TATHAM ENGINEERING

Enhancing our communities

Maple Bridge Subdivision, Phase 2

PRELIMINARY STORMWATER MANAGEMENT REPORT

Mason Homes Limited

File 422492 | April 18, 2024

Document Control

File:

422492

Date:

April 18, 2024

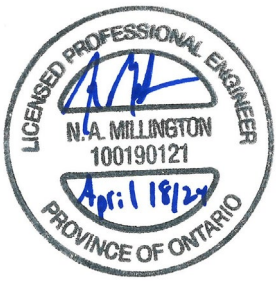
Prepared by:

Tatham Engineering Limited
41 King Street, Unit 4
Barrie, Ontario L4N 6B5

T 705-733-9037
tathameng.com

Prepared for:

Mason Homes Limited
70 Innovator Avenue, Unit 1
Stouffville, Ontario L4A 0Y2

Authored by:	Reviewed by:
	 
Lawrence Carretas, B.A.Sc., EIT Engineering Intern – Land Development	John Gore, B.Eng., P.Eng. Engineer – Water Resources

Disclaimer	Copyright
The information contained in this document is solely for the use of the Client identified on the cover sheet for the purpose for which it has been prepared and Tatham Engineering Limited undertakes no duty to or accepts any responsibility to any third party who may rely upon this document.	

Issue	Date	Description
1	April 18, 2024	Issued for Draft Plan Approval

Document Contents

1 Introduction 3

1.1 Report Objective 3

1.2 Guidelines & Background Reports 3

2 Development Site 5

2.1 Location 5

2.2 Site Description 6

2.3 Proposed Development 7

3 Existing Drainage Conditions 8

3.1 Background Information 8

3.2 Drainage Patterns 8

3.3 Hydrology 8

4 Stormwater Management Design Criteria 10

5 Stormwater Management Plan 12

5.1 Drainage Conditions 12

5.2 Quantity Control 13

5.3 Conveyance 14

5.4 Quality Control 14

5.5 Runoff Volume Control 15

5.6 Water Balance 16

5.7 Phosphorus Treatment & Mitigation 16

5.8 Erosion & Sediment Control 17

6 Summary 19

Tables

Table 1: Existing Conditions Peak Flow Summary 9
Table 2: Post-Development Conditions Peak Flow Summary 14
Table 3: Water Balance Summary 16
Table 4: Phosphorus Loading Summary 17

Figures

Figure 1: Site Location 5

Appendices

Appendix A: Draft Plan
Appendix B: Existing Conditions Analysis
Appendix C: Proposed Condition Analysis
Appendix D: Stage-Storage-Discharge Tables
Appendix E: Water Quality Calculations
Appendix F: Water Balance
Appendix G: Phosphorus Balance

Drawings

Drawing CDP-1: Concept Development Plan
Drawing DP-1: Pre-Development Drainage Plan
Drawing DP-2: Post-Development Drainage Plan
Drawing PND-1: Stormwater Management Facility

1 Introduction

Tatham Engineering Limited was retained by Mason Homes Limited to prepare a Preliminary Stormwater Management (SWM) Report in support of a Draft Plan of Subdivision application for Phase 2 of the Maple Bridge Subdivision located northeast of the Centre Road and Oakside Drive intersection in the Township of Uxbridge (Township), within the Regional Municipality of Durham (Region). The location of the development site is illustrated in Figure 1.

1.1 REPORT OBJECTIVE

This report was prepared to demonstrate the proposed development will not adversely affect local stormwater quantity or stormwater quality conditions. This will be accomplished by evaluating the effect of the proposed development on local drainage conditions and, where necessary, providing solutions to mitigate any adverse impacts. The feasibility of providing appropriate SWM controls will be demonstrated.

1.2 GUIDELINES & BACKGROUND REPORTS

This report is prepared in consideration of the following guidelines and documents:

- The Ministry of the Environment, Conservation, and Parks (MECP, formerly known as Ministry of Environment), *Stormwater Management Practices Planning and Design Manual* (2003);
- The Ministry of the Environment, Conservation, and Parks (MECP, formerly known as Ministry of Environment), *Lake Simcoe Protection Plan* (LSPP) (2009);
- Lake Simcoe Region Conservation Authority (LSRCA), *Technical Guidelines for Stormwater Submissions* (2022);
- Lake Simcoe Region Conservation Authority (LSRCA), *Phosphorus Offsetting Policy* (2023);
- The Township of Uxbridge, *Zoning By-Law Number 81-19 (As Amended) of the Corporation of the Township of Uxbridge*, Township of Uxbridge (2019);
- The Township of Uxbridge, *Stormwater Management Master Plan - Uxbridge Urban Area and Hamlet of Coppin's Corners* (2016); and
- Regional Municipality of Durham, *Design and Construction Specifications for Regional* Services (2023).

This report is prepared in consideration of the following site-specific reports:

- GHD, *Geotechnical and Hydrogeologic Investigation Report: Proposed Residential Development Centre Road Phase 2 Uxbridge, Ontario* (March 2021); and

- Tatham Engineering Limited, *Maple Bridge Subdivision Phase 2: Functional Servicing Report* (April 2024).

2 Development Site

2.1 LOCATION

As illustrated in Figure 1, the subject site is located at the property known municipally as 7309 Centre Road, Township of Uxbridge.

As per the boundary survey completed by H.F. Grander Co. Ltd. in October 2022, the site is legally described as:

(Parts 1, 2, 3, Plan 40R-21667
Save & Except Parts 1, 2, 3, & 4, Plan 40R-23402,
Save & Except Parts 1, 2, 3, 4, 5, 6, & 7, Plan 40R-23403,
And Save & Except Plan 40M-2256)
Of Part of Lot 33, Concession 6,
Geographic Township of Uxbridge,
Now in the, Township of Uxbridge,
Regional Municipality of Durham

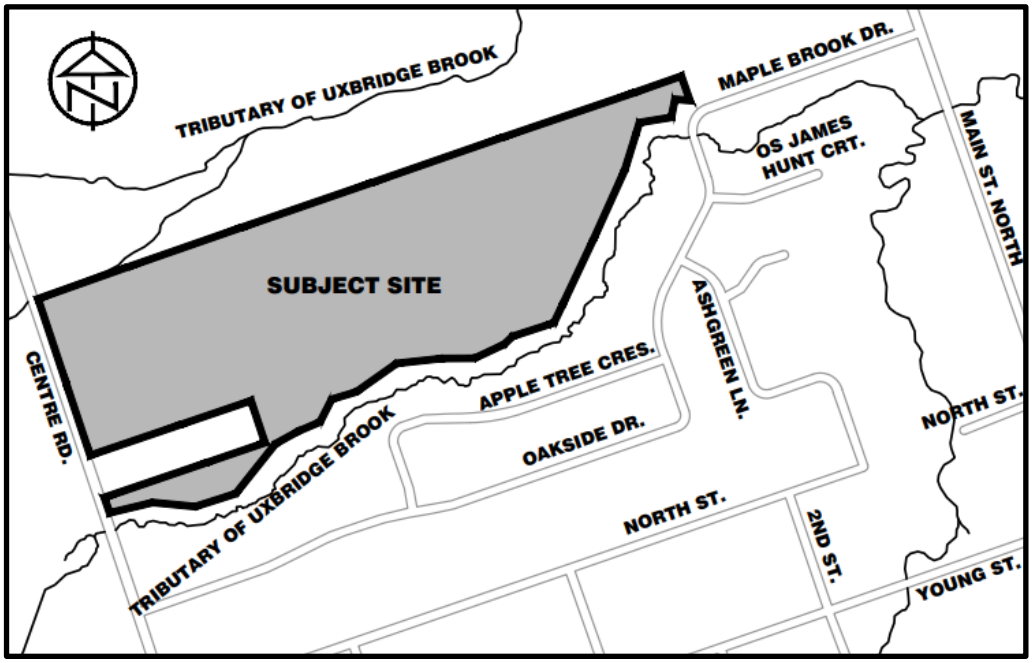


Figure 1: Site Location

2.2 SITE DESCRIPTION

2.2.1 Zoning & Land Uses

Based on the Township's current Official Plan the property is designated 'Future Residential Area' and 'Natural Hazard Area.' Based on the Township's Zoning By-law the property is within a Rural Zone (RU) and Environmental Protection Zone (EP-27).

The site is located within the LSRCA watershed and is partially located within the LSRCA regulated area due to natural hazards associated with the Uxbridge Brook.

2.2.2 Topography

Information relating to existing topography, ground cover, and drainage patterns was obtained through a review of relevant background studies, available plans, base mapping, and topographic surveys. A detailed topographic survey of the site was completed by IBW Surveyors in September 2019. This survey has been reviewed and compared to other available contour mapping and appears to be sufficient for preliminary design. If required, additional topographic survey will be completed during the detailed design stage.

The subject property is approximately 14.5 ha in area and consists mainly of agricultural croplands with areas of woodland. It is bound by existing agricultural lands to the north and southwest, Tributary 6.1 of the Uxbridge Brook to the south and east, Tributary 4.0 of the Uxbridge Brook to the north, and Centre Road to the west.

Under existing conditions, runoff from the Phase 2 lands generally flow overland in an east and southeast direction towards Tributary 6.1 of the Uxbridge Brook, which meanders between the subject site and neighbouring Phase 1 lands immediately south of the watercourse.

2.2.3 Geotechnical & Hydrogeological Setting

The *Geotechnical and Hydrogeologic Investigation Report: Proposed Residential Development Centre Road Phase 2 Uxbridge, Ontario* identified the subsurface conditions as a layer of topsoil over silty sand over basal deposits of either glacial till or clayey silt. Topsoil was found at depths ranging from 0.12 to 0.18 mbg.

Groundwater monitoring well readings were recorded in four monitoring wells at depths ranging from 0.9 to 3.3 mbg, indicating groundwater generally flows southeast across the site. Additional groundwater monitoring will be required to establish a seasonal high groundwater table to support the detailed engineering design.

Hydraulic conductivity (K) testing was performed at four monitoring wells. The K values at these locations ranged from 1.5 x 10^{-5} cm/sec to 8.6 x 10^{-5} cm/sec, equivalent to an infiltration rate of approximately 50 mm/hr. At this infiltration rate the design of low impact facilities would be feasible for the development, however location-specific infiltration testing will be required to support the detailed design.

2.3 PROPOSED DEVELOPMENT

2.3.1 Land Use

The proposed residential development consists of the following:

- 82 townhouse units;
- 154 single family dwellings; and
- a 0.79 ha stormwater management block.

The Draft Plan also includes Open Space blocks, Walkway blocks, an Environmental Protection block, and a Future Road Connection Block.

The proposed development surrounds an existing 0.9 ha residential property fronting Centre Road (owned by others). Mason Homes Limited intends to purchase the property in the future with the intention of developing it with a similar built form to what is proposed for the subject site. The proposed Draft Plan of Subdivision does not include development of this property, and, therefore, the proposed preliminary SWM plan for the subject site does not account for the development of this 0.9 ha parcel. It is expected the preliminary SWM plan for the subject lands could be revised during detailed design to accommodate the development of this parcel with no changes to the size of the proposed SWM block.

Refer to Appendix A for the proposed Draft Plan.

2.3.2 Access

The site will be accessed from two new connections to existing roadways. The west connection will be made from Street 'A,' which is a 20 m right-of-way, in the northwest corner of the development to Centre Road. The east connection will be made from Street 'A' in the northeast corner of the development to Oakside Drive.

2.3.3 Internal Roads

The internal roadways will be a combination of 20 m road allowances, 17 m road allowances and 7.5 m laneways.

3 Existing Drainage Conditions

3.1 BACKGROUND INFORMATION

Existing topography, ground cover, soil condition, land use and drainage patterns for the site and the surrounding area were established through a review of available aerial photography, topographic survey and relevant background reports.

3.2 DRAINAGE PATTERNS

The development site consists of approximately 14.5 ha of undeveloped agriculture land with forested areas along the property boundaries. The site generally drains east and southeast towards Tributary 6.1 of the Uxbridge Brook at a gentle slope (2% to 5%), while a small portion of the lands drains north towards Tributary 4.0 of the Uxbridge Brook at a significantly steeper slope (upwards to 30%+).

Two existing conditions drainage catchments (Catchment 100 and 101) have been delineated using base mapping and detailed topographic survey information and are illustrated on the Pre-Development Drainage Plan (Drawing DP-1) enclosed for reference.

- Catchment 100 is approximately 0.62 ha and consists of woodland, meadows, and cultivated lands. The catchment generally drains north to Tributary 4.0 of Uxbridge Brook, which has been denoted as Outlet #2.
- Catchment 101 is approximately 13.85 ha and consists of woodland, lawns, meadows, cultivated lands, and an existing residential development at 7309 Centre Road. The catchment generally drains south and east to Tributary 6.1 of Uxbridge Brook, which has been denoted as Outlet #1.

Note that Drawing DP-1 includes external drainage catchments 304, 305, 307, 308 and 309. These catchments were utilized for the hydraulic floodplain analysis and are not required for this preliminary SWM design.

3.3 HYDROLOGY

In accordance with the Township and LSRCA requirements, a Visual OTTHYMO (VO6.2) model has been prepared to estimate the pre-development peak flows for the 1:2-year through 1:100-year storm events. Site-specific Intensity-Duration Frequency (IDF) rainfall data was generated using the *IDF Curve Look-up Tool* in accordance with Township standards. The design storms were modeled with a 4-hour CHI, 12-hour SCS, and 24-hour SCS distribution under AMCII

conditions. In addition, the Regional storm (Hurricane Hazel) storm has been modelled under AMCIII conditions, in accordance with LSRCA requirements.

The existing condition peak flows from the site at Outlet #1 and Outlet #2 are summarized in Table 1 while detailed model results are included in Appendix B for reference. Detailed calculations of the existing condition hydrological modelling parameters are also included in Appendix B for reference.

Table 1: Existing Conditions Peak Flow Summary

DESIGN STORM	OUTLET #1 (m^3/s)			OUTLET #2 (m^3/s)		
	4-hr CHI	12-hr SCS	24-hr SCS	4-hr CHI	12-hr SCS	24-hr SCS
25 mm		0.03			0.00	
1:2-year	0.06	0.13	0.17	0.01	0.02	0.02
1:5-year	0.11	0.24	0.30	0.01	0.03	0.04
1:10-year	0.16	0.32	0.40	0.02	0.04	0.05
1:25-year	0.23	0.44	0.54	0.03	0.05	0.07
1:50-year	0.28	0.53	0.66	0.04	0.07	0.09
1:100-year	0.34	0.63	0.78	0.04	0.08	0.10
Hurricane Hazel		1.48			0.08	

Hazel peak flows presented in this table are representative of AMCIII conditions.

4 Stormwater Management Design Criteria

The SWM plan is subject to review and approval from the Township and the LSRCA. The SWM plan has been developed in accordance with the following Township and LSRCA design criteria:

Quantity Control

Post-development peak flow rates must be controlled to pre-development rates or less for storm events up to and including the 1:100-year event to ensure no adverse impacts for downstream landowners.

Conveyance

Under proposed conditions, the 1:100-year return frequency design storm from subject property must be safely conveyed to the site outlet. In addition, the Regional Storm peak flows for the upstream development must be safely conveyed through the site to the site outlet.

Quality Control

Water quality controls must be provided to satisfy the *MECP Stormwater Management Planning and Design Manual*. Enhanced level water quality protection, which corresponds to 80% long term suspended solids (TSS) removal, is required.

Runoff Volume Control

In accordance with LSRCA policies, any works meeting the definition of 'major development' are required to meet the volume control requirements as outlined in Section 3.2.4 of the *Technical Guidelines for Stormwater Management Submissions*. Best efforts must be demonstrated to infiltrate, filter or re-use the 25 mm storm event runoff from impervious areas on site.

Water Balance

As the proposed development is categorized as a 'major development' under the LSPP, best efforts must be demonstrated towards maintaining pre-development infiltration rates under post-development conditions.

Phosphorus Treatment & Mitigation

In accordance with the LSPP, the site will be subject to the removal of 80% of the annual total phosphorus (TP) load from all major development areas.

In accordance with the Township's SWM Master Plan additional controls to provide 90% TP reduction are required.

The proposed development is categorized as a 'major development' and in accordance with LSRCA requirements, the site will be subject to *the Lake Simcoe Phosphorus Offsetting Policy* which requires all 'major' development projects to control post-development phosphorus loading

rates to pre-development rates. Any remaining phosphorus loadings that cannot be mitigated will be subject to a cash-contribution for off-site mitigation.

Erosion & Sediment Control

An erosion and sediment control plan is required for the subject development to demonstrate erosion mitigation measures to manage the risk of sediment transport downstream.

5 Stormwater Management Plan

Under proposed conditions, the 14.5 ha site will be graded to convey runoff to the proposed SWM pond at the east end of the development.

5.1 DRAINAGE CONDITIONS

The subject property has been divided into four drainage catchments under proposed conditions (Catchments 200, 201, 202, and 203) as illustrated on the Post-Development Drainage Plan (Drawing DP-2) enclosed for reference.

- Catchment 200 includes a portion of the proposed development towards the north boundary of the site consisting of single dwelling lots. Due to grading constraints, this catchment has been delineated such that 0.37 ha of drainage is discharged uncontrolled to Outlet #2 (Uxbridge Brook Tributary 4.0) to the north. Catchment 200 was delineated such that rear yard and landscaped areas are drained to Outlet #2 while rooftop drainage is conveyed to the SWM pond.
- Catchment 201 is approximately 11.16 ha and includes a majority of the proposed development. Minor flows from this catchment will be conveyed to the SWM pond via storm sewer while major flows will be conveyed to the pond overland via the road right-of-way. The design of the internal storm sewer will occur at detailed design. Attenuated peak flows are discharged to Outlet #1 located south of the site, which is a sufficient outlet. Catchment 201 was delineated to maximize peak flows contributing to the SWM pond by accounting for rooftop drainage from the lots located within Catchments 200 and 202.
- Catchment 202 is approximately 2.51 ha and consists of rear yards, landscape, and forested areas. This catchment includes the existing 0.9 ha residential block as described in Section 2.5 of this SWM report. This catchment will drain uncontrolled to Outlet #1 (Uxbridge Brook Tributary 6.1). Due to grading constraints, Catchment 202 was delineated such that rooftop drainage from lots located within this catchment will be conveyed to the SWM pond.
- Catchment 203 is approximately 0.43 ha and consists of a small portion of Street 'A' and an open space block. Due to grading constraints this catchment will drain uncontrolled to Outlet #1 (Uxbridge Brook Tributary 6.1).

It is noted that per LSRCA *Technical Guidelines for Stormwater Submission*, peak flow rates generated on site must be conveyed to a sufficient outlet. Since peak flows from Catchments 201, 202, and 203 are discharged directly to Outlet #1 (Uxbridge Brook Tributary 6.1), this requirement is met. Peak flows from Catchment 200 which drains uncontrolled to the north are

shown to be less than pre-development rates as shown in Table 2, below, and also drain into the Uxbridge Brook Tributary 4.0, which is a sufficient outlet for this uncontrolled catchment.

The hydrologic modelling parameters for proposed conditions have been calculated based on the proposed site plan, standard ROW cross-sections, and the maximum lot coverages defined in the *Zoning By-Law Number 81-19 (As Amended) of the Corporation of the Township of Uxbridge* and engineering judgement. The preliminary proposed condition hydrologic parameter calculations are included in Appendix C for reference.

5.2 QUANTITY CONTROL

As the proposed development will result in an increase in impervious areas (roads, buildings and driveways), on-site stormwater quantity controls are required to reduce post-development peak flow rates to the allowable release rates or less.

Water quantity controls will be provided by an end-of-pipe SWM pond to attenuate proposed peak flows to pre-development levels. Due to grading constraints, Catchments 200, 202 and 203 will drain uncontrolled to the site outlets. As such the SWM pond has been sized to over-control the peak flows from Catchment 201 such that the post-development peak flows at the site outlets are below pre-development peak flows, accounting for the uncontrolled flow.

Peak flow attenuation will be provided by the proposed SWM pond which consists of an 85 mm orifice plate at an elevation of 267.00 m, a secondary 375 mm dia. outlet pipe with an invert of 267.90 m and an emergency overflow weir set at 268.70 m. During the 1:100-year design storm the pond will provide an active storage volume of 5,976 m^3 at an elevation of 268.81 m and 0.39 m of freeboard. The preliminary stage-storage-discharge tables for the SWM pond are included in Appendix D for reference. Refer to the Stormwater Management Facility plan (Drawing PND-1), appended, for preliminary design details. It is noted that the outlet elevation of the pond (267.00 m) has been set above the Regional flood elevation (266.67 m), as shown on Drawing PND-1.

Due to the implementation of on-site water quantity controls, post-development peak flow rates at Outlet #1 and Outlet #2 are less than or equal to the existing peak flows leaving the site for the selected design storms. A summary of post-development peak flows at Outlet #1 and Outlet #2 is provided in Table 2 while detailed model results are included in Appendix C for reference.

Table 2: Post-Development Conditions Peak Flow Summary

DESIGN STORM	OUTLET #1 (m^3/s)			OUTLET #2 (m^3/s)		
	4-hr CHI	12-hr SCS	24-hr SCS	4-hr CHI	12-hr SCS	24-hr SCS
25 mm		0.03 *(0.03)*			0.00 *(0.00)*	
1:2-year	0.05 *(0.06)*	0.09 *(0.13)*	0.11 *(0.17)*	0.00 *(0.01)*	0.01 *(0.02)*	0.01 *(0.02)*
1:5-year	0.09 *(0.11)*	0.15 *(0.24)*	0.19 *(0.30)*	0.01 *(0.01)*	0.02 *(0.03)*	0.02 *(0.04)*
1:10-year	0.11 *(0.16)*	0.19 *(0.32)*	0.24 *(0.40)*	0.01 *(0.02)*	0.02 *(0.04)*	0.03 *(0.05)*
1:25-year	0.15 *(0.23)*	0.26 *(0.44)*	0.39 *(0.54)*	0.02 *(0.03)*	0.03 *(0.05)*	0.04 *(0.07)*
1:50-year	0.17 *(0.28)*	0.36 *(0.53)*	0.51 *(0.66)*	0.02 *(0.04)*	0.04 *(0.07)*	0.05 *(0.09)*
1:100-year	0.21 *(0.34)*	0.46 *(0.63)*	0.62 *(0.78)*	0.03 *(0.04)*	0.05 *(0.08)*	0.06 *(0.10)*
Hurricane Hazel		1.96 *(1.48)*			0.05 *(0.08)*	

Hazel peak flows presented in this table are representative of AMCIII conditions.
Values in *italics* represent existing peak flow rates.

5.3 CONVEYANCE

As previously mentioned, major and minor peak flows generated from the upstream development will be collected internally and conveyed to the SWM pond. The Regulatory storm peak flows must be safely conveyed through the site to the site outlet. In addition, the design of the internal storm sewer will occur at detailed design.

Under an emergency scenario in which the storm sewers are 100% blocked, a conveyance channel located in the 6.0 m servicing easement (between lots 51 and 52) is proposed to provide safe conveyance of flows to the wet pond. The Regulatory storm (the uncontrolled 1:100-year 24-hour SCS storm event of 3.3 m^3/s) can be sufficiently conveyed through the conveyance channel. Supporting calculations are provided in Appendix C.

5.4 QUALITY CONTROL

"Enhanced" level water quality control corresponding to 80% TSS removal is required for developed areas of the site. Water quality controls for the majority of the development will be provided by the SWM pond which has been designed as a wet pond with a sediment forebay to provide adequate water quality storage volumes based on the MOE *Stormwater Management Practices Planning and Design Manual* (2003) Table 3.2. The wet pond has been designed to

provide "Enhanced" Level 1 water quality treatment for all contributing drainage from the upstream catchments.

The SWM pond was designed using a drainage area of 11.2 ha and an imperviousness of 73% contributing from the subject development. Therefore, based on Table 3.2 of the MOE *Stormwater Design Manual*, the required water quality storage volume is 179 m^3/ha (or 1,998 m^3 for the 11.2 ha area). Of this volume, 1,551 m^3 is required for the permanent pool and 446 m^3 (or 40 m^3/ha for the 11.2 ha area) is required for extended detention. The provided permanent pool and extended detention volumes are 2,657 m^3 and 2,584 m^3 respectively. As such the pond is adequately sized to provide the required "Enhanced" level water quality control. Detailed water quality calculations are included in Appendix E for reference. Based on the available groundwater information, it is noted the SWM pond may need to be lined to avoid groundwater interaction with the permanent pool. This will be further assessed during detailed design.

Catchments 200 and 202 consist of only rear yards and forested areas and as such, water quality treatment is not required for these catchments.

Due to grading constraints, runoff from Catchment 203 is unable to be conveyed to the SWM pond and will be released uncontrolled to Outlet #1. The size of this catchment has been minimized through the site grading to reduce the untreated area. This catchment will be further assessed at detailed design to further minimize the uncontrolled area, if possible.

5.5 RUNOFF VOLUME CONTROL

In accordance with LSRCA requirements, projects defined as 'major developments' are required to meet the volume control requirements as outlined in Section 3.2.4 of the *Technical Guidelines for Stormwater Management Submissions*. As such, best efforts must be provided to infiltrate, filter, or re-use runoff generated from impervious areas on site.

Lot-level soakaway pits are proposed to capture 50% of the runoff from the rooftops of the single-family dwelling units and 50% of the rooftop runoff from the townhouses. Each soakaway pit has been sized to provide 1.5 m^3 of storage each (344 m^3 total storage across the site) which is equivalent to the 25 mm rainfall event for the drainage areas being treated (i.e., rooftop areas). As the total impervious area of the site is 8.4 ha, the soakaway pits will provide runoff control equivalent to the 4.1 mm storm across the site. Preliminary soakaway pit sizing calculations are included in Appendix F for reference. Additional opportunities to increase infiltration/filtration will be explored in support of the detailed design.

In-situ testing will be required to confirm soil infiltration rates on site. Additional design details of the LIDs will be provided in support of the detailed design.

5.6 WATER BALANCE

In accordance with the LSPP, an evaluation of the anticipated changes in the water balance between pre-development and post-development conditions has been included to demonstrate how the proposed SWM control measures will minimize changes to water balance across the site.

Using Thornthwaite Method and historical rainfall data from the King Smoke Tree rain gauge station (1994-2003), the pre-development total infiltration volume is 13,319 m^3 over the subject development area (14.47 ha). The post-development total infiltration volume will be 5,612 m^3. Infiltration on site will decrease by 58% corresponding to an annual infiltration deficit of 7,708 m^3 without mitigation.

As previously discussed, lot level soakaway pits are proposed to treat 1.3 ha of rooftop area across the development to mitigate the infiltration deficit. The soakaway pits are expected to provide an additional 8,717 m^3 of infiltration per year and will be sufficient to match post-development infiltration volumes to pre-development levels. The water balance calculations are summarized in Table 3, while detailed calculations are provided in Appendix F.

Table 3: Water Balance Summary

SCENARIO	ANNUAL INFILTRATION VOLUME (m^3)
Pre-Development	13,319
Post-Development (no additional controls)	5,612
Deficit (no additional controls)	7,708
Post-Development (with additional controls)	14,328

As shown, the post-development annual infiltration conditions have been maximized to provide an increase in the annual infiltration volume from pre-development levels to achieve a water balance across the subject development.

5.7 PHOSPHORUS TREATMENT & MITIGATION

An assessment of the phosphorus loading from the site under existing and proposed conditions has been completed using the Low Impact Development Treatment Train Tool (LID-TTT).

Phosphorus mitigation for the site will be provided via lot level soakaway pits and the wet pond which have median phosphorus removal efficiency rates of 87% and 63% respectively.

The proposed condition catchment delineation previously discussed was used to calculate the phosphorus rates under proposed conditions. The portion of Catchment 201 that drains directly to the SWM pond is labeled 201A while the area treated by the lot level soakaway pits and the SWM pond is labeled 201B in the LID-TTT results. Due to grading constraints Catchments 200, 202 and 203 are released uncontrolled to the site outlets.

Therefore, the estimated total annual post-development phosphorus load is reduced to 4.25 kg/year which represents a 66% net reduction in phosphorus loadings. The additional 24% phosphorus removal can be achieved through the implementation of additional soakaway pits throughout the development and/or through the implementation of a filtration treatment device such as a Jellyfish Filter unit or approved equivalent, if feasible. Additional treatment methods will be explored at detailed design.

A summary of the phosphorus loading under existing, post-development and post-development with mitigation scenarios is provided in Table 4 below. The detailed LID-TTT results are provided in Appendix G for reference.

Table 4: Phosphorus Loading Summary

SCENARIO		AREA (ha)	PHOSPHORUS LOADING (kg/year)
Outlet #1	Pre-Development	13.85	0.03
	Post-Development (Without Controls)	14.10	12.62
	Post-Development (With Controls) –	14.10	4.20
Outlet #2	Pre-Development	0.62	0.23
	Post-Development (Without Controls)	0.37	0.05
Total Pre-Development		**14.47**	**0.26**
Total Post-Development (Without Controls)		**14.47**	**12.67**
Total Post-Development (With Controls)		**14.47**	**4.25**

5.8 EROSION & SEDIMENT CONTROL

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

- minimize disturbance activities where possible;
- expose the smallest possible land area to erosion for the shortest amount of time;
- institute erosion control measures as required immediately;
- implement sediment control measures before the outset of construction activities; and
- carry out regular inspection of erosion/sediment control measures and repair or maintain them, as necessary.

Erosion and sediment control measures shall be implemented in accordance with the *Erosion & Sediment Control Best Management Practices Guide* and are to include the following:

- sediment control fence;
- construction access mat;
- heavy-duty silt fence surrounding stripping and material stock pile areas;
- catch basin filter screens; and
- sediment traps placed in all existing and proposed catch basins adjacent to the site.

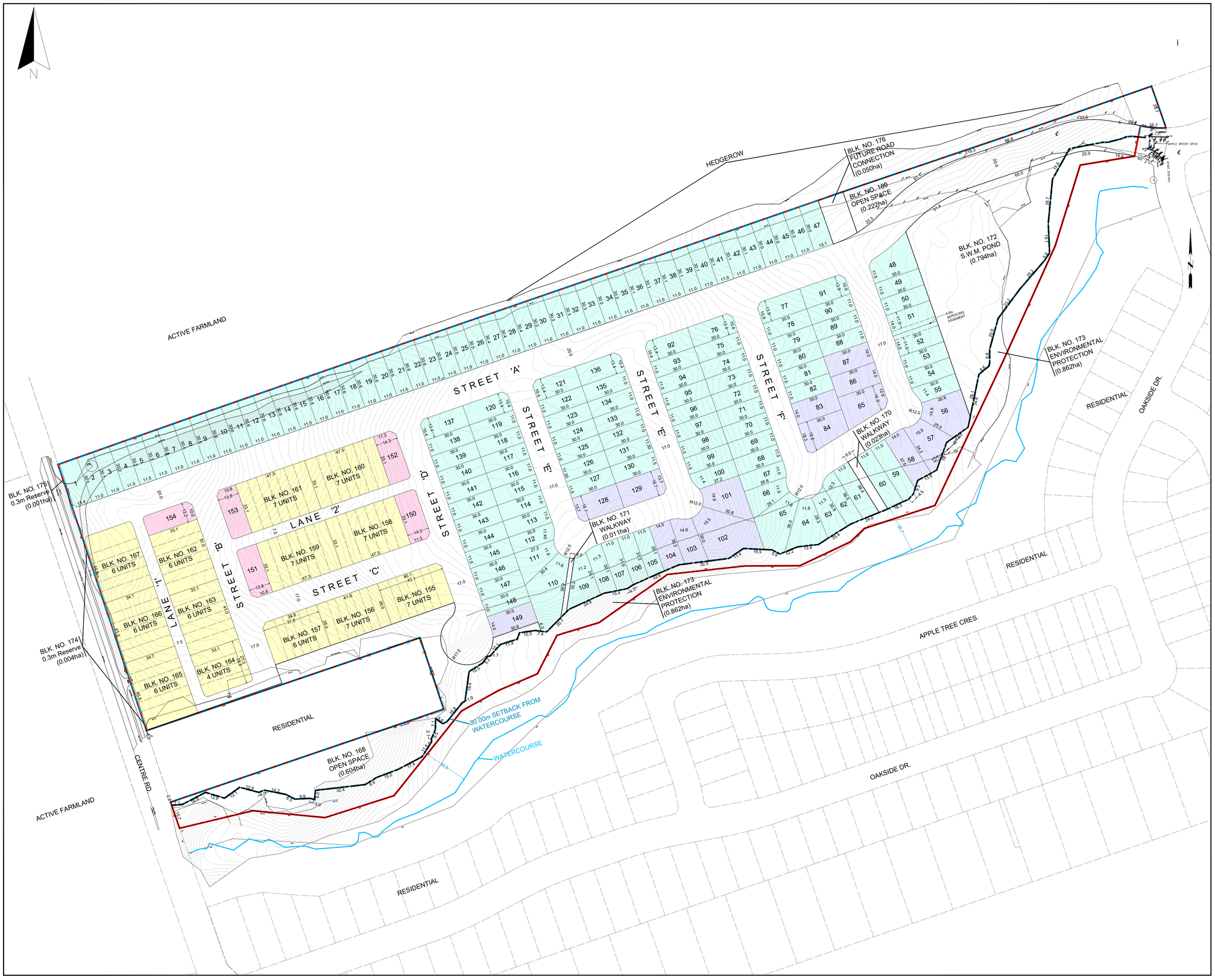
Regular inspection of control measures will be completed through a monitoring and mitigation plan, with regular repairs made as necessary. An erosion and sediment control plan will be developed during the detailed design stage.

6 Summary

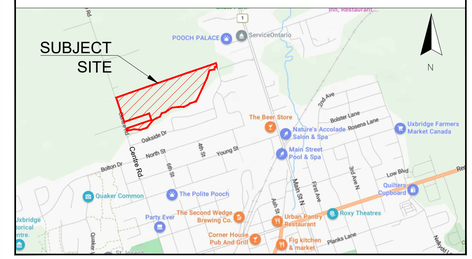
This report has been prepared to document the preliminary drainage and SWM plan for the proposed development. The SWM plan ensures the development can be constructed in accordance with all applicable municipal and provincial guidelines while minimizing the impact of the development on local surface water conditions. The SWM design criteria described in Section 5 of this report will be achieved as detailed below.

- Post-development peak flow rates will be controlled to pre-development rates or less for all storm events at Outlet #1 and Outlet #2. Water quantity storage will be provided via wet SWM pond with sufficient storage to attenuate the proposed peak flows to below pre-development levels.
- "Enhanced" Level 1 water quality controls corresponding to 80% TSS removal will be provided for the proposed development via the wet SWM pond.
- The proposed development will have a net increase of infiltration across the site due to the proposed lot level soakaway pits. These LIDs will provide 25 mm of storage for the treated areas, resulting in an equivalent of 4.1 mm of volume control across the total impervious area of the site.
- Best efforts have also been provided to mitigate phosphorus loadings on site. The proposed wet SWM pond and lot level LIDs will be utilized to provide approximately 66% reduction in annual phosphorus loading. Additional treatment options will be explored at detailed design to achieve the required 90% phosphorus removal.
- A series of erosion and sediment controls including heavy duty silt fence and a construction access mats, will be implemented for all construction activities.

Appendix A: Draft Plan



KEY MAP 1:20,000



DRAFT PLAN OF SUBDIVISION

Part of Lot 33, Concession 6,
Township of Uxbridge,
(formerly in the County of Ontario)
Regional Municipality of Durham

Scale

0 25 50 75 100m

LEGEND

SUBJECT LANDS (135,746.80m^2 / 13.575ha)

OWNER'S CERTIFICATE
I HEREBY AUTHORIZE INNOVATIVE PLANNING SOLUTIONS TO PREPARE THIS DRAFT PLAN OF SUBDIVISION AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION FOR APPROVAL.

DATE 2001976 ONTARIO LIMITED

SURVEYOR'S CERTIFICATE
I CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

DATE IVAN B. WALLACE, O.L.S.

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT

a) SHOWN ON PLAN
b) SHOWN ON PLAN
c) SEE KEY PLAN
d) RESIDENTIAL
e) SHOWN ON PLAN
f) SHOWN ON PLAN
g) SHOWN ON PLAN
h) MUNICIPAL WATER
i) SILTY SAND, GLACIAL TILL AND/OR CLAYEY SILT
j) SHOWN ON PLAN
k) MUNICIPAL WATER & SEWAGE
l) NONE

LAND USE STATISTICS

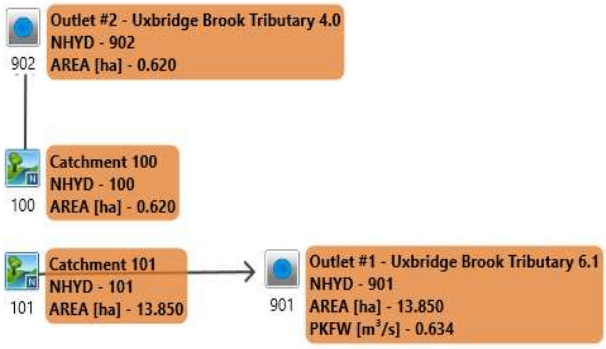
Land Use	Lot / Blk. No.	Units	Area (ha)
Residential Single Lot (10.97m / 36')	1 - 55, 59 -82, 88 - 100, 105 - 127, 130 - 148	134	4.691
Residential Single Lot (14.02m / 46')	56 - 58, 83 - 87, 101 - 104, 128 - 129, 149	15	0.792
Residential Single Lot - Rear Lane (10.97m / 36')	150 - 154	5	0.226
Residential Townhouses (6.30m / 20.76')	155 - 167	82	1.782
Open Space	168 - 169		0.826
3.00m Walkways	170 - 171		0.034
S.W.M. Pond	172		0.794
Environmental Protection	173		0.862
0.3m Reserves	174 - 175		0.005
Future Road Connection	176		0.050
Roads			3.513
TOTAL	**176**	**236**	**13.575**

INNOVATIVE PLANNING SOLUTIONS
PLANNERS • PROJECT MANAGERS • LAND DEVELOPERS
647 WELHAM ROAD, UNIT 9, BARRIE, ON, L4N 0B7
tel: 705 • 812 • 3281 fax: 705 • 812 • 3438 e: info@ipsconsultinginc.com www.ipsconsultinginc.com

Date:	March 11, 2024	Drawn By:	A.S.
File:	21 - 1241	Checked:	K.B.

Appendix B:
Existing Conditions Analysis

PROJECT	Maple Bridge Subdivision	FILE	422492
		DATE	4/4/2024
SUBJECT	VO Schematic - Pre-Development	NAME	LJC
		PAGE	1 OF 1



NASHYD

ROUTE PIPE

DUHYD

STANDHYD

ROUTE CHANNEL

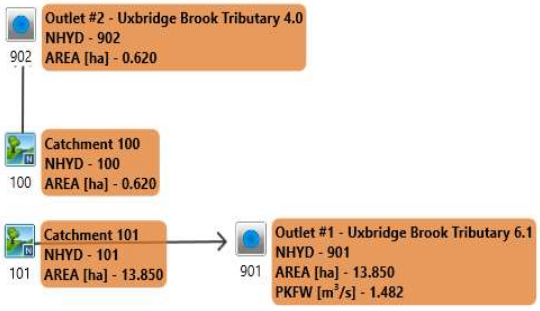
DIVERT HYD

ADDHYD

ROUTE RESERVOIR

TATHAM ENGINEERING

PROJECT	Maple Bridge Subdivision	FILE	422492
		DATE	4/4/2024
SUBJECT	VO Schematic - Pre-Development - AMCIII	NAME	LJC
		PAGE	1 OF 1




NASHYD


ROUTE PIPE


DUHYD


STANDHYD


ROUTE CHANNEL


DIVERT HYD


ADDHYD


ROUTE RESERVOIR

TATHAM ENGINEERING

Visual OTTHYMO Model Parameter Calculations (NasHYD)

Project Details

Maple Bridge Subdivision	422492

Prepared By

LJC	8/11/2023

Data Sources

Detailed Soil Survey Reports for Ontario, LSRCA Technical Guidelines for Stormwater Management Submissions (2016), MTO Drainage Management Manual (1997)

Pre-Development Condition

Watershed:	LSRCA
Catchment ID:	100
Catchment Area (ha):	0.62
Impervious %:	

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

Soil Symbol		**Ds**											
Soil Series		Dundonald											
Hydrologic Soils Group		AB											
Soil Texture		Sand Loam											
Runoff Coefficient Type		1											
Area (ha)		0.62											
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		98	0.95									
Gravel	3		81	0.14									
Woodland	10	0.25	46	0.12									
Pasture/Lawns	5		59	0.15									
Meadows	8	0.12	51	0.14									
Cultivated	7	0.25	68	0.30									
Waterbody	12		50	0.05									
Average CN		55.74											
Average C		0.19											
Average IA		8.42											

Time to Peak Calculations

Max. Catchment Elev. (m):	286.24
Min. Catchment Elev. (m):	284.05
Catchment Length (m):	29
Catchment Slope (%):	7.55%
Method: Airport Method	
Time of Concentration (mins):	8.16

Summary

Catchment CN:	55.7
Catchment C:	0.19
Catchment IA (mm):	8.42
Time of Concentration (hrs):	0.14
Catchment Time to Peak (hrs):	0.09
Catchment Time Step (mins):	1.09

TATHAM ENGINEERING

Visual OTTHYMO Model Parameter Calculations (NasHYD)

Project Details

Maple Bridge Subdivision	422492

Prepared By

LJC	8/11/2023

Data Sources

Detailed Soil Survey Reports for Ontario, LSRCA Technical Guidelines for Stormwater Management Submissions (2016), MTO Drainage Management Manual (1997)

Pre-Development Condition

Watershed:	LSRCA
Catchment ID:	101
Catchment Area (ha):	13.85
Impervious %:	1%

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

Soil Symbol		**Ds**			**Brs**								
Soil Series		Dundonald			Brighton								
Hydrologic Soils Group		AB			A								
Soil Texture		Sand Loam			Sand								
Runoff Coefficient Type		1			1								
Area (ha)		9.89			3.97								
Percentage of Catchment		71%			29%								
Land Cover Category	**IA**	**A (ha)**	**CN**	**C**	**A (ha)**	**CN**	**C**	**A (ha)**	**CN**	**C**	**A (ha)**	**CN**	**C**
Impervious	2	0.11	98	0.95		98	0.95						
Gravel	3		81	0.09		76	0.09						
Woodland	10	0.90	46	0.08	0.70	32	0.08						
Pasture/Lawns	5	0.95	59	0.10		49	0.10						
Meadows	8	1.82	51	0.09	0.51	38	0.09						
Cultivated	7	6.11	68	0.22	2.76	62	0.22						
Waterbody	12		50	0.05		50	0.05						
Average CN		62.33			53.64								
Average C		0.18			0.18								
Average IA		7.21			7.66								

Time to Peak Calculations

Max. Catchment Elev. (m):	287.50
Min. Catchment Elev. (m):	266.66
Catchment Length (m):	697
Catchment Slope (%):	2.99%
Method: Airport Method	
Time of Concentration (mins):	55.20

Summary

Catchment CN:	59.8
Catchment C:	0.18
Catchment IA (mm):	7.34
Time of Concentration (hrs):	0.92
Catchment Time to Peak (hrs):	0.61
Catchment Time Step (mins):	7.36

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

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\0685eb48-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\0685eb48-


DATE: 04/05/2024                          TIME: 03:20:28

USER:


COMMENTS: _____________________________________________________


  ************************************************
  ** SIMULATION : 25 mm 4-hr CHI                **
  ************************************************

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

     START @  0.00 hrs
     --------------------
   READ STORM                10.0
   [ Ptot= 25.00 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\d98d1005-1e85-4b79-95a8
   remark: 25 mm 4-hr CHI
*
 ** CALIB NASHYD         0101  1  5.0   13.85    0.03  2.58   1.65 0.07   0.000
   [CN=59.8        ]
   [ N = 3.0:Tp 0.61]
*
   READ STORM                10.0
   [ Ptot= 25.00 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\d98d1005-1e85-4b79-95a8
   remark: 25 mm 4-hr CHI
*
 ** CALIB NASHYD         0100  1  5.0    0.62    0.00  1.58   1.21 0.05   0.000
   [CN=55.7        ]
   [ N = 3.0:Tp 0.09]
*
 FINISH

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

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

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

                  *****  S U M M A R Y   O U T P U T  *****
```

```
  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\e1ba4601-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\e1ba4601-


DATE: 04/05/2024                          TIME: 03:20:27

USER:


COMMENTS: _____________________________________________________


  ************************************************
  ** SIMULATION : Run 01 - 2yr 4hr 10min Chicag **
  ************************************************

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

     START @  0.00 hrs
     --------------------
   CHIC STORM                10.0
   [ Ptot= 33.23 mm ]
*
 ** CALIB NASHYD         0101  1  5.0   13.85    0.06  2.25   3.41 0.10   0.000
   [CN=59.8        ]
   [ N = 3.0:Tp 0.61]
*
   CHIC STORM                10.0
   [ Ptot= 33.23 mm ]
*
 ** CALIB NASHYD         0100  1  5.0    0.62    0.01  1.33   2.61 0.08   0.000
   [CN=55.7        ]
   [ N = 3.0:Tp 0.09]
*
================================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\e7c1f747-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\e7c1f747-


DATE: 04/05/2024                          TIME: 03:20:27

USER:


COMMENTS: _____________________________________________________


  ************************************************
  ** SIMULATION : Run 02 - 5yr 4hr 10min Chicag **
  ************************************************

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

     START @  0.00 hrs
     --------------------
   CHIC STORM                10.0
   [ Ptot= 44.30 mm ]
*
```

```
 ** CALIB NASHYD         0101  1  5.0   13.85    0.11  2.17   6.58 0.15   0.000
    [CN=59.8         ]
    [ N = 3.0:Tp 0.61]
*
    CHIC STORM                 10.0
    [ Ptot= 44.30 mm ]
*
 ** CALIB NASHYD         0100  1  5.0    0.62    0.01  1.33   5.21 0.12   0.000
    [CN=55.7         ]
    [ N = 3.0:Tp 0.09]
*
================================================================================================================


       V    V   I    SSSSS  U   U    A    L             (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\39b1e940-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\39b1e940-


DATE: 04/05/2024                          TIME: 03:20:26

USER:


COMMENTS: ________________________________________________________


  ************************************************
  ** SIMULATION : Run 03 - 10yr 4hr 10min Chica **
  ************************************************

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

     START @  0.00 hrs
     --------------------
    CHIC STORM                 10.0
    [ Ptot= 51.44 mm ]
*
 ** CALIB NASHYD         0101  1  5.0   13.85    0.16  2.17   9.05 0.18   0.000
    [CN=59.8         ]
    [ N = 3.0:Tp 0.61]
*
    CHIC STORM                 10.0
    [ Ptot= 51.44 mm ]
*
 ** CALIB NASHYD         0100  1  5.0    0.62    0.02  1.33   7.27 0.14   0.000
    [CN=55.7         ]
    [ N = 3.0:Tp 0.09]
*
================================================================================================================


       V    V   I    SSSSS  U   U    A    L             (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.
```

```
                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\ad25d4e4-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\ad25d4e4-


DATE: 04/05/2024                          TIME: 03:20:26

USER:


COMMENTS: ________________________________________________________


  ************************************************
  ** SIMULATION : Run 04 - 25yr 4hr 10min Chica **
  ************************************************

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

     START @  0.00 hrs
     --------------------
    CHIC STORM                 10.0
    [ Ptot= 60.54 mm ]
*
 ** CALIB NASHYD         0101  1  5.0   13.85    0.23  2.08  12.64 0.21   0.000
    [CN=59.8         ]
    [ N = 3.0:Tp 0.61]
*
    CHIC STORM                 10.0
    [ Ptot= 60.54 mm ]
*
 ** CALIB NASHYD         0100  1  5.0    0.62    0.03  1.33  10.28 0.17   0.000
    [CN=55.7         ]
    [ N = 3.0:Tp 0.09]
*
================================================================================================================


       V    V   I    SSSSS  U   U    A    L             (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\95107345-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\95107345-


DATE: 04/05/2024                          TIME: 03:20:26

USER:


COMMENTS: ________________________________________________________


  ************************************************
  ** SIMULATION : Run 05 - 50yr 4hr 10min Chica **
  ************************************************

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

     START @  0.00 hrs
     --------------------
```

```
    CHIC STORM                10.0
    [ Ptot= 67.21 mm ]
*
 ** CALIB NASHYD         0101  1  5.0   13.85    0.28  2.08  15.54 0.23   0.000
    [CN=59.8        ]
    [ N = 3.0:Tp 0.61]
*
    CHIC STORM                10.0
    [ Ptot= 67.21 mm ]
*
 ** CALIB NASHYD         0100  1  5.0    0.62    0.04  1.33  12.75 0.19   0.000
    [CN=55.7        ]
    [ N = 3.0:Tp 0.09]
*
================================================================================================================


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.


                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\1548b85d-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\1548b85d-


DATE: 04/05/2024                          TIME: 03:20:26

USER:


COMMENTS: _____________________________________________________


  ************************************************
  ** SIMULATION : Run 06 - 100yr 4hr 10min Chic **
  ************************************************

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

     START @  0.00 hrs
     --------------------
    CHIC STORM                10.0
    [ Ptot= 73.89 mm ]
*
 ** CALIB NASHYD         0101  1  5.0   13.85    0.34  2.08  18.66 0.25   0.000
    [CN=59.8        ]
    [ N = 3.0:Tp 0.61]
*
    CHIC STORM                10.0
    [ Ptot= 73.89 mm ]
*
 ** CALIB NASHYD         0100  1  5.0    0.62    0.04  1.33  15.42 0.21   0.000
    [CN=55.7        ]
    [ N = 3.0:Tp 0.09]
*
================================================================================================================


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.


                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\6973c860-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\6973c860-


DATE: 04/05/2024                          TIME: 03:20:27

USER:


COMMENTS: _____________________________________________________


  ************************************************
  ** SIMULATION : Run 07 - 2yr 12hr 15min SCS T **
  ************************************************

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

     START @  0.00 hrs
     --------------------
    READ STORM                15.0
    [ Ptot= 46.27 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\b2ae71f7-ae0f-442a-b969
    remark: 2yr 12hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0101  1  5.0   13.85    0.13  6.83   7.23 0.16   0.000
    [CN=59.8        ]
    [ N = 3.0:Tp 0.61]
*
    READ STORM                15.0
    [ Ptot= 46.27 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\b2ae71f7-ae0f-442a-b969
    remark: 2yr 12hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0100  1  5.0    0.62    0.02  6.25   5.75 0.12   0.000
    [CN=55.7        ]
    [ N = 3.0:Tp 0.09]
*
================================================================================================================


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.


                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\1744a2a2-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\1744a2a2-


DATE: 04/05/2024                          TIME: 03:20:27

USER:


COMMENTS: _____________________________________________________


  ************************************************
  ** SIMULATION : Run 08 - 5yr 12hr 15min SCS T **
```

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

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

     START @  0.00 hrs
     --------------------
    READ STORM                 15.0
    [ Ptot= 61.69 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\12dc4c30-dc5c-4036-a369
    remark: 5yr 12hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0101  1  5.0   13.85    0.24  6.83  13.12 0.21   0.000
    [CN=59.8         ]
    [ N = 3.0:Tp 0.61]
*
    READ STORM                 15.0
    [ Ptot= 61.69 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\12dc4c30-dc5c-4036-a369
    remark: 5yr 12hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0100  1  5.0    0.62    0.03  6.25  10.70 0.17   0.000
    [CN=55.7         ]
    [ N = 3.0:Tp 0.09]
*
================================================================================================================


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.


                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\cdc9f2c3-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\cdc9f2c3-


DATE: 04/05/2024                          TIME: 03:20:28

USER:


COMMENTS: _____________________________________________________


  ************************************************
  ** SIMULATION : Run 09 - 10yr 12hr 15min SCS  **
  ************************************************

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

     START @  0.00 hrs
     --------------------
    READ STORM                 15.0
    [ Ptot= 71.62 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\9eae1c74-c47d-4044-bc76
    remark: 10yr 12hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0101  1  5.0   13.85    0.32  6.83  17.58 0.25   0.000
    [CN=59.8         ]
    [ N = 3.0:Tp 0.61]
*
    READ STORM                 15.0
    [ Ptot= 71.62 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\9eae1c74-c47d-4044-bc76
    remark: 10yr 12hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0100  1  5.0    0.62    0.04  6.25  14.49 0.20   0.000
    [CN=55.7         ]
    [ N = 3.0:Tp 0.09]
*
================================================================================================================


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.


                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\8616212a-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\8616212a-


DATE: 04/05/2024                          TIME: 03:20:28

USER:


COMMENTS: _____________________________________________________


  ************************************************
  ** SIMULATION : Run 10 - 25yr 12hr 15min SCS  **
  ************************************************

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

     START @  0.00 hrs
     --------------------
    READ STORM                 15.0
    [ Ptot= 84.30 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\973c359e-7963-43c5-9f84
    remark: 25yr 12hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0101  1  5.0   13.85    0.44  6.83  23.91 0.28   0.000
    [CN=59.8         ]
    [ N = 3.0:Tp 0.61]
*
    READ STORM                 15.0
    [ Ptot= 84.30 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\973c359e-7963-43c5-9f84
    remark: 25yr 12hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0100  1  5.0    0.62    0.05  6.25  19.94 0.24   0.000
    [CN=55.7         ]
    [ N = 3.0:Tp 0.09]
*
================================================================================================================


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.


                  *****  S U M M A R Y   O U T P U T  *****
```

```
  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\1624ff89-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\1624ff89-

DATE: 04/05/2024                          TIME: 03:20:27

USER:

COMMENTS: _____________________________________________________

  ************************************************
  ** SIMULATION : Run 11 - 50yr 12hr 15min SCS  **
  ************************************************

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

     START @  0.00 hrs
     --------------------
   READ STORM                15.0
   [ Ptot= 93.59 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\42fd7725-35a6-48e7-a68b
   remark: 50yr 12hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0101  1  5.0   13.85    0.53  6.83  28.95 0.31   0.000
   [CN=59.8         ]
   [ N = 3.0:Tp 0.61]
*
   READ STORM                15.0
   [ Ptot= 93.59 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\42fd7725-35a6-48e7-a68b
   remark: 50yr 12hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0100  1  5.0    0.62    0.07  6.25  24.31 0.26   0.000
   [CN=55.7         ]
   [ N = 3.0:Tp 0.09]
*
================================================================================================================


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

                  *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\b3009718-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\b3009718-

DATE: 04/05/2024                          TIME: 03:20:28

USER:

COMMENTS: _____________________________________________________

  ************************************************
  ** SIMULATION : Run 12 - 100yr 12hr 15min SCS **
  ************************************************

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

     START @  0.00 hrs
     --------------------
   READ STORM                15.0
   [ Ptot=102.89 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\b9bc5393-c514-4b42-b02e
   remark: 100yr 12hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0101  1  5.0   13.85    0.63  6.83  34.28 0.33   0.000
   [CN=59.8         ]
   [ N = 3.0:Tp 0.61]
*
   READ STORM                15.0
   [ Ptot=102.89 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\b9bc5393-c514-4b42-b02e
   remark: 100yr 12hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0100  1  5.0    0.62    0.08  6.25  28.96 0.28   0.000
   [CN=55.7         ]
   [ N = 3.0:Tp 0.09]
*
================================================================================================================


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

                  *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\397eef87-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\397eef87-

DATE: 04/05/2024                          TIME: 03:20:27

USER:

COMMENTS: _____________________________________________________

  ************************************************
  ** SIMULATION : Run 13 - 2yr 24hr 15min SCS T **
  ************************************************

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

     START @  0.00 hrs
     --------------------
   READ STORM                15.0
   [ Ptot= 57.00 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\2b6e45fc-8f7a-4339-92f1
   remark: 2yr 24hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0101  1  5.0   13.85    0.17 12.83  11.19 0.20   0.000
   [CN=59.8         ]
   [ N = 3.0:Tp 0.61]
*
   READ STORM                15.0
   [ Ptot= 57.00 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\2b6e45fc-8f7a-4339-92f1
   remark: 2yr 24hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0100  1  5.0    0.62    0.02 12.25   9.06 0.16   0.000
   [CN=55.7         ]
   [ N = 3.0:Tp 0.09]
*
================================================================================================================


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
```

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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

                    *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\6e584004-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\6e584004-

DATE: 04/05/2024                          TIME: 03:20:27

USER:

COMMENTS: _____________________________________________________

  ************************************************
  ** SIMULATION : Run 14 - 5yr 24hr 15min SCS T **
  ************************************************

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

      START @  0.00 hrs
      ---------------------
    READ STORM                 15.0
    [ Ptot= 76.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\2b0170f9-a76f-44e2-b9a1
    remark: 5yr 24hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0101  1  5.0   13.85    0.30 12.83  19.69 0.26   0.000
    [CN=59.8         ]
    [ N = 3.0:Tp 0.61]
*
    READ STORM                 15.0
    [ Ptot= 76.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\2b0170f9-a76f-44e2-b9a1
    remark: 5yr 24hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0100  1  5.0    0.62    0.04 12.25  16.30 0.21   0.000
    [CN=55.7         ]
    [ N = 3.0:Tp 0.09]
*
================================================================================================================


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

                    *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\84d41a3c-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\84d41a3c-

DATE: 04/05/2024                          TIME: 03:20:27

USER:

COMMENTS: _____________________________________________________

  ************************************************
  ** SIMULATION : Run 15 - 10yr 24hr 15min SCS  **
  ************************************************

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

      START @  0.00 hrs
      ---------------------
    READ STORM                 15.0
    [ Ptot= 88.24 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\922067fb-cd2e-49ce-b832
    remark: 10yr 24hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0101  1  5.0   13.85    0.40 12.83  26.01 0.29   0.000
    [CN=59.8         ]
    [ N = 3.0:Tp 0.61]
*
    READ STORM                 15.0
    [ Ptot= 88.24 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\922067fb-cd2e-49ce-b832
    remark: 10yr 24hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0100  1  5.0    0.62    0.05 12.25  21.75 0.25   0.000
    [CN=55.7         ]
    [ N = 3.0:Tp 0.09]
*
================================================================================================================


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

                    *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\9289e100-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\9289e100-

DATE: 04/05/2024                          TIME: 03:20:27

USER:

COMMENTS: _____________________________________________________

  ************************************************
  ** SIMULATION : Run 16 - 25yr 24hr 15min SCS  **
  ************************************************

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

      START @  0.00 hrs
      ---------------------
    READ STORM                 15.0
    [ Ptot=103.85 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\5887a2ec-b7af-4120-8fc6
    remark: 25yr 24hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0101  1  5.0   13.85    0.54 12.75  34.85 0.34   0.000
    [CN=59.8         ]
    [ N = 3.0:Tp 0.61]
*
```

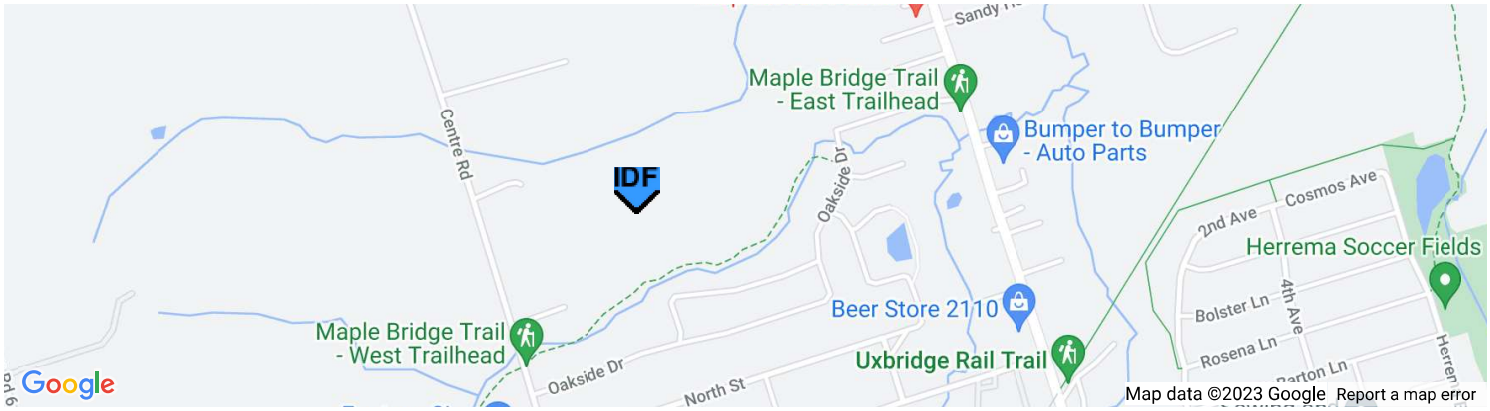
```
    READ STORM                 15.0
    [ Ptot=103.85 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\5887a2ec-b7af-4120-8fc6
    remark: 25yr 24hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0100  1  5.0    0.62    0.07 12.25  29.46 0.28   0.000
    [CN=55.7         ]
    [ N = 3.0:Tp 0.09]
*
================================================================================================================


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.


                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\995a0e26-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\995a0e26-


DATE: 04/05/2024                          TIME: 03:20:27

USER:


COMMENTS: _____________________________________________________


  ************************************************
  ** SIMULATION : Run 17 - 50yr 24hr 15min SCS  **
  ************************************************

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

     START @  0.00 hrs
     --------------------
    READ STORM                 15.0
    [ Ptot=115.30 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\8f729958-6162-4208-9eed
    remark: 50yr 24hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0101  1  5.0   13.85    0.66 12.75  41.82 0.36   0.000
    [CN=59.8         ]
    [ N = 3.0:Tp 0.61]
*
    READ STORM                 15.0
    [ Ptot=115.30 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\8f729958-6162-4208-9eed
    remark: 50yr 24hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0100  1  5.0    0.62    0.09 12.25  35.59 0.31   0.000
    [CN=55.7         ]
    [ N = 3.0:Tp 0.09]
*
================================================================================================================


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.


                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\1eca5525-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\1eca5525-


DATE: 04/05/2024                          TIME: 03:20:27

USER:


COMMENTS: _____________________________________________________


  ************************************************
  ** SIMULATION : Run 18 - 100yr 24hr 15min SCS **
  ************************************************

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

     START @  0.00 hrs
     --------------------
    READ STORM                 15.0
    [ Ptot=126.76 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\4335f593-3a45-4748-8bfa
    remark: 100yr 24hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0101  1  5.0   13.85    0.78 12.75  49.15 0.39   0.000
    [CN=59.8         ]
    [ N = 3.0:Tp 0.61]
*
    READ STORM                 15.0
    [ Ptot=126.76 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\838070a0-dfd4-435d-b44b-84bac7fc035b\4335f593-3a45-4748-8bfa
    remark: 100yr 24hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0100  1  5.0    0.62    0.10 12.25  42.06 0.33   0.000
    [CN=55.7         ]
    [ N = 3.0:Tp 0.09]
*
```

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


       V    V   I    SSSSS  U   U    A    L             (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.


                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\215619d0-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\215619d0-


DATE: 04/05/2024                          TIME: 03:21:01

USER:


COMMENTS: _____________________________________________________


  ************************************************
  ** SIMULATION : Hazel                         **
  ************************************************

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

     START @  0.00 hrs
     --------------------
    READ STORM                60.0
    [ Ptot=212.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\254e3988-db35-4507-9323-c57f9f7db100\9e68e583-1067-4218-9df6
    remark: Hazel
*
 ** CALIB NASHYD         0101  1  5.0   13.85    1.48 10.50 149.31 0.70   0.000
    [CN=77.0        ]
    [ N = 3.0:Tp 0.61]
*
    READ STORM                60.0
    [ Ptot=212.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\254e3988-db35-4507-9323-c57f9f7db100\9e68e583-1067-4218-9df6
    remark: Hazel
*
 ** CALIB NASHYD         0100  1  5.0    0.62    0.08 10.00 136.19 0.64   0.000
    [CN=74.0        ]
    [ N = 3.0:Tp 0.09]
*
 FINISH

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

Active coordinate

44° 7' 15" N, 79° 7' 44" W (44.120833,-79.129167)

Retrieved: Mon, 14 Aug 2023 12:52:26 GMT



Location summary

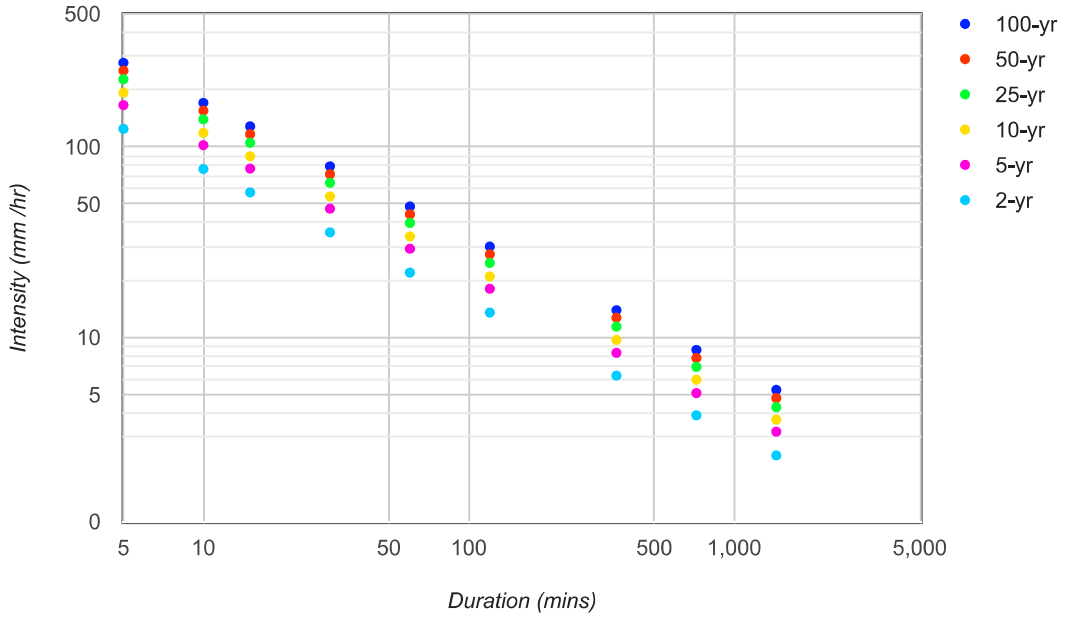
These are the locations in the selection.

IDF Curve: 44° 7' 15" N, 79° 7' 44" W (44.120833,-79.129167)

Results

An IDF curve was found.

Coordinate: 44.120833, -79.129167
IDF curve year: 2010



Coefficient summary

IDF Curve: 44° 7' 15" N, 79° 7' 44" W (44.120833,-79.129167)

Retrieved: Mon, 14 Aug 2023 12:52:26 GMT

Data year: 2010
IDF curve year: 2010

Return period	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
A	21.9	29.2	33.9	39.9	44.3	48.7
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	124.4	76.6	57.7	35.6	21.9	13.5	6.3	3.9	2.4
5-yr	165.9	102.2	77.0	47.4	29.2	18.0	8.3	5.1	3.2
10-yr	192.6	118.6	89.3	55.0	33.9	20.9	9.7	6.0	3.7
25-yr	226.6	139.6	105.2	64.8	39.9	24.6	11.4	7.0	4.3
50-yr	251.6	155.0	116.7	71.9	44.3	27.3	12.7	7.8	4.8
100-yr	276.6	170.4	128.3	79.1	48.7	30.0	13.9	8.6	5.3

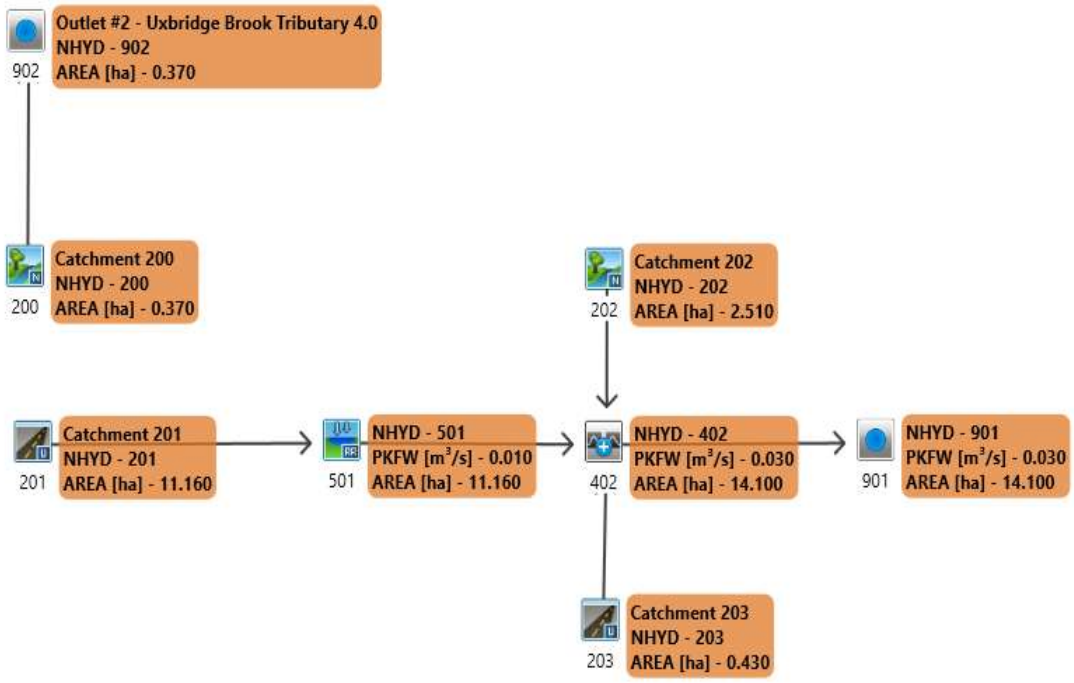
Rainfall depth (mm)

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	10.4	12.8	14.4	17.8	21.9	27.0	37.6	46.3	57.0
5-yr	13.8	17.0	19.2	23.7	29.2	36.0	50.1	61.7	76.0
10-yr	16.0	19.8	22.3	27.5	33.9	41.8	58.1	71.6	88.2
25-yr	18.9	23.3	26.3	32.4	39.9	49.2	68.4	84.3	103.9
50-yr	21.0	25.8	29.2	36.0	44.3	54.6	76.0	93.6	115.3
100-yr	23.1	28.4	32.1	39.5	48.7	60.0	83.5	102.9	126.8

Terms of Use

Appendix C:
Proposed Condition Analysis

PROJECT	Maple Bridge Subdivision	FILE	422492
		DATE	4/4/2024
SUBJECT	VO Schematic - Post-Development	NAME	LJC
		PAGE	1 OF 1



NASHYD

ROUTE PIPE

DUHYD

STANDHYD

ROUTE CHANNEL

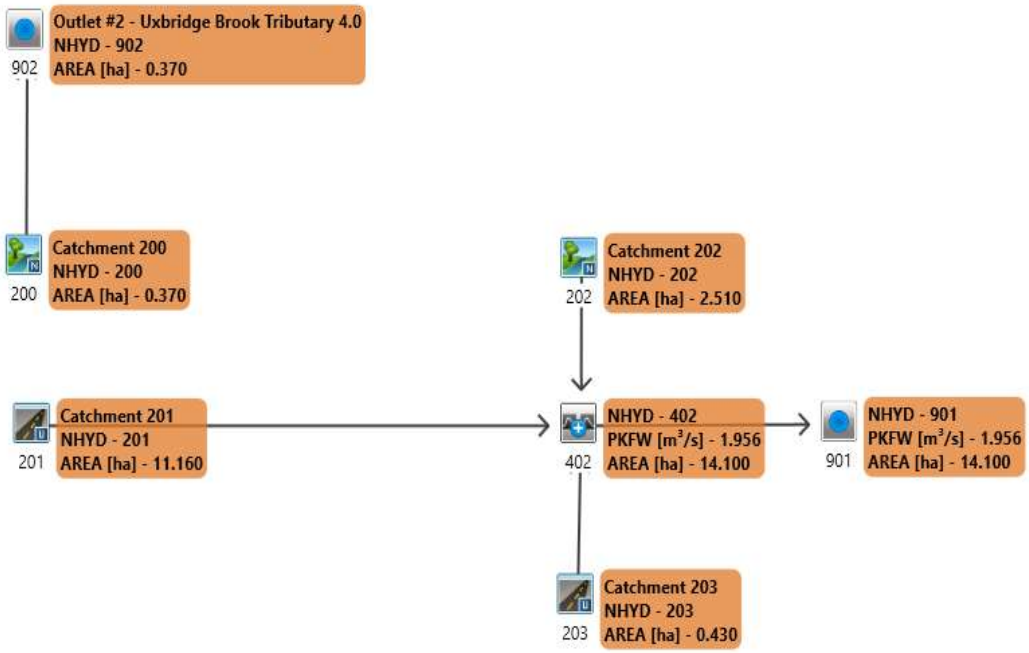
DIVERT HYD

ADDHYD

ROUTE RESERVOIR

TATHAM ENGINEERING

PROJECT	Maple Bridge Subdivision	FILE	422492
		DATE	4/4/2024
SUBJECT	VO Schematic - Post-Development - AMCIII	NAME	LJC
		PAGE	1 OF 1




NASHYD


ROUTE PIPE


DUHYD


STANDHYD


ROUTE CHANNEL


DIVERT HYD


ADDHYD


ROUTE RESERVOIR

TATHAM ENGINEERING

Visual OTTHYMO Model Parameter Calculations (NasHYD)

Project Details

Maple Bridge Subdivision	422492

Prepared By

LJC	4/4/2024

Data Sources

Detailed Soil Survey Reports for Ontario, LSRCA Technical Guidelines for Stormwater Management Submissions (2016), MTO Drainage Management Manual (1997)

Pre-Development Condition

Watershed:	LSRCA
Catchment ID:	200
Catchment Area (ha):	0.37
Impervious %:	

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

Soil Symbol		**Ds**											
Soil Series		Dundonald											
Hydrologic Soils Group		AB											
Soil Texture		Sand Loam											
Runoff Coefficient Type		1											
Area (ha)		0.37											
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		98	0.95									
Gravel	3		81	0.09									
Woodland	10		46	0.08									
Pasture/Lawns	5	0.37	59	0.10									
Meadows	8		51	0.09									
Cultivated	7		68	0.22									
Waterbody	12		50	0.05									
Average CN		59.00											
Average C		0.10											
Average IA		5.00											

Time to Peak Calculations

Max. Catchment Elev. (m):	284.91
Min. Catchment Elev. (m):	284.46
Catchment Length (m):	22.5
Catchment Slope (%):	2.00%
Method: Airport Method	
Time of Concentration (mins):	12.30

Summary

Catchment CN:	59.0
Catchment C:	0.10
Catchment IA (mm):	5.00
Time of Concentration (hrs):	0.21
Catchment Time to Peak (hrs):	0.14
Catchment Time Step (mins):	1.64

TATHAM ENGINEERING

Visual OTTHYMO Model Parameter Calculations (NasHYD)

Project Details

Maple Bridge Subdivision	422492

Prepared By

LJC	4/4/2024

Data Sources

Detailed Soil Survey Reports for Ontario, LSRCA Technical Guidelines for Stormwater Management Submissions (2016), MTO Drainage Management Manual (1997)

Pre-Development Condition

Watershed:	LSRCA
Catchment ID:	202
Catchment Area (ha):	2.51
Impervious %:	5%

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

Soil Symbol		**Ds**			**Brs**								
Soil Series		Dundonald			Brighton								
Hydrologic Soils Group		AB			A								
Soil Texture		Sand Loam			Sand								
Runoff Coefficient Type		1			1								
Area (ha)		2.13			0.38								
Percentage of Catchment		85%			15%								
Land Cover Category	**IA**	**A (ha)**	**CN**	**C**	**A (ha)**	**CN**	**C**	**A (ha)**	**CN**	**C**	**A (ha)**	**CN**	**C**
Impervious	2	0.12	98	0.95		98	0.95						
Gravel	3		81	0.09		76	0.09						
Woodland	10	0.67	46	0.08	0.24	32	0.08						
Pasture/Lawns	5	1.34	59	0.10	0.14	49	0.10						
Meadows	8		51	0.09		38	0.09						
Cultivated	7		68	0.22		62	0.22						
Waterbody	12		50	0.05		50	0.05						
Average CN		57.11			38.26								
Average C		0.14			0.09								
Average IA		6.40			8.16								

Time to Peak Calculations

Max. Catchment Elev. (m):	284.91
Min. Catchment Elev. (m):	284.40
Catchment Length (m):	25.3
Catchment Slope (%):	2.02%
Method: Airport Method	
Time of Concentration (mins):	12.58

Summary

Catchment CN:	54.3
Catchment C:	0.13
Catchment IA (mm):	6.67
Time of Concentration (hrs):	0.21
Catchment Time to Peak (hrs):	0.14
Catchment Time Step (mins):	1.68

TATHAM ENGINEERING

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Maple Bridge Subdivision	422492

Prepared By

LJC	4/4/2024

Data Sources

Detailed Soil Survey Reports for Ontario, LSRCA Technical Guidelines for Stormwater Management Submissions (2016), MTO Drainage Management Manual (1997)

Pre-Development Condition

Watershed:	LSRCA
Catchment ID:	201
Catchment Area (ha):	11.16
Impervious %:	73%
Pervious Area (ha):	3.06

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

Soil Symbol		**Ds**		**Brs**					
Soil Series		Dundonald		Brighton					
Hydrologic Soils Group		AB		A					
Soil Texture		Sand Loam		Sand					
Runoff Coefficient Type		1		1					
Area (ha)		2.21		0.85					
Percentage of Catchment		72%		28%					
Land Cover Category	**IA**	**A (ha)**	**CN**	**A (ha)**	**CN**	**A (ha)**	**CN**	**A (ha)**	**CN**
Impervious	2		98		98				
Gravel	3		81		76				
Woodland	10		46		32				
Pasture/Lawns	5	2.21	59	0.85	49				
Meadows	8		51		38				
Cultivated	7		68		62				
Waterbody	12		50		50				
Average CN		59.00		49.00					
Average IA		5.00		5.00					

Notes

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

Summary

Catchment CN:	56.2
Catchment IA (mm):	5.00

TATHAM ENGINEERING

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

Maple Bridge Subdivision	422492

Prepared By

LJC	4/4/2024

Data Sources

Detailed Soil Survey Reports for Ontario, LSRCA Technical Guidelines for Stormwater Management Submissions (2016), MTO Drainage Management Manual (1997)

Pre-Development Condition

Watershed:	LSRCA
Catchment ID:	203
Catchment Area (ha):	0.43
Impervious %:	47%
Pervious Area (ha):	0.23

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

Soil Symbol		**Brs**							
Soil Series		Brighton							
Hydrologic Soils Group		A							
Soil Texture		Sand							
Runoff Coefficient Type		1							
Area (ha)		0.23							
Percentage of Catchment		100%							
Land Cover Category	**IA**	**A (ha)**	**CN**	**A (ha)**	**CN**	**A (ha)**	**CN**	**A (ha)**	**CN**
Impervious	2		98						
Gravel	3		76						
Woodland	10		32						
Pasture/Lawns	5	0.23	49						
Meadows	8		38						
Cultivated	7		62						
Waterbody	12		50						
Average CN		49.00							
Average IA		5.00							

Notes

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

Summary

Catchment CN:	49.0
Catchment IA (mm):	5.00

TATHAM ENGINEERING

PROJECT	Maple Bridge Subdivision, Phase 2	FILE	422492
		DATE	4/4/2024
SUBJECT	Land Use Allocation - StandHyd	NAME	LJC
		PAGE	1 OF 2

CATCHMENT 200

Land Use Category	Total Area	Total Impervious (TIMP)	Total Impervious Area	Directly Connected Impervious	Total Directly Connected Impervious Area	Pervious Area	Pervious CN	Pervious IA
	ha	%	ha	%	ha	ha		
Landscape	0.37	0%	0.00	0%	0.00	0.37	59.0	5
Total	**0.37**	**0%**	**0.00**	**0%**	**0.00**	**0.37**	**59.0**	**5**

CATCHMENT 201

Land Use Category	Total Area	Total Impervious (TIMP)	Total Impervious Area	Directly Connected Impervious	Total Directly Connected Impervious Area	Pervious Area	Pervious CN	Pervious IA
	ha	%	ha	%	ha	ha		
22' Courtyard Townhomes	1.80	82%	1.48	55%	0.81	0.32	56.2	5
36' Classic Lots	3.48	67%	2.33	27%	0.64	1.15	56.2	5
46' Classic Lots	0.55	61%	0.34	21%	0.07	0.21	56.2	5
SWM Pond	0.45	100%	0.45	100%	0.45	0.00	56.2	5
Lawn	0.52	0%	0.00	0%	0.00	0.52	56.2	5
ROW	3.26	74%	2.40	74%	1.77	0.86	56.2	5
Catchment 200 Rooftops and Driveways	0.74	100%	0.74	41%	0.30	0.00	56.2	5
Catchment 202 Rooftops and Driveways	0.37	100%	0.37	37%	0.14	0.00	56.2	5
Total	**11.16**	**73%**	**8.10**	**37%**	**4.18**	**3.06**	**56.2**	**5.00**

CATCHMENT 202

Land Use Category	Total Area	Total Impervious (TIMP)	Total Impervious Area	Directly Connected Impervious	Total Directly Connected Impervious Area	Pervious Area	Pervious CN	Pervious IA
	ha	%	ha	%	ha	ha		
Landscape	1.48	0%	0.00	0%	0.00	1.48	54.3	6.67
Woodland	0.91	0%	0.00	0%	0.00	0.91	54.3	6.67
Walkways	0.02	100%	0.02	100%	0.02	0.00	54.3	6.67
Ex. Impervious	0.10	100%	0.10	0%	0.00	0.00	54.3	6.67
Total	**2.51**	**5%**	**0.12**	**1%**	**0.02**	**2.39**	**54.3**	**6.67**

TATHAM ENGINEERING

PROJECT	Maple Bridge Subdivision, Phase 2	FILE	422492
		DATE	4/4/2024
SUBJECT	Land Use Allocation - StandHyd	NAME	LJC
		PAGE	2 OF 2

CATCHMENT 203

Land Use Category	Total Area	Total Impervious (TIMP)	Total Impervious Area	Directly Connected Impervious	Total Directly Connected Impervious Area	Pervious Area	Pervious CN	Pervious IA
	ha	%	ha	%	ha	ha		
Lawn	0.14	0%	0.00	0%	0.00	0.14	49.0	5.0
ROW	0.29	70%	0.20	70%	0.14	0.09	49.0	5.0
Total	**0.43**	**47%**	**0.20**	**33%**	**0.14**	**0.23**	**49.0**	**5.0**

TATHAM ENGINEERING

PROJECT	Maple Bridge Subdivision	FILE	422492
		DATE	4/4/2024
SUBJECT	Road Allowance Imperviousness	NAME	LJC
		PAGE	1 OF 1

Catchment 201

Pavement, Sidewalk, and Driveway Area

Street Name	Area of ROW (m^2)	Length of Road (m)	Road Paved Area (m^2)	Sidewalk Area (m^2)	Driveway Area in ROW (m^2)	Total Imp. Area (m^2)	Total Imp. %
Street A (20 m)	11,841	590	6,490	1,770	828	9,088	76.8%
Street B (17 m)	2,249	132	1,175	198	376	1,749	77.7%
Street C (17 m)	2,103	123	1,095	185	317	1,596	75.9%
Street D (17 m)	3,137	150	1,335	225	593	2,153	68.6%
Street E (17 m)	5,152	286	2,545	429	890	3,865	75.0%
Street F (17 m)	5,972	292	2,599	438	890	3,927	65.8%
Lane A (7.5 m)	1,245	132	726	0	120	846	67.9%
Lane B (7.5 m)	924	123	677	0	96	773	83.6%
Total	**32,624**	**1,828**	**16,641**	**3,245**	**4,110**	**23,996**	**73.6%**

Catchment 203

Pavement, Sidewalk, and Driveway Area

Street Name	Area of ROW (m^2)	Length of Road (m)	Road Paved Area (m^2)	Sidewalk Area (m^2)	Driveway Area in ROW (m^2)	Total Imp. Area (m^2)	Total Imp. %
Street A (20 m)	2,923	146	1,608	439	0	2,047	70.0%
Total	**2,923**	**146**	**1,608**	**439**	**0**	**2,047**	**70.0%**

Notes

1. OPSD 600.070 was utilized to determine the width of curb.

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

       V    V   I    SSSSS  U   U    A    L             (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M  M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

                  *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\74e779b4-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\74e779b4-

DATE: 04/05/2024                          TIME: 03:23:24

USER:

COMMENTS: _____________________________________________________

  ************************************************
  ** SIMULATION : 25 mm 4-hr CHI                **
  ************************************************

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

     START @  0.00 hrs
     --------------------
    READ STORM                10.0
    [ Ptot= 25.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\d98d1005-1e85-4b79-95a8
    remark: 25 mm 4-hr CHI
*
 ** CALIB NASHYD         0202  1  5.0    2.51    0.01  1.67   1.44 0.06   0.000
    [CN=54.3        ]
    [ N = 3.0:Tp 0.14]
*
    READ STORM                10.0
    [ Ptot= 25.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\d98d1005-1e85-4b79-95a8
    remark: 25 mm 4-hr CHI
*
 ** CALIB STANDHYD       0201  1  5.0   11.16    0.50  1.50  11.93 0.48   0.000
    [I%=37.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0501  1  5.0   11.16    0.01  4.42  11.79  n/a   0.000
*
    READ STORM                10.0
    [ Ptot= 25.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\d98d1005-1e85-4b79-95a8
    remark: 25 mm 4-hr CHI
*
  * CALIB STANDHYD       0203  1  5.0    0.43    0.02  1.50   9.16 0.37   0.000
    [I%=33.0:S%= 2.00]
*
    ADD [  0202+  0203]  0402  3  5.0    2.94    0.03  1.50   2.57  n/a   0.000
*
    ADD [  0402+  0501]  0402  1  5.0   14.10    0.03  1.50   9.87  n/a   0.000
*
    READ STORM                10.0
    [ Ptot= 25.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\d98d1005-1e85-4b79-95a8
    remark: 25 mm 4-hr CHI
*
  * CALIB NASHYD         0200  1  5.0    0.37    0.00  1.58   2.02 0.08   0.000
    [CN=59.0        ]
    [ N = 3.0:Tp 0.14]
*
 FINISH
================================================================================================================
================================================================================================================

       V    V   I    SSSSS  U   U    A    L             (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M  M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

                  *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\b947fd3b-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\b947fd3b-

DATE: 04/05/2024                          TIME: 03:23:21

USER:

COMMENTS: _____________________________________________________

  ************************************************
  ** SIMULATION : Run 01 - 2yr 4hr 10min Chicag **
  ************************************************

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

     START @  0.00 hrs
     --------------------
    CHIC STORM                10.0
    [ Ptot= 33.23 mm ]
*
 ** CALIB NASHYD         0202  1  5.0    2.51    0.02  1.42   2.91 0.09   0.000
    [CN=54.3        ]
    [ N = 3.0:Tp 0.14]
*
    CHIC STORM                10.0
    [ Ptot= 33.23 mm ]
*
 ** CALIB STANDHYD       0201  1  5.0   11.16    0.82  1.33  17.17 0.52   0.000
    [I%=37.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0501  1  5.0   11.16    0.01  4.33  17.03  n/a   0.000
*
    CHIC STORM                10.0
    [ Ptot= 33.23 mm ]
*
  * CALIB STANDHYD       0203  1  5.0    0.43    0.03  1.33  13.01 0.39   0.000
    [I%=33.0:S%= 2.00]
*
    ADD [  0202+  0203]  0402  3  5.0    2.94    0.05  1.33   4.39  n/a   0.000
*
    ADD [  0402+  0501]  0402  1  5.0   14.10    0.05  1.33  14.40  n/a   0.000
*
    CHIC STORM                10.0
    [ Ptot= 33.23 mm ]
*
  * CALIB NASHYD         0200  1  5.0    0.37    0.00  1.42   3.86 0.12   0.000
    [CN=59.0        ]
    [ N = 3.0:Tp 0.14]
*
================================================================================================================

       V    V   I    SSSSS  U   U    A    L             (v 6.2.2015)
```

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

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


***** S U M M A R Y O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
Output filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\642b8c2d-
Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\642b8c2d-

DATE: 04/05/2024 TIME: 03:23:22

USER:

COMMENTS: _____

****
** SIMULATION : Run 02 - 5yr 4hr 10min Chicag **
****

W/E	COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R.V. mm	R.C.	Qbase cms
	START @ 0.00 hrs								
	CHIC STORM		10.0						
	[Ptot= 44.30 mm]								
*									
**	CALIB NASHYD [CN=54.3] [N = 3.0:Tp 0.14]	0202	1 5.0	2.51	0.04	1.42	5.59	0.13	0.000
*									
	CHIC STORM		10.0						
	[Ptot= 44.30 mm]								
*									
*	CALIB STANDHYD [I%=37.0:S%= 2.00]	0201	1 5.0	11.16	1.20	1.33	24.84	0.56	0.000
*									
**	Reservoir OUTFLOW:	0501	1 5.0	11.16	0.01	4.00	24.70	n/a	0.000
*									
	CHIC STORM		10.0						
	[Ptot= 44.30 mm]								
*									
*	CALIB STANDHYD [I%=33.0:S%= 2.00]	0203	1 5.0	0.43	0.04	1.33	18.64	0.42	0.000
*									
	ADD [0202+ 0203]	0402	3 5.0	2.94	0.08	1.33	7.50	n/a	0.000
*									
	ADD [0402+ 0501]	0402	1 5.0	14.10	0.08	1.33	21.11	n/a	0.000
*									
	CHIC STORM		10.0						
	[Ptot= 44.30 mm]								
*									
*	CALIB NASHYD [CN=59.0] [N = 3.0:Tp 0.14]	0200	1 5.0	0.37	0.01	1.42	7.10	0.16	0.000
*									

==========

```
       V    V   I    SSSSS  U   U    A    L             (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
```
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

***** S U M M A R Y O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
Output filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\1a5101dc-
Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\1a5101dc-

DATE: 04/05/2024 TIME: 03:23:21

USER:

COMMENTS: _____

****
** SIMULATION : Run 03 - 10yr 4hr 10min Chica **
****

W/E	COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R.V. mm	R.C.	Qbase cms
	START @ 0.00 hrs								
	CHIC STORM		10.0						
	[Ptot= 51.44 mm]								
*									
**	CALIB NASHYD [CN=54.3] [N = 3.0:Tp 0.14]	0202	1 5.0	2.51	0.06	1.42	7.69	0.15	0.000
*									
	CHIC STORM		10.0						
	[Ptot= 51.44 mm]								
*									
*	CALIB STANDHYD [I%=37.0:S%= 2.00]	0201	1 5.0	11.16	1.44	1.33	30.07	0.58	0.000
*									
**	Reservoir OUTFLOW:	0501	1 5.0	11.16	0.04	4.17	29.93	n/a	0.000
*									
	CHIC STORM		10.0						
	[Ptot= 51.44 mm]								
*									
*	CALIB STANDHYD [I%=33.0:S%= 2.00]	0203	1 5.0	0.43	0.05	1.33	22.51	0.44	0.000
*									
	ADD [0202+ 0203]	0402	3 5.0	2.94	0.10	1.33	9.86	n/a	0.000
*									
	ADD [0402+ 0501]	0402	1 5.0	14.10	0.11	1.33	25.75	n/a	0.000
*									
	CHIC STORM		10.0						
	[Ptot= 51.44 mm]								
*									
*	CALIB NASHYD [CN=59.0] [N = 3.0:Tp 0.14]	0200	1 5.0	0.37	0.01	1.42	9.60	0.19	0.000
*									

==========

```
       V    V   I    SSSSS  U   U    A    L             (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
```
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

***** S U M M A R Y O U T P U T *****

```
  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\db194f3f-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\db194f3f-

DATE: 04/05/2024                          TIME: 03:23:23

USER:

COMMENTS: _____________________________________________________________

  ************************************************
  ** SIMULATION : Run 04 - 25yr 4hr 10min Chica **
  ************************************************

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

     START @  0.00 hrs
     --------------------
   CHIC STORM                 10.0
   [ Ptot= 60.54 mm ]
*
 ** CALIB NASHYD        0202  1  5.0    2.51    0.09  1.42  10.76 0.18   0.000
   [CN=54.3         ]
   [ N = 3.0:Tp 0.14]
*
   CHIC STORM                 10.0
   [ Ptot= 60.54 mm ]
*
  * CALIB STANDHYD       0201  1  5.0   11.16    1.77  1.33  37.03 0.61   0.000
   [I%=37.0:S%= 2.00]
*
  ** Reservoir
   OUTFLOW:               0501  1  5.0   11.16    0.10  4.00  36.89  n/a   0.000
*
   CHIC STORM                 10.0
   [ Ptot= 60.54 mm ]
*
  * CALIB STANDHYD       0203  1  5.0    0.43    0.06  1.33  27.70 0.46   0.000
   [I%=33.0:S%= 2.00]
*
   ADD [  0202+  0203]  0402  3  5.0    2.94    0.14  1.33  13.24  n/a   0.000
*
   ADD [  0402+  0501]  0402  1  5.0   14.10    0.14  1.33  31.95  n/a   0.000
*
   CHIC STORM                 10.0
   [ Ptot= 60.54 mm ]
*
  * CALIB NASHYD        0200  1  5.0    0.37    0.02  1.42  13.19 0.22   0.000
   [CN=59.0         ]
   [ N = 3.0:Tp 0.14]
*
================================================================================================

       V    V   I    SSSSS  U   U    A    L             (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

                  *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\622e36a4-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\622e36a4-

DATE: 04/05/2024                          TIME: 03:23:21

USER:

COMMENTS: _____________________________________________________________

  ************************************************
  ** SIMULATION : Run 05 - 50yr 4hr 10min Chica **
  ************************************************

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

     START @  0.00 hrs
     --------------------
   CHIC STORM                 10.0
   [ Ptot= 67.21 mm ]
*
 ** CALIB NASHYD        0202  1  5.0    2.51    0.11  1.42  13.26 0.20   0.000
   [CN=54.3         ]
   [ N = 3.0:Tp 0.14]
*
   CHIC STORM                 10.0
   [ Ptot= 67.21 mm ]
*
  * CALIB STANDHYD       0201  1  5.0   11.16    2.02  1.33  42.29 0.63   0.000
   [I%=37.0:S%= 2.00]
*
  ** Reservoir
   OUTFLOW:               0501  1  5.0   11.16    0.13  3.75  42.15  n/a   0.000
*
   CHIC STORM                 10.0
   [ Ptot= 67.21 mm ]
*
  * CALIB STANDHYD       0203  1  5.0    0.43    0.07  1.33  31.67 0.47   0.000
   [I%=33.0:S%= 2.00]
*
   ADD [  0202+  0203]  0402  3  5.0    2.94    0.16  1.33  15.96  n/a   0.000
*
   ADD [  0402+  0501]  0402  1  5.0   14.10    0.17  1.33  36.69  n/a   0.000
*
   CHIC STORM                 10.0
   [ Ptot= 67.21 mm ]
*
  * CALIB NASHYD        0200  1  5.0    0.37    0.02  1.42  16.09 0.24   0.000
   [CN=59.0         ]
   [ N = 3.0:Tp 0.14]
*
================================================================================================

       V    V   I    SSSSS  U   U    A    L             (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

                  *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\7c99fc4e-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\7c99fc4e-

DATE: 04/05/2024                          TIME: 03:23:22

USER:

COMMENTS: _____________________________________________________________

  ************************************************
  ** SIMULATION : Run 06 - 100yr 4hr 10min Chic **
```

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

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

      START @  0.00 hrs
      --------------------
    CHIC STORM                 10.0
    [ Ptot= 73.89 mm ]
*
 ** CALIB NASHYD         0202  1  5.0    2.51    0.14  1.42  15.96 0.22   0.000
    [CN=54.3        ]
    [ N = 3.0:Tp 0.14]
*
    CHIC STORM                 10.0
    [ Ptot= 73.89 mm ]
*
  * CALIB STANDHYD       0201  1  5.0   11.16    2.53  1.33  47.68 0.65   0.000
    [I%=37.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:               0501  1  5.0   11.16    0.16  3.50  47.54  n/a   0.000
*
    CHIC STORM                 10.0
    [ Ptot= 73.89 mm ]
*
  * CALIB STANDHYD       0203  1  5.0    0.43    0.07  1.33  35.78 0.48   0.000
    [I%=33.0:S%= 2.00]
*
    ADD [  0202+  0203]  0402  3  5.0    2.94    0.19  1.33  18.86  n/a   0.000
*
    ADD [  0402+  0501]  0402  1  5.0   14.10    0.20  1.33  41.56  n/a   0.000
*
    CHIC STORM                 10.0
    [ Ptot= 73.89 mm ]
*
  * CALIB NASHYD         0200  1  5.0    0.37    0.02  1.42  19.19 0.26   0.000
    [CN=59.0        ]
    [ N = 3.0:Tp 0.14]
*
================================================================================================================


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.


                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\8d2c495c-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\8d2c495c-


DATE: 04/05/2024                          TIME: 03:23:24

USER:


COMMENTS: _____________________________________________________________


  ************************************************
  ** SIMULATION : Run 07 - 2yr 12hr 15min SCS T **
  ************************************************

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

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

```
    [ Ptot= 46.27 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\b2ae71f7-ae0f-442a-b969
    remark: 2yr 12hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0202  1  5.0    2.51    0.05  6.25   6.14 0.13   0.000
    [CN=54.3        ]
    [ N = 3.0:Tp 0.14]
*
    READ STORM                 15.0
    [ Ptot= 46.27 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\b2ae71f7-ae0f-442a-b969
    remark: 2yr 12hr 15min SCS Type II (MTO)
*
 ** CALIB STANDHYD       0201  1  5.0   11.16    0.90  6.25  26.26 0.57   0.000
    [I%=37.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:               0501  1  5.0   11.16    0.01 12.33  26.12  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot= 46.27 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\b2ae71f7-ae0f-442a-b969
    remark: 2yr 12hr 15min SCS Type II (MTO)
*
  * CALIB STANDHYD       0203  1  5.0    0.43    0.03  6.25  19.69 0.43   0.000
    [I%=33.0:S%= 2.00]
*
    ADD [  0202+  0203]  0402  3  5.0    2.94    0.08  6.25   8.12  n/a   0.000
*
    ADD [  0402+  0501]  0402  1  5.0   14.10    0.09  6.25  22.37  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot= 46.27 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\b2ae71f7-ae0f-442a-b969
    remark: 2yr 12hr 15min SCS Type II (MTO)
*
  * CALIB NASHYD         0200  1  5.0    0.37    0.01  6.25   7.76 0.17   0.000
    [CN=59.0        ]
    [ N = 3.0:Tp 0.14]
*
================================================================================================================


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.


                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\70d73834-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\70d73834-


DATE: 04/05/2024                          TIME: 03:23:24

USER:


COMMENTS: _____________________________________________________________


  ************************************************
  ** SIMULATION : Run 08 - 5yr 12hr 15min SCS T **
  ************************************************

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

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

```
    [ Ptot= 61.69 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\12dc4c30-dc5c-4036-a369
    remark: 5yr 12hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0202  1  5.0    2.51    0.10  6.25  11.18 0.18   0.000
    [CN=54.3        ]
    [ N = 3.0:Tp 0.14]
*
    READ STORM                  15.0
    [ Ptot= 61.69 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\12dc4c30-dc5c-4036-a369
    remark: 5yr 12hr 15min SCS Type II (MTO)
*
 ** CALIB STANDHYD        0201  1  5.0   11.16    1.32  6.25  37.93 0.61   0.000
    [I%=37.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0501  1  5.0   11.16    0.06  8.58  37.78  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot= 61.69 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\12dc4c30-dc5c-4036-a369
    remark: 5yr 12hr 15min SCS Type II (MTO)
*
 *  CALIB STANDHYD        0203  1  5.0    0.43    0.04  6.25  28.38 0.46   0.000
    [I%=33.0:S%= 2.00]
*
    ADD [  0202+  0203]  0402  3  5.0    2.94    0.14  6.25  13.69  n/a   0.000
*
    ADD [  0402+  0501]  0402  1  5.0   14.10    0.15  6.25  32.76  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot= 61.69 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\12dc4c30-dc5c-4036-a369
    remark: 5yr 12hr 15min SCS Type II (MTO)
*
 *  CALIB NASHYD          0200  1  5.0    0.37    0.02  6.25  13.68 0.22   0.000
    [CN=59.0        ]
    [ N = 3.0:Tp 0.14]
*
================================================================================================================
```

```
    [ Ptot= 71.62 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\9eae1c74-c47d-4044-bc76
    remark: 10yr 12hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0202  1  5.0    2.51    0.13  6.25  15.02 0.21   0.000
    [CN=54.3        ]
    [ N = 3.0:Tp 0.14]
*
    READ STORM                  15.0
    [ Ptot= 71.62 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\9eae1c74-c47d-4044-bc76
    remark: 10yr 12hr 15min SCS Type II (MTO)
*
 *  CALIB STANDHYD        0201  1  5.0   11.16    1.61  6.25  45.84 0.64   0.000
    [I%=37.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0501  1  5.0   11.16    0.12  7.50  45.69  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot= 71.62 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\9eae1c74-c47d-4044-bc76
    remark: 10yr 12hr 15min SCS Type II (MTO)
*
 *  CALIB STANDHYD        0203  1  5.0    0.43    0.05  6.25  34.37 0.48   0.000
    [I%=33.0:S%= 2.00]
*
    ADD [  0202+  0203]  0402  3  5.0    2.94    0.18  6.25  17.85  n/a   0.000
*
    ADD [  0402+  0501]  0402  1  5.0   14.10    0.19  6.25  39.89  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot= 71.62 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\9eae1c74-c47d-4044-bc76
    remark: 10yr 12hr 15min SCS Type II (MTO)
*
 *  CALIB NASHYD          0200  1  5.0    0.37    0.02  6.25  18.12 0.25   0.000
    [CN=59.0        ]
    [ N = 3.0:Tp 0.14]
*
================================================================================================================
```

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I      SS   U   U  AAAAA  L
        V  V    I       SS  U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

                  *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\ec7d560a-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\ec7d560a-

DATE: 04/05/2024                          TIME: 03:23:24

USER:

COMMENTS: _____________________________________________________

  ************************************************
  ** SIMULATION : Run 09 - 10yr 12hr 15min SCS  **
  ************************************************

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

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

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I      SS   U   U  AAAAA  L
        V  V    I       SS  U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

                  *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\70c14fc2-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\70c14fc2-

DATE: 04/05/2024                          TIME: 03:23:23

USER:

COMMENTS: _____________________________________________________

  ************************************************
  ** SIMULATION : Run 10 - 25yr 12hr 15min SCS  **
  ************************************************

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

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

```
    [ Ptot= 84.30 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\973c359e-7963-43c5-9f84
    remark: 25yr 12hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0202  1  5.0    2.51    0.18  6.25  20.53 0.24   0.000
    [CN=54.3        ]
    [ N = 3.0:Tp 0.14]
*
    READ STORM                  15.0
    [ Ptot= 84.30 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\973c359e-7963-43c5-9f84
    remark: 25yr 12hr 15min SCS Type II (MTO)
*
  * CALIB STANDHYD       0201  1  5.0   11.16    2.00  6.25  56.28 0.67   0.000
    [I%=37.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0501  1  5.0   11.16    0.18  7.25  56.14  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot= 84.30 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\973c359e-7963-43c5-9f84
    remark: 25yr 12hr 15min SCS Type II (MTO)
*
  * CALIB STANDHYD       0203  1  5.0    0.43    0.06  6.25  42.41 0.50   0.000
    [I%=33.0:S%= 2.00]
*
    ADD [  0202+  0203]  0402  3  5.0    2.94    0.24  6.25  23.73  n/a   0.000
*
    ADD [  0402+  0501]  0402  1  5.0   14.10    0.26  6.25  49.38  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot= 84.30 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\973c359e-7963-43c5-9f84
    remark: 25yr 12hr 15min SCS Type II (MTO)
*
  * CALIB NASHYD         0200  1  5.0    0.37    0.03  6.25  24.40 0.29   0.000
    [CN=59.0        ]
    [ N = 3.0:Tp 0.14]
*
================================================================================================================
```

```
    [ Ptot= 93.59 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\42fd7725-35a6-48e7-a68b
    remark: 50yr 12hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0202  1  5.0    2.51    0.22  6.25  24.94 0.27   0.000
    [CN=54.3        ]
    [ N = 3.0:Tp 0.14]
*
    READ STORM                  15.0
    [ Ptot= 93.59 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\42fd7725-35a6-48e7-a68b
    remark: 50yr 12hr 15min SCS Type II (MTO)
*
  * CALIB STANDHYD       0201  1  5.0   11.16    2.47  6.25  64.14 0.69   0.000
    [I%=37.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0501  1  5.0   11.16    0.22  7.08  64.00  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot= 93.59 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\42fd7725-35a6-48e7-a68b
    remark: 50yr 12hr 15min SCS Type II (MTO)
*
  * CALIB STANDHYD       0203  1  5.0    0.43    0.07  6.25  48.56 0.52   0.000
    [I%=33.0:S%= 2.00]
*
    ADD [  0202+  0203]  0402  3  5.0    2.94    0.29  6.25  28.39  n/a   0.000
*
    ADD [  0402+  0501]  0402  1  5.0   14.10    0.36  6.33  56.58  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot= 93.59 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\42fd7725-35a6-48e7-a68b
    remark: 50yr 12hr 15min SCS Type II (MTO)
*
  * CALIB NASHYD         0200  1  5.0    0.37    0.04  6.25  29.38 0.31   0.000
    [CN=59.0        ]
    [ N = 3.0:Tp 0.14]
*
================================================================================================================
```

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I      SS   U   U  AAAAA  L
        V  V    I       SS  U   U A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

                  *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\2cbd7aa6-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\2cbd7aa6-

DATE: 04/05/2024                          TIME: 03:23:23

USER:

COMMENTS: _____________________________________________________

  ************************************************
  ** SIMULATION : Run 11 - 50yr 12hr 15min SCS  **
  ************************************************

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

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

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I      SS   U   U  AAAAA  L
        V  V    I       SS  U   U A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

                  *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\f5cade04-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\f5cade04-

DATE: 04/05/2024                          TIME: 03:23:24

USER:

COMMENTS: _____________________________________________________

  ************************************************
  ** SIMULATION : Run 12 - 100yr 12hr 15min SCS **
  ************************************************

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

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

```
    [ Ptot=102.89 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\b9bc5393-c514-4b42-b02e
    remark: 100yr 12hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0202  1  5.0    2.51    0.26  6.25  29.64 0.29   0.000
    [CN=54.3       ]
    [ N = 3.0:Tp 0.14]
*
    READ STORM                 15.0
    [ Ptot=102.89 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\b9bc5393-c514-4b42-b02e
    remark: 100yr 12hr 15min SCS Type II (MTO)
*
  * CALIB STANDHYD       0201  1  5.0   11.16    2.80  6.25  72.15 0.70   0.000
    [I%=37.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0501  1  5.0   11.16    0.25  7.08  72.01  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot=102.89 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\b9bc5393-c514-4b42-b02e
    remark: 100yr 12hr 15min SCS Type II (MTO)
*
  * CALIB STANDHYD       0203  1  5.0    0.43    0.08  6.25  54.89 0.53   0.000
    [I%=33.0:S%= 2.00]
*
    ADD [  0202+  0203]  0402  3  5.0    2.94    0.35  6.25  33.34  n/a   0.000
*
    ADD [  0402+  0501]  0402  1  5.0   14.10    0.46  6.25  63.95  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot=102.89 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\b9bc5393-c514-4b42-b02e
    remark: 100yr 12hr 15min SCS Type II (MTO)
*
  * CALIB NASHYD         0200  1  5.0    0.37    0.05  6.25  34.66 0.34   0.000
    [CN=59.0       ]
    [ N = 3.0:Tp 0.14]
*
================================================================================================================
```

```
    [ Ptot= 57.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\2b6e45fc-8f7a-4339-92f1
    remark: 2yr 24hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0202  1  5.0    2.51    0.07 12.25   9.52 0.17   0.000
    [CN=54.3       ]
    [ N = 3.0:Tp 0.14]
*
    READ STORM                 15.0
    [ Ptot= 57.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\2b6e45fc-8f7a-4339-92f1
    remark: 2yr 24hr 15min SCS Type II (MTO)
*
 ** CALIB STANDHYD       0201  1  5.0   11.16    1.06 12.25  34.29 0.60   0.000
    [I%=37.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0501  1  5.0   11.16    0.02 20.33  34.15  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot= 57.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\2b6e45fc-8f7a-4339-92f1
    remark: 2yr 24hr 15min SCS Type II (MTO)
*
  * CALIB STANDHYD       0203  1  5.0    0.43    0.03 12.25  25.65 0.45   0.000
    [I%=33.0:S%= 2.00]
*
    ADD [  0202+  0203]  0402  3  5.0    2.94    0.10 12.25  11.88  n/a   0.000
*
    ADD [  0402+  0501]  0402  1  5.0   14.10    0.11 12.25  29.51  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot= 57.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\2b6e45fc-8f7a-4339-92f1
    remark: 2yr 24hr 15min SCS Type II (MTO)
*
  * CALIB NASHYD         0200  1  5.0    0.37    0.01 12.25  11.74 0.21   0.000
    [CN=59.0       ]
    [ N = 3.0:Tp 0.14]
*
================================================================================================================
```

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I      SS   U   U  AAAAA  L
        V  V    I       SS  U   U A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

                  *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\9b3c5304-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\9b3c5304-

DATE: 04/05/2024                          TIME: 03:23:22

USER:

COMMENTS: _____________________________________________________________

  ************************************************
  ** SIMULATION : Run 13 - 2yr 24hr 15min SCS T **
  ************************************************

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

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

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I      SS   U   U  AAAAA  L
        V  V    I       SS  U   U A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

                  *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\a9f3516e-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\a9f3516e-

DATE: 04/05/2024                          TIME: 03:23:22

USER:

COMMENTS: _____________________________________________________________

  ************************************************
  ** SIMULATION : Run 14 - 5yr 24hr 15min SCS T **
  ************************************************

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

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

```
    [ Ptot= 76.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\2b0170f9-a76f-44e2-b9a1
    remark: 5yr 24hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0202  1  5.0    2.51    0.13 12.25  16.85 0.22   0.000
    [CN=54.3        ]
    [ N = 3.0:Tp 0.14]
*
    READ STORM                  15.0
    [ Ptot= 76.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\2b0170f9-a76f-44e2-b9a1
    remark: 5yr 24hr 15min SCS Type II (MTO)
*
  * CALIB STANDHYD       0201  1  5.0   11.16    1.56 12.25  49.40 0.65   0.000
    [I%=37.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0501  1  5.0   11.16    0.11 13.58  49.26  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot= 76.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\2b0170f9-a76f-44e2-b9a1
    remark: 5yr 24hr 15min SCS Type II (MTO)
*
  * CALIB STANDHYD       0203  1  5.0    0.43    0.05 12.25  37.10 0.49   0.000
    [I%=33.0:S%= 2.00]
*
    ADD [  0202+  0203]  0402  3  5.0    2.94    0.18 12.25  19.81  n/a   0.000
*
    ADD [  0402+  0501]  0402  1  5.0   14.10    0.19 12.25  43.12  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot= 76.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\2b0170f9-a76f-44e2-b9a1
    remark: 5yr 24hr 15min SCS Type II (MTO)
*
  * CALIB NASHYD         0200  1  5.0    0.37    0.02 12.25  20.21 0.27   0.000
    [CN=59.0        ]
    [ N = 3.0:Tp 0.14]
*
================================================================================================================


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.


                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\dc762117-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\dc762117-


DATE: 04/05/2024                          TIME: 03:23:23

USER:


COMMENTS: _____________________________________________________________


  ************************************************
  ** SIMULATION : Run 15 - 10yr 24hr 15min SCS  **
  ************************************************

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

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

```
    [ Ptot= 88.24 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\922067fb-cd2e-49ce-b832
    remark: 10yr 24hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0202  1  5.0    2.51    0.17 12.25  22.36 0.25   0.000
    [CN=54.3        ]
    [ N = 3.0:Tp 0.14]
*
    READ STORM                  15.0
    [ Ptot= 88.24 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\922067fb-cd2e-49ce-b832
    remark: 10yr 24hr 15min SCS Type II (MTO)
*
  * CALIB STANDHYD       0201  1  5.0   11.16    1.90 12.25  59.60 0.68   0.000
    [I%=37.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0501  1  5.0   11.16    0.17 13.25  59.46  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot= 88.24 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\922067fb-cd2e-49ce-b832
    remark: 10yr 24hr 15min SCS Type II (MTO)
*
  * CALIB STANDHYD       0203  1  5.0    0.43    0.06 12.25  44.99 0.51   0.000
    [I%=33.0:S%= 2.00]
*
    ADD [  0202+  0203]  0402  3  5.0    2.94    0.23 12.25  25.67  n/a   0.000
*
    ADD [  0402+  0501]  0402  1  5.0   14.10    0.24 12.25  52.41  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot= 88.24 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\922067fb-cd2e-49ce-b832
    remark: 10yr 24hr 15min SCS Type II (MTO)
*
  * CALIB NASHYD         0200  1  5.0    0.37    0.03 12.25  26.47 0.30   0.000
    [CN=59.0        ]
    [ N = 3.0:Tp 0.14]
*
================================================================================================================


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.


                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\88e57e32-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\88e57e32-


DATE: 04/05/2024                          TIME: 03:23:22

USER:


COMMENTS: _____________________________________________________________


  ************************************************
  ** SIMULATION : Run 16 - 25yr 24hr 15min SCS  **
  ************************************************

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

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

```
    [ Ptot=103.85 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\5887a2ec-b7af-4120-8fc6
    remark: 25yr 24hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0202  1  5.0    2.51    0.23 12.25  30.14 0.29   0.000
    [CN=54.3        ]
    [ N = 3.0:Tp 0.14]
*
    READ STORM                 15.0
    [ Ptot=103.85 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\5887a2ec-b7af-4120-8fc6
    remark: 25yr 24hr 15min SCS Type II (MTO)
*
  * CALIB STANDHYD       0201  1  5.0   11.16    2.55 12.25  72.99 0.70   0.000
    [I%=37.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0501  1  5.0   11.16    0.22 13.08  72.85  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot=103.85 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\5887a2ec-b7af-4120-8fc6
    remark: 25yr 24hr 15min SCS Type II (MTO)
*
  * CALIB STANDHYD       0203  1  5.0    0.43    0.07 12.25  55.56 0.53   0.000
    [I%=33.0:S%= 2.00]
*
    ADD [  0202+  0203]  0402  3  5.0    2.94    0.30 12.25  33.86  n/a   0.000
*
    ADD [  0402+  0501]  0402  1  5.0   14.10    0.39 12.33  64.72  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot=103.85 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\5887a2ec-b7af-4120-8fc6
    remark: 25yr 24hr 15min SCS Type II (MTO)
*
  * CALIB NASHYD         0200  1  5.0    0.37    0.04 12.25  35.22 0.34   0.000
    [CN=59.0        ]
    [ N = 3.0:Tp 0.14]
*
================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

                  *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\bf28f820-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\bf28f820-

DATE: 04/05/2024                          TIME: 03:23:22

USER:

COMMENTS: _____________________________________________________

  ************************************************
  ** SIMULATION : Run 17 - 50yr 24hr 15min SCS  **
  ************************************************

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

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

```
    [ Ptot=115.30 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\8f729958-6162-4208-9eed
    remark: 50yr 24hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0202  1  5.0    2.51    0.28 12.25  36.33 0.32   0.000
    [CN=54.3        ]
    [ N = 3.0:Tp 0.14]
*
    READ STORM                 15.0
    [ Ptot=115.30 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\8f729958-6162-4208-9eed
    remark: 50yr 24hr 15min SCS Type II (MTO)
*
  * CALIB STANDHYD       0201  1  5.0   11.16    2.93 12.25  83.03 0.72   0.000
    [I%=37.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0501  1  5.0   11.16    0.26 13.00  82.89  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot=115.30 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\8f729958-6162-4208-9eed
    remark: 50yr 24hr 15min SCS Type II (MTO)
*
  * CALIB STANDHYD       0203  1  5.0    0.43    0.09 12.25  63.63 0.55   0.000
    [I%=33.0:S%= 2.00]
*
    ADD [  0202+  0203]  0402  3  5.0    2.94    0.37 12.25  40.32  n/a   0.000
*
    ADD [  0402+  0501]  0402  1  5.0   14.10    0.51 12.25  74.01  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot=115.30 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\8f729958-6162-4208-9eed
    remark: 50yr 24hr 15min SCS Type II (MTO)
*
  * CALIB NASHYD         0200  1  5.0    0.37    0.05 12.25  42.10 0.37   0.000
    [CN=59.0        ]
    [ N = 3.0:Tp 0.14]
*
================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

                  *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\da73dd4a-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\da73dd4a-

DATE: 04/05/2024                          TIME: 03:23:23

USER:

COMMENTS: _____________________________________________________

  ************************************************
  ** SIMULATION : Run 18 - 100yr 24hr 15min SCS **
  ************************************************

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

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

```
    [ Ptot=126.76 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\4335f593-3a45-4748-8bfa
    remark: 100yr 24hr 15min SCS Type II (MTO)
*
 ** CALIB NASHYD         0202  1  5.0    2.51    0.34 12.25  42.87 0.34   0.000
    [CN=54.3        ]
    [ N = 3.0:Tp 0.14]
*
    READ STORM                  15.0
    [ Ptot=126.76 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\4335f593-3a45-4748-8bfa
    remark: 100yr 24hr 15min SCS Type II (MTO)
*
  * CALIB STANDHYD       0201  1  5.0   11.16    3.32 12.25  93.24 0.74   0.000
    [I%=37.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0501  1  5.0   11.16    0.46 12.83  93.10  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot=126.76 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\4335f593-3a45-4748-8bfa
    remark: 100yr 24hr 15min SCS Type II (MTO)
*
  * CALIB STANDHYD       0203  1  5.0    0.43    0.10 12.25  71.93 0.57   0.000
    [I%=33.0:S%= 2.00]
*
    ADD [  0202+  0203]  0402  3  5.0    2.94    0.44 12.25  47.12  n/a   0.000
*
    ADD [  0402+  0501]  0402  1  5.0   14.10    0.62 12.25  83.51  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot=126.76 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\736d0563-2924-46d1-b6a6-99ff568708bf\4335f593-3a45-4748-8bfa
    remark: 100yr 24hr 15min SCS Type II (MTO)
*
  * CALIB NASHYD         0200  1  5.0    0.37    0.06 12.25  49.33 0.39   0.000
    [CN=59.0        ]
    [ N = 3.0:Tp 0.14]
*
```

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


       V    V   I    SSSSS  U   U    A    L             (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.


                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\6d8fafe7-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\13981d5a-de9d-475d-ae56-06a5922f796b\6d8fafe7-


DATE: 04/05/2024                          TIME: 03:24:59

USER:


COMMENTS: _____________________________________________________


  ************************************************
  ** SIMULATION : Hazel                         **
  ************************************************

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

     START @  0.00 hrs
     --------------------
    READ STORM                60.0
    [ Ptot=212.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\05b1bece-6713-4cd3-a8be-234075ef4a4b\9e68e583-1067-4218-9df6
    remark: Hazel
*
 ** CALIB NASHYD         0202  1  5.0    2.51    0.31 10.00 139.82 0.66   0.000
    [CN=73.0        ]
    [ N = 3.0:Tp 0.14]
*
    READ STORM                60.0
    [ Ptot=212.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\05b1bece-6713-4cd3-a8be-234075ef4a4b\9e68e583-1067-4218-9df6
    remark: Hazel
*
 ** CALIB STANDHYD       0201  1  5.0   11.16    1.59 10.00 190.79 0.90   0.000
    [I%=37.0:S%= 2.00]
*
    READ STORM                60.0
    [ Ptot=212.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\05b1bece-6713-4cd3-a8be-234075ef4a4b\9e68e583-1067-4218-9df6
    remark: Hazel
*
 *  CALIB STANDHYD       0203  1  5.0    0.43    0.06 10.00 166.83 0.79   0.000
    [I%=33.0:S%= 2.00]
*
    ADD [  0201+  0202]  0402  3  5.0   13.67    1.90 10.00 181.43  n/a   0.000
*
    ADD [  0402+  0203]  0402  1  5.0   14.10    1.96 10.00 180.99  n/a   0.000
*
    READ STORM                60.0
    [ Ptot=212.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\05b1bece-6713-4cd3-a8be-234075ef4a4b\9e68e583-1067-4218-9df6
    remark: Hazel
*
 *  CALIB NASHYD         0200  1  5.0    0.37    0.05 10.00 150.34 0.71   0.000
    [CN=77.0        ]
    [ N = 3.0:Tp 0.14]
*
 FINISH

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

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Apr 4 2024

Drainage Channel to SWM Facility - 1:100-Year 24-hr SCS Type II

User-defined

Invert Elev (m)	= 270.6300
Slope (%)	= 1.3000
N-Value	= 0.029

Calculations

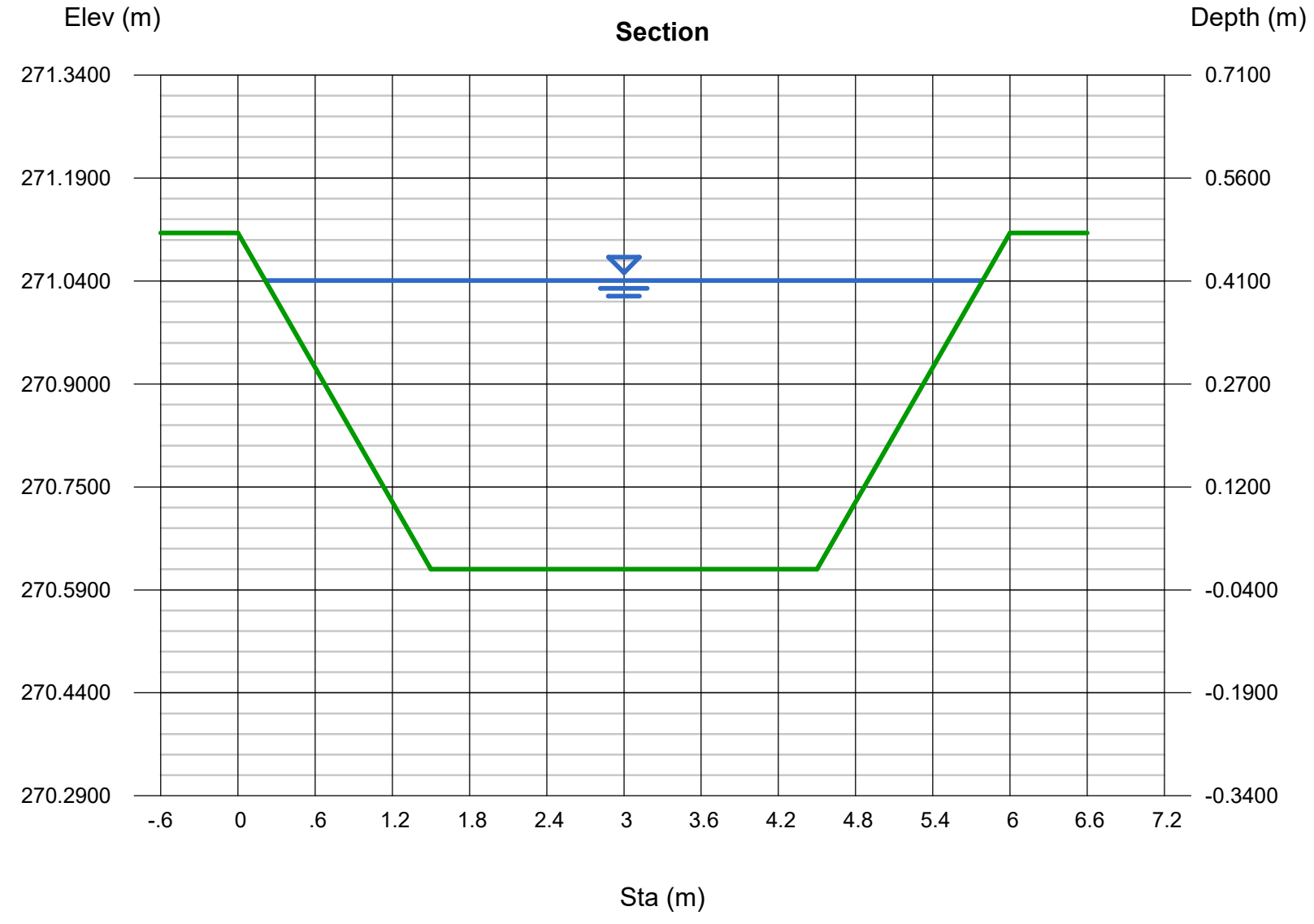
Compute by:	Known Q
Known Q (cms)	= 3.3170

Highlighted

Depth (m)	= 0.4206
Q (cms)	= 3.3170
Area (sqm)	= 1.8035
Velocity (m/s)	= 1.8392
Wetted Perim (m)	= 5.7092
Crit Depth, Yc (m)	= 0.4298
Top Width (m)	= 5.5753
EGL (m)	= 0.5932

(Sta, El, n)-(Sta, El, n)...

(0.0000, 271.1200)-(1.5000, 270.6300, 0.040)-(4.5000, 270.6300, 0.016)-(6.0000, 271.1200, 0.040)



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Apr 4 2024

Drainage Channel to SWM Facility - Hazel

User-defined

Invert Elev (m)	= 270.6300
Slope (%)	= 1.3000
N-Value	= 0.026

Calculations

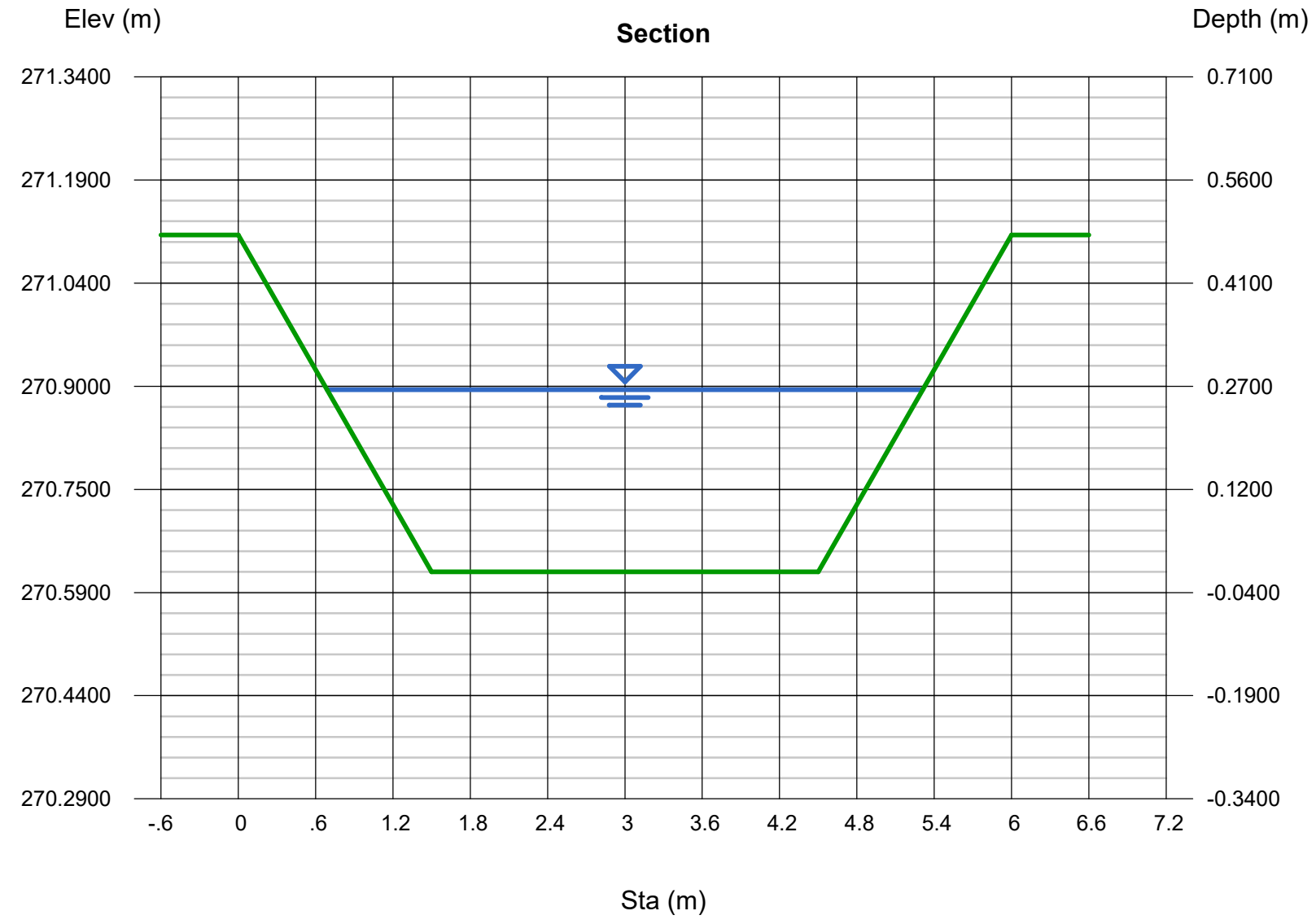
Compute by:	Known Q
Known Q (cms)	= 1.5890

Highlighted

Depth (m)	= 0.2652
Q (cms)	= 1.5890
Area (sqm)	= 1.0108
Velocity (m/s)	= 1.5720
Wetted Perim (m)	= 4.7080
Crit Depth, Yc (m)	= 0.2774
Top Width (m)	= 4.6235
EGL (m)	= 0.3912

(Sta, El, n)-(Sta, El, n)...

(0.0000, 271.1200)-(1.5000, 270.6300, 0.040)-(4.5000, 270.6300, 0.016)-(6.0000, 271.1200, 0.040)



Appendix D:
Stage-Storage-Discharge Tables

Maple Bridge Subdivision
SWM Pond Volume Table

Designed: LJC
Checked: JG
Date: 8/16/2023

Wet Pond Characteristics:

Side Slope:	5 :1
Top Elevation:	269.20 m
Bottom Elev:	265.00 m
Permanent Pool:	267.00 m
Stage	0.1 m

Stormwater Management Pond							
Pond Geometry				Pond Volume (m^3)			
Elevation (m)	Depth (m)	Area (m^2)	Avg. Area (m)	Dead	Accum. Dead	Live	Accum. Live
265.00	**0.00**	**671**	**671.24**	**0.00**	**0.00**	**0.00**	**0.00**
265.10	0.10	760	715.66	71.57	71.57	0.00	0.00
265.20	0.20	849	804.51	80.45	152.02	0.00	0.00
265.30	0.30	938	893.36	89.34	241.35	0.00	0.00
265.40	0.40	1027	982.21	98.22	339.58	0.00	0.00
265.50	0.50	1115	1071.06	107.11	446.68	0.00	0.00
265.60	0.60	1204	1159.91	115.99	562.67	0.00	0.00
265.70	0.70	1293	1248.76	124.88	687.55	0.00	0.00
265.80	0.80	1382	1337.61	133.76	821.31	0.00	0.00
265.90	0.90	1471	1426.46	142.65	963.96	0.00	0.00
266.00	1.00	1560	1515.31	151.53	1115.49	0.00	0.00
266.10	1.10	1649	1604.16	160.42	1275.90	0.00	0.00
266.20	1.20	1737	1693.01	169.30	1445.20	0.00	0.00
266.30	1.30	1826	1781.86	178.19	1623.39	0.00	0.00
266.40	1.40	1915	1870.71	187.07	1810.46	0.00	0.00
266.50	1.50	2004	1959.56	195.96	2006.42	0.00	0.00
266.60	1.60	2093	2048.41	204.84	2211.26	0.00	0.00
266.70	1.70	2182	2137.26	213.73	2424.98	0.00	0.00
266.80	1.80	2271	2226.11	222.61	2647.59	0.00	0.00
266.90	1.90	2359	2314.96	231.50	2879.09	0.00	0.00
267.00	**2.00**	**2448**	**2403.81**	**240.38**	**2657.14**	**0.00**	**0.00**
267.10	2.10	2542	2495.19	240.38	2657.14	249.52	249.52
267.20	2.20	2636	2589.10	240.38	2657.14	258.91	508.43
267.30	2.30	2730	2683.01	240.38	2657.14	268.30	776.73
267.40	2.40	2824	2776.92	240.38	2657.14	277.69	1054.42
267.50	2.50	2918	2870.84	240.38	2657.14	287.08	1341.51
267.60	2.60	3012	2964.75	240.38	2657.14	296.47	1637.98
267.70	2.70	3106	3058.66	240.38	2657.14	305.87	1943.85
267.80	2.80	3200	3152.57	240.38	2657.14	315.26	2259.10
267.90	2.90	3293	3246.48	240.38	2657.14	324.65	2583.75
268.00	3.00	3387	3340.40	240.38	2657.14	334.04	2917.79
268.10	3.10	3481	3434.31	240.38	2657.14	343.43	3261.22
268.20	3.20	3575	3528.22	240.38	2657.14	352.82	3614.04
268.30	3.30	3669	3622.13	240.38	2657.14	362.21	3976.26
268.40	3.40	3763	3716.05	240.38	2657.14	371.60	4347.86
268.50	3.50	3857	3809.96	240.38	2657.14	381.00	4728.86
268.60	3.60	3951	3903.87	240.38	2657.14	390.39	5119.25
268.70	3.70	4045	3997.78	240.38	2657.14	399.78	5519.02
268.80	3.80	4139	4091.69	240.38	2657.14	409.17	5928.19
268.90	3.90	4233	4185.61	240.38	2657.14	418.56	6346.75
269.00	4.00	4326	4279.52	240.38	2657.14	427.95	6774.71
269.10	4.10	4420	4373.43	240.38	2657.14	437.34	7212.05
269.20	**4.20**	**4514**	**4467.34**	**240.38**	**2657.14**	**446.73**	**7658.78**

Maple Bridge Subdivision
SWM Pond Discharge Table

Designed:	LJC
Checked:	JG
Date:	8/16/2023

Pond Discharge Table:

Orifice #1:		**Orifice #2:**			**Outlet Pipe**		**Overflow Weir:**		
Diameter:	85	Diameter:	375	mm	Diameter:	600	Bottom Length:	3	m
Area:	0.0057	Area:	0.1104	m^2	Area:	0.2827	Sill Elevation:	268.7	m
C:	0.63	C:	0.63		C:	0.8	D/S Weir Length:	15.4	m
Invert:	267.00	Invert:	267.9	m	Invert:	267.00	Side Slopes (H:V)	5	:1

	Orifice #1		Orifice #2		Outlet Pipe		Overflow Weir			
Elevation (m)	Head (m)	Discharge (m)	Head (m)	Discharge (m)	Head (m)	Discharge (m)	Head (m)	Discharge (m)	Hydraulic Control	Discharge (m^3/s)
267.00	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	Orifice	0.000
267.10	0.058	0.004	0.000	0.000	0.100	0.317	0	0.000	Orifice	0.004
267.20	0.158	0.006	0.000	0.000	0.200	0.448	0	0.000	Orifice	0.006
267.30	0.258	0.008	0.000	0.000	0.300	0.549	0	0.000	Orifice	0.008
267.40	0.358	0.009	0.000	0.000	0.400	0.634	0	0.000	Orifice	0.009
267.50	0.458	0.011	0.000	0.000	0.500	0.708	0	0.000	Orifice	0.011
267.60	0.558	0.012	0.000	0.000	0.600	0.776	0	0.000	Orifice	0.012
267.70	0.658	0.013	0.000	0.000	0.700	0.838	0	0.000	Orifice	0.013
267.80	0.758	0.014	0.000	0.000	0.800	0.896	0	0.000	Orifice	0.014
267.90	0.858	0.015	0.000	0.000	0.900	0.951	0	0.000	Orifice	0.015
268.00	0.958	0.015	0.000	0.000	1.000	1.002	0	0.000	Orifice	0.015
268.10	1.058	0.016	0.013	0.034	1.100	1.051	0	0.000	Orifice	0.051
268.20	1.158	0.017	0.113	0.103	1.200	1.098	0	0.000	Orifice	0.120
268.30	1.258	0.018	0.213	0.142	1.300	1.142	0	0.000	Orifice	0.160
268.40	1.358	0.018	0.313	0.172	1.400	1.185	0	0.000	Orifice	0.191
268.50	1.458	0.019	0.413	0.198	1.500	1.227	0	0.000	Orifice	0.217
268.60	1.558	0.020	0.513	0.221	1.600	1.267	0	0.000	Orifice	0.240
268.70	1.658	0.020	0.613	0.241	1.700	1.306	8.5E-13	0.000	Orifice	0.262
268.80	1.758	0.021	0.713	0.260	1.800	1.344	0.1	0.149	Orifice	0.431
268.90	1.858	0.022	0.813	0.278	1.900	1.381	0.2	0.470	Orifice	0.769
269.00	1.958	0.022	0.913	0.294	2.000	1.417	0.3	0.949	Orifice	1.265
269.10	2.058	0.023	1.013	0.310	2.100	1.452	0.4	1.609	Orifice	1.942
269.20	2.157	0.023	1.113	0.325	2.200	1.486	0.5	2.476	Orifice	2.824

Comments:

1 **Orifice Equation is:** $Q = C \times A \times (2gH)^{0.5}$

Where:
Q = flow rate (cms)
C = constant
A = area of opening(sq. m)
H = net head on the orifice
g = Acceleration due to gravity

Maple Bridge Subdivision
Discharge-Volume

Designed:	LJC
Checked:	JG
Date:	8/16/2023

Elevation	Discharge	Volume
267.00	0.00	0.00
267.10	0.00	249.52
267.20	0.01	508.43
267.30	0.01	776.73
267.40	0.01	1054.42
267.50	0.01	1341.51
267.60	0.01	1637.98
267.70	0.01	1943.85
267.80	0.01	2259.10
267.90	0.01	2583.75
268.00	0.02	2917.79
268.10	0.05	3261.22
268.20	0.12	3614.04
268.30	0.16	3976.26
268.40	0.19	4347.86
268.50	0.22	4728.86
268.60	0.24	5119.25
268.70	0.26	5519.02
268.80	0.43	5928.19
268.90	0.77	6346.75
269.00	1.27	6774.71
269.10	1.94	7212.05
269.20	2.82	7658.78

Maple Bridge Subdivision
Stage-Storage-Discharge

Designed:	LJC
Checked:	JG
Date:	8/16/2023

Stormwater Management Pond							
Pond Geometry				Pond Volume (m^3)			Discharge
Elevation (m)	Depth (m)	Area (m^2)	Avg. Area (m)	Dead	Live	Total	(m^3/s)
265.00	**0.00**	**671.2**	**671.2**	**0**	**0**	**0.0**	**0.000**
265.10	0.10	760.1	715.7	71.6	0	71.6	0.000
265.20	0.20	848.9	804.5	152.0	0	152.0	0.000
265.30	0.30	937.8	893.4	241.4	0	241.4	0.000
265.40	0.40	1026.6	982.2	339.6	0	339.6	0.000
265.50	0.50	1115.5	1071.1	446.7	0	446.7	0.000
265.60	0.60	1204.3	1159.9	562.7	0	562.7	0.000
265.70	0.70	1293.2	1248.8	687.5	0	687.5	0.000
265.80	0.80	1382.0	1337.6	821.3	0	821.3	0.000
265.90	0.90	1470.9	1426.5	964.0	0	964.0	0.000
266.00	1.00	1559.7	1515.3	1115.5	0	1115.5	0.000
266.10	1.10	1648.6	1604.2	1275.9	0	1275.9	0.000
266.20	1.20	1737.4	1693.0	1445.2	0	1445.2	0.000
266.30	1.30	1826.3	1781.9	1623.4	0	1623.4	0.000
266.40	1.40	1915.1	1870.7	1810.5	0	1810.5	0.000
266.50	1.50	2004.0	1959.6	2006.4	0	2006.4	0.000
266.60	1.60	2092.8	2048.4	2211.3	0	2211.3	0.000
266.70	1.70	2181.7	2137.3	2425.0	0	2425.0	0.000
266.80	1.80	2270.5	2226.1	2647.6	0	2647.6	0.000
266.90	1.90	2359.4	2315.0	2879.1	0	2879.1	0.000
267.00	**2.00**	**2448.2**	**2403.8**	**2657.1**	**0**	**2657.1**	**0.000**
267.10	2.10	2542.1	2495.2	2657.1	250	2906.7	0.004
267.20	2.20	2636.1	2589.1	2657.1	508	3165.6	0.006
267.30	2.30	2730.0	2683.0	2657.1	777	3433.9	0.008
267.40	2.40	2823.9	2776.9	2657.1	1054	3711.6	0.009
267.50	2.50	2917.8	2870.8	2657.1	1342	3998.6	0.011
267.60	2.60	3011.7	2964.7	2657.1	1638	4295.1	0.012
267.70	2.70	3105.6	3058.7	2657.1	1944	4601.0	0.013
267.80	2.80	3199.5	3152.6	2657.1	2259	4916.2	0.014
267.90	2.90	3293.4	3246.5	2657.1	2584	5240.9	0.015
268.00	3.00	3387.4	3340.4	2657.1	2918	5574.9	0.015
268.10	3.10	3481.3	3434.3	2657.1	3261	5918.4	0.051
268.20	3.20	3575.2	3528.2	2657.1	3614	6271.2	0.120
268.30	3.30	3669.1	3622.1	2657.1	3976	6633.4	0.160
268.40	3.40	3763.0	3716.0	2657.1	4348	7005.0	0.191
268.50	3.50	3856.9	3810.0	2657.1	4729	7386.0	0.217
268.60	3.60	3950.8	3903.9	2657.1	5119	7776.4	0.240
268.70	3.70	4044.7	3997.8	2657.1	5519	8176.2	0.262
268.80	3.80	4138.7	4091.7	2657.1	5928	8585.3	0.431
268.90	3.90	4232.6	4185.6	2657.1	6347	9003.9	0.769
269.00	4.00	4326.5	4279.5	2657.1	6775	9431.8	1.265
269.10	4.10	4420.4	4373.4	2657.1	7212	9869.2	1.942
269.20	**4.20**	**4514.3**	**4467.3**	**2657.1**	**7659**	**10315.9**	**2.824**

Total Dead Storage = **2657** m^3
Total Live Storage = **7659** m^3

```
**********************************
** SIMULATION:25 mm 4-hr CHI  **
**********************************
--------------------
| RESERVOIR(  0501)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.0150     0.2920
                         0.0040     0.0250   |   0.0510     0.3260
                         0.0060     0.0510   |   0.1200     0.3610
                         0.0080     0.0780   |   0.1600     0.3980
                         0.0090     0.1050   |   0.1910     0.4350
                         0.0110     0.1340   |   0.2170     0.4730
                         0.0120     0.1640   |   0.2400     0.5120
                         0.0130     0.1940   |   0.2620     0.5520
                         0.0140     0.2260   |   0.4310     0.5930
                         0.0150     0.2580   |   0.7690     0.6350

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0201)     11.160      0.500      1.50      11.93
   OUTFLOW: ID= 1 (  0501)     11.160      0.010      4.42      11.79

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.03
                  TIME SHIFT OF PEAK FLOW         (min)=175.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1221

--------------------------------------------------------------------------------
**********************************************
** SIMULATION:Run 01 - 2yr 4hr 10min Chicago **
**********************************************
--------------------
| RESERVOIR(  0501)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.0150     0.2920
                         0.0040     0.0250   |   0.0510     0.3260
                         0.0060     0.0510   |   0.1200     0.3610
                         0.0080     0.0780   |   0.1600     0.3980
                         0.0090     0.1050   |   0.1910     0.4350
                         0.0110     0.1340   |   0.2170     0.4730
                         0.0120     0.1640   |   0.2400     0.5120
                         0.0130     0.1940   |   0.2620     0.5520
                         0.0140     0.2260   |   0.4310     0.5930
                         0.0150     0.2580   |   0.7690     0.6350

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0201)     11.160      0.819      1.33      17.17
   OUTFLOW: ID= 1 (  0501)     11.160      0.012      4.33      17.03

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  1.52
                  TIME SHIFT OF PEAK FLOW         (min)=180.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1778

--------------------------------------------------------------------------------
**********************************************
** SIMULATION:Run 02 - 5yr 4hr 10min Chicago **
**********************************************
--------------------
| RESERVOIR(  0501)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.0150     0.2920
                         0.0040     0.0250   |   0.0510     0.3260
                         0.0060     0.0510   |   0.1200     0.3610
                         0.0080     0.0780   |   0.1600     0.3980
                         0.0090     0.1050   |   0.1910     0.4350
                         0.0110     0.1340   |   0.2170     0.4730
                         0.0120     0.1640   |   0.2400     0.5120
                         0.0130     0.1940   |   0.2620     0.5520
                         0.0140     0.2260   |   0.4310     0.5930
                         0.0150     0.2580   |   0.7690     0.6350

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0201)     11.160      1.200      1.33      24.84
   OUTFLOW: ID= 1 (  0501)     11.160      0.015      4.00      24.70

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  1.25
                  TIME SHIFT OF PEAK FLOW         (min)=160.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.2608

--------------------------------------------------------------------------------
**********************************************
** SIMULATION:Run 03 - 10yr 4hr 10min Chicago **
**********************************************
--------------------
| RESERVOIR(  0501)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.0150     0.2920
                         0.0040     0.0250   |   0.0510     0.3260
                         0.0060     0.0510   |   0.1200     0.3610
                         0.0080     0.0780   |   0.1600     0.3980
                         0.0090     0.1050   |   0.1910     0.4350
                         0.0110     0.1340   |   0.2170     0.4730
                         0.0120     0.1640   |   0.2400     0.5120
                         0.0130     0.1940   |   0.2620     0.5520
                         0.0140     0.2260   |   0.4310     0.5930
                         0.0150     0.2580   |   0.7690     0.6350

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0201)     11.160      1.444      1.33      30.07
   OUTFLOW: ID= 1 (  0501)     11.160      0.037      4.17      29.93

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.59
                  TIME SHIFT OF PEAK FLOW         (min)=170.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.3132

--------------------------------------------------------------------------------
**********************************************
** SIMULATION:Run 04 - 25yr 4hr 10min Chicago **
**********************************************
--------------------
| RESERVOIR(  0501)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.0150     0.2920
                         0.0040     0.0250   |   0.0510     0.3260
                         0.0060     0.0510   |   0.1200     0.3610
                         0.0080     0.0780   |   0.1600     0.3980
                         0.0090     0.1050   |   0.1910     0.4350
                         0.0110     0.1340   |   0.2170     0.4730
                         0.0120     0.1640   |   0.2400     0.5120
                         0.0130     0.1940   |   0.2620     0.5520
                         0.0140     0.2260   |   0.4310     0.5930
                         0.0150     0.2580   |   0.7690     0.6350

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0201)     11.160      1.770      1.33      37.03
   OUTFLOW: ID= 1 (  0501)     11.160      0.103      4.00      36.89

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  5.80
                  TIME SHIFT OF PEAK FLOW         (min)=160.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.3524

--------------------------------------------------------------------------------
**********************************************
** SIMULATION:Run 05 - 50yr 4hr 10min Chicago **
**********************************************
--------------------
| RESERVOIR(  0501)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.0150     0.2920
                         0.0040     0.0250   |   0.0510     0.3260
                         0.0060     0.0510   |   0.1200     0.3610
                         0.0080     0.0780   |   0.1600     0.3980
                         0.0090     0.1050   |   0.1910     0.4350
                         0.0110     0.1340   |   0.2170     0.4730
                         0.0120     0.1640   |   0.2400     0.5120
                         0.0130     0.1940   |   0.2620     0.5520
                         0.0140     0.2260   |   0.4310     0.5930
                         0.0150     0.2580   |   0.7690     0.6350

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0201)     11.160      2.018      1.33      42.29
   OUTFLOW: ID= 1 (  0501)     11.160      0.135      3.75      42.15
```

```
                    PEAK    FLOW    REDUCTION [Qout/Qin](%)=  6.67
                    TIME SHIFT OF PEAK FLOW          (min)=145.00
                    MAXIMUM  STORAGE    USED        (ha.m.)=  0.3745

------------------------------------------------------------------------------
**************************************************
** SIMULATION:Run 06 - 100yr 4hr 10min Chicago **
**************************************************
--------------------
| RESERVOIR(  0501)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                          0.0000     0.0000    |   0.0150      0.2920
                          0.0040     0.0250    |   0.0510      0.3260
                          0.0060     0.0510    |   0.1200      0.3610
                          0.0080     0.0780    |   0.1600      0.3980
                          0.0090     0.1050    |   0.1910      0.4350
                          0.0110     0.1340    |   0.2170      0.4730
                          0.0120     0.1640    |   0.2400      0.5120
                          0.0130     0.1940    |   0.2620      0.5520
                          0.0140     0.2260    |   0.4310      0.5930
                          0.0150     0.2580    |   0.7690      0.6350

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0201)     11.160     2.534      1.33      47.68
   OUTFLOW: ID= 1 (  0501)     11.160     0.164      3.50      47.54

                    PEAK    FLOW    REDUCTION [Qout/Qin](%)=  6.47
                    TIME SHIFT OF PEAK FLOW          (min)=130.00
                    MAXIMUM  STORAGE    USED        (ha.m.)=  0.4028

------------------------------------------------------------------------------
************************************************************
** SIMULATION:Run 07 - 2yr 12hr 15min SCS Type II (MTO) **
************************************************************
--------------------
| RESERVOIR(  0501)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                          0.0000     0.0000    |   0.0150      0.2920
                          0.0040     0.0250    |   0.0510      0.3260
                          0.0060     0.0510    |   0.1200      0.3610
                          0.0080     0.0780    |   0.1600      0.3980
                          0.0090     0.1050    |   0.1910      0.4350
                          0.0110     0.1340    |   0.2170      0.4730
                          0.0120     0.1640    |   0.2400      0.5120
                          0.0130     0.1940    |   0.2620      0.5520
                          0.0140     0.2260    |   0.4310      0.5930
                          0.0150     0.2580    |   0.7690      0.6350

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0201)     11.160     0.899      6.25      26.26
   OUTFLOW: ID= 1 (  0501)     11.160     0.015     12.33      26.12

                    PEAK    FLOW    REDUCTION [Qout/Qin](%)=  1.66
                    TIME SHIFT OF PEAK FLOW          (min)=365.00
                    MAXIMUM  STORAGE    USED        (ha.m.)=  0.2560

------------------------------------------------------------------------------
************************************************************
** SIMULATION:Run 08 - 5yr 12hr 15min SCS Type II (MTO) **
************************************************************
--------------------
| RESERVOIR(  0501)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                          0.0000     0.0000    |   0.0150      0.2920
                          0.0040     0.0250    |   0.0510      0.3260
                          0.0060     0.0510    |   0.1200      0.3610
                          0.0080     0.0780    |   0.1600      0.3980
                          0.0090     0.1050    |   0.1910      0.4350
                          0.0110     0.1340    |   0.2170      0.4730
                          0.0120     0.1640    |   0.2400      0.5120
                          0.0130     0.1940    |   0.2620      0.5520
                          0.0140     0.2260    |   0.4310      0.5930
                          0.0150     0.2580    |   0.7690      0.6350

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0201)     11.160     1.319      6.25      37.93
   OUTFLOW: ID= 1 (  0501)     11.160     0.059      8.58      37.78

                    PEAK    FLOW    REDUCTION [Qout/Qin](%)=  4.44
                    TIME SHIFT OF PEAK FLOW          (min)=140.00
                    MAXIMUM  STORAGE    USED        (ha.m.)=  0.3299

------------------------------------------------------------------------------
************************************************************
** SIMULATION:Run 09 - 10yr 12hr 15min SCS Type II (MTO) **
************************************************************
--------------------
| RESERVOIR(  0501)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                          0.0000     0.0000    |   0.0150      0.2920
                          0.0040     0.0250    |   0.0510      0.3260
                          0.0060     0.0510    |   0.1200      0.3610
                          0.0080     0.0780    |   0.1600      0.3980
                          0.0090     0.1050    |   0.1910      0.4350
                          0.0110     0.1340    |   0.2170      0.4730
                          0.0120     0.1640    |   0.2400      0.5120
                          0.0130     0.1940    |   0.2620      0.5520
                          0.0140     0.2260    |   0.4310      0.5930
                          0.0150     0.2580    |   0.7690      0.6350

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0201)     11.160     1.610      6.25      45.84
   OUTFLOW: ID= 1 (  0501)     11.160     0.121      7.50      45.69

                    PEAK    FLOW    REDUCTION [Qout/Qin](%)=  7.50
                    TIME SHIFT OF PEAK FLOW          (min)= 75.00
                    MAXIMUM  STORAGE    USED        (ha.m.)=  0.3618

------------------------------------------------------------------------------
************************************************************
** SIMULATION:Run 10 - 25yr 12hr 15min SCS Type II (MTO) **
************************************************************
--------------------
| RESERVOIR(  0501)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                          0.0000     0.0000    |   0.0150      0.2920
                          0.0040     0.0250    |   0.0510      0.3260
                          0.0060     0.0510    |   0.1200      0.3610
                          0.0080     0.0780    |   0.1600      0.3980
                          0.0090     0.1050    |   0.1910      0.4350
                          0.0110     0.1340    |   0.2170      0.4730
                          0.0120     0.1640    |   0.2400      0.5120
                          0.0130     0.1940    |   0.2620      0.5520
                          0.0140     0.2260    |   0.4310      0.5930
                          0.0150     0.2580    |   0.7690      0.6350

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0201)     11.160     2.001      6.25      56.28
   OUTFLOW: ID= 1 (  0501)     11.160     0.182      7.25      56.14

                    PEAK    FLOW    REDUCTION [Qout/Qin](%)=  9.09
                    TIME SHIFT OF PEAK FLOW          (min)= 60.00
                    MAXIMUM  STORAGE    USED        (ha.m.)=  0.4241

------------------------------------------------------------------------------
************************************************************
** SIMULATION:Run 11 - 50yr 12hr 15min SCS Type II (MTO) **
************************************************************
--------------------
| RESERVOIR(  0501)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                          0.0000     0.0000    |   0.0150      0.2920
                          0.0040     0.0250    |   0.0510      0.3260
                          0.0060     0.0510    |   0.1200      0.3610
                          0.0080     0.0780    |   0.1600      0.3980
                          0.0090     0.1050    |   0.1910      0.4350
                          0.0110     0.1340    |   0.2170      0.4730
                          0.0120     0.1640    |   0.2400      0.5120
                          0.0130     0.1940    |   0.2620      0.5520
                          0.0140     0.2260    |   0.4310      0.5930
```

0.0150	0.2580	0.7690	0.6350

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0201)	11.160	2.466	6.25	64.14
OUTFLOW: ID= 1 (0501)	11.160	0.219	7.08	64.00

PEAK FLOW REDUCTION [Qout/Qin](%)= 8.88
TIME SHIFT OF PEAK FLOW (min)= 50.00
MAXIMUM STORAGE USED (ha.m.)= 0.4765

****
** SIMULATION:Run 12 - 100yr 12hr 15min SCS Type II (MTO) **
****

RESERVOIR(0501) / IN= 2---> OUT= 1 / DT= 5.0 min	OVERFLOW IS OFF			
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0150	0.2920
	0.0040	0.0250	0.0510	0.3260
	0.0060	0.0510	0.1200	0.3610
	0.0080	0.0780	0.1600	0.3980
	0.0090	0.1050	0.1910	0.4350
	0.0110	0.1340	0.2170	0.4730
	0.0120	0.1640	0.2400	0.5120
	0.0130	0.1940	0.2620	0.5520
	0.0140	0.2260	0.4310	0.5930
	0.0150	0.2580	0.7690	0.6350

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0201)	11.160	2.799	6.25	72.15
OUTFLOW: ID= 1 (0501)	11.160	0.251	7.08	72.01

PEAK FLOW REDUCTION [Qout/Qin](%)= 8.98
TIME SHIFT OF PEAK FLOW (min)= 50.00
MAXIMUM STORAGE USED (ha.m.)= 0.5328

****
** SIMULATION:Run 13 - 2yr 24hr 15min SCS Type II (MTO) **
****

RESERVOIR(0501) / IN= 2---> OUT= 1 / DT= 5.0 min	OVERFLOW IS OFF			
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0150	0.2920
	0.0040	0.0250	0.0510	0.3260
	0.0060	0.0510	0.1200	0.3610
	0.0080	0.0780	0.1600	0.3980
	0.0090	0.1050	0.1910	0.4350
	0.0110	0.1340	0.2170	0.4730
	0.0120	0.1640	0.2400	0.5120
	0.0130	0.1940	0.2620	0.5520
	0.0140	0.2260	0.4310	0.5930
	0.0150	0.2580	0.7690	0.6350

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0201)	11.160	1.061	12.25	34.29
OUTFLOW: ID= 1 (0501)	11.160	0.022	20.33	34.15

PEAK FLOW REDUCTION [Qout/Qin](%)= 2.05
TIME SHIFT OF PEAK FLOW (min)=485.00
MAXIMUM STORAGE USED (ha.m.)= 0.2984

****
** SIMULATION:Run 14 - 5yr 24hr 15min SCS Type II (MTO) **
****

RESERVOIR(0501) / IN= 2---> OUT= 1 / DT= 5.0 min	OVERFLOW IS OFF			
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0150	0.2920
	0.0040	0.0250	0.0510	0.3260
	0.0060	0.0510	0.1200	0.3610
	0.0080	0.0780	0.1600	0.3980
	0.0090	0.1050	0.1910	0.4350
	0.0110	0.1340	0.2170	0.4730
	0.0120	0.1640	0.2400	0.5120
	0.0130	0.1940	0.2620	0.5520
	0.0140	0.2260	0.4310	0.5930
	0.0150	0.2580	0.7690	0.6350

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0201)	11.160	1.557	12.25	49.40
OUTFLOW: ID= 1 (0501)	11.160	0.106	13.58	49.26

PEAK FLOW REDUCTION [Qout/Qin](%)= 6.79
TIME SHIFT OF PEAK FLOW (min)= 80.00
MAXIMUM STORAGE USED (ha.m.)= 0.3538

****
** SIMULATION:Run 15 - 10yr 24hr 15min SCS Type II (MTO) **
****

RESERVOIR(0501) / IN= 2---> OUT= 1 / DT= 5.0 min	OVERFLOW IS OFF			
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0150	0.2920
	0.0040	0.0250	0.0510	0.3260
	0.0060	0.0510	0.1200	0.3610
	0.0080	0.0780	0.1600	0.3980
	0.0090	0.1050	0.1910	0.4350
	0.0110	0.1340	0.2170	0.4730
	0.0120	0.1640	0.2400	0.5120
	0.0130	0.1940	0.2620	0.5520
	0.0140	0.2260	0.4310	0.5930
	0.0150	0.2580	0.7690	0.6350

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0201)	11.160	1.900	12.25	59.60
OUTFLOW: ID= 1 (0501)	11.160	0.166	13.25	59.46

PEAK FLOW REDUCTION [Qout/Qin](%)= 8.75
TIME SHIFT OF PEAK FLOW (min)= 60.00
MAXIMUM STORAGE USED (ha.m.)= 0.4056

****
** SIMULATION:Run 16 - 25yr 24hr 15min SCS Type II (MTO) **
****

RESERVOIR(0501) / IN= 2---> OUT= 1 / DT= 5.0 min	OVERFLOW IS OFF			
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0150	0.2920
	0.0040	0.0250	0.0510	0.3260
	0.0060	0.0510	0.1200	0.3610
	0.0080	0.0780	0.1600	0.3980
	0.0090	0.1050	0.1910	0.4350
	0.0110	0.1340	0.2170	0.4730
	0.0120	0.1640	0.2400	0.5120
	0.0130	0.1940	0.2620	0.5520
	0.0140	0.2260	0.4310	0.5930
	0.0150	0.2580	0.7690	0.6350

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0201)	11.160	2.546	12.25	72.99
OUTFLOW: ID= 1 (0501)	11.160	0.225	13.08	72.85

PEAK FLOW REDUCTION [Qout/Qin](%)= 8.82
TIME SHIFT OF PEAK FLOW (min)= 50.00
MAXIMUM STORAGE USED (ha.m.)= 0.4859

****
** SIMULATION:Run 17 - 50yr 24hr 15min SCS Type II (MTO) **
****

RESERVOIR(0501) / IN= 2---> OUT= 1 / DT= 5.0 min	OVERFLOW IS OFF			
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0150	0.2920
	0.0040	0.0250	0.0510	0.3260
	0.0060	0.0510	0.1200	0.3610

```
                          0.0080     0.0780   |   0.1600      0.3980
                          0.0090     0.1050   |   0.1910      0.4350
                          0.0110     0.1340   |   0.2170      0.4730
                          0.0120     0.1640   |   0.2400      0.5120
                          0.0130     0.1940   |   0.2620      0.5520
                          0.0140     0.2260   |   0.4310      0.5930
                          0.0150     0.2580   |   0.7690      0.6350

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0201)     11.160      2.927     12.25      83.03
   OUTFLOW: ID= 1 (  0501)     11.160      0.261     13.00      82.89

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  8.92
                   TIME SHIFT OF PEAK FLOW         (min)= 45.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.5506

--------------------------------------------------------------------------------
************************************************************
** SIMULATION:Run 18 - 100yr 24hr 15min SCS Type II (MTO) **
************************************************************
--------------------
| RESERVOIR(  0501)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0150      0.2920
                          0.0040     0.0250   |   0.0510      0.3260
                          0.0060     0.0510   |   0.1200      0.3610
                          0.0080     0.0780   |   0.1600      0.3980
                          0.0090     0.1050   |   0.1910      0.4350
                          0.0110     0.1340   |   0.2170      0.4730
                          0.0120     0.1640   |   0.2400      0.5120
                          0.0130     0.1940   |   0.2620      0.5520
                          0.0140     0.2260   |   0.4310      0.5930
                          0.0150     0.2580   |   0.7690      0.6350

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0201)     11.160      3.317     12.25      93.24
   OUTFLOW: ID= 1 (  0501)     11.160      0.463     12.83      93.10

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 13.97
                   TIME SHIFT OF PEAK FLOW         (min)= 35.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.5976

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

Appendix E:
Water Quality Calculations

Water Quality Requirements

Project Details

Maple Bridge Subdivision	422492

Prepared By

LJC	4/4/2024

Water Quality Sizing Criteria

Methodology & Data Source	Volumetric water quality criteria as presented in Table 3.2 in Ministry of Environment, Conservation and Parks (MECP) Stormwater Management Planning & Design Manual (SWMPDM) March 2003.

Contributing Catchments

Catchment ID	Area (ha)	Impervious (%)
201	11.16	73%
Total	**11.16**	**73.0%**

Treatment Method Details

SWM Facility Type	Wet Pond
Target Treatment Level	Enhanced Level
Treatment Percentage	80%

Treatment

Water Quality Storage Requirement	1,998	m^3
Extended Detention Volume (40 m^3)	446	m^3
Permanent Pool Volume Required	1,551	m^3
25 mm Storm Runoff Depth	12	mm
25 mm Storm Runoff Volume	1,316	m^3
Required Extended Detention Volume	1,316	m^3
Erosion Control Storage Required	2,009	m^3

Permanent Pool Volume Provided	2,657	**Provided > Required**	
Extended Detention Storage Provided	2,584	**Provided > Required**	
Active Storage Provided	5,976	**Provided > Required**	

TATHAM ENGINEERING

PROJECT	Maple Bridge Subdivision, Phase 2	FILE	422492
		DATE	4/4/2024
SUBJECT	Orifice Drawdown Time - 25mm Water Quality Volume	NAME	LJC
		PAGE	1 OF 1

Checked: JG

Drawdown Time (Equation 4.10 - MECP SWM Planning & Design Manual

$$t = \frac{2 A_p}{C A_o (2g)^{0.5}} (h_1^{0.5} - h_2^{0.5})$$

where:
- t = drawdown time (seconds)
- A_p = surface area of pond (m^2) (at extended detention depth)
- c = discharge coefficient
- A_o = cross-sectional area of orifice (m^2)
- g = gravitational acceleration constant (9.81 m/s^2)
- h_1 = starting water elevation above the orifice (m) (at centroid)
- h_2 = ending water elevation above the orifice (m) (at centroid)

Orifice Diameter 85 mm

Permanent Pool: 267.00 m
Extended Detention: 267.46 m
Orifice Invert 267.00 m

Note: Extended detention volume, surface area and elevation determined from Stage-Storage-Discharge calculation sheet

Therefore:

A_p	=	2,852	m^2	
c	=	0.63		
A_o	=	0.006	m^2	
g	=	9.81	m/s^2	
h_1	=	0.42		267.46 m
h_2	=	0.00		267.04 m

t = 232,754 seconds

t = 64.7 hours

PROJECT	Maple Bridge Subdivision	FILE	422492
		DATE	4/4/2024
SUBJECT	Water Quality - Treatment Train Calculations	NAME	LJC
		PAGE	1 OF 1

Water Quality Treatment Train Calculations

Site Area (Catchment 201)

Total Drainage Area Conveyed to Controls: 11.4 ha

Total Imperviousness Conveyed to Controls: 71%

Device		Target Total Suspended Solids (TSS) Removal
Primary Treatment	Wet Pond	80%

Note: TSS removal efficiencies obtained from the Sustainable Technologies Evaluation Program (STEP) Low Impact Development Treatment Tool.

$$\textbf{TSS Removal} = 1 - [(1 - R_P) \times (1 - R_S) \times (1 - R_T)]$$

where:

R_P = % TSS Removal provided by Primary Treatment Strategy

R_S = % TSS Removal provided by Secondary Treatment Strategy

R_T = % TSS Removal provided by Tertiary Treatment Strategy

TSS Removal Provided By Controls: **80%**

Due to grading constraints, Catchment 202 by-passes the wet pond and discharges flows directly to Uxbridge Brooke Tributary 6.1. Best efforts were made to mimize the post-development flows discharging to the tributary and therefore minimize the discharge of TSS at the tributary.

Appendix F:
Water Balance

TATHAM ENGINEERING

PROJECT	Maple Bridge Subdivision, Phase 2	FILE	422492
		DATE	4/4/2024
SUBJECT	Soakaway Pit Sizing	NAME	LJC/JG
		PAGE	1 OF 1

SINGLE FAMILY DWELLINGS

Soakaway Pit Length	1.5	m
Soakaway Pit Width	2	m
Pipe Diamter	0.15	m
Clearstone Height	1.2	m
Clearstone Void Ratio	0.4	
Pipe Storage Volume	0.03	m^3
Clearstone Storage Volume	1.43	m^3
Total Storage Volume	1.46	m^3
Total Site Impervious Area	8.42	ha
Number of Soakaway Pits	154	
Total Storage Volume	**224**	**m^3**
Equivalent Storm Captured	**2.7**	**mm**

TOWNHOUSES

Soakaway Pit Length	1.5	m
Soakaway Pit Width	2	m
Pipe Diamter	0.15	m
Clearstone Height	1.2	m
Clearstone Void Ratio	0.4	
Pipe Storage Volume	0.03	m^3
Clearstone Storage Volume	1.43	m^3
Total Storage Volume	1.46	m^3
Total Site Impervious Area	8.42	ha
Number of Soakaway Pits	82	
Total Storage Volume	**119**	**m^3**
Equivalent Storm Captured	**1.4**	**mm**

Total Storage Volume	**344**	**m^3**
Total Equivalent Storm Captured	**4.1**	**mm**

TATHAM ENGINEERING

Water Budget
Climate Normal Data

Project Details

Maple Bridge Subdivision	422492

Prepared By

LJC/JG	4/4/2024

Water Budget Details

Methodology	Thornthwaite Method
Climate Data & Source	King Smoke Tree
	Climate Normal Data for 1984 to 2003 (Environment Canada)
Thornthwaite Coefficient	1.076

Month	Temp (°C)	Precip (mm)	Heat Index	PET (mm)	Daylight Factor	Adjusted PET (mm)	AET (mm)	Surplus (mm)	Deficit (mm)
Jan.	-7.4	51.7	0.0	0.0	0.77	0.0	0.0	51.7	0.0
Feb.	-6.1	46	0.0	0.0	0.87	0.0	0.0	46.0	0.0
Mar.	-1.5	51.2	0.0	0.0	1.00	0.0	0.0	51.2	0.0
Apr.	6	64.9	1.3	30.7	1.12	34.5	34.5	30.4	0.0
May	12.5	87.1	4.0	76.8	1.23	94.7	87.1	0.0	7.6
Jun.	17.7	84.8	6.8	112.9	1.29	145.7	84.8	0.0	60.9
Jul.	20.5	86.4	8.5	133.7	1.26	168.8	86.4	0.0	82.4
Aug.	19.6	88.4	7.9	117.7	1.17	137.2	88.4	0.0	48.8
Sep.	15.3	84.2	5.4	78.1	1.04	81.4	81.4	2.8	0.0
Oct.	8.6	72.9	2.3	38.1	0.92	34.9	34.9	38.0	0.0
Nov.	2.2	84.6	0.3	7.4	0.80	6.0	6.0	78.6	0.0
Dec.	-3.7	55.5	0.0	0.0	0.74	0.0	0.0	55.5	0.0
Total	**-**	**858**	**36.5**	**595.5**	**-**	**703.1**	**503.4**	**354.3**	**199.7**

Additional Notes

PET = Potential Evapotranspiration; AET = Actual Evapotranspiration

Equations

$PET = 16\left(\frac{L}{12}\right)\left(\frac{N}{30}\right)\left(\frac{10T_d}{I}\right)^{\alpha}$ Where

PET is the estimated potential evapotranspiration (mm/month)

T_d is the average daily temperature (degrees Celsius; if this is negative, use 0) of the month being calculated

N is the number of days in the month being calculated

L is the average day length (hours) of the month being calculated

$\alpha = (6.75 \times 10^{-7})I^3 - (7.71 \times 10^{-5})I^2 + (1.792 \times 10^{-2})I + 0.49239$

$I = \sum_{i=1}^{12}\left(\frac{T_{m_i}}{5}\right)^{1.514}$ is a heat index which depends on the 12 monthly mean temperatures T_{m_i}.[1]

TATHAM ENGINEERING

Water Budget

Pre and Post Development Comparison

Project Details

Maple Bridge Subdivision	422492

Prepared By

LJC/JG	4/4/2024

Pre-Development Catchment Details

Area (ha)	14.5
Pervious Area (ha)	14.4
Impervious Area (ha)	0.1

Post Development Catchment Details

Area (ha)	14.5
Pervious Area (ha)	6.1
Impervious Area (ha)	8.4

Infiltration Factor

Infiltration Factor	Pre-Development		Post Development	
	Pervious	Impervious	Pervious	Impervious
Topography	0.100	0.0	0.100	0.0
Soil	0.400	0.0	0.400	0.0
Land Cover	0.100	0.0	0.100	0.0
Infiltration Factor	0.600	0.0	0.600	0.0

Water Budget

Water Budget	Pervious	Impervious	Total	Pervious	Impervious	Total
Water Surplus (m^3)	22,199	170	22,369	9,353	13,016	22,369
Infiltration (m^3)	13,319	0	13,319	5,612	0	5,612
Runoff (m^3)	8,880	170	9,050	3,741	13,016	16,757
Reduction in Infiltration Volume (m^3)						**7,708**

Additional Notes

Infiltration Factors

Topography	Flat Land, average slope < 0.6 m/km	0.3
	Rolling Land, average slope 2.8 m to 3.8 m/km	0.2
	Hilly Land, average slope 28 m to 47 m/km	0.1
Soils	Tight impervious clay	0.1
	Medium combinations of clay and loam	0.2
	Open Sandy loam	0.4
Cover	Cultivated Land	0.1
	Woodland	0.2

(Stormwater Planning and Design Manual. MOE, 2003.)

TATHAM ENGINEERING

Water Budget

Mitigation Measures

LID Design

Project Details

Maple Bridge Subdivision	422492

Prepared By

LJC/JG	4/4/2024

LID Design Details

LID Measure	Infiltration Gallery
LID Impervious Drainage Area (ha)	1.34
Number of LIDs	236
Void Ratio	0.4
Footprint of LID (m^2)	3.00
Depth of LID (m)	1.20
Storage Volume Required (m^3)	196.1
Volume Required / LID (m^3)	0.83
Volume Provided / LID (m^3)	1.44
Volume Provided (m^3)	339.84
Design Precipitation Depth (mm)	25.4
Annual Volume Captured (mm)	815.2
Annual Volume Captured excluding Evapotransiration (m^3)	10,896
Annual Volume Captured after Evapotranspiration (m^3)	8,717

Additional Notes

TATHAM ENGINEERING

Water Budget
Summary

Project Details

Maple Bridge Subdivision	422492

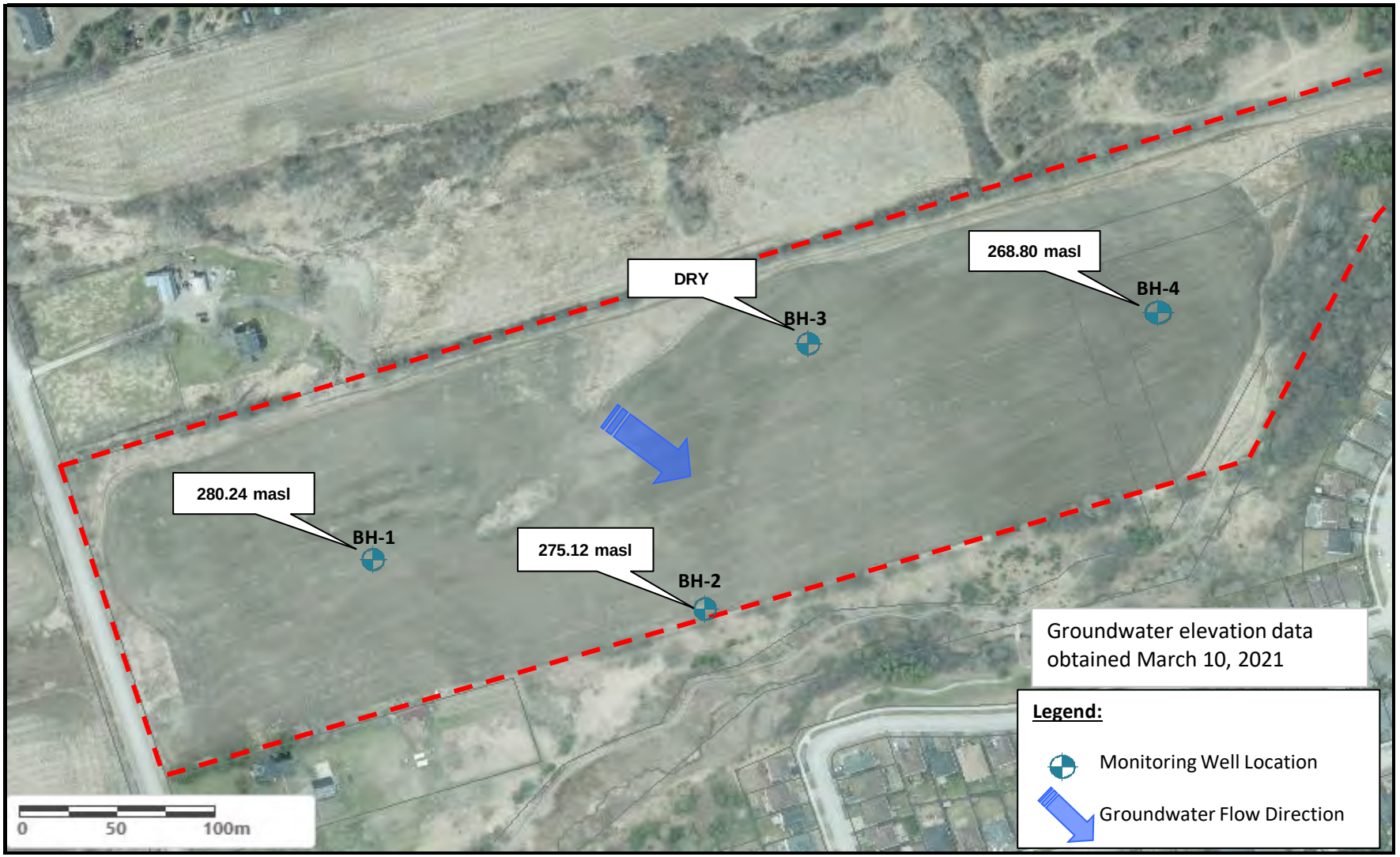
Prepared By

LJC/JG	4/4/2024

Summary

Existing Infiltration (m^3)	13,319
Proposed Infiltration (m^3) - No Mitigtation	5,612
Infiltration Deficit Prior to Mitigation (m^3)	-7,708
Proposed Infiltration Measures	
[ ] Increase Topsoil Depth	
[x] Infiltration LID	
[ ] Impervious Area Routed Over Pervious Area	
Mitigation - Increase Topsoil Reduction in Pervious Runoff (m^3)	0
Mitigation Measure - Implementing LID (m^3)	8,717
Mitigation Measure - Impervious Area Routed over Pervious Area (m^3)	0
Proposed Infiltration (m^3)	14,328
Infiltration Deficit after Mitigation (m^3)	1,009

Additional Notes



Source: Ministry of Natural Resources and Forestry. © Queen's Printer for Ontario, 2020. Elevation Data obtained by GHD using Leica RTX1250X GPS unit.

Scale:
Refer to Scale Bar
Coordinate System:
NAD 1983 UTM Zone 17

Geotechnical and Hydrogeologic Investigation
Mason Homes Limited
Proposed Residential Development
Centre Road Phase 2, Uxbridge

11223795-01
March, 2021

Groundwater Elevations

FIGURE 6

Appendix G:
Phosphorus Balance

Existing Conditions

Loading Summary TP | Phosphorus Budget Assessment

Catchment	Total Catchment TP Removal	Peak Outflow	Generated Total Flow (m^3) Average Concentration (mg/l) Total Load (kg)	Outgoing Total Flow (m^3) Average Concentration (mg/l) Total Load (kg)
Catchment 1	-3.448 %	0.008 m^3/s	5,255.12 m^3 0.224 mg/l 1.177 kg	116 m^3 0.232 mg/l 0.027 kg
Catchment 2	-0.406 %	0.01 m^3/s	117,392.6 m^3 0.231 mg/l 27.141 kg	986 m^3 0.232 mg/l 0.229 kg
Total	**99.097 %**	**0.018 m^3/s**	**122,647.72 m^3** **0.231 mg/l** **28.318 kg**	**1,102 m^3** **0.232 mg/l** **0.256 kg**

Proposed Conditions - No Mitigation

Loading Summary TP | Phosphorus Budget Assessment

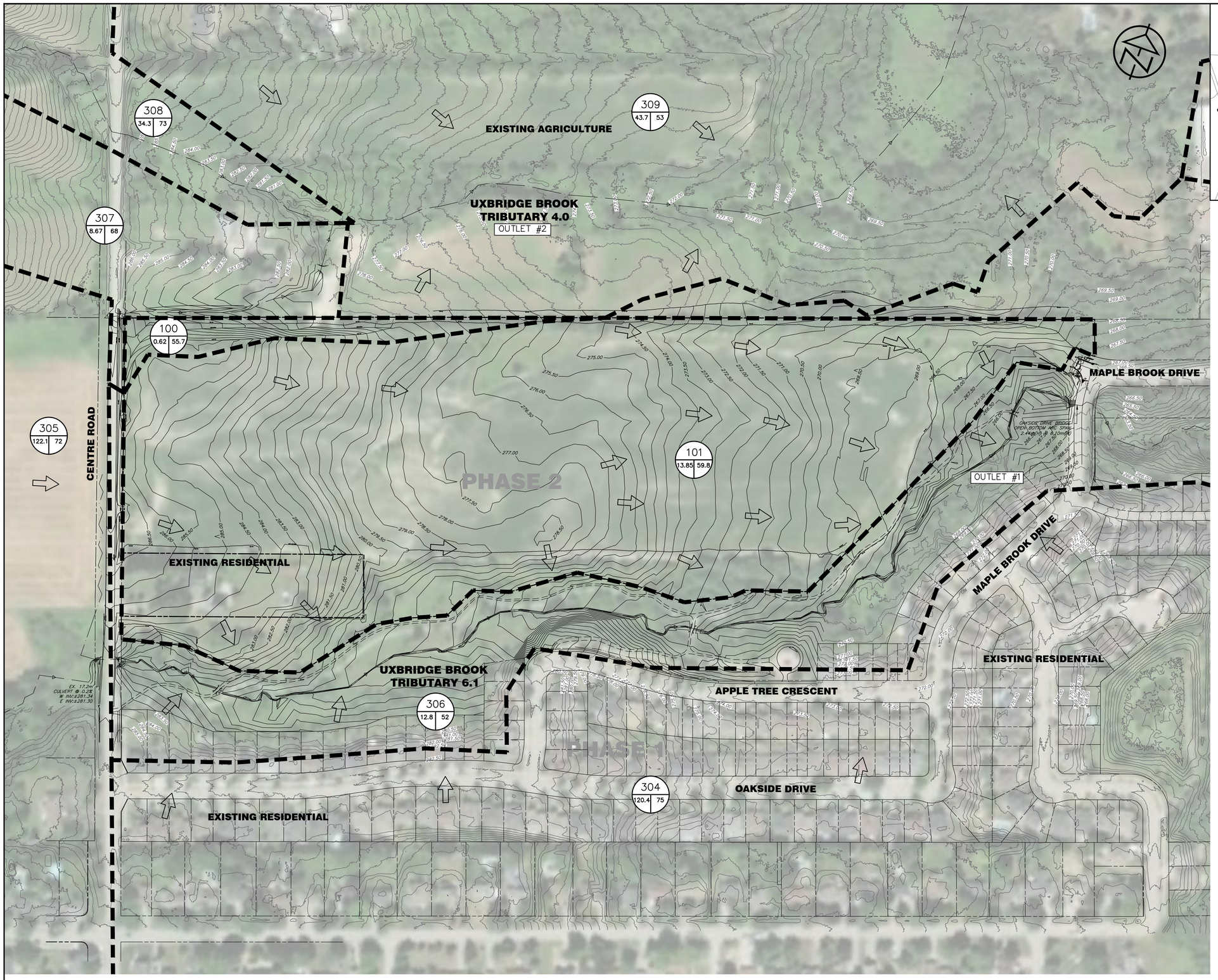
Catchment 1	3.205 %	0.477 m^3/s	119,511.6 m^3	53,158 m^3
			0.245 mg/l	0.237 mg/l
			29.311 kg	12.62 kg
Catchment 2	1.235 %	0.008 m^3/s	3,136.12 m^3	162 m^3
			0.32 mg/l	0.316 mg/l
			1.004 kg	0.051 kg
Total	**58.203 %**	**0.485 m^3/s**	**122,647.72 m^3**	**53,320 m^3**
			0.247 mg/l	**0.238 mg/l**
			30.315 kg	**12.671 kg**

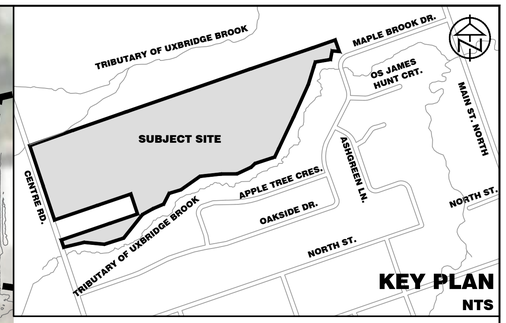
Proposed Conditions - With Mitigation

Loading Summary TP | Phosphorus Budget Assessment

Catchment 1	59.629 %	0.103 m^3/s	119,511.6 m^3	42,044 m^3
			0.247 mg/l	0.1 mg/l
			29.565 kg	4.199 kg
Catchment 2	1.235 %	0.008 m^3/s	3,136.12 m^3	162 m^3
			0.32 mg/l	0.316 mg/l
			1.004 kg	0.051 kg
Total	**86.096 %**	**0.111 m^3/s**	**122,647.72 m^3**	**42,206 m^3**
			0.249 mg/l	**0.101 mg/l**
			30.569 kg	**4.25 kg**

Drawings





KEY PLAN
NTS

LEGEND

- 285.00 — EXISTING CONTOURS (0.5m INTERVALS)
- 285.00 — LSRCA CONTOURS (5.0m INTERVALS)
- EXISTING WATERCOURSE AND FLOW DIRECTION
- DRAINAGE CATCHMENT BOUNDARY
- EXISTING OVERLAND FLOW DIRECTION
- 301 / 335.6 / 44 — DRAINAGE CATCHMENT ID / CURVE NUMBER / DRAINAGE AREA (ha)

DISCLAIMER AND COPYRIGHT

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

DRAWING REFERENCES

TOPOGRAPHIC FEATURES, CONTOURS AND LEGAL BOUNDARIES SHOWN ON THIS PLAN BASED ON SURVEY COMPLETED BY IBW SURVEYORS LTD., COMPLETED ON SEPTEMBER 10, 2019 AND H.F.GRANDER Co. LTD., COMPLETED AND APRIL 6, 2023.

SUPPLEMENTARY SURVEY DATA GENERATED FROM LSRCA DIGITAL TERRAIN MODEL. REFER TO NATURAL HAZARD ASSESSMENT PREPARED BY TATHAM ENGINEERING LIMITED FOR DETAILS.

DRAFT PLAN INFORMATION SHOWN ON THIS PLAN BASED ON PLAN PROVIDED BY IPS, DATED MARCH 11, 2024.

No.	REVISION DESCRIPTION	DATE
1.	ISSUED FOR DRAFT PLAN APPROVAL	APR. 17/24

ENGINEER STAMP

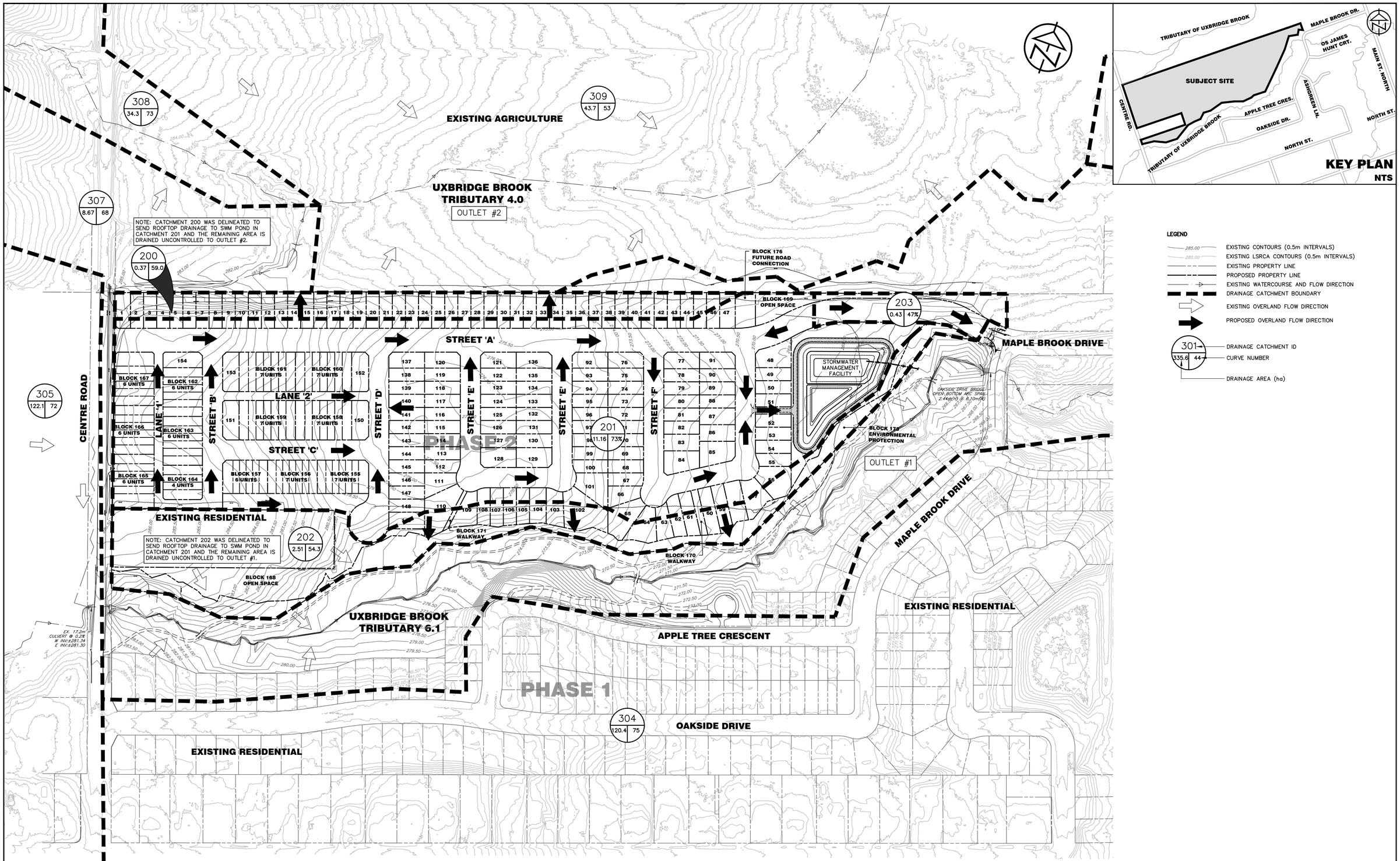
MAPLE BRIDGE RESIDENTIAL DEVELOPMENT - PHASE 2
TOWNSHIP OF UXBRIDGE
REGIONAL MUNICIPALITY OF DURHAM
MASON HOMES LIMITED

TATHAM ENGINEERING

PRE-DEVELOPMENT DRAINAGE PLAN

DESIGN: LJC	FILE: 422492	DWG: DP-1
DRAWN: NB/LQ	DATE: AUG 2023	
CHECK: LC	SCALE: 1:1500	

Drawing Name: 422492-DP01.dwg, Plotted: Apr 18, 2024



LEGEND

- EXISTING CONTOURS (0.5m INTERVALS)
- EXISTING LSRCA CONTOURS (0.5m INTERVALS)
- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE
- EXISTING WATERCOURSE AND FLOW DIRECTION
- DRAINAGE CATCHMENT BOUNDARY
- EXISTING OVERLAND FLOW DIRECTION
- PROPOSED OVERLAND FLOW DIRECTION
- 301 / 335.6 | 44 — DRAINAGE CATCHMENT ID / CURVE NUMBER
- DRAINAGE AREA (ha)

DISCLAIMER AND COPYRIGHT

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

DRAWING REFERENCES

TOPOGRAPHIC FEATURES, CONTOURS AND LEGAL BOUNDARIES SHOWN ON THIS PLAN BASED ON SURVEY COMPLETED BY IBW SURVEYORS LTD., COMPLETED ON SEPTEMBER 10, 2019 AND H.F.GRANDER Co. LTD., COMPLETED AND APRIL 6, 2023.

SUPPLEMENTARY SURVEY DATA GENERATED FROM LSRCA DIGITAL TERRAIN MODEL. REFER TO NATURAL HAZARD ASSESSMENT PREPARED BY TATHAM ENGINEERING LIMITED FOR DETAILS.

DRAFT PLAN INFORMATION SHOWN ON THIS PLAN BASED ON PLAN PROVIDED BY IPS, DATED MARCH 11, 2024.

No.	REVISION DESCRIPTION	DATE
1.	ISSUED FOR DRAFT PLAN APPROVAL	APR. 17/24

ENGINEER STAMP

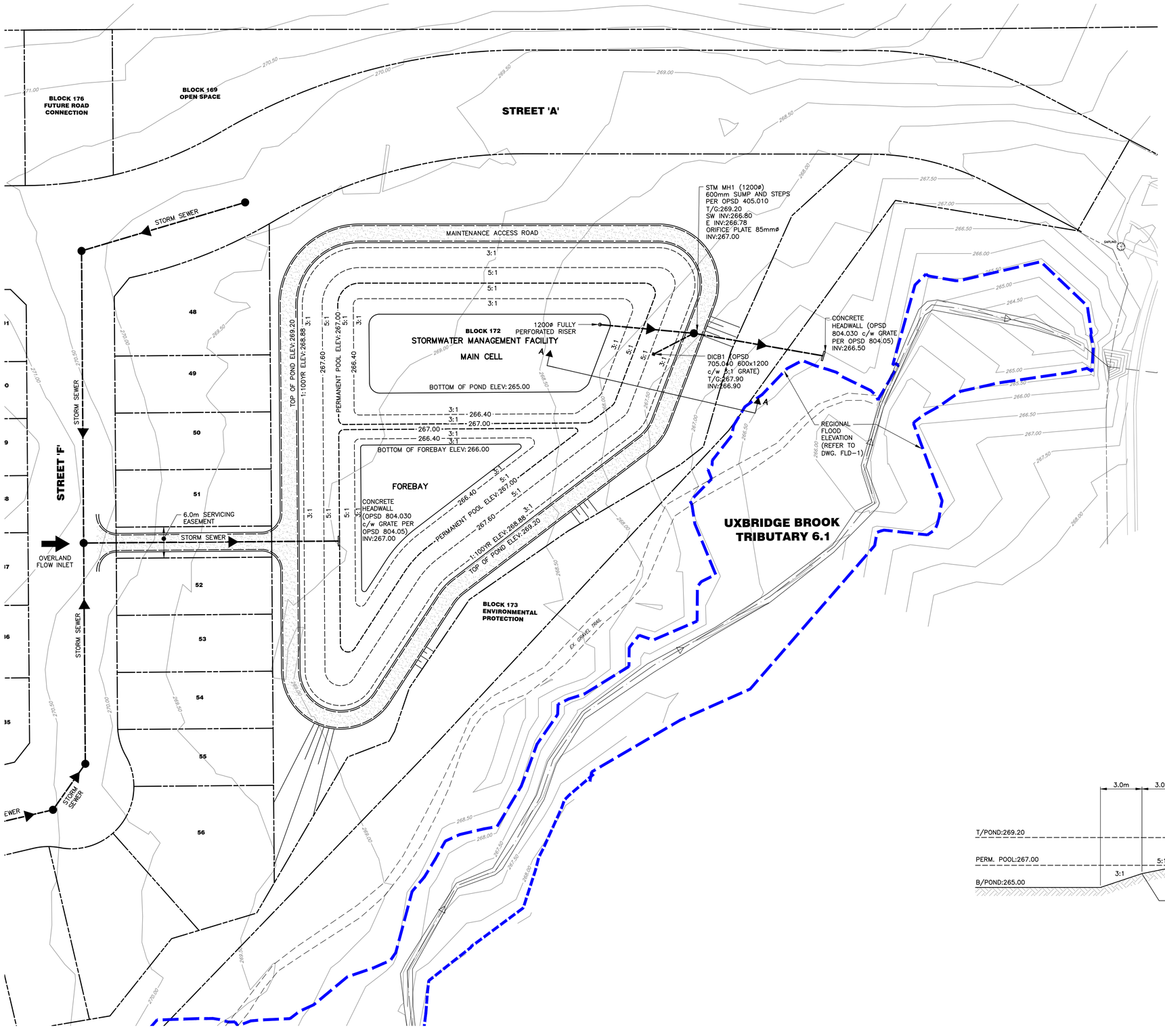
MAPLE BRIDGE RESIDENTIAL DEVELOPMENT - PHASE 2
TOWNSHIP OF UXBRIDGE
REGIONAL MUNICIPALITY OF DURHAM
MASON HOMES LIMITED

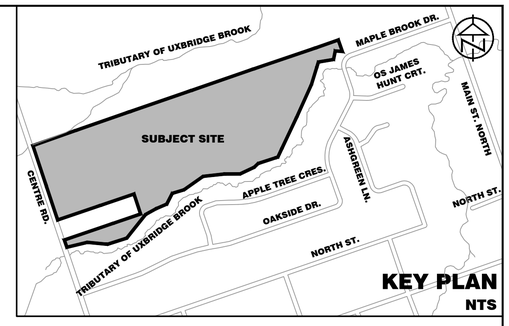
POST–DEVELOPMENT DRAINAGE PLAN

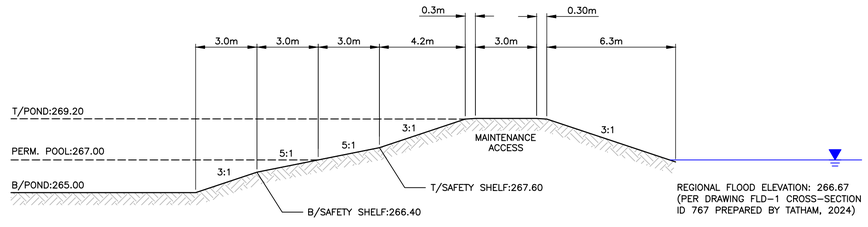
TATHAM ENGINEERING

DESIGN: LJC	FILE: 422492	DWG:	
DRAWN: NB/LQ	DATE: AUG 2023	DP-2	
CHECK: LC	SCALE: 1:1500		

Drawing Name: 422492-DP02.dwg, Plotted: Apr 18, 2024







POND SECTION A–A'
N.T.S.

DRAWING REFERENCES

TOPOGRAPHIC FEATURES, CONTOURS AND LEGAL BOUNDARIES SHOWN ON THIS PLAN BASED ON SURVEY COMPLETED BY IBW SURVEYORS LTD., COMPLETED ON SEPTEMBER 10, 2019 AND H.F.GRANDER Co. LTD., COMPLETED AND APRIL 6, 2023.

SUPPLEMENTARY SURVEY DATA GENERATED FROM LSRCA DIGITAL TERRAIN MODEL. REFER TO NATURAL HAZARD ASSESSMENT PREPARED BY TATHAM ENGINEERING LIMITED FOR DETAILS.

DRAFT PLAN INFORMATION SHOWN ON THIS PLAN BASED ON PLAN PROVIDED BY IPS, DATED MARCH 11, 2024.

No.	REVISION DESCRIPTION	DATE
1.	ISSUED FOR DRAFT PLAN APPROVAL	APR. 17/24

ENGINEER STAMP

MAPLE BRIDGE RESIDENTIAL DEVELOPMENT - PHASE 2
TOWNSHIP OF UXBRIDGE
REGIONAL MUNICIPALITY OF DURHAM
MASON HOMES LIMITED

TATHAM ENGINEERING

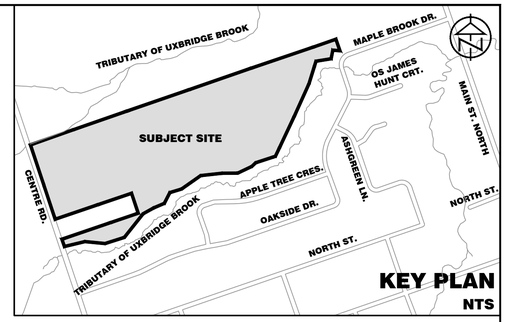
STORMWATER MANAGEMENT FACILITY

DESIGN: LG/LJC	FILE: 422492	DWG:	PND-1
DRAWN: LG	DATE: AUGUST 2023		
CHECK: LC	SCALE: 1:400		

Drawing Name: 422492-PND01.dwg, Plotted: Apr 19, 2024

LEGEND

- EXISTING CONTOUR
- EXISTING PROPERTY LINE
- REGIONAL FLOOD HAZARD LIMIT
- PROPOSED PROPERTY LINE
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED WATERMAIN
- TRIBUTARY OF UXBRIDGE BROOK
- SAN MH — EXISTING SANITARY MAINTENANCE HOLE
- STM MH — EXISTING STORM MAINTENANCE HOLE
- PROPOSED SANITARY MAINTENANCE HOLE
- PROPOSED STORM MAINTENANCE HOLE
- PROPOSED OVERLAND FLOW DIRECTION
- 275.08 — PROPOSED ELEVATION



UXBRIDGE BROOK TRIBUTARY 4.0

CENTRE ROAD

PR. WATERMAIN

SPLIT LOT DRAINAGE

BLOCK 176 FUTURE ROAD CONNECTION

BLOCK 169 OPEN SPACE

BLOCK 172 SWM POND REFER TO DWG. PND-1

STM INV: 266.50

STM INV: 267.00

STM INV: 268.21

CONNECT TO EX. 200ø WATERMAIN

REGIONAL FLOODLINE

OAKSIDE DRIVE

EXISTING RESIDENTIAL

BLOCK 167 6 UNITS

BLOCK 166 6 UNITS

BLOCK 165 6 UNITS

BLOCK 162 6 UNITS

BLOCK 163 6 UNITS

BLOCK 164 4 UNITS

LANE '1'

STREET 'B'

BLOCK 161 7 UNITS

BLOCK 160 7 UNITS

LANE '2'

BLOCK 159 7 UNITS

BLOCK 158 7 UNITS

STREET 'C'

BLOCK 157 6 UNITS

BLOCK 156 7 UNITS

BLOCK 155 7 UNITS

STREET 'A'

STREET 'D'

STREET 'E'

STREET 'E'

STREET 'F'

PHASE 2

SAN INV: 284.79
STM INV: 285.79

SAN INV: 281.63
STM INV: 282.63

SAN INV: 274.67
STM INV: 275.67

SAN INV: 272.53
STM INV: 273.53

SAN INV: 271.11
STM INV: 272.11

SAN INV: 269.70
STM INV: 270.70

SAN INV: 268.57
STM INV: 269.57

SAN INV: 282.13
STM INV: 283.13

SAN INV: 275.60
STM INV: 276.60

SAN INV: 277.25
STM INV: 278.25

SAN INV: 282.97
STM INV: 283.97

SAN INV: 274.24
STM INV: 275.24

SAN INV: 268.07

STM INV: 269.34

SAN INV: 267.63

SAN INV: 267.50
CREEK INV: 270.03

BLOCK 168 OPEN SPACE

BLOCK 173 ENVIRONMENTAL PROTECTION

BLOCK 171 WALKWAY

BLOCK 170 WALKWAY

EX. TRAIL GRANULAR

UXBRIDGE BROOK TRIBUTARY 6.1

EX. CONC. BOX CULVERT

EX. STM HEADWALL

APPLE TREE CRESCENT

CONNECT TO EX. 250ø SANITARY

EX. 250ø SAN STUB INV. 267.29

CONNECT TO EX. 300ø WATERMAIN

PHASE 1

EXISTING RESIDENTIAL

EXISTING RESIDENTIAL

OAKSIDE DRIVE

DISCLAIMER AND COPYRIGHT

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

DRAWING REFERENCES

TOPOGRAPHIC FEATURES, CONTOURS AND LEGAL BOUNDARIES SHOWN ON THIS PLAN BASED ON SURVEY COMPLETED BY IBW SURVEYORS LTD., COMPLETED ON SEPTEMBER 10, 2019 AND H.F.GRANDER Co. LTD., COMPLETED AND APRIL 6, 2023.

SUPPLEMENTARY SURVEY DATA GENERATED FROM LSRCA DIGITAL TERRAIN MODEL. REFER TO NATURAL HAZARD ASSESSMENT PREPARED BY TATHAM ENGINEERING LIMITED FOR DETAILS.

DRAFT PLAN INFORMATION SHOWN ON THIS PLAN BASED ON PLAN PROVIDED BY IPS, DATED MARCH 11, 2024.

No.	REVISION DESCRIPTION	DATE
1.	ISSUED FOR DRAFT PLAN APPROVAL	APR. 17/24

ENGINEER STAMP

MAPLE BRIDGE RESIDENTIAL DEVELOPMENT - PHASE 2
TOWNSHIP OF UXBRIDGE
REGIONAL MUNICIPALITY OF DURHAM
MASON HOMES LIMITED

CONCEPT DEVELOPMENT PLAN

TATHAM ENGINEERING

DESIGN: LC/JLM	FILE: 422492	DWG: CDP-1
DRAWN: LQ/NB	DATE: JUNE 2023	
CHECK: NM	SCALE: 1:1,000	

Drawing Name: 422492-CDP01.dwg, Plotted: Apr 19, 2024