level water quality treatment of runoff.

Outlet 4

The proposed development within Catchment 204 (10.7 ha) includes approximately 267 m of internal road, the hotel spa resort building, secondary parking, two retail buildings, a network of walking pathways, and a number of spa facilities including small cabins, steam rooms, pools, saunas etc. The balance of Catchment 204 consists of existing natural areas which are to remain undisturbed. Runoff from the total Catchment 204 area discharges from the site directly into Stones Lake. Since Stones Lake is the ultimate receiver of runoff and due to the extremely large flood storage volume that is available above the normal water level of the lake it is not necessary to control post development peak flow rates from Catchment 204 to pre-development peak flow rates, provided that runoff from all design storms within Catchment 204 can be safely conveyed to the lake. Wate quality treatment however is of utmost importance to reduce the potential for any adverse water quality impacts resulting from the proposed development. Accordingly, a combination of lot level controls and end-of-pipe facilities are proposed including roof leaders directed to pervious areas, enhanced road ditches, and dry SWM facilities are proposed throughout Catchment 104.

7.5.1 Water Quantity Control

A hydrologic analysis of the post development condition was completed utilizing the single event Visual Otthymo Hydrologic Model Version 6 (VO6). Peak flow rates for storms up to and including the 100-year storm were calculated for the 4-hour Chicago and 24-hour SCS Type II design storms generated using historic rainfall data from the MTO's online IDF Curve Lookup Tool, as described in Section 7.3 above.

The catchment delineations for the contributing lands were completed utilizing the Site Plan in combination with the topographic survey and the preliminary site grading design. The total impervious (TIMP) and percent directly connected imperviousness for the proposed development was determined based on the road and building footprints shown on the Site Plan



and will be revised as the detailed design for the site advances. A summary of all catchment parameters established for the post development hydrologic model have been included in Appendix C.

As noted in Section 7.5, water quantity control is only required within Outlets 1, 2 and 3.

The time to peak values for the individual catchment areas were calculated using either the Bransby Williams and Airport Methods for runoff coefficient “C” values greater than and less than 0.4 respectively.

Preliminary stage-storage-discharge data was input into the ‘route reservoir’ commands of the hydrologic model to confirm the quantity control storage requirements for SWMF1 and SWMF2. Specific details relating to the pond outlet control structures will be determined at the detailed design stage.

Detailed calculations and Visual Otthymo modeling output are included in Appendix C with the results summarized below in Tables 5 and 6.

Table 5: Proposed Condition Peak Flow Summary – Outlet 1

DESIGN STORM	CATCHMENT 201 23.2 ha UNCONTROLLED (m ³ /s)		CATCHMENT EXT-1 11.6 ha (m ³ /s)		TOTAL OUTLET 1 34.8 ha (m ³ /s)	
	4-hr CHI	24-hr SCS Type II	4-hr CHI	24-hr SCS Type II	4-hr CHI	24-hr SCS Type II
25mm	0.019 (0.019)	-	0.018 (0.018)	-	0.030 (0.031)	-
2-Year	0.033 (0.035)	0.093 (0.098)	0.029 (0.029)	0.108 (0.108)	0.052 (0.053)	0.167 (0.171)
5-Year	0.071 (0.075)	0.182 (0.192)	0.066 (0.066)	0.206 (0.206)	0.113 (0.116)	0.323 (0.331)
10-Year	0.103 (0.108)	0.251 (0.266)	0.097 (0.097)	0.282 (0.282)	0.164 (0.168)	0.446 (0.457)
25-Year	0.149 (0.158)	0.350 (0.370)	0.144 (0.144)	0.389 (0.389)	0.239 (0.246)	0.619 (0.634)
50-Year	0.190 (0.200)	0.432 (0.457)	0.184 (0.184)	0.477 (0.477)	0.305 (0.313)	0.763 (0.782)
100-Year	0.233 (0.246)	0.517 (0.547)	0.228 (0.228)	0.569 (0.569)	0.375 (0.385)	0.912 (0.934)

Notes: (0.019) refers to the existing condition peak flow rate.



Table 6: Proposed Condition Peak Flow Summary – Outlet 2

DESIGN STORM	CATCHMENT 202 4.5 ha CONTROLLED BY SWMF1 (m ³ /s)	
	4-hr CHI	24-hr SCS Type II
25mm	0.005 (0.007)	-
2-Year	0.008 (0.011)	0.024 (0.039)
5-Year	0.017 (0.024)	0.051 (0.074)
10-Year	0.025 (0.036)	0.075 (0.102)
25-Year	0.039 (0.053)	0.128 (0.140)
50-Year	0.050 (0.067)	0.163 (0.172)
100-Year	0.064 (0.083)	0.199 (0.205)

Notes: (0.026) refers to the existing condition peak flow rate.

Table 7: Proposed Condition Peak Flow Summary – Outlet 3

DESIGN STORM	CATCHMENT 203A 16.7 ha CONTROLLED BY SWMF2 (m ³ /s)		CATCHMENT 203B 3.6 ha (m ³ /s)		TOTAL OUTLET 3 20.3 ha (m ³ /s)	
	4-hr CHI	24-hr SCS Type II	4-hr CHI	24-hr SCS Type II	4-hr CHI	24-hr SCS Type II
25mm	0.022	-	0.005	-	0.025 (0.021)	-
2-Year	0.031	0.055	0.008	0.029	0.035 (0.035)	0.077 (0.111)
5-Year	0.051	0.120	0.018	0.057	0.060 (0.076)	0.164 (0.212)
10-Year	0.069	0.179	0.026	0.078	0.082 (0.111)	0.242 (0.291)
25-Year	0.107	0.274	0.039	0.108	0.129 (0.162)	0.373 (0.402)
50-Year	0.136	0.344	0.051	0.133	0.168 (0.206)	0.469 (0.493)
100-Year	0.171	0.414	0.063	0.159	0.211 (0.253)	0.564 (0.588)

Notes: (0.026) refers to the existing condition peak flow rate.



A comparison of the tables above showing the post-development peak flow summaries with the existing condition peak flows confirms the SWM plans for each outlet can attenuate the 2-year through 100-year post-development peak flows at or below existing peak flow rates.

SWMF 1 is planned to be a dry pond and will be designed with a minimum of 372 m³ of active storage and an additional 0.3 m of freeboard as illustrated on Drawing SG-1, whereas 338 m³ of active storage is required during the 100-year 24-hour SCS design storm.

SWMF 2 is also a dry pond and will be designed with a minimum of 5,280 m³ of active storage and an additional 0.3 m of freeboard, whereas 4,184 m³ of active storage is required during the 100-year 24-hour SCS design storm.

Preliminary stage-volume tables for each facility are included in Appendix C.

7.5.2 Water Quality Control

The proposed water quality control plan for the development will follow a treatment train approach consisting of enhanced 0.5 m wide flat bottom grassed swales in the road ditches and dry SWM ponds that are equipped with plunge pools within the pond forebays and a low flow channel between the pond inlet and the outlet. Roof leaders, where feasible, will be directed to pervious areas further promoting filtration of runoff upstream of the conveyance route.

Preliminary water quality control plans have been developed for each outlet and are described below.

Outlet 1

Runoff from the roadway area in Catchment 201, which totals approximately 0.21 ha, will be captured by the road ditches which have been enhanced with 0.5 m wide flat bottoms and reduced longitudinal slopes (2.5% - 5.0%) thereby reducing flow velocities and promoting filtering and settling of sediment and pollutants. In accordance with the MECP SWM manual, enhanced grassed swales are effective at providing water quality treatment when the maximum peak flow velocity does not exceed 0.5 m/s during a 4-hour, 25 mm storm event. The maximum ditch velocity during the 25 mm storm event was determined to be 0.3 m/s which is less than the velocity threshold for providing enhanced water quality treatment.

The balance of the area within Catchment 201 is undisturbed by the proposed development and does not contribute additional runoff to the road ditches



Outlet 2

Similar to Outlet 1, the roadway area in Catchment 202, which totals approximately 0.21 ha, will be captured by the road ditches which will also be enhanced with 0.5 m wide flat bottoms and reduced longitudinal slopes (0.7% - 4.2%) thereby reducing flow velocities and promoting filtering and settling of sediment and pollutants. The maximum ditch velocity during the 25 mm storm event was determined to be 0.3 m/s, which is less than the velocity threshold for providing enhanced water quality treatment.

At the limit of Catchment 202, a dry SWM facility (SWMF1) is proposed to provide water quantity and water quality control. Catchment 202 (4.5 ha) has an estimated imperviousness of 5%. As per the MECP design guidelines the larger of the erosion control active storage (25 mm storm runoff volume) and the water quality active storage (MECP Table 3.2) is to be detained a minimum of 24 hours. The erosion control active storage volume was determined to be 64 m³. It is noted that SWMF 1 has approximately 372 m³ of active storage and the water quality active storage requirement will make up a portion of the water quantity control storage volume. Based on the above, SWMF 1 will provide basic level (60% TSS removal) water quality treatment of runoff from Catchment 202 in addition to the MECP enhanced level treatment provided in the upstream enhanced 0.5 m flat bottom grassed swales.

The balance of the area within Catchment 202 is undisturbed by the proposed development and does not contribute additional runoff to the road ditches

Outlet 3

Water quality control for runoff within Catchment 203A will be provided by means of a treatment train approach whereby not one single element of the SWM plan will be relied on for MECP enhanced level water quality control.

If concentrated stormwater runoff from the centralized parking area ultimately drains as sheet flow into conveyance ditches surrounding the parking area and into the flat bottom ditches on either side of the internal access roads, then the conveyance ditches will be equipped with filtration practices and designed as dry swales in order to provide at-source and conveyance type water quality treatment for the parking lot runoff. Alternatively, if runoff from the parking areas is proposed to be captured by storm structures with surface inlets (i.e. concrete catchbasin or catchbasin maintenance hole) within the parking areas, oil-grit-separator units will be specified to provide pre-treatment and water quality protection upstream of the internal access road ditches. Detailed design of the parking area grading will be advanced at the detailed design stage in support of Site Plan Approval.



The water quality treatment of runoff from the roadway area within Catchment 203A, which totals approximately 1.83 ha, will be captured by the road ditches which have been enhanced with 0.5 m wide flat bottoms and reduced longitudinal slopes (0.5% - 4.7%) thereby reducing flow velocities and promoting filtering and settling of sediment and pollutants. The maximum ditch velocity during the 25 mm storm event was determined to be 0.36 m/s, corresponding to the section of ditch located at SWMF 2, which is less than the velocity threshold for providing enhanced water quality treatment.

At the limit of Catchment 203A, a dry SWM facility (SWMF2) is proposed to provide water quantity and water quality control. Catchment 203A (16.7 ha) has an estimated imperviousness of 24%. As per the MECP design guidelines the larger of the erosion control active storage (25 mm storm runoff volume) and the water quality active storage (MECP Table 3.2) is to be detained a minimum of 24 hours. The erosion control active storage requirement was determined to be 743 m³ whereas the water quality active storage requirement from MECP Table 3.2 was determined to be 963 m³ and therefore is the more stringent volume criteria. It is noted that SWMF 2 has approximately 5,280 m³ of active storage and the water quality active storage requirement will make up a portion of the water quantity control storage volume. Based on the above, SWMF 2 will provide basic level (60% TSS removal) water quality treatment of runoff from Catchment 203A in addition to the MECP enhanced level treatment provided in the upstream enhanced 0.5 m flat bottom grassed swales and the dry swales provided around the perimeter of the centralized parking area.

Runoff from the entertainment and distillery building complex is considered clean and unimpaired and therefore does not require water quality treatment.

Outlet 4

Runoff from the roadway area in Catchment 204, which totals approximately 0.23 ha, will be captured by the road ditches which have been enhanced with 0.5 m wide flat bottoms and reduced longitudinal slopes (0.9% - 3.0%) thereby reducing flow velocities and promoting filtering and settling of sediment and pollutants. In accordance with the MECP SWM manual, enhanced grassed swales are effective at providing water quality treatment when the maximum peak flow velocity does not exceed 0.5 m/s during a 4-hour, 25 mm storm event. The maximum ditch velocity during the 25 mm storm event was determined to be 0.22 m/s which is less than the velocity threshold for providing enhanced water quality treatment.

Similar to Catchment 203A, runoff from the centralized parking area within Catchment 204 will either be captured and treated via dry swales around the perimeter of the parking area or captured by storm structures with surface inlets and treated via oil-grit separator units.



Runoff from both the internal access roads and the parking area, upon being treated, will discharge directly to Stones Lake.

Runoff from the main hotel/spa resort building and spa related out buildings and facilities (small cabins, steam rooms, pools, sauna etc.) and access pathways is considered clean and unimpaired and therefore does not require water quality treatment.

7.6 STORMWATER CONVEYANCE

Minor and major system drainage will be conveyed in the road ditches, culverts, and the SWM facilities to the intended outlets. The enhanced road ditches will be sized to convey peak flows from all storms up to and including the 100-year storm.

The proposed road cross culverts will be sized to convey the peak runoff rate from storms up to and including the 25-year storm prior to overtopping the road. The proposed culvert and ditch sizing calculations will be provided at the detailed design stage in support of Site Plan Approval.



8 Siltation and Erosion Control

Siltation and erosion control measures will be implemented for all construction activities within the site including vegetation clearing, topsoil stripping, grading, and stockpiling of materials. The basic principles considered to minimize erosion, sedimentation and resultant negative environmental impacts include:

- All erosion control devices to be specified in accordance with the Erosion and Sediment Control Guide for Urban Construction (Sustainable Technologies Evaluation Program, 2019);
- Silt control fences to be erected before the commencement of any grading operations to control sediment movement;
- A designated construction vehicle entrance(s) with a stone mud mat will be specified to reduce off-site tracking of material;
- Temporary swales, and earth berms will be constructed to control runoff during construction by lowering velocities and promoting settling of particulates;
- All topsoil and fill piles are to be surrounded with heavy duty silt fence and are to be seeded immediately upon completion of earthworks;
- Expose the smallest possible land area to erosion for the shortest possible time;
- Long term siltation and erosion control will be enhanced with a re-vegetation strategy for disturbed areas;
- Confine refuelling and servicing of equipment to areas well away from the drainage systems and the lake; and
- Regular inspection of control measures to be instituted through a monitoring and mitigation plan and repairs will be made as necessary. Bi-weekly inspections of the site erosion and sediment control should be completed.

A detailed erosion and sediment control plan(s) will be prepared at the detailed design stage in support of Site Plan Approval.



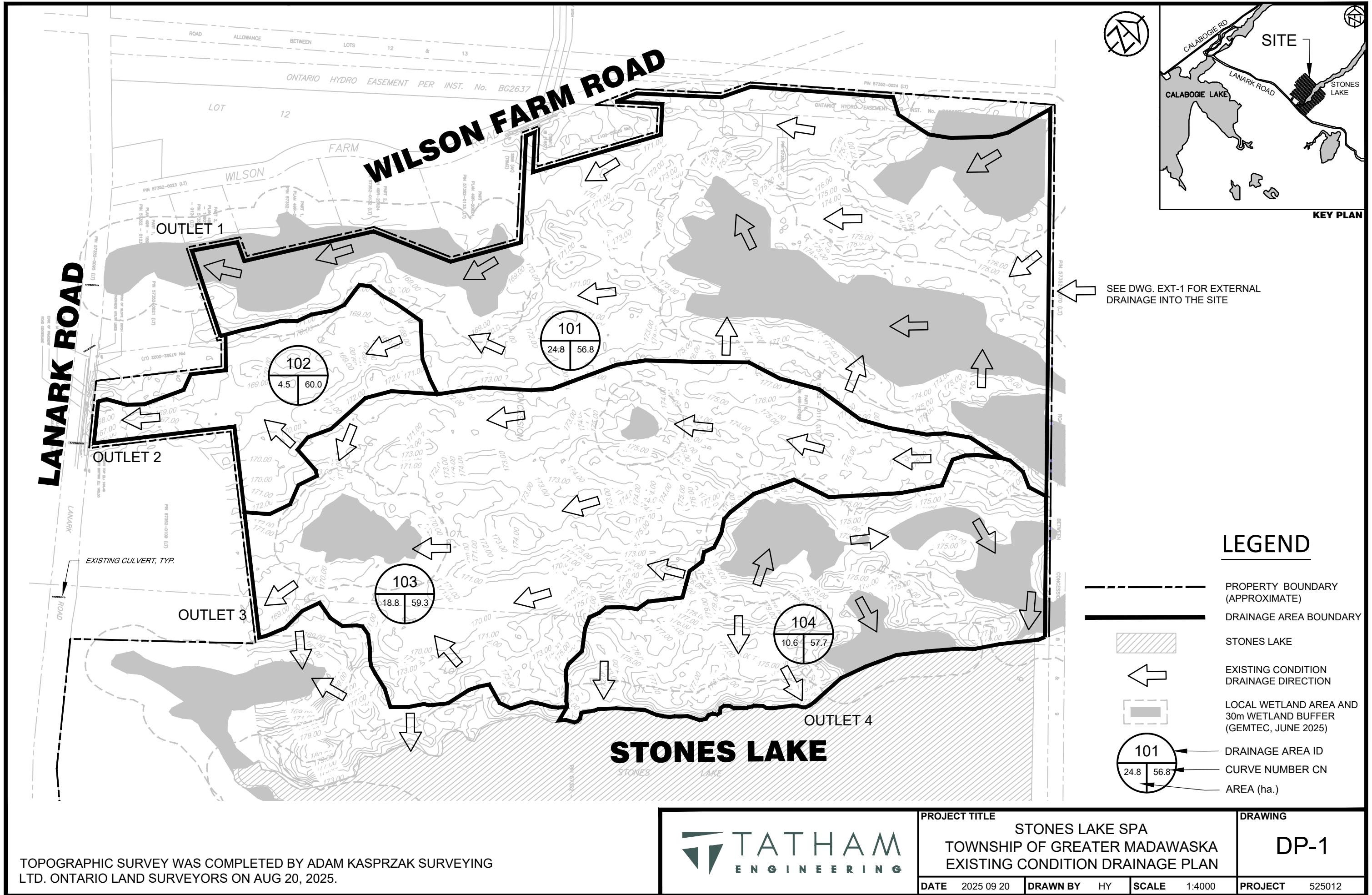
9 Summary

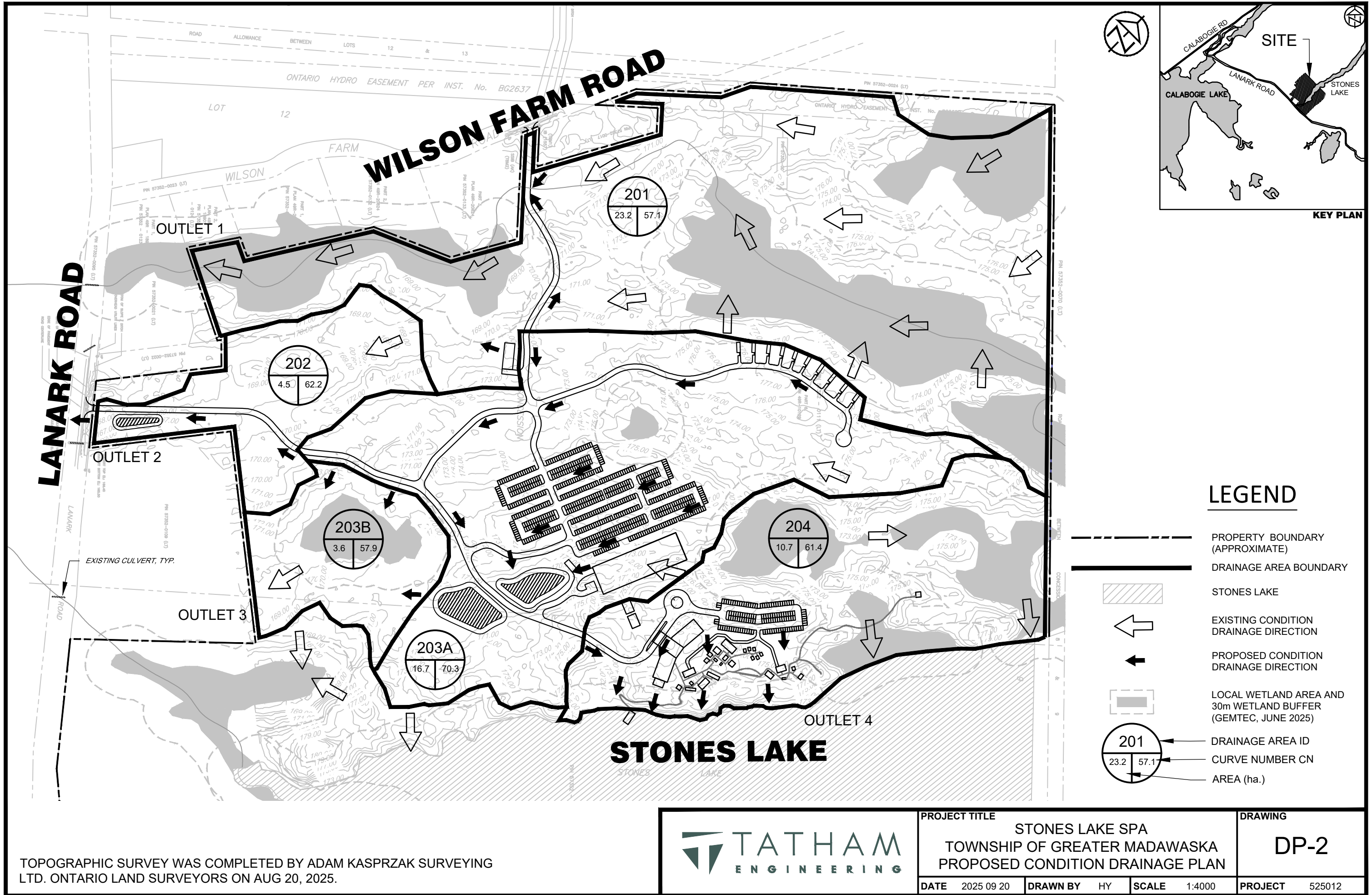
The proposed SWM plan demonstrates how existing drainage conditions will generally be maintained to the existing surface water outlets. Stormwater management facilities consisting of enhanced grassed swales in the road ditches and two dry ponds are proposed and are sufficient to provide MEP enhanced level water quality treatment and water quantity controls. At-source LID practices consisting of roof leaders directed to pervious areas will also be provided thereby providing a treatment train approach to water quality control. The detailed design of SWM plans for each outlet will be provided at the detailed design stage, however the work completed to date confirms that appropriate stormwater management can be provided to support the proposed development.

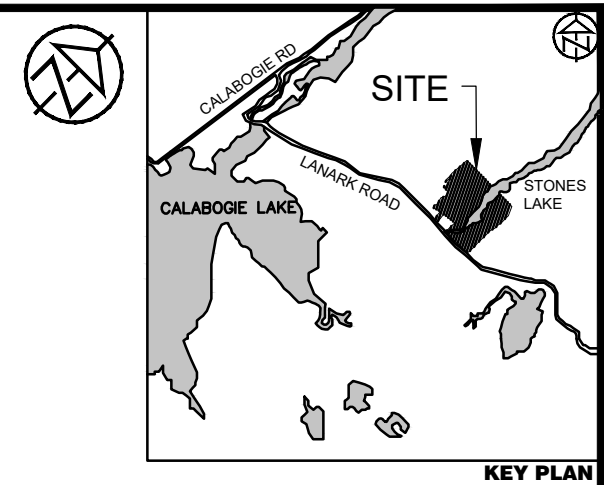
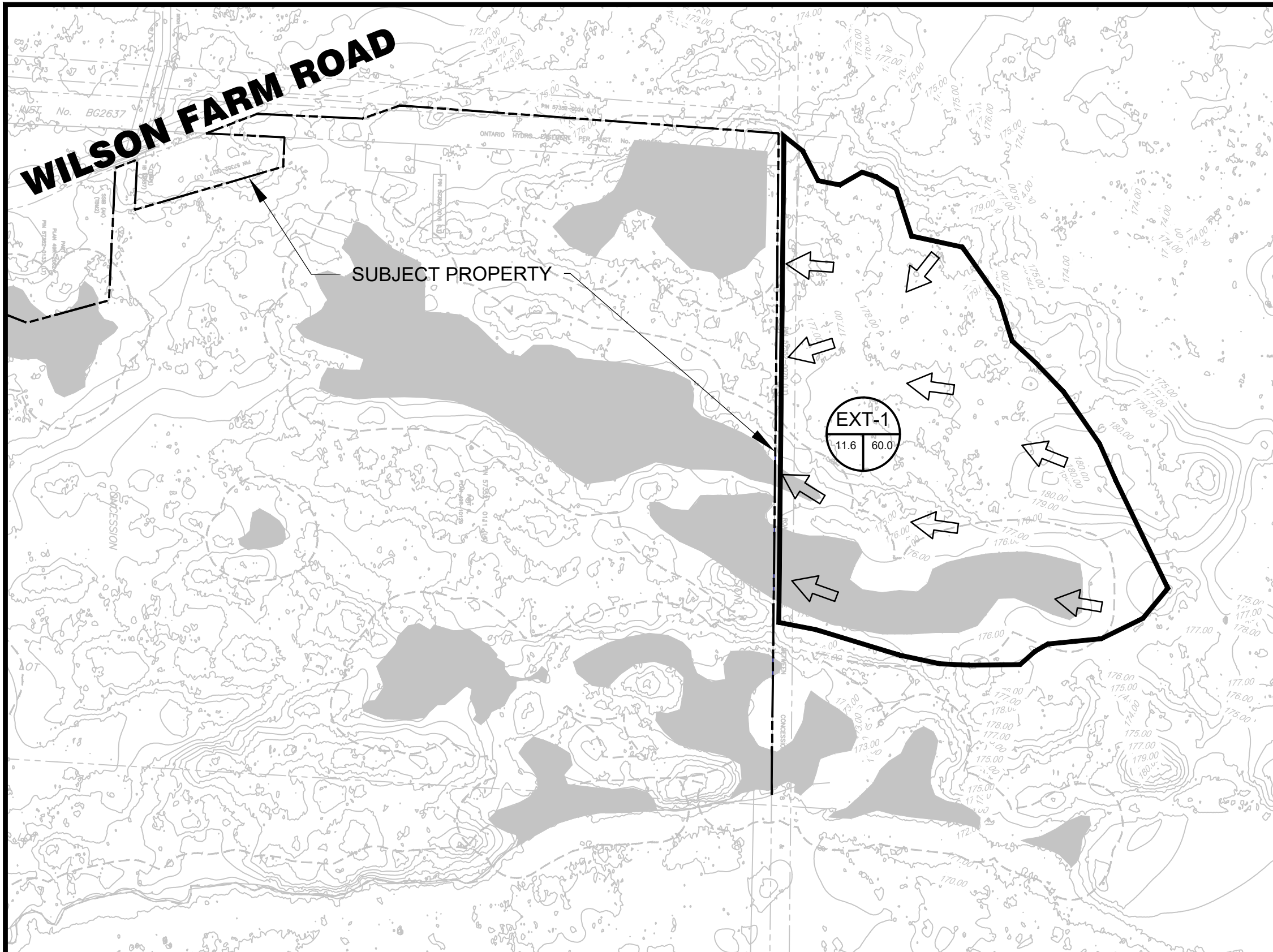
Siltation and erosion control will be provided with the proper construction mitigation efforts. Long-term erosion control will be enhanced with an effective revegetation strategy.

We trust this report demonstrates the feasibility of the proposed development as it relates to stormwater management and is sufficient to support the proposed zoning by law amendment application.









LEGEND

- PROPERTY BOUNDARY (APPROXIMATE)
- DRAINAGE AREA BOUNDARY
- STONES LAKE
- EXISTING CONDITION DRAINAGE DIRECTION
- LOCAL WETLAND AREA AND 30m WETLAND BUFFER (GEMTEC, JUNE 2025)
- DRAINAGE AREA ID
- CURVE NUMBER CN
- AREA (ha.)

TOPOGRAPHIC INFORMATION SHOWN FROM LAND INFORMATION ONTARIO (2014)



PROJECT TITLE
STONES LAKE SPA
TOWNSHIP OF GREATER MADAWASKA
EXTERNAL DRAINAGE PLAN

DRAWING
EXT-1

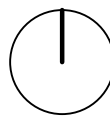
DATE	2025 09 20	DRAWN BY	HY	SCALE	1:4000	PROJECT	525012
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STONES LAKE RESORT AND SPA

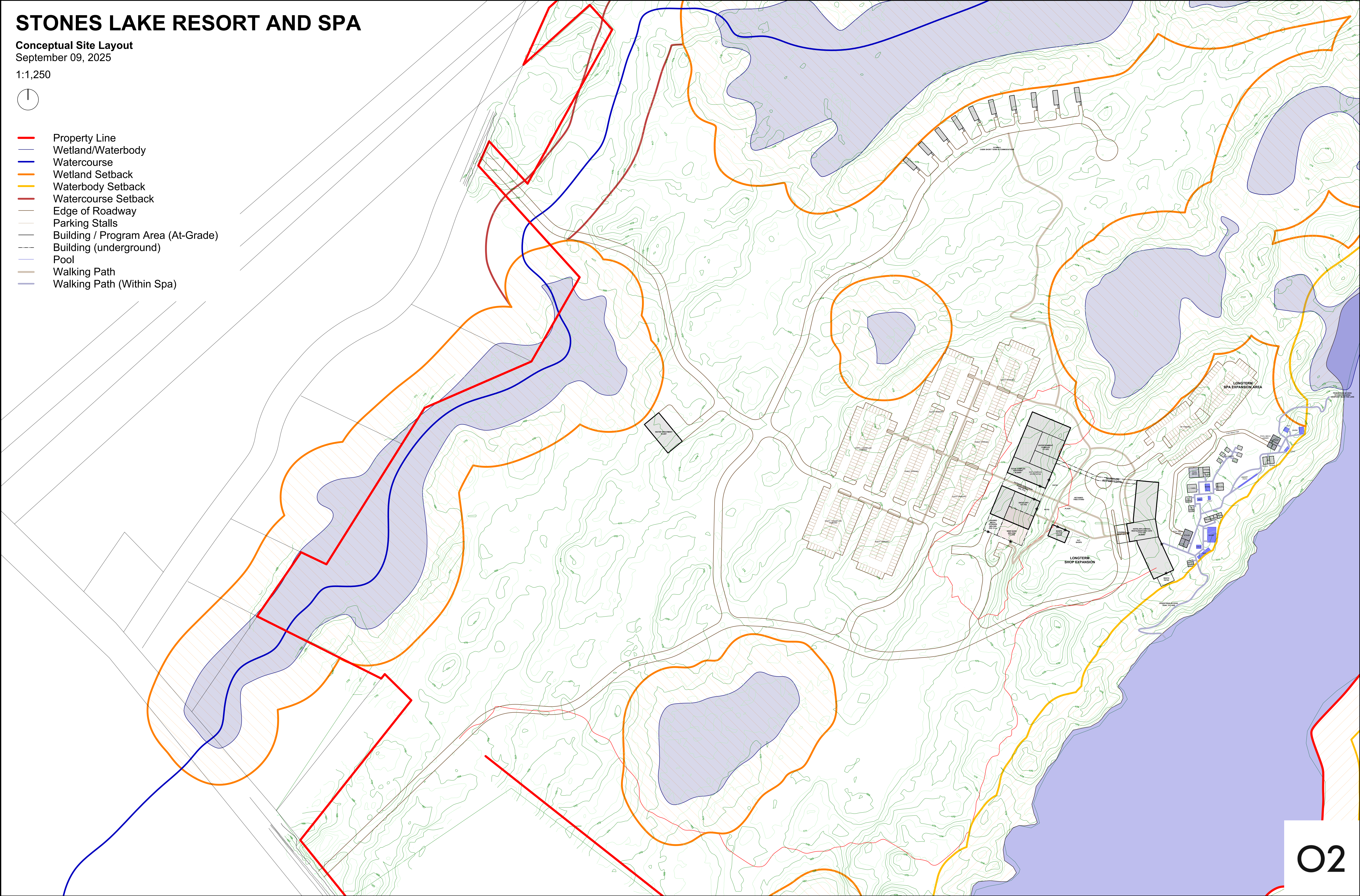
Conceptual Site Layout

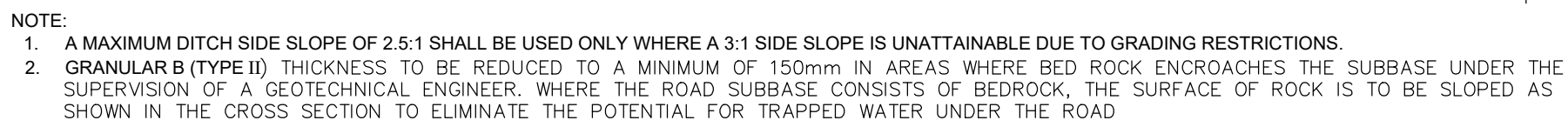
September 09, 2025

1:1,250



- Property Line
- Wetland/Waterbody
- Watercourse
- Wetland Setback
- Waterbody Setback
- Watercourse Setback
- Edge of Roadway
- Parking Stalls
- Building / Program Area (At-Grade)
- Building (underground)
- Pool
- Walking Path
- Walking Path (Within Spa)





- SURVEY**
TOPOGRAPHIC SURVEY COMPLETED BY ADAM KASPRZAK SURVEYING LTD. ON JUL
22, 2025.

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DESIGN BY HY	DRAWN BY HY	CHECKED BY JA
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STAMP

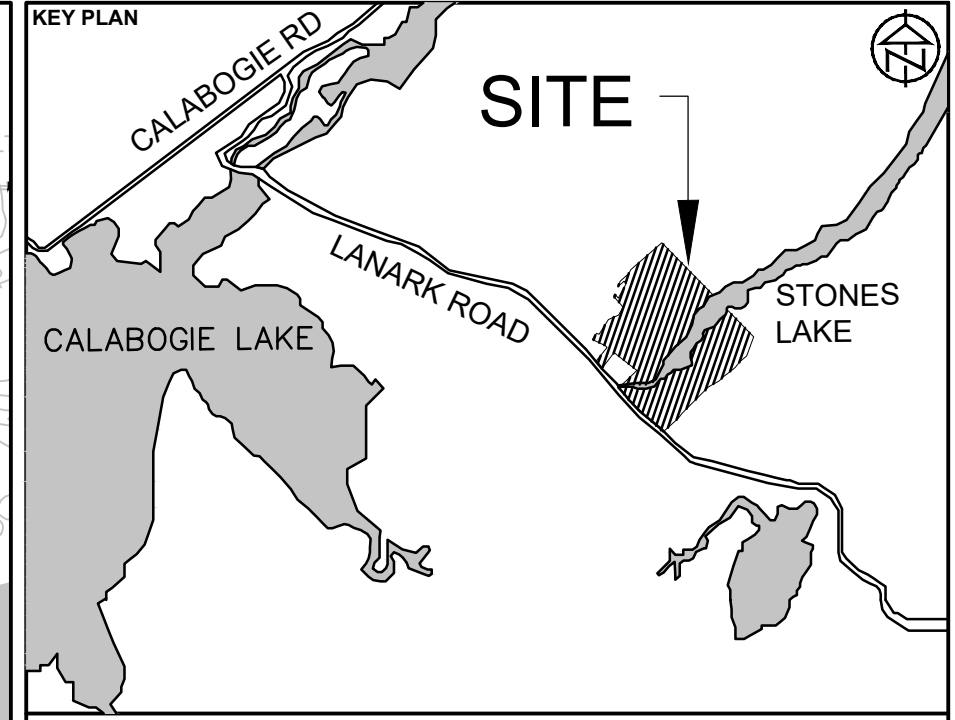
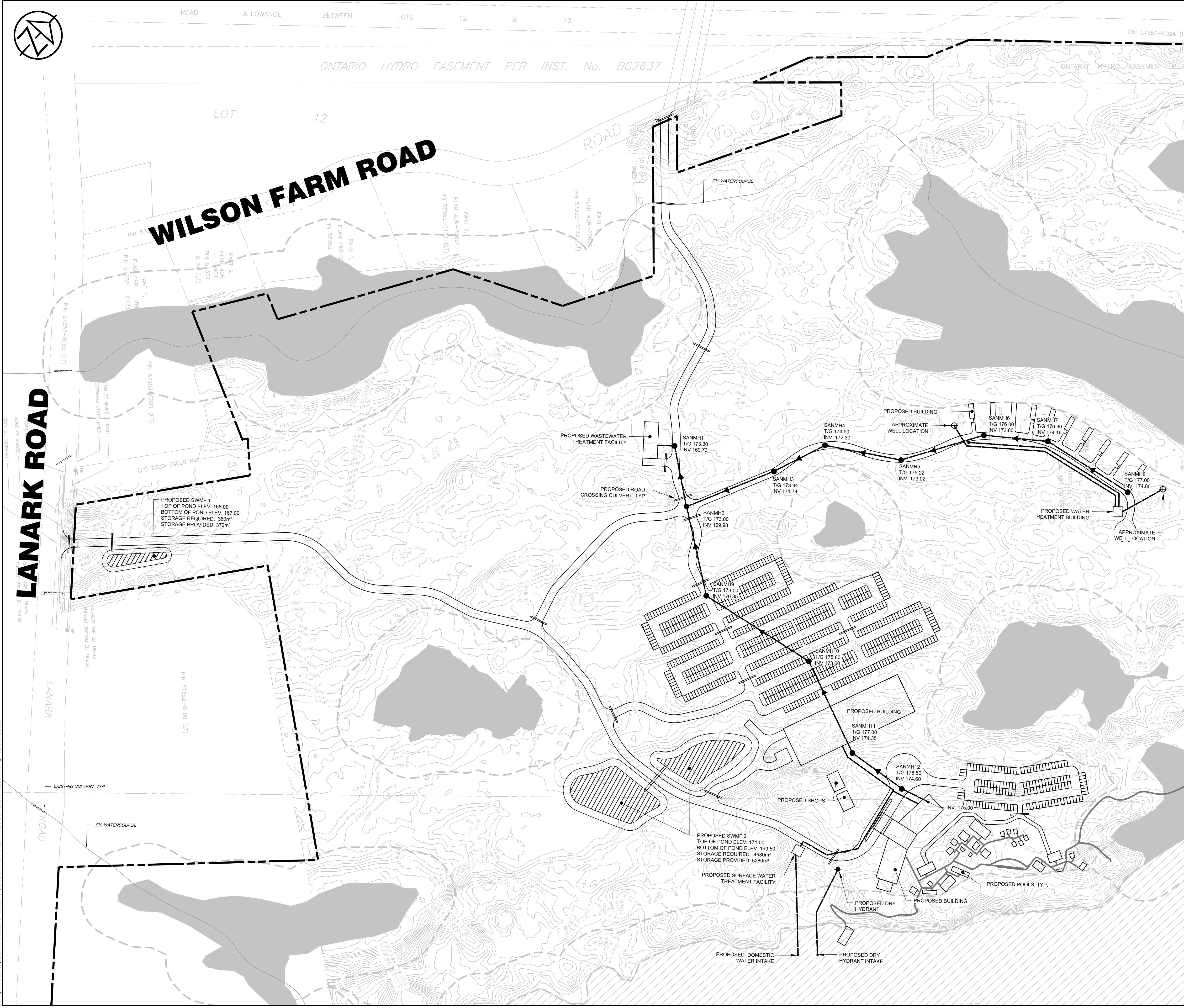


PROJECT TITLE	
---------------	--

DRAWING TITLE

PROJECT	SCALE	DRAWING
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SG-1



- LEGEND**
- EXISTING ELEVATION
 - PROPOSED WATERMAIN
 - PROPOSED SANITARY SEWER
 - LOCAL WETLAND AREA AND 30m WETLAND BUFFER (GEMTEC, JUNE 2025)
 - PROPERTY BOUNDARY (APPROXIMATE)

SURVEY
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VERSION	DATE
1 ISSUED FOR ZBA APPROVAL	2025 09 19

DESIGN BY HY	DRAWN BY HY	CHECKED BY JA
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STAMP



COLLINGWOOD - BRACEBRIDGE - ORILLIA - BARRIE - OTTAWA - GUELPH

PROJECT TITLE
STONES LAKE SPA
TOWNSHIP OF GREATER
MADAWASKA

DRAWING TITLE
PRELIMINARY
SITE SERVICING PLAN

PROJECT	SCALE	DRAWING
525012	1:1500	SS-1

Drawing Path: C:\Users\hy\OneDrive\My Desktop\525012 - Stones Lake Spa - Township of Greater Madawaska\CD\Design\Main\525012-SS01.dwg, Printed: Sep 25, 2025

Appendix A: Sewage Design Flow Calculations

Sewage Flow & Septic Tank Sizing

Tatham File No. : 525012
Project : Stones Lake Resort and Spa
Date : September 24, 2025
Designed by : AA
Checked by : JA

Building Structure Description

- One Resort Hotel (200 units)
- One Wine Bank & Underground Storage and Service Building (12 WC)
- Entertainment Building- Commercial Leisure Space
- One Retail Store
- One Staff Housing Building (Above Retail)
- One Distillery / Restaurant
- Small Dispersed Cabins (10 Units)
- Spa Exterior Buildings

Applicable types of establishment for septic design:

- Dwellings (OBC Table 8.2.1.3.A. Item 4.i);
- Warehouse (OBC Table 8.2.1.3.B. Item 26.a)
- Stores (OBC Table 8.2.1.3.B. Item 22.a)
- Dwellings (OBC Table 8.2.1.3.A. Item 4.b)
- Food service Operations (OBC Table 8.2.1.3.B. Item 12.i)
- Swimming and Bathing Facilities (as per OBC Table 8.2.1.3.B. Item 23)

Daily Design Flow

Daily Design Flow from Dwellings/Warehouse/Stores/Food Service

$$\begin{aligned}
 &= 500 \text{ L per each bedroom over 5 (as per OBC Table 8.2.1.3.A. Item 4.i)} \\
 &= (200 \text{ Units}) * 500 \text{ L} \\
 &= 100,000 \quad \text{L/d} \\
 &+ \\
 &= 950 \text{ L per warehouse water closets (as per OBC Table 8.2.1.3.B. Item 26.a)} \\
 &= (12 \text{ WC}) * 950 \\
 &= 11,400 \quad \text{L/d} \\
 &+ \\
 &= 5 \text{ L per store } 1.0 \text{ m}^2 \text{ of floor area (as per OBC Table 8.2.1.3.B. Item 22.a)} \\
 &= (4134) * 5 \text{ L} \\
 &= 20,670 \quad \text{L/d} \\
 &+ \\
 &= 5 \text{ L per store } 1.0 \text{ m}^2 \text{ of floor area (as per OBC Table 8.2.1.3.B. Item 22.a)} \\
 &= (139) * 5 \text{ L} \\
 &= 695 \quad \text{L/d} \\
 &+ \\
 &= 1100 \text{ L per 2 bedroom dwelling (as per OBC Table 8.2.1.3.A. Item 4.b)} \\
 &= 2 \text{ bedroom dwelling} \\
 &= 1,100 \quad \text{L/d} \\
 &+ \\
 &= 190 \text{ L per } 9.25 \text{ m}^2 \text{ of food service operation floor area (as per OBC Table 8.2.1.3.B. Item 12.i)} \\
 &= (190 \text{ m}^2 / 9.25 \text{ m}^2) * 929 \text{ L} \\
 &= 19,082 \quad \text{L/d} \\
 &+ \\
 &= 500 \text{ L per each bedroom over 5 (as per OBC Table 8.2.1.3.A. Item 4.i)} \\
 &= (10 \text{ Units}) * 500 \text{ L} \\
 &= 5,000 \quad \text{L/d} \\
 &+ \\
 &= 40 \text{ L per person swimming and bathing facility (as per OBC Table 8.2.1.3.B. Item 23)} \\
 &= 1000 \text{ people} * 40 \text{ L} \quad \quad \quad (\text{Assumed population 1000}) \\
 &= 40,000 \quad \text{L/d}
 \end{aligned}$$

Inflow and Infiltration Flow

$$\begin{aligned}
 &= \text{Inflow and Infiltration Flow area m}^2 * 0.28 \text{ L/s/ha} \\
 &\quad \text{Total building area} = 6,666 \text{ m}^2 \\
 &\quad \text{Total sewer length area} = 15,840 \text{ m}^2 \text{ (total sewer length} = 792 \text{ m} \times 20 \text{ m, i.e 10 m on either side of the sewer)} \\
 &\quad \text{Total inflow and infiltration area} = 22,506 \text{ m}^2 \\
 &= 22,506 \text{ m}^2 * 0.28 \text{ L/s/ha} \\
 &= 54447 \quad \text{L/d}
 \end{aligned}$$

$$\text{Total Daily Design Flow (Q)} = 252,394 \quad \text{L/d}$$

From: Brad Gaffney <bgaffney@newterra.com>
Sent: Thursday, October 2, 2025 4:18 PM
To: Guillaume Courtois <gcourtois@tathameng.com>
Cc: Christine McCuaig <christine@q9planning.com>; rump96@gmail.com
Subject: RE: Civil Meeting Follow Up - Stone Lake

CAUTION: This email originated from outside of Tatham Engineering or Envision-Tatham. Do not click on links or open attachments unless you know the sender and have verified the sender's email address and know the content is safe.

Hello Guillaume,

Thank you for the information regarding the sewage flow, based on that information we developed a process design using these assumptions:

- Total sewage flow in the attachment equals the maximum monthly flow (MMF)
- Total sewage flow plus extraneous flow equals the maximum daily flow (MDF)
- Annual average flow is 83% of MMF
- Medium-strength domestic wastewater
- Surface water discharge targets: BOD5 < 5 mg/L, TSS < 5 mg/L, TAN < 1 mg/L, TP < 0.1 mg/L

This aligns well with our Clear Cube 225. The system layout will be similar to the concept shown below, case study, and in the attachment 3D renders.

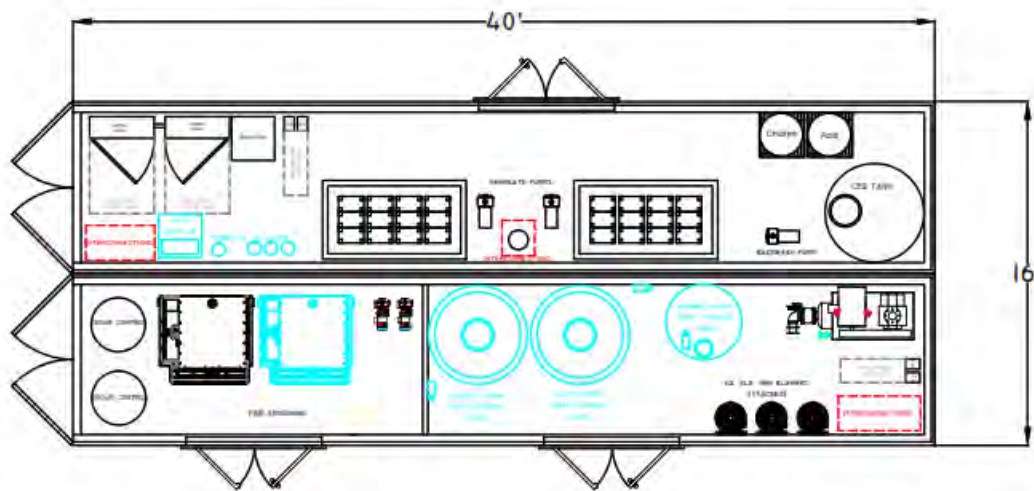
Let us know if you need more information for the appendix, we have built a number of these systems and can pull more details as needed.

Influent Flow Rate	Design Value	Metric Unit
Average Daily Flow (ADF)	225	m ³ /d
Maximum Month Flow (MMF)	270	m ³ /d

Maximum Daily Flow (MDF)	450	m ³ /d
Peak Instantaneous Flow (PIF)	56.25	m ³ /h

Influent Wastewater Characteristics	Design Value	Metric Unit
Chemical Oxygen Demand, COD, assumed	800	mg/L
Biochemical Oxygen Demand, BOD	400	mg/L
Total Suspended Solids, TSS	350	mg/L
Total Kjeldahl Nitrogen, TKN	70	mg/L
Ammonia nitrogen, NH ₄ -N	49	mg/L
Total Phosphorus, TP	10	mg/L
Fat, Oil and Grease, FOG	30	mg/L
Minimum water temperature	10	°C
Maximum water temperature	25	°C
Site elevation	100	m

Effluent Water Specification	Design Value	Metric Unit
cBOD ₅	< 5	mg/L
TSS	< 1	mg/L
NH ₄ -N	< 1	mg/L
TP	< 0.1	mg/L
DO	> 2	mg/L





Case Studies

Warehouse WWTP

Location: St. Thomas, Ontario

Capacity: 4,226 to 61,287 GPD (16 to 232 m³/day)

Startup Date: 2022

Newterra was contracted by a major Canadian Commercial Developer to supply a new wastewater treatment facility for a major online retail client who was looking for a logistically ideal location for their latest warehouse facility. The site was a former automobile assembly plant that had been returned to greenfield conditions including the decommissioning of the previous wastewater treatment plant.



The developer had previous experience supplying similar turnkey warehouses for this major online retail client. The new wastewater plant was meant to treat the domestic wastewater from the new warehouse facility and discharge the treated effluent into the municipal drain, which flows into a creek. The proposed system would have to handle a wide range of peak and off-peak flows, accommodating fluctuations in employee numbers and seasonal variations.

The developers felt the best solution for the project was the Clear3 MBR.ST-225 Sewage Treatment System by Newterra. This system was chosen for its ability to meet stringent effluent requirements, its tolerance to fluctuation of flows, and ease of constructability and installation.

The use of Newterra's MBR system allowed the customer to not only solve some of the constraints typically faced with a standard WWTP, but it also provided further benefits by streamlining operations and mitigating risks associated with maintenance and regulatory requirements.



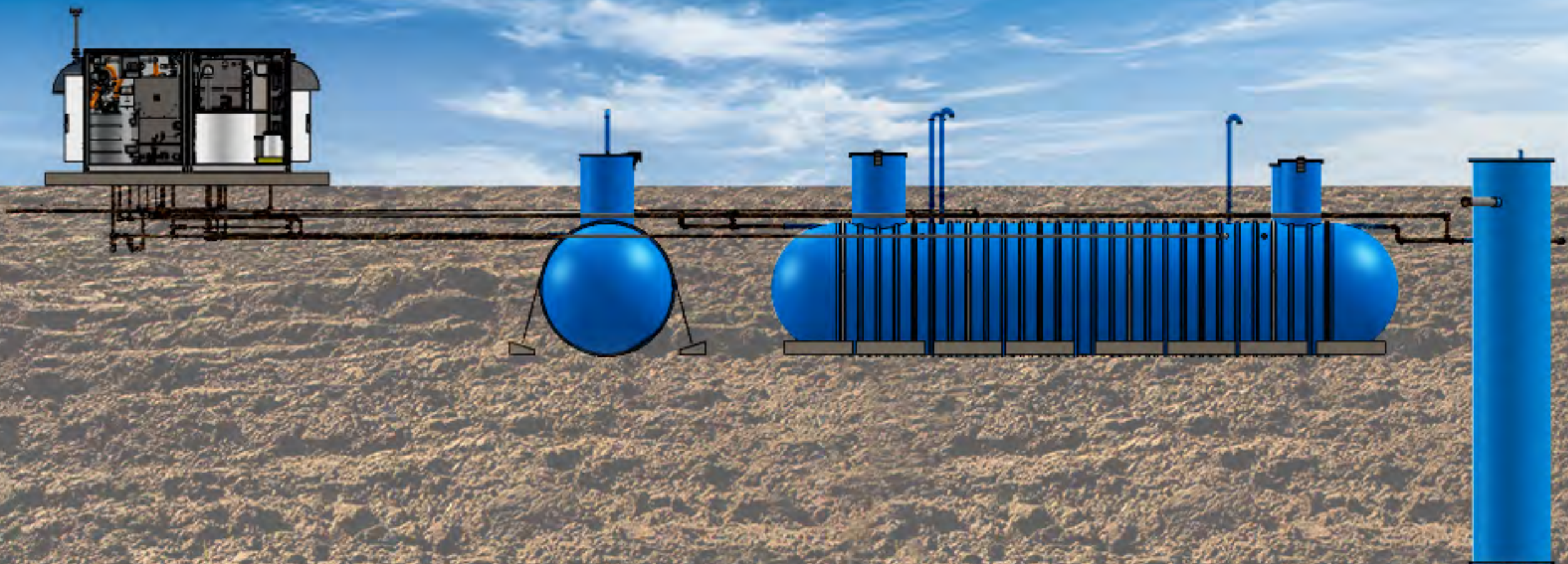
Kind Regards,

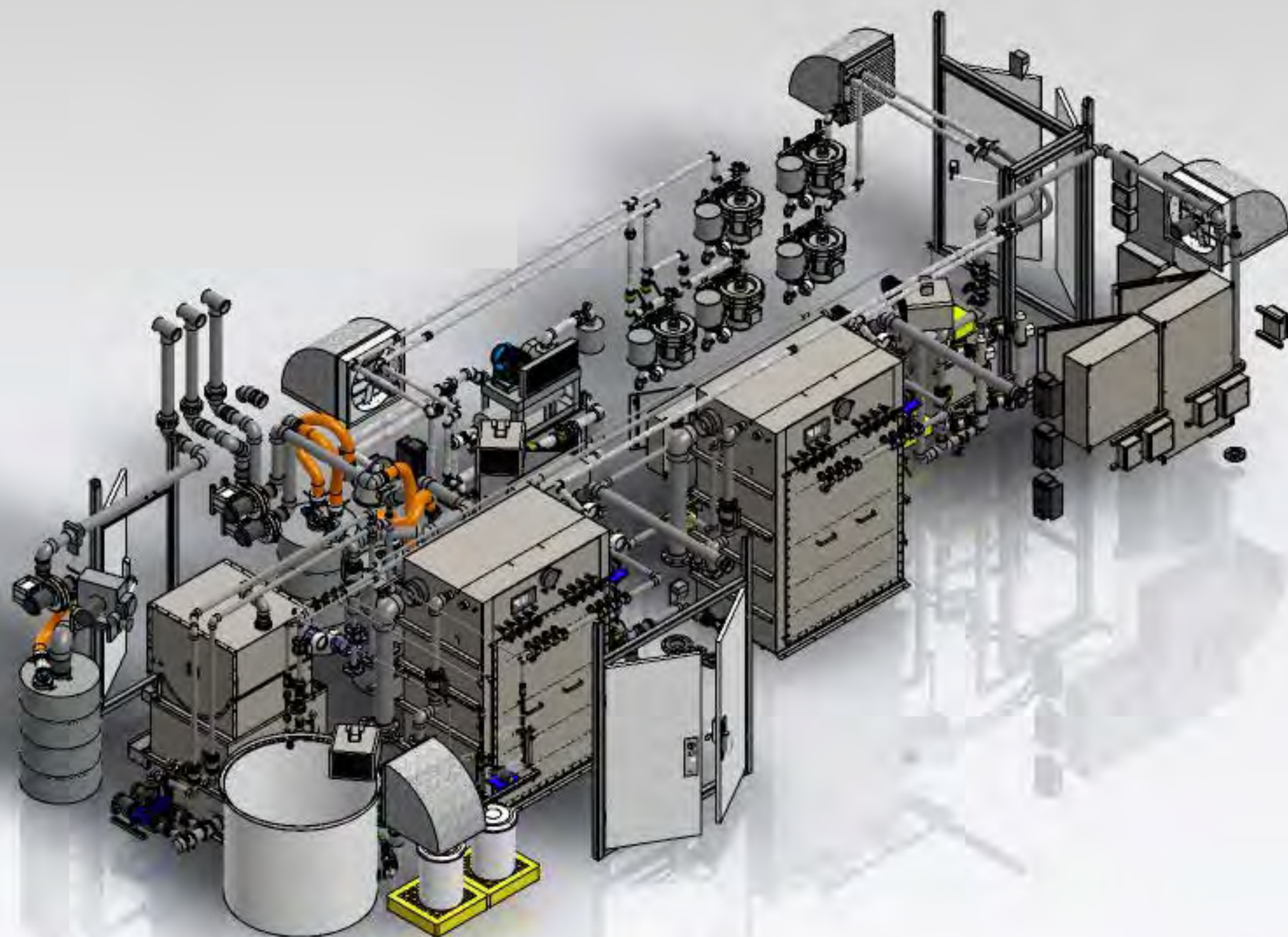
Brad Gaffney P.Eng

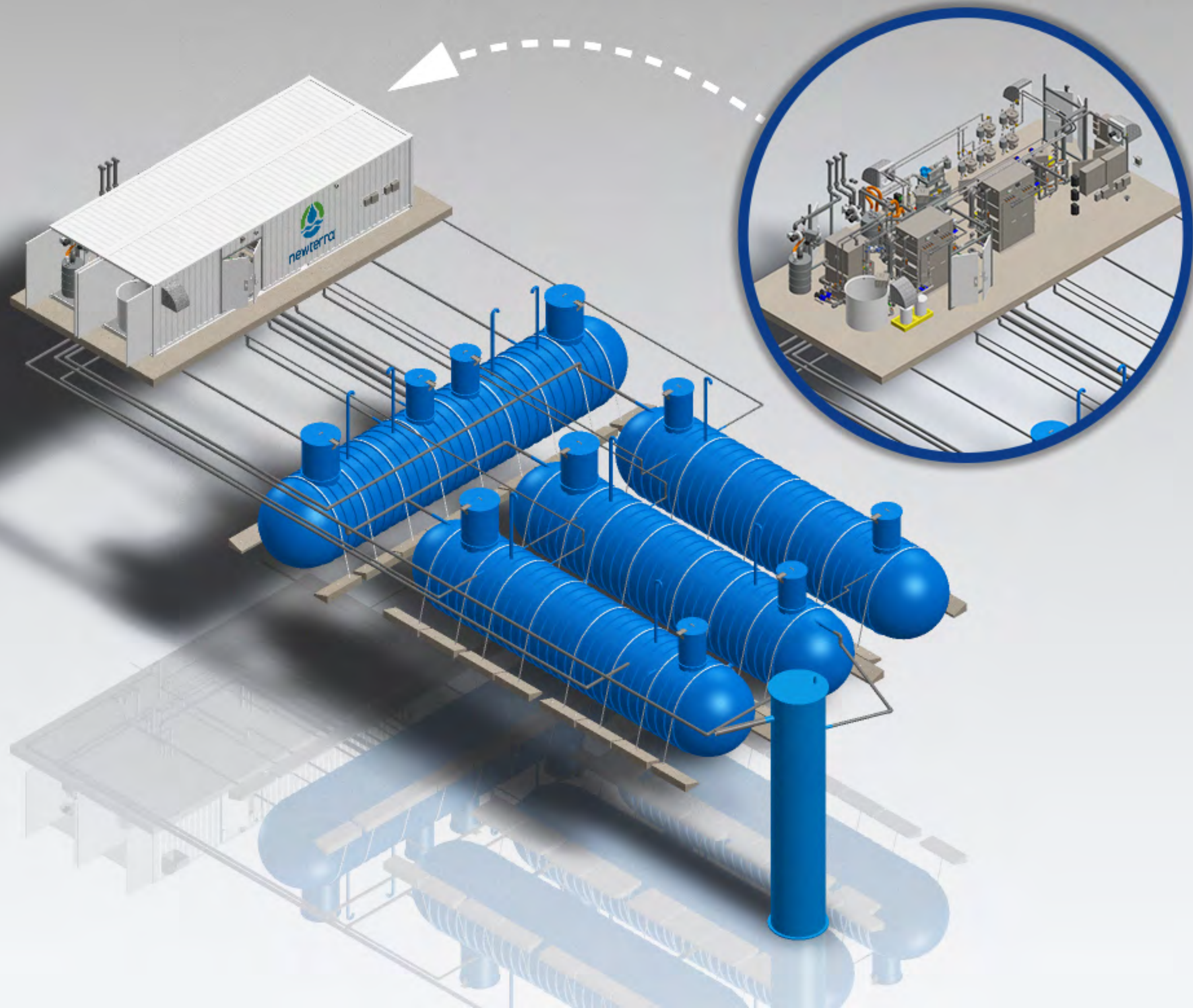
Regional Sales Manager

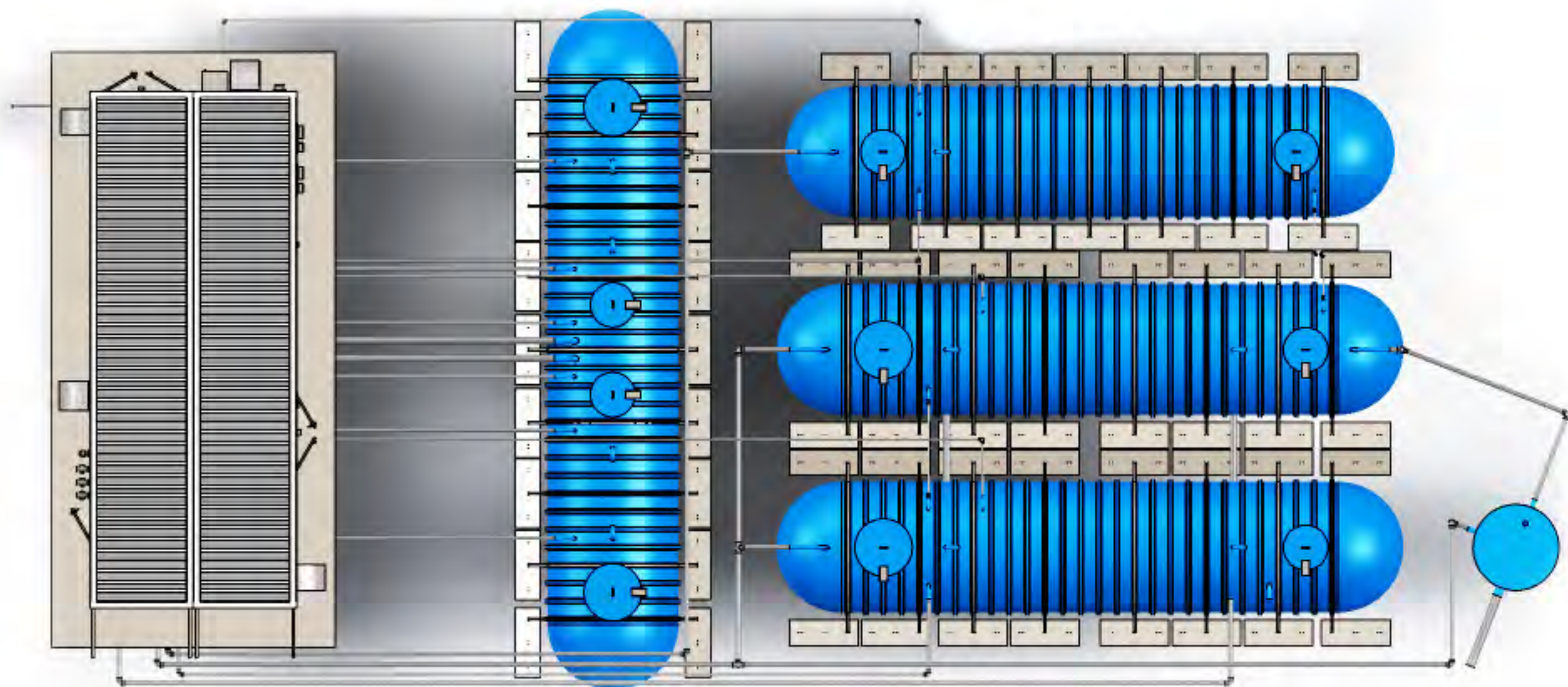
P: +1 800.420.4056 Ext: 236 | C: +1 613.803.5875

bgaffney@newterra.com | www.newterra.com









Appendix B: Domestic Water Demand Calculations



Water Demand Calculations

Tatham File No. : 525012
Project : Stone Lake Spa
Date : September 25, 2025
Designed by : DVF
Reviewed by : JA

Water Demands (OBC Type of Establishment Method)

Establishment	Max Day Population	Total Area (m ²)	Rate (L/d)	Total Daily Demand (L/d)	
Resort Hotel (200 units)	-	9476	500	100,000	
Wine Bank & Underground Storage and Service Building (12 WC)	-	3715	950	11,400	storage
Entertainment Building - Commercial Leisure Space	-	4134	5	20,670	
Retail	-	139	5	695	
Staff Housing Building (above retail)	2	139	1100	1,100	
Distillery / Restaurant	-	929	20.5	19,082	
Small Dispersed Cabins (10 units)	-	492	500	5,000	
Spa Exterior Buildings	1000		40	40,000	(Assumed population 1000)
Total				197,947	
Instantaneous Flow Rate	2.29	L/s	(Total Daily Demand Over 24hr Period)		

Appendix C: Stormwater Management Calculations

Project Details

Project Number	525012
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Data Sources

Detailed Soil Survey Reports for Ontario, MTO Drainage Management Manual (1997)

Prepared By

Name	HY
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Pre-Development Condition

Watershed:	N/A
Catchment ID:	EXT-1
Catchment Area (ha):	11.60
Impervious %:	

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

Soil Symbol		Tws-R											
Soil Series		Tweed											
Hydrologic Soils Group		B											
Soil Texture		Sand Loam or Rock											
Runoff Coefficient Type		2											
Area (ha)		11.60											
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	11.60	60	0.25									
Pasture/Lawns	5		69	0.28									
Meadows	8		65	0.27									
Cultivated	7		74	0.35									
Waterbody	12		50	0.05									
Average CN		60.00											
Average C		0.25											
Average IA		10.00											

Time to Peak Calculations

Max. Catchment Elev. (m):	179.20
Min. Catchment Elev. (m):	174.90
Catchment Length (m):	359
Catchment Slope (%):	1.20%
Method:	Airport Method
Time of Concentration (mins):	49.47

Summary

Catchment CN:	60.0
Catchment C:	0.25
Catchment IA (mm):	10.00
Time of Concentration (hrs):	0.82
Catchment Time to Peak (hrs):	0.55
Catchment Time Step (mins):	6.60

Project Details

Project Number	525012
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Data Sources

Detailed Soil Survey Reports for Ontario, MTO Drainage Management Manual (1997)

Prepared By

Name	HY
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Pre-Development Condition

Watershed:	N/A
Catchment ID:	101
Catchment Area (ha):	24.80
Impervious %:	

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

Soil Symbol		Tws-R											
Soil Series		Tweed											
Hydrologic Soils Group		B											
Soil Texture		Sand Loam or Rock											
Runoff Coefficient Type		2											
Area (ha)		24.80											
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	16.90	60	0.25									
Pasture/Lawns	5		69	0.28									
Meadows	8		65	0.27									
Cultivated	7		74	0.35									
Waterbody	12	7.90	50	0.05									
Average CN		56.81											
Average C		0.19											
Average IA		10.64											

Time to Peak Calculations

Max. Catchment Elev. (m):	173.50
Min. Catchment Elev. (m):	168.50
Catchment Length (m):	1080
Catchment Slope (%):	0.46%
Method:	Airport Method
Time of Concentration (mins):	126.21

Summary

Catchment CN:	56.8
Catchment C:	0.19
Catchment IA (mm):	10.64
Time of Concentration (hrs):	2.10
Catchment Time to Peak (hrs):	1.40
Catchment Time Step (mins):	16.83

Project Details

Project Number	525012
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Data Sources

Detailed Soil Survey Reports for Ontario, MTO Drainage Management Manual (1997)

Prepared By

Name	HY
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Pre-Development Condition

Watershed:	N/A
Catchment ID:	102
Catchment Area (ha):	4.50
Impervious %:	

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

Soil Symbol		Tws-R											
Soil Series		Tweed											
Hydrologic Soils Group		B											
Soil Texture		Sand Loam or Rock											
Runoff Coefficient Type		2											
Area (ha)		4.50											
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	4.50	60	0.25									
Pasture/Lawns	5		69	0.28									
Meadows	8		65	0.27									
Cultivated	7		74	0.35									
Waterbody	12		50	0.05									
Average CN		60.00											
Average C		0.25											
Average IA		10.00											

Time to Peak Calculations

Max. Catchment Elev. (m):	170.62
Min. Catchment Elev. (m):	165.90
Catchment Length (m):	424
Catchment Slope (%):	1.11%
Method:	Airport Method
Time of Concentration (mins):	55.07

Summary

Catchment CN:	60.0
Catchment C:	0.25
Catchment IA (mm):	10.00
Time of Concentration (hrs):	0.92
Catchment Time to Peak (hrs):	0.61
Catchment Time Step (mins):	7.34

Project Details

Project Number	525012
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Data Sources

Detailed Soil Survey Reports for Ontario, MTO Drainage Management Manual (1997)

Prepared By

Name	HY
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Pre-Development Condition

Watershed:	N/A
Catchment ID:	103
Catchment Area (ha):	18.80
Impervious %:	

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

Soil Symbol		Tws-R											
Soil Series		Tweed											
Hydrologic Soils Group		B											
Soil Texture		Sand Loam or Rock											
Runoff Coefficient Type		2											
Area (ha)		18.80											
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	17.95	60	0.25									
Pasture/Lawns	5		69	0.28									
Meadows	8		65	0.27									
Cultivated	7		74	0.35									
Waterbody	12	0.85	50	0.05									
Average CN		59.55											
Average C		0.24											
Average IA		10.09											

Time to Peak Calculations

Max. Catchment Elev. (m):	178.20
Min. Catchment Elev. (m):	168.00
Catchment Length (m):	1026
Catchment Slope (%):	0.99%
Method:	Airport Method
Time of Concentration (mins):	89.88

Summary

Catchment CN:	59.5
Catchment C:	0.24
Catchment IA (mm):	10.09
Time of Concentration (hrs):	1.50
Catchment Time to Peak (hrs):	1.00
Catchment Time Step (mins):	11.98

Project Details

Project Number	525012
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Data Sources

Detailed Soil Survey Reports for Ontario, MTO Drainage Management Manual (1997)

Prepared By

Name	HY
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Pre-Development Condition

Watershed:	N/A
Catchment ID:	104
Catchment Area (ha):	10.60
Impervious %:	

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

Soil Symbol		Tws-R											
Soil Series		Tweed											
Hydrologic Soils Group		B											
Soil Texture		Sand Loam or Rock											
Runoff Coefficient Type		2											
Area (ha)		10.60											
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	8.18	60	0.25									
Pasture/Lawns	5		69	0.28									
Meadows	8		65	0.27									
Cultivated	7		74	0.35									
Waterbody	12	2.42	50	0.05									
Average CN		57.72											
Average C		0.20											
Average IA		10.46											

Time to Peak Calculations

Max. Catchment Elev. (m):	176.00
Min. Catchment Elev. (m):	172.00
Catchment Length (m):	453
Catchment Slope (%):	0.88%
Method: Airport Method	
Time of Concentration (mins):	64.75

Summary

Catchment CN:	57.7
Catchment C:	0.20
Catchment IA (mm):	10.46
Time of Concentration (hrs):	1.08
Catchment Time to Peak (hrs):	0.72
Catchment Time Step (mins):	8.63

Project Details

Project Number	525012
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Data Sources

Detailed Soil Survey Reports for Ontario, MTO Drainage Management Manual (1997)

Prepared By

Name	HY
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Pre-Development Condition

Watershed:	N/A
Catchment ID:	201
Catchment Area (ha):	23.20
Impervious %:	1%

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

Soil Symbol		Tws-R											
Soil Series		Tweed											
Hydrologic Soils Group		B											
Soil Texture		Sand Loam or Rock											
Runoff Coefficient Type		2											
Area (ha)		23.20											
Percentage of Catchment		100%											
Land Cover Category	IA	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C
Impervious	2	0.26	100	0.95									
Gravel	3		89	0.27									
Woodland	10	14.89	60	0.25									
Pasture/Lawns	5	0.14	69	0.28									
Meadows	8		65	0.27									
Cultivated	7		74	0.35									
Waterbody	12	7.90	50	0.05									
Average CN		57.10											
Average C		0.19											
Average IA		10.56											

Time to Peak Calculations

Max. Catchment Elev. (m):	173.50
Min. Catchment Elev. (m):	168.50
Catchment Length (m):	1080
Catchment Slope (%):	0.46%
Method:	Airport Method
Time of Concentration (mins):	125.70

Summary

Catchment CN:	57.1
Catchment C:	0.19
Catchment IA (mm):	10.56
Time of Concentration (hrs):	2.10
Catchment Time to Peak (hrs):	1.40
Catchment Time Step (mins):	16.76

Project Details

Project Number	525012
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Data Sources

Detailed Soil Survey Reports for Ontario, MTO Drainage Management Manual (1997)

Prepared By

Name	HY
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Pre-Development Condition

Watershed:	N/A
Catchment ID:	202
Catchment Area (ha):	4.50
Impervious %:	5%

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

Soil Symbol		Tws-R											
Soil Series		Tweed											
Hydrologic Soils Group		B											
Soil Texture		Sand Loam or Rock											
Runoff Coefficient Type		2											
Area (ha)		4.50											
Percentage of Catchment		100%											
Land Cover Category	IA	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C
Impervious	2	0.22	100	0.95									
Gravel	3		89	0.27									
Woodland	10	4.14	60	0.25									
Pasture/Lawns	5	0.15	69	0.28									
Meadows	8		65	0.27									
Cultivated	7		74	0.35									
Waterbody	12		50	0.05									
Average CN		62.21											
Average C		0.28											
Average IA		9.45											

Time to Peak Calculations

Max. Catchment Elev. (m):	170.62
Min. Catchment Elev. (m):	165.90
Catchment Length (m):	424
Catchment Slope (%):	1.11%
Method:	Airport Method
Time of Concentration (mins):	52.84

Summary

Catchment CN:	62.2
Catchment C:	0.28
Catchment IA (mm):	9.45
Time of Concentration (hrs):	0.88
Catchment Time to Peak (hrs):	0.59
Catchment Time Step (mins):	7.04

Project Details

Project Number	525012
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Data Sources

Detailed Soil Survey Reports for Ontario, MTO Drainage Management Manual (1997)

Prepared By

Name	HY
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Pre-Development Condition

Watershed:	N/A
Catchment ID:	203
Catchment Area (ha):	16.70
Impervious %:	24%

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

Soil Symbol		Tws-R											
Soil Series		Tweed											
Hydrologic Soils Group		B											
Soil Texture		Sand Loam or Rock											
Runoff Coefficient Type		2											
Area (ha)		16.70											
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	4.04	100	0.95									
Gravel	3		89	0.27									
Woodland	10	11.32	60	0.25									
Pasture/Lawns	5	1.24	69	0.28									
Meadows	8		65	0.27									
Cultivated	7		74	0.35									
Waterbody	12	0.10	50	0.05									
Average CN		70.28											
Average C		0.42											
Average IA		7.71											

Time to Peak Calculations

Max. Catchment Elev. (m):	178.20
Min. Catchment Elev. (m):	168.00
Catchment Length (m):	1026
Catchment Slope (%):	0.99%
Method:	Bransby-Williams Formula
Time of Concentration (mins):	44.18

Summary

Catchment CN:	70.3
Catchment C:	0.42
Catchment IA (mm):	7.71
Time of Concentration (hrs):	0.74
Catchment Time to Peak (hrs):	0.49
Catchment Time Step (mins):	5.89

Project Details

Project Number	525012
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Data Sources

Detailed Soil Survey Reports for Ontario, MTO Drainage Management Manual (1997)

Prepared By

Name	HY
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Pre-Development Condition

Watershed:	N/A
Catchment ID:	203
Catchment Area (ha):	3.60
Impervious %:	

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

Soil Symbol		Tws-R											
Soil Series		Tweed											
Hydrologic Soils Group		B											
Soil Texture		Sand Loam or Rock											
Runoff Coefficient Type		2											
Area (ha)		3.60											
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	2.85	60	0.25									
Pasture/Lawns	5		69	0.28									
Meadows	8		65	0.27									
Cultivated	7		74	0.35									
Waterbody	12	0.75	50	0.05									
Average CN		57.92											
Average C		0.21											
Average IA		10.42											

Time to Peak Calculations

Max. Catchment Elev. (m):	170.00
Min. Catchment Elev. (m):	168.00
Catchment Length (m):	267
Catchment Slope (%):	0.75%
Method: Airport Method	
Time of Concentration (mins):	52.25

Summary

Catchment CN:	57.9
Catchment C:	0.21
Catchment IA (mm):	10.42
Time of Concentration (hrs):	0.87
Catchment Time to Peak (hrs):	0.58
Catchment Time Step (mins):	6.97

Project Details

Project Number	525012
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Data Sources

Detailed Soil Survey Reports for Ontario, MTO Drainage Management Manual (1997)

Prepared By

Name	HY
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Pre-Development Condition

Watershed:	N/A
Catchment ID:	204
Catchment Area (ha):	10.70
Impervious %:	9%

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

Soil Symbol		Tws-R											
Soil Series		Tweed											
Hydrologic Soils Group		B											
Soil Texture		Sand Loam or Rock											
Runoff Coefficient Type		2											
Area (ha)		10.70											
Percentage of Catchment		100%											
Land Cover Category	IA	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C
Impervious	2	0.94	100	0.95									
Gravel	3		89	0.27									
Woodland	10	7.18	60	0.25									
Pasture/Lawns	5	0.15	69	0.28									
Meadows	8		65	0.27									
Cultivated	7		74	0.35									
Waterbody	12	2.42	50	0.05									
Average CN		61.39											
Average C		0.27											
Average IA		9.68											

Time to Peak Calculations

Max. Catchment Elev. (m):	176.00
Min. Catchment Elev. (m):	172.00
Catchment Length (m):	453
Catchment Slope (%):	0.88%
Method:	Airport Method
Time of Concentration (mins):	60.23

Summary

Catchment CN:	61.4
Catchment C:	0.27
Catchment IA (mm):	9.68
Time of Concentration (hrs):	1.00
Catchment Time to Peak (hrs):	0.67
Catchment Time Step (mins):	8.03



Project :	Stones Lake Resort and Spa
File No.:	525012
Date:	Sep-25
Designed by:	HY
Checked By:	JA
Subject:	Impervious Area Calculations

Impervious Area Calculations		Grass Area
201	Area (ha)	Area (ha)
Road	0.214	
Building	0.048	
Parking	0.00	
Total Impervious Area (ha)	0.26	0.145
202	Area (ha)	
Road	0.216	
Building	0.000	
Parking	0.000	
Total Impervious Area (ha)	0.22	0.146
203	Area (ha)	
Road	1.832	
Building	0.441	
Parking	1.77	
Total Impervious Area (ha)	4.04	1.239
204	Area (ha)	
Road	0.227	
Building	0.178	
Parking	0.347	
Miscellaneous	0.190	
Total Impervious Area (ha)	0.94	0.154

	Project :	Stones Lake Spa
	File No.	525012
	Date:	Sep-25
	Designed By:	HY
	Checked By:	JA
	Subject:	SWM Facility 1

Dry Pond Storage

Elevation	Depth	Increasing Area	Accum Area	Volume	Storage Volume ¹
(m)	(m)	(m ²)	(m ²)	(m ³)	(m ³)
166.00	0.00	0.00	380.00	0.00	0.00
166.05	0.05	19.65	399.65	19.49	19.49
166.10	0.10	20.14	419.79	20.48	39.97
166.15	0.15	20.64	440.42	21.50	61.48
166.20	0.20	21.13	461.56	22.55	84.02
166.25	0.25	21.63	483.18	23.62	107.64
166.30	0.30	22.12	505.30	24.71	132.35
166.35	0.35	22.62	527.92	25.83	158.18
166.40	0.40	23.11	551.03	26.97	185.15
166.45	0.45	23.61	574.64	28.14	213.29
166.50	0.50	24.10	598.74	29.33	242.62
166.55	0.55	24.60	623.34	30.55	273.17
166.60	0.60	25.09	648.43	31.79	304.96
166.65	0.65	25.59	674.02	33.06	338.02
166.70	0.70	26.08	700.10	34.35	372.38
166.75	0.75	26.58	726.68	35.67	408.04
166.80	0.80	27.07	753.76	37.01	445.05
166.85	0.85	27.57	781.32	38.37	483.43
166.90	0.90	28.06	809.39	39.77	523.19
166.95	0.95	28.56	837.95	41.18	564.37
167.00	1.00	29.05	867.00	42.62	607.00

	Project :	Stones Lake Spa
	File No.	525012
	Date:	Sep-25
	Designed By:	HY
	Checked By:	JA
	Subject:	SWM Facility 2

Pond Storage 1

Elevation	Depth	Increasing Area	Accum Area	Volume	Storage Volume ¹
(m)	(m)	(m ²)	(m ²)	(m ³)	(m ³)
169.50	0.00	0.00	1371.00	0.00	0.00
169.55	0.05	32.24	1403.24	69.35	69.35
169.60	0.10	32.61	1435.85	70.98	140.33
169.65	0.15	32.98	1468.83	72.62	212.95
169.70	0.20	33.36	1502.19	74.27	287.22
169.75	0.25	33.73	1535.92	75.95	363.17
169.80	0.30	34.11	1570.03	77.65	440.82
169.85	0.35	34.48	1604.51	79.36	520.18
169.90	0.40	34.86	1639.37	81.10	601.28
169.95	0.45	35.23	1674.60	82.85	684.12
170.00	0.50	35.61	1710.21	84.62	768.74
170.05	0.55	35.98	1746.19	86.41	855.15
170.10	0.60	36.36	1782.55	88.22	943.37
170.15	0.65	36.73	1819.28	90.04	1033.41
170.20	0.70	37.10	1856.38	91.89	1125.30
170.25	0.75	37.48	1893.86	93.75	1219.06
170.30	0.80	37.85	1931.71	95.64	1314.69
170.35	0.85	38.23	1969.94	97.54	1412.23
170.40	0.90	38.60	2008.55	99.46	1511.69
170.45	0.95	38.98	2047.52	101.40	1613.09
170.50	1.00	39.35	2086.88	103.36	1716.45
170.55	1.05	39.73	2126.60	105.34	1821.79
170.60	1.10	40.10	2166.70	107.33	1929.12
170.65	1.15	40.48	2207.18	109.35	2038.46
170.70	1.20	40.85	2248.03	111.38	2149.84
170.75	1.25	41.23	2289.26	113.43	2263.27
170.80	1.30	41.60	2330.86	115.50	2378.77
170.85	1.35	41.97	2372.83	117.59	2496.37
170.90	1.40	42.35	2415.18	119.70	2616.06
170.95	1.45	42.72	2457.90	121.83	2737.89
171.00	1.50	43.10	2501.00	123.97	2861.86

Pond Storage 2

Elevation	Depth	Increasing Area	Accum Area	Volume	Storage Volume ¹
(m)	(m)	(m ²)	(m ²)	(m ³)	(m ³)
169.50	0.00	0.00	2145.00	0.00	0.00
169.55	0.05	36.34	2181.34	108.16	108.16
169.60	0.10	36.65	2217.99	109.98	218.14
169.65	0.15	36.95	2254.94	111.82	329.96
169.70	0.20	37.26	2292.19	113.68	443.64

Total Volume
(m ³)
0.00
177.51
358.47
542.91
730.86

Water Quality Calculation (Catchment 201)

Enhanced 0.5 m Wide Flat Bottom Swale

Design Storms
25mm (m ³ /s)
0.019

Channel Depth	Channel Type	Manning's N	Base Width	Side Slopes	Max. Slope	Total Area (ha)	Area Contributing (ha)
1.00 m	Grass Ditch	0.035	0.50 m	3H : 1V	5.00%	23.200	0.105

Storm Conditions		Swale Flow Conditions					
Return Period	Peak Flow (m ³ /s)	Flow Depth	Area (m ²)	WP	R	Q (m ³ /s)	V (m/s)
25mm storm	0.0003	0.010	0.01	0.56	0.01	0.002	0.28
Comments:							
1. Area contributing is the total road area, 0.21 ha, divided by 2 (crowned road).							
2. MTO pro-rating methodology for obtaining peak flow is as per the equation below.							
3. V is lower than 0.5 m/s during the 25 mm storm.							

Mannings Equation

$$(1.00/n)AR^{2/3}S^{1/2}$$

Where Q = Peak Flow (m³)

n = Roughness Coefficient

A = Cross Sectional Area (m²)

R = Hydraulic Radius

S = Channel Slope (m/m)

MTO Pro-rating Methodology for Obtaining Peak Flow

$$Q_2 = Q_1(A_2/A_1)^{0.75}$$

Where Q₁ = Total Peak Flow for Catchment

Q₂ = Pro-Rated Peak Flow

A₁ = Total Area

A₂ = Area Contributing

Water Quality Calculation (Catchment 202)

Enhanced 0.5 m Wide Flat Bottom Swale

Design Storms
25mm (m ³ /s)
0.008

Channel Depth	Channel Type	Manning's n	Base Width	Side Slopes	Max. Slope	Total Area (ha)	Area Contributing (ha)
1.00 m	Grass Ditch	0.035	0.50 m	3H : 1V	4.20%	4.600	0.105

Storm Conditions		Swale Flow Conditions					
Return Period	Peak Flow (m ³ /s)	Flow Depth	Area (m ²)	WP	R	Q (m ³ /s)	V (m/s)
25mm storm	0.0005	0.010	0.01	0.56	0.01	0.001	0.26
Comments:							
1. Area contributing is the total road area, 0.21 ha, divided by 2 (crowned road).							
2. MTO pro-rating methodology for obtaining peak flow is as per the equation below.							
3. V is lower than 0.5 m/s during the 25 mm storm.							

Mannings Equation

$$(1.00/n)AR^{2/3}S^{1/2}$$

Where Q = Peak Flow (m³)

n = Roughness Coefficient

A = Cross Sectional Area (m²)

R = Hydraulic Radius

S = Channel Slope (m/m)

MTO Pro-rating Methodology for Obtaining Peak Flow

$$Q_2 = Q_1(A_2/A_1)^{0.75}$$

Where Q₁ = Total Peak Flow for Catchment

Q₂ = Pro-Rated Peak Flow

A₁ = Total Area

A₂ = Area Contributing

Water Quality Calculation (Catchment 203)

Enhanced 0.5 m Wide Flat Bottom Swale

Design Storms
25mm (m ³ /s)
0.288

Channel Depth	Channel Type	Manning's n	Base Width	Side Slopes	Max. Slope	Total Area (ha)	Area Contributing (ha)
1.00 m	Grass Ditch	0.035	0.50 m	3H : 1V	0.50%	16.700	0.915

Storm Conditions		Swale Flow Conditions					
Return Period	Peak Flow (m ³ /s)	Flow Depth	Area (m ²)	WP	R	Q (m ³ /s)	V (m/s)
25mm storm	0.0326	0.110	0.09	1.20	0.08	0.033	0.36
Comments:							
1. Area contributing is the total road area, 1.83 ha, divided by 2 (crowned road).							
2. MTO pro-rating methodology for obtaining peak flow is as per the equation below.							
3. V is lower than 0.5 m/s during the 25 mm storm.							

Mannings Equation

$$(1.00/n)AR^{2/3}S^{1/2}$$

Where Q = Peak Flow (m³)

n = Roughness Coefficient

A = Cross Sectional Area (m²)

R = Hydraulic Radius

S = Channel Slope (m/m)

MTO Pro-rating Methodology for Obtaining Peak Flow

$$Q_2 = Q_1(A_2/A_1)^{0.75}$$

Where Q₁ = Total Peak Flow for Catchment

Q₂ = Pro-Rated Peak Flow

A₁ = Total Area

A₂ = Area Contributing

Water Quality Calculation (Catchment 204)

Enhanced 0.5 m Wide Flat Bottom Swale

Design Storms
25mm (m ³ /s)
0.017

Channel Depth	Channel Type	Manning's n	Base Width	Side Slopes	Max. Slope	Total Area (ha)	Area Contributing (ha)
1.00 m	Grass Ditch	0.035	0.50 m	3H : 1V	3.00%	16.700	0.115

Storm Conditions		Swale Flow Conditions					
Return Period	Peak Flow (m ³ /s)	Flow Depth	Area (m ²)	WP	R	Q (m ³ /s)	V (m/s)
25mm storm	0.0004	0.010	0.01	0.56	0.01	0.001	0.22
Comments:							
1. Area contributing is the total road area, 0.23 ha, divided by 2 (crowned road).							
2. MTO pro-rating methodology for obtaining peak flow is as per the equation below.							
3. V is lower than 0.5 m/s during the 25 mm storm.							

Mannings Equation

$$(1.00/n)AR^{2/3}S^{1/2}$$

Where Q = Peak Flow (m³)

n = Roughness Coefficient

A = Cross Sectional Area (m²)

R = Hydraulic Radius

S = Channel Slope (m/m)

MTO Pro-rating Methodology for Obtaining Peak Flow

$$Q_2 = Q_1(A_2/A_1)^{0.75}$$

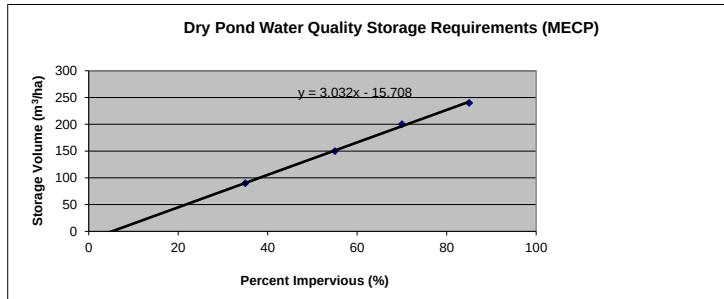
Where Q₁ = Total Peak Flow for Catchment

Q₂ = Pro-Rated Peak Flow

A₁ = Total Area

A₂ = Area Contributing

	Project: Stones Lakes Resort and Spa	Date: Sep-25
	File No.: 525012	Designed By: HY
	Subject: Dry SWM Pond Water Quality Calculations	Checked By: JA



MECP Water Quality Storage Volumes

Table 3.2 Values

% imp	Storage (m³/ha)
35	90
55	150
70	200
85	240

(Basic 60% long-term TSS Removal)

SWMF 1 (Catchment 202)

Drainage Area (ha):	4.5
% imp:	4.8%
MECP Storage Volume Required (m³/ha):	-
Water Quality Storage Requirement (m³):	-
25 mm Runoff Volume (m³):	63.9 (1.42 mm RV from Catchment 202 during a 25 mm storm)

As per the MECP manual, the larger of the 25 mm runoff volume erosion control active storage (64 m³) and the water quality active storage (-) is to be detained a minimum of 24 hrs. As is recommended in the MECP manual, a detention time of 48 hours will be incorporated into the detailed design to improve suspended solids removal.

SWMF 2 (Catchment 203A)

Drainage Area (ha):	16.7
% imp:	24.2%
MECP Storage Volume Required (m³/ha):	57.6
Water Quality Storage Requirement (m³):	962.6
25 mm Runoff Volume (m³):	742.8 (4.49 mm RV from Catchment 203A during a 25 mm storm)

As per the MECP manual, the larger of the 25 mm runoff volume erosion control active storage (742.8 m³) and the water quality active storage (962.6 m³) is to be detained a minimum of 24 hrs. As is recommended in the MECP manual, a detention time of 48 hours will be incorporated into the detailed design to improve suspended solids removal.

Coefficient summary**IDF Curve:** 45° 18' 15" N, 76° 46' 14" W (45.304167,-76.770833)

Retrieved: Mon, 31 Jan 2022 14:27:51 GMT

Data year: 2010**IDF curve year:** 2010

Return period	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
A	20.0	26.6	30.9	36.3	40.4	44.4
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	113.6	70.0	52.7	32.5	20.0	12.3	5.7	3.5	2.2
5-yr	151.1	93.1	70.1	43.2	26.6	16.4	7.6	4.7	2.9
10-yr	175.5	108.1	81.4	50.2	30.9	19.0	8.8	5.4	3.4
25-yr	206.2	127.0	95.7	58.9	36.3	22.4	10.4	6.4	3.9
50-yr	229.5	141.4	106.5	65.6	40.4	24.9	11.5	7.1	4.4
100-yr	252.2	155.3	117.0	72.1	44.4	27.4	12.7	7.8	4.8

Rainfall depth (mm)

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	9.5	11.7	13.2	16.2	20.0	24.6	34.3	42.3	52.1
5-yr	12.6	15.5	17.5	21.6	26.6	32.8	45.6	56.2	69.2
10-yr	14.6	18.0	20.4	25.1	30.9	38.1	53.0	65.3	80.4
25-yr	17.2	21.2	23.9	29.5	36.3	44.7	62.2	76.7	94.5
50-yr	19.1	23.6	26.6	32.8	40.4	49.8	69.3	85.4	105.2
100-yr	21.0	25.9	29.3	36.0	44.4	54.7	76.1	93.8	115.6

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V V I SSSSS U U A L (v 6.2.2019)
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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:

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Summary filename:

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DATE: 09/25/2025

TIME: 04:13:52

USER:

COMMENTS: _____

** SIMULATION : 25mm **

| READ STORM |

Filename: C:\Users\aaahmed\AppData\Local\Temp\

			bd1542d1-d6c0-4b63-9a58-4482ee477887\6329a775
	Ptotal= 25.00 mm		Comments: 25mm

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	1.48	1.00	6.32	2.00	4.37	3.00	2.04
0.08	1.58	1.08	9.36	2.08	3.96	3.08	1.96
0.17	1.67	1.17	18.42	2.17	3.63	3.17	1.89
0.25	1.80	1.25	79.14	2.25	3.36	3.25	1.82
0.33	1.94	1.33	34.99	2.33	3.12	3.33	1.76
0.42	2.10	1.42	18.68	2.42	2.92	3.42	1.70
0.50	2.31	1.50	12.60	2.50	2.75	3.50	1.65
0.58	2.56	1.58	9.50	2.58	2.59	3.58	1.59
0.67	2.88	1.67	7.64	2.67	2.46	3.67	1.55
0.75	3.31	1.75	6.41	2.75	2.34	3.75	1.50
0.83	3.91	1.83	5.53	2.83	2.23	3.83	1.46
0.92	4.81	1.92	4.87	2.92	2.13	3.92	1.43

CALIB		
NASHYD (0002)	Area (ha)= 4.50	Curve Number (CN)= 60.0
ID= 1 DT= 5.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.61	

Unit Hyd Qpeak (cms)= 0.282

PEAK FLOW (cms)= 0.007 (i)
 TIME TO PEAK (hrs)= 2.417
 RUNOFF VOLUME (mm)= 1.221
 TOTAL RAINFALL (mm)= 25.002
 RUNOFF COEFFICIENT = 0.049

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

CALIB		
NASHYD (0003)	Area (ha)= 18.80	Curve Number (CN)= 59.5
ID= 1 DT= 5.0 min	Ia (mm)= 10.09	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 1.00	

Unit Hyd Qpeak (cms)= 0.718

PEAK FLOW (cms)= 0.021 (i)
 TIME TO PEAK (hrs)= 3.167
 RUNOFF VOLUME (mm)= 1.184
 TOTAL RAINFALL (mm)= 25.002
 RUNOFF COEFFICIENT = 0.047

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

CALIB		
NASHYD (0004)	Area (ha)= 10.60	Curve Number (CN)= 57.7
ID= 1 DT= 5.0 min	Ia (mm)= 10.46	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.72	

Unit Hyd Qpeak (cms)= 0.562

PEAK FLOW (cms)= 0.012 (i)

TIME TO PEAK (hrs)= 2.667

RUNOFF VOLUME (mm)= 1.053

TOTAL RAINFALL (mm)= 25.002

RUNOFF COEFFICIENT = 0.042

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

CALIB		
NASHYD (0001)	Area (ha)= 24.80	Curve Number (CN)= 56.8
ID= 1 DT= 5.0 min	Ia (mm)= 10.64	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 1.40	

Unit Hyd Qpeak (cms)= 0.677

PEAK FLOW (cms)= 0.019 (i)

TIME TO PEAK (hrs)= 3.833

RUNOFF VOLUME (mm)= 0.994

TOTAL RAINFALL (mm)= 25.002

RUNOFF COEFFICIENT = 0.040

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

CALIB		
NASHYD (0064)	Area (ha)= 11.60	Curve Number (CN)= 60.0
ID= 1 DT= 5.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.55	

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.018 (i)

TIME TO PEAK (hrs)= 2.333

RUNOFF VOLUME (mm)= 1.221

TOTAL RAINFALL (mm)= 25.002

RUNOFF COEFFICIENT = 0.049

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

```
-----
| ADD HYD ( 0065) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
ID1= 1 ( 0001):   24.80    0.019    3.83    0.99
+ ID2= 2 ( 0064):   11.60    0.018    2.33    1.22
=====
ID = 3 ( 0065):   36.40    0.031    3.08    1.07
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
=====
V  V  I  SSSSS  U  U  A  L          (v 6.2.2019)
V  V  I  SS    U  U  A A  L
V  V  I  SS    U  U  AAAAA L
V  V  I  SS    U  U  A  A  L
VV    I  SSSSS  UUUUU  A  A  LLLLL

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

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8c-e0ca-42e7-9586-9bc4b3ef4e36\scena

DATE: 09/25/2025

TIME: 04:13:54

USER:

COMMENTS: _____

** SIMULATION : Calabogie SCS24 100yr **

READ STORM	Filename: C:\Users\aaahmed\AppData\Local\Temp\bd1542d1-d6c0-4b63-9a58-4482ee477887\2b99ff6d
Ptotal=115.60 mm	Comments: Calabogie SCS24 100yr

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	1.27	6.00	2.31	12.00	16.65	18.00	2.08
0.08	1.27	6.08	2.31	12.08	16.65	18.08	2.08
0.17	1.27	6.17	2.31	12.17	16.65	18.17	2.08
0.25	1.27	6.25	2.31	12.25	16.65	18.25	2.08
0.33	1.27	6.33	2.31	12.33	16.65	18.33	2.08
0.42	1.27	6.42	2.31	12.42	16.65	18.42	2.08
0.50	1.27	6.50	2.31	12.50	8.55	18.50	2.08
0.58	1.27	6.58	2.31	12.58	8.55	18.58	2.08
0.67	1.27	6.67	2.31	12.67	8.55	18.67	2.08
0.75	1.27	6.75	2.31	12.75	8.55	18.75	2.08
0.83	1.27	6.83	2.31	12.83	8.55	18.83	2.08
0.92	1.27	6.92	2.31	12.92	8.55	18.92	2.08
1.00	1.27	7.00	2.31	13.00	1.62	19.00	2.08
1.08	1.27	7.08	2.31	13.08	1.62	19.08	2.08
1.17	1.27	7.17	2.31	13.17	1.62	19.17	2.08
1.25	1.27	7.25	2.31	13.25	1.62	19.25	2.08
1.33	1.27	7.33	2.31	13.33	1.62	19.33	2.08
1.42	1.27	7.42	2.31	13.42	1.62	19.42	2.08
1.50	1.27	7.50	2.31	13.50	9.48	19.50	2.08
1.58	1.27	7.58	2.31	13.58	9.48	19.58	2.08
1.67	1.27	7.67	2.31	13.67	9.48	19.67	2.08
1.75	1.27	7.75	2.31	13.75	9.48	19.75	2.08
1.83	1.27	7.83	2.31	13.83	9.48	19.83	2.08
1.92	1.27	7.92	2.31	13.92	9.48	19.92	2.08
2.00	1.50	8.00	3.12	14.00	3.47	20.00	1.39
2.08	1.50	8.08	3.12	14.08	3.47	20.08	1.39
2.17	1.50	8.17	3.12	14.17	3.47	20.17	1.39
2.25	1.50	8.25	3.12	14.25	3.47	20.25	1.39

2.33	1.50	8.33	3.12	14.33	3.47	20.33	1.39
2.42	1.50	8.42	3.12	14.42	3.47	20.42	1.39
2.50	1.50	8.50	3.12	14.50	3.47	20.50	1.39
2.58	1.50	8.58	3.12	14.58	3.47	20.58	1.39
2.67	1.50	8.67	3.12	14.67	3.47	20.67	1.39
2.75	1.50	8.75	3.12	14.75	3.47	20.75	1.39
2.83	1.50	8.83	3.12	14.83	3.47	20.83	1.39
2.92	1.50	8.92	3.12	14.92	3.47	20.92	1.39
3.00	1.50	9.00	3.70	15.00	3.47	21.00	1.39
3.08	1.50	9.08	3.70	15.08	3.47	21.08	1.39
3.17	1.50	9.17	3.70	15.17	3.47	21.17	1.39
3.25	1.50	9.25	3.70	15.25	3.47	21.25	1.39
3.33	1.50	9.33	3.70	15.33	3.47	21.33	1.39
3.42	1.50	9.42	3.70	15.42	3.47	21.42	1.39
3.50	1.50	9.50	4.16	15.50	3.47	21.50	1.39
3.58	1.50	9.58	4.16	15.58	3.47	21.58	1.39
3.67	1.50	9.67	4.16	15.67	3.47	21.67	1.39
3.75	1.50	9.75	4.16	15.75	3.47	21.75	1.39
3.83	1.50	9.83	4.16	15.83	3.47	21.83	1.39
3.92	1.50	9.92	4.16	15.92	3.47	21.92	1.39
4.00	1.85	10.00	5.32	16.00	2.08	22.00	1.39
4.08	1.85	10.08	5.32	16.08	2.08	22.08	1.39
4.17	1.85	10.17	5.32	16.17	2.08	22.17	1.39
4.25	1.85	10.25	5.32	16.25	2.08	22.25	1.39
4.33	1.85	10.33	5.32	16.33	2.08	22.33	1.39
4.42	1.85	10.42	5.32	16.42	2.08	22.42	1.39
4.50	1.85	10.50	7.17	16.50	2.08	22.50	1.39
4.58	1.85	10.58	7.17	16.58	2.08	22.58	1.39
4.67	1.85	10.67	7.17	16.67	2.08	22.67	1.39
4.75	1.85	10.75	7.17	16.75	2.08	22.75	1.39
4.83	1.85	10.83	7.17	16.83	2.08	22.83	1.39
4.92	1.85	10.92	7.17	16.92	2.08	22.92	1.39
5.00	1.85	11.00	11.10	17.00	2.08	23.00	1.39
5.08	1.85	11.08	11.10	17.08	2.08	23.08	1.39
5.17	1.85	11.17	11.10	17.17	2.08	23.17	1.39
5.25	1.85	11.25	11.10	17.25	2.08	23.25	1.39
5.33	1.85	11.33	11.10	17.33	2.08	23.33	1.39
5.42	1.85	11.42	11.10	17.42	2.08	23.42	1.39
5.50	1.85	11.50	48.09	17.50	2.08	23.50	1.39
5.58	1.85	11.58	48.09	17.58	2.08	23.58	1.39
5.67	1.85	11.67	48.09	17.67	2.08	23.67	1.39
5.75	1.85	11.75	127.62	17.75	2.08	23.75	1.39
5.83	1.85	11.83	127.62	17.83	2.08	23.83	1.39
5.92	1.85	11.92	127.62	17.92	2.08	23.92	1.39

CALIB					
NASHYD	(0002)	Area	(ha)= 4.50	Curve Number	(CN)= 60.0

NASHYD (0001)	Area (ha)= 24.80	Curve Number (CN)= 56.8
ID= 1 DT= 5.0 min	Ia (mm)= 10.64	# of Linear Res.(N)= 3.00
-----	U.H. Tp(hrs)= 1.40	

Unit Hyd Qpeak (cms)= 0.677

PEAK FLOW (cms)= 0.547 (i)
 TIME TO PEAK (hrs)= 13.417
 RUNOFF VOLUME (mm)= 36.952
 TOTAL RAINFALL (mm)= 115.603
 RUNOFF COEFFICIENT = 0.320

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

CALIB		
NASHYD (0064)	Area (ha)= 11.60	Curve Number (CN)= 60.0
ID= 1 DT= 5.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00
-----	U.H. Tp(hrs)= 0.55	

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.569 (i)
 TIME TO PEAK (hrs)= 12.417
 RUNOFF VOLUME (mm)= 40.560
 TOTAL RAINFALL (mm)= 115.603
 RUNOFF COEFFICIENT = 0.351

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

ADD HYD (0065)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
-----	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0001):	24.80	0.547	13.42	36.95
+ ID2= 2 (0064):	11.60	0.569	12.42	40.56
=====				
ID = 3 (0065):	36.40	0.934	12.67	38.10

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

FINISH

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V   V   I   SSSSS   U   U   A   L           (v 6.2.2019)
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
W       I   SSSSS   UUUUU   A   A   LLLLL
```

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

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\bcbdde
b8-4d60-4f79-b1b6-2f79ca02e844\scena

Summary filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\bcbdde
b8-4d60-4f79-b1b6-2f79ca02e844\scena

DATE: 09/25/2025

TIME: 04:13:53

USER:

COMMENTS: _____


```
*****
** SIMULATION : Calabogie SCS24 10yr          **
*****
```

| READ STORM |
| |
| |

Filename: C:\Users\aaahmed\AppData
ata\Local\Temp\
bd1542d1-d6c0-4b63-9a58-4482ee477887\15367154

| Ptotal= 80.40 mm | Comments: Calabogie SCS24 10yr

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.88	6.00	1.61	12.00	11.58	18.00	1.45
0.08	0.88	6.08	1.61	12.08	11.58	18.08	1.45
0.17	0.88	6.17	1.61	12.17	11.58	18.17	1.45
0.25	0.88	6.25	1.61	12.25	11.58	18.25	1.45
0.33	0.88	6.33	1.61	12.33	11.58	18.33	1.45
0.42	0.88	6.42	1.61	12.42	11.58	18.42	1.45
0.50	0.88	6.50	1.61	12.50	5.95	18.50	1.45
0.58	0.88	6.58	1.61	12.58	5.95	18.58	1.45
0.67	0.88	6.67	1.61	12.67	5.95	18.67	1.45
0.75	0.88	6.75	1.61	12.75	5.95	18.75	1.45
0.83	0.88	6.83	1.61	12.83	5.95	18.83	1.45
0.92	0.88	6.92	1.61	12.92	5.95	18.92	1.45
1.00	0.88	7.00	1.61	13.00	1.13	19.00	1.45
1.08	0.88	7.08	1.61	13.08	1.13	19.08	1.45
1.17	0.88	7.17	1.61	13.17	1.13	19.17	1.45
1.25	0.88	7.25	1.61	13.25	1.13	19.25	1.45
1.33	0.88	7.33	1.61	13.33	1.13	19.33	1.45
1.42	0.88	7.42	1.61	13.42	1.13	19.42	1.45
1.50	0.88	7.50	1.61	13.50	6.59	19.50	1.45
1.58	0.88	7.58	1.61	13.58	6.59	19.58	1.45
1.67	0.88	7.67	1.61	13.67	6.59	19.67	1.45
1.75	0.88	7.75	1.61	13.75	6.59	19.75	1.45
1.83	0.88	7.83	1.61	13.83	6.59	19.83	1.45
1.92	0.88	7.92	1.61	13.92	6.59	19.92	1.45
2.00	1.05	8.00	2.17	14.00	2.41	20.00	0.96
2.08	1.05	8.08	2.17	14.08	2.41	20.08	0.96
2.17	1.05	8.17	2.17	14.17	2.41	20.17	0.96
2.25	1.05	8.25	2.17	14.25	2.41	20.25	0.96
2.33	1.05	8.33	2.17	14.33	2.41	20.33	0.96
2.42	1.05	8.42	2.17	14.42	2.41	20.42	0.96
2.50	1.05	8.50	2.17	14.50	2.41	20.50	0.96
2.58	1.05	8.58	2.17	14.58	2.41	20.58	0.96
2.67	1.05	8.67	2.17	14.67	2.41	20.67	0.96
2.75	1.05	8.75	2.17	14.75	2.41	20.75	0.96
2.83	1.05	8.83	2.17	14.83	2.41	20.83	0.96
2.92	1.05	8.92	2.17	14.92	2.41	20.92	0.96
3.00	1.05	9.00	2.57	15.00	2.41	21.00	0.96
3.08	1.05	9.08	2.57	15.08	2.41	21.08	0.96
3.17	1.05	9.17	2.57	15.17	2.41	21.17	0.96
3.25	1.05	9.25	2.57	15.25	2.41	21.25	0.96
3.33	1.05	9.33	2.57	15.33	2.41	21.33	0.96
3.42	1.05	9.42	2.57	15.42	2.41	21.42	0.96
3.50	1.05	9.50	2.89	15.50	2.41	21.50	0.96
3.58	1.05	9.58	2.89	15.58	2.41	21.58	0.96
3.67	1.05	9.67	2.89	15.67	2.41	21.67	0.96
3.75	1.05	9.75	2.89	15.75	2.41	21.75	0.96

3.83	1.05	9.83	2.89	15.83	2.41	21.83	0.96
3.92	1.05	9.92	2.89	15.92	2.41	21.92	0.96
4.00	1.29	10.00	3.70	16.00	1.45	22.00	0.96
4.08	1.29	10.08	3.70	16.08	1.45	22.08	0.96
4.17	1.29	10.17	3.70	16.17	1.45	22.17	0.96
4.25	1.29	10.25	3.70	16.25	1.45	22.25	0.96
4.33	1.29	10.33	3.70	16.33	1.45	22.33	0.96
4.42	1.29	10.42	3.70	16.42	1.45	22.42	0.96
4.50	1.29	10.50	4.98	16.50	1.45	22.50	0.96
4.58	1.29	10.58	4.98	16.58	1.45	22.58	0.96
4.67	1.29	10.67	4.98	16.67	1.45	22.67	0.96
4.75	1.29	10.75	4.98	16.75	1.45	22.75	0.96
4.83	1.29	10.83	4.98	16.83	1.45	22.83	0.96
4.92	1.29	10.92	4.98	16.92	1.45	22.92	0.96
5.00	1.29	11.00	7.72	17.00	1.45	23.00	0.96
5.08	1.29	11.08	7.72	17.08	1.45	23.08	0.96
5.17	1.29	11.17	7.72	17.17	1.45	23.17	0.96
5.25	1.29	11.25	7.72	17.25	1.45	23.25	0.96
5.33	1.29	11.33	7.72	17.33	1.45	23.33	0.96
5.42	1.29	11.42	7.72	17.42	1.45	23.42	0.96
5.50	1.29	11.50	33.45	17.50	1.45	23.50	0.96
5.58	1.29	11.58	33.45	17.58	1.45	23.58	0.96
5.67	1.29	11.67	33.45	17.67	1.45	23.67	0.96
5.75	1.29	11.75	88.76	17.75	1.45	23.75	0.96
5.83	1.29	11.83	88.76	17.83	1.45	23.83	0.96
5.92	1.29	11.92	88.76	17.92	1.45	23.92	0.96

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-----
| CALIB |
| NASHYD ( 0002) | Area (ha)= 4.50 Curve Number (CN)= 60.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.61

```

Unit Hyd Qpeak (cms)= 0.282

PEAK FLOW (cms)= 0.102 (i)
TIME TO PEAK (hrs)= 12.583
RUNOFF VOLUME (mm)= 20.672
TOTAL RAINFALL (mm)= 80.398
RUNOFF COEFFICIENT = 0.257

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

```

-----
| CALIB |
| NASHYD ( 0003) | Area (ha)= 18.80 Curve Number (CN)= 59.5
| ID= 1 DT= 5.0 min | Ia (mm)= 10.09 # of Linear Res.(N)= 3.00

```


----- U.H. Tp(hrs)= 1.00

Unit Hyd Qpeak (cms)= 0.718

PEAK FLOW (cms)= 0.291 (i)

TIME TO PEAK (hrs)= 13.000

RUNOFF VOLUME (mm)= 20.325

TOTAL RAINFALL (mm)= 80.398

RUNOFF COEFFICIENT = 0.253

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

| CALIB |
| NASHYD (0004) | Area (ha)= 10.60 Curve Number (CN)= 57.7
| ID= 1 DT= 5.0 min | Ia (mm)= 10.46 # of Linear Res.(N)= 3.00
----- U.H. Tp(hrs)= 0.72

Unit Hyd Qpeak (cms)= 0.562

PEAK FLOW (cms)= 0.195 (i)

TIME TO PEAK (hrs)= 12.667

RUNOFF VOLUME (mm)= 19.095

TOTAL RAINFALL (mm)= 80.398

RUNOFF COEFFICIENT = 0.238

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

| CALIB |
| NASHYD (0001) | Area (ha)= 24.80 Curve Number (CN)= 56.8
| ID= 1 DT= 5.0 min | Ia (mm)= 10.64 # of Linear Res.(N)= 3.00
----- U.H. Tp(hrs)= 1.40

Unit Hyd Qpeak (cms)= 0.677

PEAK FLOW (cms)= 0.266 (i)

TIME TO PEAK (hrs)= 13.417

RUNOFF VOLUME (mm)= 18.506

TOTAL RAINFALL (mm)= 80.398

RUNOFF COEFFICIENT = 0.230

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

| CALIB |
| NASHYD (0064) | Area (ha)= 11.60 Curve Number (CN)= 60.0

| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
 ----- U.H. Tp(hrs)= 0.55

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.282 (i)
 TIME TO PEAK (hrs)= 12.500
 RUNOFF VOLUME (mm)= 20.672
 TOTAL RAINFALL (mm)= 80.398
 RUNOFF COEFFICIENT = 0.257

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

 | ADD HYD (0065) |
 | 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
 ----- (ha) (cms) (hrs) (mm)
 ID1= 1 (0001): 24.80 0.266 13.42 18.51
 + ID2= 2 (0064): 11.60 0.282 12.50 20.67
 =====
 ID = 3 (0065): 36.40 0.457 12.75 19.20

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

V V I SSSSS U U A L (v 6.2.2019)
 V V I SS U U A A L
 V V I SS U U AAAAA L
 V V I SS U U A A L
 VV I SSSSS UUUUU A A LLLLL

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

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\d692b635-e36b-417f-a878-1c3cd037c3b9\scena

Summary filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\d692b635-e36b-417f-a878-1c3cd037c3b9\scena

DATE: 09/25/2025

TIME: 04:13:53

USER:

COMMENTS: _____

** SIMULATION : Calabogie SCS24 25yr **

READ STORM	Filename: C:\Users\aaahmed\AppData\Local\Temp\bd1542d1-d6c0-4b63-9a58-4482ee477887\431e6d61
Ptotal= 94.47 mm	Comments: Calabogie SCS24 25yr

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	1.04	6.00	1.89	12.00	13.61	18.00	1.70
0.08	1.04	6.08	1.89	12.08	13.61	18.08	1.70
0.17	1.04	6.17	1.89	12.17	13.61	18.17	1.70
0.25	1.04	6.25	1.89	12.25	13.61	18.25	1.70
0.33	1.04	6.33	1.89	12.33	13.61	18.33	1.70
0.42	1.04	6.42	1.89	12.42	13.61	18.42	1.70
0.50	1.04	6.50	1.89	12.50	6.99	18.50	1.70
0.58	1.04	6.58	1.89	12.58	6.99	18.58	1.70
0.67	1.04	6.67	1.89	12.67	6.99	18.67	1.70
0.75	1.04	6.75	1.89	12.75	6.99	18.75	1.70
0.83	1.04	6.83	1.89	12.83	6.99	18.83	1.70
0.92	1.04	6.92	1.89	12.92	6.99	18.92	1.70
1.00	1.04	7.00	1.89	13.00	1.32	19.00	1.70
1.08	1.04	7.08	1.89	13.08	1.32	19.08	1.70
1.17	1.04	7.17	1.89	13.17	1.32	19.17	1.70
1.25	1.04	7.25	1.89	13.25	1.32	19.25	1.70
1.33	1.04	7.33	1.89	13.33	1.32	19.33	1.70
1.42	1.04	7.42	1.89	13.42	1.32	19.42	1.70
1.50	1.04	7.50	1.89	13.50	7.75	19.50	1.70

1.58	1.04	7.58	1.89	13.58	7.75	19.58	1.70
1.67	1.04	7.67	1.89	13.67	7.75	19.67	1.70
1.75	1.04	7.75	1.89	13.75	7.75	19.75	1.70
1.83	1.04	7.83	1.89	13.83	7.75	19.83	1.70
1.92	1.04	7.92	1.89	13.92	7.75	19.92	1.70
2.00	1.23	8.00	2.55	14.00	2.84	20.00	1.13
2.08	1.23	8.08	2.55	14.08	2.83	20.08	1.13
2.17	1.23	8.17	2.55	14.17	2.84	20.17	1.13
2.25	1.23	8.25	2.55	14.25	2.83	20.25	1.13
2.33	1.23	8.33	2.55	14.33	2.84	20.33	1.13
2.42	1.23	8.42	2.55	14.42	2.83	20.42	1.13
2.50	1.23	8.50	2.55	14.50	2.84	20.50	1.13
2.58	1.23	8.58	2.55	14.58	2.83	20.58	1.13
2.67	1.23	8.67	2.55	14.67	2.84	20.67	1.13
2.75	1.23	8.75	2.55	14.75	2.83	20.75	1.13
2.83	1.23	8.83	2.55	14.83	2.84	20.83	1.13
2.92	1.23	8.92	2.55	14.92	2.83	20.92	1.13
3.00	1.23	9.00	3.02	15.00	2.84	21.00	1.13
3.08	1.23	9.08	3.02	15.08	2.83	21.08	1.13
3.17	1.23	9.17	3.02	15.17	2.84	21.17	1.13
3.25	1.23	9.25	3.02	15.25	2.83	21.25	1.13
3.33	1.23	9.33	3.02	15.33	2.84	21.33	1.13
3.42	1.23	9.42	3.02	15.42	2.83	21.42	1.13
3.50	1.23	9.50	3.40	15.50	2.84	21.50	1.13
3.58	1.23	9.58	3.40	15.58	2.83	21.58	1.13
3.67	1.23	9.67	3.40	15.67	2.84	21.67	1.13
3.75	1.23	9.75	3.40	15.75	2.83	21.75	1.13
3.83	1.23	9.83	3.40	15.83	2.83	21.83	1.13
3.92	1.23	9.92	3.40	15.92	2.84	21.92	1.13
4.00	1.51	10.00	4.35	16.00	1.70	22.00	1.13
4.08	1.51	10.08	4.35	16.08	1.70	22.08	1.13
4.17	1.51	10.17	4.35	16.17	1.70	22.17	1.13
4.25	1.51	10.25	4.35	16.25	1.70	22.25	1.13
4.33	1.51	10.33	4.35	16.33	1.70	22.33	1.13
4.42	1.51	10.42	4.35	16.42	1.70	22.42	1.13
4.50	1.51	10.50	5.86	16.50	1.70	22.50	1.13
4.58	1.51	10.58	5.86	16.58	1.70	22.58	1.13
4.67	1.51	10.67	5.86	16.67	1.70	22.67	1.13
4.75	1.51	10.75	5.86	16.75	1.70	22.75	1.13
4.83	1.51	10.83	5.86	16.83	1.70	22.83	1.13
4.92	1.51	10.92	5.86	16.92	1.70	22.92	1.13
5.00	1.51	11.00	9.07	17.00	1.70	23.00	1.13
5.08	1.51	11.08	9.07	17.08	1.70	23.08	1.13
5.17	1.51	11.17	9.07	17.17	1.70	23.17	1.13
5.25	1.51	11.25	9.07	17.25	1.70	23.25	1.13
5.33	1.51	11.33	9.07	17.33	1.70	23.33	1.13
5.42	1.51	11.42	9.07	17.42	1.70	23.42	1.13
5.50	1.51	11.50	39.31	17.50	1.70	23.50	1.13
5.58	1.51	11.58	39.31	17.58	1.70	23.58	1.13
5.67	1.51	11.67	39.31	17.67	1.70	23.67	1.13

5.75	1.51		11.75	104.33		17.75	1.70		23.75	1.13
5.83	1.51		11.83	104.33		17.83	1.70		23.83	1.13
5.92	1.51		11.92	104.33		17.92	1.70		23.92	1.13

CALIB			
NASHYD (0002)	Area (ha)=	4.50	Curve Number (CN)= 60.0
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.61	

Unit Hyd Qpeak (cms)= 0.282

PEAK FLOW (cms)= 0.140 (i)
 TIME TO PEAK (hrs)= 12.500
 RUNOFF VOLUME (mm)= 28.115
 TOTAL RAINFALL (mm)= 94.475
 RUNOFF COEFFICIENT = 0.298

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

CALIB			
NASHYD (0003)	Area (ha)=	18.80	Curve Number (CN)= 59.5
ID= 1 DT= 5.0 min	Ia (mm)=	10.09	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	1.00	

Unit Hyd Qpeak (cms)= 0.718

PEAK FLOW (cms)= 0.402 (i)
 TIME TO PEAK (hrs)= 13.000
 RUNOFF VOLUME (mm)= 27.678
 TOTAL RAINFALL (mm)= 94.475
 RUNOFF COEFFICIENT = 0.293

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

CALIB			
NASHYD (0004)	Area (ha)=	10.60	Curve Number (CN)= 57.7
ID= 1 DT= 5.0 min	Ia (mm)=	10.46	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.72	

Unit Hyd Qpeak (cms)= 0.562

PEAK FLOW (cms)= 0.271 (i)
 TIME TO PEAK (hrs)= 12.667

RUNOFF VOLUME (mm)= 26.121
TOTAL RAINFALL (mm)= 94.475
RUNOFF COEFFICIENT = 0.276

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

CALIB			
NASHYD (0001)	Area (ha)= 24.80	Curve Number (CN)= 56.8	
ID= 1 DT= 5.0 min	Ia (mm)= 10.64	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 1.40		

Unit Hyd Qpeak (cms)= 0.677

PEAK FLOW (cms)= 0.370 (i)
TIME TO PEAK (hrs)= 13.417
RUNOFF VOLUME (mm)= 25.371
TOTAL RAINFALL (mm)= 94.475
RUNOFF COEFFICIENT = 0.269

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

CALIB			
NASHYD (0064)	Area (ha)= 11.60	Curve Number (CN)= 60.0	
ID= 1 DT= 5.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.55		

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.389 (i)
TIME TO PEAK (hrs)= 12.500
RUNOFF VOLUME (mm)= 28.115
TOTAL RAINFALL (mm)= 94.475
RUNOFF COEFFICIENT = 0.298

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

ADD HYD (0065)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0001):	24.80	0.370	13.42	25.37
+ ID2= 2 (0064):	11.60	0.389	12.50	28.11
=====				
ID = 3 (0065):	36.40	0.634	12.75	26.25

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

=====

V V I SSSSS U U A L (v 6.2.2019)
V V I SS U U A A L
V V I SS U U AAAAA L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

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

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\092598
64-f24a-42e7-8f3a-c25c393a066f\scena

Summary filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\092598
64-f24a-42e7-8f3a-c25c393a066f\scena

DATE: 09/25/2025

TIME: 04:13:53

USER:

COMMENTS: _____

** SIMULATION : Calabogie SCS24 2yr **

 | READ STORM |
 |
Ptotal= 52.12 mm

Filename: C:\Users\aaahmed\AppData
 ata\Local\Temp\
 bd1542d1-d6c0-4b63-9a58-4482ee477887\10f4efab
 Comments: Calabogie SCS24 2yr

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.57	6.00	1.04	12.00	7.50	18.00	0.94
0.08	0.57	6.08	1.04	12.08	7.50	18.08	0.94
0.17	0.57	6.17	1.04	12.17	7.50	18.17	0.94
0.25	0.57	6.25	1.04	12.25	7.50	18.25	0.94
0.33	0.57	6.33	1.04	12.33	7.50	18.33	0.94
0.42	0.57	6.42	1.04	12.42	7.50	18.42	0.94
0.50	0.57	6.50	1.04	12.50	3.86	18.50	0.94
0.58	0.57	6.58	1.04	12.58	3.86	18.58	0.94
0.67	0.57	6.67	1.04	12.67	3.86	18.67	0.94
0.75	0.57	6.75	1.04	12.75	3.86	18.75	0.94
0.83	0.57	6.83	1.04	12.83	3.86	18.83	0.94
0.92	0.57	6.92	1.04	12.92	3.86	18.92	0.94
1.00	0.57	7.00	1.04	13.00	0.73	19.00	0.94
1.08	0.57	7.08	1.04	13.08	0.73	19.08	0.94
1.17	0.57	7.17	1.04	13.17	0.73	19.17	0.94
1.25	0.57	7.25	1.04	13.25	0.73	19.25	0.94
1.33	0.57	7.33	1.04	13.33	0.73	19.33	0.94
1.42	0.57	7.42	1.04	13.42	0.73	19.42	0.94
1.50	0.57	7.50	1.04	13.50	4.27	19.50	0.94
1.58	0.57	7.58	1.04	13.58	4.27	19.58	0.94
1.67	0.57	7.67	1.04	13.67	4.27	19.67	0.94
1.75	0.57	7.75	1.04	13.75	4.27	19.75	0.94
1.83	0.57	7.83	1.04	13.83	4.27	19.83	0.94
1.92	0.57	7.92	1.04	13.92	4.27	19.92	0.94
2.00	0.68	8.00	1.41	14.00	1.56	20.00	0.63
2.08	0.68	8.08	1.41	14.08	1.56	20.08	0.63
2.17	0.68	8.17	1.41	14.17	1.56	20.17	0.63
2.25	0.68	8.25	1.41	14.25	1.56	20.25	0.63
2.33	0.68	8.33	1.41	14.33	1.56	20.33	0.63
2.42	0.68	8.42	1.41	14.42	1.56	20.42	0.63
2.50	0.68	8.50	1.41	14.50	1.56	20.50	0.63
2.58	0.68	8.58	1.41	14.58	1.56	20.58	0.63
2.67	0.68	8.67	1.41	14.67	1.56	20.67	0.63
2.75	0.68	8.75	1.41	14.75	1.56	20.75	0.63
2.83	0.68	8.83	1.41	14.83	1.56	20.83	0.63
2.92	0.68	8.92	1.41	14.92	1.56	20.92	0.63
3.00	0.68	9.00	1.67	15.00	1.56	21.00	0.63
3.08	0.68	9.08	1.67	15.08	1.56	21.08	0.63
3.17	0.68	9.17	1.67	15.17	1.56	21.17	0.63
3.25	0.68	9.25	1.67	15.25	1.56	21.25	0.63
3.33	0.68	9.33	1.67	15.33	1.56	21.33	0.63
3.42	0.68	9.42	1.67	15.42	1.56	21.42	0.63

3.50	0.68	9.50	1.88	15.50	1.56	21.50	0.63
3.58	0.68	9.58	1.88	15.58	1.56	21.58	0.63
3.67	0.68	9.67	1.88	15.67	1.56	21.67	0.63
3.75	0.68	9.75	1.88	15.75	1.56	21.75	0.63
3.83	0.68	9.83	1.88	15.83	1.56	21.83	0.63
3.92	0.68	9.92	1.88	15.92	1.56	21.92	0.63
4.00	0.83	10.00	2.40	16.00	0.94	22.00	0.63
4.08	0.83	10.08	2.40	16.08	0.94	22.08	0.63
4.17	0.83	10.17	2.40	16.17	0.94	22.17	0.63
4.25	0.83	10.25	2.40	16.25	0.94	22.25	0.63
4.33	0.83	10.33	2.40	16.33	0.94	22.33	0.63
4.42	0.83	10.42	2.40	16.42	0.94	22.42	0.63
4.50	0.83	10.50	3.23	16.50	0.94	22.50	0.63
4.58	0.83	10.58	3.23	16.58	0.94	22.58	0.63
4.67	0.83	10.67	3.23	16.67	0.94	22.67	0.63
4.75	0.83	10.75	3.23	16.75	0.94	22.75	0.63
4.83	0.83	10.83	3.23	16.83	0.94	22.83	0.63
4.92	0.83	10.92	3.23	16.92	0.94	22.92	0.63
5.00	0.83	11.00	5.00	17.00	0.94	23.00	0.63
5.08	0.83	11.08	5.00	17.08	0.94	23.08	0.63
5.17	0.83	11.17	5.00	17.17	0.94	23.17	0.63
5.25	0.83	11.25	5.00	17.25	0.94	23.25	0.63
5.33	0.83	11.33	5.00	17.33	0.94	23.33	0.63
5.42	0.83	11.42	5.00	17.42	0.94	23.42	0.63
5.50	0.83	11.50	21.67	17.50	0.94	23.50	0.63
5.58	0.83	11.58	21.67	17.58	0.94	23.58	0.63
5.67	0.83	11.67	21.67	17.67	0.94	23.67	0.63
5.75	0.83	11.75	57.52	17.75	0.94	23.75	0.63
5.83	0.83	11.83	57.52	17.83	0.94	23.83	0.63
5.92	0.83	11.92	57.52	17.92	0.94	23.92	0.63

CALIB			
NASHYD (0002)	Area (ha)=	4.50	Curve Number (CN)= 60.0
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.61	

Unit Hyd Qpeak (cms)= 0.282

PEAK FLOW (cms)= 0.039 (i)

TIME TO PEAK (hrs)= 12.583

RUNOFF VOLUME (mm)= 8.389

TOTAL RAINFALL (mm)= 52.117

RUNOFF COEFFICIENT = 0.161

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

CALIB		
NASHYD (0003)	Area (ha)= 18.80	Curve Number (CN)= 59.5
ID= 1 DT= 5.0 min	Ia (mm)= 10.09	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 1.00	

Unit Hyd Qpeak (cms)= 0.718

PEAK FLOW (cms)= 0.111 (i)

TIME TO PEAK (hrs)= 13.083

RUNOFF VOLUME (mm)= 8.218

TOTAL RAINFALL (mm)= 52.117

RUNOFF COEFFICIENT = 0.158

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

CALIB		
NASHYD (0004)	Area (ha)= 10.60	Curve Number (CN)= 57.7
ID= 1 DT= 5.0 min	Ia (mm)= 10.46	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.72	

Unit Hyd Qpeak (cms)= 0.562

PEAK FLOW (cms)= 0.073 (i)

TIME TO PEAK (hrs)= 12.750

RUNOFF VOLUME (mm)= 7.615

TOTAL RAINFALL (mm)= 52.117

RUNOFF COEFFICIENT = 0.146

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

CALIB		
NASHYD (0001)	Area (ha)= 24.80	Curve Number (CN)= 56.8
ID= 1 DT= 5.0 min	Ia (mm)= 10.64	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 1.40	

Unit Hyd Qpeak (cms)= 0.677

PEAK FLOW (cms)= 0.098 (i)

TIME TO PEAK (hrs)= 13.500

RUNOFF VOLUME (mm)= 7.331

TOTAL RAINFALL (mm)= 52.117

RUNOFF COEFFICIENT = 0.141

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


```

-----
| CALIB |
| NASHYD ( 0064) | Area (ha)= 11.60 Curve Number (CN)= 60.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
-----
U.H. Tp(hrs)= 0.55

```

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.108 (i)
 TIME TO PEAK (hrs)= 12.500
 RUNOFF VOLUME (mm)= 8.389
 TOTAL RAINFALL (mm)= 52.117
 RUNOFF COEFFICIENT = 0.161

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

```

-----
| ADD HYD ( 0065) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
ID1= 1 ( 0001):  24.80  0.098  13.50  7.33
+ ID2= 2 ( 0064):  11.60  0.108  12.50  8.39
=====
ID = 3 ( 0065):  36.40  0.171  12.75  7.67

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

=====
V  V  I  SSSSS  U  U  A  L          (v 6.2.2019)
V  V  I  SS    U  U  A A  L
V  V  I  SS    U  U  AAAAA L
V  V  I  SS    U  U  A  A  L
VV    I  SSSSS  UUUUU  A  A  LLLLL

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

```

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\22cc83ee-c68b-47b5-8987-8ab7a7d03485\scena

Summary filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\22cc83ee-c68b-47b5-8987-8ab7a7d03485\scena

DATE: 09/25/2025

TIME: 04:13:53

USER:

COMMENTS: _____

** SIMULATION : Calabogie SCS24 50yr **

READ STORM	Filename: C:\Users\aaahmed\AppData\Local\Temp\bd1542d1-d6c0-4b63-9a58-4482ee477887\3e1633fb
Ptotal=105.18 mm	Comments: Calabogie SCS24 50yr

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	1.16	6.00	2.10	12.00	15.15	18.00	1.89
0.08	1.16	6.08	2.10	12.08	15.15	18.08	1.89
0.17	1.16	6.17	2.10	12.17	15.15	18.17	1.89
0.25	1.16	6.25	2.10	12.25	15.15	18.25	1.89
0.33	1.16	6.33	2.10	12.33	15.15	18.33	1.89
0.42	1.16	6.42	2.10	12.42	15.15	18.42	1.89
0.50	1.16	6.50	2.10	12.50	7.78	18.50	1.89
0.58	1.16	6.58	2.10	12.58	7.78	18.58	1.89
0.67	1.16	6.67	2.10	12.67	7.78	18.67	1.89
0.75	1.16	6.75	2.10	12.75	7.78	18.75	1.89
0.83	1.16	6.83	2.10	12.83	7.78	18.83	1.89
0.92	1.16	6.92	2.10	12.92	7.78	18.92	1.89
1.00	1.16	7.00	2.10	13.00	1.47	19.00	1.89
1.08	1.16	7.08	2.10	13.08	1.47	19.08	1.89
1.17	1.16	7.17	2.10	13.17	1.47	19.17	1.89

1.25	1.16	7.25	2.10	13.25	1.47	19.25	1.89
1.33	1.16	7.33	2.10	13.33	1.47	19.33	1.89
1.42	1.16	7.42	2.10	13.42	1.47	19.42	1.89
1.50	1.16	7.50	2.10	13.50	8.63	19.50	1.89
1.58	1.16	7.58	2.10	13.58	8.63	19.58	1.89
1.67	1.16	7.67	2.10	13.67	8.63	19.67	1.89
1.75	1.16	7.75	2.10	13.75	8.63	19.75	1.89
1.83	1.16	7.83	2.10	13.83	8.63	19.83	1.89
1.92	1.16	7.92	2.10	13.92	8.63	19.92	1.89
2.00	1.37	8.00	2.84	14.00	3.16	20.00	1.26
2.08	1.37	8.08	2.84	14.08	3.16	20.08	1.26
2.17	1.37	8.17	2.84	14.17	3.16	20.17	1.26
2.25	1.37	8.25	2.84	14.25	3.16	20.25	1.26
2.33	1.37	8.33	2.84	14.33	3.16	20.33	1.26
2.42	1.37	8.42	2.84	14.42	3.16	20.42	1.26
2.50	1.37	8.50	2.84	14.50	3.16	20.50	1.26
2.58	1.37	8.58	2.84	14.58	3.16	20.58	1.26
2.67	1.37	8.67	2.84	14.67	3.16	20.67	1.26
2.75	1.37	8.75	2.84	14.75	3.16	20.75	1.26
2.83	1.37	8.83	2.84	14.83	3.16	20.83	1.26
2.92	1.37	8.92	2.84	14.92	3.16	20.92	1.26
3.00	1.37	9.00	3.37	15.00	3.16	21.00	1.26
3.08	1.37	9.08	3.37	15.08	3.16	21.08	1.26
3.17	1.37	9.17	3.37	15.17	3.16	21.17	1.26
3.25	1.37	9.25	3.37	15.25	3.16	21.25	1.26
3.33	1.37	9.33	3.37	15.33	3.16	21.33	1.26
3.42	1.37	9.42	3.37	15.42	3.16	21.42	1.26
3.50	1.37	9.50	3.79	15.50	3.16	21.50	1.26
3.58	1.37	9.58	3.79	15.58	3.16	21.58	1.26
3.67	1.37	9.67	3.79	15.67	3.16	21.67	1.26
3.75	1.37	9.75	3.79	15.75	3.16	21.75	1.26
3.83	1.37	9.83	3.79	15.83	3.16	21.83	1.26
3.92	1.37	9.92	3.79	15.92	3.16	21.92	1.26
4.00	1.68	10.00	4.84	16.00	1.89	22.00	1.26
4.08	1.68	10.08	4.84	16.08	1.89	22.08	1.26
4.17	1.68	10.17	4.84	16.17	1.89	22.17	1.26
4.25	1.68	10.25	4.84	16.25	1.89	22.25	1.26
4.33	1.68	10.33	4.84	16.33	1.89	22.33	1.26
4.42	1.68	10.42	4.84	16.42	1.89	22.42	1.26
4.50	1.68	10.50	6.52	16.50	1.89	22.50	1.26
4.58	1.68	10.58	6.52	16.58	1.89	22.58	1.26
4.67	1.68	10.67	6.52	16.67	1.89	22.67	1.26
4.75	1.68	10.75	6.52	16.75	1.89	22.75	1.26
4.83	1.68	10.83	6.52	16.83	1.89	22.83	1.26
4.92	1.68	10.92	6.52	16.92	1.89	22.92	1.26
5.00	1.68	11.00	10.10	17.00	1.89	23.00	1.26
5.08	1.68	11.08	10.10	17.08	1.89	23.08	1.26
5.17	1.68	11.17	10.10	17.17	1.89	23.17	1.26
5.25	1.68	11.25	10.10	17.25	1.89	23.25	1.26
5.33	1.68	11.33	10.10	17.33	1.89	23.33	1.26

5.42	1.68	11.42	10.10	17.42	1.89	23.42	1.26
5.50	1.68	11.50	43.76	17.50	1.89	23.50	1.26
5.58	1.68	11.58	43.76	17.58	1.89	23.58	1.26
5.67	1.68	11.67	43.76	17.67	1.89	23.67	1.26
5.75	1.68	11.75	116.14	17.75	1.89	23.75	1.26
5.83	1.68	11.83	116.14	17.83	1.89	23.83	1.26
5.92	1.68	11.92	116.14	17.92	1.89	23.92	1.26

```

-----
| CALIB                                     |
| NASHYD ( 0002) | Area (ha)= 4.50 Curve Number (CN)= 60.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
-----
|                                     |
| U.H. Tp(hrs)= 0.61                |

```

Unit Hyd Qpeak (cms)= 0.282

PEAK FLOW (cms)= 0.172 (i)
 TIME TO PEAK (hrs)= 12.500
 RUNOFF VOLUME (mm)= 34.248
 TOTAL RAINFALL (mm)= 105.180
 RUNOFF COEFFICIENT = 0.326

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

```

-----
| CALIB                                     |
| NASHYD ( 0003) | Area (ha)= 18.80 Curve Number (CN)= 59.5
| ID= 1 DT= 5.0 min | Ia (mm)= 10.09 # of Linear Res.(N)= 3.00
-----
|                                     |
| U.H. Tp(hrs)= 1.00                |

```

Unit Hyd Qpeak (cms)= 0.718

PEAK FLOW (cms)= 0.493 (i)
 TIME TO PEAK (hrs)= 13.000
 RUNOFF VOLUME (mm)= 33.741
 TOTAL RAINFALL (mm)= 105.180
 RUNOFF COEFFICIENT = 0.321

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

```

-----
| CALIB                                     |
| NASHYD ( 0004) | Area (ha)= 10.60 Curve Number (CN)= 57.7
| ID= 1 DT= 5.0 min | Ia (mm)= 10.46 # of Linear Res.(N)= 3.00
-----
|                                     |
| U.H. Tp(hrs)= 0.72                |

```

Unit Hyd Qpeak (cms)= 0.562

PEAK FLOW (cms)= 0.334 (i)
TIME TO PEAK (hrs)= 12.667
RUNOFF VOLUME (mm)= 31.936
TOTAL RAINFALL (mm)= 105.180
RUNOFF COEFFICIENT = 0.304

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

CALIB			
NASHYD (0001)	Area (ha)= 24.80	Curve Number (CN)= 56.8	
ID= 1 DT= 5.0 min	Ia (mm)= 10.64	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 1.40		

Unit Hyd Qpeak (cms)= 0.677

PEAK FLOW (cms)= 0.457 (i)
TIME TO PEAK (hrs)= 13.417
RUNOFF VOLUME (mm)= 31.064
TOTAL RAINFALL (mm)= 105.180
RUNOFF COEFFICIENT = 0.295

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

CALIB			
NASHYD (0064)	Area (ha)= 11.60	Curve Number (CN)= 60.0	
ID= 1 DT= 5.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.55		

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.477 (i)
TIME TO PEAK (hrs)= 12.417
RUNOFF VOLUME (mm)= 34.247
TOTAL RAINFALL (mm)= 105.180
RUNOFF COEFFICIENT = 0.326

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

ADD HYD (0065)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)

ID1= 1 (0001):	24.80	0.457	13.42	31.06
+ ID2= 2 (0064):	11.60	0.477	12.42	34.25
=====				
ID = 3 (0065):	36.40	0.782	12.75	32.08

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 =====
 =====

V	V	I	SSSSS	U	U	A	L	(v 6.2.2019)
V	V	I	SS	U	U	A	A	L
V	V	I	SS	U	U	AAAAA	L	
V	V	I	SS	U	U	A	A	L
V	V	I	SSSSS	UUUUU	A	A	LLLLL	

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

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\f90129
 0e-903a-4934-b291-d75292ee385e\scena

Summary filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\f90129
 0e-903a-4934-b291-d75292ee385e\scena

DATE: 09/25/2025

TIME: 04:13:54

USER:

COMMENTS: _____

** SIMULATION : Calabogie SCS24 5yr **

READ STORM	Filename: C:\Users\aaahmed\AppData\Local\Temp\bd1542d1-d6c0-4b63-9a58-4482ee477887\dd0f30fa
Ptotal= 69.21 mm	Comments: Calabogie SCS24 5yr

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.76	6.00	1.38	12.00	9.96	18.00	1.25
0.08	0.76	6.08	1.38	12.08	9.96	18.08	1.25
0.17	0.76	6.17	1.38	12.17	9.96	18.17	1.25
0.25	0.76	6.25	1.38	12.25	9.96	18.25	1.25
0.33	0.76	6.33	1.38	12.33	9.96	18.33	1.25
0.42	0.76	6.42	1.38	12.42	9.96	18.42	1.25
0.50	0.76	6.50	1.38	12.50	5.12	18.50	1.25
0.58	0.76	6.58	1.38	12.58	5.12	18.58	1.25
0.67	0.76	6.67	1.38	12.67	5.12	18.67	1.25
0.75	0.76	6.75	1.38	12.75	5.12	18.75	1.25
0.83	0.76	6.83	1.38	12.83	5.12	18.83	1.25
0.92	0.76	6.92	1.38	12.92	5.12	18.92	1.25
1.00	0.76	7.00	1.38	13.00	0.97	19.00	1.25
1.08	0.76	7.08	1.38	13.08	0.97	19.08	1.25
1.17	0.76	7.17	1.38	13.17	0.97	19.17	1.25
1.25	0.76	7.25	1.38	13.25	0.97	19.25	1.25
1.33	0.76	7.33	1.38	13.33	0.97	19.33	1.25
1.42	0.76	7.42	1.38	13.42	0.97	19.42	1.25
1.50	0.76	7.50	1.38	13.50	5.67	19.50	1.25
1.58	0.76	7.58	1.38	13.58	5.67	19.58	1.25
1.67	0.76	7.67	1.38	13.67	5.67	19.67	1.25
1.75	0.76	7.75	1.38	13.75	5.67	19.75	1.25
1.83	0.76	7.83	1.38	13.83	5.67	19.83	1.25
1.92	0.76	7.92	1.38	13.92	5.67	19.92	1.25
2.00	0.90	8.00	1.87	14.00	2.08	20.00	0.83
2.08	0.90	8.08	1.87	14.08	2.08	20.08	0.83
2.17	0.90	8.17	1.87	14.17	2.08	20.17	0.83
2.25	0.90	8.25	1.87	14.25	2.08	20.25	0.83
2.33	0.90	8.33	1.87	14.33	2.08	20.33	0.83
2.42	0.90	8.42	1.87	14.42	2.08	20.42	0.83
2.50	0.90	8.50	1.87	14.50	2.08	20.50	0.83
2.58	0.90	8.58	1.87	14.58	2.08	20.58	0.83
2.67	0.90	8.67	1.87	14.67	2.08	20.67	0.83
2.75	0.90	8.75	1.87	14.75	2.08	20.75	0.83
2.83	0.90	8.83	1.87	14.83	2.08	20.83	0.83
2.92	0.90	8.92	1.87	14.92	2.08	20.92	0.83
3.00	0.90	9.00	2.21	15.00	2.08	21.00	0.83
3.08	0.90	9.08	2.21	15.08	2.08	21.08	0.83

3.17	0.90	9.17	2.21	15.17	2.08	21.17	0.83
3.25	0.90	9.25	2.21	15.25	2.08	21.25	0.83
3.33	0.90	9.33	2.21	15.33	2.08	21.33	0.83
3.42	0.90	9.42	2.21	15.42	2.08	21.42	0.83
3.50	0.90	9.50	2.49	15.50	2.08	21.50	0.83
3.58	0.90	9.58	2.49	15.58	2.08	21.58	0.83
3.67	0.90	9.67	2.49	15.67	2.08	21.67	0.83
3.75	0.90	9.75	2.49	15.75	2.08	21.75	0.83
3.83	0.90	9.83	2.49	15.83	2.08	21.83	0.83
3.92	0.90	9.92	2.49	15.92	2.08	21.92	0.83
4.00	1.11	10.00	3.18	16.00	1.25	22.00	0.83
4.08	1.11	10.08	3.18	16.08	1.25	22.08	0.83
4.17	1.11	10.17	3.18	16.17	1.25	22.17	0.83
4.25	1.11	10.25	3.18	16.25	1.25	22.25	0.83
4.33	1.11	10.33	3.18	16.33	1.25	22.33	0.83
4.42	1.11	10.42	3.18	16.42	1.25	22.42	0.83
4.50	1.11	10.50	4.29	16.50	1.25	22.50	0.83
4.58	1.11	10.58	4.29	16.58	1.25	22.58	0.83
4.67	1.11	10.67	4.29	16.67	1.25	22.67	0.83
4.75	1.11	10.75	4.29	16.75	1.25	22.75	0.83
4.83	1.11	10.83	4.29	16.83	1.25	22.83	0.83
4.92	1.11	10.92	4.29	16.92	1.25	22.92	0.83
5.00	1.11	11.00	6.64	17.00	1.25	23.00	0.83
5.08	1.11	11.08	6.64	17.08	1.25	23.08	0.83
5.17	1.11	11.17	6.64	17.17	1.25	23.17	0.83
5.25	1.11	11.25	6.64	17.25	1.25	23.25	0.83
5.33	1.11	11.33	6.64	17.33	1.25	23.33	0.83
5.42	1.11	11.42	6.64	17.42	1.25	23.42	0.83
5.50	1.11	11.50	28.79	17.50	1.25	23.50	0.83
5.58	1.11	11.58	28.79	17.58	1.25	23.58	0.83
5.67	1.11	11.67	28.79	17.67	1.25	23.67	0.83
5.75	1.11	11.75	76.40	17.75	1.25	23.75	0.83
5.83	1.11	11.83	76.40	17.83	1.25	23.83	0.83
5.92	1.11	11.92	76.40	17.92	1.25	23.92	0.83

CALIB			
NASHYD (0002)			
ID= 1 DT= 5.0 min			

Area	(ha)=	4.50	Curve Number (CN)= 60.0
Ia	(mm)=	10.00	# of Linear Res.(N)= 3.00
U.H. Tp(hrs)=	0.61		

Unit Hyd Qpeak (cms)= 0.282

PEAK FLOW (cms)= 0.074 (i)

TIME TO PEAK (hrs)= 12.583

RUNOFF VOLUME (mm)= 15.340

TOTAL RAINFALL (mm)= 69.213

RUNOFF COEFFICIENT = 0.222

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

CALIB		
NASHYD (0003)	Area (ha)= 18.80	Curve Number (CN)= 59.5
ID= 1 DT= 5.0 min	Ia (mm)= 10.09	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 1.00	

Unit Hyd Qpeak (cms)= 0.718

PEAK FLOW (cms)= 0.212 (i)

TIME TO PEAK (hrs)= 13.000

RUNOFF VOLUME (mm)= 15.066

TOTAL RAINFALL (mm)= 69.213

RUNOFF COEFFICIENT = 0.218

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

CALIB		
NASHYD (0004)	Area (ha)= 10.60	Curve Number (CN)= 57.7
ID= 1 DT= 5.0 min	Ia (mm)= 10.46	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.72	

Unit Hyd Qpeak (cms)= 0.562

PEAK FLOW (cms)= 0.141 (i)

TIME TO PEAK (hrs)= 12.667

RUNOFF VOLUME (mm)= 14.091

TOTAL RAINFALL (mm)= 69.213

RUNOFF COEFFICIENT = 0.204

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

CALIB		
NASHYD (0001)	Area (ha)= 24.80	Curve Number (CN)= 56.8
ID= 1 DT= 5.0 min	Ia (mm)= 10.64	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 1.40	

Unit Hyd Qpeak (cms)= 0.677

PEAK FLOW (cms)= 0.192 (i)

TIME TO PEAK (hrs)= 13.417

RUNOFF VOLUME (mm)= 13.627

TOTAL RAINFALL (mm)= 69.213

RUNOFF COEFFICIENT = 0.197

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

```
-----
| CALIB |
| NASHYD ( 0064) | Area (ha)= 11.60 Curve Number (CN)= 60.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
-----
U.H. Tp(hrs)= 0.55
```

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.206 (i)
TIME TO PEAK (hrs)= 12.500
RUNOFF VOLUME (mm)= 15.340
TOTAL RAINFALL (mm)= 69.213
RUNOFF COEFFICIENT = 0.222

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

```
-----
| ADD HYD ( 0065) |
| 1 + 2 = 3 |
-----
          AREA    QPEAK    TPEAK    R.V.
          (ha)    (cms)    (hrs)    (mm)
ID1= 1 ( 0001):  24.80    0.192    13.42    13.63
+ ID2= 2 ( 0064):  11.60    0.206    12.50    15.34
=====
ID = 3 ( 0065):  36.40    0.331    12.75    14.17
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

=====

V V I SSSSS U U A L (v 6.2.2019)
V V I SS U U A A L
V V I SS U U AAAAA L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

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

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\28a9d267-048c-4516-997c-176a45559f3d\scena

Summary filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\28a9d267-048c-4516-997c-176a45559f3d\scena

DATE: 09/25/2025

TIME: 04:18:48

USER:

COMMENTS: _____

** SIMULATION : 25mm **

| READ STORM |

Filename: C:\Users\aaahmed\AppData\Local\Temp\

		3f1ae911-35b1-4fff-9ed6-16a2585fe3e2\6329a775
	Ptotal= 25.00 mm	Comments: 25mm

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	1.48	1.00	6.32	2.00	4.37	3.00	2.04
0.08	1.58	1.08	9.36	2.08	3.96	3.08	1.96
0.17	1.67	1.17	18.42	2.17	3.63	3.17	1.89
0.25	1.80	1.25	79.14	2.25	3.36	3.25	1.82
0.33	1.94	1.33	34.99	2.33	3.12	3.33	1.76
0.42	2.10	1.42	18.68	2.42	2.92	3.42	1.70
0.50	2.31	1.50	12.60	2.50	2.75	3.50	1.65
0.58	2.56	1.58	9.50	2.58	2.59	3.58	1.59
0.67	2.88	1.67	7.64	2.67	2.46	3.67	1.55
0.75	3.31	1.75	6.41	2.75	2.34	3.75	1.50
0.83	3.91	1.83	5.53	2.83	2.23	3.83	1.46
0.92	4.81	1.92	4.87	2.92	2.13	3.92	1.43

CALIB		
NASHYD (0366)	Area (ha)= 10.70	Curve Number (CN)= 61.4
ID= 1 DT= 5.0 min	Ia (mm)= 9.68	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.67	

Unit Hyd Qpeak (cms)= 0.610

PEAK FLOW (cms)= 0.017 (i)
 TIME TO PEAK (hrs)= 2.500
 RUNOFF VOLUME (mm)= 1.341
 TOTAL RAINFALL (mm)= 25.002
 RUNOFF COEFFICIENT = 0.054

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

CALIB		
NASHYD (0362)	Area (ha)= 3.60	Curve Number (CN)= 57.9
ID= 1 DT= 5.0 min	Ia (mm)= 10.42	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.58	

Unit Hyd Qpeak (cms)= 0.237

PEAK FLOW (cms)= 0.005 (i)
 TIME TO PEAK (hrs)= 2.417
 RUNOFF VOLUME (mm)= 1.067
 TOTAL RAINFALL (mm)= 25.002
 RUNOFF COEFFICIENT = 0.043

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

```
-----
| CALIB |
| STANDHYD ( 0367) | Area (ha)= 16.70
| ID= 1 DT= 5.0 min | Total Imp(%)= 24.00 Dir. Conn.(%)= 12.00
-----
```

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	4.01	12.69	
Dep. Storage (mm)=	1.00	9.50	
Average Slope (%)=	1.00	2.00	
Length (m)=	333.67	40.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	79.14	1.55	
over (min)	5.00	45.00	
Storage Coeff. (min)=	5.78 (ii)	43.11 (ii)	
Unit Hyd. Tpeak (min)=	5.00	45.00	
Unit Hyd. peak (cms)=	0.20	0.03	
			TOTALS
PEAK FLOW (cms)=	0.29	0.03	0.288 (iii)
TIME TO PEAK (hrs)=	1.33	2.42	1.33
RUNOFF VOLUME (mm)=	24.00	1.78	4.45
TOTAL RAINFALL (mm)=	25.00	25.00	25.00
RUNOFF COEFFICIENT =	0.96	0.07	0.18

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 60.8 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
-----
| RESERVOIR( 0363) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
-----
```

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0630	0.1434	0.3528	0.3702
0.1550	0.2322	0.4320	0.4325
0.2556	0.2978	0.5148	0.4977

**** WARNING : FIRST OUTFLOW IS NOT ZERO.

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

INFLOW : ID= 2 (0367) 16.700 0.288 1.33 4.45
 OUTFLOW: ID= 1 (0363) 16.700 0.022 4.08 4.41

PEAK FLOW REDUCTION [Qout/Qin](%)= 7.65
 TIME SHIFT OF PEAK FLOW (min)=165.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0502

```

-----
| ADD HYD ( 0360) |
| 1 + 2 = 3 |
-----
                AREA    QPEAK    TPEAK    R.V.
                (ha)    (cms)    (hrs)    (mm)
ID1= 1 ( 0362):    3.60    0.005    2.42    1.07
+ ID2= 2 ( 0363):   16.70    0.022    4.08    4.41
=====
ID = 3 ( 0360):   20.30    0.025    3.58    3.82
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD ( 0365) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 4.50      Curve Number (CN)= 62.2
Ia (mm)= 9.45      # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.59
  
```

Unit Hyd Qpeak (cms)= 0.291

PEAK FLOW (cms)= 0.008 (i)
 TIME TO PEAK (hrs)= 2.417
 RUNOFF VOLUME (mm)= 1.423
 TOTAL RAINFALL (mm)= 25.002
 RUNOFF COEFFICIENT = 0.057

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

```

-----
| RESERVOIR( 0364) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
-----
                OVERFLOW IS OFF
                OUTFLOW    STORAGE    OUTFLOW    STORAGE
                (cms)    (ha.m.)    (cms)    (ha.m.)
***** WARNING : FIRST OUTFLOW IS NOT ZERO.
                0.0238    0.0111    |    0.1431    0.0294
                0.0518    0.0193    |    0.1809    0.0325
                0.0778    0.0248    |    0.2241    0.0356
                AREA    QPEAK    TPEAK    R.V.
                (ha)    (cms)    (hrs)    (mm)
INFLOW : ID= 2 ( 0365)    4.500    0.008    2.42    1.42
  
```

OUTFLOW: ID= 1 (0364) 4.500 0.005 3.58 1.40

PEAK FLOW REDUCTION [Qout/Qin](%)= 62.73
TIME SHIFT OF PEAK FLOW (min)= 70.00
MAXIMUM STORAGE USED (ha.m.)= 0.0023

CALIB			
NASHYD (0361)	Area (ha)= 23.20	Curve Number (CN)= 57.1	
ID= 1 DT= 5.0 min	Ia (mm)= 10.56	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 1.40		

Unit Hyd Qpeak (cms)= 0.633

PEAK FLOW (cms)= 0.019 (i)
TIME TO PEAK (hrs)= 3.833
RUNOFF VOLUME (mm)= 1.016
TOTAL RAINFALL (mm)= 25.002
RUNOFF COEFFICIENT = 0.041

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

CALIB			
NASHYD (0064)	Area (ha)= 11.60	Curve Number (CN)= 60.0	
ID= 1 DT= 5.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.55		

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.018 (i)
TIME TO PEAK (hrs)= 2.333
RUNOFF VOLUME (mm)= 1.221
TOTAL RAINFALL (mm)= 25.002
RUNOFF COEFFICIENT = 0.049

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

ADD HYD (0259)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0361):	23.20	0.019	3.83	1.02
+ ID2= 2 (0064):	11.60	0.018	2.33	1.22
=====				
ID = 3 (0259):	34.80	0.030	3.00	1.08

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

=====

V V I SSSSS U U A L (v 6.2.2019)
V V I SS U U A A L
V V I SS U U AAAAA L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

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

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\1f6c4d
2f-f70b-4636-9b60-5e9f0860f420\scena

Summary filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\1f6c4d
2f-f70b-4636-9b60-5e9f0860f420\scena

DATE: 09/25/2025

TIME: 04:18:50

USER:

COMMENTS: _____

** SIMULATION : Calabogie SCS24 100yr **

 | READ STORM |
 |
Ptotal=115.60 mm

Filename: C:\Users\aaahmed\AppData
 ata\Local\Temp\
 3f1ae911-35b1-4fff-9ed6-16a2585fe3e2\2b99ff6d
 Comments: Calabogie SCS24 100yr

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr
0.00	1.27	6.00	2.31		12.00	16.65	18.00	2.08
0.08	1.27	6.08	2.31		12.08	16.65	18.08	2.08
0.17	1.27	6.17	2.31		12.17	16.65	18.17	2.08
0.25	1.27	6.25	2.31		12.25	16.65	18.25	2.08
0.33	1.27	6.33	2.31		12.33	16.65	18.33	2.08
0.42	1.27	6.42	2.31		12.42	16.65	18.42	2.08
0.50	1.27	6.50	2.31		12.50	8.55	18.50	2.08
0.58	1.27	6.58	2.31		12.58	8.55	18.58	2.08
0.67	1.27	6.67	2.31		12.67	8.55	18.67	2.08
0.75	1.27	6.75	2.31		12.75	8.55	18.75	2.08
0.83	1.27	6.83	2.31		12.83	8.55	18.83	2.08
0.92	1.27	6.92	2.31		12.92	8.55	18.92	2.08
1.00	1.27	7.00	2.31		13.00	1.62	19.00	2.08
1.08	1.27	7.08	2.31		13.08	1.62	19.08	2.08
1.17	1.27	7.17	2.31		13.17	1.62	19.17	2.08
1.25	1.27	7.25	2.31		13.25	1.62	19.25	2.08
1.33	1.27	7.33	2.31		13.33	1.62	19.33	2.08
1.42	1.27	7.42	2.31		13.42	1.62	19.42	2.08
1.50	1.27	7.50	2.31		13.50	9.48	19.50	2.08
1.58	1.27	7.58	2.31		13.58	9.48	19.58	2.08
1.67	1.27	7.67	2.31		13.67	9.48	19.67	2.08
1.75	1.27	7.75	2.31		13.75	9.48	19.75	2.08
1.83	1.27	7.83	2.31		13.83	9.48	19.83	2.08
1.92	1.27	7.92	2.31		13.92	9.48	19.92	2.08
2.00	1.50	8.00	3.12		14.00	3.47	20.00	1.39
2.08	1.50	8.08	3.12		14.08	3.47	20.08	1.39
2.17	1.50	8.17	3.12		14.17	3.47	20.17	1.39
2.25	1.50	8.25	3.12		14.25	3.47	20.25	1.39
2.33	1.50	8.33	3.12		14.33	3.47	20.33	1.39
2.42	1.50	8.42	3.12		14.42	3.47	20.42	1.39
2.50	1.50	8.50	3.12		14.50	3.47	20.50	1.39
2.58	1.50	8.58	3.12		14.58	3.47	20.58	1.39
2.67	1.50	8.67	3.12		14.67	3.47	20.67	1.39
2.75	1.50	8.75	3.12		14.75	3.47	20.75	1.39
2.83	1.50	8.83	3.12		14.83	3.47	20.83	1.39
2.92	1.50	8.92	3.12		14.92	3.47	20.92	1.39
3.00	1.50	9.00	3.70		15.00	3.47	21.00	1.39
3.08	1.50	9.08	3.70		15.08	3.47	21.08	1.39
3.17	1.50	9.17	3.70		15.17	3.47	21.17	1.39
3.25	1.50	9.25	3.70		15.25	3.47	21.25	1.39
3.33	1.50	9.33	3.70		15.33	3.47	21.33	1.39
3.42	1.50	9.42	3.70		15.42	3.47	21.42	1.39

3.50	1.50	9.50	4.16	15.50	3.47	21.50	1.39
3.58	1.50	9.58	4.16	15.58	3.47	21.58	1.39
3.67	1.50	9.67	4.16	15.67	3.47	21.67	1.39
3.75	1.50	9.75	4.16	15.75	3.47	21.75	1.39
3.83	1.50	9.83	4.16	15.83	3.47	21.83	1.39
3.92	1.50	9.92	4.16	15.92	3.47	21.92	1.39
4.00	1.85	10.00	5.32	16.00	2.08	22.00	1.39
4.08	1.85	10.08	5.32	16.08	2.08	22.08	1.39
4.17	1.85	10.17	5.32	16.17	2.08	22.17	1.39
4.25	1.85	10.25	5.32	16.25	2.08	22.25	1.39
4.33	1.85	10.33	5.32	16.33	2.08	22.33	1.39
4.42	1.85	10.42	5.32	16.42	2.08	22.42	1.39
4.50	1.85	10.50	7.17	16.50	2.08	22.50	1.39
4.58	1.85	10.58	7.17	16.58	2.08	22.58	1.39
4.67	1.85	10.67	7.17	16.67	2.08	22.67	1.39
4.75	1.85	10.75	7.17	16.75	2.08	22.75	1.39
4.83	1.85	10.83	7.17	16.83	2.08	22.83	1.39
4.92	1.85	10.92	7.17	16.92	2.08	22.92	1.39
5.00	1.85	11.00	11.10	17.00	2.08	23.00	1.39
5.08	1.85	11.08	11.10	17.08	2.08	23.08	1.39
5.17	1.85	11.17	11.10	17.17	2.08	23.17	1.39
5.25	1.85	11.25	11.10	17.25	2.08	23.25	1.39
5.33	1.85	11.33	11.10	17.33	2.08	23.33	1.39
5.42	1.85	11.42	11.10	17.42	2.08	23.42	1.39
5.50	1.85	11.50	48.09	17.50	2.08	23.50	1.39
5.58	1.85	11.58	48.09	17.58	2.08	23.58	1.39
5.67	1.85	11.67	48.09	17.67	2.08	23.67	1.39
5.75	1.85	11.75	127.62	17.75	2.08	23.75	1.39
5.83	1.85	11.83	127.62	17.83	2.08	23.83	1.39
5.92	1.85	11.92	127.62	17.92	2.08	23.92	1.39

CALIB			
NASHYD (0366)	Area (ha)=	10.70	Curve Number (CN)= 61.4
ID= 1 DT= 5.0 min	Ia (mm)=	9.68	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.67	

Unit Hyd Qpeak (cms)= 0.610

PEAK FLOW (cms)= 0.478 (i)

TIME TO PEAK (hrs)= 12.583

RUNOFF VOLUME (mm)= 42.241

TOTAL RAINFALL (mm)= 115.603

RUNOFF COEFFICIENT = 0.365

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

```

-----
| CALIB |
| NASHYD ( 0362) | Area (ha)= 3.60 Curve Number (CN)= 57.9
| ID= 1 DT= 5.0 min | Ia (mm)= 10.42 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.58

```

Unit Hyd Qpeak (cms)= 0.237

PEAK FLOW (cms)= 0.159 (i)
 TIME TO PEAK (hrs)= 12.500
 RUNOFF VOLUME (mm)= 38.165
 TOTAL RAINFALL (mm)= 115.603
 RUNOFF COEFFICIENT = 0.330

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

```

-----
| CALIB |
| STANDHYD ( 0367) | Area (ha)= 16.70
| ID= 1 DT= 5.0 min | Total Imp(%)= 24.00 Dir. Conn.(%)= 12.00
-----

```

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	4.01	12.69	
Dep. Storage	(mm)=	1.00	9.50	
Average Slope	(%)=	1.00	2.00	
Length	(m)=	333.67	40.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		127.62	73.09	
over (min)		5.00	15.00	
Storage Coeff. (min)=		4.77 (ii)	12.78 (ii)	
Unit Hyd. Tpeak (min)=		5.00	15.00	
Unit Hyd. peak (cms)=		0.22	0.08	
				TOTALS
PEAK FLOW (cms)=		0.69	1.58	2.071 (iii)
TIME TO PEAK (hrs)=		12.00	12.08	12.00
RUNOFF VOLUME (mm)=		114.60	46.35	54.54
TOTAL RAINFALL (mm)=		115.60	115.60	115.60
RUNOFF COEFFICIENT =		0.99	0.40	0.47

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

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 60.8 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| RESERVOIR( 0363) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----

```

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
------------------	--------------------	------------------	--------------------

**** WARNING : FIRST OUTFLOW IS NOT ZERO.

0.0630	0.1434	0.3528	0.3702
0.1550	0.2322	0.4320	0.4325
0.2556	0.2978	0.5148	0.4977

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0367)	16.700	2.071	12.00	54.54
OUTFLOW: ID= 1 (0363)	16.700	0.414	12.75	54.51

PEAK FLOW REDUCTION [Qout/Qin](%)= 19.99
 TIME SHIFT OF PEAK FLOW (min)= 45.00
 MAXIMUM STORAGE USED (ha.m.)= 0.4184

```

-----
| ADD HYD ( 0360) |
| 1 + 2 = 3       |
-----

```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0362):	3.60	0.159	12.50	38.17
+ ID2= 2 (0363):	16.70	0.414	12.75	54.51
=====				
ID = 3 (0360):	20.30	0.564	12.67	51.61

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB          |
| NASHYD ( 0365) |
| ID= 1 DT= 5.0 min |
-----

```

Area (ha)=	4.50	Curve Number (CN)=	62.2
Ia (mm)=	9.45	# of Linear Res.(N)=	3.00
U.H. Tp(hrs)=	0.59		

Unit Hyd Qpeak (cms)= 0.291

PEAK FLOW (cms)= 0.226 (i)
 TIME TO PEAK (hrs)= 12.500
 RUNOFF VOLUME (mm)= 43.253
 TOTAL RAINFALL (mm)= 115.603
 RUNOFF COEFFICIENT = 0.374

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

```

-----
| RESERVOIR( 0364) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
      OUTFLOW    STORAGE | OUTFLOW    STORAGE
      (cms)      (ha.m.) | (cms)      (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
      0.0238      0.0111 | 0.1431      0.0294
      0.0518      0.0193 | 0.1809      0.0325
      0.0778      0.0248 | 0.2241      0.0356

      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0365)  4.500      0.226      12.50      43.25
OUTFLOW: ID= 1 ( 0364)  4.500      0.199      12.83      43.23

      PEAK FLOW REDUCTION [Qout/Qin](%)= 88.02
      TIME SHIFT OF PEAK FLOW (min)= 20.00
      MAXIMUM STORAGE USED (ha.m.)= 0.0338

```

```

-----
| CALIB
| NASHYD ( 0361) | Area (ha)= 23.20 Curve Number (CN)= 57.1
| ID= 1 DT= 5.0 min | Ia (mm)= 10.56 # of Linear Res.(N)= 3.00
-----
      U.H. Tp(hrs)= 1.40

Unit Hyd Qpeak (cms)= 0.633

PEAK FLOW (cms)= 0.517 (i)
TIME TO PEAK (hrs)= 13.417
RUNOFF VOLUME (mm)= 37.292
TOTAL RAINFALL (mm)= 115.603
RUNOFF COEFFICIENT = 0.323

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

```

```

-----
| CALIB
| NASHYD ( 0064) | Area (ha)= 11.60 Curve Number (CN)= 60.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
-----
      U.H. Tp(hrs)= 0.55

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.569 (i)
TIME TO PEAK (hrs)= 12.417
RUNOFF VOLUME (mm)= 40.560
TOTAL RAINFALL (mm)= 115.603

```

RUNOFF COEFFICIENT = 0.351

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

```
-----
| ADD HYD ( 0259) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
ID1= 1 ( 0361):  23.20  0.517  13.42  37.29
+ ID2= 2 ( 0064):  11.60  0.569  12.42  40.56
=====
ID = 3 ( 0259):  34.80  0.912  12.67  38.38
=====
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

FINISH

=====

=====

=====

=====

```
V  V  I  SSSSS  U  U  A  L          (v 6.2.2019)
V  V  I  SS    U  U  A A  L
V  V  I  SS    U  U  AAAAA L
V  V  I  SS    U  U  A  A  L
VV    I  SSSSS  UUUUU  A  A  LLLLL
```

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

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\52894df-cf9f-41a3-9c45-54ed6422e0c8\scena

Summary filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\52894

df-cf9f-41a3-9c45-54ed6422e0c8\scena

DATE: 09/25/2025

TIME: 04:18:49

USER:

COMMENTS: _____

** SIMULATION : Calabogie SCS24 10yr **

READ STORM	Filename: C:\Users\aaahmed\AppData\Local\Temp\3f1ae911-35b1-4fff-9ed6-16a2585fe3e2\15367154
Ptotal= 80.40 mm	Comments: Calabogie SCS24 10yr

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.88	6.00	1.61	12.00	11.58	18.00	1.45
0.08	0.88	6.08	1.61	12.08	11.58	18.08	1.45
0.17	0.88	6.17	1.61	12.17	11.58	18.17	1.45
0.25	0.88	6.25	1.61	12.25	11.58	18.25	1.45
0.33	0.88	6.33	1.61	12.33	11.58	18.33	1.45
0.42	0.88	6.42	1.61	12.42	11.58	18.42	1.45
0.50	0.88	6.50	1.61	12.50	5.95	18.50	1.45
0.58	0.88	6.58	1.61	12.58	5.95	18.58	1.45
0.67	0.88	6.67	1.61	12.67	5.95	18.67	1.45
0.75	0.88	6.75	1.61	12.75	5.95	18.75	1.45
0.83	0.88	6.83	1.61	12.83	5.95	18.83	1.45
0.92	0.88	6.92	1.61	12.92	5.95	18.92	1.45
1.00	0.88	7.00	1.61	13.00	1.13	19.00	1.45
1.08	0.88	7.08	1.61	13.08	1.13	19.08	1.45
1.17	0.88	7.17	1.61	13.17	1.13	19.17	1.45
1.25	0.88	7.25	1.61	13.25	1.13	19.25	1.45
1.33	0.88	7.33	1.61	13.33	1.13	19.33	1.45
1.42	0.88	7.42	1.61	13.42	1.13	19.42	1.45
1.50	0.88	7.50	1.61	13.50	6.59	19.50	1.45
1.58	0.88	7.58	1.61	13.58	6.59	19.58	1.45
1.67	0.88	7.67	1.61	13.67	6.59	19.67	1.45
1.75	0.88	7.75	1.61	13.75	6.59	19.75	1.45
1.83	0.88	7.83	1.61	13.83	6.59	19.83	1.45

1.92	0.88	7.92	1.61	13.92	6.59	19.92	1.45
2.00	1.05	8.00	2.17	14.00	2.41	20.00	0.96
2.08	1.05	8.08	2.17	14.08	2.41	20.08	0.96
2.17	1.05	8.17	2.17	14.17	2.41	20.17	0.96
2.25	1.05	8.25	2.17	14.25	2.41	20.25	0.96
2.33	1.05	8.33	2.17	14.33	2.41	20.33	0.96
2.42	1.05	8.42	2.17	14.42	2.41	20.42	0.96
2.50	1.05	8.50	2.17	14.50	2.41	20.50	0.96
2.58	1.05	8.58	2.17	14.58	2.41	20.58	0.96
2.67	1.05	8.67	2.17	14.67	2.41	20.67	0.96
2.75	1.05	8.75	2.17	14.75	2.41	20.75	0.96
2.83	1.05	8.83	2.17	14.83	2.41	20.83	0.96
2.92	1.05	8.92	2.17	14.92	2.41	20.92	0.96
3.00	1.05	9.00	2.57	15.00	2.41	21.00	0.96
3.08	1.05	9.08	2.57	15.08	2.41	21.08	0.96
3.17	1.05	9.17	2.57	15.17	2.41	21.17	0.96
3.25	1.05	9.25	2.57	15.25	2.41	21.25	0.96
3.33	1.05	9.33	2.57	15.33	2.41	21.33	0.96
3.42	1.05	9.42	2.57	15.42	2.41	21.42	0.96
3.50	1.05	9.50	2.89	15.50	2.41	21.50	0.96
3.58	1.05	9.58	2.89	15.58	2.41	21.58	0.96
3.67	1.05	9.67	2.89	15.67	2.41	21.67	0.96
3.75	1.05	9.75	2.89	15.75	2.41	21.75	0.96
3.83	1.05	9.83	2.89	15.83	2.41	21.83	0.96
3.92	1.05	9.92	2.89	15.92	2.41	21.92	0.96
4.00	1.29	10.00	3.70	16.00	1.45	22.00	0.96
4.08	1.29	10.08	3.70	16.08	1.45	22.08	0.96
4.17	1.29	10.17	3.70	16.17	1.45	22.17	0.96
4.25	1.29	10.25	3.70	16.25	1.45	22.25	0.96
4.33	1.29	10.33	3.70	16.33	1.45	22.33	0.96
4.42	1.29	10.42	3.70	16.42	1.45	22.42	0.96
4.50	1.29	10.50	4.98	16.50	1.45	22.50	0.96
4.58	1.29	10.58	4.98	16.58	1.45	22.58	0.96
4.67	1.29	10.67	4.98	16.67	1.45	22.67	0.96
4.75	1.29	10.75	4.98	16.75	1.45	22.75	0.96
4.83	1.29	10.83	4.98	16.83	1.45	22.83	0.96
4.92	1.29	10.92	4.98	16.92	1.45	22.92	0.96
5.00	1.29	11.00	7.72	17.00	1.45	23.00	0.96
5.08	1.29	11.08	7.72	17.08	1.45	23.08	0.96
5.17	1.29	11.17	7.72	17.17	1.45	23.17	0.96
5.25	1.29	11.25	7.72	17.25	1.45	23.25	0.96
5.33	1.29	11.33	7.72	17.33	1.45	23.33	0.96
5.42	1.29	11.42	7.72	17.42	1.45	23.42	0.96
5.50	1.29	11.50	33.45	17.50	1.45	23.50	0.96
5.58	1.29	11.58	33.45	17.58	1.45	23.58	0.96
5.67	1.29	11.67	33.45	17.67	1.45	23.67	0.96
5.75	1.29	11.75	88.76	17.75	1.45	23.75	0.96
5.83	1.29	11.83	88.76	17.83	1.45	23.83	0.96
5.92	1.29	11.92	88.76	17.92	1.45	23.92	0.96

```

-----
| CALIB                                     |
| NASHYD ( 0366) | Area (ha)= 10.70   Curve Number (CN)= 61.4
| ID= 1 DT= 5.0 min | Ia (mm)= 9.68   # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.67

```

Unit Hyd Qpeak (cms)= 0.610

PEAK FLOW (cms)= 0.239 (i)
 TIME TO PEAK (hrs)= 12.583
 RUNOFF VOLUME (mm)= 21.705
 TOTAL RAINFALL (mm)= 80.398
 RUNOFF COEFFICIENT = 0.270

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

```

-----
| CALIB                                     |
| NASHYD ( 0362) | Area (ha)= 3.60   Curve Number (CN)= 57.9
| ID= 1 DT= 5.0 min | Ia (mm)= 10.42  # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.58

```

Unit Hyd Qpeak (cms)= 0.237

PEAK FLOW (cms)= 0.078 (i)
 TIME TO PEAK (hrs)= 12.500
 RUNOFF VOLUME (mm)= 19.228
 TOTAL RAINFALL (mm)= 80.398
 RUNOFF COEFFICIENT = 0.239

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

```

-----
| CALIB                                     |
| STANDHYD ( 0367) | Area (ha)= 16.70
| ID= 1 DT= 5.0 min | Total Imp(%)= 24.00   Dir. Conn.(%)= 12.00
|-----|

```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	4.01	12.69
Dep. Storage	(mm)=	1.00	9.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	333.67	40.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		88.76	35.72
over (min)		5.00	20.00

Storage Coeff. (min)=	5.52 (ii)	16.18 (ii)	
Unit Hyd. Tpeak (min)=	5.00	20.00	
Unit Hyd. peak (cms)=	0.20	0.06	
			TOTALS
PEAK FLOW (cms)=	0.47	0.70	0.959 (iii)
TIME TO PEAK (hrs)=	12.00	12.17	12.00
RUNOFF VOLUME (mm)=	79.40	24.40	31.00
TOTAL RAINFALL (mm)=	80.40	80.40	80.40
RUNOFF COEFFICIENT =	0.99	0.30	0.39

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 60.8 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| RESERVOIR( 0363) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----

```

	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.	0.0630	0.1434	0.3528	0.3702
	0.1550	0.2322	0.4320	0.4325
	0.2556	0.2978	0.5148	0.4977

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0367)	16.700	0.959	12.00	31.00
OUTFLOW: ID= 1 (0363)	16.700	0.179	13.08	30.96

PEAK FLOW REDUCTION [Qout/Qin](%)= 18.65
TIME SHIFT OF PEAK FLOW (min)= 65.00
MAXIMUM STORAGE USED (ha.m.)= 0.2479

```

-----
| ADD HYD ( 0360) |
| 1 + 2 = 3       |
-----

```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0362):	3.60	0.078	12.50	19.23
+ ID2= 2 (0363):	16.70	0.179	13.08	30.96
=====				
ID = 3 (0360):	20.30	0.242	12.83	28.88

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0365)	Area (ha)=	4.50	Curve Number (CN)= 62.2
ID= 1 DT= 5.0 min	Ia (mm)=	9.45	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.59	

Unit Hyd Qpeak (cms)= 0.291

PEAK FLOW (cms)= 0.113 (i)
TIME TO PEAK (hrs)= 12.500
RUNOFF VOLUME (mm)= 22.340
TOTAL RAINFALL (mm)= 80.398
RUNOFF COEFFICIENT = 0.278

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

RESERVOIR(0364)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
***** WARNING : FIRST OUTFLOW IS NOT ZERO.				
	0.0238	0.0111	0.1431	0.0294
	0.0518	0.0193	0.1809	0.0325
	0.0778	0.0248	0.2241	0.0356
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0365)	4.500	0.113	12.50	22.34
OUTFLOW: ID= 1 (0364)	4.500	0.075	13.17	22.31

PEAK FLOW REDUCTION [Qout/Qin](%)= 66.35
TIME SHIFT OF PEAK FLOW (min)= 40.00
MAXIMUM STORAGE USED (ha.m.)= 0.0243

CALIB			
NASHYD (0361)	Area (ha)=	23.20	Curve Number (CN)= 57.1
ID= 1 DT= 5.0 min	Ia (mm)=	10.56	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	1.40	

Unit Hyd Qpeak (cms)= 0.633

PEAK FLOW (cms)= 0.251 (i)
TIME TO PEAK (hrs)= 13.417
RUNOFF VOLUME (mm)= 18.710

TOTAL RAINFALL (mm)= 80.398
RUNOFF COEFFICIENT = 0.233

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

```
-----
| CALIB |
| NASHYD ( 0064) | Area (ha)= 11.60 Curve Number (CN)= 60.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
-----
U.H. Tp(hrs)= 0.55
```

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.282 (i)
TIME TO PEAK (hrs)= 12.500
RUNOFF VOLUME (mm)= 20.672
TOTAL RAINFALL (mm)= 80.398
RUNOFF COEFFICIENT = 0.257

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

```
-----
| ADD HYD ( 0259) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
ID1= 1 ( 0361):  23.20  0.251  13.42  18.71
+ ID2= 2 ( 0064):  11.60  0.282  12.50  20.67
=====
ID = 3 ( 0259):  34.80  0.446  12.75  19.36
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

```
V  V  I  SSSSS  U  U  A  L  (v 6.2.2019)
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
  WV  I  SSSSS  UUUUU  A  A  LLLLL
```

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

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\57a10a
ea-f9bb-4566-96ea-97f05fbe225d\scena

Summary filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\57a10a
ea-f9bb-4566-96ea-97f05fbe225d\scena

DATE: 09/25/2025

TIME: 04:18:48

USER:

COMMENTS: _____

** SIMULATION : Calabogie SCS24 25yr **

| READ STORM | Filename: C:\Users\aaahmed\AppData
| | ata\Local\Temp\
| | 3f1ae911-35b1-4fff-9ed6-16a2585fe3e2\431e6d61
| Ptotal= 94.47 mm | Comments: Calabogie SCS24 25yr

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr
0.00	1.04	6.00	1.89		12.00	13.61	18.00	1.70
0.08	1.04	6.08	1.89		12.08	13.61	18.08	1.70
0.17	1.04	6.17	1.89		12.17	13.61	18.17	1.70
0.25	1.04	6.25	1.89		12.25	13.61	18.25	1.70
0.33	1.04	6.33	1.89		12.33	13.61	18.33	1.70
0.42	1.04	6.42	1.89		12.42	13.61	18.42	1.70
0.50	1.04	6.50	1.89		12.50	6.99	18.50	1.70
0.58	1.04	6.58	1.89		12.58	6.99	18.58	1.70
0.67	1.04	6.67	1.89		12.67	6.99	18.67	1.70
0.75	1.04	6.75	1.89		12.75	6.99	18.75	1.70

0.83	1.04	6.83	1.89	12.83	6.99	18.83	1.70
0.92	1.04	6.92	1.89	12.92	6.99	18.92	1.70
1.00	1.04	7.00	1.89	13.00	1.32	19.00	1.70
1.08	1.04	7.08	1.89	13.08	1.32	19.08	1.70
1.17	1.04	7.17	1.89	13.17	1.32	19.17	1.70
1.25	1.04	7.25	1.89	13.25	1.32	19.25	1.70
1.33	1.04	7.33	1.89	13.33	1.32	19.33	1.70
1.42	1.04	7.42	1.89	13.42	1.32	19.42	1.70
1.50	1.04	7.50	1.89	13.50	7.75	19.50	1.70
1.58	1.04	7.58	1.89	13.58	7.75	19.58	1.70
1.67	1.04	7.67	1.89	13.67	7.75	19.67	1.70
1.75	1.04	7.75	1.89	13.75	7.75	19.75	1.70
1.83	1.04	7.83	1.89	13.83	7.75	19.83	1.70
1.92	1.04	7.92	1.89	13.92	7.75	19.92	1.70
2.00	1.23	8.00	2.55	14.00	2.84	20.00	1.13
2.08	1.23	8.08	2.55	14.08	2.83	20.08	1.13
2.17	1.23	8.17	2.55	14.17	2.84	20.17	1.13
2.25	1.23	8.25	2.55	14.25	2.83	20.25	1.13
2.33	1.23	8.33	2.55	14.33	2.84	20.33	1.13
2.42	1.23	8.42	2.55	14.42	2.83	20.42	1.13
2.50	1.23	8.50	2.55	14.50	2.84	20.50	1.13
2.58	1.23	8.58	2.55	14.58	2.83	20.58	1.13
2.67	1.23	8.67	2.55	14.67	2.84	20.67	1.13
2.75	1.23	8.75	2.55	14.75	2.83	20.75	1.13
2.83	1.23	8.83	2.55	14.83	2.84	20.83	1.13
2.92	1.23	8.92	2.55	14.92	2.83	20.92	1.13
3.00	1.23	9.00	3.02	15.00	2.84	21.00	1.13
3.08	1.23	9.08	3.02	15.08	2.83	21.08	1.13
3.17	1.23	9.17	3.02	15.17	2.84	21.17	1.13
3.25	1.23	9.25	3.02	15.25	2.83	21.25	1.13
3.33	1.23	9.33	3.02	15.33	2.84	21.33	1.13
3.42	1.23	9.42	3.02	15.42	2.83	21.42	1.13
3.50	1.23	9.50	3.40	15.50	2.84	21.50	1.13
3.58	1.23	9.58	3.40	15.58	2.83	21.58	1.13
3.67	1.23	9.67	3.40	15.67	2.84	21.67	1.13
3.75	1.23	9.75	3.40	15.75	2.83	21.75	1.13
3.83	1.23	9.83	3.40	15.83	2.83	21.83	1.13
3.92	1.23	9.92	3.40	15.92	2.84	21.92	1.13
4.00	1.51	10.00	4.35	16.00	1.70	22.00	1.13
4.08	1.51	10.08	4.35	16.08	1.70	22.08	1.13
4.17	1.51	10.17	4.35	16.17	1.70	22.17	1.13
4.25	1.51	10.25	4.35	16.25	1.70	22.25	1.13
4.33	1.51	10.33	4.35	16.33	1.70	22.33	1.13
4.42	1.51	10.42	4.35	16.42	1.70	22.42	1.13
4.50	1.51	10.50	5.86	16.50	1.70	22.50	1.13
4.58	1.51	10.58	5.86	16.58	1.70	22.58	1.13
4.67	1.51	10.67	5.86	16.67	1.70	22.67	1.13
4.75	1.51	10.75	5.86	16.75	1.70	22.75	1.13
4.83	1.51	10.83	5.86	16.83	1.70	22.83	1.13
4.92	1.51	10.92	5.86	16.92	1.70	22.92	1.13

5.00	1.51	11.00	9.07	17.00	1.70	23.00	1.13
5.08	1.51	11.08	9.07	17.08	1.70	23.08	1.13
5.17	1.51	11.17	9.07	17.17	1.70	23.17	1.13
5.25	1.51	11.25	9.07	17.25	1.70	23.25	1.13
5.33	1.51	11.33	9.07	17.33	1.70	23.33	1.13
5.42	1.51	11.42	9.07	17.42	1.70	23.42	1.13
5.50	1.51	11.50	39.31	17.50	1.70	23.50	1.13
5.58	1.51	11.58	39.31	17.58	1.70	23.58	1.13
5.67	1.51	11.67	39.31	17.67	1.70	23.67	1.13
5.75	1.51	11.75	104.33	17.75	1.70	23.75	1.13
5.83	1.51	11.83	104.33	17.83	1.70	23.83	1.13
5.92	1.51	11.92	104.33	17.92	1.70	23.92	1.13

CALIB			
NASHYD (0366)		Area (ha)= 10.70	Curve Number (CN)= 61.4
ID= 1 DT= 5.0 min		Ia (mm)= 9.68	# of Linear Res.(N)= 3.00
		U.H. Tp(hrs)= 0.67	

Unit Hyd Qpeak (cms)= 0.610

PEAK FLOW (cms)= 0.328 (i)
 TIME TO PEAK (hrs)= 12.583
 RUNOFF VOLUME (mm)= 29.410
 TOTAL RAINFALL (mm)= 94.475
 RUNOFF COEFFICIENT = 0.311

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

CALIB			
NASHYD (0362)		Area (ha)= 3.60	Curve Number (CN)= 57.9
ID= 1 DT= 5.0 min		Ia (mm)= 10.42	# of Linear Res.(N)= 3.00
		U.H. Tp(hrs)= 0.58	

Unit Hyd Qpeak (cms)= 0.237

PEAK FLOW (cms)= 0.108 (i)
 TIME TO PEAK (hrs)= 12.500
 RUNOFF VOLUME (mm)= 26.289
 TOTAL RAINFALL (mm)= 94.475
 RUNOFF COEFFICIENT = 0.278

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

CALIB		
STANDHYD (0367)	Area (ha)= 16.70	
ID= 1 DT= 5.0 min	Total Imp(%)= 24.00	Dir. Conn.(%)= 12.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	4.01	12.69
Dep. Storage (mm)=	1.00	9.50
Average Slope (%)=	1.00	2.00
Length (m)=	333.67	40.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	104.33	51.69
over (min)	5.00	15.00
Storage Coeff. (min)=	5.18 (ii)	14.37 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.21	0.08

TOTALS

PEAK FLOW (cms)=	0.56	1.05	1.461 (iii)
TIME TO PEAK (hrs)=	12.00	12.08	12.00
RUNOFF VOLUME (mm)=	93.47	32.69	39.98
TOTAL RAINFALL (mm)=	94.47	94.47	94.47
RUNOFF COEFFICIENT =	0.99	0.35	0.42

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 60.8 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0363)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
***** WARNING : FIRST OUTFLOW IS NOT ZERO.				
	0.0630	0.1434	0.3528	0.3702
	0.1550	0.2322	0.4320	0.4325
	0.2556	0.2978	0.5148	0.4977

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0367)	16.700	1.461	12.00	39.98
OUTFLOW: ID= 1 (0363)	16.700	0.274	12.83	39.95

PEAK FLOW REDUCTION [Qout/Qin](%)= 18.73
TIME SHIFT OF PEAK FLOW (min)= 50.00

MAXIMUM STORAGE USED (ha.m.)= 0.3115

```
-----
| ADD HYD ( 0360) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
ID1= 1 ( 0362):    3.60    0.108    12.50    26.29
+ ID2= 2 ( 0363):   16.70    0.274    12.83    39.95
=====
ID = 3 ( 0360):    20.30    0.373    12.67    37.52
-----
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| CALIB |
| NASHYD ( 0365) | Area (ha)= 4.50 Curve Number (CN)= 62.2
| ID= 1 DT= 5.0 min | Ia (mm)= 9.45 # of Linear Res.(N)= 3.00
-----
          U.H. Tp(hrs)= 0.59
```

Unit Hyd Qpeak (cms)= 0.291

PEAK FLOW (cms)= 0.156 (i)
TIME TO PEAK (hrs)= 12.500
RUNOFF VOLUME (mm)= 30.198
TOTAL RAINFALL (mm)= 94.475
RUNOFF COEFFICIENT = 0.320

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

```
-----
| RESERVOIR( 0364) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
-----
          OUTFLOW      STORAGE      OUTFLOW      STORAGE
          (cms)      (ha.m.)      (cms)      (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
          0.0238      0.0111      0.1431      0.0294
          0.0518      0.0193      0.1809      0.0325
          0.0778      0.0248      0.2241      0.0356
-----
```

```
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0365)    4.500    0.156    12.50    30.20
OUTFLOW: ID= 1 ( 0364)    4.500    0.128    12.92    30.17
```

PEAK FLOW REDUCTION [Qout/Qin](%)= 82.03
TIME SHIFT OF PEAK FLOW (min)= 25.00
MAXIMUM STORAGE USED (ha.m.)= 0.0283

```

-----
| CALIB |
| NASHYD ( 0361) | Area (ha)= 23.20 Curve Number (CN)= 57.1
| ID= 1 DT= 5.0 min | Ia (mm)= 10.56 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 1.40

```

Unit Hyd Qpeak (cms)= 0.633

PEAK FLOW (cms)= 0.350 (i)
 TIME TO PEAK (hrs)= 13.417
 RUNOFF VOLUME (mm)= 25.630
 TOTAL RAINFALL (mm)= 94.475
 RUNOFF COEFFICIENT = 0.271

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

```

-----
| CALIB |
| NASHYD ( 0064) | Area (ha)= 11.60 Curve Number (CN)= 60.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.55

```

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.389 (i)
 TIME TO PEAK (hrs)= 12.500
 RUNOFF VOLUME (mm)= 28.115
 TOTAL RAINFALL (mm)= 94.475
 RUNOFF COEFFICIENT = 0.298

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

```

-----
| ADD HYD ( 0259) |
| 1 + 2 = 3 |
-----
| AREA QPEAK TPEAK R.V. |
| (ha) (cms) (hrs) (mm) |
| ID1= 1 ( 0361): 23.20 0.350 13.42 25.63 |
| + ID2= 2 ( 0064): 11.60 0.389 12.50 28.11 |
| ===== |
| ID = 3 ( 0259): 34.80 0.619 12.67 26.46 |

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

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

```

```

V   V   I   SSSSS U   U   A   L           (v 6.2.2019)
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
  WV    I   SSSSS UUUUU A   A   LLLLL

```

```

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

```

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\28323
 44-46b1-4880-bb31-ed3d7022b61a\scena

Summary filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\28323
 44-46b1-4880-bb31-ed3d7022b61a\scena

DATE: 09/25/2025

TIME: 04:18:49

USER:

COMMENTS: _____

```

*****
** SIMULATION : Calabogie SCS24 2yr **
*****

```

READ STORM	Filename: C:\Users\aaahmed\AppData\Local\Temp\3f1ae911-35b1-4fff-9ed6-16a2585fe3e2\10f4efab
Ptotal= 52.12 mm	Comments: Calabogie SCS24 2yr

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.57	6.00	1.04	12.00	7.50	18.00	0.94
0.08	0.57	6.08	1.04	12.08	7.50	18.08	0.94
0.17	0.57	6.17	1.04	12.17	7.50	18.17	0.94
0.25	0.57	6.25	1.04	12.25	7.50	18.25	0.94
0.33	0.57	6.33	1.04	12.33	7.50	18.33	0.94
0.42	0.57	6.42	1.04	12.42	7.50	18.42	0.94
0.50	0.57	6.50	1.04	12.50	3.86	18.50	0.94
0.58	0.57	6.58	1.04	12.58	3.86	18.58	0.94
0.67	0.57	6.67	1.04	12.67	3.86	18.67	0.94
0.75	0.57	6.75	1.04	12.75	3.86	18.75	0.94
0.83	0.57	6.83	1.04	12.83	3.86	18.83	0.94
0.92	0.57	6.92	1.04	12.92	3.86	18.92	0.94
1.00	0.57	7.00	1.04	13.00	0.73	19.00	0.94
1.08	0.57	7.08	1.04	13.08	0.73	19.08	0.94
1.17	0.57	7.17	1.04	13.17	0.73	19.17	0.94
1.25	0.57	7.25	1.04	13.25	0.73	19.25	0.94
1.33	0.57	7.33	1.04	13.33	0.73	19.33	0.94
1.42	0.57	7.42	1.04	13.42	0.73	19.42	0.94
1.50	0.57	7.50	1.04	13.50	4.27	19.50	0.94
1.58	0.57	7.58	1.04	13.58	4.27	19.58	0.94
1.67	0.57	7.67	1.04	13.67	4.27	19.67	0.94
1.75	0.57	7.75	1.04	13.75	4.27	19.75	0.94
1.83	0.57	7.83	1.04	13.83	4.27	19.83	0.94
1.92	0.57	7.92	1.04	13.92	4.27	19.92	0.94
2.00	0.68	8.00	1.41	14.00	1.56	20.00	0.63
2.08	0.68	8.08	1.41	14.08	1.56	20.08	0.63
2.17	0.68	8.17	1.41	14.17	1.56	20.17	0.63
2.25	0.68	8.25	1.41	14.25	1.56	20.25	0.63
2.33	0.68	8.33	1.41	14.33	1.56	20.33	0.63
2.42	0.68	8.42	1.41	14.42	1.56	20.42	0.63
2.50	0.68	8.50	1.41	14.50	1.56	20.50	0.63
2.58	0.68	8.58	1.41	14.58	1.56	20.58	0.63
2.67	0.68	8.67	1.41	14.67	1.56	20.67	0.63
2.75	0.68	8.75	1.41	14.75	1.56	20.75	0.63
2.83	0.68	8.83	1.41	14.83	1.56	20.83	0.63
2.92	0.68	8.92	1.41	14.92	1.56	20.92	0.63
3.00	0.68	9.00	1.67	15.00	1.56	21.00	0.63
3.08	0.68	9.08	1.67	15.08	1.56	21.08	0.63
3.17	0.68	9.17	1.67	15.17	1.56	21.17	0.63
3.25	0.68	9.25	1.67	15.25	1.56	21.25	0.63
3.33	0.68	9.33	1.67	15.33	1.56	21.33	0.63
3.42	0.68	9.42	1.67	15.42	1.56	21.42	0.63
3.50	0.68	9.50	1.88	15.50	1.56	21.50	0.63
3.58	0.68	9.58	1.88	15.58	1.56	21.58	0.63
3.67	0.68	9.67	1.88	15.67	1.56	21.67	0.63
3.75	0.68	9.75	1.88	15.75	1.56	21.75	0.63
3.83	0.68	9.83	1.88	15.83	1.56	21.83	0.63

3.92	0.68	9.92	1.88	15.92	1.56	21.92	0.63
4.00	0.83	10.00	2.40	16.00	0.94	22.00	0.63
4.08	0.83	10.08	2.40	16.08	0.94	22.08	0.63
4.17	0.83	10.17	2.40	16.17	0.94	22.17	0.63
4.25	0.83	10.25	2.40	16.25	0.94	22.25	0.63
4.33	0.83	10.33	2.40	16.33	0.94	22.33	0.63
4.42	0.83	10.42	2.40	16.42	0.94	22.42	0.63
4.50	0.83	10.50	3.23	16.50	0.94	22.50	0.63
4.58	0.83	10.58	3.23	16.58	0.94	22.58	0.63
4.67	0.83	10.67	3.23	16.67	0.94	22.67	0.63
4.75	0.83	10.75	3.23	16.75	0.94	22.75	0.63
4.83	0.83	10.83	3.23	16.83	0.94	22.83	0.63
4.92	0.83	10.92	3.23	16.92	0.94	22.92	0.63
5.00	0.83	11.00	5.00	17.00	0.94	23.00	0.63
5.08	0.83	11.08	5.00	17.08	0.94	23.08	0.63
5.17	0.83	11.17	5.00	17.17	0.94	23.17	0.63
5.25	0.83	11.25	5.00	17.25	0.94	23.25	0.63
5.33	0.83	11.33	5.00	17.33	0.94	23.33	0.63
5.42	0.83	11.42	5.00	17.42	0.94	23.42	0.63
5.50	0.83	11.50	21.67	17.50	0.94	23.50	0.63
5.58	0.83	11.58	21.67	17.58	0.94	23.58	0.63
5.67	0.83	11.67	21.67	17.67	0.94	23.67	0.63
5.75	0.83	11.75	57.52	17.75	0.94	23.75	0.63
5.83	0.83	11.83	57.52	17.83	0.94	23.83	0.63
5.92	0.83	11.92	57.52	17.92	0.94	23.92	0.63

CALIB			
NASHYD (0366)	Area (ha)= 10.70	Curve Number (CN)= 61.4	
ID= 1 DT= 5.0 min	Ia (mm)= 9.68	# of Linear Res.(N)= 3.00	
U.H. Tp(hrs)= 0.67			

Unit Hyd Qpeak (cms)= 0.610

PEAK FLOW (cms)= 0.093 (i)

TIME TO PEAK (hrs)= 12.667

RUNOFF VOLUME (mm)= 8.910

TOTAL RAINFALL (mm)= 52.117

RUNOFF COEFFICIENT = 0.171

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

CALIB			
NASHYD (0362)	Area (ha)= 3.60	Curve Number (CN)= 57.9	
ID= 1 DT= 5.0 min	Ia (mm)= 10.42	# of Linear Res.(N)= 3.00	
U.H. Tp(hrs)= 0.58			

Unit Hyd Qpeak (cms)= 0.237

PEAK FLOW (cms)= 0.029 (i)

TIME TO PEAK (hrs)= 12.583

RUNOFF VOLUME (mm)= 7.680

TOTAL RAINFALL (mm)= 52.117

RUNOFF COEFFICIENT = 0.147

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

```
-----
| CALIB |
| STANDHYD ( 0367) | Area (ha)= 16.70
| ID= 1 DT= 5.0 min | Total Imp(%)= 24.00 Dir. Conn.(%)= 12.00
-----
```

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	4.01	12.69
Dep. Storage (mm)=	1.00	9.50
Average Slope (%)=	1.00	2.00
Length (m)=	333.67	40.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	57.52	12.00
over (min)	5.00	25.00
Storage Coeff. (min)=	6.57 (ii)	23.05 (ii)
Unit Hyd. Tpeak (min)=	5.00	25.00
Unit Hyd. peak (cms)=	0.18	0.05

TOTALS

PEAK FLOW (cms)=	0.30	0.23	0.425 (iii)
TIME TO PEAK (hrs)=	12.00	12.25	12.00
RUNOFF VOLUME (mm)=	51.12	10.40	15.29
TOTAL RAINFALL (mm)=	52.12	52.12	52.12
RUNOFF COEFFICIENT =	0.98	0.20	0.29

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 60.8 Ia = Dep. Storage (Above)

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.

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

```
-----
| RESERVOIR( 0363) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min | OUTFLOW STORAGE | OUTFLOW STORAGE
-----
```

	(cms)	(ha.m.)		(cms)	(ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.					
	0.0630	0.1434		0.3528	0.3702
	0.1550	0.2322		0.4320	0.4325
	0.2556	0.2978		0.5148	0.4977

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0367)	16.700	0.425	12.00	15.29
OUTFLOW: ID= 1 (0363)	16.700	0.055	14.25	15.25

PEAK FLOW REDUCTION [Qout/Qin](%)= 13.01
 TIME SHIFT OF PEAK FLOW (min)=135.00
 MAXIMUM STORAGE USED (ha.m.)= 0.1262

ADD HYD (0360)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0362):	3.60	0.029	12.58	7.68
+ ID2= 2 (0363):	16.70	0.055	14.25	15.25
=====				
ID = 3 (0360):	20.30	0.077	12.75	13.91

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0365)	Area (ha)=	4.50	Curve Number (CN)= 62.2
ID= 1 DT= 5.0 min	Ia (mm)=	9.45	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.59	

Unit Hyd Qpeak (cms)= 0.291

PEAK FLOW (cms)= 0.044 (i)
 TIME TO PEAK (hrs)= 12.583
 RUNOFF VOLUME (mm)= 9.239
 TOTAL RAINFALL (mm)= 52.117
 RUNOFF COEFFICIENT = 0.177

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

RESERVOIR(0364)	OVERFLOW IS OFF				
IN= 2---> OUT= 1					
DT= 5.0 min					
	OUTFLOW	STORAGE		OUTFLOW	STORAGE
	(cms)	(ha.m.)		(cms)	(ha.m.)

***** WARNING : FIRST OUTFLOW IS NOT ZERO.

0.0238	0.0111		0.1431	0.0294
0.0518	0.0193		0.1809	0.0325
0.0778	0.0248		0.2241	0.0356

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0365)	4.500	0.044	12.58	9.24
OUTFLOW: ID= 1 (0364)	4.500	0.024	13.33	9.21

PEAK FLOW REDUCTION [Qout/Qin](%)= 53.06
TIME SHIFT OF PEAK FLOW (min)= 45.00
MAXIMUM STORAGE USED (ha.m.)= 0.0110

| CALIB |
| NASHYD (0361) | Area (ha)= 23.20 Curve Number (CN)= 57.1
| ID= 1 DT= 5.0 min | Ia (mm)= 10.56 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 1.40

Unit Hyd Qpeak (cms)= 0.633

PEAK FLOW (cms)= 0.093 (i)
TIME TO PEAK (hrs)= 13.500
RUNOFF VOLUME (mm)= 7.431
TOTAL RAINFALL (mm)= 52.117
RUNOFF COEFFICIENT = 0.143

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

| CALIB |
| NASHYD (0064) | Area (ha)= 11.60 Curve Number (CN)= 60.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.55

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.108 (i)
TIME TO PEAK (hrs)= 12.500
RUNOFF VOLUME (mm)= 8.389
TOTAL RAINFALL (mm)= 52.117
RUNOFF COEFFICIENT = 0.161

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

```

-----
| ADD HYD ( 0259) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
ID1= 1 ( 0361):  23.20  0.093  13.50  7.43
+ ID2= 2 ( 0064):  11.60  0.108  12.50  8.39
=====
ID = 3 ( 0259):  34.80  0.167  12.75  7.75

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
=====
=====
V   V   I   SSSSS U   U   A   L           (v 6.2.2019)
V   V   I   SS   U   U   A A   L
V   V   I   SS   U   U   AAAAA L
V   V   I   SS   U   U   A   A   L
VV      I   SSSSS UUUUU A   A   LLLLL
000  TTTTT TTTTT H   H   Y   Y   M   M   000   TM
O   O   T   T   H   H   Y   Y   MM MM   O   O
O   O   T   T   H   H   Y   M   M   O   O
000  T   T   H   H   Y   M   M   000

```

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\6336e2
 e4-3913-4aa2-b19a-bbcb0be44234\scena

Summary filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\6336e2
 e4-3913-4aa2-b19a-bbcb0be44234\scena

DATE: 09/25/2025

TIME: 04:18:48

USER:

COMMENTS: _____

 ** SIMULATION : Calabogie SCS24 50yr **

READ STORM	Filename: C:\Users\aaahmed\AppData\Local\Temp\3f1ae911-35b1-4fff-9ed6-16a2585fe3e2\3e1633fb
Ptotal=105.18 mm	Comments: Calabogie SCS24 50yr

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	1.16	6.00	2.10	12.00	15.15	18.00	1.89
0.08	1.16	6.08	2.10	12.08	15.15	18.08	1.89
0.17	1.16	6.17	2.10	12.17	15.15	18.17	1.89
0.25	1.16	6.25	2.10	12.25	15.15	18.25	1.89
0.33	1.16	6.33	2.10	12.33	15.15	18.33	1.89
0.42	1.16	6.42	2.10	12.42	15.15	18.42	1.89
0.50	1.16	6.50	2.10	12.50	7.78	18.50	1.89
0.58	1.16	6.58	2.10	12.58	7.78	18.58	1.89
0.67	1.16	6.67	2.10	12.67	7.78	18.67	1.89
0.75	1.16	6.75	2.10	12.75	7.78	18.75	1.89
0.83	1.16	6.83	2.10	12.83	7.78	18.83	1.89
0.92	1.16	6.92	2.10	12.92	7.78	18.92	1.89
1.00	1.16	7.00	2.10	13.00	1.47	19.00	1.89
1.08	1.16	7.08	2.10	13.08	1.47	19.08	1.89
1.17	1.16	7.17	2.10	13.17	1.47	19.17	1.89
1.25	1.16	7.25	2.10	13.25	1.47	19.25	1.89
1.33	1.16	7.33	2.10	13.33	1.47	19.33	1.89
1.42	1.16	7.42	2.10	13.42	1.47	19.42	1.89
1.50	1.16	7.50	2.10	13.50	8.63	19.50	1.89
1.58	1.16	7.58	2.10	13.58	8.63	19.58	1.89
1.67	1.16	7.67	2.10	13.67	8.63	19.67	1.89
1.75	1.16	7.75	2.10	13.75	8.63	19.75	1.89
1.83	1.16	7.83	2.10	13.83	8.63	19.83	1.89
1.92	1.16	7.92	2.10	13.92	8.63	19.92	1.89
2.00	1.37	8.00	2.84	14.00	3.16	20.00	1.26
2.08	1.37	8.08	2.84	14.08	3.16	20.08	1.26
2.17	1.37	8.17	2.84	14.17	3.16	20.17	1.26
2.25	1.37	8.25	2.84	14.25	3.16	20.25	1.26
2.33	1.37	8.33	2.84	14.33	3.16	20.33	1.26
2.42	1.37	8.42	2.84	14.42	3.16	20.42	1.26
2.50	1.37	8.50	2.84	14.50	3.16	20.50	1.26
2.58	1.37	8.58	2.84	14.58	3.16	20.58	1.26
2.67	1.37	8.67	2.84	14.67	3.16	20.67	1.26
2.75	1.37	8.75	2.84	14.75	3.16	20.75	1.26

2.83	1.37	8.83	2.84	14.83	3.16	20.83	1.26
2.92	1.37	8.92	2.84	14.92	3.16	20.92	1.26
3.00	1.37	9.00	3.37	15.00	3.16	21.00	1.26
3.08	1.37	9.08	3.37	15.08	3.16	21.08	1.26
3.17	1.37	9.17	3.37	15.17	3.16	21.17	1.26
3.25	1.37	9.25	3.37	15.25	3.16	21.25	1.26
3.33	1.37	9.33	3.37	15.33	3.16	21.33	1.26
3.42	1.37	9.42	3.37	15.42	3.16	21.42	1.26
3.50	1.37	9.50	3.79	15.50	3.16	21.50	1.26
3.58	1.37	9.58	3.79	15.58	3.16	21.58	1.26
3.67	1.37	9.67	3.79	15.67	3.16	21.67	1.26
3.75	1.37	9.75	3.79	15.75	3.16	21.75	1.26
3.83	1.37	9.83	3.79	15.83	3.16	21.83	1.26
3.92	1.37	9.92	3.79	15.92	3.16	21.92	1.26
4.00	1.68	10.00	4.84	16.00	1.89	22.00	1.26
4.08	1.68	10.08	4.84	16.08	1.89	22.08	1.26
4.17	1.68	10.17	4.84	16.17	1.89	22.17	1.26
4.25	1.68	10.25	4.84	16.25	1.89	22.25	1.26
4.33	1.68	10.33	4.84	16.33	1.89	22.33	1.26
4.42	1.68	10.42	4.84	16.42	1.89	22.42	1.26
4.50	1.68	10.50	6.52	16.50	1.89	22.50	1.26
4.58	1.68	10.58	6.52	16.58	1.89	22.58	1.26
4.67	1.68	10.67	6.52	16.67	1.89	22.67	1.26
4.75	1.68	10.75	6.52	16.75	1.89	22.75	1.26
4.83	1.68	10.83	6.52	16.83	1.89	22.83	1.26
4.92	1.68	10.92	6.52	16.92	1.89	22.92	1.26
5.00	1.68	11.00	10.10	17.00	1.89	23.00	1.26
5.08	1.68	11.08	10.10	17.08	1.89	23.08	1.26
5.17	1.68	11.17	10.10	17.17	1.89	23.17	1.26
5.25	1.68	11.25	10.10	17.25	1.89	23.25	1.26
5.33	1.68	11.33	10.10	17.33	1.89	23.33	1.26
5.42	1.68	11.42	10.10	17.42	1.89	23.42	1.26
5.50	1.68	11.50	43.76	17.50	1.89	23.50	1.26
5.58	1.68	11.58	43.76	17.58	1.89	23.58	1.26
5.67	1.68	11.67	43.76	17.67	1.89	23.67	1.26
5.75	1.68	11.75	116.14	17.75	1.89	23.75	1.26
5.83	1.68	11.83	116.14	17.83	1.89	23.83	1.26
5.92	1.68	11.92	116.14	17.92	1.89	23.92	1.26

CALIB		
NASHYD (0366)	Area (ha)= 10.70	Curve Number (CN)= 61.4
ID= 1 DT= 5.0 min	Ia (mm)= 9.68	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.67	

Unit Hyd Qpeak (cms)= 0.610

PEAK FLOW (cms)= 0.402 (i)

TIME TO PEAK (hrs)= 12.583
 RUNOFF VOLUME (mm)= 35.740
 TOTAL RAINFALL (mm)= 105.180
 RUNOFF COEFFICIENT = 0.340

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

CALIB		
NASHYD (0362)	Area (ha)= 3.60	Curve Number (CN)= 57.9
ID= 1 DT= 5.0 min	Ia (mm)= 10.42	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.58	

Unit Hyd Qpeak (cms)= 0.237

PEAK FLOW (cms)= 0.133 (i)
 TIME TO PEAK (hrs)= 12.500
 RUNOFF VOLUME (mm)= 32.132
 TOTAL RAINFALL (mm)= 105.180
 RUNOFF COEFFICIENT = 0.305

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

CALIB		
STANDHYD (0367)	Area (ha)= 16.70	
ID= 1 DT= 5.0 min	Total Imp(%)= 24.00	Dir. Conn.(%)= 12.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	4.01	12.69
Dep. Storage (mm)=	1.00	9.50
Average Slope (%)=	1.00	2.00
Length (m)=	333.67	40.00
Mannings n =	0.013	0.250

Max.Eff.Inten.(mm/hr)=	116.14	62.30
over (min)	5.00	15.00
Storage Coeff. (min)=	4.96 (ii)	13.49 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.22	0.08

TOTALS

PEAK FLOW (cms)=	0.63	1.31	1.761 (iii)
TIME TO PEAK (hrs)=	12.00	12.08	12.00
RUNOFF VOLUME (mm)=	104.18	39.45	47.21
TOTAL RAINFALL (mm)=	105.18	105.18	105.18
RUNOFF COEFFICIENT =	0.99	0.38	0.45

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

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 60.8 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| RESERVOIR( 0363) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
      OUTFLOW    STORAGE | OUTFLOW    STORAGE
      (cms)      (ha.m.) | (cms)      (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
      0.0630      0.1434 | 0.3528      0.3702
      0.1550      0.2322 | 0.4320      0.4325
      0.2556      0.2978 | 0.5148      0.4977

      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0367)  16.700      1.761      12.00      47.21
OUTFLOW: ID= 1 ( 0363)  16.700      0.344      12.83      47.18

      PEAK FLOW REDUCTION [Qout/Qin](%)= 19.56
      TIME SHIFT OF PEAK FLOW      (min)= 50.00
      MAXIMUM STORAGE USED      (ha.m.)= 0.3643

```

```

-----
| ADD HYD ( 0360) |
| 1 + 2 = 3       |
-----
      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
      ID1= 1 ( 0362):  3.60      0.133      12.50      32.13
      + ID2= 2 ( 0363):  16.70      0.344      12.83      47.18
      =====
      ID = 3 ( 0360):  20.30      0.469      12.67      44.51

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB           |
| NASHYD ( 0365) | Area (ha)= 4.50 Curve Number (CN)= 62.2
| ID= 1 DT= 5.0 min | Ia (mm)= 9.45 # of Linear Res.(N)= 3.00
-----
      U.H. Tp(hrs)= 0.59

```

Unit Hyd Qpeak (cms)= 0.291

PEAK FLOW (cms)= 0.190 (i)
 TIME TO PEAK (hrs)= 12.500
 RUNOFF VOLUME (mm)= 36.642
 TOTAL RAINFALL (mm)= 105.180
 RUNOFF COEFFICIENT = 0.348

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

```

-----
| RESERVOIR( 0364) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
      OUTFLOW    STORAGE | OUTFLOW    STORAGE
      (cms)      (ha.m.) | (cms)      (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
      0.0238      0.0111 | 0.1431      0.0294
      0.0518      0.0193 | 0.1809      0.0325
      0.0778      0.0248 | 0.2241      0.0356

      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0365)  4.500      0.190      12.50      36.64
OUTFLOW: ID= 1 ( 0364)  4.500      0.163      12.83      36.62

      PEAK FLOW REDUCTION [Qout/Qin](%)= 85.63
      TIME SHIFT OF PEAK FLOW (min)= 20.00
      MAXIMUM STORAGE USED (ha.m.)= 0.0310
  
```

```

-----
| CALIB
| NASHYD ( 0361) | Area (ha)= 23.20 Curve Number (CN)= 57.1
| ID= 1 DT= 5.0 min | Ia (mm)= 10.56 # of Linear Res.(N)= 3.00
-----
      U.H. Tp(hrs)= 1.40
  
```

Unit Hyd Qpeak (cms)= 0.633

PEAK FLOW (cms)= 0.432 (i)
 TIME TO PEAK (hrs)= 13.417
 RUNOFF VOLUME (mm)= 31.364
 TOTAL RAINFALL (mm)= 105.180
 RUNOFF COEFFICIENT = 0.298

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

```

-----
| CALIB
| NASHYD ( 0064) | Area (ha)= 11.60 Curve Number (CN)= 60.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
  
```

----- U.H. Tp(hrs)= 0.55

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.477 (i)

TIME TO PEAK (hrs)= 12.417

RUNOFF VOLUME (mm)= 34.247

TOTAL RAINFALL (mm)= 105.180

RUNOFF COEFFICIENT = 0.326

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

| ADD HYD (0259) |
| 1 + 2 = 3 |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0361):	23.20	0.432	13.42	31.36
+ ID2= 2 (0064):	11.60	0.477	12.42	34.25
=====				
ID = 3 (0259):	34.80	0.763	12.67	32.32

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

=====

V	V	I	SSSSS	U	U	A	L					(v 6.2.2019)
V	V	I	SS	U	U	A	A	L				
V	V	I	SS	U	U	A	A	A	A	A	L	
V	V	I	SS	U	U	A	A	L				
VV		I	SSSSS	UUUUU		A	A	LLLLL				

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

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\dd52b5

0f-d5f6-42cf-bee3-58cedcab3b5a\scena

Summary filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\dd52b5
0f-d5f6-42cf-bee3-58cedcab3b5a\scena

DATE: 09/25/2025

TIME: 04:18:49

USER:

COMMENTS: _____

** SIMULATION : Calabogie SCS24 5yr **

READ STORM	Filename: C:\Users\aaahmed\AppData\Local\Temp\3f1ae911-35b1-4fff-9ed6-16a2585fe3e2\dd0f30fa
Ptotal= 69.21 mm	Comments: Calabogie SCS24 5yr

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.76	6.00	1.38	12.00	9.96	18.00	1.25
0.08	0.76	6.08	1.38	12.08	9.96	18.08	1.25
0.17	0.76	6.17	1.38	12.17	9.96	18.17	1.25
0.25	0.76	6.25	1.38	12.25	9.96	18.25	1.25
0.33	0.76	6.33	1.38	12.33	9.96	18.33	1.25
0.42	0.76	6.42	1.38	12.42	9.96	18.42	1.25
0.50	0.76	6.50	1.38	12.50	5.12	18.50	1.25
0.58	0.76	6.58	1.38	12.58	5.12	18.58	1.25
0.67	0.76	6.67	1.38	12.67	5.12	18.67	1.25
0.75	0.76	6.75	1.38	12.75	5.12	18.75	1.25
0.83	0.76	6.83	1.38	12.83	5.12	18.83	1.25
0.92	0.76	6.92	1.38	12.92	5.12	18.92	1.25
1.00	0.76	7.00	1.38	13.00	0.97	19.00	1.25
1.08	0.76	7.08	1.38	13.08	0.97	19.08	1.25
1.17	0.76	7.17	1.38	13.17	0.97	19.17	1.25
1.25	0.76	7.25	1.38	13.25	0.97	19.25	1.25
1.33	0.76	7.33	1.38	13.33	0.97	19.33	1.25
1.42	0.76	7.42	1.38	13.42	0.97	19.42	1.25
1.50	0.76	7.50	1.38	13.50	5.67	19.50	1.25
1.58	0.76	7.58	1.38	13.58	5.67	19.58	1.25

1.67	0.76	7.67	1.38	13.67	5.67	19.67	1.25
1.75	0.76	7.75	1.38	13.75	5.67	19.75	1.25
1.83	0.76	7.83	1.38	13.83	5.67	19.83	1.25
1.92	0.76	7.92	1.38	13.92	5.67	19.92	1.25
2.00	0.90	8.00	1.87	14.00	2.08	20.00	0.83
2.08	0.90	8.08	1.87	14.08	2.08	20.08	0.83
2.17	0.90	8.17	1.87	14.17	2.08	20.17	0.83
2.25	0.90	8.25	1.87	14.25	2.08	20.25	0.83
2.33	0.90	8.33	1.87	14.33	2.08	20.33	0.83
2.42	0.90	8.42	1.87	14.42	2.08	20.42	0.83
2.50	0.90	8.50	1.87	14.50	2.08	20.50	0.83
2.58	0.90	8.58	1.87	14.58	2.08	20.58	0.83
2.67	0.90	8.67	1.87	14.67	2.08	20.67	0.83
2.75	0.90	8.75	1.87	14.75	2.08	20.75	0.83
2.83	0.90	8.83	1.87	14.83	2.08	20.83	0.83
2.92	0.90	8.92	1.87	14.92	2.08	20.92	0.83
3.00	0.90	9.00	2.21	15.00	2.08	21.00	0.83
3.08	0.90	9.08	2.21	15.08	2.08	21.08	0.83
3.17	0.90	9.17	2.21	15.17	2.08	21.17	0.83
3.25	0.90	9.25	2.21	15.25	2.08	21.25	0.83
3.33	0.90	9.33	2.21	15.33	2.08	21.33	0.83
3.42	0.90	9.42	2.21	15.42	2.08	21.42	0.83
3.50	0.90	9.50	2.49	15.50	2.08	21.50	0.83
3.58	0.90	9.58	2.49	15.58	2.08	21.58	0.83
3.67	0.90	9.67	2.49	15.67	2.08	21.67	0.83
3.75	0.90	9.75	2.49	15.75	2.08	21.75	0.83
3.83	0.90	9.83	2.49	15.83	2.08	21.83	0.83
3.92	0.90	9.92	2.49	15.92	2.08	21.92	0.83
4.00	1.11	10.00	3.18	16.00	1.25	22.00	0.83
4.08	1.11	10.08	3.18	16.08	1.25	22.08	0.83
4.17	1.11	10.17	3.18	16.17	1.25	22.17	0.83
4.25	1.11	10.25	3.18	16.25	1.25	22.25	0.83
4.33	1.11	10.33	3.18	16.33	1.25	22.33	0.83
4.42	1.11	10.42	3.18	16.42	1.25	22.42	0.83
4.50	1.11	10.50	4.29	16.50	1.25	22.50	0.83
4.58	1.11	10.58	4.29	16.58	1.25	22.58	0.83
4.67	1.11	10.67	4.29	16.67	1.25	22.67	0.83
4.75	1.11	10.75	4.29	16.75	1.25	22.75	0.83
4.83	1.11	10.83	4.29	16.83	1.25	22.83	0.83
4.92	1.11	10.92	4.29	16.92	1.25	22.92	0.83
5.00	1.11	11.00	6.64	17.00	1.25	23.00	0.83
5.08	1.11	11.08	6.64	17.08	1.25	23.08	0.83
5.17	1.11	11.17	6.64	17.17	1.25	23.17	0.83
5.25	1.11	11.25	6.64	17.25	1.25	23.25	0.83
5.33	1.11	11.33	6.64	17.33	1.25	23.33	0.83
5.42	1.11	11.42	6.64	17.42	1.25	23.42	0.83
5.50	1.11	11.50	28.79	17.50	1.25	23.50	0.83
5.58	1.11	11.58	28.79	17.58	1.25	23.58	0.83
5.67	1.11	11.67	28.79	17.67	1.25	23.67	0.83
5.75	1.11	11.75	76.40	17.75	1.25	23.75	0.83

5.83	1.11		11.83	76.40		17.83	1.25		23.83	0.83
5.92	1.11		11.92	76.40		17.92	1.25		23.92	0.83

CALIB			
NASHYD (0366)	Area (ha)=	10.70	Curve Number (CN)= 61.4
ID= 1 DT= 5.0 min	Ia (mm)=	9.68	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.67	

Unit Hyd Qpeak (cms)= 0.610

PEAK FLOW (cms)= 0.175 (i)
 TIME TO PEAK (hrs)= 12.583
 RUNOFF VOLUME (mm)= 16.167
 TOTAL RAINFALL (mm)= 69.213
 RUNOFF COEFFICIENT = 0.234

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

CALIB			
NASHYD (0362)	Area (ha)=	3.60	Curve Number (CN)= 57.9
ID= 1 DT= 5.0 min	Ia (mm)=	10.42	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.58	

Unit Hyd Qpeak (cms)= 0.237

PEAK FLOW (cms)= 0.057 (i)
 TIME TO PEAK (hrs)= 12.500
 RUNOFF VOLUME (mm)= 14.196
 TOTAL RAINFALL (mm)= 69.213
 RUNOFF COEFFICIENT = 0.205

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

CALIB			
STANDHYD (0367)	Area (ha)=	16.70	
ID= 1 DT= 5.0 min	Total Imp(%)=	24.00	Dir. Conn.(%)= 12.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	4.01	12.69
Dep. Storage	(mm)=	1.00	9.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	333.67	40.00
Mannings n	=	0.013	0.250

Max.Eff.Inten.(mm/hr)=	76.40	26.71	
over (min)	5.00	20.00	
Storage Coeff. (min)=	5.86 (ii)	17.83 (ii)	
Unit Hyd. Tpeak (min)=	5.00	20.00	
Unit Hyd. peak (cms)=	0.19	0.06	
			TOTALS
PEAK FLOW (cms)=	0.40	0.50	0.743 (iii)
TIME TO PEAK (hrs)=	12.00	12.17	12.00
RUNOFF VOLUME (mm)=	68.21	18.39	24.36
TOTAL RAINFALL (mm)=	69.21	69.21	69.21
RUNOFF COEFFICIENT =	0.99	0.27	0.35

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 60.8 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| RESERVOIR( 0363) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----

```

	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.				
	0.0630	0.1434	0.3528	0.3702
	0.1550	0.2322	0.4320	0.4325
	0.2556	0.2978	0.5148	0.4977

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0367)	16.700	0.743	12.00	24.36
OUTFLOW: ID= 1 (0363)	16.700	0.120	13.17	24.33

PEAK FLOW REDUCTION [Qout/Qin](%)= 16.11
 TIME SHIFT OF PEAK FLOW (min)= 70.00
 MAXIMUM STORAGE USED (ha.m.)= 0.1982

```

-----
| ADD HYD ( 0360) |
| 1 + 2 = 3       |
-----

```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0362):	3.60	0.057	12.50	14.20
+ ID2= 2 (0363):	16.70	0.120	13.17	24.33

=====

ID = 3 (0360):	20.30	0.164	12.83	22.53
-----------------	-------	-------	-------	-------

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0365)	Area (ha)=	4.50	Curve Number (CN)= 62.2
ID= 1 DT= 5.0 min	Ia (mm)=	9.45	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.59	

Unit Hyd Qpeak (cms)= 0.291

PEAK FLOW (cms)= 0.083 (i)
TIME TO PEAK (hrs)= 12.500
RUNOFF VOLUME (mm)= 16.679
TOTAL RAINFALL (mm)= 69.213
RUNOFF COEFFICIENT = 0.241

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

RESERVOIR(0364)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)

**** WARNING : FIRST OUTFLOW IS NOT ZERO.

	0.0238	0.0111	0.1431	0.0294
	0.0518	0.0193	0.1809	0.0325
	0.0778	0.0248	0.2241	0.0356

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0365)	4.500	0.083	12.50	16.68
OUTFLOW: ID= 1 (0364)	4.500	0.051	13.25	16.66

PEAK FLOW REDUCTION [Qout/Qin](%)= 61.07
TIME SHIFT OF PEAK FLOW (min)= 45.00
MAXIMUM STORAGE USED (ha.m.)= 0.0190

CALIB			
NASHYD (0361)	Area (ha)=	23.20	Curve Number (CN)= 57.1
ID= 1 DT= 5.0 min	Ia (mm)=	10.56	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	1.40	

Unit Hyd Qpeak (cms)= 0.633

PEAK FLOW (cms)= 0.182 (i)
 TIME TO PEAK (hrs)= 13.417
 RUNOFF VOLUME (mm)= 13.789
 TOTAL RAINFALL (mm)= 69.213
 RUNOFF COEFFICIENT = 0.199

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

CALIB		
NASHYD (0064)	Area (ha)= 11.60	Curve Number (CN)= 60.0
ID= 1 DT= 5.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.55	

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.206 (i)
 TIME TO PEAK (hrs)= 12.500
 RUNOFF VOLUME (mm)= 15.340
 TOTAL RAINFALL (mm)= 69.213
 RUNOFF COEFFICIENT = 0.222

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

ADD HYD (0259)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0361):	23.20	0.182	13.42	13.79
+ ID2= 2 (0064):	11.60	0.206	12.50	15.34
=====				
ID = 3 (0259):	34.80	0.323	12.75	14.31

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

=====

V V I SSSSS U U A L (v 6.2.2019)
V V I SS U U A A L
V V I SS U U AAAAA L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

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

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:

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ae-3522-4a49-b1bf-bf414e06e86c\scena

Summary filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\8899dc
ae-3522-4a49-b1bf-bf414e06e86c\scena

DATE: 09/25/2025

TIME: 04:20:47

USER:

COMMENTS: _____

** SIMULATION : 25mm **

| READ STORM |

Filename: C:\Users\aaahmed\AppData\Local\Temp\

		878648c9-c90b-4c9f-a781-f00ef101b83b\6329a775
	Ptotal= 25.00 mm	Comments: 25mm

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	1.48	1.00	6.32	2.00	4.37	3.00	2.04
0.08	1.58	1.08	9.36	2.08	3.96	3.08	1.96
0.17	1.67	1.17	18.42	2.17	3.63	3.17	1.89
0.25	1.80	1.25	79.14	2.25	3.36	3.25	1.82
0.33	1.94	1.33	34.99	2.33	3.12	3.33	1.76
0.42	2.10	1.42	18.68	2.42	2.92	3.42	1.70
0.50	2.31	1.50	12.60	2.50	2.75	3.50	1.65
0.58	2.56	1.58	9.50	2.58	2.59	3.58	1.59
0.67	2.88	1.67	7.64	2.67	2.46	3.67	1.55
0.75	3.31	1.75	6.41	2.75	2.34	3.75	1.50
0.83	3.91	1.83	5.53	2.83	2.23	3.83	1.46
0.92	4.81	1.92	4.87	2.92	2.13	3.92	1.43

CALIB		
NASHYD (0004)	Area (ha)= 10.60	Curve Number (CN)= 57.7
ID= 1 DT= 5.0 min	Ia (mm)= 10.46	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.72	

Unit Hyd Qpeak (cms)= 0.562

PEAK FLOW (cms)= 0.012 (i)
 TIME TO PEAK (hrs)= 2.667
 RUNOFF VOLUME (mm)= 1.053
 TOTAL RAINFALL (mm)= 25.002
 RUNOFF COEFFICIENT = 0.042

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

CALIB		
NASHYD (0003)	Area (ha)= 18.80	Curve Number (CN)= 59.5
ID= 1 DT= 5.0 min	Ia (mm)= 10.09	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 1.00	

Unit Hyd Qpeak (cms)= 0.718

PEAK FLOW (cms)= 0.021 (i)
 TIME TO PEAK (hrs)= 3.167
 RUNOFF VOLUME (mm)= 1.184
 TOTAL RAINFALL (mm)= 25.002
 RUNOFF COEFFICIENT = 0.047

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

```
-----
| CALIB |
| NASHYD ( 0001) | Area (ha)= 24.80 Curve Number (CN)= 56.8
| ID= 1 DT= 5.0 min | Ia (mm)= 10.64 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 1.40
```

Unit Hyd Qpeak (cms)= 0.677

PEAK FLOW (cms)= 0.019 (i)

TIME TO PEAK (hrs)= 3.833

RUNOFF VOLUME (mm)= 0.994

TOTAL RAINFALL (mm)= 25.002

RUNOFF COEFFICIENT = 0.040

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

```
-----
| CALIB |
| NASHYD ( 0064) | Area (ha)= 11.60 Curve Number (CN)= 60.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.55
```

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.018 (i)

TIME TO PEAK (hrs)= 2.333

RUNOFF VOLUME (mm)= 1.221

TOTAL RAINFALL (mm)= 25.002

RUNOFF COEFFICIENT = 0.049

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

```
-----
| ADD HYD ( 0065) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
|-----| (ha) (cms) (hrs) (mm)
ID1= 1 ( 0001): 24.80 0.019 3.83 0.99
+ ID2= 2 ( 0064): 11.60 0.018 2.33 1.22
=====
ID = 3 ( 0065): 36.40 0.031 3.08 1.07
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD ( 0002) | Area (ha)= 4.50 Curve Number (CN)= 60.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
-----
U.H. Tp(hrs)= 0.61

```

Unit Hyd Qpeak (cms)= 0.282

PEAK FLOW (cms)= 0.007 (i)

TIME TO PEAK (hrs)= 2.417

RUNOFF VOLUME (mm)= 1.221

TOTAL RAINFALL (mm)= 25.002

RUNOFF COEFFICIENT = 0.049

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

```

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

```

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V V I SSSSS U U A L (v 6.2.2019)
V V I SS U U A A L
V V I SS U U AAAAA L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

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

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\fba93f
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Summary filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\fba93f
 f2-c0fe-400b-9fb0-9d1aa4a9ceff\scena

DATE: 09/25/2025

TIME: 04:20:47

USER:

COMMENTS: _____

** SIMULATION : Calabogie 4hr CHI 100yr **

| CHICAGO STORM | IDF curve parameters: A= 776.803
| Ptotal= 67.37 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 = 0.33

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	5.66	1.00	26.81	2.00	11.20	3.00	6.53
0.17	6.33	1.17	155.35	2.17	9.89	3.17	6.15
0.33	7.22	1.33	32.90	2.33	8.90	3.33	5.81
0.50	8.50	1.50	20.74	2.50	8.12	3.50	5.52
0.67	10.54	1.67	15.82	2.67	7.49	3.67	5.27
0.83	14.41	1.83	13.03	2.83	6.97	3.83	5.04

| CALIB |
| NASHYD (0004) | Area (ha)= 10.60 Curve Number (CN)= 57.7
| ID= 1 DT= 5.0 min | Ia (mm)= 10.46 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.72

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	5.66	1.083	26.81	2.083	11.20	3.08	6.53
0.167	5.66	1.167	26.81	2.167	11.20	3.17	6.53
0.250	6.33	1.250	155.35	2.250	9.89	3.25	6.15
0.333	6.33	1.333	155.35	2.333	9.89	3.33	6.15

0.417	7.22	1.417	32.90	2.417	8.90	3.42	5.81
0.500	7.22	1.500	32.90	2.500	8.90	3.50	5.81
0.583	8.50	1.583	20.74	2.583	8.12	3.58	5.52
0.667	8.50	1.667	20.74	2.667	8.12	3.67	5.52
0.750	10.54	1.750	15.82	2.750	7.49	3.75	5.27
0.833	10.54	1.833	15.82	2.833	7.49	3.83	5.27
0.917	14.41	1.917	13.03	2.917	6.97	3.92	5.04
1.000	14.41	2.000	13.03	3.000	6.97	4.00	5.04

Unit Hyd Qpeak (cms)= 0.562

PEAK FLOW (cms)= 0.161 (i)
TIME TO PEAK (hrs)= 2.333
RUNOFF VOLUME (mm)= 13.320
TOTAL RAINFALL (mm)= 67.367
RUNOFF COEFFICIENT = 0.198

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

```

-----
| CALIB |
| NASHYD ( 0003) | Area (ha)= 18.80 Curve Number (CN)= 59.5
| ID= 1 DT= 5.0 min | Ia (mm)= 10.09 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 1.00

```

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	5.66	1.083	26.81	2.083	11.20	3.08	6.53
0.167	5.66	1.167	26.81	2.167	11.20	3.17	6.53
0.250	6.33	1.250	155.35	2.250	9.89	3.25	6.15
0.333	6.33	1.333	155.35	2.333	9.89	3.33	6.15
0.417	7.22	1.417	32.90	2.417	8.90	3.42	5.81
0.500	7.22	1.500	32.90	2.500	8.90	3.50	5.81
0.583	8.50	1.583	20.74	2.583	8.12	3.58	5.52
0.667	8.50	1.667	20.74	2.667	8.12	3.67	5.52
0.750	10.54	1.750	15.82	2.750	7.49	3.75	5.27
0.833	10.54	1.833	15.82	2.833	7.49	3.83	5.27
0.917	14.41	1.917	13.03	2.917	6.97	3.92	5.04
1.000	14.41	2.000	13.03	3.000	6.97	4.00	5.04

Unit Hyd Qpeak (cms)= 0.718

PEAK FLOW (cms)= 0.253 (i)
TIME TO PEAK (hrs)= 2.750
RUNOFF VOLUME (mm)= 14.253

TOTAL RAINFALL (mm)= 67.367
RUNOFF COEFFICIENT = 0.212

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

```
-----  
| CALIB |  
| NASHYD ( 0001) | Area (ha)= 24.80 Curve Number (CN)= 56.8  
| ID= 1 DT= 5.0 min | Ia (mm)= 10.64 # of Linear Res.(N)= 3.00  
-----  
U.H. Tp(hrs)= 1.40
```

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 5.66 | 1.083 26.81 | 2.083 11.20 | 3.08 6.53  
0.167 5.66 | 1.167 26.81 | 2.167 11.20 | 3.17 6.53  
0.250 6.33 | 1.250 155.35 | 2.250 9.89 | 3.25 6.15  
0.333 6.33 | 1.333 155.35 | 2.333 9.89 | 3.33 6.15  
0.417 7.22 | 1.417 32.90 | 2.417 8.90 | 3.42 5.81  
0.500 7.22 | 1.500 32.90 | 2.500 8.90 | 3.50 5.81  
0.583 8.50 | 1.583 20.74 | 2.583 8.12 | 3.58 5.52  
0.667 8.50 | 1.667 20.74 | 2.667 8.12 | 3.67 5.52  
0.750 10.54 | 1.750 15.82 | 2.750 7.49 | 3.75 5.27  
0.833 10.54 | 1.833 15.82 | 2.833 7.49 | 3.83 5.27  
0.917 14.41 | 1.917 13.03 | 2.917 6.97 | 3.92 5.04  
1.000 14.41 | 2.000 13.03 | 3.000 6.97 | 4.00 5.04
```

Unit Hyd Qpeak (cms)= 0.677

PEAK FLOW (cms)= 0.246 (i)
TIME TO PEAK (hrs)= 3.417
RUNOFF VOLUME (mm)= 12.876
TOTAL RAINFALL (mm)= 67.367
RUNOFF COEFFICIENT = 0.191

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

```
-----  
| CALIB |  
| NASHYD ( 0064) | Area (ha)= 11.60 Curve Number (CN)= 60.0  
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00  
-----  
U.H. Tp(hrs)= 0.55
```

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	5.66	1.083	26.81	2.083	11.20	3.08	6.53
0.167	5.66	1.167	26.81	2.167	11.20	3.17	6.53
0.250	6.33	1.250	155.35	2.250	9.89	3.25	6.15
0.333	6.33	1.333	155.35	2.333	9.89	3.33	6.15
0.417	7.22	1.417	32.90	2.417	8.90	3.42	5.81
0.500	7.22	1.500	32.90	2.500	8.90	3.50	5.81
0.583	8.50	1.583	20.74	2.583	8.12	3.58	5.52
0.667	8.50	1.667	20.74	2.667	8.12	3.67	5.52
0.750	10.54	1.750	15.82	2.750	7.49	3.75	5.27
0.833	10.54	1.833	15.82	2.833	7.49	3.83	5.27
0.917	14.41	1.917	13.03	2.917	6.97	3.92	5.04
1.000	14.41	2.000	13.03	3.000	6.97	4.00	5.04

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.228 (i)

TIME TO PEAK (hrs)= 2.000

RUNOFF VOLUME (mm)= 14.516

TOTAL RAINFALL (mm)= 67.367

RUNOFF COEFFICIENT = 0.215

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

ADD HYD (0065)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0001):	24.80	0.246	3.42	12.88
+ ID2= 2 (0064):	11.60	0.228	2.00	14.52
=====				
ID = 3 (0065):	36.40	0.385	2.58	13.40

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0002)			
ID= 1 DT= 5.0 min			

Area	(ha)=	4.50	Curve Number (CN)= 60.0
Ia	(mm)=	10.00	# of Linear Res.(N)= 3.00
U.H. Tp	(hrs)=	0.61	

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	5.66	1.083	26.81	2.083	11.20	3.08	6.53
0.167	5.66	1.167	26.81	2.167	11.20	3.17	6.53
0.250	6.33	1.250	155.35	2.250	9.89	3.25	6.15
0.333	6.33	1.333	155.35	2.333	9.89	3.33	6.15
0.417	7.22	1.417	32.90	2.417	8.90	3.42	5.81
0.500	7.22	1.500	32.90	2.500	8.90	3.50	5.81
0.583	8.50	1.583	20.74	2.583	8.12	3.58	5.52
0.667	8.50	1.667	20.74	2.667	8.12	3.67	5.52
0.750	10.54	1.750	15.82	2.750	7.49	3.75	5.27
0.833	10.54	1.833	15.82	2.833	7.49	3.83	5.27
0.917	14.41	1.917	13.03	2.917	6.97	3.92	5.04
1.000	14.41	2.000	13.03	3.000	6.97	4.00	5.04

Unit Hyd Qpeak (cms)= 0.282

PEAK FLOW (cms)= 0.083 (i)
TIME TO PEAK (hrs)= 2.167
RUNOFF VOLUME (mm)= 14.516
TOTAL RAINFALL (mm)= 67.367
RUNOFF COEFFICIENT = 0.215

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

FINISH
=====

=====

V	V	I	SSSSS	U	U	A	L	(v 6.2.2019)
V	V	I	SS	U	U	A	A	L
V	V	I	SS	U	U	AAAAA	L	
V	V	I	SS	U	U	A	A	L
VV		I	SSSSS	UUUUU	A	A	LLLLL	

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

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:
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Summary filename:
C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\ed2ea
16-9972-4435-b9ca-9ec3723a9661\scena

DATE: 09/25/2025

TIME: 04:20:47

USER:

COMMENTS: _____

** SIMULATION : Calabogie 4hr CHI 10yr **

| CHICAGO STORM |
Ptotal= 46.88 mm

IDF curve parameters: A= 540.613
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 = 0.33

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	3.94	1.00	18.66	2.00	7.79	3.00	4.54
0.17	4.40	1.17	108.12	2.17	6.88	3.17	4.28
0.33	5.03	1.33	22.89	2.33	6.20	3.33	4.05
0.50	5.92	1.50	14.44	2.50	5.65	3.50	3.84
0.67	7.33	1.67	11.01	2.67	5.21	3.67	3.67
0.83	10.03	1.83	9.07	2.83	4.85	3.83	3.51

CALIB

NASHYD (0004)	Area (ha)= 10.60	Curve Number (CN)= 57.7
ID= 1 DT= 5.0 min	Ia (mm)= 10.46	# of Linear Res.(N)= 3.00
-----	U.H. Tp(hrs)= 0.72	

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	3.94	1.083	18.66	2.083	7.79	3.08	4.54
0.167	3.94	1.167	18.66	2.167	7.79	3.17	4.54
0.250	4.40	1.250	108.12	2.250	6.88	3.25	4.28
0.333	4.40	1.333	108.12	2.333	6.88	3.33	4.28
0.417	5.03	1.417	22.89	2.417	6.20	3.42	4.05
0.500	5.03	1.500	22.89	2.500	6.20	3.50	4.05
0.583	5.92	1.583	14.44	2.583	5.65	3.58	3.84
0.667	5.92	1.667	14.44	2.667	5.65	3.67	3.84
0.750	7.33	1.750	11.01	2.750	5.21	3.75	3.67
0.833	7.33	1.833	11.01	2.833	5.21	3.83	3.67
0.917	10.03	1.917	9.07	2.917	4.85	3.92	3.51
1.000	10.03	2.000	9.07	3.000	4.85	4.00	3.51

Unit Hyd Qpeak (cms)= 0.562

PEAK FLOW (cms)= 0.068 (i)
 TIME TO PEAK (hrs)= 2.417
 RUNOFF VOLUME (mm)= 5.959
 TOTAL RAINFALL (mm)= 46.883
 RUNOFF COEFFICIENT = 0.127

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

CALIB		
NASHYD (0003)	Area (ha)= 18.80	Curve Number (CN)= 59.5
ID= 1 DT= 5.0 min	Ia (mm)= 10.09	# of Linear Res.(N)= 3.00
-----	U.H. Tp(hrs)= 1.00	

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	3.94	1.083	18.66	2.083	7.79	3.08	4.54
0.167	3.94	1.167	18.66	2.167	7.79	3.17	4.54
0.250	4.40	1.250	108.12	2.250	6.88	3.25	4.28
0.333	4.40	1.333	108.12	2.333	6.88	3.33	4.28

0.417	5.03	1.417	22.89	2.417	6.20	3.42	4.05
0.500	5.03	1.500	22.89	2.500	6.20	3.50	4.05
0.583	5.92	1.583	14.44	2.583	5.65	3.58	3.84
0.667	5.92	1.667	14.44	2.667	5.65	3.67	3.84
0.750	7.33	1.750	11.01	2.750	5.21	3.75	3.67
0.833	7.33	1.833	11.01	2.833	5.21	3.83	3.67
0.917	10.03	1.917	9.07	2.917	4.85	3.92	3.51
1.000	10.03	2.000	9.07	3.000	4.85	4.00	3.51

Unit Hyd Qpeak (cms)= 0.718

PEAK FLOW (cms)= 0.111 (i)
TIME TO PEAK (hrs)= 2.833
RUNOFF VOLUME (mm)= 6.456
TOTAL RAINFALL (mm)= 46.883
RUNOFF COEFFICIENT = 0.138

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

```

-----
| CALIB |
| NASHYD ( 0001) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 24.80 Curve Number (CN)= 56.8
Ia (mm)= 10.64 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 1.40

```

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	3.94	1.083	18.66	2.083	7.79	3.08	4.54
0.167	3.94	1.167	18.66	2.167	7.79	3.17	4.54
0.250	4.40	1.250	108.12	2.250	6.88	3.25	4.28
0.333	4.40	1.333	108.12	2.333	6.88	3.33	4.28
0.417	5.03	1.417	22.89	2.417	6.20	3.42	4.05
0.500	5.03	1.500	22.89	2.500	6.20	3.50	4.05
0.583	5.92	1.583	14.44	2.583	5.65	3.58	3.84
0.667	5.92	1.667	14.44	2.667	5.65	3.67	3.84
0.750	7.33	1.750	11.01	2.750	5.21	3.75	3.67
0.833	7.33	1.833	11.01	2.833	5.21	3.83	3.67
0.917	10.03	1.917	9.07	2.917	4.85	3.92	3.51
1.000	10.03	2.000	9.07	3.000	4.85	4.00	3.51

Unit Hyd Qpeak (cms)= 0.677

PEAK FLOW (cms)= 0.108 (i)
TIME TO PEAK (hrs)= 3.583
RUNOFF VOLUME (mm)= 5.725

TOTAL RAINFALL (mm)= 46.883
RUNOFF COEFFICIENT = 0.122

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

```
-----
| CALIB |
| NASHYD ( 0064) | Area (ha)= 11.60 Curve Number (CN)= 60.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.55
```

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 3.94 | 1.083 18.66 | 2.083 7.79 | 3.08 4.54
0.167 3.94 | 1.167 18.66 | 2.167 7.79 | 3.17 4.54
0.250 4.40 | 1.250 108.12 | 2.250 6.88 | 3.25 4.28
0.333 4.40 | 1.333 108.12 | 2.333 6.88 | 3.33 4.28
0.417 5.03 | 1.417 22.89 | 2.417 6.20 | 3.42 4.05
0.500 5.03 | 1.500 22.89 | 2.500 6.20 | 3.50 4.05
0.583 5.92 | 1.583 14.44 | 2.583 5.65 | 3.58 3.84
0.667 5.92 | 1.667 14.44 | 2.667 5.65 | 3.67 3.84
0.750 7.33 | 1.750 11.01 | 2.750 5.21 | 3.75 3.67
0.833 7.33 | 1.833 11.01 | 2.833 5.21 | 3.83 3.67
0.917 10.03 | 1.917 9.07 | 2.917 4.85 | 3.92 3.51
1.000 10.03 | 2.000 9.07 | 3.000 4.85 | 4.00 3.51
```

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.097 (i)
TIME TO PEAK (hrs)= 2.083
RUNOFF VOLUME (mm)= 6.597
TOTAL RAINFALL (mm)= 46.883
RUNOFF COEFFICIENT = 0.141

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

```
-----
| ADD HYD ( 0065) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
| | (ha) (cms) (hrs) (mm)
-----
ID1= 1 ( 0001): 24.80 0.108 3.58 5.73
+ ID2= 2 ( 0064): 11.60 0.097 2.08 6.60
=====
```

ID = 3 (0065): 36.40 0.168 2.75 6.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| CALIB |
| NASHYD ( 0002) | Area (ha)= 4.50 Curve Number (CN)= 60.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
|-----|
| U.H. Tp(hrs)= 0.61
```

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 3.94 | 1.083 18.66 | 2.083 7.79 | 3.08 4.54
0.167 3.94 | 1.167 18.66 | 2.167 7.79 | 3.17 4.54
0.250 4.40 | 1.250 108.12 | 2.250 6.88 | 3.25 4.28
0.333 4.40 | 1.333 108.12 | 2.333 6.88 | 3.33 4.28
0.417 5.03 | 1.417 22.89 | 2.417 6.20 | 3.42 4.05
0.500 5.03 | 1.500 22.89 | 2.500 6.20 | 3.50 4.05
0.583 5.92 | 1.583 14.44 | 2.583 5.65 | 3.58 3.84
0.667 5.92 | 1.667 14.44 | 2.667 5.65 | 3.67 3.84
0.750 7.33 | 1.750 11.01 | 2.750 5.21 | 3.75 3.67
0.833 7.33 | 1.833 11.01 | 2.833 5.21 | 3.83 3.67
0.917 10.03 | 1.917 9.07 | 2.917 4.85 | 3.92 3.51
1.000 10.03 | 2.000 9.07 | 3.000 4.85 | 4.00 3.51
```

Unit Hyd Qpeak (cms)= 0.282

PEAK FLOW (cms)= 0.036 (i)
TIME TO PEAK (hrs)= 2.167
RUNOFF VOLUME (mm)= 6.596
TOTAL RAINFALL (mm)= 46.883
RUNOFF COEFFICIENT = 0.141

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

```
-----
=====
=====
V V I SSSSS U U A L (v 6.2.2019)
V V I SS U U A A L
V V I SS U U AAAAA L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL
000 TTTTT TTTTT H H Y Y M M 000 TM
```

0 0 T T H H Y Y M M O O
0 0 T T H H Y M M O O
000 T T H H Y M M 000

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

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Summary filename:

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e5-2f2a-445d-8063-5324e2dc7486\scena

DATE: 09/25/2025

TIME: 04:20:47

USER:

COMMENTS: _____

** SIMULATION : Calabogie 4hr CHI 25yr **

| CHICAGO STORM |
Ptotal= 55.08 mm

IDF curve parameters: A= 635.089

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 = 0.33

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	4.63	1.00	21.92	2.00	9.16	3.00	5.33
0.17	5.17	1.17	127.01	2.17	8.09	3.17	5.02

0.33	5.91	1.33	26.89	2.33	7.28	3.33	4.75
0.50	6.95	1.50	16.96	2.50	6.64	3.50	4.52
0.67	8.61	1.67	12.93	2.67	6.13	3.67	4.31
0.83	11.78	1.83	10.65	2.83	5.70	3.83	4.12

```

-----
| CALIB                                     |
| NASHYD ( 0004) | Area (ha)= 10.60 Curve Number (CN)= 57.7
| ID= 1 DT= 5.0 min | Ia (mm)= 10.46 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.72

```

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	4.63	1.083	21.92	2.083	9.16	3.08	5.33
0.167	4.63	1.167	21.92	2.167	9.16	3.17	5.33
0.250	5.17	1.250	127.01	2.250	8.09	3.25	5.02
0.333	5.17	1.333	127.01	2.333	8.09	3.33	5.02
0.417	5.91	1.417	26.89	2.417	7.28	3.42	4.75
0.500	5.91	1.500	26.89	2.500	7.28	3.50	4.75
0.583	6.95	1.583	16.96	2.583	6.64	3.58	4.52
0.667	6.95	1.667	16.96	2.667	6.64	3.67	4.52
0.750	8.61	1.750	12.93	2.750	6.13	3.75	4.31
0.833	8.61	1.833	12.93	2.833	6.13	3.83	4.31
0.917	11.78	1.917	10.65	2.917	5.70	3.92	4.12
1.000	11.78	2.000	10.65	3.000	5.70	4.00	4.12

Unit Hyd Qpeak (cms)= 0.562

PEAK FLOW (cms)= 0.102 (i)

TIME TO PEAK (hrs)= 2.333

RUNOFF VOLUME (mm)= 8.624

TOTAL RAINFALL (mm)= 55.077

RUNOFF COEFFICIENT = 0.157

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

```

-----
| CALIB                                     |
| NASHYD ( 0003) | Area (ha)= 18.80 Curve Number (CN)= 59.5
| ID= 1 DT= 5.0 min | Ia (mm)= 10.09 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 1.00

```

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	4.63	1.083	21.92	2.083	9.16	3.08	5.33
0.167	4.63	1.167	21.92	2.167	9.16	3.17	5.33
0.250	5.17	1.250	127.01	2.250	8.09	3.25	5.02
0.333	5.17	1.333	127.01	2.333	8.09	3.33	5.02
0.417	5.91	1.417	26.89	2.417	7.28	3.42	4.75
0.500	5.91	1.500	26.89	2.500	7.28	3.50	4.75
0.583	6.95	1.583	16.96	2.583	6.64	3.58	4.52
0.667	6.95	1.667	16.96	2.667	6.64	3.67	4.52
0.750	8.61	1.750	12.93	2.750	6.13	3.75	4.31
0.833	8.61	1.833	12.93	2.833	6.13	3.83	4.31
0.917	11.78	1.917	10.65	2.917	5.70	3.92	4.12
1.000	11.78	2.000	10.65	3.000	5.70	4.00	4.12

Unit Hyd Qpeak (cms)= 0.718

PEAK FLOW (cms)= 0.162 (i)

TIME TO PEAK (hrs)= 2.833

RUNOFF VOLUME (mm)= 9.289

TOTAL RAINFALL (mm)= 55.077

RUNOFF COEFFICIENT = 0.169

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

CALIB			
NASHYD (0001)	Area (ha)= 24.80	Curve Number (CN)= 56.8	
ID= 1 DT= 5.0 min	Ia (mm)= 10.64	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 1.40		

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	4.63	1.083	21.92	2.083	9.16	3.08	5.33
0.167	4.63	1.167	21.92	2.167	9.16	3.17	5.33
0.250	5.17	1.250	127.01	2.250	8.09	3.25	5.02
0.333	5.17	1.333	127.01	2.333	8.09	3.33	5.02
0.417	5.91	1.417	26.89	2.417	7.28	3.42	4.75
0.500	5.91	1.500	26.89	2.500	7.28	3.50	4.75
0.583	6.95	1.583	16.96	2.583	6.64	3.58	4.52
0.667	6.95	1.667	16.96	2.667	6.64	3.67	4.52
0.750	8.61	1.750	12.93	2.750	6.13	3.75	4.31

0.833	8.61		1.833	12.93		2.833	6.13		3.83	4.31
0.917	11.78		1.917	10.65		2.917	5.70		3.92	4.12
1.000	11.78		2.000	10.65		3.000	5.70		4.00	4.12

Unit Hyd Qpeak (cms)= 0.677

PEAK FLOW (cms)= 0.158 (i)

TIME TO PEAK (hrs)= 3.500

RUNOFF VOLUME (mm)= 8.310

TOTAL RAINFALL (mm)= 55.077

RUNOFF COEFFICIENT = 0.151

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

```

-----
| CALIB |
| NASHYD ( 0064) | Area (ha)= 11.60 Curve Number (CN)= 60.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.55

```

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	4.63	1.083	21.92	2.083	9.16	3.08	5.33
0.167	4.63	1.167	21.92	2.167	9.16	3.17	5.33
0.250	5.17	1.250	127.01	2.250	8.09	3.25	5.02
0.333	5.17	1.333	127.01	2.333	8.09	3.33	5.02
0.417	5.91	1.417	26.89	2.417	7.28	3.42	4.75
0.500	5.91	1.500	26.89	2.500	7.28	3.50	4.75
0.583	6.95	1.583	16.96	2.583	6.64	3.58	4.52
0.667	6.95	1.667	16.96	2.667	6.64	3.67	4.52
0.750	8.61	1.750	12.93	2.750	6.13	3.75	4.31
0.833	8.61	1.833	12.93	2.833	6.13	3.83	4.31
0.917	11.78	1.917	10.65	2.917	5.70	3.92	4.12
1.000	11.78	2.000	10.65	3.000	5.70	4.00	4.12

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.144 (i)

TIME TO PEAK (hrs)= 2.083

RUNOFF VOLUME (mm)= 9.476

TOTAL RAINFALL (mm)= 55.077

RUNOFF COEFFICIENT = 0.172

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

```

-----
| ADD HYD ( 0065) |
| 1 + 2 = 3 |
-----

```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0001):	24.80	0.158	3.50	8.31
+ ID2= 2 (0064):	11.60	0.144	2.08	9.48
=====				
ID = 3 (0065):	36.40	0.246	2.67	8.68

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD ( 0002) |
| ID= 1 DT= 5.0 min |
-----

```

Area (ha)= 4.50 Curve Number (CN)= 60.0
Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.61

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	4.63	1.083	21.92	2.083	9.16	3.08	5.33
0.167	4.63	1.167	21.92	2.167	9.16	3.17	5.33
0.250	5.17	1.250	127.01	2.250	8.09	3.25	5.02
0.333	5.17	1.333	127.01	2.333	8.09	3.33	5.02
0.417	5.91	1.417	26.89	2.417	7.28	3.42	4.75
0.500	5.91	1.500	26.89	2.500	7.28	3.50	4.75
0.583	6.95	1.583	16.96	2.583	6.64	3.58	4.52
0.667	6.95	1.667	16.96	2.667	6.64	3.67	4.52
0.750	8.61	1.750	12.93	2.750	6.13	3.75	4.31
0.833	8.61	1.833	12.93	2.833	6.13	3.83	4.31
0.917	11.78	1.917	10.65	2.917	5.70	3.92	4.12
1.000	11.78	2.000	10.65	3.000	5.70	4.00	4.12

Unit Hyd Qpeak (cms)= 0.282

PEAK FLOW (cms)= 0.053 (i)
TIME TO PEAK (hrs)= 2.167
RUNOFF VOLUME (mm)= 9.476
TOTAL RAINFALL (mm)= 55.077
RUNOFF COEFFICIENT = 0.172

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

=====

```
V   V   I   SSSSS U   U   A   L           (v 6.2.2019)
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
W       I   SSSSS UUUUU A   A   LLLLL
```

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

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:

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Summary filename:

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DATE: 09/25/2025

TIME: 04:20:46

USER:

COMMENTS: _____


```
*****
** SIMULATION : Calabogie 4hr CHI 2yr           **
*****
```

```
-----
| CHICAGO STORM |
| Ptotal= 30.35 mm |
-----
```

IDF curve parameters: A= 349.911

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 = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	2.55	1.00	12.07	2.00	5.04	3.00	2.94
0.17	2.85	1.17	69.98	2.17	4.46	3.17	2.77
0.33	3.25	1.33	14.82	2.33	4.01	3.33	2.62
0.50	3.83	1.50	9.34	2.50	3.66	3.50	2.49
0.67	4.75	1.67	7.13	2.67	3.37	3.67	2.37
0.83	6.49	1.83	5.87	2.83	3.14	3.83	2.27

```

-----
| CALIB |
| NASHYD ( 0004) | Area (ha)= 10.60 Curve Number (CN)= 57.7
| ID= 1 DT= 5.0 min | Ia (mm)= 10.46 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.72

```

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	2.55	1.083	12.07	2.083	5.04	3.08	2.94
0.167	2.55	1.167	12.07	2.167	5.04	3.17	2.94
0.250	2.85	1.250	69.98	2.250	4.46	3.25	2.77
0.333	2.85	1.333	69.98	2.333	4.46	3.33	2.77
0.417	3.25	1.417	14.82	2.417	4.01	3.42	2.62
0.500	3.25	1.500	14.82	2.500	4.01	3.50	2.62
0.583	3.83	1.583	9.34	2.583	3.66	3.58	2.49
0.667	3.83	1.667	9.34	2.667	3.66	3.67	2.49
0.750	4.75	1.750	7.13	2.750	3.37	3.75	2.37
0.833	4.75	1.833	7.13	2.833	3.37	3.83	2.37
0.917	6.49	1.917	5.87	2.917	3.14	3.92	2.27
1.000	6.49	2.000	5.87	3.000	3.14	4.00	2.27

Unit Hyd Qpeak (cms)= 0.562

PEAK FLOW (cms)= 0.020 (i)

TIME TO PEAK (hrs)= 2.667

RUNOFF VOLUME (mm)= 1.918

TOTAL RAINFALL (mm)= 30.345

RUNOFF COEFFICIENT = 0.063

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

```

-----
| CALIB                                     |
| NASHYD ( 0003) | Area (ha)= 18.80 Curve Number (CN)= 59.5
| ID= 1 DT= 5.0 min | Ia (mm)= 10.09 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 1.00

```

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    2.55 | 1.083   12.07 | 2.083    5.04 | 3.08    2.94
0.167    2.55 | 1.167   12.07 | 2.167    5.04 | 3.17    2.94
0.250    2.85 | 1.250   69.98 | 2.250    4.46 | 3.25    2.77
0.333    2.85 | 1.333   69.98 | 2.333    4.46 | 3.33    2.77
0.417    3.25 | 1.417   14.82 | 2.417    4.01 | 3.42    2.62
0.500    3.25 | 1.500   14.82 | 2.500    4.01 | 3.50    2.62
0.583    3.83 | 1.583    9.34 | 2.583    3.66 | 3.58    2.49
0.667    3.83 | 1.667    9.34 | 2.667    3.66 | 3.67    2.49
0.750    4.75 | 1.750    7.13 | 2.750    3.37 | 3.75    2.37
0.833    4.75 | 1.833    7.13 | 2.833    3.37 | 3.83    2.37
0.917    6.49 | 1.917    5.87 | 2.917    3.14 | 3.92    2.27
1.000    6.49 | 2.000    5.87 | 3.000    3.14 | 4.00    2.27

```

Unit Hyd Qpeak (cms)= 0.718

PEAK FLOW (cms)= 0.035 (i)
 TIME TO PEAK (hrs)= 3.167
 RUNOFF VOLUME (mm)= 2.124
 TOTAL RAINFALL (mm)= 30.345
 RUNOFF COEFFICIENT = 0.070

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

```

-----
| CALIB                                     |
| NASHYD ( 0001) | Area (ha)= 24.80 Curve Number (CN)= 56.8
| ID= 1 DT= 5.0 min | Ia (mm)= 10.64 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 1.40

```

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	2.55	1.083	12.07	2.083	5.04	3.08	2.94
0.167	2.55	1.167	12.07	2.167	5.04	3.17	2.94
0.250	2.85	1.250	69.98	2.250	4.46	3.25	2.77
0.333	2.85	1.333	69.98	2.333	4.46	3.33	2.77
0.417	3.25	1.417	14.82	2.417	4.01	3.42	2.62
0.500	3.25	1.500	14.82	2.500	4.01	3.50	2.62
0.583	3.83	1.583	9.34	2.583	3.66	3.58	2.49
0.667	3.83	1.667	9.34	2.667	3.66	3.67	2.49
0.750	4.75	1.750	7.13	2.750	3.37	3.75	2.37
0.833	4.75	1.833	7.13	2.833	3.37	3.83	2.37
0.917	6.49	1.917	5.87	2.917	3.14	3.92	2.27
1.000	6.49	2.000	5.87	3.000	3.14	4.00	2.27

Unit Hyd Qpeak (cms)= 0.677

PEAK FLOW (cms)= 0.035 (i)

TIME TO PEAK (hrs)= 4.000

RUNOFF VOLUME (mm)= 1.824

TOTAL RAINFALL (mm)= 30.345

RUNOFF COEFFICIENT = 0.060

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

```

-----
| CALIB |
| NASHYD ( 0064) | Area (ha)= 11.60 Curve Number (CN)= 60.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.55

```

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	2.55	1.083	12.07	2.083	5.04	3.08	2.94
0.167	2.55	1.167	12.07	2.167	5.04	3.17	2.94
0.250	2.85	1.250	69.98	2.250	4.46	3.25	2.77
0.333	2.85	1.333	69.98	2.333	4.46	3.33	2.77
0.417	3.25	1.417	14.82	2.417	4.01	3.42	2.62
0.500	3.25	1.500	14.82	2.500	4.01	3.50	2.62
0.583	3.83	1.583	9.34	2.583	3.66	3.58	2.49
0.667	3.83	1.667	9.34	2.667	3.66	3.67	2.49
0.750	4.75	1.750	7.13	2.750	3.37	3.75	2.37
0.833	4.75	1.833	7.13	2.833	3.37	3.83	2.37
0.917	6.49	1.917	5.87	2.917	3.14	3.92	2.27
1.000	6.49	2.000	5.87	3.000	3.14	4.00	2.27

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.029 (i)
 TIME TO PEAK (hrs)= 2.250
 RUNOFF VOLUME (mm)= 2.182
 TOTAL RAINFALL (mm)= 30.345
 RUNOFF COEFFICIENT = 0.072

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

```

-----
| ADD HYD ( 0065) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
ID1= 1 ( 0001):  24.80  0.035  4.00  1.82
+ ID2= 2 ( 0064):  11.60  0.029  2.25  2.18
=====
ID = 3 ( 0065):  36.40  0.053  3.33  1.94
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD ( 0002) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 4.50 Curve Number (CN)= 60.0
Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.61
  
```

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    2.55 | 1.083    12.07 | 2.083    5.04 | 3.08     2.94
0.167    2.55 | 1.167    12.07 | 2.167    5.04 | 3.17     2.94
0.250    2.85 | 1.250    69.98 | 2.250    4.46 | 3.25     2.77
0.333    2.85 | 1.333    69.98 | 2.333    4.46 | 3.33     2.77
0.417    3.25 | 1.417    14.82 | 2.417    4.01 | 3.42     2.62
0.500    3.25 | 1.500    14.82 | 2.500    4.01 | 3.50     2.62
0.583    3.83 | 1.583     9.34 | 2.583    3.66 | 3.58     2.49
0.667    3.83 | 1.667     9.34 | 2.667    3.66 | 3.67     2.49
0.750    4.75 | 1.750     7.13 | 2.750    3.37 | 3.75     2.37
0.833    4.75 | 1.833     7.13 | 2.833    3.37 | 3.83     2.37
0.917    6.49 | 1.917     5.87 | 2.917    3.14 | 3.92     2.27
1.000    6.49 | 2.000     5.87 | 3.000    3.14 | 4.00     2.27
  
```

Unit Hyd Qpeak (cms)= 0.282

PEAK FLOW (cms)= 0.011 (i)

TIME TO PEAK (hrs)= 2.417
RUNOFF VOLUME (mm)= 2.182
TOTAL RAINFALL (mm)= 30.345
RUNOFF COEFFICIENT = 0.072

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

=====

V V I SSSSS U U A L (v 6.2.2019)
V V I SS U U A A L
V V I SS U U AAAAA L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

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

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:

C:\Users\ahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\f5480d
1d-5b89-4e16-b1d8-939a2053be4e\scena

Summary filename:

C:\Users\ahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\f5480d
1d-5b89-4e16-b1d8-939a2053be4e\scena

DATE: 09/25/2025

TIME: 04:20:47

USER:

COMMENTS: _____

 ** SIMULATION : Calabogie 4hr CHI 50yr **

```

-----
| CHICAGO STORM      | IDF curve parameters: A= 706.820
| Ptotal= 61.30 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 = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	5.15	1.00	24.39	2.00	10.19	3.00	5.94
0.17	5.76	1.17	141.35	2.17	9.00	3.17	5.59
0.33	6.57	1.33	29.93	2.33	8.10	3.33	5.29
0.50	7.74	1.50	18.87	2.50	7.39	3.50	5.03
0.67	9.59	1.67	14.39	2.67	6.82	3.67	4.79
0.83	13.11	1.83	11.86	2.83	6.34	3.83	4.58

```

-----
| CALIB              |
| NASHYD ( 0004)    | Area (ha)= 10.60 Curve Number (CN)= 57.7
| ID= 1 DT= 5.0 min | Ia (mm)= 10.46 # of Linear Res.(N)= 3.00
-----              | U.H. Tp(hrs)= 0.72
  
```

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	5.15	1.083	24.39	2.083	10.19	3.08	5.94
0.167	5.15	1.167	24.39	2.167	10.19	3.17	5.94
0.250	5.76	1.250	141.35	2.250	9.00	3.25	5.59
0.333	5.76	1.333	141.35	2.333	9.00	3.33	5.59
0.417	6.57	1.417	29.93	2.417	8.10	3.42	5.29
0.500	6.57	1.500	29.93	2.500	8.10	3.50	5.29
0.583	7.74	1.583	18.87	2.583	7.39	3.58	5.03
0.667	7.74	1.667	18.87	2.667	7.39	3.67	5.03
0.750	9.59	1.750	14.39	2.750	6.82	3.75	4.79
0.833	9.59	1.833	14.39	2.833	6.82	3.83	4.79
0.917	13.11	1.917	11.86	2.917	6.34	3.92	4.58
1.000	13.11	2.000	11.86	3.000	6.34	4.00	4.58

Unit Hyd Qpeak (cms)= 0.562

PEAK FLOW (cms)= 0.130 (i)
TIME TO PEAK (hrs)= 2.333
RUNOFF VOLUME (mm)= 10.902
TOTAL RAINFALL (mm)= 61.297
RUNOFF COEFFICIENT = 0.178

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

```
-----
| CALIB |
| NASHYD ( 0003) | Area (ha)= 18.80 Curve Number (CN)= 59.5
| ID= 1 DT= 5.0 min | Ia (mm)= 10.09 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 1.00
```

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 5.15 | 1.083 24.39 | 2.083 10.19 | 3.08 5.94
0.167 5.15 | 1.167 24.39 | 2.167 10.19 | 3.17 5.94
0.250 5.76 | 1.250 141.35 | 2.250 9.00 | 3.25 5.59
0.333 5.76 | 1.333 141.35 | 2.333 9.00 | 3.33 5.59
0.417 6.57 | 1.417 29.93 | 2.417 8.10 | 3.42 5.29
0.500 6.57 | 1.500 29.93 | 2.500 8.10 | 3.50 5.29
0.583 7.74 | 1.583 18.87 | 2.583 7.39 | 3.58 5.03
0.667 7.74 | 1.667 18.87 | 2.667 7.39 | 3.67 5.03
0.750 9.59 | 1.750 14.39 | 2.750 6.82 | 3.75 4.79
0.833 9.59 | 1.833 14.39 | 2.833 6.82 | 3.83 4.79
0.917 13.11 | 1.917 11.86 | 2.917 6.34 | 3.92 4.58
1.000 13.11 | 2.000 11.86 | 3.000 6.34 | 4.00 4.58
```

Unit Hyd Qpeak (cms)= 0.718

PEAK FLOW (cms)= 0.206 (i)
TIME TO PEAK (hrs)= 2.750
RUNOFF VOLUME (mm)= 11.701
TOTAL RAINFALL (mm)= 61.297
RUNOFF COEFFICIENT = 0.191

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

```
-----
| CALIB |
| NASHYD ( 0001) | Area (ha)= 24.80 Curve Number (CN)= 56.8
```

| ID= 1 DT= 5.0 min | Ia (mm)= 10.64 # of Linear Res.(N)= 3.00
 ----- U.H. Tp(hrs)= 1.40

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	5.15	1.083	24.39	2.083	10.19	3.08	5.94
0.167	5.15	1.167	24.39	2.167	10.19	3.17	5.94
0.250	5.76	1.250	141.35	2.250	9.00	3.25	5.59
0.333	5.76	1.333	141.35	2.333	9.00	3.33	5.59
0.417	6.57	1.417	29.93	2.417	8.10	3.42	5.29
0.500	6.57	1.500	29.93	2.500	8.10	3.50	5.29
0.583	7.74	1.583	18.87	2.583	7.39	3.58	5.03
0.667	7.74	1.667	18.87	2.667	7.39	3.67	5.03
0.750	9.59	1.750	14.39	2.750	6.82	3.75	4.79
0.833	9.59	1.833	14.39	2.833	6.82	3.83	4.79
0.917	13.11	1.917	11.86	2.917	6.34	3.92	4.58
1.000	13.11	2.000	11.86	3.000	6.34	4.00	4.58

Unit Hyd Qpeak (cms)= 0.677

PEAK FLOW (cms)= 0.200 (i)
 TIME TO PEAK (hrs)= 3.417
 RUNOFF VOLUME (mm)= 10.524
 TOTAL RAINFALL (mm)= 61.297
 RUNOFF COEFFICIENT = 0.172

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

CALIB			
NASHYD (0064)	Area (ha)= 11.60	Curve Number (CN)= 60.0	
ID= 1 DT= 5.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00	
-----	U.H. Tp(hrs)= 0.55		

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	5.15	1.083	24.39	2.083	10.19	3.08	5.94
0.167	5.15	1.167	24.39	2.167	10.19	3.17	5.94
0.250	5.76	1.250	141.35	2.250	9.00	3.25	5.59
0.333	5.76	1.333	141.35	2.333	9.00	3.33	5.59
0.417	6.57	1.417	29.93	2.417	8.10	3.42	5.29

0.500	6.57	1.500	29.93	2.500	8.10	3.50	5.29
0.583	7.74	1.583	18.87	2.583	7.39	3.58	5.03
0.667	7.74	1.667	18.87	2.667	7.39	3.67	5.03
0.750	9.59	1.750	14.39	2.750	6.82	3.75	4.79
0.833	9.59	1.833	14.39	2.833	6.82	3.83	4.79
0.917	13.11	1.917	11.86	2.917	6.34	3.92	4.58
1.000	13.11	2.000	11.86	3.000	6.34	4.00	4.58

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.184 (i)

TIME TO PEAK (hrs)= 2.083

RUNOFF VOLUME (mm)= 11.926

TOTAL RAINFALL (mm)= 61.297

RUNOFF COEFFICIENT = 0.195

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

ADD HYD (0065)					
1 + 2 = 3					
		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0001):		24.80	0.200	3.42	10.52
+ ID2= 2 (0064):		11.60	0.184	2.08	11.93
=====					
ID = 3 (0065):		36.40	0.313	2.58	10.97

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0002)		Area	(ha)=	4.50	Curve Number (CN)= 60.0
ID= 1 DT= 5.0 min		Ia	(mm)=	10.00	# of Linear Res.(N)= 3.00
		U.H. Tp	(hrs)=	0.61	

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	5.15	1.083	24.39	2.083	10.19	3.08	5.94
0.167	5.15	1.167	24.39	2.167	10.19	3.17	5.94
0.250	5.76	1.250	141.35	2.250	9.00	3.25	5.59
0.333	5.76	1.333	141.35	2.333	9.00	3.33	5.59
0.417	6.57	1.417	29.93	2.417	8.10	3.42	5.29
0.500	6.57	1.500	29.93	2.500	8.10	3.50	5.29
0.583	7.74	1.583	18.87	2.583	7.39	3.58	5.03

0.667	7.74		1.667	18.87		2.667	7.39		3.67	5.03
0.750	9.59		1.750	14.39		2.750	6.82		3.75	4.79
0.833	9.59		1.833	14.39		2.833	6.82		3.83	4.79
0.917	13.11		1.917	11.86		2.917	6.34		3.92	4.58
1.000	13.11		2.000	11.86		3.000	6.34		4.00	4.58

Unit Hyd Qpeak (cms)= 0.282

PEAK FLOW (cms)= 0.067 (i)

TIME TO PEAK (hrs)= 2.167

RUNOFF VOLUME (mm)= 11.926

TOTAL RAINFALL (mm)= 61.297

RUNOFF COEFFICIENT = 0.195

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

 =====
 =====

V	V	I	SSSSS	U	U	A	L		(v 6.2.2019)
V	V	I	SS	U	U	A	A	L	
V	V	I	SS	U	U	AAAAA	L		
V	V	I	SS	U	U	A	A	L	
VV		I	SSSSS	UUUUU	A	A	LLLLL		

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

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\204892
 b8-1629-4829-b418-748daab62217\scena

Summary filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\204892
 b8-1629-4829-b418-748daab62217\scena

DATE: 09/25/2025

TIME: 04:20:46

USER:

COMMENTS: _____

** SIMULATION : Calabogie 4hr CHI 5yr **

| CHICAGO STORM |
Ptotal= 40.36 mm

IDF curve parameters: A= 465.382
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 = 0.33

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	3.39	1.00	16.06	2.00	6.71	3.00	3.91
0.17	3.79	1.17	93.07	2.17	5.93	3.17	3.68
0.33	4.33	1.33	19.71	2.33	5.33	3.33	3.48
0.50	5.10	1.50	12.43	2.50	4.87	3.50	3.31
0.67	6.31	1.67	9.48	2.67	4.49	3.67	3.16
0.83	8.63	1.83	7.81	2.83	4.17	3.83	3.02

| CALIB |
| NASHYD (0004) |
ID= 1 DT= 5.0 min

Area (ha)= 10.60 Curve Number (CN)= 57.7
Ia (mm)= 10.46 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.72

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	3.39	1.083	16.06	2.083	6.71	3.08	3.91
0.167	3.39	1.167	16.06	2.167	6.71	3.17	3.91
0.250	3.79	1.250	93.07	2.250	5.93	3.25	3.68
0.333	3.79	1.333	93.07	2.333	5.93	3.33	3.68

0.417	4.33	1.417	19.71	2.417	5.33	3.42	3.48
0.500	4.33	1.500	19.71	2.500	5.33	3.50	3.48
0.583	5.10	1.583	12.43	2.583	4.87	3.58	3.31
0.667	5.10	1.667	12.43	2.667	4.87	3.67	3.31
0.750	6.31	1.750	9.48	2.750	4.49	3.75	3.16
0.833	6.31	1.833	9.48	2.833	4.49	3.83	3.16
0.917	8.63	1.917	7.81	2.917	4.17	3.92	3.02
1.000	8.63	2.000	7.81	3.000	4.17	4.00	3.02

Unit Hyd Qpeak (cms)= 0.562

PEAK FLOW (cms)= 0.046 (i)
TIME TO PEAK (hrs)= 2.500
RUNOFF VOLUME (mm)= 4.136
TOTAL RAINFALL (mm)= 40.359
RUNOFF COEFFICIENT = 0.102

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

```

-----
| CALIB |
| NASHYD ( 0003) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 18.80 Curve Number (CN)= 59.5
Ia (mm)= 10.09 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 1.00

```

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	3.39	1.083	16.06	2.083	6.71	3.08	3.91
0.167	3.39	1.167	16.06	2.167	6.71	3.17	3.91
0.250	3.79	1.250	93.07	2.250	5.93	3.25	3.68
0.333	3.79	1.333	93.07	2.333	5.93	3.33	3.68
0.417	4.33	1.417	19.71	2.417	5.33	3.42	3.48
0.500	4.33	1.500	19.71	2.500	5.33	3.50	3.48
0.583	5.10	1.583	12.43	2.583	4.87	3.58	3.31
0.667	5.10	1.667	12.43	2.667	4.87	3.67	3.31
0.750	6.31	1.750	9.48	2.750	4.49	3.75	3.16
0.833	6.31	1.833	9.48	2.833	4.49	3.83	3.16
0.917	8.63	1.917	7.81	2.917	4.17	3.92	3.02
1.000	8.63	2.000	7.81	3.000	4.17	4.00	3.02

Unit Hyd Qpeak (cms)= 0.718

PEAK FLOW (cms)= 0.076 (i)
TIME TO PEAK (hrs)= 2.917
RUNOFF VOLUME (mm)= 4.510

TOTAL RAINFALL (mm)= 40.359
RUNOFF COEFFICIENT = 0.112

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

| CALIB |
| NASHYD (0001) | Area (ha)= 24.80 Curve Number (CN)= 56.8
| ID= 1 DT= 5.0 min | Ia (mm)= 10.64 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 1.40

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 3.39 | 1.083 16.06 | 2.083 6.71 | 3.08 3.91
0.167 3.39 | 1.167 16.06 | 2.167 6.71 | 3.17 3.91
0.250 3.79 | 1.250 93.07 | 2.250 5.93 | 3.25 3.68
0.333 3.79 | 1.333 93.07 | 2.333 5.93 | 3.33 3.68
0.417 4.33 | 1.417 19.71 | 2.417 5.33 | 3.42 3.48
0.500 4.33 | 1.500 19.71 | 2.500 5.33 | 3.50 3.48
0.583 5.10 | 1.583 12.43 | 2.583 4.87 | 3.58 3.31
0.667 5.10 | 1.667 12.43 | 2.667 4.87 | 3.67 3.31
0.750 6.31 | 1.750 9.48 | 2.750 4.49 | 3.75 3.16
0.833 6.31 | 1.833 9.48 | 2.833 4.49 | 3.83 3.16
0.917 8.63 | 1.917 7.81 | 2.917 4.17 | 3.92 3.02
1.000 8.63 | 2.000 7.81 | 3.000 4.17 | 4.00 3.02

Unit Hyd Qpeak (cms)= 0.677

PEAK FLOW (cms)= 0.075 (i)
TIME TO PEAK (hrs)= 3.667
RUNOFF VOLUME (mm)= 3.962
TOTAL RAINFALL (mm)= 40.359
RUNOFF COEFFICIENT = 0.098

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

| CALIB |
| NASHYD (0064) | Area (ha)= 11.60 Curve Number (CN)= 60.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.55

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	3.39	1.083	16.06	2.083	6.71	3.08	3.91
0.167	3.39	1.167	16.06	2.167	6.71	3.17	3.91
0.250	3.79	1.250	93.07	2.250	5.93	3.25	3.68
0.333	3.79	1.333	93.07	2.333	5.93	3.33	3.68
0.417	4.33	1.417	19.71	2.417	5.33	3.42	3.48
0.500	4.33	1.500	19.71	2.500	5.33	3.50	3.48
0.583	5.10	1.583	12.43	2.583	4.87	3.58	3.31
0.667	5.10	1.667	12.43	2.667	4.87	3.67	3.31
0.750	6.31	1.750	9.48	2.750	4.49	3.75	3.16
0.833	6.31	1.833	9.48	2.833	4.49	3.83	3.16
0.917	8.63	1.917	7.81	2.917	4.17	3.92	3.02
1.000	8.63	2.000	7.81	3.000	4.17	4.00	3.02

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.066 (i)

TIME TO PEAK (hrs)= 2.167

RUNOFF VOLUME (mm)= 4.615

TOTAL RAINFALL (mm)= 40.359

RUNOFF COEFFICIENT = 0.114

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

ADD HYD (0065)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0001):	24.80	0.075	3.67	3.96
+ ID2= 2 (0064):	11.60	0.066	2.17	4.62
=====				
ID = 3 (0065):	36.40	0.116	2.92	4.17

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0002)			
ID= 1 DT= 5.0 min			

Area	(ha)=	4.50	Curve Number (CN)= 60.0
Ia	(mm)=	10.00	# of Linear Res.(N)= 3.00
U.H. Tp	(hrs)=	0.61	

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	3.39	1.083	16.06	2.083	6.71	3.08	3.91
0.167	3.39	1.167	16.06	2.167	6.71	3.17	3.91
0.250	3.79	1.250	93.07	2.250	5.93	3.25	3.68
0.333	3.79	1.333	93.07	2.333	5.93	3.33	3.68
0.417	4.33	1.417	19.71	2.417	5.33	3.42	3.48
0.500	4.33	1.500	19.71	2.500	5.33	3.50	3.48
0.583	5.10	1.583	12.43	2.583	4.87	3.58	3.31
0.667	5.10	1.667	12.43	2.667	4.87	3.67	3.31
0.750	6.31	1.750	9.48	2.750	4.49	3.75	3.16
0.833	6.31	1.833	9.48	2.833	4.49	3.83	3.16
0.917	8.63	1.917	7.81	2.917	4.17	3.92	3.02
1.000	8.63	2.000	7.81	3.000	4.17	4.00	3.02

Unit Hyd Qpeak (cms)= 0.282

PEAK FLOW (cms)= 0.024 (i)

TIME TO PEAK (hrs)= 2.250

RUNOFF VOLUME (mm)= 4.615

TOTAL RAINFALL (mm)= 40.359

RUNOFF COEFFICIENT = 0.114

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

=====

V V I SSSSS U U A L (v 6.2.2019)
V V I SS U U A A L
V V I SS U U AAAAA L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

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

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\2b7bc
6f-c0dd-4da3-ac96-adac8b6a0a42\scena

Summary filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\2b7bc
6f-c0dd-4da3-ac96-adac8b6a0a42\scena

DATE: 09/25/2025

TIME: 04:21:39

USER:

COMMENTS: _____

** SIMULATION : 25mm **

| READ STORM |

Filename: C:\Users\aaahmed\AppData\Local\Temp\

		e3447974-dd98-476d-a575-61b1680b1872\6329a775
	Ptotal= 25.00 mm	Comments: 25mm

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	1.48	1.00	6.32	2.00	4.37	3.00	2.04
0.08	1.58	1.08	9.36	2.08	3.96	3.08	1.96
0.17	1.67	1.17	18.42	2.17	3.63	3.17	1.89
0.25	1.80	1.25	79.14	2.25	3.36	3.25	1.82
0.33	1.94	1.33	34.99	2.33	3.12	3.33	1.76
0.42	2.10	1.42	18.68	2.42	2.92	3.42	1.70
0.50	2.31	1.50	12.60	2.50	2.75	3.50	1.65
0.58	2.56	1.58	9.50	2.58	2.59	3.58	1.59
0.67	2.88	1.67	7.64	2.67	2.46	3.67	1.55
0.75	3.31	1.75	6.41	2.75	2.34	3.75	1.50
0.83	3.91	1.83	5.53	2.83	2.23	3.83	1.46
0.92	4.81	1.92	4.87	2.92	2.13	3.92	1.43

CALIB		
NASHYD (0371)	Area (ha)= 3.60	Curve Number (CN)= 57.9
ID= 1 DT= 5.0 min	Ia (mm)= 10.42	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.58	

Unit Hyd Qpeak (cms)= 0.237

PEAK FLOW (cms)= 0.005 (i)
 TIME TO PEAK (hrs)= 2.417
 RUNOFF VOLUME (mm)= 1.067
 TOTAL RAINFALL (mm)= 25.002
 RUNOFF COEFFICIENT = 0.043

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

CALIB		
STANDHYD (0372)	Area (ha)= 16.70	
ID= 1 DT= 5.0 min	Total Imp(%)= 24.00	Dir. Conn.(%)= 12.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	4.01	12.69
Dep. Storage (mm)=	1.00	9.50
Average Slope (%)=	1.00	2.00
Length (m)=	333.67	40.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	79.14	1.55

over (min)	5.00	45.00	
Storage Coeff. (min)=	5.78 (ii)	43.11 (ii)	
Unit Hyd. Tpeak (min)=	5.00	45.00	
Unit Hyd. peak (cms)=	0.20	0.03	
			TOTALS
PEAK FLOW (cms)=	0.29	0.03	0.288 (iii)
TIME TO PEAK (hrs)=	1.33	2.42	1.33
RUNOFF VOLUME (mm)=	24.00	1.78	4.45
TOTAL RAINFALL (mm)=	25.00	25.00	25.00
RUNOFF COEFFICIENT =	0.96	0.07	0.18

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 60.8 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| RESERVOIR( 0368) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
| OUTFLOW          | STORAGE          | OUTFLOW          | STORAGE          |
| (cms)            | (ha.m.)         | (cms)            | (ha.m.)         |
|-----|-----|
| ***** WARNING : FIRST OUTFLOW IS NOT ZERO.
| 0.0630          | 0.1434          | 0.3528          | 0.3702          |
| 0.1550          | 0.2322          | 0.4320          | 0.4325          |
| 0.2556          | 0.2978          | 0.5148          | 0.4977          |

```

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0372)	16.700	0.288	1.33	4.45
OUTFLOW: ID= 1 (0368)	16.700	0.022	4.08	4.41

PEAK FLOW REDUCTION [Qout/Qin](%)= 7.65
TIME SHIFT OF PEAK FLOW (min)=165.00
MAXIMUM STORAGE USED (ha.m.)= 0.0502

```

-----
| ADD HYD ( 0369) |
| 1 + 2 = 3       |
-----
| ID1= 1 ( 0368): | AREA  QPEAK  TPEAK  R.V.
| + ID2= 2 ( 0371): | (ha)  (cms)  (hrs)  (mm)
|=====|
| ID = 3 ( 0369): | 20.30 0.025 3.58 3.82

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| NASHYD (0370) | Area (ha)= 10.70 Curve Number (CN)= 61.4
| ID= 1 DT= 5.0 min | Ia (mm)= 9.68 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.67

Unit Hyd Qpeak (cms)= 0.610

PEAK FLOW (cms)= 0.017 (i)
TIME TO PEAK (hrs)= 2.500
RUNOFF VOLUME (mm)= 1.341
TOTAL RAINFALL (mm)= 25.002
RUNOFF COEFFICIENT = 0.054

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

| CALIB |
| NASHYD (0064) | Area (ha)= 11.60 Curve Number (CN)= 60.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.55

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.018 (i)
TIME TO PEAK (hrs)= 2.333
RUNOFF VOLUME (mm)= 1.221
TOTAL RAINFALL (mm)= 25.002
RUNOFF COEFFICIENT = 0.049

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

| CALIB |
| NASHYD (0373) | Area (ha)= 23.20 Curve Number (CN)= 57.1
| ID= 1 DT= 5.0 min | Ia (mm)= 10.56 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 1.40

Unit Hyd Qpeak (cms)= 0.633

PEAK FLOW (cms)= 0.019 (i)
TIME TO PEAK (hrs)= 3.833
RUNOFF VOLUME (mm)= 1.016
TOTAL RAINFALL (mm)= 25.002
RUNOFF COEFFICIENT = 0.041

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

```
-----
| ADD HYD ( 0259) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
ID1= 1 ( 0373):  23.20  0.019  3.83  1.02
+ ID2= 2 ( 0064):  11.60  0.018  2.33  1.22
=====
ID = 3 ( 0259):  34.80  0.030  3.00  1.08
-----
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| CALIB
| NASHYD ( 0374) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 4.50 Curve Number (CN)= 62.2
Ia (mm)= 9.45 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.59
-----
```

Unit Hyd Qpeak (cms)= 0.291

PEAK FLOW (cms)= 0.008 (i)
TIME TO PEAK (hrs)= 2.417
RUNOFF VOLUME (mm)= 1.423
TOTAL RAINFALL (mm)= 25.002
RUNOFF COEFFICIENT = 0.057

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

```
-----
| RESERVOIR( 0375) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
-----
          OVERFLOW IS OFF
          OUTFLOW      STORAGE      OUTFLOW      STORAGE
          (cms)      (ha.m.)      (cms)      (ha.m.)
***** WARNING : FIRST OUTFLOW IS NOT ZERO.
          0.0238      0.0111      0.1431      0.0294
          0.0518      0.0193      0.1809      0.0325
          0.0778      0.0248      0.2241      0.0356
-----
```

```
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0374)  4.500  0.008  2.42  1.42
OUTFLOW: ID= 1 ( 0375)  4.500  0.005  3.58  1.40
-----
```

PEAK FLOW REDUCTION [Qout/Qin](%)= 62.73
TIME SHIFT OF PEAK FLOW (min)= 70.00

MAXIMUM STORAGE USED (ha.m.)= 0.0023

=====

V V I SSSSS U U A L (v 6.2.2019)
V V I SS U U A A L
V V I SS U U AAAAA L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

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

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\ab6e99
91-e6b4-4bb8-bc50-5f66559dc17c\scena

Summary filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\ab6e99
91-e6b4-4bb8-bc50-5f66559dc17c\scena

DATE: 09/25/2025

TIME: 04:21:39

USER:

COMMENTS: _____

** SIMULATION : Calabogie 4hr CHI 100yr **

| CHICAGO STORM |
Ptotal= 67.37 mm

IDF curve parameters: A= 776.803
 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 = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	5.66	1.00	26.81	2.00	11.20	3.00	6.53
0.17	6.33	1.17	155.35	2.17	9.89	3.17	6.15
0.33	7.22	1.33	32.90	2.33	8.90	3.33	5.81
0.50	8.50	1.50	20.74	2.50	8.12	3.50	5.52
0.67	10.54	1.67	15.82	2.67	7.49	3.67	5.27
0.83	14.41	1.83	13.03	2.83	6.97	3.83	5.04

 | CALIB |
 | NASHYD (0371) |
ID= 1 DT= 5.0 min

Area (ha)= 3.60 Curve Number (CN)= 57.9
 Ia (mm)= 10.42 # of Linear Res.(N)= 3.00
 U.H. Tp(hrs)= 0.58

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	5.66	1.083	26.81	2.083	11.20	3.08	6.53
0.167	5.66	1.167	26.81	2.167	11.20	3.17	6.53
0.250	6.33	1.250	155.35	2.250	9.89	3.25	6.15
0.333	6.33	1.333	155.35	2.333	9.89	3.33	6.15
0.417	7.22	1.417	32.90	2.417	8.90	3.42	5.81
0.500	7.22	1.500	32.90	2.500	8.90	3.50	5.81
0.583	8.50	1.583	20.74	2.583	8.12	3.58	5.52
0.667	8.50	1.667	20.74	2.667	8.12	3.67	5.52
0.750	10.54	1.750	15.82	2.750	7.49	3.75	5.27
0.833	10.54	1.833	15.82	2.833	7.49	3.83	5.27
0.917	14.41	1.917	13.03	2.917	6.97	3.92	5.04
1.000	14.41	2.000	13.03	3.000	6.97	4.00	5.04

Unit Hyd Qpeak (cms)= 0.237

PEAK FLOW (cms)= 0.063 (i)

TIME TO PEAK (hrs)= 2.083

RUNOFF VOLUME (mm)= 13.420

TOTAL RAINFALL (mm)= 67.367
RUNOFF COEFFICIENT = 0.199

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

| CALIB |
| STANDHYD (0372) | Area (ha)= 16.70
| ID= 1 DT= 5.0 min | Total Imp(%)= 24.00 Dir. Conn.(%)= 12.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	4.01	12.69
Dep. Storage	(mm)=	1.00	9.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	333.67	40.00
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	5.66	1.083	26.81	2.083	11.20	3.08	6.53
0.167	5.66	1.167	26.81	2.167	11.20	3.17	6.53
0.250	6.33	1.250	155.35	2.250	9.89	3.25	6.15
0.333	6.33	1.333	155.35	2.333	9.89	3.33	6.15
0.417	7.22	1.417	32.90	2.417	8.90	3.42	5.81
0.500	7.22	1.500	32.90	2.500	8.90	3.50	5.81
0.583	8.50	1.583	20.74	2.583	8.12	3.58	5.52
0.667	8.50	1.667	20.74	2.667	8.12	3.67	5.52
0.750	10.54	1.750	15.82	2.750	7.49	3.75	5.27
0.833	10.54	1.833	15.82	2.833	7.49	3.83	5.27
0.917	14.41	1.917	13.03	2.917	6.97	3.92	5.04
1.000	14.41	2.000	13.03	3.000	6.97	4.00	5.04

Max.Eff.Inten.(mm/hr)=	155.35	29.19
over (min)	5.00	20.00
Storage Coeff. (min)=	4.41 (ii)	15.96 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.23	0.07

TOTALS

PEAK FLOW (cms)=	0.79	0.59	0.973 (iii)
TIME TO PEAK (hrs)=	1.33	1.58	1.33
RUNOFF VOLUME (mm)=	66.37	17.45	23.32
TOTAL RAINFALL (mm)=	67.37	67.37	67.37
RUNOFF COEFFICIENT =	0.99	0.26	0.35

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

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 60.8 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| RESERVOIR( 0368) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
      OUTFLOW    STORAGE | OUTFLOW    STORAGE
      (cms)      (ha.m.) | (cms)      (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
      0.0630      0.1434 | 0.3528      0.3702
      0.1550      0.2322 | 0.4320      0.4325
      0.2556      0.2978 | 0.5148      0.4977

      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0372)  16.700      0.973      1.33      23.32
OUTFLOW: ID= 1 ( 0368)  16.700      0.171      3.33      23.28

      PEAK FLOW REDUCTION [Qout/Qin](%)= 17.59
      TIME SHIFT OF PEAK FLOW (min)=120.00
      MAXIMUM STORAGE USED (ha.m.)= 0.2428

```

```

-----
| ADD HYD ( 0369) |
| 1 + 2 = 3       |
-----
      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
      ID1= 1 ( 0368):  16.70  0.171      3.33      23.28
      + ID2= 2 ( 0371):   3.60  0.063      2.08      13.42
      =====
      ID = 3 ( 0369):  20.30  0.211      2.83      21.54

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB          |
| NASHYD ( 0370) | Area (ha)= 10.70 Curve Number (CN)= 61.4
| ID= 1 DT= 5.0 min | Ia (mm)= 9.68 # of Linear Res.(N)= 3.00
-----
      U.H. Tp(hrs)= 0.67

```

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	5.66	1.083	26.81	2.083	11.20	3.08	6.53
0.167	5.66	1.167	26.81	2.167	11.20	3.17	6.53
0.250	6.33	1.250	155.35	2.250	9.89	3.25	6.15
0.333	6.33	1.333	155.35	2.333	9.89	3.33	6.15
0.417	7.22	1.417	32.90	2.417	8.90	3.42	5.81
0.500	7.22	1.500	32.90	2.500	8.90	3.50	5.81
0.583	8.50	1.583	20.74	2.583	8.12	3.58	5.52
0.667	8.50	1.667	20.74	2.667	8.12	3.67	5.52
0.750	10.54	1.750	15.82	2.750	7.49	3.75	5.27
0.833	10.54	1.833	15.82	2.833	7.49	3.83	5.27
0.917	14.41	1.917	13.03	2.917	6.97	3.92	5.04
1.000	14.41	2.000	13.03	3.000	6.97	4.00	5.04

Unit Hyd Qpeak (cms)= 0.610

PEAK FLOW (cms)= 0.198 (i)

TIME TO PEAK (hrs)= 2.250

RUNOFF VOLUME (mm)= 15.309

TOTAL RAINFALL (mm)= 67.367

RUNOFF COEFFICIENT = 0.227

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

```

-----
| CALIB |
| NASHYD ( 0064) | Area (ha)= 11.60 Curve Number (CN)= 60.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.55

```

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	5.66	1.083	26.81	2.083	11.20	3.08	6.53
0.167	5.66	1.167	26.81	2.167	11.20	3.17	6.53
0.250	6.33	1.250	155.35	2.250	9.89	3.25	6.15
0.333	6.33	1.333	155.35	2.333	9.89	3.33	6.15
0.417	7.22	1.417	32.90	2.417	8.90	3.42	5.81
0.500	7.22	1.500	32.90	2.500	8.90	3.50	5.81
0.583	8.50	1.583	20.74	2.583	8.12	3.58	5.52
0.667	8.50	1.667	20.74	2.667	8.12	3.67	5.52
0.750	10.54	1.750	15.82	2.750	7.49	3.75	5.27
0.833	10.54	1.833	15.82	2.833	7.49	3.83	5.27

0.917	14.41		1.917	13.03		2.917	6.97		3.92	5.04
1.000	14.41		2.000	13.03		3.000	6.97		4.00	5.04

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.228 (i)
 TIME TO PEAK (hrs)= 2.000
 RUNOFF VOLUME (mm)= 14.516
 TOTAL RAINFALL (mm)= 67.367
 RUNOFF COEFFICIENT = 0.215

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

CALIB			
NASHYD (0373)	Area (ha)= 23.20	Curve Number (CN)= 57.1	
ID= 1 DT= 5.0 min	Ia (mm)= 10.56	# of Linear Res.(N)= 3.00	
U.H. Tp(hrs)= 1.40			

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	5.66	1.083	26.81	2.083	11.20	3.08	6.53
0.167	5.66	1.167	26.81	2.167	11.20	3.17	6.53
0.250	6.33	1.250	155.35	2.250	9.89	3.25	6.15
0.333	6.33	1.333	155.35	2.333	9.89	3.33	6.15
0.417	7.22	1.417	32.90	2.417	8.90	3.42	5.81
0.500	7.22	1.500	32.90	2.500	8.90	3.50	5.81
0.583	8.50	1.583	20.74	2.583	8.12	3.58	5.52
0.667	8.50	1.667	20.74	2.667	8.12	3.67	5.52
0.750	10.54	1.750	15.82	2.750	7.49	3.75	5.27
0.833	10.54	1.833	15.82	2.833	7.49	3.83	5.27
0.917	14.41	1.917	13.03	2.917	6.97	3.92	5.04
1.000	14.41	2.000	13.03	3.000	6.97	4.00	5.04

Unit Hyd Qpeak (cms)= 0.633

PEAK FLOW (cms)= 0.233 (i)
 TIME TO PEAK (hrs)= 3.417
 RUNOFF VOLUME (mm)= 13.031
 TOTAL RAINFALL (mm)= 67.367
 RUNOFF COEFFICIENT = 0.193

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

```

-----
| ADD HYD ( 0259) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
ID1= 1 ( 0373):  23.20  0.233  3.42  13.03
+ ID2= 2 ( 0064):  11.60  0.228  2.00  14.52
=====
ID = 3 ( 0259):  34.80  0.375  2.50  13.53

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD ( 0374) |
| ID= 1 DT= 5.0 min |
-----
          Area      (ha)=  4.50  Curve Number (CN)= 62.2
          Ia      (mm)=  9.45  # of Linear Res.(N)= 3.00
          U.H. Tp(hrs)=  0.59

```

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    5.66 | 1.083    26.81 | 2.083    11.20 | 3.08      6.53
0.167    5.66 | 1.167    26.81 | 2.167    11.20 | 3.17      6.53
0.250    6.33 | 1.250   155.35 | 2.250     9.89 | 3.25      6.15
0.333    6.33 | 1.333   155.35 | 2.333     9.89 | 3.33      6.15
0.417    7.22 | 1.417    32.90 | 2.417     8.90 | 3.42      5.81
0.500    7.22 | 1.500    32.90 | 2.500     8.90 | 3.50      5.81
0.583    8.50 | 1.583    20.74 | 2.583     8.12 | 3.58      5.52
0.667    8.50 | 1.667    20.74 | 2.667     8.12 | 3.67      5.52
0.750   10.54 | 1.750    15.82 | 2.750     7.49 | 3.75      5.27
0.833   10.54 | 1.833    15.82 | 2.833     7.49 | 3.83      5.27
0.917   14.41 | 1.917    13.03 | 2.917     6.97 | 3.92      5.04
1.000   14.41 | 2.000    13.03 | 3.000     6.97 | 4.00      5.04

```

Unit Hyd Qpeak (cms)= 0.291

PEAK FLOW (cms)= 0.093 (i)

TIME TO PEAK (hrs)= 2.083

RUNOFF VOLUME (mm)= 15.801

TOTAL RAINFALL (mm)= 67.367

RUNOFF COEFFICIENT = 0.235

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

```

-----
| RESERVOIR( 0375) | OVERFLOW IS OFF

```


IN= 2--> OUT= 1	DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
***** WARNING : FIRST OUTFLOW IS NOT ZERO.					
		0.0238	0.0111	0.1431	0.0294
		0.0518	0.0193	0.1809	0.0325
		0.0778	0.0248	0.2241	0.0356

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0374)	4.500	0.093	2.08	15.80
OUTFLOW: ID= 1 (0375)	4.500	0.064	2.92	15.78

PEAK FLOW REDUCTION [Qout/Qin](%)= 69.05
 TIME SHIFT OF PEAK FLOW (min)= 50.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0220

=====

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V	V	I	SSSSS	U	U	A	L		(v 6.2.2019)
V	V	I	SS	U	U	A	A	L	
V	V	I	SS	U	U	AAAAA	L		
V	V	I	SS	U	U	A	A	L	
VV		I	SSSSS	UUUUU	A	A	LLLLL		

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

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\bfc13
 48-2997-439d-b2b9-07562749d283\scena

Summary filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\bfc13
 48-2997-439d-b2b9-07562749d283\scena

DATE: 09/25/2025

TIME: 04:21:40

USER:

COMMENTS: _____

** SIMULATION : Calabogie 4hr CHI 10yr **

| CHICAGO STORM |
Ptotal= 46.88 mm

IDF curve parameters: A= 540.613
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 = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	'	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	3.94	1.00	18.66		2.00	7.79	3.00	4.54
0.17	4.40	1.17	108.12		2.17	6.88	3.17	4.28
0.33	5.03	1.33	22.89		2.33	6.20	3.33	4.05
0.50	5.92	1.50	14.44		2.50	5.65	3.50	3.84
0.67	7.33	1.67	11.01		2.67	5.21	3.67	3.67
0.83	10.03	1.83	9.07		2.83	4.85	3.83	3.51

| CALIB |
| NASHYD (0371) |
ID= 1 DT= 5.0 min

Area (ha)= 3.60 Curve Number (CN)= 57.9
Ia (mm)= 10.42 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.58

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	3.94	1.083	18.66		2.083	7.79	3.08	4.54
0.167	3.94	1.167	18.66		2.167	7.79	3.17	4.54
0.250	4.40	1.250	108.12		2.250	6.88	3.25	4.28

0.333	4.40	1.333	108.12	2.333	6.88	3.33	4.28
0.417	5.03	1.417	22.89	2.417	6.20	3.42	4.05
0.500	5.03	1.500	22.89	2.500	6.20	3.50	4.05
0.583	5.92	1.583	14.44	2.583	5.65	3.58	3.84
0.667	5.92	1.667	14.44	2.667	5.65	3.67	3.84
0.750	7.33	1.750	11.01	2.750	5.21	3.75	3.67
0.833	7.33	1.833	11.01	2.833	5.21	3.83	3.67
0.917	10.03	1.917	9.07	2.917	4.85	3.92	3.51
1.000	10.03	2.000	9.07	3.000	4.85	4.00	3.51

Unit Hyd Qpeak (cms)= 0.237

PEAK FLOW (cms)= 0.026 (i)

TIME TO PEAK (hrs)= 2.167

RUNOFF VOLUME (mm)= 6.012

TOTAL RAINFALL (mm)= 46.883

RUNOFF COEFFICIENT = 0.128

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

CALIB	
STANDHYD (0372)	Area (ha)= 16.70
ID= 1 DT= 5.0 min	Total Imp(%)= 24.00 Dir. Conn.(%)= 12.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	4.01	12.69
Dep. Storage	(mm)=	1.00	9.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	333.67	40.00
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	3.94	1.083	18.66	2.083	7.79	3.08	4.54
0.167	3.94	1.167	18.66	2.167	7.79	3.17	4.54
0.250	4.40	1.250	108.12	2.250	6.88	3.25	4.28
0.333	4.40	1.333	108.12	2.333	6.88	3.33	4.28
0.417	5.03	1.417	22.89	2.417	6.20	3.42	4.05
0.500	5.03	1.500	22.89	2.500	6.20	3.50	4.05
0.583	5.92	1.583	14.44	2.583	5.65	3.58	3.84
0.667	5.92	1.667	14.44	2.667	5.65	3.67	3.84
0.750	7.33	1.750	11.01	2.750	5.21	3.75	3.67
0.833	7.33	1.833	11.01	2.833	5.21	3.83	3.67
0.917	10.03	1.917	9.07	2.917	4.85	3.92	3.51

1.000 10.03 | 2.000 9.07 | 3.000 4.85 | 4.00 3.51

Max.Eff.Inten.(mm/hr)=	108.12	11.01	
over (min)	5.00	25.00	
Storage Coeff. (min)=	5.10 (ii)	22.16 (ii)	
Unit Hyd. Tpeak (min)=	5.00	25.00	
Unit Hyd. peak (cms)=	0.21	0.05	
			TOTALS
PEAK FLOW (cms)=	0.53	0.21	0.572 (iii)
TIME TO PEAK (hrs)=	1.33	1.67	1.33
RUNOFF VOLUME (mm)=	45.88	8.31	12.81
TOTAL RAINFALL (mm)=	46.88	46.88	46.88
RUNOFF COEFFICIENT =	0.98	0.18	0.27

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 60.8 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| RESERVOIR( 0368) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----

```

	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.	0.0630	0.1434	0.3528	0.3702
	0.1550	0.2322	0.4320	0.4325
	0.2556	0.2978	0.5148	0.4977

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0372)	16.700	0.572	1.33	12.81
OUTFLOW: ID= 1 (0368)	16.700	0.069	4.08	12.78

PEAK FLOW REDUCTION [Qout/Qin](%)= 12.14
TIME SHIFT OF PEAK FLOW (min)=165.00
MAXIMUM STORAGE USED (ha.m.)= 0.1497

```

-----
| ADD HYD ( 0369) |
| 1 + 2 = 3       |
-----

```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0368):	16.70	0.069	4.08	12.78

```

+ ID2= 2 ( 0371):      3.60   0.026   2.17   6.01
=====
ID = 3 ( 0369):      20.30   0.082   4.00   11.58

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD ( 0370) | Area (ha)= 10.70 Curve Number (CN)= 61.4
| ID= 1 DT= 5.0 min | Ia (mm)= 9.68 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.67

```

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	3.94	1.083	18.66	2.083	7.79	3.08	4.54
0.167	3.94	1.167	18.66	2.167	7.79	3.17	4.54
0.250	4.40	1.250	108.12	2.250	6.88	3.25	4.28
0.333	4.40	1.333	108.12	2.333	6.88	3.33	4.28
0.417	5.03	1.417	22.89	2.417	6.20	3.42	4.05
0.500	5.03	1.500	22.89	2.500	6.20	3.50	4.05
0.583	5.92	1.583	14.44	2.583	5.65	3.58	3.84
0.667	5.92	1.667	14.44	2.667	5.65	3.67	3.84
0.750	7.33	1.750	11.01	2.750	5.21	3.75	3.67
0.833	7.33	1.833	11.01	2.833	5.21	3.83	3.67
0.917	10.03	1.917	9.07	2.917	4.85	3.92	3.51
1.000	10.03	2.000	9.07	3.000	4.85	4.00	3.51

Unit Hyd Qpeak (cms)= 0.610

PEAK FLOW (cms)= 0.086 (i)
 TIME TO PEAK (hrs)= 2.250
 RUNOFF VOLUME (mm)= 7.030
 TOTAL RAINFALL (mm)= 46.883
 RUNOFF COEFFICIENT = 0.150

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

```

-----
| CALIB |
| NASHYD ( 0064) | Area (ha)= 11.60 Curve Number (CN)= 60.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.55

```

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	3.94	1.083	18.66	2.083	7.79	3.08	4.54
0.167	3.94	1.167	18.66	2.167	7.79	3.17	4.54
0.250	4.40	1.250	108.12	2.250	6.88	3.25	4.28
0.333	4.40	1.333	108.12	2.333	6.88	3.33	4.28
0.417	5.03	1.417	22.89	2.417	6.20	3.42	4.05
0.500	5.03	1.500	22.89	2.500	6.20	3.50	4.05
0.583	5.92	1.583	14.44	2.583	5.65	3.58	3.84
0.667	5.92	1.667	14.44	2.667	5.65	3.67	3.84
0.750	7.33	1.750	11.01	2.750	5.21	3.75	3.67
0.833	7.33	1.833	11.01	2.833	5.21	3.83	3.67
0.917	10.03	1.917	9.07	2.917	4.85	3.92	3.51
1.000	10.03	2.000	9.07	3.000	4.85	4.00	3.51

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.097 (i)

TIME TO PEAK (hrs)= 2.083

RUNOFF VOLUME (mm)= 6.597

TOTAL RAINFALL (mm)= 46.883

RUNOFF COEFFICIENT = 0.141

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

```

-----
| CALIB |
| NASHYD ( 0373) | Area (ha)= 23.20 Curve Number (CN)= 57.1
| ID= 1 DT= 5.0 min | Ia (mm)= 10.56 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 1.40

```

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	3.94	1.083	18.66	2.083	7.79	3.08	4.54
0.167	3.94	1.167	18.66	2.167	7.79	3.17	4.54
0.250	4.40	1.250	108.12	2.250	6.88	3.25	4.28
0.333	4.40	1.333	108.12	2.333	6.88	3.33	4.28
0.417	5.03	1.417	22.89	2.417	6.20	3.42	4.05
0.500	5.03	1.500	22.89	2.500	6.20	3.50	4.05
0.583	5.92	1.583	14.44	2.583	5.65	3.58	3.84
0.667	5.92	1.667	14.44	2.667	5.65	3.67	3.84
0.750	7.33	1.750	11.01	2.750	5.21	3.75	3.67
0.833	7.33	1.833	11.01	2.833	5.21	3.83	3.67

0.917	10.03		1.917	9.07		2.917	4.85		3.92	3.51
1.000	10.03		2.000	9.07		3.000	4.85		4.00	3.51

Unit Hyd Qpeak (cms)= 0.633

PEAK FLOW (cms)= 0.103 (i)
 TIME TO PEAK (hrs)= 3.583
 RUNOFF VOLUME (mm)= 5.808
 TOTAL RAINFALL (mm)= 46.883
 RUNOFF COEFFICIENT = 0.124

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

ADD HYD (0259)					
1 + 2 = 3					

		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0373):	23.20	0.103	3.58	5.81	
+ ID2= 2 (0064):	11.60	0.097	2.08	6.60	
=====					
ID = 3 (0259):	34.80	0.164	2.75	6.07	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0374)			
ID= 1 DT= 5.0 min			

Area	(ha)=	4.50	Curve Number (CN)= 62.2
Ia	(mm)=	9.45	# of Linear Res.(N)= 3.00
U.H. Tp(hrs)=	0.59		

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	3.94	1.083	18.66	2.083	7.79	3.08	4.54
0.167	3.94	1.167	18.66	2.167	7.79	3.17	4.54
0.250	4.40	1.250	108.12	2.250	6.88	3.25	4.28
0.333	4.40	1.333	108.12	2.333	6.88	3.33	4.28
0.417	5.03	1.417	22.89	2.417	6.20	3.42	4.05
0.500	5.03	1.500	22.89	2.500	6.20	3.50	4.05
0.583	5.92	1.583	14.44	2.583	5.65	3.58	3.84
0.667	5.92	1.667	14.44	2.667	5.65	3.67	3.84
0.750	7.33	1.750	11.01	2.750	5.21	3.75	3.67
0.833	7.33	1.833	11.01	2.833	5.21	3.83	3.67
0.917	10.03	1.917	9.07	2.917	4.85	3.92	3.51
1.000	10.03	2.000	9.07	3.000	4.85	4.00	3.51

Unit Hyd Qpeak (cms)= 0.291

PEAK FLOW (cms)= 0.041 (i)

TIME TO PEAK (hrs)= 2.167

RUNOFF VOLUME (mm)= 7.306

TOTAL RAINFALL (mm)= 46.883

RUNOFF COEFFICIENT = 0.156

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

```
-----
| RESERVOIR( 0375) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
      OUTFLOW    STORAGE    |    OUTFLOW    STORAGE
      (cms)      (ha.m.)    |    (cms)      (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
      0.0238      0.0111    |    0.1431      0.0294
      0.0518      0.0193    |    0.1809      0.0325
      0.0778      0.0248    |    0.2241      0.0356

      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0374)  4.500      0.041      2.17      7.31
OUTFLOW: ID= 1 ( 0375)  4.500      0.025      3.33      7.28

      PEAK FLOW REDUCTION [Qout/Qin](%)= 61.72
      TIME SHIFT OF PEAK FLOW (min)= 70.00
      MAXIMUM STORAGE USED (ha.m.)= 0.0115
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```
V  V  I  SSSSS  U  U  A  L          (v 6.2.2019)
V  V  I  SS     U  U  A  A  L
V  V  I  SS     U  U  AAAAA L
V  V  I  SS     U  U  A  A  L
VV   I  SSSSS  UUUUU  A  A  LLLLL
```

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

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\caf413
d7-34fb-4e27-85de-1c77abce59a7\scena

Summary filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\caf413
d7-34fb-4e27-85de-1c77abce59a7\scena

DATE: 09/25/2025

TIME: 04:21:40

USER:

COMMENTS: _____

** SIMULATION : Calabogie 4hr CHI 25yr **

| CHICAGO STORM | IDF curve parameters: A= 635.089
| Ptotal= 55.08 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 = 0.33

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	4.63	1.00	21.92	2.00	9.16	3.00	5.33
0.17	5.17	1.17	127.01	2.17	8.09	3.17	5.02
0.33	5.91	1.33	26.89	2.33	7.28	3.33	4.75
0.50	6.95	1.50	16.96	2.50	6.64	3.50	4.52
0.67	8.61	1.67	12.93	2.67	6.13	3.67	4.31
0.83	11.78	1.83	10.65	2.83	5.70	3.83	4.12

CALIB			
NASHYD (0371)		Area (ha)= 3.60	Curve Number (CN)= 57.9
ID= 1 DT= 5.0 min		Ia (mm)= 10.42	# of Linear Res.(N)= 3.00
-----		U.H. Tp(hrs)= 0.58	

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	4.63	1.083	21.92	2.083	9.16	3.08	5.33
0.167	4.63	1.167	21.92	2.167	9.16	3.17	5.33
0.250	5.17	1.250	127.01	2.250	8.09	3.25	5.02
0.333	5.17	1.333	127.01	2.333	8.09	3.33	5.02
0.417	5.91	1.417	26.89	2.417	7.28	3.42	4.75
0.500	5.91	1.500	26.89	2.500	7.28	3.50	4.75
0.583	6.95	1.583	16.96	2.583	6.64	3.58	4.52
0.667	6.95	1.667	16.96	2.667	6.64	3.67	4.52
0.750	8.61	1.750	12.93	2.750	6.13	3.75	4.31
0.833	8.61	1.833	12.93	2.833	6.13	3.83	4.31
0.917	11.78	1.917	10.65	2.917	5.70	3.92	4.12
1.000	11.78	2.000	10.65	3.000	5.70	4.00	4.12

Unit Hyd Qpeak (cms)= 0.237

PEAK FLOW (cms)= 0.039 (i)

TIME TO PEAK (hrs)= 2.083

RUNOFF VOLUME (mm)= 8.695

TOTAL RAINFALL (mm)= 55.077

RUNOFF COEFFICIENT = 0.158

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

CALIB			
STANDHYD (0372)		Area (ha)= 16.70	
ID= 1 DT= 5.0 min		Total Imp(%)= 24.00	Dir. Conn.(%)= 12.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	4.01	12.69
Dep. Storage	(mm)=	1.00	9.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	333.67	40.00
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	4.63	1.083	21.92	2.083	9.16	3.08	5.33
0.167	4.63	1.167	21.92	2.167	9.16	3.17	5.33
0.250	5.17	1.250	127.01	2.250	8.09	3.25	5.02
0.333	5.17	1.333	127.01	2.333	8.09	3.33	5.02
0.417	5.91	1.417	26.89	2.417	7.28	3.42	4.75
0.500	5.91	1.500	26.89	2.500	7.28	3.50	4.75
0.583	6.95	1.583	16.96	2.583	6.64	3.58	4.52
0.667	6.95	1.667	16.96	2.667	6.64	3.67	4.52
0.750	8.61	1.750	12.93	2.750	6.13	3.75	4.31
0.833	8.61	1.833	12.93	2.833	6.13	3.83	4.31
0.917	11.78	1.917	10.65	2.917	5.70	3.92	4.12
1.000	11.78	2.000	10.65	3.000	5.70	4.00	4.12

Max.Eff.Inten.(mm/hr)= 127.01 18.52
over (min) 5.00 20.00
Storage Coeff. (min)= 4.78 (ii) 18.64 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.22 0.06

TOTALS

PEAK FLOW (cms)= 0.63 0.35 0.732 (iii)
TIME TO PEAK (hrs)= 1.33 1.58 1.33
RUNOFF VOLUME (mm)= 54.08 11.67 16.76
TOTAL RAINFALL (mm)= 55.08 55.08 55.08
RUNOFF COEFFICIENT = 0.98 0.21 0.30

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 60.8 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| RESERVOIR(0368) |
| IN= 2---> OUT= 1 |
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
------------------	--------------------	------------------	--------------------

**** WARNING : FIRST OUTFLOW IS NOT ZERO.

0.0630	0.1434	0.3528	0.3702
0.1550	0.2322	0.4320	0.4325
0.2556	0.2978	0.5148	0.4977

AREA	QPEAK	TPEAK	R.V.
------	-------	-------	------

		(ha)	(cms)	(hrs)	(mm)
INFLOW :	ID= 2 (0372)	16.700	0.732	1.33	16.76
OUTFLOW:	ID= 1 (0368)	16.700	0.107	3.83	16.72

PEAK FLOW REDUCTION [Qout/Qin](%)= 14.62
 TIME SHIFT OF PEAK FLOW (min)=150.00
 MAXIMUM STORAGE USED (ha.m.)= 0.1859

```

-----
| ADD HYD ( 0369) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
ID1= 1 ( 0368):  16.70  0.107    3.83    16.72
+ ID2= 2 ( 0371):   3.60  0.039    2.08     8.69
=====
ID = 3 ( 0369):  20.30  0.129    3.08    15.30
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD ( 0370) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 10.70   Curve Number (CN)= 61.4
Ia (mm)= 9.68     # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.67
  
```

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   4.63 | 1.083  21.92 | 2.083   9.16 | 3.08   5.33
0.167   4.63 | 1.167  21.92 | 2.167   9.16 | 3.17   5.33
0.250   5.17 | 1.250 127.01 | 2.250   8.09 | 3.25   5.02
0.333   5.17 | 1.333 127.01 | 2.333   8.09 | 3.33   5.02
0.417   5.91 | 1.417  26.89 | 2.417   7.28 | 3.42   4.75
0.500   5.91 | 1.500  26.89 | 2.500   7.28 | 3.50   4.75
0.583   6.95 | 1.583  16.96 | 2.583   6.64 | 3.58   4.52
0.667   6.95 | 1.667  16.96 | 2.667   6.64 | 3.67   4.52
0.750   8.61 | 1.750  12.93 | 2.750   6.13 | 3.75   4.31
0.833   8.61 | 1.833  12.93 | 2.833   6.13 | 3.83   4.31
0.917  11.78 | 1.917  10.65 | 2.917   5.70 | 3.92   4.12
1.000  11.78 | 2.000  10.65 | 3.000   5.70 | 4.00   4.12
  
```

Unit Hyd Qpeak (cms)= 0.610

PEAK FLOW (cms)= 0.126 (i)

TIME TO PEAK (hrs)= 2.250

RUNOFF VOLUME (mm)= 10.049
TOTAL RAINFALL (mm)= 55.077
RUNOFF COEFFICIENT = 0.182

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

| CALIB |
| NASHYD (0064) | Area (ha)= 11.60 Curve Number (CN)= 60.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.55

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	4.63	1.083	21.92	2.083	9.16	3.08	5.33
0.167	4.63	1.167	21.92	2.167	9.16	3.17	5.33
0.250	5.17	1.250	127.01	2.250	8.09	3.25	5.02
0.333	5.17	1.333	127.01	2.333	8.09	3.33	5.02
0.417	5.91	1.417	26.89	2.417	7.28	3.42	4.75
0.500	5.91	1.500	26.89	2.500	7.28	3.50	4.75
0.583	6.95	1.583	16.96	2.583	6.64	3.58	4.52
0.667	6.95	1.667	16.96	2.667	6.64	3.67	4.52
0.750	8.61	1.750	12.93	2.750	6.13	3.75	4.31
0.833	8.61	1.833	12.93	2.833	6.13	3.83	4.31
0.917	11.78	1.917	10.65	2.917	5.70	3.92	4.12
1.000	11.78	2.000	10.65	3.000	5.70	4.00	4.12

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.144 (i)
TIME TO PEAK (hrs)= 2.083
RUNOFF VOLUME (mm)= 9.476
TOTAL RAINFALL (mm)= 55.077
RUNOFF COEFFICIENT = 0.172

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

| CALIB |
| NASHYD (0373) | Area (ha)= 23.20 Curve Number (CN)= 57.1
| ID= 1 DT= 5.0 min | Ia (mm)= 10.56 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 1.40

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	4.63	1.083	21.92	2.083	9.16	3.08	5.33
0.167	4.63	1.167	21.92	2.167	9.16	3.17	5.33
0.250	5.17	1.250	127.01	2.250	8.09	3.25	5.02
0.333	5.17	1.333	127.01	2.333	8.09	3.33	5.02
0.417	5.91	1.417	26.89	2.417	7.28	3.42	4.75
0.500	5.91	1.500	26.89	2.500	7.28	3.50	4.75
0.583	6.95	1.583	16.96	2.583	6.64	3.58	4.52
0.667	6.95	1.667	16.96	2.667	6.64	3.67	4.52
0.750	8.61	1.750	12.93	2.750	6.13	3.75	4.31
0.833	8.61	1.833	12.93	2.833	6.13	3.83	4.31
0.917	11.78	1.917	10.65	2.917	5.70	3.92	4.12
1.000	11.78	2.000	10.65	3.000	5.70	4.00	4.12

Unit Hyd Qpeak (cms)= 0.633

PEAK FLOW (cms)= 0.149 (i)

TIME TO PEAK (hrs)= 3.500

RUNOFF VOLUME (mm)= 8.420

TOTAL RAINFALL (mm)= 55.077

RUNOFF COEFFICIENT = 0.153

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

ADD HYD (0259)				
1 + 2 = 3				

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0373):	23.20	0.149	3.50	8.42
+ ID2= 2 (0064):	11.60	0.144	2.08	9.48
=====				
ID = 3 (0259):	34.80	0.239	2.67	8.77

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0374)					
ID= 1 DT= 5.0 min					

	Area	(ha)=	4.50	Curve Number	(CN)= 62.2
	Ia	(mm)=	9.45	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.59			

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	4.63	1.083	21.92	2.083	9.16	3.08	5.33
0.167	4.63	1.167	21.92	2.167	9.16	3.17	5.33
0.250	5.17	1.250	127.01	2.250	8.09	3.25	5.02
0.333	5.17	1.333	127.01	2.333	8.09	3.33	5.02
0.417	5.91	1.417	26.89	2.417	7.28	3.42	4.75
0.500	5.91	1.500	26.89	2.500	7.28	3.50	4.75
0.583	6.95	1.583	16.96	2.583	6.64	3.58	4.52
0.667	6.95	1.667	16.96	2.667	6.64	3.67	4.52
0.750	8.61	1.750	12.93	2.750	6.13	3.75	4.31
0.833	8.61	1.833	12.93	2.833	6.13	3.83	4.31
0.917	11.78	1.917	10.65	2.917	5.70	3.92	4.12
1.000	11.78	2.000	10.65	3.000	5.70	4.00	4.12

Unit Hyd Qpeak (cms)= 0.291

PEAK FLOW (cms)= 0.060 (i)
 TIME TO PEAK (hrs)= 2.083
 RUNOFF VOLUME (mm)= 10.409
 TOTAL RAINFALL (mm)= 55.077
 RUNOFF COEFFICIENT = 0.189

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

RESERVOIR(0375)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min				
-----	OUTFLOW	STORAGE	OUTFLOW	STORAGE
	(cms)	(ha.m.)	(cms)	(ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.				
	0.0238	0.0111	0.1431	0.0294
	0.0518	0.0193	0.1809	0.0325
	0.0778	0.0248	0.2241	0.0356

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0374)	4.500	0.060	2.08	10.41
OUTFLOW: ID= 1 (0375)	4.500	0.039	3.08	10.38

PEAK FLOW REDUCTION [Qout/Qin](%)= 65.32
 TIME SHIFT OF PEAK FLOW (min)= 60.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0155

V	V	I	SSSSS	U	U	A	L	(v 6.2.2019)
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	

Storm time step = 10.00 min
Time to peak ratio = 0.33

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	2.55	1.00	12.07	2.00	5.04	3.00	2.94
0.17	2.85	1.17	69.98	2.17	4.46	3.17	2.77
0.33	3.25	1.33	14.82	2.33	4.01	3.33	2.62
0.50	3.83	1.50	9.34	2.50	3.66	3.50	2.49
0.67	4.75	1.67	7.13	2.67	3.37	3.67	2.37
0.83	6.49	1.83	5.87	2.83	3.14	3.83	2.27

```

-----
| CALIB |
| NASHYD ( 0371) | Area (ha)= 3.60 Curve Number (CN)= 57.9
| ID= 1 DT= 5.0 min | Ia (mm)= 10.42 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.58

```

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	2.55	1.083	12.07	2.083	5.04	3.08	2.94
0.167	2.55	1.167	12.07	2.167	5.04	3.17	2.94
0.250	2.85	1.250	69.98	2.250	4.46	3.25	2.77
0.333	2.85	1.333	69.98	2.333	4.46	3.33	2.77
0.417	3.25	1.417	14.82	2.417	4.01	3.42	2.62
0.500	3.25	1.500	14.82	2.500	4.01	3.50	2.62
0.583	3.83	1.583	9.34	2.583	3.66	3.58	2.49
0.667	3.83	1.667	9.34	2.667	3.66	3.67	2.49
0.750	4.75	1.750	7.13	2.750	3.37	3.75	2.37
0.833	4.75	1.833	7.13	2.833	3.37	3.83	2.37
0.917	6.49	1.917	5.87	2.917	3.14	3.92	2.27
1.000	6.49	2.000	5.87	3.000	3.14	4.00	2.27

Unit Hyd Qpeak (cms)= 0.237

PEAK FLOW (cms)= 0.008 (i)
TIME TO PEAK (hrs)= 2.333
RUNOFF VOLUME (mm)= 1.940
TOTAL RAINFALL (mm)= 30.345
RUNOFF COEFFICIENT = 0.064

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

```

-----
| CALIB |
| STANDHYD ( 0372) | Area (ha)= 16.70
| ID= 1 DT= 5.0 min | Total Imp(%)= 24.00 Dir. Conn.(%)= 12.00
-----

```

```

                IMPERVIOUS      PERVIOUS (i)
Surface Area    (ha)=          4.01      12.69
Dep. Storage    (mm)=          1.00      9.50
Average Slope    (%)=          1.00      2.00
Length          (m)=        333.67      40.00
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      2.55 | 1.083    12.07 | 2.083     5.04 | 3.08      2.94
0.167      2.55 | 1.167    12.07 | 2.167     5.04 | 3.17      2.94
0.250      2.85 | 1.250    69.98 | 2.250     4.46 | 3.25      2.77
0.333      2.85 | 1.333    69.98 | 2.333     4.46 | 3.33      2.77
0.417      3.25 | 1.417    14.82 | 2.417     4.01 | 3.42      2.62
0.500      3.25 | 1.500    14.82 | 2.500     4.01 | 3.50      2.62
0.583      3.83 | 1.583     9.34 | 2.583     3.66 | 3.58      2.49
0.667      3.83 | 1.667     9.34 | 2.667     3.66 | 3.67      2.49
0.750      4.75 | 1.750     7.13 | 2.750     3.37 | 3.75      2.37
0.833      4.75 | 1.833     7.13 | 2.833     3.37 | 3.83      2.37
0.917      6.49 | 1.917     5.87 | 2.917     3.14 | 3.92      2.27
1.000      6.49 | 2.000     5.87 | 3.000     3.14 | 4.00      2.27

```

```

Max.Eff.Inten.(mm/hr)=      69.98      2.73
over (min)              5.00      40.00
Storage Coeff. (min)=      6.07 (ii)  35.86 (ii)
Unit Hyd. Tpeak (min)=      5.00      40.00
Unit Hyd. peak (cms)=      0.19      0.03

```

```

                                *TOTALS*
PEAK FLOW      (cms)=          0.33      0.05      0.330 (iii)
TIME TO PEAK    (hrs)=          1.33      2.17      1.33
RUNOFF VOLUME   (mm)=         29.35      3.00      6.16
TOTAL RAINFALL  (mm)=         30.35     30.35     30.35
RUNOFF COEFFICIENT =          0.97      0.10      0.20

```

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 60.8 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.

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

```
-----
| RESERVOIR( 0368) | OVERFLOW IS OFF
| IN= 2--> OUT= 1 |
| DT= 5.0 min      |
-----
      OUTFLOW    STORAGE | OUTFLOW    STORAGE
      (cms)      (ha.m.) | (cms)      (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
      0.0630      0.1434 | 0.3528      0.3702
      0.1550      0.2322 | 0.4320      0.4325
      0.2556      0.2978 | 0.5148      0.4977

      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0372) 16.700      0.330      1.33      6.16
OUTFLOW: ID= 1 ( 0368) 16.700      0.031      4.17      6.12

      PEAK FLOW REDUCTION [Qout/Qin](%)= 9.28
      TIME SHIFT OF PEAK FLOW (min)=170.00
      MAXIMUM STORAGE USED (ha.m.)= 0.0697
-----
```

```
-----
| ADD HYD ( 0369) |
| 1 + 2 = 3       |
-----
      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
      ID1= 1 ( 0368): 16.70 0.031 4.17 6.12
      + ID2= 2 ( 0371): 3.60 0.008 2.33 1.94
      =====
      ID = 3 ( 0369): 20.30 0.035 4.00 5.38
-----
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| CALIB          |
| NASHYD ( 0370) | Area (ha)= 10.70 Curve Number (CN)= 61.4
| ID= 1 DT= 5.0 min | Ia (mm)= 9.68 # of Linear Res.(N)= 3.00
-----
      U.H. Tp(hrs)= 0.67
-----
```

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      2.55 | 1.083     12.07 | 2.083      5.04 | 3.08      2.94
0.167      2.55 | 1.167     12.07 | 2.167      5.04 | 3.17      2.94
0.250      2.85 | 1.250     69.98 | 2.250      4.46 | 3.25      2.77
```

0.333	2.85	1.333	69.98	2.333	4.46	3.33	2.77
0.417	3.25	1.417	14.82	2.417	4.01	3.42	2.62
0.500	3.25	1.500	14.82	2.500	4.01	3.50	2.62
0.583	3.83	1.583	9.34	2.583	3.66	3.58	2.49
0.667	3.83	1.667	9.34	2.667	3.66	3.67	2.49
0.750	4.75	1.750	7.13	2.750	3.37	3.75	2.37
0.833	4.75	1.833	7.13	2.833	3.37	3.83	2.37
0.917	6.49	1.917	5.87	2.917	3.14	3.92	2.27
1.000	6.49	2.000	5.87	3.000	3.14	4.00	2.27

Unit Hyd Qpeak (cms)= 0.610

PEAK FLOW (cms)= 0.027 (i)

TIME TO PEAK (hrs)= 2.500

RUNOFF VOLUME (mm)= 2.368

TOTAL RAINFALL (mm)= 30.345

RUNOFF COEFFICIENT = 0.078

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

CALIB			
NASHYD (0064)			
ID= 1 DT= 5.0 min			

Area (ha)= 11.60		Curve Number (CN)= 60.0	
Ia (mm)= 10.00		# of Linear Res.(N)= 3.00	
U.H. Tp(hrs)= 0.55			

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	2.55	1.083	12.07	2.083	5.04	3.08	2.94
0.167	2.55	1.167	12.07	2.167	5.04	3.17	2.94
0.250	2.85	1.250	69.98	2.250	4.46	3.25	2.77
0.333	2.85	1.333	69.98	2.333	4.46	3.33	2.77
0.417	3.25	1.417	14.82	2.417	4.01	3.42	2.62
0.500	3.25	1.500	14.82	2.500	4.01	3.50	2.62
0.583	3.83	1.583	9.34	2.583	3.66	3.58	2.49
0.667	3.83	1.667	9.34	2.667	3.66	3.67	2.49
0.750	4.75	1.750	7.13	2.750	3.37	3.75	2.37
0.833	4.75	1.833	7.13	2.833	3.37	3.83	2.37
0.917	6.49	1.917	5.87	2.917	3.14	3.92	2.27
1.000	6.49	2.000	5.87	3.000	3.14	4.00	2.27

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.029 (i)

TIME TO PEAK (hrs)= 2.250

RUNOFF VOLUME (mm)= 2.182
TOTAL RAINFALL (mm)= 30.345
RUNOFF COEFFICIENT = 0.072

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

```

-----
| CALIB |
| NASHYD ( 0373) | Area (ha)= 23.20 Curve Number (CN)= 57.1
| ID= 1 DT= 5.0 min | Ia (mm)= 10.56 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 1.40

```

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 2.55 | 1.083 12.07 | 2.083 5.04 | 3.08 2.94
0.167 2.55 | 1.167 12.07 | 2.167 5.04 | 3.17 2.94
0.250 2.85 | 1.250 69.98 | 2.250 4.46 | 3.25 2.77
0.333 2.85 | 1.333 69.98 | 2.333 4.46 | 3.33 2.77
0.417 3.25 | 1.417 14.82 | 2.417 4.01 | 3.42 2.62
0.500 3.25 | 1.500 14.82 | 2.500 4.01 | 3.50 2.62
0.583 3.83 | 1.583 9.34 | 2.583 3.66 | 3.58 2.49
0.667 3.83 | 1.667 9.34 | 2.667 3.66 | 3.67 2.49
0.750 4.75 | 1.750 7.13 | 2.750 3.37 | 3.75 2.37
0.833 4.75 | 1.833 7.13 | 2.833 3.37 | 3.83 2.37
0.917 6.49 | 1.917 5.87 | 2.917 3.14 | 3.92 2.27
1.000 6.49 | 2.000 5.87 | 3.000 3.14 | 4.00 2.27

```

Unit Hyd Qpeak (cms)= 0.633

PEAK FLOW (cms)= 0.033 (i)
TIME TO PEAK (hrs)= 4.000
RUNOFF VOLUME (mm)= 1.858
TOTAL RAINFALL (mm)= 30.345
RUNOFF COEFFICIENT = 0.061

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

```

-----
| ADD HYD ( 0259) |
| 1 + 2 = 3 |
-----
ID1= 1 ( 0373): AREA QPEAK TPEAK R.V.
+ ID2= 2 ( 0064): (ha) (cms) (hrs) (mm)
23.20 0.033 4.00 1.86
11.60 0.029 2.25 2.18

```

=====

ID = 3 (0259): 34.80 0.052 3.25 1.97

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0374)		Area (ha)=	4.50	Curve Number (CN)=	62.2
ID= 1 DT= 5.0 min		Ia (mm)=	9.45	# of Linear Res.(N)=	3.00
-----		U.H. Tp(hrs)=	0.59		

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	2.55	1.083	12.07	2.083	5.04	3.08	2.94
0.167	2.55	1.167	12.07	2.167	5.04	3.17	2.94
0.250	2.85	1.250	69.98	2.250	4.46	3.25	2.77
0.333	2.85	1.333	69.98	2.333	4.46	3.33	2.77
0.417	3.25	1.417	14.82	2.417	4.01	3.42	2.62
0.500	3.25	1.500	14.82	2.500	4.01	3.50	2.62
0.583	3.83	1.583	9.34	2.583	3.66	3.58	2.49
0.667	3.83	1.667	9.34	2.667	3.66	3.67	2.49
0.750	4.75	1.750	7.13	2.750	3.37	3.75	2.37
0.833	4.75	1.833	7.13	2.833	3.37	3.83	2.37
0.917	6.49	1.917	5.87	2.917	3.14	3.92	2.27
1.000	6.49	2.000	5.87	3.000	3.14	4.00	2.27

Unit Hyd Qpeak (cms)= 0.291

PEAK FLOW (cms)= 0.013 (i)
 TIME TO PEAK (hrs)= 2.333
 RUNOFF VOLUME (mm)= 2.491
 TOTAL RAINFALL (mm)= 30.345
 RUNOFF COEFFICIENT = 0.082

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

RESERVOIR(0375)		OVERFLOW IS OFF		
IN= 2---> OUT= 1				
DT= 5.0 min		OUTFLOW	STORAGE	OUTFLOW
-----		(cms)	(ha.m.)	(cms)
				STORAGE
				(ha.m.)

**** WARNING : FIRST OUTFLOW IS NOT ZERO.

0.0238	0.0111	0.1431	0.0294
0.0518	0.0193	0.1809	0.0325
0.0778	0.0248	0.2241	0.0356

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0374)	4.500	0.013	2.33	2.49
OUTFLOW: ID= 1 (0375)	4.500	0.008	3.67	2.47

PEAK FLOW REDUCTION [Qout/Qin](%)= 66.02
 TIME SHIFT OF PEAK FLOW (min)= 80.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0039

=====

V V I SSSSS U U A L (v 6.2.2019)
 V V I SS U U A A L
 V V I SS U U AAAAA L
 V V I SS U U A A L
 VV I SSSSS UUUUU A A LLLLL

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

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\fb7de4
 20-d7d1-40bb-9ca2-cc838c9c2368\scena

Summary filename:

C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\fb7de4
 20-d7d1-40bb-9ca2-cc838c9c2368\scena

DATE: 09/25/2025

TIME: 04:21:40

USER:

COMMENTS: _____

 ** SIMULATION : Calabogie 4hr CHI 50yr **

 | CHICAGO STORM |
Ptotal= 61.30 mm

IDF curve parameters: A= 706.820
 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 = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	5.15	1.00	24.39	2.00	10.19	3.00	5.94
0.17	5.76	1.17	141.35	2.17	9.00	3.17	5.59
0.33	6.57	1.33	29.93	2.33	8.10	3.33	5.29
0.50	7.74	1.50	18.87	2.50	7.39	3.50	5.03
0.67	9.59	1.67	14.39	2.67	6.82	3.67	4.79
0.83	13.11	1.83	11.86	2.83	6.34	3.83	4.58

 | CALIB |
 | NASHYD (0371) |
ID= 1 DT= 5.0 min

Area (ha)= 3.60 Curve Number (CN)= 57.9
 Ia (mm)= 10.42 # of Linear Res.(N)= 3.00
 U.H. Tp(hrs)= 0.58

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	5.15	1.083	24.39	2.083	10.19	3.08	5.94
0.167	5.15	1.167	24.39	2.167	10.19	3.17	5.94
0.250	5.76	1.250	141.35	2.250	9.00	3.25	5.59
0.333	5.76	1.333	141.35	2.333	9.00	3.33	5.59
0.417	6.57	1.417	29.93	2.417	8.10	3.42	5.29
0.500	6.57	1.500	29.93	2.500	8.10	3.50	5.29
0.583	7.74	1.583	18.87	2.583	7.39	3.58	5.03
0.667	7.74	1.667	18.87	2.667	7.39	3.67	5.03
0.750	9.59	1.750	14.39	2.750	6.82	3.75	4.79
0.833	9.59	1.833	14.39	2.833	6.82	3.83	4.79

0.917	13.11		1.917	11.86		2.917	6.34		3.92	4.58
1.000	13.11		2.000	11.86		3.000	6.34		4.00	4.58

Unit Hyd Qpeak (cms)= 0.237

PEAK FLOW (cms)= 0.051 (i)
 TIME TO PEAK (hrs)= 2.083
 RUNOFF VOLUME (mm)= 10.988
 TOTAL RAINFALL (mm)= 61.297
 RUNOFF COEFFICIENT = 0.179

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

 | CALIB |
 | STANDHYD (0372) | Area (ha)= 16.70
 | ID= 1 DT= 5.0 min | Total Imp(%)= 24.00 Dir. Conn.(%)= 12.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	4.01	12.69
Dep. Storage	(mm)=	1.00	9.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	333.67	40.00
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	5.15	1.083	24.39	2.083	10.19	3.08	5.94
0.167	5.15	1.167	24.39	2.167	10.19	3.17	5.94
0.250	5.76	1.250	141.35	2.250	9.00	3.25	5.59
0.333	5.76	1.333	141.35	2.333	9.00	3.33	5.59
0.417	6.57	1.417	29.93	2.417	8.10	3.42	5.29
0.500	6.57	1.500	29.93	2.500	8.10	3.50	5.29
0.583	7.74	1.583	18.87	2.583	7.39	3.58	5.03
0.667	7.74	1.667	18.87	2.667	7.39	3.67	5.03
0.750	9.59	1.750	14.39	2.750	6.82	3.75	4.79
0.833	9.59	1.833	14.39	2.833	6.82	3.83	4.79
0.917	13.11	1.917	11.86	2.917	6.34	3.92	4.58
1.000	13.11	2.000	11.86	3.000	6.34	4.00	4.58

Max.Eff.Inten.(mm/hr)=	141.35	23.70
over (min)	5.00	20.00
Storage Coeff. (min)=	4.58 (ii)	17.14 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.23	0.06

				TOTALS
PEAK FLOW	(cms)=	0.71	0.46	0.850 (iii)
TIME TO PEAK	(hrs)=	1.33	1.58	1.33
RUNOFF VOLUME	(mm)=	60.30	14.49	19.99
TOTAL RAINFALL	(mm)=	61.30	61.30	61.30
RUNOFF COEFFICIENT	=	0.98	0.24	0.33

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 60.8 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| RESERVOIR( 0368) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----

```

	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.				
	0.0630	0.1434	0.3528	0.3702
	0.1550	0.2322	0.4320	0.4325
	0.2556	0.2978	0.5148	0.4977

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0372)	16.700	0.850	1.33	19.99
OUTFLOW: ID= 1 (0368)	16.700	0.136	3.58	19.95

PEAK FLOW REDUCTION [Qout/Qin](%)= 16.04
 TIME SHIFT OF PEAK FLOW (min)=135.00
 MAXIMUM STORAGE USED (ha.m.)= 0.2143

```

-----
| ADD HYD ( 0369) |
| 1 + 2 = 3       |
-----

```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0368):	16.70	0.136	3.58	19.95
+ ID2= 2 (0371):	3.60	0.051	2.08	10.99
=====				
ID = 3 (0369):	20.30	0.168	2.83	18.36

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB                                     |
| NASHYD ( 0370) | Area (ha)= 10.70 Curve Number (CN)= 61.4
| ID= 1 DT= 5.0 min | Ia (mm)= 9.68 # of Linear Res.(N)= 3.00
-----
|                                     |
| U.H. Tp(hrs)= 0.67                  |
|                                     |

```

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   5.15 | 1.083   24.39 | 2.083   10.19 | 3.08    5.94
0.167   5.15 | 1.167   24.39 | 2.167   10.19 | 3.17    5.94
0.250   5.76 | 1.250  141.35 | 2.250    9.00 | 3.25    5.59
0.333   5.76 | 1.333  141.35 | 2.333    9.00 | 3.33    5.59
0.417   6.57 | 1.417   29.93 | 2.417    8.10 | 3.42    5.29
0.500   6.57 | 1.500   29.93 | 2.500    8.10 | 3.50    5.29
0.583   7.74 | 1.583   18.87 | 2.583    7.39 | 3.58    5.03
0.667   7.74 | 1.667   18.87 | 2.667    7.39 | 3.67    5.03
0.750   9.59 | 1.750   14.39 | 2.750    6.82 | 3.75    4.79
0.833   9.59 | 1.833   14.39 | 2.833    6.82 | 3.83    4.79
0.917  13.11 | 1.917   11.86 | 2.917    6.34 | 3.92    4.58
1.000  13.11 | 2.000   11.86 | 3.000    6.34 | 4.00    4.58

```

Unit Hyd Qpeak (cms)= 0.610

PEAK FLOW (cms)= 0.161 (i)
 TIME TO PEAK (hrs)= 2.250
 RUNOFF VOLUME (mm)= 12.609
 TOTAL RAINFALL (mm)= 61.297
 RUNOFF COEFFICIENT = 0.206

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

```

-----
| CALIB                                     |
| NASHYD ( 0064) | Area (ha)= 11.60 Curve Number (CN)= 60.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
-----
|                                     |
| U.H. Tp(hrs)= 0.55                  |
|                                     |

```

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   5.15 | 1.083   24.39 | 2.083   10.19 | 3.08    5.94
0.167   5.15 | 1.167   24.39 | 2.167   10.19 | 3.17    5.94

```

0.250	5.76	1.250	141.35	2.250	9.00	3.25	5.59
0.333	5.76	1.333	141.35	2.333	9.00	3.33	5.59
0.417	6.57	1.417	29.93	2.417	8.10	3.42	5.29
0.500	6.57	1.500	29.93	2.500	8.10	3.50	5.29
0.583	7.74	1.583	18.87	2.583	7.39	3.58	5.03
0.667	7.74	1.667	18.87	2.667	7.39	3.67	5.03
0.750	9.59	1.750	14.39	2.750	6.82	3.75	4.79
0.833	9.59	1.833	14.39	2.833	6.82	3.83	4.79
0.917	13.11	1.917	11.86	2.917	6.34	3.92	4.58
1.000	13.11	2.000	11.86	3.000	6.34	4.00	4.58

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.184 (i)
TIME TO PEAK (hrs)= 2.083
RUNOFF VOLUME (mm)= 11.926
TOTAL RAINFALL (mm)= 61.297
RUNOFF COEFFICIENT = 0.195

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

CALIB			
NASHYD (0373)			
ID= 1 DT= 5.0 min			

Area (ha)= 23.20		Curve Number (CN)= 57.1	
Ia (mm)= 10.56		# of Linear Res.(N)= 3.00	
U.H. Tp(hrs)= 1.40			

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	5.15	1.083	24.39	2.083	10.19	3.08	5.94
0.167	5.15	1.167	24.39	2.167	10.19	3.17	5.94
0.250	5.76	1.250	141.35	2.250	9.00	3.25	5.59
0.333	5.76	1.333	141.35	2.333	9.00	3.33	5.59
0.417	6.57	1.417	29.93	2.417	8.10	3.42	5.29
0.500	6.57	1.500	29.93	2.500	8.10	3.50	5.29
0.583	7.74	1.583	18.87	2.583	7.39	3.58	5.03
0.667	7.74	1.667	18.87	2.667	7.39	3.67	5.03
0.750	9.59	1.750	14.39	2.750	6.82	3.75	4.79
0.833	9.59	1.833	14.39	2.833	6.82	3.83	4.79
0.917	13.11	1.917	11.86	2.917	6.34	3.92	4.58
1.000	13.11	2.000	11.86	3.000	6.34	4.00	4.58

Unit Hyd Qpeak (cms)= 0.633

PEAK FLOW (cms)= 0.190 (i)

TIME TO PEAK (hrs)= 3.417
 RUNOFF VOLUME (mm)= 10.656
 TOTAL RAINFALL (mm)= 61.297
 RUNOFF COEFFICIENT = 0.174

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

```

-----
| ADD HYD ( 0259) |
| 1 + 2 = 3 |
-----
                AREA      QPEAK      TPEAK      R.V.
                (ha)      (cms)      (hrs)      (mm)
    ID1= 1 ( 0373):  23.20    0.190    3.42    10.66
    + ID2= 2 ( 0064):  11.60    0.184    2.08    11.93
    =====
    ID = 3 ( 0259):  34.80    0.305    2.58    11.08
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD ( 0374) |
| ID= 1 DT= 5.0 min |
-----
    Area (ha)= 4.50    Curve Number (CN)= 62.2
    Ia (mm)= 9.45    # of Linear Res.(N)= 3.00
    U.H. Tp(hrs)= 0.59
  
```

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    5.15 | 1.083    24.39 | 2.083    10.19 | 3.08      5.94
    0.167    5.15 | 1.167    24.39 | 2.167    10.19 | 3.17      5.94
    0.250    5.76 | 1.250   141.35 | 2.250     9.00 | 3.25      5.59
    0.333    5.76 | 1.333   141.35 | 2.333     9.00 | 3.33      5.59
    0.417    6.57 | 1.417    29.93 | 2.417     8.10 | 3.42      5.29
    0.500    6.57 | 1.500    29.93 | 2.500     8.10 | 3.50      5.29
    0.583    7.74 | 1.583    18.87 | 2.583     7.39 | 3.58      5.03
    0.667    7.74 | 1.667    18.87 | 2.667     7.39 | 3.67      5.03
    0.750    9.59 | 1.750    14.39 | 2.750     6.82 | 3.75      4.79
    0.833    9.59 | 1.833    14.39 | 2.833     6.82 | 3.83      4.79
    0.917   13.11 | 1.917    11.86 | 2.917     6.34 | 3.92      4.58
    1.000   13.11 | 2.000    11.86 | 3.000     6.34 | 4.00      4.58
  
```

Unit Hyd Qpeak (cms)= 0.291

PEAK FLOW (cms)= 0.076 (i)
 TIME TO PEAK (hrs)= 2.083
 RUNOFF VOLUME (mm)= 13.036

TOTAL RAINFALL (mm)= 61.297
RUNOFF COEFFICIENT = 0.213

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

```
-----
| RESERVOIR( 0375) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
          OUTFLOW    STORAGE | OUTFLOW    STORAGE
          (cms)      (ha.m.) | (cms)      (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
          0.0238      0.0111 | 0.1431      0.0294
          0.0518      0.0193 | 0.1809      0.0325
          0.0778      0.0248 | 0.2241      0.0356

          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0374) 4.500      0.076      2.08      13.04
OUTFLOW: ID= 1 ( 0375) 4.500      0.050      3.00      13.01

          PEAK FLOW REDUCTION [Qout/Qin](%)= 66.23
          TIME SHIFT OF PEAK FLOW (min)= 55.00
          MAXIMUM STORAGE USED (ha.m.)= 0.0188
-----
```

FINISH

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

```
V  V  I  SSSSS  U  U  A  L          (v 6.2.2019)
V  V  I  SS    U  U  A A  L
V  V  I  SS    U  U  AAAAA L
V  V  I  SS    U  U  A  A  L
VV    I  SSSSS  UUUUU  A  A  LLLLL
```

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

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat

Output filename:
C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\5f85fc2c-c896-4696-9b4d-346b407c6e93\scena
Summary filename:
C:\Users\aaahmed\AppData\Local\Civica\XH5\d26c4025-12e9-4b5b-8ca9-5854fc23b703\5f85fc2c-c896-4696-9b4d-346b407c6e93\scena

DATE: 09/25/2025

TIME: 04:21:38

USER:

COMMENTS: _____

** SIMULATION : Calabogie 4hr CHI 5yr **

| CHICAGO STORM |
Ptotal= 40.36 mm

IDF curve parameters: A= 465.382
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 = 0.33

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	3.39	1.00	16.06	2.00	6.71	3.00	3.91
0.17	3.79	1.17	93.07	2.17	5.93	3.17	3.68
0.33	4.33	1.33	19.71	2.33	5.33	3.33	3.48
0.50	5.10	1.50	12.43	2.50	4.87	3.50	3.31
0.67	6.31	1.67	9.48	2.67	4.49	3.67	3.16
0.83	8.63	1.83	7.81	2.83	4.17	3.83	3.02

CALIB

NASHYD (0371)	Area (ha)= 3.60	Curve Number (CN)= 57.9
ID= 1 DT= 5.0 min	Ia (mm)= 10.42	# of Linear Res.(N)= 3.00
-----	U.H. Tp(hrs)= 0.58	

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	3.39	1.083	16.06	2.083	6.71	3.08	3.91
0.167	3.39	1.167	16.06	2.167	6.71	3.17	3.91
0.250	3.79	1.250	93.07	2.250	5.93	3.25	3.68
0.333	3.79	1.333	93.07	2.333	5.93	3.33	3.68
0.417	4.33	1.417	19.71	2.417	5.33	3.42	3.48
0.500	4.33	1.500	19.71	2.500	5.33	3.50	3.48
0.583	5.10	1.583	12.43	2.583	4.87	3.58	3.31
0.667	5.10	1.667	12.43	2.667	4.87	3.67	3.31
0.750	6.31	1.750	9.48	2.750	4.49	3.75	3.16
0.833	6.31	1.833	9.48	2.833	4.49	3.83	3.16
0.917	8.63	1.917	7.81	2.917	4.17	3.92	3.02
1.000	8.63	2.000	7.81	3.000	4.17	4.00	3.02

Unit Hyd Qpeak (cms)= 0.237

PEAK FLOW (cms)= 0.018 (i)
 TIME TO PEAK (hrs)= 2.167
 RUNOFF VOLUME (mm)= 4.176
 TOTAL RAINFALL (mm)= 40.359
 RUNOFF COEFFICIENT = 0.103

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

CALIB	
STANDHYD (0372)	Area (ha)= 16.70
ID= 1 DT= 5.0 min	Total Imp(%)= 24.00 Dir. Conn.(%)= 12.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	4.01	12.69
Dep. Storage (mm)=	1.00	9.50
Average Slope (%)=	1.00	2.00
Length (m)=	333.67	40.00
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	3.39	1.083	16.06	2.083	6.71	3.08	3.91
0.167	3.39	1.167	16.06	2.167	6.71	3.17	3.91
0.250	3.79	1.250	93.07	2.250	5.93	3.25	3.68
0.333	3.79	1.333	93.07	2.333	5.93	3.33	3.68
0.417	4.33	1.417	19.71	2.417	5.33	3.42	3.48
0.500	4.33	1.500	19.71	2.500	5.33	3.50	3.48
0.583	5.10	1.583	12.43	2.583	4.87	3.58	3.31
0.667	5.10	1.667	12.43	2.667	4.87	3.67	3.31
0.750	6.31	1.750	9.48	2.750	4.49	3.75	3.16
0.833	6.31	1.833	9.48	2.833	4.49	3.83	3.16
0.917	8.63	1.917	7.81	2.917	4.17	3.92	3.02
1.000	8.63	2.000	7.81	3.000	4.17	4.00	3.02

Max.Eff.Inten.(mm/hr)= 93.07 7.45
over (min) 5.00 30.00
Storage Coeff. (min)= 5.42 (ii) 25.36 (ii)
Unit Hyd. Tpeak (min)= 5.00 30.00
Unit Hyd. peak (cms)= 0.20 0.04

TOTALS

PEAK FLOW (cms)= 0.45 0.13 0.468 (iii)
TIME TO PEAK (hrs)= 1.33 1.83 1.33
RUNOFF VOLUME (mm)= 39.36 5.96 9.96
TOTAL RAINFALL (mm)= 40.36 40.36 40.36
RUNOFF COEFFICIENT = 0.98 0.15 0.25

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 60.8 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0368)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min				

**** WARNING : FIRST OUTFLOW IS NOT ZERO.				
	OUTFLOW	STORAGE	OUTFLOW	STORAGE
	(cms)	(ha.m.)	(cms)	(ha.m.)
	0.0630	0.1434	0.3528	0.3702
	0.1550	0.2322	0.4320	0.4325
	0.2556	0.2978	0.5148	0.4977
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0372)	16.700	0.468	1.33	9.96

OUTFLOW: ID= 1 (0368) 16.700 0.051 4.08 9.93

PEAK FLOW REDUCTION [Qout/Qin](%)= 10.87
TIME SHIFT OF PEAK FLOW (min)=165.00
MAXIMUM STORAGE USED (ha.m.)= 0.1159

```
-----
| ADD HYD ( 0369) |
| 1 + 2 = 3 |
-----
          AREA    QPEAK    TPEAK    R.V.
          (ha)    (cms)    (hrs)    (mm)
ID1= 1 ( 0368):  16.70  0.051  4.08  9.93
+ ID2= 2 ( 0371):  3.60  0.018  2.17  4.18
=====
ID = 3 ( 0369):  20.30  0.060  3.50  8.91
=====
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| CALIB |
| NASHYD ( 0370) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 10.70      Curve Number (CN)= 61.4
Ia (mm)= 9.68      # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.67
```

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    3.39 | 1.083    16.06 | 2.083    6.71 | 3.08     3.91
0.167    3.39 | 1.167    16.06 | 2.167    6.71 | 3.17     3.91
0.250    3.79 | 1.250    93.07 | 2.250    5.93 | 3.25     3.68
0.333    3.79 | 1.333    93.07 | 2.333    5.93 | 3.33     3.68
0.417    4.33 | 1.417    19.71 | 2.417    5.33 | 3.42     3.48
0.500    4.33 | 1.500    19.71 | 2.500    5.33 | 3.50     3.48
0.583    5.10 | 1.583    12.43 | 2.583    4.87 | 3.58     3.31
0.667    5.10 | 1.667    12.43 | 2.667    4.87 | 3.67     3.31
0.750    6.31 | 1.750     9.48 | 2.750    4.49 | 3.75     3.16
0.833    6.31 | 1.833     9.48 | 2.833    4.49 | 3.83     3.16
0.917    8.63 | 1.917     7.81 | 2.917    4.17 | 3.92     3.02
1.000    8.63 | 2.000     7.81 | 3.000    4.17 | 4.00     3.02
```

Unit Hyd Qpeak (cms)= 0.610

PEAK FLOW (cms)= 0.059 (i)
TIME TO PEAK (hrs)= 2.333
RUNOFF VOLUME (mm)= 4.944
TOTAL RAINFALL (mm)= 40.359

RUNOFF COEFFICIENT = 0.123

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

```
-----
| CALIB                                     |
| NASHYD ( 0064) | Area (ha)= 11.60 Curve Number (CN)= 60.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.55
```

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    3.39 | 1.083   16.06 | 2.083    6.71 | 3.08    3.91
0.167    3.39 | 1.167   16.06 | 2.167    6.71 | 3.17    3.91
0.250    3.79 | 1.250   93.07 | 2.250    5.93 | 3.25    3.68
0.333    3.79 | 1.333   93.07 | 2.333    5.93 | 3.33    3.68
0.417    4.33 | 1.417   19.71 | 2.417    5.33 | 3.42    3.48
0.500    4.33 | 1.500   19.71 | 2.500    5.33 | 3.50    3.48
0.583    5.10 | 1.583   12.43 | 2.583    4.87 | 3.58    3.31
0.667    5.10 | 1.667   12.43 | 2.667    4.87 | 3.67    3.31
0.750    6.31 | 1.750    9.48 | 2.750    4.49 | 3.75    3.16
0.833    6.31 | 1.833    9.48 | 2.833    4.49 | 3.83    3.16
0.917    8.63 | 1.917    7.81 | 2.917    4.17 | 3.92    3.02
1.000    8.63 | 2.000    7.81 | 3.000    4.17 | 4.00    3.02
```

Unit Hyd Qpeak (cms)= 0.806

PEAK FLOW (cms)= 0.066 (i)

TIME TO PEAK (hrs)= 2.167

RUNOFF VOLUME (mm)= 4.615

TOTAL RAINFALL (mm)= 40.359

RUNOFF COEFFICIENT = 0.114

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

```
-----
| CALIB                                     |
| NASHYD ( 0373) | Area (ha)= 23.20 Curve Number (CN)= 57.1
| ID= 1 DT= 5.0 min | Ia (mm)= 10.56 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 1.40
```

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	3.39	1.083	16.06	2.083	6.71	3.08	3.91
0.167	3.39	1.167	16.06	2.167	6.71	3.17	3.91
0.250	3.79	1.250	93.07	2.250	5.93	3.25	3.68
0.333	3.79	1.333	93.07	2.333	5.93	3.33	3.68
0.417	4.33	1.417	19.71	2.417	5.33	3.42	3.48
0.500	4.33	1.500	19.71	2.500	5.33	3.50	3.48
0.583	5.10	1.583	12.43	2.583	4.87	3.58	3.31
0.667	5.10	1.667	12.43	2.667	4.87	3.67	3.31
0.750	6.31	1.750	9.48	2.750	4.49	3.75	3.16
0.833	6.31	1.833	9.48	2.833	4.49	3.83	3.16
0.917	8.63	1.917	7.81	2.917	4.17	3.92	3.02
1.000	8.63	2.000	7.81	3.000	4.17	4.00	3.02

Unit Hyd Qpeak (cms)= 0.633

PEAK FLOW (cms)= 0.071 (i)
 TIME TO PEAK (hrs)= 3.667
 RUNOFF VOLUME (mm)= 4.025
 TOTAL RAINFALL (mm)= 40.359
 RUNOFF COEFFICIENT = 0.100

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

ADD HYD (0259)				
1 + 2 = 3				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0373):	23.20	0.071	3.67	4.02
+ ID2= 2 (0064):	11.60	0.066	2.17	4.62
=====				
ID = 3 (0259):	34.80	0.113	2.83	4.22

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0374)			
ID= 1 DT= 5.0 min			

Area	(ha)=	4.50	Curve Number (CN)= 62.2
Ia	(mm)=	9.45	# of Linear Res.(N)= 3.00
U.H. Tp	(hrs)=	0.59	

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	3.39	1.083	16.06	2.083	6.71	3.08	3.91
0.167	3.39	1.167	16.06	2.167	6.71	3.17	3.91
0.250	3.79	1.250	93.07	2.250	5.93	3.25	3.68
0.333	3.79	1.333	93.07	2.333	5.93	3.33	3.68
0.417	4.33	1.417	19.71	2.417	5.33	3.42	3.48
0.500	4.33	1.500	19.71	2.500	5.33	3.50	3.48
0.583	5.10	1.583	12.43	2.583	4.87	3.58	3.31
0.667	5.10	1.667	12.43	2.667	4.87	3.67	3.31
0.750	6.31	1.750	9.48	2.750	4.49	3.75	3.16
0.833	6.31	1.833	9.48	2.833	4.49	3.83	3.16
0.917	8.63	1.917	7.81	2.917	4.17	3.92	3.02
1.000	8.63	2.000	7.81	3.000	4.17	4.00	3.02

Unit Hyd Qpeak (cms)= 0.291

PEAK FLOW (cms)= 0.028 (i)
 TIME TO PEAK (hrs)= 2.167
 RUNOFF VOLUME (mm)= 5.156
 TOTAL RAINFALL (mm)= 40.359
 RUNOFF COEFFICIENT = 0.128

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

RESERVOIR(0375)		OVERFLOW IS OFF			
IN= 2---> OUT= 1					
DT= 5.0 min					
		OUTFLOW	STORAGE	OUTFLOW	STORAGE
		(cms)	(ha.m.)	(cms)	(ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.					
		0.0238	0.0111	0.1431	0.0294
		0.0518	0.0193	0.1809	0.0325
		0.0778	0.0248	0.2241	0.0356
		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0374)		4.500	0.028	2.17	5.16
OUTFLOW: ID= 1 (0375)		4.500	0.017	3.42	5.13
PEAK FLOW REDUCTION [Qout/Qin](%)= 62.18					
TIME SHIFT OF PEAK FLOW (min)= 75.00					
MAXIMUM STORAGE USED (ha.m.)= 0.0081					