927 MARCH ROAD
KANATA NORTH - BRIGIL

Functional Servicing and Stormwater Management

January 24, 2024

Prepared for:
3223701 Canada Inc.

Prepared by:
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Stantec Project Number:
160401347

927 March Road
Kanata North - Brigil

Revision	Description	Author	Date	Quality Check	Date	Independent Review	Date
0	Draft Plan Submission #2	RB	2024/01/24	DT	2024/01/24	KK	2024/01/24

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January 24, 2024

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To Whom it May Concern,

Reference: 927 March Road
Kanata North - Brigil
Functional Servicing and Stormwater Management

On behalf of 3223701 Canada Inc. (Brigil) this Functional Servicing and Stormwater Management report (FSR) is submitted in support of the Draft Plan of Subdivision application.

Since the previous FSR submission dated August 2020, the overall report structure is revised so a full list of the changes is not practical. A copy of the response to the comments from May 2021 that are directly applicable to the servicing conditions associated with this FSR is included within this revised report (see Appendix B).

General updates made to the FSR since 2020 include:

- Review of water servicing with boundary conditions considered and desired service connections to the 400mm water main in March Road.
- Confirmation of the updated sanitary sewer design flows relative to the additional 18 L/s residual capacity in the downstream system and the desired service connections to the March Road Trunk sewer.
- Confirmation of contributing upstream existing rural storm drainage areas.
- Stormwater management and related servicing strategy with associated analytical updates to better reflect the nature of the current draft plan and associated development concept plan.
- Allowance for servicing conditions associated with 940 March Road (former stormwater management pond facility location).
- References to proposed deviations from the Kanata North Master Servicing Study and Environmental Management Plan are noted where applicable.
- References to coordination with the adjacent Copperwood Estate development are noted where applicable.

A copy of the PCSWMM data files used for the stormwater management analysis are included with the submission package. The data files are provided in the packaged PCSWMM file format (*.pcz). This format includes all relevant input and output data. Two model files are provided. The file '01347_2023-12_emp-sim.pcz', provides the comparison to the analysis of the external drainage areas completed in the Environmental Management Plan. The file '01347_2024-01_fsr.pcz', includes all post-development design storm simulations.

The servicing and stormwater management strategy for the 927 March Road project site as described in this updated FSR supports the proposed development in general accordance with the applicable guidelines.

Sincerely,

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1.0 Introduction

1.1 Project Information

This report is prepared to demonstrate the Functional Servicing and Stormwater Management in support of a Draft Plan of Subdivision application for the proposed development located at 927 March Road in the City of Ottawa. The site is approximately 17.7 ha in size. The site is in the southwest quadrant of the Kanata North Urban Expansion Area (KNUEA) and the Dunrobin Neighbourhood of the City of Ottawa.

The site location is illustrated in **Figure 1** below.

Image Source: Google Earth Pro

Figure 1: Site Location

Current zoning is RU. The site is currently vacant and is farmed. The site is bound by private undeveloped/agricultural land to the north, March Road to the east, private undeveloped/agricultural land and Old Carp Road to the south, and rural residential development to the west.

A copy of the proposed Concept Plan (dated 2023-10-26) with preliminary unit counts prepared by NEUF architects is provided in **Appendix A**. The proposed plan consists of a public road, park dedication, part of a school site dedication, four private development blocks, single family detached lots, and townhouse lots. Private development blocks are anticipated to contain multi-storey residential apartment units with private open space and internal roadways (where needed).

The current anticipated unit counts are listed in **Table 1.1** below.

Table 1.1: Unit Count

Development Zone	Units
A – Residential Apartment	491
B – Residential Apartment	326
C – Residential Apartment	238
D – Residential Apartment	802
E – Single Family Detached	19
E - Townhouse	32
Total	**1908**

A conceptual unit type breakdown for each of the residential apartment buildings is 75% one-bedroom, 20% two bedrooms, and 5% three bedrooms (see confirmation from Brigil in **Appendix A**). Subsequent applications through the development process can confirm unit types as needed.

1.1.1 ADJACENT PROPERTY

The functional servicing condition for the 927 March Road project site area considers the adjacent properties owned by others as they relate to the project site area.

- At the northwest corner of the property, coordination with CU Developments Copperwood Estate project is ongoing as development plans progress for both CU Developments and Brigil.
- The property at 941 March Road is considered a non-participating owner. Allowance for a storm sewer connection is made as part of the 927 March Road development, but water and sewer connections are considered as being made directly to March Road.
- The remainder of the school block and the multi-residential block anticipated within the property at 1145 Old Carp Road are considered serviced through the 927 March Road project.
- Allowance for a storm sewer connection is made as part of the 927 March Road development for the property at 895 March Road and 1054 Halton Terrace. Water and sewer connections are considered as being made directly to March Road for these two properties.

- It is acknowledged that the property 905 March Road needs to either be part of the proposed 927 March Road development plan or that an agreement to cross the land with a road and related services is required. For this Brigil North - Functional Servicing and Stormwater Management report (FSR), it is considered that this property is part of the 927 March Road development plan with allowance for future commercial development.

1.1.2 VARIATIONS FROM MSS AND EMP

The overall intention for the proposed water servicing is carried forward from the MSS. However, given the unknown nature of the development planning for the adjacent 1145 Old Carp Road property, an alternate 300mm connection to March Road is proposed.

There is some re-allocation of areas to service connection locations, but the overall intention for the proposed sanitary sewer servicing is carried forward from the MSS. Based on coordination with the City of Ottawa, allowance for an increase in development density is accommodated using an additional 18 L/s of sanitary sewer capacity in the downstream system.

For the stormwater management (SWM) servicing strategy, there are two notable exceptions from the MSS and EMP. These exceptions involve the areas identified as ‘EXT-1’ and ‘F307A’ on **Drawing OSD-1**.

The area ‘EXT-1’ is the address 941 March Road. The landowner is not currently interested in developing the land and is considered a non-participating owner. For this reason, the proposed Pond 2 SWM facility location is moved to be within the Brigil owned land. Correspondingly, the 941 March Road property is left to establish an independent SWM servicing strategy that complies with the MSS and EMP.

The area ‘F307A’ is an additional external contributing drainage area identified through the review of the drainage conditions completed for this Kanata North - Brigil Functional Servicing and Stormwater Management report. Additional information is provided in Section 4.3.

1.2 Regulatory Framework

The development of the 927 March Road project site is governed by the City of Ottawa’s current Official Plan, the Kanata North Community Design Plan, and applicable development application requirements.

The Mississippi Valley Conservation Authority (MVCA) administers development regulations in areas subject to natural hazards (such as flooding, erosion, and unstable slopes) and in environmentally sensitive areas (such as wetlands, shorelines, and waterways). The MVCA also reviews development proposals and municipal planning applications within or adjacent to natural areas.

1.2.1 REFERENCE DOCUMENTS

Documents referenced in support of this report include:

- *City of Ottawa Sewer Design Guidelines* (SDG), City of Ottawa, October 2012, including all subsequent technical bulletins.

- *City of Ottawa Design Guidelines – Water Distribution*, City of Ottawa, July 2010, including all subsequent technical bulletins.
- *Stormwater Management Planning and Design Manual*, Ministry of Environment, Conservation and Parks (MECP), 2003.
- *Design Guidelines for Drinking Water Systems*, Ministry of the Environment, Conservation, and Parks (MECP), 2008.
- *Fire Protection Water Supply Guideline* for Part 3 in the Ontario Building Code, Office of the Fire Marshal (OFM), October 2020.
- *Water Supply for Public Fire Protection*, Fire Underwriters Survey (FUS), 2020.
- *Kanata North Community Design Plan,* Novatech, June 2016 (CDP).
- *Kanata North Master Servicing Study,* Novatech, June 2016 (MSS).
- *Kanata North Environmental Management Plan,* Novatech, June 2016 and *Stormwater Management Solution Addendum*, Novatech, February 2020 (EMP).

  Where applicable, key excerpts from the MSS and EMP are provided for reference in the appendices related to the associated servicing component.
- *Kanata North Transportation Master Plan*, Novatech, June 2016.
- *Hydrogeological Assessment Proposed Residential Development 927 March Road*, Paterson Group, April 2021.
- Site topographic survey data provided to Stantec.
- *Copperwood Estate (formerly CU Development), Detailed Site Servicing and Stormwater Management Report (Phase 1)*, Novatech, Revised May 2023.

Information on infrastructure located within the adjacent public roads are obtained from available City of Ottawa as-built records.

A copy of the response to the comments from May 2021 that are directly applicable to the servicing conditions associated with this FSR is included in **Appendix B**.

1.3 Objective

This FSR assesses and identifies preliminary servicing and SWM conditions which are generally consistent with the associated MSS and EMP, and the City of Ottawa Design Guidelines. Significant deviation from existing reference documents is identified with an explanation for the change in relation to site specific circumstances.

Preliminary general and applicable site-specific objectives considered are summarized below. Specific technical design criteria details are described in the associated servicing sections of this report.

Potable Water Servicing

- Develop a functional assessment of the potable water and fire flow demand for the site.
- Identify that the City of Ottawa water distribution system can supply adequate water pressure to the site for typical operational and emergency conditions.

Wastewater (Sanitary Sewer) Servicing

- Develop a functional assessment of the wastewater flow projected for the site.
- Identify that the City of Ottawa sanitary sewer system can support the wastewater flow from the site.

Storm Sewer Servicing and Stormwater Management

- Identify allowable flow contributions from the site to the adjacent receiving water bodies.
- Identify applicable water quality control targets.
- Develop a functional assessment of the SWM system for the site to achieve applicable water quantity (minor and major system) control and water quality control targets.

Site Grading Plan

- Prepare a preliminary grading plan to support the servicing assessments and identify compatibility with surrounding existing ground conditions.

The accompanying figures and drawings illustrate the key components of the functional servicing assessments.

To reflect changes in design conditions, related objectives and/or assessment findings may be adjusted as needed through subsequent stages of the development application process.

2.0 Potable Water Servicing

2.1 Background

The site is within Pressure Zone ‘2W’ of the City of Ottawa water distribution system.

The existing watermains along the boundaries of the site consist of a 400 mm diameter PVC watermain within March Road.

Existing fire hydrants are located along March Road and Invention Boulevard immediately adjacent to the site.

In addition to the proposed development condition within the site, the water servicing review also considers the future commercial development along March Road, on either side of the southern road connection. It is anticipated that the service connections for these future commercial areas will be made to the watermain in the proposed street, rather than the watermain in March Road.

2.2 Design Criteria

The following design criteria are considered with the assessment of the potable water and fire protection servicing for the site.

2.2.1 WATER DEMAND AND ALLOWABLE PRESSURE

Preliminary potable water demand and allowable water pressure are assessed using the City of Ottawa Guidelines - Water Distribution (2010) as amended, and the ISTB 2021-03 Technical Bulletin.

Residential Apartment Population Rate	
Single Family	3.4 persons / unit
Townhouse (Row)	2.7 persons / unit
Average Apartment	1.8 persons / unit
One Bedroom Apartment	1.4 persons / unit
Two Bedroom Apartment	2.1 persons / unit
Three Bedroom Apartment	3.1 persons / unit
Residential Demand	
Average Daily (AVDY)	280 L/cap/day
Maximum Daily (MXDY)	2.5 x AVDY
Peak Hour (PKHR)	2.2 x MXDY

Commercial / Institutional Demand	
Average Daily (AVDY)	28,000 L/gross ha/day
Maximum Daily (MXDY)	1.5 x AVDY
Peak Hour (PKHR)	1.8 x MXDY

Allowable Water Pressure	
MXDY Flow	345 kPa (50 psi) to 552 kPa (80 psi)
PKHR Flow Minimum	276 kPa (40 psi.)
MXDY + Fire Flow	140 kPa (20 psi.)
Maximum Allowable for Occupied Area	552 kPa (80 psi)

2.2.2 FIRE FLOW AND HYDRANT CAPACITY

Preliminary fire flow requirements are assessed using the Fire Underwriters Survey (FUS) methodology (2020). Site specific criteria considered are noted in Section 2.3.2.

Fire hydrant capacity is assessed based on Table 18.5.4.3 of the National Fire Protection Agency (NFPA) Fire Code document. A hydrant situated less than 76 m away from a building can supply a maximum capacity of 5,678 L/min, and a hydrant 76 to less than 152 m away can supply a maximum capacity of 3,785 L/min.

2.2.3 WATERMAIN SERVICING

The preliminary watermain network is considered in general accordance with Ministry of Environment, Conservation and Parks (MECP) Guidelines, City of Ottawa Design Guidelines – Water Distribution (2010), Ministry of Environment, Conservation and Parks (MECP) Guidelines, and the pre-application meeting notes.

2.3 Water Demand

2.3.1 DOMESTIC WATER DEMAND

The domestic water demand is assessed based on the proposed development conditions described in **Table 1.1** and the design criteria described in **Section 2.2**. As noted in **Section 1.1**, the conceptual unit type breakdown for each of the residential apartment buildings is 75% one-bedroom, 20% two bedrooms, and 5% three bedrooms.

The assessed domestic water demand for the site is summarized in **Table 2.1**. Supporting calculations are provided in **Appendix C.1**.

Table 2.1: Estimated Domestic Water Demand

Demand Type	Units	Population	Area (ha)	AVDY (L/s)	MXDY (L/s)	PKHR (L/s)
Zone A - Residential Apartment	491	798	n/a	2.6	6.5	14.2
Zone B - Residential Apartment	326	530	n/a	1.7	4.3	9.4
Zone C - Residential Apartment	238	387	n/a	1.3	3.1	6.9
Zone D - Residential Apartment	802	1304	n/a	4.2	10.6	23.2
Zone E – Single Family Detached	19	65	n/a	0.2	0.5	1.2
Zone E - Townhouse	32	87	n/a	0.3	0.7	1.6
Commercial – Zone D (D1 & D2)	n/a	n/a	0.502	0.2	0.2	0.4
Institutional	n/a	n/a	2.02	0.7	1.0	1.8
Total	**1908**	**3171**		**11.1**	**26.9**	**58.7**

Note that the values for the commercial and institutional areas are updated relative to the October 27, 2023 boundary request. The result is a net drop in the demand flow. The existing and proposed commercial areas along March Road and the 941 March Road property are considered tied directly to the 400 mm water main in March Road and not included in the review of the demands within the 927 March Road project site area.

2.3.2 FIRE FLOW DEMAND

The fire flow demand is assessed based on the following for the varying building types.

Townhomes and Single-Family Homes

- Type V – Wood Frame / Type IV-A - Mass Timber Construction.
- Total effective building area is the sum of all floor areas.
- Occupancy and contents factor considering limited combustible materials.
- No sprinkler system is in place.
- Exposure distances based on the proposed adjacent structures having Type V construction with no sprinkler system.
  It is noted that the 8-unit townhouse reference in the FUS calculations provided with the October 27, 2023 boundary request includes an indication of a sprinklered condition to the south. The reference to a sprinklered condition is removed with the calculations included in this FSR, but this does not change the overall governing fire flow condition within the 927 March Road project site area.
- Fire separation to meet OBC Part 9 requirements for 8-unit townhomes with units separated into two 4-unit clusters.

Apartment Buildings

- Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction (i.e., building construction materials with a 1-hour fire resistance rating).
- Total effective building area is the gross floor area of the two largest floor plus 50% of the floor area for eight adjoining floors.
  - Vertical openings are not protected.
- Occupancy and contents factor considering limited combustible materials.
- Sprinkler systems confirming to the NFPA-13 standard, a standard water supply, and is unsupervised.
- Exposure distances based on the proposed adjacent structures having Type I-II (fire resistive or non-combustible rating) construction with unprotected openings and sprinkler systems.

The highest fire flow is assessed to be approximately 14,000 L/min (233 L/s), for the 6-unit Townhomes at the portion of the proposed site plan fronting the adjacent Copperwood Estate development. Supporting calculations per the FUS methodology are provided in **Appendix C.2**.

2.4 Available Level of Service

2.4.1 BOUNDARY CONDITIONS

The assessed domestic water and fire flow demands are used to confirm the level of servicing available to the proposed development from the adjacent municipal watermain and hydrants. The associated hydraulic grade line (HGL) elevation boundary conditions provided by the City of Ottawa (see **Appendix C.3** for correspondence) are summarized in **Table 2.2**.

Table 2.2: Boundary Conditions

HGL Condition	Elevation (m)			
	Connection 1	**Connection 2**	**Connection 3**	**Future Tie-In**
Maximum HGL	130.7	130.7	130.7	130.7
Peak Hour (Minimum) HGL	124.4	124.3	124.4	124.5
Max. Day + Fire Flow (217 L/s) HGL	116.5	109.9	115.9	Not Provided
Max. Day + Fire Flow (233 L/s) HGL	115.1	107.6	114.5	Not Provided
Connection 1 – March Road North Connection 2 – March Road South Connection 3 – Subdivision to the northwest Future Tie-in to the Old Carp Road				

2.4.2 ALLOWABLE DOMESTIC PRESSURE

Finished elevations across the site will vary. To review the anticipated pressure conditions, a low elevation and high elevation are considered as reference for the calculation of residual pressures at ground level. The ground elevations selected are taken from the grading information shown on **Drawing OGP-1**. The low elevation selected is 79.6 metres. The high elevation selected is 88.6 metres.

From the boundary condition HGL elevations, the pressures under normal operating conditions are anticipated as:

- Low elevation (79.6 m) = 545 kPa to 620 kPa (64 psi to 73 psi).
- High elevation (88.6 m) = 511 kPa to 585 kPa (51 psi to 60 psi).

The anticipated pressures for occupied areas are not anticipated to require booster pumping or pressure reducing measures.

To ensure adequate water pressure above the first-floor elevation of the apartment buildings, booster pump requirements are to be confirmed by the mechanical engineering consultant during subsequent stages of the development application process.

2.4.3 ALLOWABLE FIRE FLOW PRESSURE

From the boundary condition HGL elevations, the existing watermain can provide the required fire flow while maintaining the minimum residual pressure of 138 kPa (20 psi).

2.4.4 FIRE HYDRANT COVERAGE

Fire hydrant coverage will be developed and confirmed within the site during the subsequent stages of the development application process.

The apartment buildings are to be sprinklered and a Siamese (fire department) connection provided. The Siamese connections are to be within 45m of a fire hydrant.

2.5 Proposed Water Servicing

The development is to be serviced with connections to the existing watermain in March Road. The proposed water servicing is shown on **Drawing OSSP-1**. Connections and service requirements are to be consistent with City of Ottawa guidelines and specifications.

Service connections to the private development blocks, single family residences, and townhouses, are to be made to the looped watermain within the proposed public roads. For each private development block, either looped watermains through the block or twinned service connections are to be applied as needed. The installation of watermains and service connections for the townhouse units along the north boundary is to be coordinated with the adjacent development to the north.

For each proposed apartment building, a mechanical engineering consultant is responsible to confirm the service size required and that the water pressure within each building is adequate to meet building code requirements. This confirmation is to occur during subsequent stages of the development application process.

As noted in the MSS, the watermain crossing under Tributary 3 is anticipated to be in rock. The excavation requires a clay cap to prevent surface water in the tributary from migrating into the underlying trench. A preliminary detail of the Tributary 3 crossing is shown on **Drawing OSSP-1**. Final details of the proposed crossing are to be provided at the detailed design stage of the development application process.

2.5.1 DEVIATION FROM MSS

It is acknowledged that the MSS and the response to the 927 March Road boundary condition request describe the need for a 300 mm water main to be provided along the future re-alignment of Old Carp Road. Given the current development timing for 927 March Road and the unknown nature of potential development timing for 1145 Old Carp Road, an alternative 300 mm water main alignment is proposed.

It is suggested to provide the 300mm water main alignment through the road within the 927 March Road project site area south of Tributary 3. This approach requires that the existing 200 mm water stub installed at the corresponding location in March Road be removed and replaced with a 300 mm connection. This replacement is proposed to be completed by Brigil as part of the 927 March Road development and is noted on **Drawing OSSP-1**.

3.0 Wastewater Servicing

3.1 Background

The existing sanitary sewers along the boundaries of the site consist of a 600 mm diameter trunk sewer along March Road.

In addition to the proposed development condition within the site, the wastewater servicing review also considers the future commercial development along March Road, on either side of the southern road connection. It is anticipated that the service connections for these future commercial areas will be made to the sanitary sewer in the proposed street, rather than the trunk sewer in March Road.

3.2 Design Criteria

Preliminary wastewater servicing is assessed using the City of Ottawa Sewer Design Guidelines (2012) as amended, and the MECP Design Guidelines for Sewage Works. The following design criteria are considered with the assessment of wastewater servicing for the site.

Population criteria are the same as that applied for the water demand analysis (see **Section 2.2.1**).

Residential Wastewater Flow	
Average Flow Generation	280 L/cap/day
Peaking Factor	Harmon Equation (max. residential = 4.0)
Harmon Correction Factor	0.80
Infiltration Allowance	0.33 L/s/ha
Commercial / Institutional Wastewater Flow	
Average Flow Generation	28,000 L/ha/day
Peaking Factor	Harmon Equation, 1.5
Sewer Design	
Minimum Velocity	0.6 m/s (0.8 m/s for upstream sections)
Maximum Velocity	3.0 m/s
Minimum Service Size	135 mm
Manning Roughness Coefficient	0.013
Minimum Service Slope	1.0 % (2.0 % preferred)
Minimum Service Cover	2.0 m

3.3 Wastewater Generation and Servicing Design

The MSS considered a total peak wastewater flow of 34 L/s coming from the southwest quadrant of the KNUEA. This consists of 8.7 L/s from area W11 and 25.3 L/s from area W12. Supporting information is included in **Appendix D.1** for reference. It is also understood that an additional 18 L/s is available in the March Road sanitary trunk sewer system to support the KNUEA. This could then allow for a total of 34 + 18 = 52 L/s peak wastewater flow to come from the southwest quadrant of the KNUEA.

The peak wastewater flow associated with the 927 March Road project site area is assessed based on the proposed development conditions described in **Table 1.1** and the design criteria described in **Section 3.2**. As noted in **Section 1.1**, the conceptual unit type breakdown for the populations associated with each of the residential apartment buildings is 75% one-bedroom, 20% two bedrooms, and 5% three bedrooms.

The assessed peak wastewater flow for the site is reviewed relative to the north and south connection points considered in the MSS. The design flow conditions for each outlet are summarized in **Table 3.1**. Supporting calculations are provided in **Appendix D.2**. The associated sanitary drainage plan is shown on **Drawing OSA-1**.

Table 3.1: Estimated Peak Wastewater Flow

Location Reference	Peak Residential Wastewater Flow			Commercial / Institutional Flow (L/s)	Infiltration Flow (L/s)	Total Peak Flow (L/s)
	Population	Peak Factor	Peak Flow (L/s)			
North Outlet	2,252	3.04	22.2	0.2	3.2	25.6
South Outlet	917	3.26	9.7	1.0	1.5	12.2
EXT-1	288	3.47	3.2	0.0	0.6	3.8
Via Old Carp Road	233	3.50	2.7	0.0	0.5	3.2
Total	**3,690**		**37.8**	**1.2**	**5.8**	**44.8**

The total peak flow rate from **Table 3.1** at 44.8 L/s is less than the 52 L/s available to support the southwest quadrant of the KNUEA. The drainage areas applied are considered consistent with the associated area included in the MSS.

Use of the additional 18 L/s capacity by the 927 March Road project site area is coordinated with the City of Ottawa. A copy of the related email correspondence is included in **Appendix D.2**. The additional request from Brigil was to use 17.7 L/s of the available 18 L/s. Based on the current analysis of the 927 March Road project site area only 10.8 L/s of additional capacity is anticipated to be required. It is also noted that use of the available capacity is subject to timing, however, it is trusted that the capacity remains available.

Consistent with the MSS, the community park space along the north boundary of the 927 March Road project site area is not included in the wastewater design flow allocation. If needed, there is additional capacity in the system still available to accommodate a wastewater flow contribution from the community park.

3.4 Proposed Sanitary Servicing

The development is to be serviced with connections to the existing sanitary sewer in March Road. The proposed sanitary servicing is shown on **Drawing OSSP-1**. Connections and service requirements are to be consistent with City of Ottawa guidelines and specifications. The sanitary sewer design conditions consider the commercial development and roadway (Area ID ‘C21D’, ‘C21E’, and ‘R21F’) that fall within the 905 March Road property to connect to the sanitary sewer within the internal roadway rather than directly to March Road. An associated sanitary sewer design sheet is provided in **Appendix D.3**.

Service connections to the private development blocks, single family residences, and townhouses, are to be made to the sanitary sewers within the proposed public roads. The installation of sanitary sewers and service connections for the townhouse units along the north boundary is to be coordinated with the adjacent Copperwood Estate development to the north.

For each proposed apartment building, a mechanical engineering consultant is responsible to confirm the service size required and that the appropriate backwater valve requirements are satisfied. This confirmation is to occur during subsequent stages of the development application process.

To maintain consistency with the storm sewer servicing, the installation of a sanitary sewer is also proposed to cross Tributary 3. To support the proposed sanitary sewer excavation where it may be made through rock, a clay cap is required to prevent surface water in the tributary from migrating into the underlying trench. A preliminary detail of the Tributary 3 crossing is shown on **Drawing OSSP-1**. Final details of the proposed crossing are to be provided at the detailed design stage of the development application process.

3.4.1 DEVIATION FROM MSS

As noted in Section 1.1, and as referenced in Section 3.3, there is an increase in the total wastewater flow from the 927 March Road project site area and some re-allocation of wastewater flow to the intended service connection locations.

The allowance for an increase in wastewater flow is coordinated with the City of Ottawa.

The re-allocation of flow to the service connection locations is based on the intended development strategy for the 927 March Road project site area. More wastewater flow is being sent to the north service connection to align the sanitary sewer direction with the storm sewer direction and because of the unknown nature of potential development timing for 1145 Old Carp Road.

For the future school site along the south boundary of the 927 March Road project site, it is assumed that the MSS originally intended to have the school site connect to the sanitary sewer connection to Old Carp Road. The school site is accommodated by the sanitary sewer within the 927 March Road project site area but could also still be connected to the future sanitary sewer in Old Carp Road. A final decision on the service connection location can be made once the development application process for the 1145 Old Carp Road property proceeds.

Given the change in the pond location, the property at 941 March Road (Area ID ‘EXT-1’) is intended to have a direct connection to the sanitary sewer in March Road.

The sanitary sewer design conditions consider the commercial development and roadway (Area ID ‘C21D’, ‘C21E’, and ‘R21F’) that fall within the 905 March Road property to connect to the sanitary sewer within the internal roadway associated with the 927 March Road project site area rather than directly to March Road.

4.0 Stormwater Management and Servicing

4.1 Background

The existing storm drainage system along the boundaries of the site consists of a ditch and culvert drainage system along March Road (east boundary) and the drainage path identified in the MSS and EMP as Tributary 4. Through the site is the drainage path identified in the MSS and EMP as Tributary 3.

The MSS and EMP provide the general stormwater management servicing strategy and associated design criteria applicable to the site. The following summarizes the primary SWM and servicing strategy components applicable to the site.

- Tributary 3 is to be maintained through the site with a 40m offset providing the necessary floodplain and meander belt buffer.
- Tributary 4 is to be intercepted by the storm sewer system proposed as part of the overall development plan. The outlet for the storm sewer intercepting Tributary 4 is to be at Tributary 3.
- A new SWM facility, referenced as Pond 2, is to provide water quantity and quality control for a portion of the site. The area(s) of the site that cannot drain to the new SWM facility are required to provide on-site quantity and quality control.
- All runoff from the site is to be discharged to Tributary 3 upstream of the March Road culvert crossing. The existing March Road culvert crossing has the capacity required to convey the 100-year flow condition evaluated in the MSS/EMP.

Key excerpts from the MSS and EMP describing the proposed SWM servicing strategy are provided in **Appendix E.1** for reference.

4.2 Design Criteria

Preliminary SWM and storm sewer servicing is assessed using the conditions and criteria presented in the MSS and EMP, the City of Ottawa Sewer Design Guidelines (2012) as amended. Additional design criteria (i.e., items specific to the detailed design stage) may be considered through the applicable subsequent stages of the development application process.

From the MSS and EMP, the following design criteria are considered.

Water Quality Control

- An enhanced level of water quality control - 80% Total Suspended Solids (TSS) removal.
- On-site water quality control can be provided using manufactured treatment units or using LID measures.

Water Quantity Control

- West of March Road, quantity control storage is to be designed to ensure no increase in peak flow in the receiving watercourses (Tributaries 2 &3) downstream of the KNUEA.
- Ensure no adverse impacts on erosion in the watercourses resulting from future development within the KNUEA.
- SWM facilities should be designed to provide baseflow enhancement in the receiving watercourses.
- The normal water level (permanent pool) in wet ponds should be above the 2-year water level in the receiving watercourse.
- On-site quantity control storage could be provided by using a combination of surface and underground storage.

Water Balance

- No specific targets for infiltration or baseflow are identified. The suitability of low Impact development (LID) measures shall be considered relative to the presence of clay soils and shallow bedrock.

Erosion Control

- No specific targets for infiltration or baseflow are identified. The suitability of low Impact development (LID) measures shall be considered relative to the presence of clay soils and shallow bedrock.

Watercourse Crossings (Culverts)

- Watercourse crossings are to be sized to convey the 100-year peak flow without overtopping the roadways.
- Watercourse crossings should be designed in accordance with geomorphology principles.
- Watercourse crossings should be designed to ensure they meet any additional requirements for terrestrial and aquatic habitat.

From the City of Ottawa Sewer Design Guidelines, the following design criteria are considered.

General

- Use of the dual drainage principle.
- Consider the impact of 100-year event outlined in the City of Ottawa Sewer Design Guidelines on the major and minor drainage systems. The impact of the 100-year + 20% climate change event is also to be considered in relation to the major and minor drainage systems.

Storm Sewer & Inlet Controls

- Surcharge in the storm sewer system shall not occur for the 2-year design storm on local roads and the 5-year design storm for collector roads.
- Within private development blocks, peak flows generated from events greater than the 5-year and including the 100-year storm must be detained on-site.

Surface Storage & Overland Flow

- Building openings to be a minimum of 0.30 m above the 100-year water level.
- Maximum depth of flow under either static or dynamic conditions shall be less than 0.35 for the 100-year design storm. Within the private development blocks, runoff greater than the 100-year design would spill to the city right-of-way.
- Provide adequate emergency overflow conveyance off-site with a minimum vertical clearance of 0.15 m between the spill elevation and the ground elevation at the building envelope in the proximity of the flow route or ponding area.

4.2.1 ANALYTICAL METHODOLOGY

To support the SWM design, a PCSWMM computer model is developed to assess the storage requirements required and confirm general agreement with the allowable discharge conditions for the proposed development plan.

It is noted that the analysis completed by the EMP uses the SWMHYMO computer model and that the use of different computer models for SWM analysis can lead to variability in the outputs for comparable inputs. However, the key finding from the EMP that is applicable to the review of the 927 March Road project site area is the allowable discharge rate(s) to Tributary 3.

It is trusted that the allowable discharge criteria developed through the EMP suitably satisfy the design criteria associated with ensuring no increase in peak flow, ensuring no adverse impacts on erosion, and providing baseflow enhancement within the associated watercourses.

No further analysis of the pre-development conditions or the post-development Tributary 3 channel conditions examined by the EMP is considered required.

Additional review of the existing external drainage area to Tributary 4 is considered. The nature of the Tributary 4 drainage area review is described in Section 4.3 and Section 4.4.

For the post-development condition, the input parameters applied in PCSWMM are consistent with the City of Ottawa guidelines. Information on the methodology and project specific data for the PCSWMM analysis is provided in **Appendix E.2** and **Appendix E.3**.

4.2.1.1 Design Storms

It is noted that the design storm types, durations, and depths considered by the EMP are not consistent with the City of Ottawa design guidelines for new development. To support the transition through to the detailed design portion of the development application process, the design storms applied in this functional servicing study are set to be consistent with the City of Ottawa design guidelines.

Because the allowable discharge rates from the EMP are the key metrics for comparison, the change in the design storm applied is not considered significant.

Consistent with the City of Ottawa design guidelines, and for relative comparison to the allowable discharge rate(s) established by the EMP, the following design storm events are applied to assess the associated design condition as part of the analytical approach for the SWM review.

Allowable Discharge	**24-Hour SCS Type II Design Storm** • 25 mm depth • 48.0 mm depth (2-Year) • 62.4 mm depth (5-Year) • 105.74 mm and 103.2 mm depth (100-Year) 60-minute time step applied
SWM Facility Storage Volume	**12-Hour SCS Type II Design Storm** • 96.0 mm depth (100-Year) 30-minute time step applied **24-Hour SCS Type II Design Storm** 103.2 mm depth (100-Year) + 20% 60-minute time step applied **3-Hour Chicago Storm** • 100-Year +20% 10-minute time step applied **Historical Storm Event** • July 1, 1979 • August 4, 1988 • August 8, 1996
SWM Facility Water Quality Volume	**4-Hour Chicago Storm** • 25 mm depth 10-minute time step applied
On-site SWM Control Volume	**3-Hour Chicago Storm** • 100-Year 10-minute time step applied

A list of the resultant design storm values input to the PCSWMM analysis is provided in **Appendix E.3**.

While all design storms are evaluated, not all results are presented. Only the results from design storms that influence the decision making associated with the proposed development plan are reported.

4.2.1.2 Drainage Areas

At this functional assessment stage, drainage areas are considered relative to anticipated land-use and the assigned runoff coefficient. Only the gross runoff condition from the evaluated drainage areas is considered in relation to assessing the Pond 2 storage requirements and resultant discharge to Tributary 3. Further refinement of drainage areas is to be considered with additional design detail developed through subsequent stages of the development application process.

For the areas being developed, runoff from the drainage areas is assessed using the Horton infiltration parameters based on the City of Ottawa design guidelines.

For the external drainage areas, the Nash Unit Hydrograph (NUH) method with the SCS CN loss method is applied. The use of these methods allows for a closer comparison to the conditions modeled in the EMP.

Additional information on the drainage areas applied and analysis completed is provided in Section 4.3 and 4.4.

4.2.1.3 Major and Minor Systems

Sufficient design detail for the major system and potential intel capture conditions to the minor system are not available at this stage of the development application process. As a result, a meaningful hydraulic grade line (HGL) review of the minor system cannot be completed. HGL conditions can be reviewed when suitable detail is developed through subsequent stages of the development application process.

Conceptual drainage system components are included in the PCSWMM analysis as needed to support the assessment of the storage requirements and resultant discharge to Tributary 3. The water level in Tributary 3 is also considered as part of the Pond 2 analysis. The Tributary 3 water levels are taken from the EMP.

4.2.1.4 Water Quality Control

For review of the water quality control performance of the proposed Pond 2 SWM facility, two conditions are considered.

- For the permanent pool volume, the recommended storage volume per contributing hectare of drainage area is applied from Table 3.2 of the MECP Stormwater Management Planning and Design Manual.
- For a 25mm design storm event, a drawdown time of two to three days is targeted.

Considerations for water quality control requirements associated with the areas contributing directly to Tributary 3 are to be made with the detailed design stage of the development application process. OGS units are anticipated to be the primary water quality enhancement mechanism.

4.2.2 ALLOWABLE DISCHARGE

As noted in Section 7.2.1 of the EMP, *"Under pre-development conditions, the 24-hour SCS distribution generated the highest peak flows in the receiving watercourses and was consequently (ed) used as the benchmark for the analysis of the proposed SWM strategy for the KNUEA."* The following allowable discharge conditions, specific to the 927 March Road project site area, are extracted from the 24-hour SCS analysis results within the EMP. Key excerpts from the SWMHYMO data taken from the EMP that is associated with the allowable discharge conditions are provided in **Appendix E.1** for reference.

Table 4.1: Allowable Discharge Summary

Location	Design Storm (24-Hour SCS Type II)			
	25 mm	2-Year	5-Year	100-Year
SWM Facility (Pond 2)	2 L/s	16 L/s	30 L/s	83 L/s
On-Site Storage	124 L/s	314 L/s	450 L/s	800 L/s
Tributary 3	130 L/s	370 L/s	566 L/s	1,449 L/s

It is noted that Section 9.3 of the EMP describes an allowable discharge rate for 'Pond 2' of 84 L/s (0.084 m^3/s). Additionally, it is noted that Section 9.6 of the EMP describes an allowable discharge rate for the 'On-Site Storage' area of 816 L/s. However, the data from the SWMHYMO results of the EMP (provided in **Appendix E.1**) as listed in **Table 4.1** are taken as the allowable discharge conditions.

It is also noted that the post-development SWMHYMO results of the EMP indicate higher peak discharge values for the key reference locations noted above for the 4-Hour Chicago and 12-Hour SCS design storms. However, as noted above, the 24-Hour SCS design storm was selected in the EMP as the benchmark design storm.

The nature of the allowable discharge calculations within the EMP consider a free flow outlet with no potential tail water impacts applied.

The discharge conditions associated with 'Tributary 3' in **Table 4.1** represent the total flow considered in the tributary west of March Road. The hydraulic analysis of the tributary completed in the EMP considers the total 100-Year flow rate contributing at the upstream end of Tributary 3 within the 927 March Road project site area (River Station 3692.41 in the HEC-RAS analysis, **Appendix E.1**).

As noted previously, it is trusted that the allowable discharge criteria developed through the EMP suitably satisfy the design criteria associated with ensuring no increase in peak flow, ensuring no adverse impacts on erosion, and providing baseflow enhancement within the associated watercourses.

4.3 Existing Conditions

This section describes the nature of anticipated upstream external contributing drainage areas to the 927 March Road project site area, and the nature of the applicable floodplain conditions.

4.3.1 EXTERNAL DRAINAGE AREA

The EMP and MSS consider potential contributions from existing properties outside of the KNUEA. Review of the existing upstream conditions is considered in additional detail to assess the potential contributions from the adjacent properties.

4.3.1.1 Existing Pre-Development External Drainage Area

From the EMP, there are five existing external drainage areas west of the 927 March Road project site boundary considered. Two areas to the west are associated with existing rural development that is intended to stay in a rural condition for the foreseeable future. The area long the north boundary is part of KNUEA development area and is intended to be managed as part of the overall development servicing strategy. Key figures and excerpts from the EMP data associated with the existing conditions are provided in **Appendix E.1** for reference.

- Area ID ‘301’ - This is an 86.43 ha area identified as part of the contributing drainage area to Tributary 3. From the 24-hour SCS design storm a 100-year peak flow of 383 L/s is established in the EMP.
- Area ID ‘302’ - This is an 80.69 ha area identified as part of the contributing drainage area to Tributary 3. From the 24-hour SCS design storm a 100-year peak flow of 287 L/s is established in the EMP.
- Area ID ‘303’ - This is a 65.19 ha area identified as part of the contributing drainage area to Tributary 3. From the 24-hour SCS design storm a 100-year peak flow of 346 L/s is established in the EMP.

The runoff from Area ID ‘301’, ‘302’, and ‘303’ is considered to continue to drain to Tributary 3 upstream of the 927 March Road project site area.

- Area ID ‘304’ - This is an 18.78 ha area identified as part of the contributing drainage area to Tributary 3. The area is largely within the 927 March Road project site boundary but does include a portion of area outside the northwest corner of the property boundary.
    - This area is intended to be entirely incorporated into the development servicing strategy for the KNUEA.
- Area ID ‘401’ – This is a 16.75 ha area (modeled as 16.78 ha) identified as part of the contributing drainage area to Tributary 4 from the existing rural Marchbrook Circle subdivision. From the 24-hour SCS design storm a post-development 100-year peak flow of 386 L/s is established in the EMP.

  - The EMP proposes that the 100-year post-development peak flow of 386 L/s, from the existing rural Marchbrook Circle subdivision, be routed to Tributary 3. The flow is to be included within the storm sewer system servicing the portion of the proposed 927 March Road project site area also being routed directly to Tributary 3.

In the MSS, the pre-development drainage condition associated with Area ID ‘301’, ‘302’, ‘303’ and ‘401’ is effectively unchanged.

For the review completed in this FSR, the existing conditions considered for Area ID ‘303’ and ‘401’ are described as follows and as illustrated on **Figure 2 Existing External Drainage Area**.

- Area ID ‘303’ - This area is reduced in size to 55.03 ha. The reduction is created by the refinement of the boundary with Area ID ‘401’ based on a review of the topographic data available from the City of Ottawa. This area continues to drain to Tributary 3 upstream of the 927 March Road project site area.
- Area ID ‘304’ - Further review of the topographic data identified a discrepancy in the existing drainage area. There is a larger portion contributing along the north boundary of the 927 March Road project site area. The drainage area along the north boundary now being considered is also shown on **Figure 2**.
  - The resultant change to Area ID ‘203’ is not considered significant relative to the overall findings and recommendations of the EMP and MSS. No further review of the potential impact on Area ID ‘203’ resulting from the change to Area ID ‘304’ is considered.
- Area ID ‘401’ – This area is increased in size to 22.98 ha. The increase is created by the refinement of the boundary with Area ID ‘303’ based on a review of the topographic data available from the City of Ottawa. This area continues to drain to Tributary 4 upstream of the 927 March Road project site area.
- New Area ID ‘F115D’ – This area created from a portion of Area ID ‘303’ and Area ID ‘401’. It represents a 2.51 ha area that contributes directly to the rear yard boundary along the western edge of the 927 March Road project site area. This area is described in the MSS and is intended to be intercepted by the new development storm sewer system and managed through the Pond 2 SWM facility.

In addition to the modifications to the existing external drainage areas described above, one additional change to the conditions existing external areas relative to the EMP and MSS is noted.

- New Area ID ‘F307A’ – This is a drainage area contributing to Tributary 4 identified as part of the topographic data review completed for the 927 March Road project site area. The full area is shown on **Figure 2**. This area is not defined in the EMP or the MSS. However, there is an existing culvert under Old Carp Road, east of Marchbrook Circle, that brings drainage from south of Old Carp Road to Tributary 4.

March Road defines the east boundary of the 927 March Road project site area. There is no directly contributing existing external drawing area from March Road considered.

4.3.1.2 Interim Post-Development External Drainage Area

Because of the change in Area ID '304', an interim external drainage area condition for the 927 March Road project site area is applied. The interim condition is also illustrated and noted on **Figure 2** as Area ID 'EXT-2'.

As per the EMP and MSS, the Copperwood Estate project by CU Developments Inc. in the northwest quadrant of the KNUEA intercepts a portion of Area ID '304'. The remainder of the external drainage area associated with the updated Area ID '304' is associated with the parcel of land with the address 1015 March Road. This parcel is not part of the KNUEA participating owner group so development of this land in the foreseeable future is not anticipated. The related portion of external drainage area is applied as a contributing area to the 927 March Road project site area.

4.3.1.3 Ultimate Post-Development External Drainage Area

In the ultimate development condition, additional refinements to the external drainage areas occur. The ultimate external drainage area conditions are illustrated on **Drawing OSD-1**.

For Area ID '303' and '401', refinements are made relative to the proposed development plan. The interim portion of Area ID '304' no longer contributes to the 927 March Road project site area and is incorporated into the servicing strategy for the northwest quadrant of the KNUEA. Area ID '311' and '312' are the remaining parts of pre-development Area ID '304' that contribute directly to Tributary 3 from within the 927 March Road project site area in the ultimate post-development condition.

The Copperwood Estate project now also contributes an additional ultimate condition area towards the 927 March Road project site. This additional ultimate condition area is also illustrated and noted on **Figure 2** as Area ID 'EXT-3'. The 1.0 ha area is the rear yards for the lots along the southern leg of Rotterdam Circle and the adjacent open space behind the rear yards. Area ID 'EXT-3' contributes runoff to Tributary 3 through Area ID '303'.

An additional portion of the Copperwood Estate development is also considered based on the Phase 1 design information shared by the project. This additional area is included as part of Area ID 'L110A' as shown on **Drawing OSD-1**

Information as to how the external drainage areas are integrated into the proposed development servicing is presented in Section 4.4 and 4.5. Refinement to the existing external conditions considered may be made through subsequent stages of the development application process.

4.3.2 FLOODPLAIN

The floodplain, meander belt, and regulation limit lines as per the shapefile data provided by the MVCA (via 2019-02-14 email from John Price, P.Eng., Director Water Resources Engineering) is added to **Drawing OSD-1** and **Drawing OGP-1**.

Water level elevations for the storm sewer outlets to Tributary 3 are taken from the EMP. The elevations at the related River Stations are summarized in the following table.

Table 4.2: Tributary 3 Water Level Elevations

Outlet Location	Tributary 3 River Station	Design Storm (24-Hour SCS Type II)		
		2-Year	5-Year	100-Year
Pond 2, Overland Escape	3625.37	81.27 m	81.32 m	81.47 m
Headwall (HWL) 146 and 200	3250.94	77.85 m	77.95 m	78.30 m

The selected river station is approximate to the station relative to the outlet location.

4.4 Stormwater Management Design

The SWM design effort completed with this FSR evaluates multiple conditions associated with the proposed 927 March Road project site area.

1. To support the transition from the SWM modeling completed with the EMP to the SWM modeling associated with this FSR and the eventual detailed design, a partial re-creation of applicable external drainage area conditions from the EMP is completed. The results associated with the changes to the external areas identified relative to the EMP are also assessed.
2. Further to the external drainage area review, additional considerations in relation to the management of Tributary 4 drainage is assessed.
3. To support the relocation of the Pond 2 SWM facility, the resultant SWM requirements for the 941 March Road property are assessed.
4. To support the establishment of the development block for the Pond 2 SWM facility, the design pond volume and associated area is assessed relative to achieving the water quantity and water quality control objectives.
5. To support the proposed road crossing of Tributary 3, a functional review of the culvert needed is completed.
6. To support portion of the 927 March Road project site area contributing directly to Tributary 3, the on-site requirements are assessed relative to achieving the water quantity and water quality control objectives.
7. A final summary of the total contributing discharge to Tributary 3 is completed and compared to the total allowable discharge to Tributary 3 as presented in the EMP.

Information specific to the SWM design reviews for each of these conditions is provided as follows.

4.4.1 EXTERNAL DRAINAGE AREA

The contribution from the existing external drainage areas is evaluated as an attempt to duplicate the results from the EMP and then make the appropriate adjustments to reflect additional review completed with this FSR.

To simplify the results comparison, only the 100-Year 24-Hour SCS Design storm is applied for the comparison. The following list and table summarize the key comparisons made to the external post-development drainage areas from the EMP to this FSR.

- The NUH method used in the SWMHYMO analysis from the EMP is not typical within PCSWMM but is available as an alternative runoff method (ARM). The 'Subcatchments' using the NUH method within PCSWMM are identified separately as 'ARM Subcatchments'.
    - The inputs for the NUH method and the SCS CN loss method between SWMHYMO and PCSWMM are different, so adjustments are made as needed to create an effective comparison.
- The full design storm data used in the EMP is not available. The precipitation depth for the 100-Year 24-Hour SCS Design storm in the EMP is 105.74 mm. A design storm using this depth and the SCS design storm derivation parameters from the City of Ottawa design guidelines is developed.

Table 4.3: External Drainage Area Analysis Comparison, 100-Year 24-Hour SCS

	Input					Output
Reference	**Area (ha)**	**CN**	**IA (mm)**	**N**	**TP / Tc**	**Peak Flow (L/s)**
Area 301						
SWMHYMO – EMP	86.43	63	12.3	1.1	1.24 hrs	383
PCSWMM – EMP Duplication	86.43	30	27.2	2	111.04 min	383
PCSWMM – FSR Update	86.43	30	27.2	2	111.04 min	358
Area 302						
SWMHYMO – EMP	80.69	64	10.9	1.1	1.80 hrs	287
PCSWMM – EMP Duplication	80.69	30	26.5	2	161.19 min	287
PCSWMM – FSR Update	80.69	30	26.5	2	161.19 min	269
Area 303						
SWMHYMO – EMP	65.19	69	8.9	1.1	1.31 hrs	346
PCSWMM – EMP Duplication	65.19	30	20	2	117.31 min	346
PCSWMM – FSR Update	55.03	30	20	2	117.31 min	275

Reference	Input					Output
	Area (ha)	CN	IA (mm)	N	TP / Tc	Peak Flow (L/s)
Area 304						
SWMHYMO – EMP	18.78	77	7.0	1.1	1.04 hrs	151
PCSWMM – EMP Duplication	18.78	35	10.2	2	122.69 min	151
PCSWMM – FSR Update	EMP Duplication Parameters applied to interim Area ‘F103D’					
Area 311						
SWMHYMO – EMP	1.15	65	9.3	1.1	0.52 hrs	11
PCSWMM – EMP Duplication	1.15	30	18	2	46.56 min	11
PCSWMM – FSR Update	0.55	30	18	2	11.4 min	8
Area 312						
SWMHYMO – EMP	1.304	76	7.5	1.1	0.65 hrs	15
PCSWMM – EMP Duplication	1.30	38	18	2	58.21 min	15
PCSWMM – FSR Update	1.95	38	18	2	50.3 min	23
Area 401 (F308B in FSR)						
SWMHYMO – EMP	16.78	68	7.0	3	1.66 hrs	386
PCSWMM – EMP Duplication	16.78	68	7.0	3	148.66 min	386
PCSWMM – FSR Update	22.98	68	7.0	3	148.66 min	507

Notes:
CN = Curve Number.
IA = Initial Abstraction.
N = Number of Reservoirs, minimum value in PCSWMM is 2.
TP = Time to Peak, value input in hours. Time of Concentration (Tc) input is minutes is used in PCSWMM. Conversion from Time to Peak to Time of Concentration is based on the equation TP = 0.67 * Tc.
Flow Length (m), Slope (%), and Impervious (%) values available in PCSWMM are not used for the EMP Duplication because the IA and TP/Tc values from the EMP SWMHYMO analysis are applied as ‘User entered value’ inputs.

The main difference between the SWMHYMO and PCSWMM analysis using the NUH method is that the PCSWMM application only allows a minimum value of two for the Number of Reservoirs, N parameter. To compensate for this difference, the CN and IA input parameter values are adjusted in the PCSWMM analysis to create a comparable result to the SWMHYMO analysis.

With the external drainage areas included as part of the FSR analysis, the area sizes are modified to reflect the additional review effort with the rest of the input parameters kept consistent with those used for the EMP duplication.

For area ‘311’ and ‘312’, an updated Time of Concentration value is used because the length of the subcatchment is changed with the introduction of the road crossing Tributary 3. Consistent with the EMP, no consideration to the existing in-line “pond” features is given in the analysis of flow conditions within Tributary 3. Additionally, the corridor enhancement conditions within Tributary 3 (as per the design developed and presented by Matrix Solutions Inc.) do not directly consider or impact the flow rate conditions from either the EMP or this FSR.

For the new external drainage areas ‘EXT-2’ and ‘F115D’, flow length and slope parameters are input (based on the existing topographic condition review) in PCSWMM to allow the time of concentration to be calculated by the model.

It is noted that there appears to be a discrepancy in the EMP for the pre-development and post-development condition reported for area ‘401’ (now ‘F308B’). The SWMHYMO results for the predevelopment conditions shows a peak flow rate of 75 L/s. The post-development peak flow rate is the 386 L/s value noted in the previous table. The difference appears to be attributed to different NUH method input parameters applied.

The review of the external drainage areas shows that results can be established from the PCSWMM analysis used with this FSR that are consistent with the SWMHYO analysis completed with the EMP. PCSWMM input and output data is provided in **Appendix E.3**.

4.4.1.1 Area ID ‘EXT-3’

As a new ultimate condition contributing area, Area ID ‘EXT-3’ is not reviewed in the same manner as the other external drainage areas. The area is included in the analysis as a typical PCSWMM subcatchment. The resultant runoff is included in the review of the total contributing flow to the Tributary 3 culvert and the overall total contributing discharge condition within Tributary 3.

4.4.2 TRIBUTARY 4

To support the KNUEA development strategy, the EMP and MSS carried a recommendation to route the pre-development flow contributing to Tributary 4, to where Tributary 3 crosses March Road. The storm sewer system through the 927 March Road project site area is intended to accommodate transferring the contributing flow from Tributary 4 to Tributary 3.

With the additional review of the external drainage areas in this FSR, it is recommended that the external drainage area associated with Tributary 4 be routed through a storm sewer along the future Old Carp Road re-alignment rather than through the 927 March Road project site area. Additionally, the upstream end of the existing Tributary 4 conveyance path lies entirely within the currently proposed park space of the 927 March Road project site area. It is recommended that the Tributary 4 conveyance path be retained within the ultimate park space. Information on the proposed storm sewer conveyance is provided in Section 4.5.4.

This new recommendation for the management of Tributary 4 drainage allows for the associated drainage area to be accommodated with the future development of the 1145 Old Carp Road property. It also allows for the development of the 927 March Road project site area to develop without the need to access private land to re-route existing drainage conditions.

4.4.2.1 Contributing Drainage Area

As noted in Section 4.3.1, updates to the contributing drainage area associated with Tributary 4 since the completion of the EMP are considered in this FSR. In relation to Tributary 4, the updated areas are to

Area ID '401' and the new Area ID 'F307A'. Additionally, to retain the portion of Tributary 4 within the ultimate park space of the 927 March Road project site area, a related contributing drainage area is established and labeled 'F308A'. The contributing drainage areas considered for Tributary 4 are shown on **Figure 2** and **Drawing OSD-1**.

To support the PCSWMM analysis within this FSR, the parameters referenced in Section 4.3.1 for Area ID 'F308B' (formerly '401') are applied. For Area ID 'F307A' and 'F308A', the parameters associated with a typical urbanized drainage area are applied. The urbanized drainage parameters for Area ID 'F307A' are selected based on the review of the topographic data. Although still associated with a rural development area, the imperviousness condition at approximately 25% is considered closer to that of an urban condition relative to the other external drainage areas.

From the PCSWMM analysis within this FSR, the following table summarizes the peak flows for the reference design storms from the Tributary 4 contributing drainage areas at the upstream end of the 927 March Road project site area.

Table 4.4: Discharge to Tributary 4

Drainage Area	Area Size	24-Hour SCS				24-Hour Chicago (100-Year)
		25.0 mm	48.0 mm (2-Year)	62.4 mm (5-Year)	103.2 mm (100-Year)	
'F308A'	0.19 ha	0.0 L/s	8.0 L/s	19.0 L/s	39.3 L/s	76.0 L/s
'F308B'	22.98 ha	23.7 L/s	117.0 L/s	200.9 L/s	507.2 L/s	417.2 L/s
'F307A'	4.20 ha	31.2 L/s	59.9 L/s	125.7 L/s	386.7 L/s	1097.1 L/s

Because of the different nature of the catchment areas, the flows for each contributing area are not totalled in the table above. The time when each peak flow occurs varies so a simple summation of each peak flow value is not meaningful. The discharge to Tributary 4 from each of these areas is the same under existing and proposed development conditions. The net flow contribution to Tributary 4 is reduced from the existing to the proposed condition based on a portion of the pre-development Area ID '402' becoming part of the controlled flow area directed to Tributary 3.

As part of the development application process for 1154 Old Carp Road, the nature of the flow from area 'F307A' in relation to the EMP and MSS, and the pre-development flow contribution from area 'F308B' can be reviewed further.

4.4.2.2 Other Considerations

Until the 1145 Old Carp Road property develops the Tributary 4 conveyance path is recommended to be maintained through the 927 March Road property as an interim condition. A holding can be placed on the existing Tributary 4 conveyance path within the 927 March road property as needed.

It is noted that there appears to be a discrepancy in the MSS with the proposed SWM strategy for the future re-alignment of Old Carp Road. In Appendix B of the MSS, the minor system drainage boundary shown on *Drawing 112117-STM1* does not coincide with the major system drainage boundary shown on

Drawing 112117-STM2. Additionally, neither drainage boundary appears to fully consider an anticipated ultimate re-alignment of Old Carp Road down to Halton Terrace. It is recommended that this apparent discrepancy be reviewed during any future development application process for the 1145 Old Carp Road property.

4.4.3 941 MARCH ROAD (AREA 'EXT-1')

As presented in Section 1.1, the landowner at 941 March Road is not currently interested in developing the land and is considered a non-participating owner within the EMP and MSS.

The elevations within 941 March Road are not anticipated to support a post-development design condition that can drain the entire property back to the new Pond 2 SWM Facility location. Therefore, to allow 941 March Road to develop an independent SWM servicing strategy that is generally consistent with the MSS and EMP, an allowable discharge rate is allocated as a proportionate share of the total allowable discharge from the Pond 2 SWM facility.

From the EMP, the total allowable discharge rate attributed to Pond 2 is 83 L/s. The total contributing area to Pond 2 as illustrated on **Drawing OSD-1** is 17.18 ha. The area associated with 941 March Road is 1.77 ha.

The equivalent allowable unit discharge rate for Pond 2 and Area 'EXT-1' is then:
83 L/s / 17.18 + 1.77 ha = 4.38 L/sha.

For 941 March Road (Area 'EXT-1') the total allowable discharge rate is then:
1.77 ha * 4.38 L/s/ha = 7.8 L/s.

Considering an overall runoff coefficient of 0.8 (86% impervious), and the 7.8 L/s allowable discharge rate, conceptual water quantity control storage volumes for 941 March Road are offered for the reference design storm conditions in the following table.

Table 4.5: 941 March Road Water Quantity Control Volumes

Drainage Area	Area (ha)	100-Year Design Storm Storage Volume		
		12-Hour SCS 96.0 mm (100-Year)	**24-Hour SCS** 103.2 mm + 20%	**3-Hour Chicago** + 20%
EXT-1	1.77	1,205 m^3	1,357 m^3	1,319 m^3

The enhanced level of water quality control - 80% Total Suspended Solids (TSS) removal, remains an applicable design criterion for 941 March Road (Area 'EXT-1').

The SWM design conditions can be reviewed and updated as needed with any future development application associated with the 941 March Road property.

4.4.4 POND 2 SWM FACILITY

The Pond 2 SWM facility is intended to provide water quantity and water quality control for the associated contributing area. Based on the current development concept plan, drainage area boundaries are defined as illustrated on **Drawing OSD-1**. The '100' series and 'Pond' catchment areas drain to the Pond 2 SWM facility prior to discharge into Tributary 3 at the corresponding allowable discharge rate. The additional interim drainage area applied is illustrated on **Figure 2**.

Preliminary runoff coefficient values for storm sewer design calculations and imperviousness allocations are assigned to each applicable drainage area based on the anticipated finished surface condition (e.g., asphalt, concrete, gravel, grass, etc.) typically associated with the associated land use. Land use within the overall Pond 2 drainage area includes the pond area itself, large open park space, low-density residential, medium-density residential, high-density residential, and related collector and local roads.

A summary of drainage areas and key analysis parameters is provided in **Table 4.6**. A complete summary of the inputs applied to PCSWMM is provided in **Appendix E.3**.

Table 4.6: Summary of Pond 2 Contributing Drainage Areas

Drainage Area	Area (ha)	Runoff Coefficient, C
Pond	1.60	0.50
C103A	0.31	0.65
C103B	1.26	0.80
L103C	4.26	0.40
C107A	0.30	0.65
C109A	0.63	0.65
L110A	0.77	0.65
F112A	0.46	0.40
C113A	0.31	0.65
C114A	0.65	0.65
C114B	0.98	0.70
C115A	0.63	0.65
C115B	0.94	0.70
L115C	0.59	0.40
F115D	2.51	CN 68
L116A	0.78	0.65
C117A	0.23	0.65
C117B	0.55	0.65
Total	**17.76**	

Drainage area 'C109A' and 'L110A' are established in connection with a review of information provided by the Copperwood Estate development project to the north. Both these areas include part of the development area with the Copperwood Estate boundary. A copy of the information used to develop the ‘C109A’ and ‘L110A’ drainage areas is included in **Appendix E.1** for reference.

In addition to the areas listed above, the interim external drainage area ‘EXT-2’ at 1.05 ha, as shown on **Figure 2**, is applied to the analysis of Pond 2. For the external drainage areas ‘EXT-2’ and ‘F115D’, the NUH runoff method is applied as described in Section 4.4.1. The related input parameters for area ‘EXT-2’ area as described in Section 4.4.1. The input parameters for area ‘F115D’ are based on the values used for area ‘401 / F308B’ as described in Section 4.4.1.

4.4.4.1 Uncontrolled Areas

There are four areas associated with the general area contributing to Pond 2 that do not drain to the pond and create uncontrolled runoff. The uncontrolled drainage areas are illustrated on **Drawing OSD-1**.

- Area ‘UNC-2’ is a 0.15 ha rear yard area west of the road crossing Tributary 3, on the south side of Tributary 3. This area is considered further as part of the review of the culvert for the proposed road crossing Tributary 3 and the total allowable flow in Tributary 3.
- Area ‘UNC-3’ is a 0.14 ha pathway allowance area west of the road crossing Tributary 3, on the north side of Tributary 3. This area is considered further as part of the review of the culvert for the proposed road crossing Tributary 3 and the total allowable flow in Tributary 3.
- Area ‘UNC-4’ is a 0.08 ha portion of the Zone B development block on the south side of Tributary 3. This area is considered further as part of the review of the total allowable flow in Tributary 3.
- Area ‘C147A’ is a 0.07 ha pathway allowance area east of Pond 2 in between the 927 March Road project site area and the non-participating 941 March Road property. This area is intended to be intercepted by the pond outlet sewer near the interface with March Road. A flow capture is factored into the storm sewer design and the major overflow is intended to go to Tributary 3 via the ditch on the west side of March Road.

The relationship to the peak flow from each uncontrolled area relative to the total allowable discharge associated with Tributary 3 and the 927 March Road Project site area is described in Section 4.4.7.

4.4.4.2 Allowable Discharge and Water Quantity Control

From the EMP, the total allowable 100-Year 24-Hour (SCS) discharge rate attributed to the Pond 2 SWM facility is 83 L/s. With the allocation of 7.8 L/s to the 941 March Road property (as described in Section 4.4.2), the available allowable discharge rate for the Pond 2 SWM facility is 75.2 L/s.

To assess the water quantity control storage volume required, a functional design for the Pond 2 SWM facility is prepared. The functional design condition is illustrated on **Drawing POND-1**. The associated data for the surface areas, storage volumes, and discharge rates and the various water levels are provided in the following table. The storage volume is calculated from the area of the pond elevation contours as developed with AutoCAD Civil 3D using an average end area calculation method.

Table 4.7: Pond 2 Functional Design Data

Water Level (m)	Depth (m)	Area (m^2)	Increment Volume (m^3)	Total Volume (m^3)	Active Volume (m^3)	Discharge (L/s)
78.5 (Bottom)	0.0	1,878	0	0	--	
79.2	0.7	2,970	1,697	1,697	--	
79.5 (Normal Water Level)	1.0	4,683	1,148	2,845	0	0
80.1	1.6	6,595	3,383	6,228	3,383	47.6
80.9	2.4	8,057	5,861	12,089	9,244	72.7
81.0 (High Water Level)	2.5	8,169	811	12,900	10,056	75.2
81.3 (Freeboard)	2.8	8,509	2,502	15,402	12,557	82.4

The discharge rate is based on a standard circular orifice – 0.169m Diameter, 0.62 coefficient, set with the invert at the Normal Water Level (NWL) elevation of 79.5 metres.

Considering the overall contributing area (including the interim external area ‘EXT-2’) and the 75.2 L/s allowable discharge rate, the Pond 2 SWM facility functional water quantity control storage volumes, related water levels, and discharge rates are determined with the PCSWMM analysis. The results for the reference design storm conditions are offered in the following tables.

Table 4.8: Pond 2 Water Quantity Control Volumes (100-Year)

Reference	12-Hour SCS 96.0 mm (100-Year)	24-Hour SCS 103.2 mm + 20%	3-Hour Chicago + 20%
100-Year Volume	8,378 m^3	9,860 m^3	9,115 m^3
100-Year Water Level	80.79 m	80.98 m	80.88 m
100-Year Discharge	63.7 L/s	68.7 L/s	66.2 L/s

The water quantity control volumes are all accommodated at or below the 81.0 metre design high water level (HWL) elevation. The 100-Year discharge rates for all design storms are below the 75.2 L/s total allowable discharge rate.

A review of the City of Ottawa historical design storms is also completed. The results are not reported, but each of the 1976, 1988, and 1996 storm events indicate a storage volume requirement and resultant discharge rate that is less than the HWL design volume available and the 100-Year allowable discharge rate. The historical storms are included with the PCSWMM data provided with the report submission.

Table 4.9: Pond 2 Discharge Rates

Reference	24-Hour SCS 25.0 mm	24-Hour SCS 48.0 mm (2-Year)	24-Hour SCS 62.4 mm (5-Year)	24-Hour SCS 103.2 mm (100-Year)
Allowable Discharge	2 L/s	16 L/s	30 L/s	72.5 L/s
Design Discharge	20.8 L/s	34.2 L/s	41.6 L/s	60.9 L/s

It is noted that the allowable discharge conditions for the 25 mm, 48.0 mm, and 62.4 mm 24-Hour SCS design storms exceed the allowable discharge rates. This is a result of only a single orifice control considered at this functional design level. To achieve the allowable discharge for the smaller design storm events and potential baseflow augmentation, it is anticipated that multiple orifice controls will be needed and that orifice sizes may need to be less than the typical minimum City of Ottawa ICD size of 83 mm.

For the detailed design stage of the development application process, it is recommended that further discussion towards achieving the allowable discharge condition at the lower range design storms be considered. The discharge from the Pond 2 SWM facility can also be considered against the overall discharge to Tributary 3 associated with the 927 March Road project site area.

For this functional servicing stage of the development application process, the results of the 100-Year design storm conditions show that the proposed pond block size can achieve the water quantity control storage requirement and related allowable discharge rate. This should allow for confidence in the proposed draft plan of subdivision.

The full summary of the functional design characteristics for the Pond 2 SWM facility is provided in Section 4.5.1.

4.4.4.3 Water Quality Control

Two criteria are considered for assessing the water quality control requirements of the Pond 2 SWM facility. The criteria from the MECP Stormwater Management Planning and Design Manual and the analysis of the draw down time for a 25mm design storm event.

MECP Guideline

From the MECP manual, Table 3.2 is referenced. Based on the contributing drainage area data in **Table 4.5**, the overall imperviousness (using the equation Impervious % = C – 0.20 / 0.70) works out to 52%.

For an 'Enhanced' protection level using a wet pond, the 190 m^3/ha value for the 55% impervious condition is considered at this functional stage of the design process. For the 17.76 ha contributing area, the required permanent pool storage volume and related extended detention storage volume to meet the MECP guideline is summarized as follows.

Permanent Pool = (190 m^3/ha – 40 m^3/ha) * 17.76 ha = 2,664 m^3. As shown in **Table 4.6**, the functional design for Pond 2 provides greater than the MECP guideline requirement with 2,845 m^3 of permanent pool storage.

Extended Detention Storage = 40 m^3/ha * 17.76 ha = 710 m^3. The extended detention storage for water quality control is compared to the storage volume derived with the PCSWMM analysis for the 25 mm 4-Hour Chicago design storm event.

Note that the full 17.76 ha contributing area to the Pond 2 SWM facility is only applied for simplicity. The external contributing area ‘F115D’ (2.51 ha) and the area for the pond itself (1.60 ha) are not anticipated to generate a TSS load.

25 mm Design Storm

The PCSWMM analysis is used to review the storage volume and drawdown time for a 25 mm 4-Hour Chicago design storm event. The model is set to run for 96 hours to allow the pond depth to be reviewed against the target draw down duration of two to three days.

The storage elevation, depth, and volume from the PCSWMM analysis is 79.80 m, 0.30 m, and 1,529 m^3. This volume exceeds the MECP guideline value calculated above for extended detention storage in relation to the water quality objective.

Figure 3 Pond 2 - 25 mm Storm Depth-Duration Curve is the result for the Pond 2 depth as extracted from the PCSWMM analysis for the 25mm 4-hour Chicago design storm duration. The curve shows that at the end of the 96-hour simulation period, the pond has not fully returned to the permanent pool elevation of 79.5 metres. After three days the pond is still approximately 3 cm above the permanent pool elevation and at four days the pond depth is still approximately 2 cm deep.

Tests with the model using orifice sizes up to one metre in diameter also indicate that the pond does not drop below the 1 cm depth mark after three days. Attempting to achieve a model result that expressly shows the pond at exactly the permanent pool elevation of 79.5 metres after two to three days may not be meaningful.

It is suggested that the pond depth draw down be reviewed along with the allowable discharge rate for the smaller design storms at the detailed design stage of the development application process. These two design criteria require different discharge measures to achieve the desired outcomes. A decision may need to be made as to whether the pond depth draw down or the lower allowable discharge rates will be the key design criteria accommodated by the pond design.

Additional information on the functional design characteristics for the Pond 2 SWM facility in relation to water quality control is provided in Section 4.5.1.

4.4.4.4 Baseflow Augmentation

The nature of potential baseflow augmentation as it relates to the Pond 2 SWM facility storage requirement is not specifically considered. While the concept is presented in the EMP, there is no flow rate established for implementation by the EMP. It is recommended that the baseflow augmentation rate be considered further at the detailed deign stage to ensure compatibility with the other design objectives for the Pond 2 SWM facility. This compatibility includes, but may not be limited to, the allowable discharge conditions at lower range design storms, desired draw down times, minimum orifice size, and operations and maintenance expectations.

It is also recommended that any potential baseflow augmentation condition shall not create a limitation on the overall storage capacity of the Pond 2 SWM facility.

4.4.4.5 Development Blocks

A summary of the water quantity control and water quality control servicing requirements for the development blocks within the overall contributing drainage area to the Pond 2 SWM facility is presented in Section 4.5.2.

4.4.5 TRIBUTARY 3 CULVERT

The EMP developed a 100-year (SCS 24-hour) peak flow to the Tributary 3 culvert of 1,449 L/s with a corresponding culvert size of 1800 mm wide X 1200 mm high.

For the analysis in this FSR, the contributing flow to the upstream end of the Tributary 3 culvert is taken from the PCSWMM outfall node ‘T3-B’ as 325 L/s.

The culvert size of 1800 mm wide X 1200 mm high proposed for the Tributary 3 culvert as presented in the EMP is maintained with this FSR. Further review of the Tributary 3 culvert size can be considered during the detailed design stage of the development application process.

4.4.6 ON-SITE SWM CONTROL

For the 927 March Road project site area that does not drain to the Pond 2 SWM facility, on-site SWM control is the intended means to provide water quantity and water quality control for the associated contributing area. Based on the current development concept plan, drainage area boundaries are defined as illustrated on **Drawing OSD-1**. The ‘200’ series catchment areas drain directly to Tributary 3. On-site SWM controls within each development block are to be implemented to achieve the total allowable discharge rates into Tributary 3.

Preliminary runoff coefficient values for storm sewer design calculations and imperviousness allocations are assigned to each applicable drainage area based on the anticipated finished surface condition (e.g., asphalt, concrete, gravel, grass, etc.) typically associated with the associated land use. Land use within the applicable drainage area includes the school site, medium-density residential, commercial, and related local road.

From Section 9.6 of the EMP, the allowable per-hectare release rate for the southwest quadrant of the KNUEA is 112 L/s/ha. Note that this allowable release rate is less than the equivalent 5-Year Rational Method flow rate.

A summary of drainage areas and key analysis parameters is provided in the following table. A complete summary of the inputs applied to PCSWMM is provided in **Appendix E.3**.

Table 4.10: Summary of On-Site SWM Control Areas

Drainage Area	Area (ha)	Runoff Coefficient, C	Design Discharge (L/s)
C201AA	0.26	0.85	29.1
C201AB	0.35	0.85	39.2
C201BA	0.19	0.85	21.3
C201BB	0.26	0.85	29.1
C201BC	1.12	0.70	125.4
L202A (Road)	0.26	0.65	Uncontrolled
C202B	0.49	0.70	54.9
C202C	0.54	0.70	60.5
L203A (Road)	0.28	0.65	Uncontrolled
C203B	2.02	0.65	226.2
C203C	1.08	0.70	121.0
Total	**6.85**		

A summary of the water quantity control and water quality control servicing requirements for the development blocks within the overall on-site SWM control drainage area is presented in Section 4.5.2. The relationship to the peak flow from the on-site SWM control areas relative to the total allowable discharge associated with Tributary 3 and the 927 March Road Project site area is described in Section 4.4.7.

4.4.6.1 Uncontrolled Areas

As described in Section 4.4.4.1, portions of the 927 March Road project site area will not be intercepted by the storm drainage systems and create uncontrolled runoff to Tributary 3. In relation to the on-site control portion of the proposed development plan, these areas are along the south side boundary of Tributary 3 as illustrated on **Drawing OSD-1**.

- Area ‘UNC-5’ is a 0.07 ha portion of the Zone B development block.
- Area ‘UNC-6’ is a 0.03 ha portion of the Zone B development block.

In addition to the uncontrolled areas along Tributary 3, the public road within the On-site SWM Control area is also expected to create uncontrolled runoff. The road runoff is uncontrolled because the road slope is high enough that there is no opportunity to create meaningful storage capacity on either the road surface or with underground pipe.

The relationship to the peak flow from each uncontrolled area relative to the total allowable discharge associated with Tributary 3 and the 927 March Road Project site area is described in Section 4.4.7.

4.4.6.2 Water Quality Control

The development blocks associated with the on-site SWM control portion of the 927 March Road project site are expected to achieve the 'Enhanced' water quality control objective using oil-grit separator (OGS) units. Each development block will have an OGS unit that can be demonstrated to achieve the 80% TSS removal target consistent with current City of Ottawa design guidelines and accepted practices.

Low Impact Development (LID) measures may also be considered as a water quality control feature within the development blocks. The implementation of LID measures as water quality control features is subject to the City of Ottawa confirming suitable means to quantify the TSS removal performance for appropriate LID measures.

For the public road within the on-site SWM control area, no specific water quality control measure is to be applied. The combined overall water quality control achieved with the OGS units in the development blocks and the Pond 2 SWM facility is considered to achieve an 'Enhanced' water quality control objective for the overall 927 March Road project site area.

4.4.7 TRIBUTARY 3 TOTAL ALLOWABLE DISCHARGE

Given the nature of the contributing drainage areas associated with the 927 March Road project site area, the review of the total post-development allowable discharge to Tributary 3 is reviewed with consideration for the different times in which peak flows could occur. As rural areas, the external catchments have a different time to when the peak flow occurs versus the urbanized area directly associated with the proposed development plan. Additionally, within the proposed development plan, the time of peak flow from uncontrolled flow contributions may not be the same as the time of peak flow from areas when flow control is implemented.

Because the time when each peak flow occurs varies, a simple summation of each singular peak flow value from the analysis results is not meaningful.

To review the design discharge from the 927 March Road project site area against the total allowable discharge conditions described in the EMP, the flow hydrographs from the PCSWMM analysis are extracted for select locations. The hydrographs are then added separately to calculate the total discharge from the proposed development plan. The hydrographs taken from the PCSWMM analysis represent the following locations.

Outfall HWL-146 – This outfall includes the discharge from the Pond 2 SWM facility, the external drainage area 'EXT-1' (941 March Road), and the uncontrolled portion of the six metre pathway allowance area 'C147A'.

Outfall HWL-200 – This outfall includes the discharge from the on-site SWM control areas within the 927 March Road project site area.

Outfall P2-T3 – This outfall includes the areas with direct discharge to Tributary 3. This includes the external drainage areas ('303', 'EXT-3'), uncontrolled drainage areas ('UNC-2', 'UNC-3', 'UNC-4', 'UNC-5', 'UNC-6'), and the areas associated with Tributary 3 ('311', '312').

The data summarized in **Table 4.11** is the total combined peak flow rate for the sum of the hydrographs taken at each of the locations noted above. The peak flow rate for each of the design storms referenced for the allowable discharge conditions is presented. Note that although the 100-Year 3-Hour Chicago design storm is not referenced in the EMP it is included in this FSR as an additional reference design storm.

Note that there is no attempt to quantify anything related to the nature of the flow or flood conditions within the natural channel of Tributary 3. The only comparison is for the total flow considered in Tributary 3 in relation to the values presented in the EMP.

The relevant hydrograph output and related summation is provided in **Appendix E.4**.

Table 4.11: Total Discharge to Tributary 3

	24-Hour SCS				3-Hour
	25.0 mm	48.0 mm (2-Year)	62.4 mm (5-Year)	103.2 mm (100-Year)	Chicago (100-Year)
EMP Analysis	130 L/s	370 L/s	566 L/s	**1,449 L/s**	N/A
FSR Analysis	171 L/s	319 L/s	457 L/s	**1,026 L/s**	**992 L/s**

From the summary table above, except for the 25.0 mm design storm, the SWM design proposed for the 927 March Road project site area shows an overall discharge to Tributary 3 which is below that considered by the EMP.

It is recommended that further discussion regarding the allowable discharge condition for the 25.0 mm design storms be considered during the detailed design stage of the development application process. For establishing the draft plan of subdivision, it is shown with the findings from the analysis within this FSR that the proposed SWM design can accommodate the 100-Year design storm in Tributary 3 in a manner that is consistent with the intention established by the EMP and MSS.

4.5 Proposed Stormwater Servicing

The proposed stormwater servicing approach is illustrated on **Drawing OSSP-1** and **Drawing OSD-1**. Related functional storm sewer design calculations are provided in **Appendix E.5**. For the rational method design calculations used for establishing the storm sewer pipe sizes, the following is noted.

- Within the on-site SWM control area, as the greater of the two values, the typical 5-Year rational method design flow is applied rather than the 112 L/sha allowable discharge rate.
- 100-Year 24-Hour SCS design storm peak flows taken from the PCSWMM analysis are applied for Area ID ‘F115D’, ‘F308B’, and ‘F307A’ as manual input flow rates.
- The maximum allowable design flow rate from the Pond 2 SWM facility is applied as a manual input flow rate. The input includes the allowable outflow from area ‘EXT-1’.

The elevation for each proposed storm sewer outlet is shown on **Drawing OSSP-1**. It is noted that the invert elevation of 77.29 m at outlet ‘HWL 200’ is below the associated 2-Year water level for Tributary 3 of 77.85 m. The invert elevation at outlet ‘HWL 200’ is based on desired depth of cover conditions at the lower end of the proposed road connection at March Road and the need to provide a service connection to the future adjacent development in the 1145 Old Carp Road property.

It is recommended that the minor system outlets to Tributary 3 be considered in connection with the minor system to be associated with the eventual upgrade of March Road to an urban divided cross-section. There may be opportunity to integrate the minor systems for the ultimate roadway and the proposed development plan to create an effective infrastructure system. The potential to integrate the roadway and development systems can be explored through the subsequent stages of the development application process.

Sufficient design detail for the major system and potential intel capture conditions to the minor system are not available at this stage of the development application process. As a result, a meaningful hydraulic grade line (HGL) review of the minor system cannot be completed. HGL conditions can be reviewed when suitable detail is developed through subsequent stages of the development application process.

The major system within the 927 March Road project site area is generally set to be consistent with the minor system. All major system paths are intended to reach Tributary 3 on the west side of March Road with no major system flow crossing March Road. As with the minor system, consideration for the potential interaction of the major system between the 927 March Road project site and the March Road urbanization could also be considered.

Information specific to the Pond 2 SWM facility is presented in Section 4.5.1 and information specific to the development blocks is presented in Section 4.5.2.

4.5.1 POND 2 SWM FACILITY

The Pond 2 SWM facility is intended to be a typical wet pond design to support both water quantity control and water quality control. The functional design concept for the pond is illustrated on **Drawing POND-1**.

The storm sewer inlet is from the road along the north boundary. The elevation of the inlet is below the design NWL of the pond because of the desired depth of cover over the upstream storm sewer segments that extend towards March Road. A bypass at the inlet is accommodated in the functional design concept for the storm sewer inlet system.

The storm sewer outlet is against the boundary with Tributary 3. Because of the water level elevations in Tributary 3 it is necessary to extend the storm sewer outlet to where Tributary 3 crosses March Road. The water level elevations of Tributary 3 at March Road range from 77.85 m to 78.30 m (2-Year to 100-Year). At the location of the proposed outlet structure, the water level elevations of Tributary 3 range from 81.27 m to 81.47 m (2-Year to 100-Year). To limit the overall grading requirement within the project site, it is necessary to establish the Pond 2 SWM facility water levels relative to the lower water levels of Tributary 3 at March Road.

The storm sewer outlet elevation of 78.62 m at ‘HWL 146’ is above the associated 100-Year water level elevation of 78.30 m for Tributary 3, so no tail-water impacts are considered.

An allowance for a six metre wide easement or dedicated block is intended to be combined with the proposed pathway to support the storm sewer outlet from the Pond 2 SWM facility.

The detailed design of the inlet and outlet systems will be provided through the subsequent stages of the development application process.

The functional design characteristics for the Pond 2 SWM facility are provided in the following table.

Table 4.12: Pond 2 Functional Design Characteristics

Parameter	Value
Bottom Elevation	78.50 m
Normal Water Level (NWL)	79.50 m
High Water Level (HWL)	81.00 m
Pond Depth Below NWL	1.00 m
Active Pond Depth (NWL to HWL)	1.50 m
Area at NWL	4,683 m^2
Area at HWL	8,169 m^2
Discharge Rate at HWL	75.2 L/s
Emergency Overflow Elevation	81.30 m
Freeboard Elevation	81.30 m
Storage Volume at NWL	2,845 m^3
Storage Volume at HWL	12,900 m^3
Active Storage Volume at HWL	10,055 m^3
100-Year Active Storage Volume (12-Hour SCS)	8,377 m^3
100-Year Water Level (12-Hour SCS)	80.79 m
100-Year Discharge (12-Hour SCS)	63.7 L/s

The detailed design of all elements associated with the Pond 2 SWM facility are to be provided through the subsequent stages of the development application process. The following offers additional functional level information regarding other key design components associated with the Pond 2 SWM facility.

4.5.1.1 Forebay

A forebay at the inlet to the Pond 2 SWM facility supports the water quality enhancement function. The forebay size is based on the MECP guidelines considering the settling and dispersion length relative to the flow rates into and out of the pond.

Preliminary forebay sizing requirements are as follows:

Settling Calculations	Dispersion Calculations
Length = (rQp / Vs) 0.5	Length = (8Q / d Vf)
= (2.5 * 0.075 / 0.0003) ^ 0.5	= (8 * 1.60 / 1.0 * 0.5)
= 25 m	= 26 m

Qp value taken as allowable discharge rate from the pond at 75.2 L/s.
Q value taken as the design flow rate into the pond at 1,601 L/s from the storm sewer design sheet.

Minimum Bottom Width = Length /8 = 26/8 = 3.3 m

The functional design concept for the Pond 2 SWM facility provides a general forebay length of approximately 50 metres, a length to width ratio at the NWL of approximately 2.5, and a minimum bottom width of approximately 5 metres.

Design details for the forebay within the Pond 2 SWM facility are to be confirmed with the detailed design stage of the development application process.

4.5.1.2 Thermal Impacts

The initial functional concept for the Pond 2 SWM facility considers mitigation for thermal impacts. The facility grading uses a narrow configuration and a 3.5 m wide, 0.30 m deep aquatic shelf/submerged vegetation bench.

Additional consideration for thermal impacts, including the potential baseflow augmentation and bottom draw outlet (reverse slope pipe) suggestion from the EMP, can be incorporated into the detailed design of the facility through the subsequent stages of the development application process.

4.5.1.3 Outlet Control

For this functional servicing stage of the development application process, the outlet control for the Pond 2 SWM facility is based on a standard orifice – 0.169m Diameter, 0.62 coefficient, set with the invert at the Normal Water Level elevation of 79.5 metres.

As noted in Section 4.4.4, to achieve the allowable discharge for the smaller design storm events and potential baseflow augmentation, it is anticipated that multiple orifice controls will be needed and that orifice sizes may need to be less than the typical minimum City of Ottawa ICD size of 83 mm.

For the detailed design stage of the development application process, further discussion is recommended towards achieving the allowable discharge conditions at lower range design storms, baseflow augmentation, desired draw down times, minimum orifice size, and operations and maintenance expectations. The associated design detail for the Pond 2 SWM facility outlet control structure is to then be confirmed with the detailed design stage of the development application process.

From Section 4.4.7, it is noted that the overall discharge objective for the 927 March Road project site area is achieved (except for the 25.0mm design storm) despite the discharge objectives specific to the Pond 2 SMW facility not being met at the lower range design storms.

4.5.1.4 Emergency Overland Escape

The emergency overland escape location is intended at the southwest corner of the Pond 2 SWM facility. This is generally in the area where the existing Tributary 3 in-line pond is located. The details associated with the grading configuration and the integration with the proposed pathway are to be developed as part of the detailed design stage of the development application process.

4.5.1.5 Maintenance

Allowance for a maintenance access route into and around the Pond 2 SWM facility is illustrated on **Drawing POND-1**. A maintenance access pavement design will be prepared and provided by a geotechnical engineer in support of subsequent stages of the development application process.

An allowance for a sediment management area is also shown on **Drawing POND-1**.

4.5.1.6 Pond Liner

For the Pond 2 SWM facility, a storm pond liner design will be prepared and provided by a geotechnical engineer in support of subsequent stages of the development application process. The pond liner design will consider local ground water levels and potential mitigations (e.g., permitter drains) as needed.

4.5.2 DEVELOPMENT BLOCKS

For the development blocks within the 927 March Road project site area, storm sewer servicing, water quantity control, and water quality control is to be provided consistent with typical City of Ottawa Design guidelines.

The development blocks within the Pond 2 SWM facility drainage area have an allowable design discharge set to the 5-Year rational method design flow based on a ten-minute time of concentration.

The development blocks contributing directly to Tributary 3 have an allowable discharge set to the 112 L/s/ha allowable discharge rate established with the EMP.

The PCSWMM analysis is also used to provide a functional water quantity control volume for each area anticipated to require site level storage. The 100-Year 3-Hour Chicago reference design storm is applied as the governing storm event to develop the required water quantity control volumes. Information on the methodology and project specific data with the PCSWMM analysis is provided in **Appendix E.2** and **Appendix E.3**.

For each associated development block, the following table summarizes an allowable discharge rate and an anticipated storage volume.

Table 4.13: Water Quantity Control Volumes (100-Year 3-Hour Chicago)

Drainage Area ID	Description	Area Size (ha)	Discharge Rate (L/s)	Storage Volume (m^3)
L103C	Community Park	4.26	364	246
C103B	Zone D Residential Block	1.26	292	156
C114B	Zone A Residential Block	0.98	199	118
C115B	Zone A Residential Block	0.94	191	116
L116A	Public Park	0.78	24.6	180
C201AA	Commercial	0.26	29.1	65
C201AB	Commercial	0.35	39.2	86
C202B	Zone B Residential Block	0.49	50.9	111
C202C	Zone C Residential Block	0.54	48.5	131
C203C	Zone B Residential Block	1.08	121.0	222
C201BA	Future Commercial (by others)	0.19	21.3	49
C201BB	Future Commercial (by others)	0.26	29.1	66
C201BC	Future Residential (by others)	1.12	125.4	242
C203B	Future School Block	2.02	226.2	327

The water quantity control storage volumes may be accommodated with the development blocks through a combination of techniques. This may include, but not be limited to, any combination of roof top, cisterns internal to the buildings, underground storage external to the buildings, surface storage, Low Impact Development (LID) measures, etc.

For each proposed building, a mechanical engineering consultant is responsible to confirm the service size required, that the appropriate backwater valve requirements are satisfied, the nature of the foundation drainage system, and that any roof drainage systems (including internal storage systems, roof drains, scuppers, etc.) are adequate for accommodating the 100-Year design storm conditions. It is noted that the 100-Year SWM design condition is more stringent than the design condition associated with the typical building code requirements.

The details of the storage and discharge mechanism for each development block (incl. building systems) are to be confirmed with the detailed design stage of the development application process.

4.5.2.1 Water Quality Control

Each block associated with residential, commercial, or school development will have an OGS unit that can be demonstrated to achieve the water quality control objectives consistent with current City of Ottawa design guidelines and accepted practices.

Low Impact Development (LID) measures may also be considered as a water quality control feature within the development blocks. The implementation of LID measures as water quality control features is subject to the City of Ottawa confirming suitable means to quantify the TSS removal performance for appropriate LID measures.

Details associated with the OGS unit sizes and configurations, and LID measures are to be provided with subsequent stages of the development application process.

4.5.3 TRIBUTARY 3 CULVERT

As noted in Section 4.4.4, the culvert size of 1800 mm wide X 1200 mm high proposed for the Tributary 3 culvert as presented in the EMP is maintained with this FSR. Further review of the Tributary 3 culvert size can be considered during the detailed design stage of the development application process.

It should be noted that there will be services located at the tributary crossings including storm sewer, sanitary sewer and watermain. The proposed trenches for these crossings will be in rock and will require a clay cap to prevent surface water in the tributaries from migrating into the underlying trenches. An initial detail for the proposed crossing is provided on **Drawing OSSP-1**.

4.5.4 TRIBUTARY 4

As noted in Section 4.4.2, it is recommended that the external drainage area associated with Tributary 4 be routed through a storm sewer along the future Old Carp Road re-alignment rather than through the 927 March Road project site area. Additionally, the upstream end of the existing Tributary 4 conveyance path lies entirely within the currently proposed park space of the 927 March Road project site area. It is recommended that the Tributary 4 conveyance path be retained within the ultimate park space.

Until the 1145 Old Carp Road property develops the Tributary 4 conveyance path is recommended to be maintained through the 927 March Road property as an interim condition. A holding can be placed on the existing Tributary 4 conveyance path within the 927 March road property as needed.

The proposed ultimate and interim conditions for conveying the drainage associated with Tributary 4 is illustrated on **Drawing OGP-1** and **Drawing OSD-1**.

As part of the development application process for 1154 Old Carp Road, the following items should be reviewed in support of accommodating a stormwater servicing strategy for Tributary 4.

- The nature of the flow from area ‘F307A’ in relation to the EMP and MSS, and the pre-development flow contribution from area ‘F308B’ can be reviewed further.
- An emergency overland escape condition where Tributary 4 is intercepted by the ultimate storm sewer system.
- Confirmation of the minor and major system boundaries associated with the re-alignment of Old Carp Road.
- The connection to the upstream end of the existing culvert that currently conveys Tributary 4 drainage under March Road.

4.5.5 LOW IMPACT DEVELOPMENT

The following table summarizes (in no relevant order) potential LID measures that could be considered for implementation within the 927 March Road project site area.

Table 4.14: Potential LID Measure Summary

LID Measure	Description	Site Consideration
Rainwater Harvesting – Retention Cisterns	Rainwater harvesting is the process of intercepting, conveying, and storing rainfall for future use for irrigation or non-potable water uses (car/bike wash, janitorial needs, toilet flushing). Cisterns are typically used on private lands within the building envelope on midrise or high-rise buildings. *Benefits* include reduced runoff, increased evapotranspiration, and reduced irrigation demand.	Rainwater harvesting using cisterns for re-use is possible. Applicable types of re-use should be compared to the proposed uses at the site plan stage and best fit solutions investigated.
Green Roofs	A roof that is partially or fully covered with a layer of vegetation and growing medium overtop of a waterproof roof membrane. Typically implemented on conventional flat roofs for midrise or high-rise buildings, and ICI buildings. *Benefits* include retention storage/reduced runoff, increased evapotranspiration, improved energy efficiency, and reduced heat-island effect in urban areas.	The site consists of industrial buildings with flat roofs providing opportunities to incorporate green roofs.
Roof Downspout Disconnection	Simple downspout disconnection involves directing flow from roof downspouts to a pervious area at grade that drains away from the building. *Benefits* include reduced runoff, increased evapotranspiration and infiltration, and reduced irrigation demand.	Downspout connections at grade are typically used in residential sites with surrounding vegetated areas. Implementation for larger scale buildings with adjacent vegetation is possible and should be appropriately designed.
Underground Infiltration Trenches and Chambers	Underground Infiltration Trenches and Chambers are open bottom storage units that convey stormwater runoff and provide retention storage (infiltration) and detention storage. These systems consist of open bottom chambers surrounded by clean aggregate and wrapped with geotextile fabric. *Benefits* include reduced runoff, increased infiltration, detention storage.	Underground infiltration chambers are possible within private development blocks and is 4 m or more away from basements. Land use and spill potential are important considerations when siting these measures as well as in-situ infiltration testing to confirm feasibility. Depth to groundwater table should be confirmed for the proposed locations to ensure separation from bottom of facilities to water table.

LID Measure	Description	Site Consideration
Bioretention	Bioretention facilities are shallow depressions that capture runoff, provide treatment (filtration), retention storage (infiltration) and detention storage. These facilities consist of vegetation with layers of soil and aggregates and optional perforated pipe/over drain. Types of bioretention include bump-outs, tree planters/cells, bioretention cells, or dry swales/bioswales. *Benefits* include filtration, reduced runoff, increased evapotranspiration, and infiltration.	Tree planters/cells are possible within the Town right-of-way (ROW). Bioretention cells or dry swales are possible within the public open space and/or private development blocks or buffers. Land use and spill potential are important considerations when siting these measures as well as in-situ infiltration testing to confirm feasibility. Depth to groundwater table should be confirmed for the proposed locations to ensure separation from bottom of facilities to water table.
Extra Depth Topsoil and/or Amended Topsoil	Amended topsoil is a mixture of higher permeability materials like sand and gravel, with lower percentage of clays and a suitable amount of compost to support plant health. Extra depth topsoil (300 mm or more) of native or amended topsoil. *Benefits* include increased retention storage, increased infiltration and evapotranspiration, and stabilization against erosion.	Appropriate soil mixtures can be incorporated into landscaped areas and other LID measures as applicable.
Permeable Pavement	Permeable pavement captures runoff, provides retention storage (infiltration) and detention storage. Permeable pavements consist of a porous load bearing surface overtop of a clean aggregate base and optional perforated pipe/over drain. Types of permeable pavements include porous asphalt, pervious concrete, permeable interlocking pavers, ore reinforced turf/gravel. *Benefits* include reduced runoff, increased infiltration, detention storage and controlled release to storm sewers.	Permeable pavements are possible for low traffic private roads, parking lots, driveways, pedestrian plazas, and walkways. Land use and spill potential are important considerations when siting these measures as well as in-situ infiltration testing to confirm feasibility. Depth to groundwater table should be confirmed for the proposed locations to ensure separation from bottom of facilities to water table.
Enhanced Grass Swales	Enhanced grass swales (enhanced vegetated swales) are vegetated open channels designed to convey stormwater runoff and provide some treatment and retention (infiltration). *Benefits* include conveyance, increased filtration, and infiltration	Enhanced grass swales are possible within public open space and/or private development blocks or buffers. Land use and spill potential are important considerations when siting these measures.

LID Measure	Description	Site Consideration
Perforated Pipe Systems	Perforated pipe systems are linear infiltration trenches or linear soakaways that convey stormwater runoff and provide retention storage (infiltration) and some detention storage. These systems consist of clean aggregate surrounding a perforated pipe. *Benefits* include reduced runoff, increased infiltration, detention storage.	Perforated pipes are possible within public open space blocks, and/or private development blocks and in areas that are 4m or more away from basements. Land use and spill potential are important considerations when siting these measures as well as in-situ infiltration testing to confirm feasibility. Depth to groundwater table should be confirmed for the proposed locations to ensure separation from bottom of facilities to water table.

Any LID measures implemented will be subject to confirmation of suitable local soils and groundwater conditions. Details associated with the potential implementation of LID measures are to be provided with subsequent stages of the development application process.

The analysis and findings of the water quantity control and water quality control measures completed within this FSR is independent of any LID measures being implemented.

The Pond 2 SWM facility achieves the water quantity control and water quality control objectives for all associated contributing drainage areas without the need for specific LID measures.

Water quantity control and water quality control objectives using LID measures within applicable development blocks could be implemented as may be accommodated by the associated development layout within each block.

The implementation of LID measures as water quality control features is subject to the City of Ottawa confirming suitable means to quantify the TSS removal performance for appropriate LID measures.

5.0 Site Grading

A functional grading plan is illustrated on **Drawing OGP-1**. The overall grading strategy serves to:

- Match existing grades along adjacent existing property, existing roadway, and proposed/required development setback boundaries.
- Provide suitable cover conditions for sanitary sewer, storm sewer, and watermain servicing.
- Establish effective overland conveyance and emergency overland escape routes for stormwater management and flood protection.

During subsequent stages of the development application process, adjustments to grading conditions may be made as needed. The associated servicing and stormwater management conditions are to be considered and may also be adjusted as needed to maintain consistency with the related design criteria.

5.1 Tributary 3 Corridor Enhancement

Matrix Solutions Inc. is engaged to prepare the functional corridor enhancements design for Tributary 3 within the 927 March Road project site area as per the EMP requirements. All related information is provided separately as part of the development application submission process.

6.0 Other Considerations

6.1 Geotechnical

An analysis and report of the geotechnical conditions specific to the 927 March Road project site area is pending. Recommendations from the geotechnical report are intended to be followed as they relate to the proposed servicing strategy for the site.

It is noted that the soil conditions noted with the geotechnical report referenced in the EMP may limit the implementation of infiltration-focused LID measures. Subsequent review of geotechnical and related conditions for future block development will confirm the applicability of LID measures as needed.

6.2 Hydrogeology

The Hydrogeological Assessment Proposed Residential Development 927 March Road, Paterson Group, April 2021 is completed and submitted separately in support of the draft plan application process. The hydrogeological assessment includes a recommendation for ground water monitoring and options for potential remediation measures in the event of observed impacts to local water wells.

It is understood that a condition of draft plan approval shall be included relating to the protection of existing wells in the area.

6.3 Utilities

Existing utilities from Hydro Ottawa, Bell, Rogers, and Enbridge are anticipated to be used to service this site. The exact size, location, and routing of utilities is to be finalized during subsequent stages of the development application process.

6.4 Erosion and Sediment Control During Construction

To protect downstream water quality and prevent sediment build-up in catch basins and storm sewers, erosion and sediment control measures must be implemented during construction. A functional erosion and sediment control (ESC) plan is provided as **Drawing EC-1**.

ESC measures are the responsibility of the contractor. Further recommendations for ESC implementation will be refined as needed and included with subsequent submissions through the development application process.

6.5 Regulatory Approvals

The City of Ottawa will review and approve most development applications as they relate to provision of water supply, wastewater collection and disposal, and stormwater conveyance and treatment. The City of Ottawa will issue a commence work notification for construction of the sanitary, storm sewers and SWM

Pond once an Environmental Compliance Approvals (ECA) is issued by the Ontario Ministry of Environment, Conservation and Parks (MECP).

Ontario Ministry of Environment, Conservation and Parks (MECP) Environmental Compliance Approvals (ECA) are required for the proposed subdivision works related to stormwater management, the SWM Pond, inlet control devices, storm sewers and sanitary sewers. The MECP is expected to review the proposed servicing works by transfer of review submission.

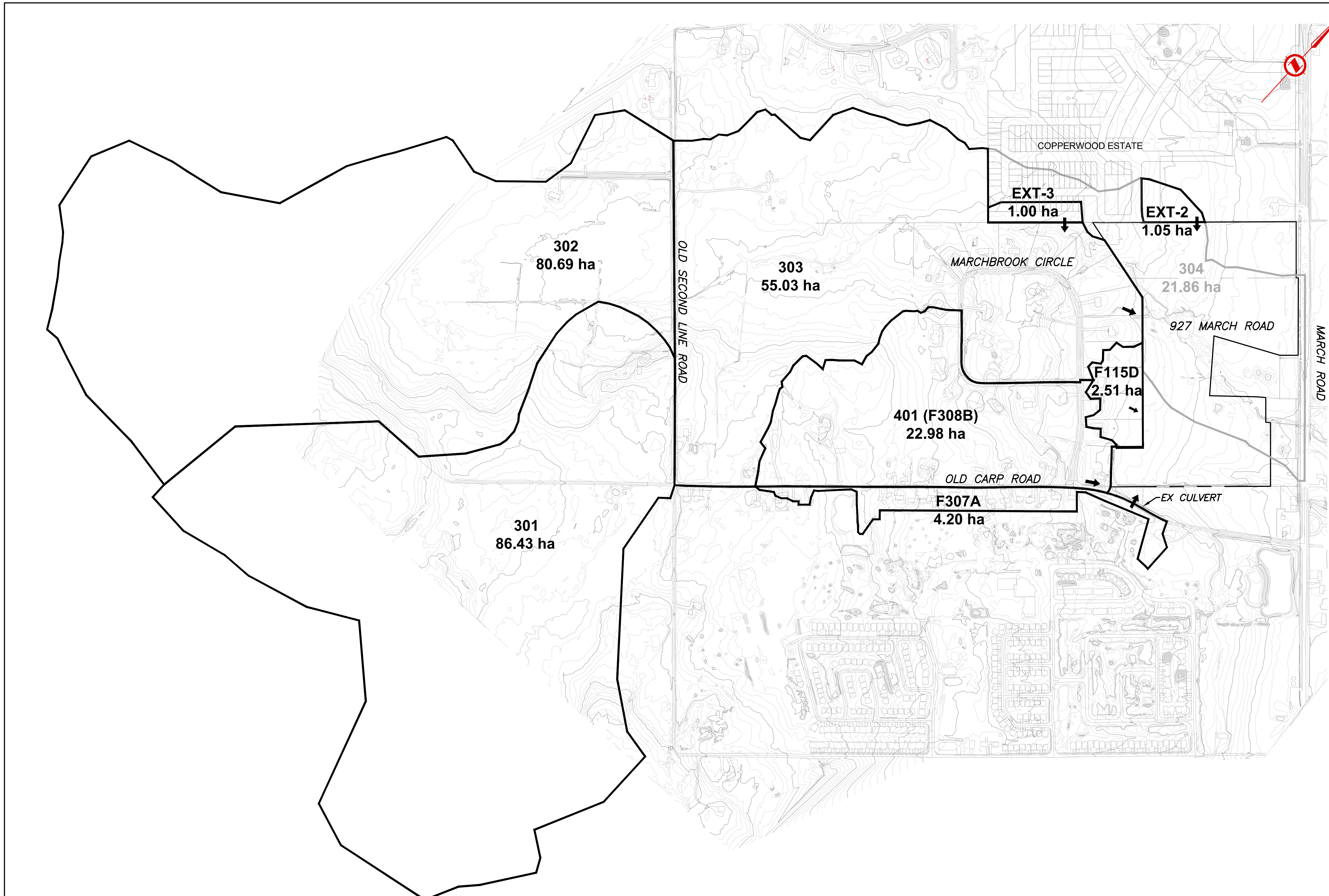
A Permit under Ontario Regulation 153/06, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation is expected to be required from the Mississippi Valley Conservation Authority (MVCA) due to alterations of existing watercourses through site as part of the proposed development. A permit is also required from the MVCA for any portion of the proposed development within the regulation limit.

An MECP Permit to Take Water (PTTW) may be required for the site. The geotechnical consultant shall confirm at the time of application if a PTTW is required.

7.0 Closing

The water, wastewater, and storm water servicing conditions assessed in this report indicate that the existing public services immediately adjacent to the project site are adequate to support the proposed development and that a suitable design condition can be created to support the development plan.

The details of the block development and the associated confirmations from the mechanical engineering consultant are to occur during subsequent stages of the development application process.



LEGEND:

EXISTING CONTOURS
0.5m INTERVAL
2.5m INTERVAL

FLOW DIRECTION

DRAINAGE AREA BOUNDARY
EXT-2 DRAINAGE AREA ID
1.05 ha DRAINAGE AREA SIZE

NOTES:

1. EXISTING CONTOURS DERIVED FROM CITY OF OTTAWA DATA.
2. AREA 301 AND 302 ARE NOT REVIEWED AGAINST THE CITY OF OTTAWA DATA FOR THE EXISTING CONTOURS.
3. THE SIZE OF AREA 304 INCLUDES AREA EXT-2 AND EXT-3 (AREA EXT-2 AND EXT-3 ARE INSIDE AREA 304).
4. AREA EXT-2 IS ONLY AN INTERIM CONTRIBUTING DRAINAGE AREA TO THE 927 MARCH ROAD PROJECT SITE.

ORIGINAL SHEET - 11x17

1:10000 0 200 400 m

JANUARY 2024
1604 01347

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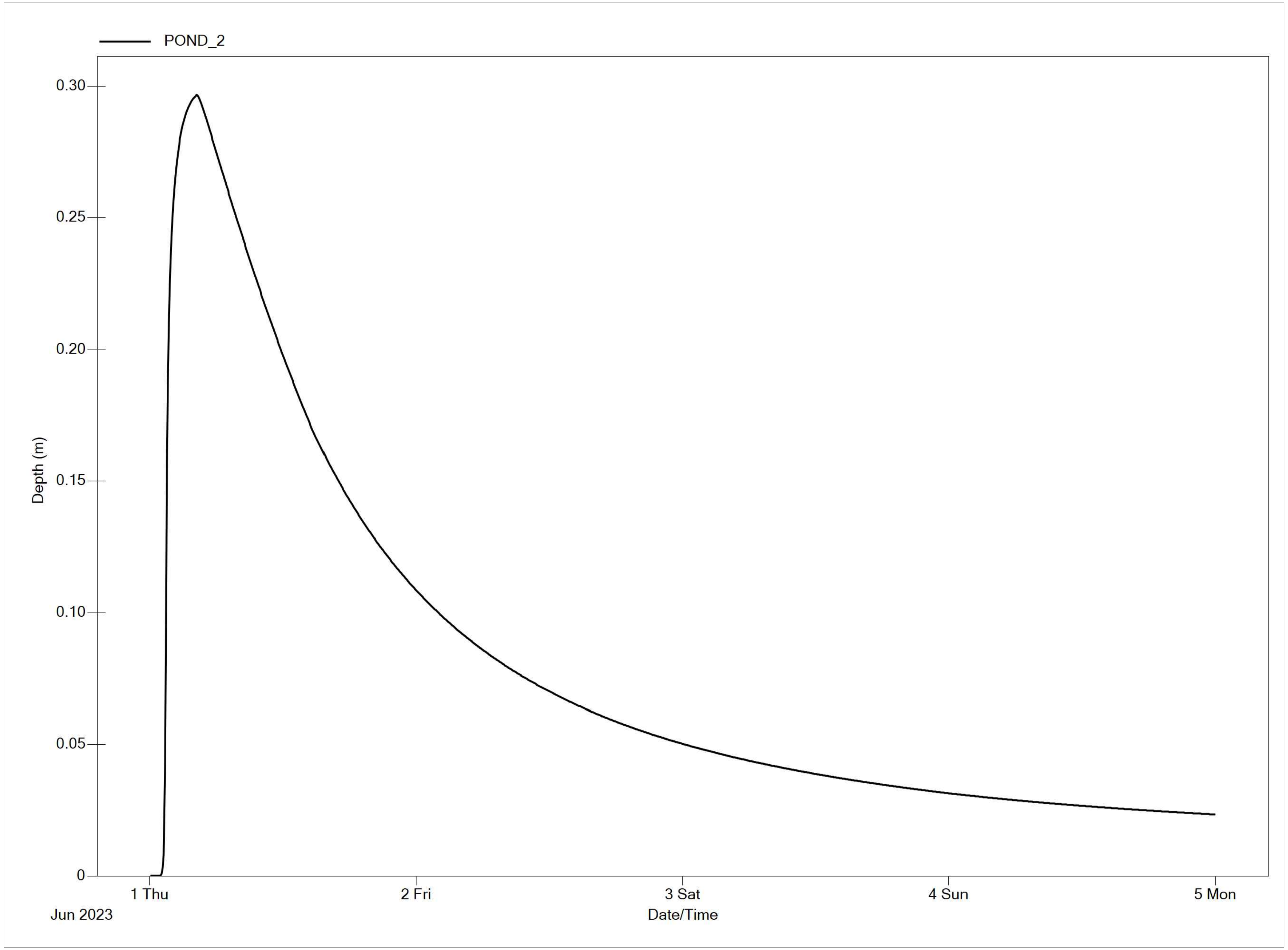
Client/Project
BRIGIL - KANATA NORTH
FUNCTIONAL SERVICING AND
STORMWATER MAANGEMENT

Figure No.
2

Title
EXISTING EXTERNAL DRAINAGE AREA



\\ca0218-ppfss01\work_group\01-604\active\160401347 Brigil Kanata North\design\analysis\swm\01347_fsr-fig.dwg
4:24 PM 12 January 2024 - Brandrick, Robert

ORIGINAL SHEET - 11x17

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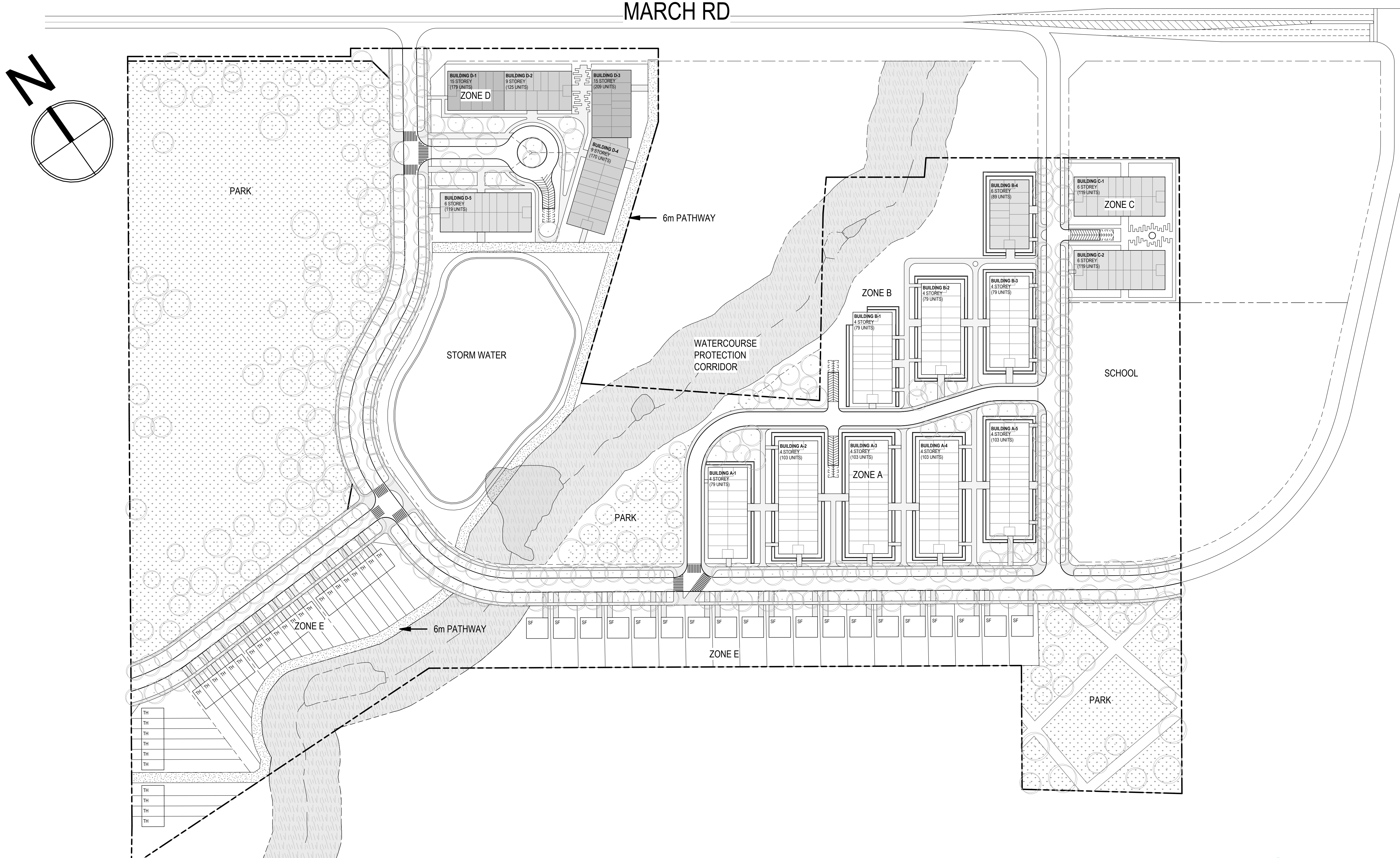
FUNCTIONAL SERVICING AND
STORMWATER MANAGEMENT

Figure No.
3

Title
POND 2 - 25 mm STORM DEPTH DURATION CUVE

APPENDICES

Appendix A Concept Plan and Site Information



CONCEPT PLAN

ÉCHELLE = 1 : 2000

NEUF
ARCHITECT(E)S

KANATA NORTH CDP

2023-10-26

13174 | KANATA NORTH CDP (OPTION D)

ZONE A

BUILDING	STORYS	BUILD. AREA (M2)	BUILD. AREA (SFT)	FLOOR AREA (M2)	FLOOR AREA (SFT)	NB OF UNITS
A-1	4	1 212	13 046	4 848	52 184	79
A-2	4	1 505	16 200	6 020	64 799	103
A-3	4	1 505	16 200	6 020	64 799	103
A-4	4	1 505	16 200	6 020	64 799	103
A-5	4	1 505	16 200	6 020	64 799	103
ZONE TOTAL	16	7 232	77 845	28 928	311 381	491

PARKING ESTIMATE (m2) ZONE C		
PARKING RATIO	1,2	589
VISITOR RATIO	0,2	98
TOTAL SPACES		687
PARKING AREA	SFT/PARK.	400
PARKING (M2)		25 544
PARKING (SFT)		274 960

LAND USE	
ZONE AREA	13850
%BUILT	52,22%
PARKING-LAND RATIO	
	1,8

ZONE B

BUILDING	STORYS	BUILD. AREA (M2)	BUILD. AREA (SFT)	FLOOR AREA (M2)	FLOOR AREA (SFT)	NB OF UNITS
B-1	4	1 212	13 046	4 848	52 184	79
B-2	4	1 212	13 046	4 848	52 184	79
B-3	4	1 212	13 046	4 848	52 184	79
B-4	6	919	9 892	5 514	59 353	89
ZONE TOTAL	12	4 555	49 030	20 058	215 904	326

PARKING ESTIMATE (m2) ZONE C		
PARKING RATIO	1,2	391
VISITOR RATIO	0,2	65
TOTAL SPACES		456
PARKING AREA	SFT/PARK.	400
PARKING (M2)		16 960
PARKING (SFT)		182 560

LAND USE	
ZONE AREA	11000
%BUILT	41,41%
PARKING-LAND RATIO	
	1,5

ZONE C

BUILDING	STORYS	BUILD. AREA (M2)	BUILD. AREA (SFT)	FLOOR AREA (M2)	FLOOR AREA (SFT)	NB OF UNITS
C-1	6	1 212	13 046	7 272	78 276	119
C-2	6	1 212	13 046	7 272	78 276	119
ZONE TOTAL	12	2 424	26 092	14 544	156 552	238

PARKING ESTIMATE (m2) ZONE C		
PARKING RATIO	1,2	286
VISITOR RATIO	0,2	48
TOTAL SPACES		333
PARKING AREA	SFT/PARK.	400
PARKING (M2)		12 382
PARKING (SFT)		133 280

LAND USE	
ZONE AREA	3550
%BUILT	68,28%
PARKING-LAND RATIO	
	3,5

ZONE D

BUILDING	STORYS	BUILD. AREA (M2)	BUILD. AREA (SFT)	FLOOR AREA (M2)	FLOOR AREA (SFT)	NB OF UNITS
D-1	15	752	8 095	11 280	121 418	179
D-2	9	899	9 677	8 091	87 092	125
D-3	15	899	9 677	13 485	145 153	209
D-4	9	1 256	13 520	11 304	121 676	170
D-5	6	1 212	13 046	7 272	78 276	119
ZONE TOTAL	45	5 018	54 014	51 432	553 614	802

PARKING ESTIMATE (m2) ZONE C		
PARKING RATIO	1,2	962
VISITOR RATIO	0,2	160
TOTAL SPACES		1 123
PARKING AREA	SFT/PARK.	400
PARKING (M2)		41 724
PARKING (SFT)		449 120

LAND USE	
ZONE AREA	10500
%BUILT	47,79%
PARKING-LAND RATIO	
	4,0

ZONE E

BUILDING	UNITS	BUILD. AREA (M2)	BUILD. AREA (SFT)	FLOOR AREA (M2)	FLOOR AREA (SFT)	NB OF UNITS
Townhouse	32	78	840	2 496	26 867	32
Single Family	19	150	1 615	2 850	30 677	19
ZONE TOTAL	51	228	2 454	5 346	57 544	51

TOWNHOUSE PARKING ESTIMATE		
PARKING RATIO	1,0	32
VISITOR RATIO	-	-
TOTAL SPACES		32
PARKING AREA	SFT/PARK.	400
PARKING (M2)		1 189
PARKING (SFT)		12 800

TOTALS	BUILD. AREA (M2)	BUILD. AREA (SFT)	FLOOR AREA (M2)	FLOOR AREA (SFT)	NB OF UNITS	PARKING (M2)		PARKING (SFT)	
TOTALS	19 457	209 435	120 308	1 294 995	1 908	PARKING (M2)	97 800	PARKING (SFT)	1 052 720

From:	Jean-Luc Rivard <jlrivard@brigil.com>
Sent:	Wednesday, October 25, 2023 1:12 PM
To:	Johnson, Warren
Cc:	Kilborn, Kris; Brandrick, Robert
Subject:	RE: Brigil Kanata North - Boundary Conditions

Hi Warren,

I confirm that the information mentioned is all good for unit spread and keep the fire compartments to a maximum of 600m2. Tks

Thank you and have a nice day! *Merci et bonne journée!*

Jean-Luc Rivard
Vice President – Land Acquisition & Development
Vice-Président –Acquisition de Terrain et Développement

jlrivard@brigil.com
c : (613) 355-1260

brigil
98 Lois, Gatineau, QC J8Y 3R7
brigil.com

From: Johnson, Warren <Warren.Johnson@stantec.com>
Sent: Wednesday, October 25, 2023 12:29 PM
To: Jean-Luc Rivard <jlrivard@brigil.com>
Cc: Kilborn, Kris <kris.kilborn@stantec.com>; Brandrick, Robert <Robert.Brandrick@stantec.com>
Subject: Brigil Kanata North - Boundary Conditions

Hi Jean-Luc,

We are in the process of resubmitting boundary conditions to the City and would like to confirm some items with you.

- Back in January before the latest revised site plan Brigil noted that the apartment unit type spread would be 75% 1-bed, 20% 2-bed, and 5% 3-bed. Can you confirm if this assumption is still valid? This would provide a slightly less conservative overall flow value than the generic apartment population count (roughly 1.6 persons/unit vs 1.8 persons per unit from the generic value) so we want to ensure that adequate residual capacity is being reserved for this development.
- Some of the long town blocks exceed the 600m2 footprint / 7 unit requirement to fall under an OBC Part 9 structure. We are currently operating under the assumption that these blocks will be broken up by a firewall to limit the fire compartments to a maximum of 600m2 as per OBC Part 9. Please confirm if this is acceptable or if you would prefer to split the blocks to be less than 600m2.

Thanks,

Warren Johnson C.E.T.

Civil Engineering Technologist

Direct: 613 784-2272
Warren.Johnson@stantec.com

Stantec

Caution: This email originated from outside of Stantec. Please take extra precaution.

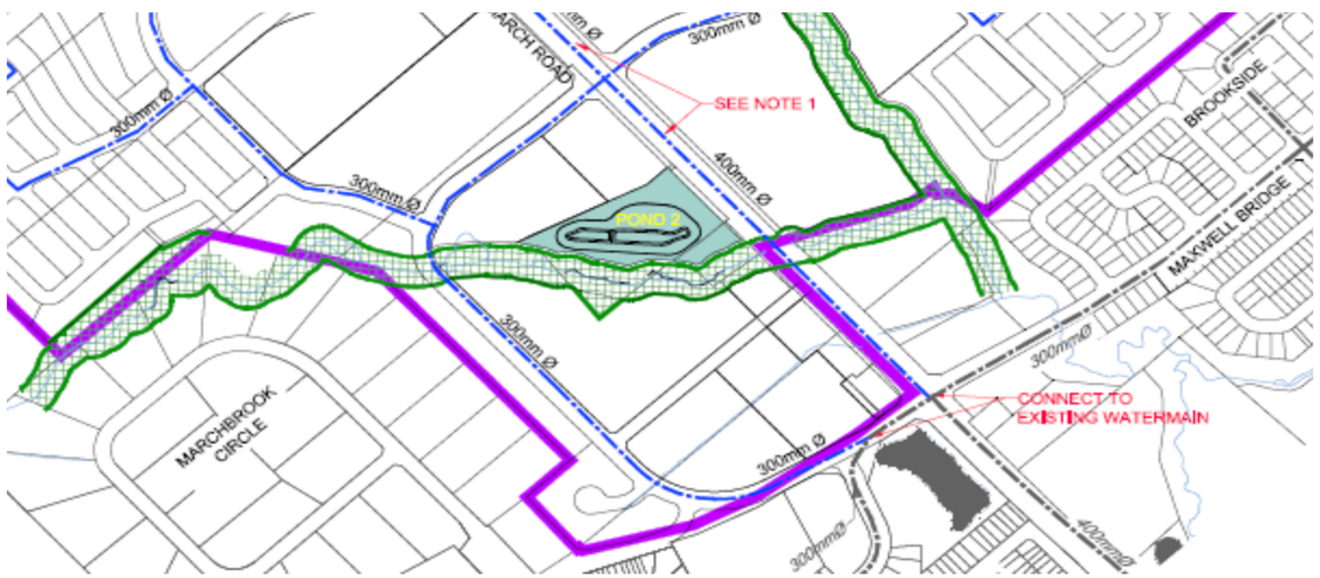
Attention: Ce courriel provient de l'extérieur de Stantec. Veuillez prendre des précautions supplémentaires.

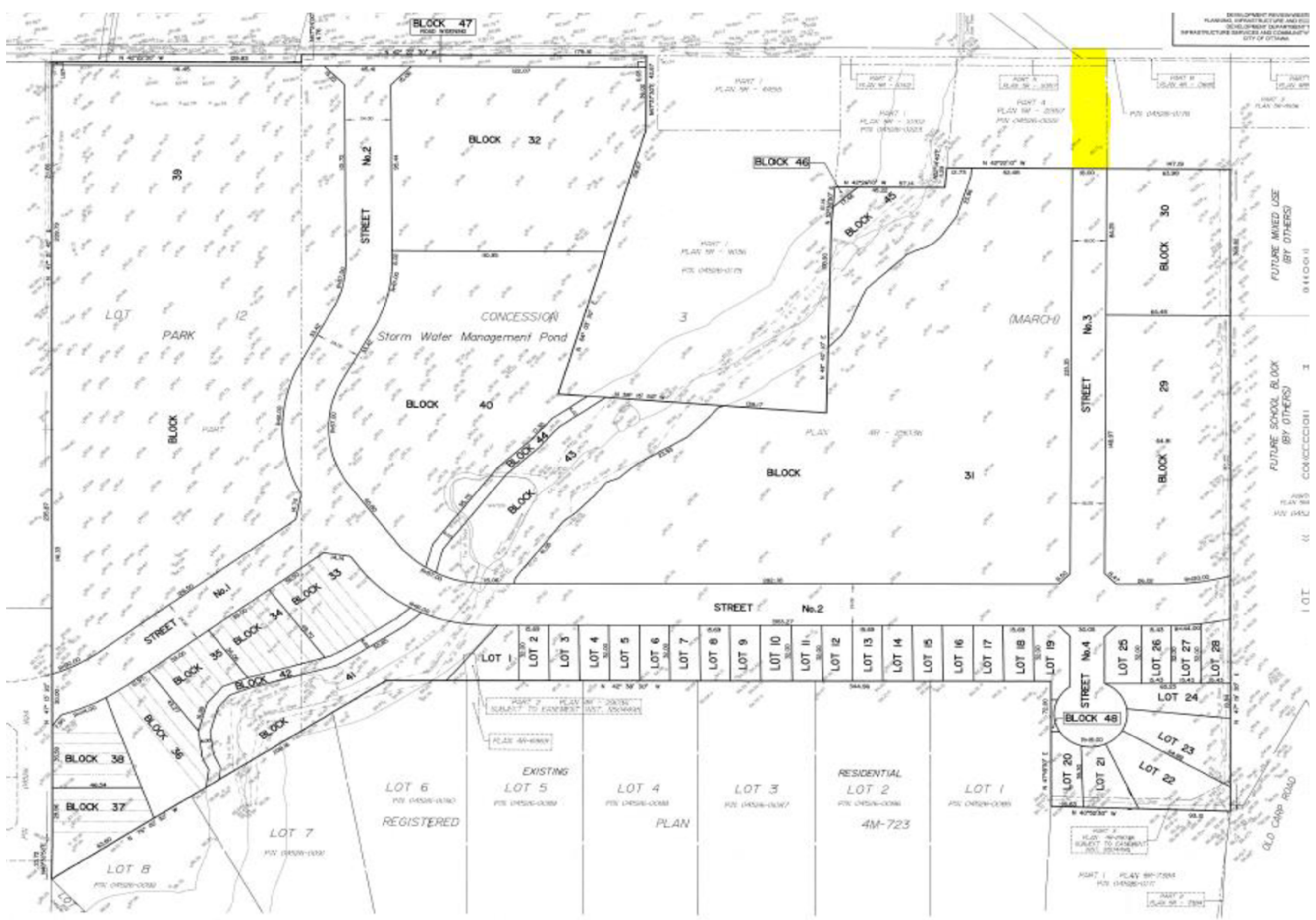
Atención: Este correo electrónico proviene de fuera de Stantec. Por favor, tome precauciones adicionales.

Appendix B Comment Response

Comments and Responses to Kanata North Submission		
MVCA (Erica Ogden) - Natural Heritage	**Comment Made By**	**Response**
MVCA also requests further information on the intended outlet of this new sewer and if there will be any treatment to the water prior to its outlet.	Erica Ogden	Included with the updated functional report.
MVCA (Erica Ogden) - Natural Hazards	**Comment Made By**	**Response**
1. Please include the limits of the 40 metre watercourse corridor and 6m pathway block on the grading plan and drainage plan.	Erica Ogden	Included with the updated drawings.
2. Please clarify how the proposed Emergency Overflow Spillway for Pond 2 will function with the 6 m pathway block proposed on the north side of Tributary 3.	Erica Ogden	The pathway will be depressed and incorporated into the emergency spillway as is standard practice in the City of Ottawa. Detailed grading information and cross-sections to be provided during detailed design.
3. The proposed grading for Block 31 in the vicinity of the conceptual vehicles turning circle, extends within the 40 metre corridor for Tributary 3. Please revise, all grading works should be outside of the 40 metre corridor.	Erica Ogden	Grading has been revised to remain outside of the 40m corridor for Tributary 3 as provided by Matrix Solutions Inc. September 29, 2023.
4. Tributary 4 currently runs along Lots 20 to 24, 28 and Blocks 29 & 30. The Drainage Plan notes "Ex. Tributary 4 Ditch To be Filled (By Others)" and "Ex. Ditch to be Filled Upon Completion of Future Storm Sewers Along Old Carp Road". In accordance with the MSS and EMP, the drainage area upstream of the property limits, including Marchbrook Circle is to be piped along Old Carp Road and outlet to Tributary3. How will Tributary 4 be addressed in the interim, prior to the completion of the storm sewer along Old Carp Road? Development setbacks from Tributary 4, particularly for Lot 28, is recommended until the works are completed. MVCA recommends 15 metres from top of bank, until such time as Tributary 4 is piped as per the MSS. An appropriate planning mechanism, such as a holding zone along the setback from Tributary 4 may be required.	Erica Ogden	The existing ditch function shall be maintained until the completion of the future storm sewers on old carp road (by others). A holding zone will be placed on Zone C while the existing ditch is still operational.
Stormwater Conveyance and Grading		
Please provide existing (pre-development) drainage area plan including grading information to support the delineation of existing drainage area boundaries.	Juraj M. Cunderlik	An existing conditions drainage area plan is added to the report as a figure.
Include all off-site drainage areas in the existing and proposed drainage plans.	Juraj M. Cunderlik	The storm drainage plans and figures are updated accordingly.
Provide section in the stormwater management report describing existing drainage conditions including peak flow rates and water levels.	Juraj M. Cunderlik	Included with the updated functional report.
Please confirm the northern and southern outlet elevations, surcharge depths for 2- to 100-year storm events, and whether backwater effects have been accounted for in the modeling.	Juraj M. Cunderlik	The northern and southern outlet elevations are included with the updated functional report. The details associated with minor and major system flow conditions are removed from the updated functional report and are to be provided with the detailed design stage of the development application process.
The location of the proposed SWM Pond 2 has changed. Please confirm the unavailability of the adjacent land that was originally assumed as the location of SWM Pond 2. Have the parcels located south of Tributary 3 been considered for SWM Pond 2?	Juraj M. Cunderlik	The property for the original location of Pond 2 could not be obtained. The new pond location is as coordinated with City Staff.
Stormwater Quantity Control		
Please clarify the drainage areas to be serviced by the proposed pond and on-site controls (various numbers are provided in the report)	Juraj M. Cunderlik	Included with the updated functional report.
The PCSWMM model should be run for existing conditions to demonstrate that the model calculates peaks flows consistent with the previous KNEMP modeling. The report should provide a clear comparison of existing and proposed flows (obtained from one model) to demonstrate no increase in peak flows in Tributary 3.	Juraj M. Cunderlik	A comparison with the modeling completed in the EMP is included with the updated functional report.
Please confirm the allowable release rate and on-site storage for the 7.2 ha area (115 L/S/ha in Section 4.1.1, 117 L/s/ha in Table 4, 112 L/s/ha in KNEMP).	Juraj M. Cunderlik	Included with the updated functional report.

Comments and Responses to Kanata North Submission		
The SCS distribution was selected for the conceptual design of the SWM Pond 2 due to its tendency to produce a greater total volume of runoff. The 100-year storm elevation in Pond 2 was generated from the 12-hr SCS; the 5-year storm elevation from 24-hr SCS. What volume/elevation was produced by the 100-year 24-hr SCS? Please provide a summary.	Juraj M. Cunderlik	Included with the updated functional report.
Table 9 – SWM Pond 2 channel velocity exceeds 5m/s.	Juraj M. Cunderlik	The details associated with minor and major system flow conditions are removed from the updated functional report and are to be provided with the detailed design stage of the development application process.
MVCA would appreciate receiving a copy of the PCSWMM model data with the next submission.	Juraj M. Cunderlik	Included with the updated functional report.
Stormwater Quality Control		
Please clarify the extended detention storage (different volumes are provided in the report)	Juraj M. Cunderlik	New information is included with the updated functional report.
Baseflow augmentation, thermal impacts and mitigation have not been discussed in the report. Fish population in Shirley's Brook and its tributaries includes cool water species. MVCA recommends maintaining infiltration, baseflow enhancement and thermal control measures to reduce water temperatures be considered and implemented where possible within the Shirley's Brook subwatershed.	Juraj M. Cunderlik	A reference baseflow augmentation flow rate value is not provided in the EMP. It is recommended that the baseflow augmentation rate be considered further at the detailed design stage to ensure compatibility with the other design objectives for the Pond 2 SWM facility. Information on the initial mitigations for thermal impacts is included in the updated functional report.
Infiltration best management practices and/or Low Impact Development (LID) design should be considered in areas with suitable conditions. MVCA acknowledges the presence of shallow clays west of March Road.	Juraj M. Cunderlik	New information is included with the updated functional report.
Floodplain Development		
Flood elevations used in the conceptual design are different from MVCA's regulatory flood elevations. Any revisions or updates made to the floodplain model must be submitted to MVCA for review and approval.	Juraj M. Cunderlik	Flood elevations for the 2-Year, 5-Year, and 100-Year return periods in Tributary 3 are taken from the EMP.
Sediment and Erosion Control		
Please provide sediment and erosion control plan with the next submission. The plan should address general site controls that will be in place during construction as well as controls specific to any in-water and near-water works, including construction timing, dewatering, temporary diversions, etc.	Juraj M. Cunderlik	A conceptual Erosion Control plan has been provided with this submission. Additional information on controls specific to in-water and near-water works to be provided during detailed design.
Infrastructure (Justin Armstrong) - General	**Comment Made By**	**Response**
1. For next submission, and for each subsequent revised design package submitted, please provide a response letter from the design consultant that clearly summarizes all revisions/changes made to the revised, proposed design package. This includes revisions/changes made to: (1) address City comments and, (2) to clearly communicate any other additional changes made (if applicable).	Justin Armstrong	A cover letter is included with the updated functional report. The overall report structure is revised so a full list of the changes is not practical. A related comment response matrix is also included with the updated functional report.
2. It is understood that at the time of Draft Plan submission, a hydrogeology/well impact study and report was in the process of being completed for this subdivision. This will need to be submitted and reviewed as part of the Draft Plan process.	Justin Armstrong	Noted.
3. A condition of draft approval shall be included relating to the protection of existing wells in the area. It is understood that at the time of preparation of the CDP, MSS, and EMP, the proponent has committed to the provision of an alternate bedrock source for affected wells and if such cannot be found on the property, the property will be connected to City water. This will be carried forward through a condition of draft approval.	Justin Armstrong	Noted.
4. Please provide an Erosion and Sediment Control Plan.	Justin Armstrong	A conceptual Erosion Control plan has been provided with this submission. Additional information on controls specific to in-water and near-water works to be provided during detailed design.

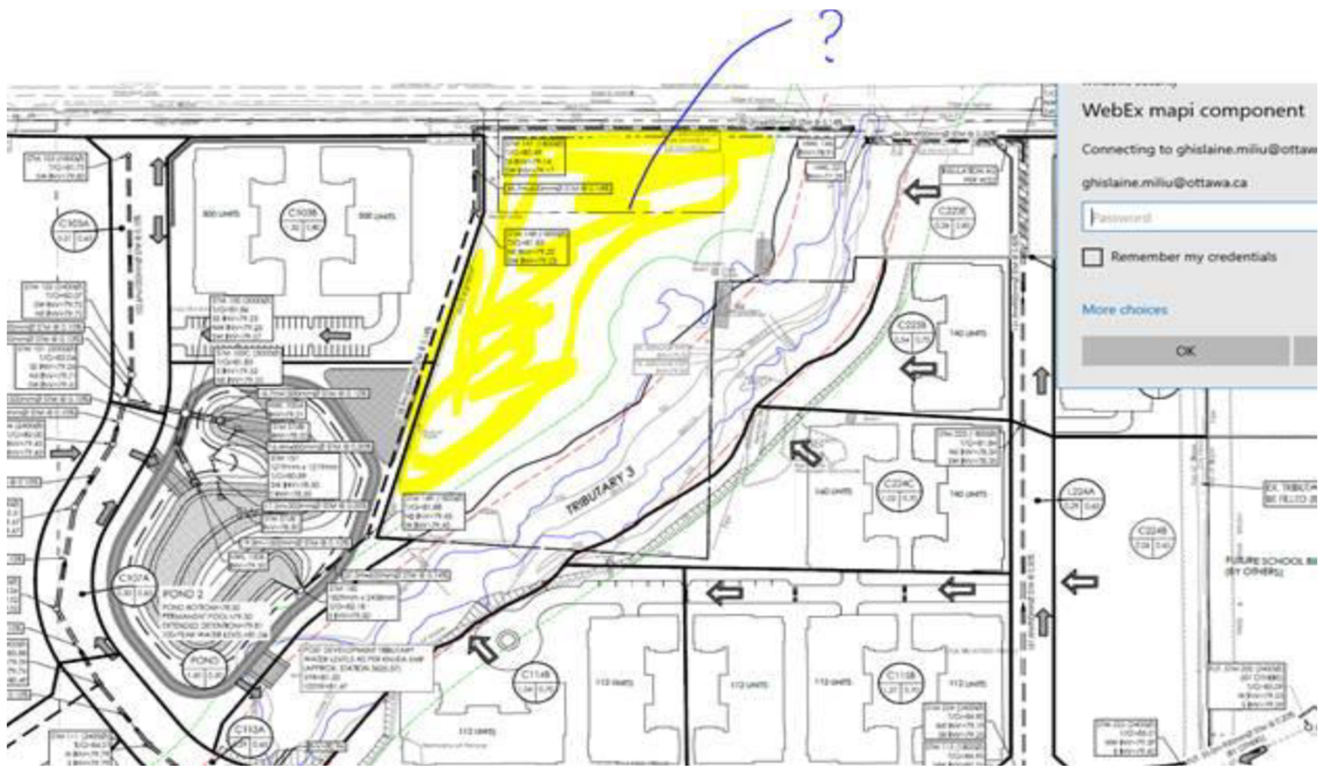
<table>
<tr><th colspan="3">Comments and Responses to Kanata North Submission</th></tr>
<tr><td>5. It should be confirmed with the City’s Parks group that an assumed runoff coefficient of 0.4 is acceptable. Parks should be consulted to determine if a plan exists for the park site and an anticipated runoff coefficient can be provided.</td><td>Justin Armstrong</td><td>As per section 5.3.1 (page 29) of the KNMSS the runoff coefficient for parks should be 0.4.</td></tr>
<tr><td>6. Please discuss servicing coordination of Draft Plan Street No.1 with neighbouring subdivision to the north (NW quadrant – CU Developments) in the Servicing and SWM Report. Also ensure full coordination as it relates to street alignment and ROW cross-section.</td><td>Justin Armstrong</td><td>Included with the updated functional report.</td></tr>
<tr><td>7. All requirements relating to MOE applications, DFO authorization, and Conservation Authority approvals and permits shall be the owner’s responsibility.</td><td>Justin Armstrong</td><td>Noted.</td></tr>
<tr><td>8. Ensure that all proposed open space blocks, including floodplain lines and the proposed 40-metre watercourse corridor are all clearly identified. Please add the 40-metre watercourse corridor and the 100-yr floodplain elevations to the drawing set. Please identify the source of the floodplain mapping on the drawing set as well.</td><td>Justin Armstrong</td><td>Floodplain mapping and watercourse corridors and setbacks have been added to the drawings with sources identified in the legend.</td></tr>
<tr><td>9. Please ensure that all pathway corridors throughout this development, and around the proposed storm facility are shown on the plan and that connections with neighbouring developments are fully coordinated.</td><td>Justin Armstrong</td><td>Included with the updated functional report.</td></tr>
<tr><th>Infrastructure (Justin Armstrong) - Water</th><th>Comment Made By</th><th>Response</th></tr>
<tr><td>15. The Kanata North MSS identified a 305 mm watermain servicing the subject site from Old Carp Road (see below). If not being done as part of this development, who is responsible for constructing the 305 mm watermain on Old Carp Road and connection to the future 406 mm watermain on March Road?

</td><td>Justin Armstrong</td><td>Future construction of the watermain in Old Carp Road is anticipated to be completed in coordination with Kanata North Landowners relative to the timing of the Old Carp Road re-alignment and/or development of the land.</td></tr>
<tr><td>16. Update Conceptual Overall Site Servicing Plan, Drawing No. OSSP-1, to show future infrastructure on Old Carp Road.</td><td>Justin Armstrong</td><td>The plan has been revised accordingly</td></tr>
</table>

Comments and Responses to Kanata North Submission		
17. Section 2.0 of the Site Servicing and SWM Report states: “The proposed development will ultimately be serviced through two watermain connections to a future 400 mm diameter watermain on March Road as shown on Drawing OSSP-1.”. This differs from what is identified in the KNMSS. Relating to the KNUEA as a whole, Section 7.4 of the KNMSS states that: “Once more than 200 units have been constructed a secondary connection is required for system reliability. This secondary connection can either be at the Old Carp Road location, the Celtic Ridge location, or a second watermain within the March Road ROW (in the interim).”. Neither the Site Servicing and SWM Report or Drawing OSSP-1 addresses this secondary connection that is required for reliability. Considering the Brigil Development is proposing roughly 1860 units, this will need to be addressed prior to draft approval.	Justin Armstrong	The nature of the required water connections is included with the updated functional report.
18. Drawing OSSP-1 shows water connections to the future 406 mm March Road watermain via Draft Plan of Subdivision Street No.2 and Street No.3, however, the Draft Plan of Subdivision does not show Street No. 3 extending to March Road. Has the land between Street No.3 and March Road been acquired in order to extend Street No.3 and servicing infrastructure to March Road? Has a dedicated block(s) been set aside for this? 	Justin Armstrong	The land is not yet acquired and it is understood as being required.
Infrastructure (Justin Armstrong) - Wastewater (Sanitary)	**Comment Made By**	**Response**
19. Update the sanitary design spreadsheet for the March Road collector to incorporate changes in the design issued for construction and land uses proposed for the subject site and other areas draining to the sewer (CU lands to the north, Minto and Valecraft to the east, and external areas south of the subject site). Confirm the collector will operate under free flow conditions.	Justin Armstrong	As per correspondence from the City on April 24, 2023 there is adequate capacity in the downstream system for the requested flow exceedance. The related correspondence with the City is included with the updated functional report

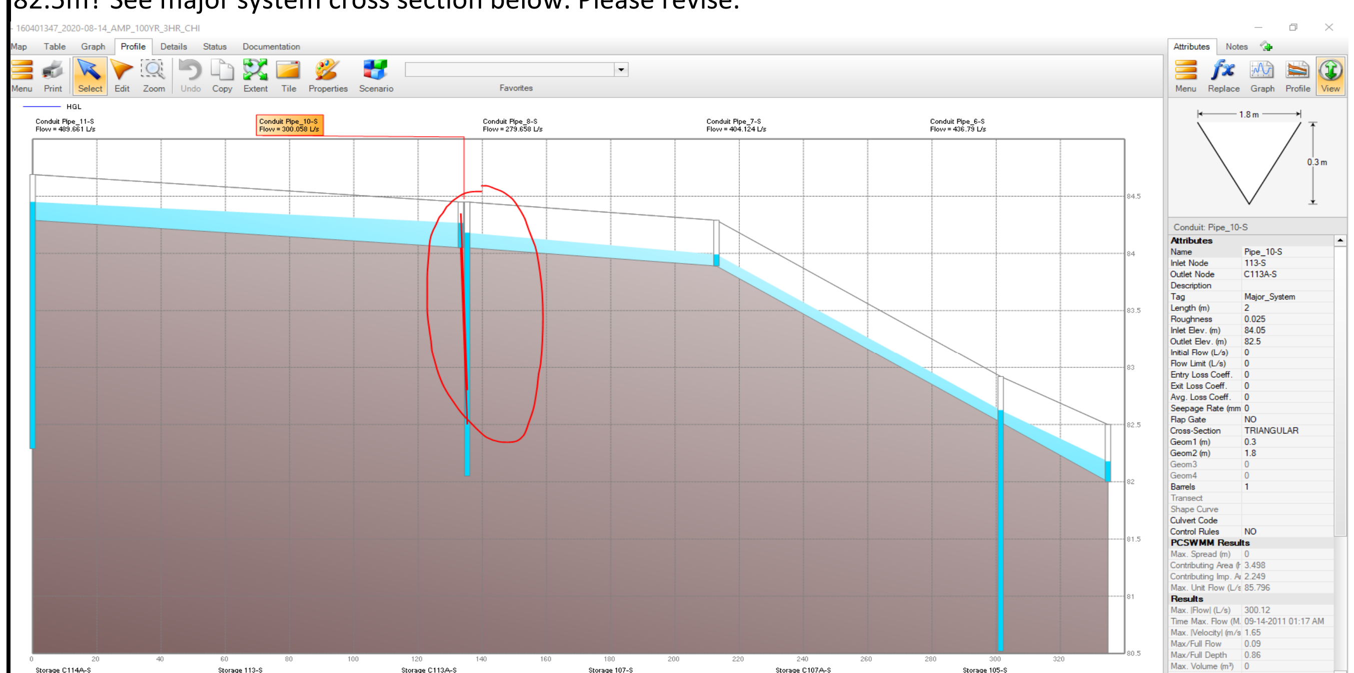
Comments and Responses to Kanata North Submission		
20. Section 3.3 of the Servicing and SWM Report identifies that: "Based on the sanitary design sheet provided in the KNMSS, there is 18 L/s residual capacity in the downstream sanitary sewers. The total peak flow exceedance to the March Road trunk sewer from the KNMSS areas W-10, W-11, and W-12 is expected to be approximately 17.7L/s.". Given that the increase in peak flow resulting from Brigil's proposed increase in density (17.7 L/s) is approaching the residual downstream sewer capacity (18.0 L/s), the sanitary analysis in the Site Servicing and SWM Report shall include updated wastewater flows resulting from the other areas contemplated in the downstream sewer design upgrades (particularly the other 3 subdivisions that make up the KNEA) and demonstrate that the proposed flows will be within the capacity of the receiving wastewater system prior to draft plan approval.	Justin Armstrong	City has agreed to Brigil Subdivision using the additional residual capacity. Email confirm by Lisa Stern - A revised sanitary design sheet for the project area is included with the updated functional report.
21. If no sanitary overflow proposed for this subdivision, and considering increased sanitary release rate resulting from increased density, check HGL and confirm any existing downstream overflow will protect HGLs in this subdivision.	Justin Armstrong	It is trusted that the confirmations of the additional capacity coordinated with the City establishes that there is no associated HGL risk.
22. Necessary upgrades to downstream sanitary infrastructure as identified by the KNMSS will need to be in place prior to Early Servicing (i.e. Trunk sewer and Briar Ridge Pumping Station). A condition shall be drafted in this regard.	Justin Armstrong	Noted.
23. Same as water comment. Drawing OSSP-1 shows sewer connections to the future 406 mm March Road watermain via Draft Plan of Subdivision Street No.2 and Street No.3, however, the Draft Plan of Subdivision does not show Street No. 3 extending to March Road. Has the land between Street No.3 and March Road been acquired in order to extend Street No.3 and servicing infrastructure to March Road?	Justin Armstrong	See response to associated water comment (#18).
24. KNMSS identified a 250 mm sewermain in Old Carp Road and tying into the future March Road trunk in order to service the subject site. As noted above, OSSP-1 shows a 250 mm sewer in Draft Plan Street 3 to service the subject site instead. If not being done as part of this development, who is responsible for constructing the sewermain on Old Carp Road?	Justin Armstrong	The sanitary condition is the same as that noted in association with the associated water comment (#15).
25. Has the proposed sanitary connection via Draft Plan Street 3 to the future March Road Trunk been coordinated with Trunk project? Drawing OSSP-1 shows a connection to future 250mm SAN stub, however this connection point was not contemplated in the KNMSS. Coordination should be made related to the dropping of this stub in addition to the one presumably being provided at Old Carp Road and March Road intersection.	Justin Armstrong	The March Road connections have been coordinated with Novatech as part of the March Road Sanitary and Watermain Upgrades project no. 112117. Notes have been included on the plans accordingly.
26. Ensure that all proposed maintenance holes are proposed as per Section 5.9.1 – Manhole Location and Spacing of the MOE Design Guidelines for Sewage Works.	Justin Armstrong	Noted.
27. Ensure that all proposed sewers are provided an appropriate minimum depth of cover as indicated in Section 6.1.11 – Depth of Cover for Local and Collector Sewers of the City of Ottawa Sewer Design Guidelines.	Justin Armstrong	Noted.
28. Drawing OSSP-1 should identify invert elevations at all sewer and water crossings.	Justin Armstrong	A crossing table has been added to the drawings for sewers. Watermain crossings will be addressed during detailed design since they can be deflected to suit proposed sewers.
29. Please provide plan and profile drawings of the sewers.	Justin Armstrong	Plan and Profile drawings are not required at Draft Plan level. A sewer crossing table has been provided to ensure there are no conflicts.
Infrastructure (Justin Armstrong) - Storm	**Comment Made By**	**Response**
30. Provide storm servicing and major system outlet information for external areas north of Old Carp Road (C223D, Future School).	Justin Armstrong	Conceptual major and minor system information has been added to the external areas north of Old Carp Road.

Comments and Responses to Kanata North Submission		
31. Additional detail is needed for the culvert and service crossing of Tributary 3. The KNMSS states that watercourse crossings are to be sized to convey the 100-yr peak flows without overtopping the roadways. Section 5.4.1 of the KNMSS also states that: "It should be noted that there will be services located at the tributary crossings including storm sewer, sanitary sewer and watermain. The proposed trenches for these crossings will be in rock and will require a clay cap to prevent surface water in the tributaries from migrating into the underlying trenches. Prior to Draft Plan Approval the details of the crossings will need to be confirmed to ensure City requirements have been met.".	Justin Armstrong	The culvert sizing from the KNMSS has been utilized. A crossing section is provided on drawing OSSP-1 with approximate locations of the clay caps shown. Additional detail will be provided during detailed design with feedback from the geotechnical consultant.
32. Additional detail is needed as it relates to the conveyance of the Marchbrook Circle off-site drainage area (F202A). Drawing OSD-1 notes that: "Offsite drainage (F202A) to be directed to tributary 3 – proposed pipes sized to capture 100-year uncontrolled runoff as per KNMSS.", however the 900mm storm pipe shown in Old Carp Road is noted (by others). If not as part of this development, who will be completing this work? Considering Tributary 4 flows through the proposed development, details related to this should be addressed prior to Draft Plan as indicated in the KNMSS Section 5.7: "Marchbrook Circle drainage – A primarily rural residential area, approximately 19 hectares in size, southwest of the KNUEA. This area currently drains to an existing ditch which outlets to Tributary 4...Prior to Draft Plan Approval this off-site drainage proposal will require confirmation including adequate maintenance access.".	Justin Armstrong	The site design has been revised to maintain the existing ditch during construction of the Brigil lands. A temporary holding zone will be placed on Block C until the completion of the Old Carp Road storm sewer and decommissioning of Tributary 4. Construction of the Old Carp Road sewers is to be coordinated among the Kanata North Landowners Group.
33. Per Section 11.4.1 of the EMP, "the stream corridor for Tributary 3 will follow the existing channel alignment. The existing inline pond on Tributary 3 will be reduced in size to fit within the proposed 40 m corridor". Who will be completing this work? Information should be provided to support resizing this inline pond and if it impacts the flow results in Tributary 3. This shall be addressed as part of the Draft Plan design.	Justin Armstrong	The Tributary 3 works are being undertaken by Matrix Solutions Inc. The 40m corridor has been coordinated with them and the proposed SWM pond has been sized to remain outside of it. The nature of the in-line pond relative to the Tributary 3 flow rate is not considered in the EMP and this approach is carried forward into the updated functional report.
34. Ensure that all proposed maintenance holes are proposed as per Section 5.9.1 – Manhole Location and Spacing of the MOE Design Guidelines for Sewage Works.	Justin Armstrong	Noted.
35. Ensure that all proposed sewers are provided an appropriate minimum depth of cover as indicated in Section 6.1.11 – Depth of Cover for Local and Collector Sewers of the City of Ottawa Sewer Design Guidelines.	Justin Armstrong	The minimum required cover has provided where possible given site constraints. Areas where cover cannot be met will be provided with equivalent insulation as per S35. Sewer depth will be optimized during detailed design.
36. Drawing OSSP-1 should identify invert elevations at all sewer and water crossings.	Justin Armstrong	A crossing table has been added to the drawings for sewers. Watermain crossings will be addressed during detailed design since they can be deflected to suit proposed sewers.
37. Please provide plan and profile drawings of the sewers.	Justin Armstrong	Plan and Profile drawings are not required at Draft Plan level. A sewer crossing table has been provided to ensure there are no conflicts.
Infrastructure (Justin Armstrong) - Stormwater Management Comments	**Comment Made By**	**Response**
38. For next submission, and for each subsequent revised design package submitted, please provide a response letter from the design consultant that clearly summarizes all revisions/changes made to the revised, proposed design package. This includes revisions/changes made to: (1) address City comments and, (2) to clearly communicate any other additional changes made (if applicable).	Justin Armstrong	See response to General Infrastructure Comment #1.
39. Runoff coefficients proposed during detailed design may differ from those proposed in Draft Plan. Please note that during detailed design, the proponent shall use runoff coefficients calculated during the detailed design considering zoning setbacks and maximum driveway widths.	Justin Armstrong	Noted.
40. Future Development Blocks - Per OSD1 future development blocks only appear to be C103C/Park, C223D/Future MURB and C224B/Future School. Is this correct? If not, please update the report and the OSD1 drawing to specify which blocks are proposed as future development blocks (by others).	Justin Armstrong	Included with the updated functional report.

Comments and Responses to Kanata North Submission		
41. Future Development Blocks - Please update the report and OSD1 drawing to specify the SWM design criteria specific to the future development blocks (including whether they need to store and attenuate up to and including the 100 year event). Please clarify whether these blocks need to store and attenuate the 100 year event and declare the maximum allowable release rate for each of these blocks.	Justin Armstrong	Included with the updated functional report.
42. Note that for detailed design the following will be required:	Justin Armstrong	
• It appears partially submerged pipes are proposed given permanent pool elevation of 79.5. Per Section 8.3.8.3 of the OSDG: "When assessing the HGL in the system, the design must also check the impact on the system assuming that these pipes are 25% filled with sediment. The intent is not to modify the design unless it is shown that the HGL will reach basement elevations on a frequent basis (10 years or less) under this condition".	Justin Armstrong	Noted.
An inlet control schedule for each sub-area (L/s/h) shall be provided, as per Technical bulletin 2016-01 section 8.3.4.1.	Justin Armstrong	Noted.
Road and rear-yard ponding to be demonstrated during detailed design (no ponding shall be modelled in the RYs).	Justin Armstrong	Noted.
The type of inlet control devices shall be specified and labelled on the drawings.	Justin Armstrong	Noted.
The Grading Plan Shall include a table declaring: Lowest proposed building opening or elevation at building envelope (which ever is lower); o Associated surface WSEL for the stress test; o Proposed USF; and o MUSF (based on the governing HGL – 100-year, stress test or Sanitary).	Justin Armstrong	Noted.
Plan and profile drawings shall indicate HGLs in the sanitary and storm pipes.	Justin Armstrong	Noted.
43. Figure 7.1 in the approved EMP (Post-Development Drainage Area Plan) includes a total area of 11.46 ha (9.61 ha + 1.85 ha), north of Tributary 3 however, the proponent is proposing a total area of 9.91 ha north of Tributary 3 (1.6 ha less than in the EMP). The area highlighted yellow in the marked up screenshot of DWG OSD-1 (below), has not been included in the drainage area to be serviced by Pond 2 however it contributes to the total Pond 2 drainage area of 17.6 ha declared in the EMP and the CDP (figure 16: Land Use Plan) identifies this area as "Service mixed use" development. Please update the design package to include servicing for all area identified in the EMP and CDP (include the area marked up yellow below). Ultimately, this area should be included in the pond drainage area and entered into a cost sharing arrangement/agreement.	Justin Armstrong	Included with the updated functional report.

Comments and Responses to Kanata North Submission		
		
44. Please update Table 6 in the Servicing and SWM Report as follows: Page 9 of 19 • Separate the outlets controlling flow to Pond 2 versus outlets controlling flow to the STM sewer directly discharging to Tributary 3 outlet • Add a column to report the relevant drainage area (ha) for each outlet; and • Add a column for the capture rate for the 100 year event (l/s/ha)	Justin Armstrong	The details associated with minor and major system flow conditions are removed from the updated functional report and are to be provided with the detailed design stage of the development application process.
45. It should be confirmed with the City's Parks group that an assumed runoff coefficient of 0.4 is acceptable. Parks should be consulted to determine if a plan exists for the park site and an anticipated runoff coefficient can be provided.	Justin Armstrong	See response to General Infrastructure Comment #5.
46. No LID have been proposed. Per the EMP with respect to Low Impact Development: "The MOECC have stated that it is critical to consider options and opportunities for the incorporation of LID practices during the watershed and subwatershed planning process, and early in the development planning process, and not left to the preparation of the detailed stormwater management plan submission." Understanding that west of March Road, stiff clays are present, as well as areas of shallow bedrock, infiltration BMPs and/or LID design should be considered in appropriate areas within this subdivision. The City of Ottawa's Low Impact Development Technical Guidance Report – Implementation in Areas with Potential Hydrogeological Constraints document dated February 2021 can be consulted.	Justin Armstrong	New information is included with the updated functional report.
47. Please refer to the Kanata North, northwest subdivision quadrant's draft plan approved design package and confirm whether the north perimeter of the subject site will receive any flow from the subdivision to the north. If applicable, please update the next design submission to include external major overland flow from the development to the North.	Justin Armstrong	Included with the updated functional report.

Comments and Responses to Kanata North Submission		
48. Please update the report to justify/clarify how the pond outlet was designed (as summarized below)? • 79.5 m – 83mm orifice • 79.9 m – 83 mm orifice (what is the reasoning for an invert of 79.9 m?) • 81.2 m – 150 mm wide weir (this weir is not used in any of the of the events modelled however it is referenced as a quantity control weir in section 4.5.2.2 of the report. How was this designed, invert and size?) • 81.7 m – 10.0 m-wide rip-rap lined emergency spillway (the invert is 66 cm higher than the governing 100 year event, how was the invert assigned?)	Justin Armstrong	New information is included with the updated functional report.
49. Per section 9.1.4 of the EMP (re pond outlets): “a perforated pipe outlet to a French Drain to provide baseflow enhancement” and Section 9.1.5: “Baseflows should be routed through a stone filled subsurface trench”. Please ensure augmentation volume is considered in the modelling in future submissions (i.e. if drawdown for quality control exceeds three days, considering baseflows to Tributary 3, then start the quantity control runs with applicable augmentation volume above the permanent pool). Please update the report to specify the baseflows and how any augmentation volumes are considered at the beginning of quantity control simulations.	Justin Armstrong	A reference baseflow augmentation flow rate value is not provided in the EMP. It is recommended that the baseflow augmentation rate be considered further at the detailed design stage to ensure compatibility with the other design objectives for the Pond 2 SWM facility. This compatibility includes, but may not be limited to, the allowable discharge conditions at lower range design storms, desired draw down times, minimum orifice size, and operations and maintenance expectations. It is also recommended that any potential baseflow augmentation condition shall not create a limitation on the overall storage capacity of the Pond 2 SWM facility.
50. A hot start was used for the 100 year event which results in a pond WSEL of 79.67 m at the beginning of the simulation. Please update the report to declare why a hot start was used as the beginning of the simulation.	Justin Armstrong	The hot start file is removed from the updated analysis.
51. The 100 year 3hr Chicago model results in a peak flow of 150 l/s at Outfall “March-Rd” Per the MSS section 5.1: “major system flows must not flow overland across arterial roads (March Road)”. The CDP states: “Some areas of the southwest quadrant are at a lower elevation and the major system flow will be directed either along March Road directly to Tributary 3, or to cross under March Road to Pond 3”. This has not been demonstrated in the design submission. Based on Minto’s submission for development of Pond 3 (and the south-east subdivision), flow at subject outfall “March-Rd” will not be directed to Pond 3. Please identify where this proposed flow is directed and provide documentation to support safe conveyance as per the MSS and CDP.	Justin Armstrong	The major system from the proposed street will be directed to tributary 3 along the existing March Road roadside ditch. A culvert will be provided as required during detailed design.
52. Section 4.1.1 of the Site Servicing and SWM Report states: “Marchbrook Circle drainage…the storm sewer will convey the major and minor system drainage though the southwest quadrant and outlet directly to tributary 3 (approx. 386 L/s in the 100-year as per KN EMP SWMHYMO modeling) through the proposed secondary storm outlet. The remainder of the area (3.5ha) will have the minor system drain to Pond 2 through the Street A storm sewer and the major system directed overland through the proposed rear yards directly to Tributary 2”. • Section 4.2 of the report states: “Areas that cannot be graded to direct the major system towards the proposed streets and ultimately to the SWM Pond have been assumed to capture the 100-year into the minor system (i.e. rear yard areas F112A and F114C)”. Please update Section 4.1.1 of the report (see bold underline above), to be consistent with Section 4.2. • Is the external drainage from Marchbrook Circle rural drainage or dual drainage (major and minor flow)? Please revise Section 4.1.1, if applicable.	Justin Armstrong	New information is included with the updated functional report.

Comments and Responses to Kanata North Submission		
53. The SWMHYMO model in the EMP references drainage area to Tributary 4 at 16.78 ha however the PCSWMM model submitted and DWG OSD-1 catchment F202A specifies an area of only 15.1 ha. Please identify the external drainage area in a drawing and confirm how this area was discretized to confirm the area modelled.	Justin Armstrong	Included with the updated functional report.
54. Per the CDP: “Prior to Draft Plan Approval, the assumptions and calculations made will need to be confirmed and the following requirements will need to be addressed: …Major system flow encroachment onto private property”. Per Section 5.7 Off-Site Drainage Areas of the MSS: “Prior to Draft Plan Approval this off-site drainage proposal will require confirmation including adequate maintenance access.” At the time of the EMP and MSS, a lumped area was modelled in SWMHYMO to represent drainage from Marchbrook Circle draining to Tributary 4. More detail is required at this stage of the project to understand existing peak flow from Marchbrook Circle to be captured and conveyed to Tributary 3 and whether a dry pond (and dedicated SWM Block) is required to ensure no flow encroachment onto existing and proposed private property Please provide more detailed modelling for this external drainage area to confirm: 1. 100 year peak flows that need to be captured and conveyed to Tributary 3 (note that subcatchment F202A, modelled in PCSWMM has 100 year peak flows reported at 3200 l/s vs 386 l/s peak flow in the EMP lump model). 2. whether a dry pond is required to store and attenuate this external drainage (especially given the utilized storage volume results from the 100 year events modelled in PCSWMM were up to 4000 m3 at storage node F202A-S). Note that dry ponds are to be designed in accordance with section 8.3.11.5 of the OSDG and section 4.6.5 of the MOE guidelines.	Justin Armstrong	Additional review of the external drainage area is presented in the updated functional report. The modeling parameters are refined to generate a peak flow condition for the external area that is consistent with the EMP. A dry pond is not required or proposed.
55. Why is Major system conduit Pipe_10-S assigned a triangular cross section with a downstream invert at 82.5m? See major system cross section below. Please revise. 	Justin Armstrong	The major system conduit is removed from the updated analysis.

Comments and Responses to Kanata North Submission		
56. Peak 5 year flow (3hr Chicago event) for catchment C103A is 69.04 l/s however outlet C103A-IC conveys a maximum 62.95 l/s. Furthermore, the collector road is receiving flow from the local roads in the 5 year event however this does not appear to have been considered in the rating curves / future ICDs for the CBs in the Collector road RoW. Please revise the model (and Table 6 in the Report) to ensure all 2 year peak flow and 5 year peak flow is captured on local roads and collector roads respectively (and that outlets at the intersection of a collector and local road consider any 5 year flow from the local roads to ensure all collector roads have no ponding/flow bypass during the 5 year event).	Justin Armstrong	The details associated with minor and major system flow conditions are removed from the updated functional report and are to be provided with the detailed design stage of the development application process.
57. Section 4.3.3 of the report references the following storm events: “100-year, 12 hour SCS storm Type II, 30-minute time step (100yr12hrSCS) and 100-year, 24 hour SCS storm Type II, 10-minute time step (100yr24hrSCS)”. The 12 hour SCS event appears to have the same time step as the OSDG however the source of the 24hour 100 year SCS event is not clear (the hyetograph used is not per the OSDG). Please justify the time step of 30 minutes used for the 24 hour SCS event referenced and modelled (what is the source of this event, is this the same 24hr SCS event used at the EMP stage?).	Justin Armstrong	The updated analysis considers storm events as per the OSDG.
58. Please update the report to justify the Zero Imperviousness assigned to the subcatchments given that the percentage assigned is not consistent for all subcatchments.	Justin Armstrong	The zero imperviousness conditions are removed.
59. Block C103C (Pond Block) was assigned Pervious Sub-Area Routing (100% routed). Is this a fair assumption if there will be a parking lot on the Park Block? Please revise if applicable.	Justin Armstrong	The 100% routing to pervious is removed.
60. The 100-year 24 hour SCS HGL and the 12 hour SCS HGL declared in Table 8 of the Servicing and SWM Report do not match those in the packaged models. Furthermore, some of the Prop. Grade (m) in Table 8 do not match the STM MH T/G elevation on drawing OSSP-1. Please revise the table where applicable.	Justin Armstrong	The details associated with HGL conditions are removed from the updated functional report and are to be provided with the detailed design stage of the development application process.
61. Based on the 100 year model results, at pond HGL/WSEL 79.81 m the total utilized storage in the pond is 4297 m3 (per the report the permanent pool volume is 2510 m3, as such this equates to extended detention volume of 4297 m3 - 2510 m3 = 1787 m3, which is inconsistent with Table 11 (extended detention volume of 1526 m3) and section 4.5.4.1 per the Servicing and SWM Report (1536 m3 extended detention volume provided). Please justify the source of the stage storage used in the model and how it represents the design package. If applicable, please revise the model and/or design package to ensure consistency. If applicable, please note the trapezoidal rule referenced in Section 5.3 Storage Unit Geometry in the SWMM Reference Manual, Volume II – Hydraulics (EPA, May 2017) for tabular storage curves (as assigned by the modeller):	Justin Armstrong	New information is included with the updated functional report.

<table>
<tr><th colspan="3">Comments and Responses to Kanata North Submission</th></tr>
<tr><td>

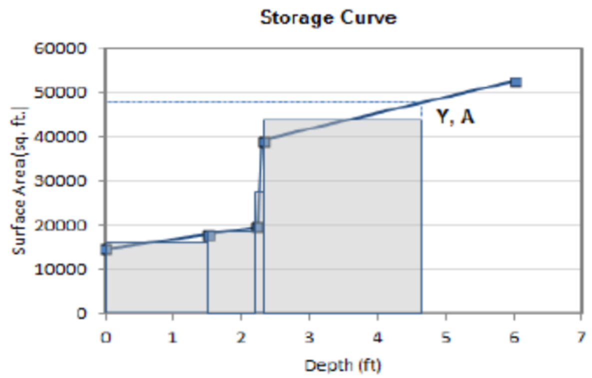


Figure 5-11 Finding the volume at a given depth for a storage curve

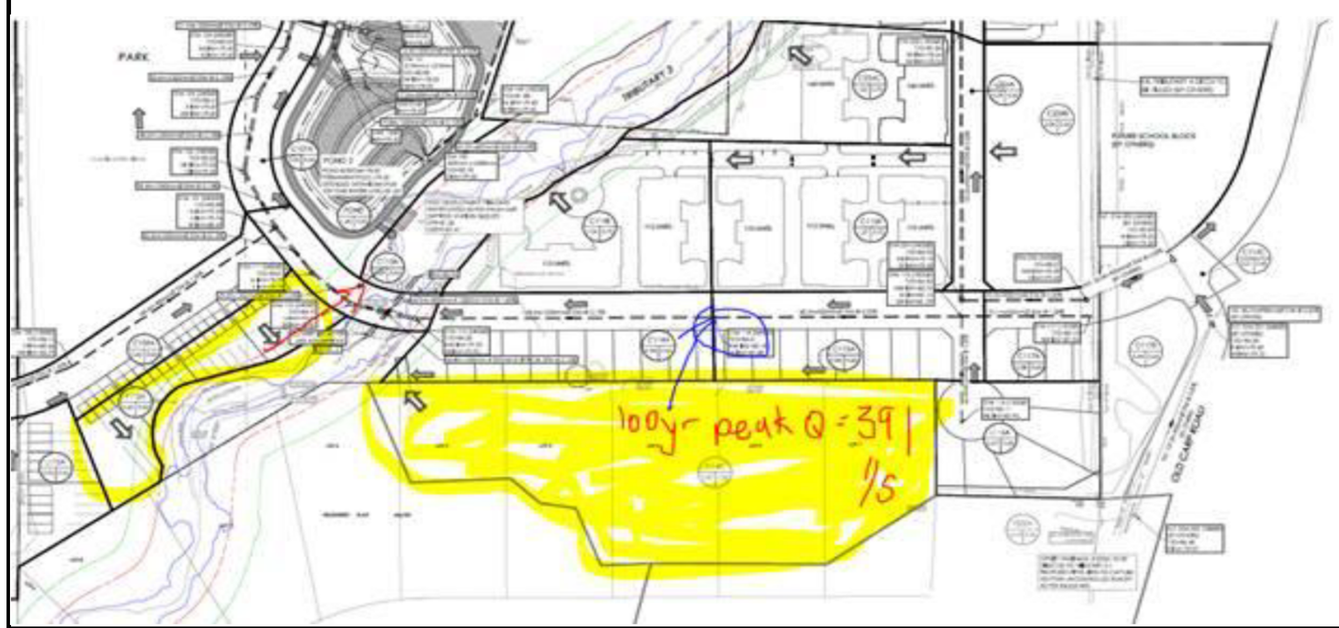
The depth that corresponds to a particular volume for a storage curve can be found as follows. Using the trapezoidal rule, sum the volumes contributed by each curve segment starting from 0 until the accumulated volume V_{sum} exceeds the target volume V. Let the data point index at the start of this segment be denoted by i. Then the depth Y that results in volume V is:

$$Y = Y_i + \left[\sqrt{A_i^2 + 2\alpha(V - V_{sum})} - A_i\right]/\alpha \qquad (5\text{-}27)$$

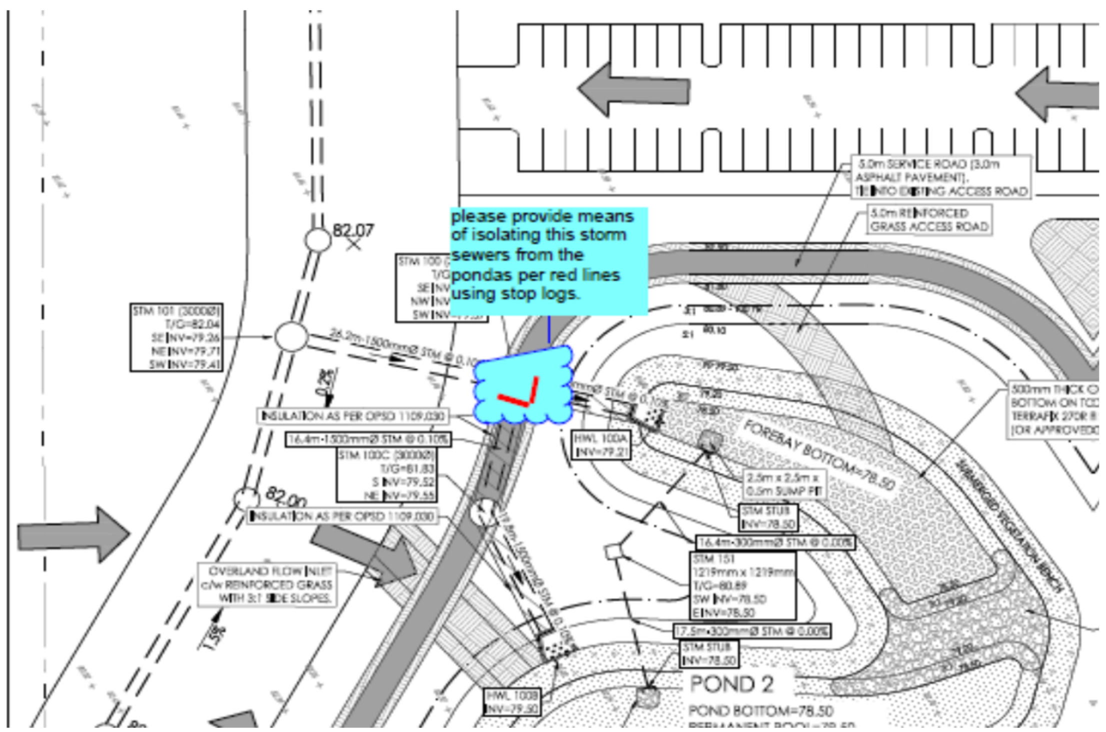
where $\alpha = (A_{i+1} - A_i)/(Y_{i+1} - Y_i)$.

</td><td></td><td></td></tr>
<tr><td>62. The extended detention WSEL declared in the Pond drawing appears to be the peak Pond 2 WSEL simulated in the 25 mm modelled event (vs the WSEL associated with MECP’s 40 m3/ha extended detention volume). Is this correct? Please update the report to clarify the difference between the extended detention calculated using the MECP’s 40 m3/ha vs modelling the 25 mm rainfall event, confirm which is used as the governing water quality volume (and extended detention WSEL in the Pond 2) ,and which is used when declaring the drawdown time.</td><td>Justin Armstrong</td><td>New information is included with the updated functional report.</td></tr>
<tr><td>63. Please update the report to declare why a hot start file was used for the quantity control events and not used for the 25 mm modelled event. Please justify why the 25 mm modelled event has not used a hot start.</td><td>Justin Armstrong</td><td>The hot start file is removed from the updated analysis.</td></tr>
</table>

Comments and Responses to Kanata North Submission		
64. Section 4.5.4.1 of the Servicing and SWM Report states: "The design of the required outlet structure incorporates three hydraulic components. An 83 mm orifice provides an approximate 53-hour extended detention for quality control. The entire extended detention volume is stored between 79.50 m and 79.81 m, as calculated below". How was the 53 hour extended detention calculated? The 25 mm event model submitted had a run duration of 48 hours. At the end of the 48 hour simulation the WSEL in the pond is at 79.65 m (15 cm higher than the permanent pool). When running the 25 mm event model for 72 hours the WSEL in the pond is at 79.59 m at 3 days/72 hours (this is still 9cm above the permanent pool). Please update the report to declare the drawdown time for the governing quality control event (40 m3/ha or the 25 mm event). Please note that the governing quality control event shall have a drawdown time of 2 days (to a maximum of 3 days). Please revise the design to ensure that drawdown times of 3 days or less is being met.	Justin Armstrong	New information is included with the updated functional report.
65. Section 4.5.5 of the report also declares: "SWM facility are met by providing extended detention of 24-48 hours and exceeding the MECP recommended water quality volumes." This contradicts Section 4.5.4.1 of the report. Please reference the comment above and revise Section 4.5.5 accordingly.	Justin Armstrong	New information is included with the updated functional report.
66. Where applicable please revise Table 12 in the Servicing and SWM Report (based on the review comments).	Justin Armstrong	New information is included with the updated functional report.
67. Section 4.1.1 of the Site Servicing and SWM Report declares: "Quantity control storage can be provided using a combination of surface and underground storage to restrict minor system post development peak flows up to the 100-year storm from KNUEA areas tributary to the secondary storm outlet to 816 L/s (2-year runoff from proposed local street catchments and approximately 115 L/s/ha from future/proposed multi-unit, mixed-use and school block)". Section 4.3.1 of the Report states: "future school block, future mixed-use service blocks, future multi-unit residential block, and proposed multi-unit residential blocks tributary to the secondary storm outlet were assigned a minor system capture rate of 117 L/s/ha to meet the allowable release rate of 816 L/s assumed in the KN EMP. How does section 4.1.1 align with section 9.6 of the EMP which states the overall release rate for 7.2 ha is 816 l/s for the 5 year peak flow (not the 2 year peak flow). Please revise the report and design accordingly. On-site controls shall include storage up to the 100 year event to meet the 112 l/s/ha allowable per hectare release rate (not 115 l/s/ha or 117 l/s/ha). Currently the 100 year minor system peak flows for catchments draining to the secondary storm outlet all exceed the maximum allowable release rate per the EMP. The 100 year, 3 hour Chicago event results in a peak flow of 1128 l/s discharged at the secondary storm outlet to Tributary 3 (38% higher than the maximum allowable flow of 816 l/s). Please revise the design package to comply with the EMP and to ensure consistency and update the report to include 100 year peak flows discharged by the secondary storm outlet to confirm compliance.	Justin Armstrong	New information is included with the updated functional report.

Comments and Responses to Kanata North Submission		
68. Section 4.3.1 of the Report states: “Storage curves in PCSWMM are required to be input as depth-area curves, as such an equivalent area was calculated at a depth of 2.35 m. All storage was assumed to occur between the top of the CB (2.0 m head) and a 0.35 m depth (2.35 m head) prior to spilling into the downstream segment.” This description appears to suggest at grade ponding however it is not clear where this at grade storage volume would be made available (for example, given the proposed layout of Block C224C it is not clear how there will be 187 m3 of surface storage volume available to store and attenuate the 100 year event). If surface storage requirements are not feasible (i.e. parking lots or drive aisles), what are the other potential and feasible options for storage onsite for the future development blocks? Note that there shall be no surface ponding for the 2 year event (storage node C224C-S utilizes 13 m3 of storage in the 2 year event).	Justin Armstrong	The storage curves within the areas assessed for on-site storage are modified in the updated analysis. The storage curves are set as a generic storage curve to identify a design storage volume relative to the allowable design discharge rate. A reference to potential storage methods to be considered with the detailed design is included in the updated functional report. For areas directly contributing to Tributary 3 and requiring site SWM control, the allowable discharge rate is less than the 2-year design flow rate. This means that some storage is anticipated to be required for the 2-year event. A method to provide storage capacity without surface ponding can be developed through the detailed design process.
69. Subcatchment Slope - A slope of 2-3% was assigned to the majority of the subcatchments modelled in PCSWMM (one RY subcatchment with slope at 4%). Its not clear how subcatchment slope was calculated however there is concern that the slopes assigned result in underestimated peak flows given that typical grading for residential lots is 2-6% and cross fall in the RoW is typically 3%. Please consider revisiting the slopes assigned in the model. Note that in detailed design review, the subcatchment slopes modelled shall be consistent with the proposed grading (a blanket assumption of 2% slopes for the subdivision will only be accepted if it is consistent with the proposed grading drawings.	Justin Armstrong	The slope conditions are re-considered in the updated analysis. The slopes are considered relative to the proposed grading and conditions that can be generalized at the draft plan of subdivision stage of the development application process.
70. The 100 year RY peak flows from two areas (highlighted yellow below) need to be captured. Modelled subcatchment F114C results in 391 l/s 100 year peak flow. Will 391 l/s require a STM pipe larger than a CB lead? If so, will a dedicated Block to connect RY drainage pipes to MH 114 be needed, as modelled in PCSWMM? Currently the Draft Plan does not include a dedicated block for rear yard minor drainage to connect to MH 114. Additional details of the drainage system requirements including block size or easements/adequate maintenance access will be required prior to draft plan approval. 	Justin Armstrong	The catch basin lead has been sized accordingly to capture the drainage from areas F115D and L115C. An easement or dedicated block will be provided for the pipe (to be determined during detailed design).
Infrastructure (Justin Armstrong) - Functional Servicing and Stormwater Management Report	**Comment Made By**	**Response**
71. The two 83mm orifices – are too small and could be easily plugged by small debris.	Justin Armstrong	Noted. Also see response to Comment #74.

Comments and Responses to Kanata North Submission		
72. Side Slopes - Section 4.5.2 of the report states: "Side slopes for safety (max 3:1) have been provided throughout the facility and along the forebay berm". Please provide a cross section of the pond to confirm this (especially for approving the Pond Block size as part of draft plan approval). The pond block is smaller than in the EMP (EMP pond block was 1.7 ha, now proposing 1.6 ha) and now proposed to service a larger area than approved in the EMP (drainage area in the EMP was 17.6 ha and now proposing 18.58 ha not including the 941 March Road area north of Tributary 3, which needs to be included, as indicated in the General SWM comments above).	Justin Armstrong	Additional grades and dimensions have been added to the pond and grading plans to confirm that maximum 3:1 side slopes are provided. Pond sections will be provided during detailed design.
73. Section 4.5.3 – Forebay Design: Please remove the paragraph regarding sediment accumulation and clean out. The forebay will be cleaned when the sediments reduce the effective storage volume and performance of the facility. It will be determining based on the facility inspection and sediment survey.	Justin Armstrong	Removed.
74. The two 83mm orifices could easily be plugged by small debris, replace them with 100 mm size and provide them with a debris hood.	Justin Armstrong	New information is included with the updated functional report.
75. The pond block, location and outlet pipe differ slightly from the approved EMP however, the Draft Plan appears to be consistent with the proposed Pond Block. Please add discussion related to the following points in the Servicing and SWM report: • Please provide a justification for long 600mm DIA storm sewer outlet discharging downstream Tributary 3 compared to direct discharge to the creek. Note that it is the City's Sewer Operations Group's preference that the storm sewer outlet be directly into Tributary 3 rather than to Moodie. A dedicated Draft Plan block or easements (City preference between dedicated block versus easement can be discussed with future submission) for this outlet pipe should be provided. Note that the outlet pipe does not include a French drain as prescribed in the EMP. Provide justification for French drain omission as the inclusion of a French drain may impact the sizing of this dedicated block. • Per section 9.1.4 of the EMP: "a perforated pipe outlet to a French Drain to provide baseflow enhancement" and Section 9.1.5: "Baseflows should be routed through a stone filled subsurface trench". The proponent has not provided a French drain in the current design package. As mentioned above, please provide justification. • The 600mm pond outlet pipe has a maximum allowable release rate of 86 l/s of flow in the 100 year event. Currently the 100 year 3hr Chicago event results in a peak flow of 30 l/s in this outlet pipe (running 15% full). Discuss outlet pipe sizing and related design criteria (i.e. meeting minimum velocity requirements, etc.). • Discuss how pathways adjacent to the emergency overflow for the pond will be incorporated into the design.	Justin Armstrong	New information is included with the updated functional report.
76. Provide information regarding the temperature mitigation and bottom draw outlet.	Justin Armstrong	Included with the updated functional report. Details are recommended to be developed as part of the detailed design stage of the development application process.
77. The current pond drawdown for the 25 mm event is greater than three days. There are concerns related to temperature increase resulting from this duration of drawdown. Additionally, for pond drawdown durations longer than 3 days (for ext. detention and/or 25 mm event) it should be ensured that the landscape design considers this (aquatic fringe/submerged shelf…) AND design of the safety bench should also be considered.	Justin Armstrong	A 3.5 m aquatic shelf/submerged vegetation bench (0.30 m deep) is considered with the functional pond grading concept. Additional detail is to be developed as needed during the detailed design stage of the development application process.
78. Remove the clean out frequency parameter.	Justin Armstrong	Removed.
79. Information regarding the pond liner is not provided.	Justin Armstrong	To be provided by the geotechnical consultant during detailed design

Comments and Responses to Kanata North Submission		
80. Section 9.1.3 of the EMP states that: “Groundwater levels will need to be considered when designing the pond liners and depending on the groundwater elevations, it may be necessary to install a perimeter drain around the facility to ensure the pond liner is not compromised or displaced by hydrostatic pressure from the surrounding water table.”. Especially given the anticipated groundwater elevations for the site, provide information related to this when discussing the pond liner as requested above.	Justin Armstrong	To be provided by the geotechnical consultant during detailed design
81. Temperature mitigation is not included in the SWM report.	Justin Armstrong	See response to Comment #76.
82. Please provide connection from a local road to the facility’s service road. Connect the service road to the sediment management area.	Justin Armstrong	Access to the pond will be from the 6m pathway south of Zone A. The sediment management area has access roads around its perimeter and will be constructed of reinforced grass so maintenance vehicles can access it from any side. Additional details to be provided during detailed design.
83. Please ensure the access road is rated for heavy equipment/vac trucks.	Justin Armstrong	Noted. Road structure to be provided during detailed design.
84. Please provide a means of isolating the inlet storm sewer from the pond as per red lines in the snippet below using stop logs 	Justin Armstrong	A note has been added. Details to be provided during detailed design.
85. Access to the inlet headwall should be provided. Please provide the details of this structure and grates design.	Justin Armstrong	During detailed design contours will be revised to indicate access locations for all structures. Structure and grate details to be provided during detailed design.
86. Please provide profile drawings of proposed structures.	Justin Armstrong	Noted. To be provided during detailed design.
87. The outlet sewer will require a maintenance/access easement or dedicated block.	Justin Armstrong	A note has been added indicating a 6m easement or dedicated block will be required. To be confirmed during detailed design.
88. Please remove the dewatering manholes from the design.	Justin Armstrong	Revised.

Appendix C Water

C.1 Domestic Water Demand

Stantec

WATER DEMAND DESIGN SHEET - City of Ottawa

Project: **Kanata North - Brigil**
Date: October 26, 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Design Parameters

Persons / Single Family	3.4	Average Day Demand			Maximum Day Demand (rate x avg.day)		
Persons / Townhome	2.7	Residential	280	L/p/day	Residential	2.5	L/p/day
Persons / Gen/ Apt.	1.8	Commercial / Institutional	28000	L/ha/day	Commercial / Institutional	1.5	L/ha/day
Persons / 1-Bed Apt.	1.4				Maximum Hour Demand (rate x max.day)		
Persons / 2-Bed Apt.	2.1				Residential	2.2	L/p/day
Persons / 3-Bed Apt.	3.1				Commercial / Institutional	1.8	L/ha/day

Location		Residential Popoulation							Commercial / Institutional	Average Day Demand (AVDY)		Maximum Day Demand (MXDY)		Maximum Hour Demand (PKHR)	
	Total Apartment Units	Single (units)	Town (units)	Gen. Apt. (units)	1-Bed Apt. (75% units)	2-Bed Apt. (20% units)	3-Bed Apt. (5% units)	Total Population	Area (ha)	(L/min)	(L/s)	(L/min)	(L/s)	(L/min)	(L/s)
Zone A - Residential Apartment	491				368	98	25	798		155.2	2.6	387.9	6.5	853.4	14.2
Zone B - Residential Apartment	326				245	65	16	530		103.1	1.7	257.6	4.3	566.8	9.4
Zone C - Residential Apartment	238				179	48	12	387		75.3	1.3	188.1	3.1	413.9	6.9
Zone D - Residential Apartment	802				602	160	40	1304		253.6	4.2	633.9	10.6	1394.6	23.2
Zone E - Residential		19						65		12.6	0.2	31.6	0.5	69.5	1.2
Zone E - Residential			32					87		16.9	0.3	42.3	0.7	93.0	1.6
Commercial - Zone D (D1 & D2)								0	0.502	9.8	0.2	14.6	0.2	26.4	0.4
School Block								0	2.02	39.3	0.7	58.9	1.0	106.1	1.8
Total Site	**1857**	**19**	**32**	**0**	**1393**	**371**	**93**	**3171**	**2.52**	**665.6**	**11.1**	**1615.0**	**26.9**	**3523.6**	**58.7**

1. Design Parameters as per City of Ottawa guidelines

C.2 Fire Flow Demand (2020 FUS)

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Townhomes (Assumed 3-Storey)
Building Area: 624 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)
8-unit townhouse ROW fronting proposed Street. 624m^2 Floorplate. Fire separation to to meet OBC Part 9 requirements with units separated in to two 4-unit clusters.

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type V - Wood Frame / Type IV-D - Mass Timber Construction										1.5	-
2	Determine Effective Floor Area	Sum of All Floor Areas										NO	-
		312	312	312								936	-
3	Determine Required Fire Flow	(F = 220 x C x $A^{1/2}$). Round to nearest 1000 L/min										-	10000
4	Determine Occupancy Charge	Limited Combustible										-15%	8500
5	Determine Sprinkler Reduction	None										0%	0
		Non-Standard Water Supply or N/A										0%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										0%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	0 to 3	13	3	21-49	Type V		NO			21%	3570
		East	> 30	0	0	0-20	Type V		NO			0%	
		South	0 to 3	13	3	21-49	Type V		NO			21%	
		West	> 30	0	0	0-20	Type V		NO			0%	
7	Determine Final Required Fire Flow	**Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min**											**12000**
		Total Required Fire Flow in L/s											**200.0**
		Required Duration of Fire Flow (hrs)											**2.50**
		Required Volume of Fire Flow (m^3)											**1800**

Stantec

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Townhomes (Assumed 3-Storey)
Building Area: 468 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)
6-unit townhouse ROW fronting proposed Street. 468m^2 Floorplate.

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type V - Wood Frame / Type IV-D - Mass Timber Construction										1.5	-
2	Determine Effective Floor Area	Sum of All Floor Areas										NO	-
		468	468	468								1404	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	12000
4	Determine Occupancy Charge	Limited Combustible										-15%	10200
5	Determine Sprinkler Reduction	None										0%	0
		Non-Standard Water Supply or N/A										0%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										0%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	10.1 to 20	13	3	21-49	Type V		NO			11%	3264
		East	> 30	0	0	0-20	Type V		NO			0%	
		South	0 to 3	13	3	21-49	Type V		NO			21%	
		West	> 30	0	0	0-20	Type V		NO			0%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min											13000
		Total Required Fire Flow in L/s											216.7
		Required Duration of Fire Flow (hrs)											2.50
		Required Volume of Fire Flow (m^3)											1950

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FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes:
Townhomes (Assumed 3-Storey)
Building Area: 468 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)
6-unit townhouse ROW fronting Future Resedential (by others). 468m^2 Floorplate.

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type V - Wood Frame / Type IV-D - Mass Timber Construction										1.5	-
2	Determine Effective Floor Area	Sum of All Floor Areas										NO	-
		468	468	468								1404	-
3	Determine Required Fire Flow	(F = 220 x C x $A^{1/2}$). Round to nearest 1000 L/min										-	12000
4	Determine Occupancy Charge	Limited Combustible										-15%	10200
5	Determine Sprinkler Reduction	None										0%	0
		Non-Standard Water Supply or N/A										0%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										0%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	20.1 to 30	36	3	> 100	Type V		NO			10%	4284
		East	> 30	0	0	0-20	Type V		NO			0%	
		South	10.1 to 20	13	3	21-49	Type V		NO			11%	
		West	0 to 3	13	3	21-49	Type V		NO			21%	
7	Determine Final Required Fire Flow	**Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min**											**14000**
		Total Required Fire Flow in L/s											**233.3**
		Required Duration of Fire Flow (hrs)											**3.00**
		Required Volume of Fire Flow (m^3)											**2520**

Stantec

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes:
Single Family Homes (Assumed 3-Storey)
Building Area: 151 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)
Worst-case building location

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type V - Wood Frame / Type IV-D - Mass Timber Construction										1.5	-
2	Determine Effective Floor Area	Sum of All Floor Areas										NO	-
		151	151	151								453	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	7000
4	Determine Occupancy Charge	Limited Combustible										-15%	5950
5	Determine Sprinkler Reduction	None										0%	0
		Non-Standard Water Supply or N/A										0%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										0%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	0 to 3	12	3	21-49	Type V		NO			21%	2499
		East	> 30	0	0	0-20	Type V		NO			0%	
		South	0 to 3	12	3	21-49	Type V		NO			21%	
		West	> 30	0	0	0-20	Type V		NO			0%	
7	Determine Final Required Fire Flow	**Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min**											**8000**
		Total Required Fire Flow in L/s											**133.3**
		Required Duration of Fire Flow (hrs)											**2.00**
		Required Volume of Fire Flow (m^3)											**960**

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'A-1', 4-Storey
Building Area: 1212 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Eight Additional Floors					Vertical Openings Protected?					NO	-
		1212	1212	1212	1212							3636	-
3	Determine Required Fire Flow	(F = 220 x C x $A^{1/2}$). Round to nearest 1000 L/min										-	11000
4	Determine Occupancy Charge	Limited Combustible										-15%	9350
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-3740
		Standard Water Supply										-10%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	> 30	0	0	0-20	Type V		NO			0%	0
		East	> 30	0	0	0-20	Type V		NO			0%	
		South	10.1 to 20	53	4	> 100	Type I-II - Unprotected Openings		YES			0%	
		West	> 30	0	0	0-20	Type V		NO			0%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min											6000
		Total Required Fire Flow in L/s											100.0
		Required Duration of Fire Flow (hrs)											2.00
		Required Volume of Fire Flow (m^3)											720

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'A-2', 4-Storey
Building Area: 1505 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)

<table>
<tr><th>Step</th><th>Task</th><th colspan="10">Notes</th><th>Value Used</th><th>Req'd Fire Flow (L/min)</th></tr>
<tr><td>1</td><td>Determine Type of Construction</td><td colspan="10">Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction</td><td>0.8</td><td>-</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Determine Effective Floor Area</td><td colspan="5">Sum of Two Largest Floors + 50% of Eight Additional Floors</td><td colspan="5">Vertical Openings Protected?</td><td>NO</td><td>-</td></tr>
<tr><td>1505</td><td>1505</td><td>1505</td><td>1505</td><td></td><td></td><td></td><td></td><td></td><td></td><td>4515</td><td>-</td></tr>
<tr><td>3</td><td>Determine Required Fire Flow</td><td colspan="10">(F = 220 x C x $A^{1/2}$). Round to nearest 1000 L/min</td><td>-</td><td>12000</td></tr>
<tr><td>4</td><td>Determine Occupancy Charge</td><td colspan="10">Limited Combustible</td><td>-15%</td><td>10200</td></tr>
<tr><td rowspan="5">5</td><td rowspan="5">Determine Sprinkler Reduction</td><td colspan="10">Conforms to NFPA 13</td><td>-30%</td><td rowspan="5">-4080</td></tr>
<tr><td colspan="10">Standard Water Supply</td><td>-10%</td></tr>
<tr><td colspan="10">Not Fully Supervised or N/A</td><td>0%</td></tr>
<tr><td colspan="10">% Coverage of Sprinkler System</td><td>100%</td></tr>
<tr><td colspan="10"></td><td></td></tr>
<tr><td rowspan="5">6</td><td rowspan="5">Determine Increase for Exposures (Max. 75%)</td><td>Direction</td><td>Exposure Distance (m)</td><td>Exposed Length (m)</td><td>Exposed Height (Stories)</td><td>Length-Height Factor (m x stories)</td><td colspan="2">Construction of Adjacent Wall</td><td colspan="3">Firewall / Sprinklered ?</td><td>-</td><td>-</td></tr>
<tr><td>North</td><td>10.1 to 20</td><td>53</td><td>4</td><td>> 100</td><td colspan="2">Type I-II - Unprotected Openings</td><td colspan="3">YES</td><td>0%</td><td rowspan="4">0</td></tr>
<tr><td>East</td><td>> 30</td><td>0</td><td>0</td><td>0-20</td><td colspan="2">Type V</td><td colspan="3">NO</td><td>0%</td></tr>
<tr><td>South</td><td>10.1 to 20</td><td>66</td><td>4</td><td>> 100</td><td colspan="2">Type I-II - Unprotected Openings</td><td colspan="3">YES</td><td>0%</td></tr>
<tr><td>West</td><td>> 30</td><td>0</td><td>0</td><td>0-20</td><td colspan="2">Type V</td><td colspan="3">NO</td><td>0%</td></tr>
<tr><td rowspan="4">7</td><td rowspan="4">Determine Final Required Fire Flow</td><td colspan="11">Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min</td><td>6000</td></tr>
<tr><td colspan="11">Total Required Fire Flow in L/s</td><td>100.0</td></tr>
<tr><td colspan="11">Required Duration of Fire Flow (hrs)</td><td>2.00</td></tr>
<tr><td colspan="11">Required Volume of Fire Flow (m^3)</td><td>720</td></tr>
</table>

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FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'A-3', 4-Storey
Building Area: 1505 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Eight Additional Floors					Vertical Openings Protected?					NO	-
		1505	1505	1505	1505							4515	-
3	Determine Required Fire Flow	(F = 220 x C x $A^{1/2}$). Round to nearest 1000 L/min										-	12000
4	Determine Occupancy Charge	Limited Combustible										-15%	10200
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-4080
		Standard Water Supply										-10%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	10.1 to 20	66	4	> 100	Type I-II - Unprotected Openings		YES			0%	0
		East	20.1 to 30	23	4	81-100	Type I-II - Unprotected Openings		YES			0%	
		South	10.1 to 20	66	4	> 100	Type I-II - Unprotected Openings		YES			0%	
		West	> 30	0	0	0-20	Type V		NO			0%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min											6000
		Total Required Fire Flow in L/s											100.0
		Required Duration of Fire Flow (hrs)											2.00
		Required Volume of Fire Flow (m^3)											720

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'A-4', 4-Storey
Building Area: 1505 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Eight Additional Floors					Vertical Openings Protected?					NO	-
		1505	1505	1505	1505							4515	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	12000
4	Determine Occupancy Charge	Limited Combustible										-15%	10200
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-4080
		Standard Water Supply										-10%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	10.1 to 20	66	4	> 100	Type I-II - Unprotected Openings		YES			0%	0
		East	> 30	0	0	0-20	Type V		NO			0%	
		South	10.1 to 20	56	4	> 100	Type I-II - Unprotected Openings		YES			0%	
		West	> 30	0	0	0-20	Type V		NO			0%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min											6000
		Total Required Fire Flow in L/s											100.0
		Required Duration of Fire Flow (hrs)											2.00
		Required Volume of Fire Flow (m^3)											720

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FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'A-5', 4-Storey
Building Area: 1505 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Eight Additional Floors					Vertical Openings Protected?					NO	-
		1505	1505	1505	1505							4515	-
3	Determine Required Fire Flow	(F = 220 x C x $A^{1/2}$). Round to nearest 1000 L/min										-	12000
4	Determine Occupancy Charge	Limited Combustible										-15%	10200
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-4080
		Standard Water Supply										-10%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	10.1 to 20	56	4	> 100	Type I-II - Unprotected Openings		YES			0%	0
		East	> 30	0	0	0-20	Type V		NO			0%	
		South	> 30	0	0	0-20	Type V		NO			0%	
		West	> 30	0	0	0-20	Type V		NO			0%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min											6000
		Total Required Fire Flow in L/s											100.0
		Required Duration of Fire Flow (hrs)											2.00
		Required Volume of Fire Flow (m^3)											720

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'B-1', 4-Storey
Building Area: 1212 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Eight Additional Floors					Vertical Openings Protected?					NO	-
		1212	1212	1212	1212							3636	-
3	Determine Required Fire Flow	(F = 220 x C x $A^{1/2}$). Round to nearest 1000 L/min										-	11000
4	Determine Occupancy Charge	Limited Combustible										-15%	9350
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-3740
		Standard Water Supply										-10%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	> 30	0	0	0-20	Type V		NO			0%	0
		East	> 30	0	0	0-20	Type V		NO			0%	
		South	10.1 to 20	36	4	> 100	Type I-II - Unprotected Openings		YES			0%	
		West	20.1 to 30	23	4	81-100	Type I-II - Unprotected Openings		YES			0%	
7	Determine Final Required Fire Flow	**Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min**											**6000**
		Total Required Fire Flow in L/s											**100.0**
		Required Duration of Fire Flow (hrs)											**2.00**
		Required Volume of Fire Flow (m^3)											**720**

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FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'B-2', 4-Storey
Building Area: 1210 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Eight Additional Floors					Vertical Openings Protected?					NO	-
		1210	1210	1210	1210							3630	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	11000
4	Determine Occupancy Charge	Limited Combustible										-15%	9350
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-3740
		Standard Water Supply										-10%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	20.1 to 30	36	4	> 100	Type I-II - Unprotected Openings		YES			0%	0
		East	> 30	0	0	0-20	Type V		NO			0%	
		South	20.1 to 30	49	4	> 100	Type I-II - Unprotected Openings		YES			0%	
		West	> 30	0	0	0-20	Type V		NO			0%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min											6000
		Total Required Fire Flow in L/s											100.0
		Required Duration of Fire Flow (hrs)											2.00
		Required Volume of Fire Flow (m^3)											720

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'B-3', 4-Storey
Building Area: 1212 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)

<table>
<tr><th>Step</th><th>Task</th><th colspan="10">Notes</th><th>Value Used</th><th>Req'd Fire Flow (L/min)</th></tr>
<tr><td>1</td><td>Determine Type of Construction</td><td colspan="10">Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction</td><td>0.8</td><td>-</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Determine Effective Floor Area</td><td colspan="5">Sum of Two Largest Floors + 50% of Eight Additional Floors</td><td colspan="5">Vertical Openings Protected?</td><td>NO</td><td>-</td></tr>
<tr><td>1212</td><td>1212</td><td>1212</td><td>1212</td><td></td><td></td><td></td><td></td><td></td><td></td><td>3636</td><td>-</td></tr>
<tr><td>3</td><td>Determine Required Fire Flow</td><td colspan="10">(F = 220 x C x A^{1/2}). Round to nearest 1000 L/min</td><td>-</td><td>11000</td></tr>
<tr><td>4</td><td>Determine Occupancy Charge</td><td colspan="10">Limited Combustible</td><td>-15%</td><td>9350</td></tr>
<tr><td rowspan="4">5</td><td rowspan="4">Determine Sprinkler Reduction</td><td colspan="10">Conforms to NFPA 13</td><td>-30%</td><td rowspan="4">-3740</td></tr>
<tr><td colspan="10">Standard Water Supply</td><td>-10%</td></tr>
<tr><td colspan="10">Not Fully Supervised or N/A</td><td>0%</td></tr>
<tr><td colspan="10">% Coverage of Sprinkler System</td><td>100%</td></tr>
<tr><td rowspan="5">6</td><td rowspan="5">Determine Increase for Exposures (Max. 75%)</td><td>Direction</td><td>Exposure Distance (m)</td><td>Exposed Length (m)</td><td>Exposed Height (Stories)</td><td>Length-Height Factor (m x stories)</td><td colspan="2">Construction of Adjacent Wall</td><td colspan="3">Firewall / Sprinklered ?</td><td>-</td><td>-</td></tr>
<tr><td>North</td><td>20.1 to 30</td><td>49</td><td>4</td><td>> 100</td><td colspan="2">Type I-II - Unprotected Openings</td><td colspan="3">YES</td><td>0%</td><td rowspan="4">0</td></tr>
<tr><td>East</td><td>10.1 to 20</td><td>23</td><td>4</td><td>81-100</td><td colspan="2">Type I-II - Unprotected Openings</td><td colspan="3">YES</td><td>0%</td></tr>
<tr><td>South</td><td>20.1 to 30</td><td>8</td><td>4</td><td>21-49</td><td colspan="2">Type I-II - Unprotected Openings</td><td colspan="3">YES</td><td>0%</td></tr>
<tr><td>West</td><td>> 30</td><td>0</td><td>0</td><td>0-20</td><td colspan="2">Type V</td><td colspan="3">NO</td><td>0%</td></tr>
<tr><td rowspan="4">7</td><td rowspan="4">Determine Final Required Fire Flow</td><td colspan="11">Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min</td><td>6000</td></tr>
<tr><td colspan="11">Total Required Fire Flow in L/s</td><td>100.0</td></tr>
<tr><td colspan="11">Required Duration of Fire Flow (hrs)</td><td>2.00</td></tr>
<tr><td colspan="11">Required Volume of Fire Flow (m³)</td><td>720</td></tr>
</table>

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'B-4', 6-Storey
Building Area: 920 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Eight Additional Floors					Vertical Openings Protected?					NO	-
		920	920	920	920	920	920					3680	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	11000
4	Determine Occupancy Charge	Limited Combustible										-15%	9350
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-3740
		Standard Water Supply										-10%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	> 30	0	0	0-20	Type V		NO			0%	1403
		East	10.1 to 20	23	6	> 100	Type V		NO			15%	
		South	10.1 to 20	21	6	> 100	Type I-II - Unprotected Openings		YES			0%	
		West	10.1 to 20	23	4	81-100	Type I-II - Unprotected Openings		YES			0%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min											7000
		Total Required Fire Flow in L/s											116.7
		Required Duration of Fire Flow (hrs)											2.00
		Required Volume of Fire Flow (m^3)											840

Stantec

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'C-1', 6-Storey
Building Area: 1212 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Eight Additional Floors					Vertical Openings Protected?					NO	-
		1212	1212	1212	1212	1212	1212					4848	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	12000
4	Determine Occupancy Charge	Limited Combustible										-15%	10200
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-4080
		Standard Water Supply										-10%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	20.1 to 30	21	6	> 100	Type I-II - Unprotected Openings		YES			0%	3570
		East	10.1 to 20	53	6	> 100	Type V		NO			15%	
		South	3.1 to 10	21	6	> 100	Type V		NO			20%	
		West	10.1 to 20	53	6	> 100	Type I-II - Unprotected Openings		YES			0%	
7	Determine Final Required Fire Flow	**Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min**											**10000**
		Total Required Fire Flow in L/s											**166.7**
		Required Duration of Fire Flow (hrs)											**2.00**
		Required Volume of Fire Flow (m^3)											**1200**

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Stantec

Project:	**Kanata North - Brigil**		
Date:	October 2023	Notes:	Building 'C-2', 6-Storey
Revision:	0		Building Area: 1212 m^2
Designed:	WAJ		Footprint areas as per NEUF Architects concept plan (2023-09-21)
Checked:	RB		
File:	160401347		

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Eight Additional Floors					Vertical Openings Protected?					NO	-
		1212	1212	1212	1212	1212	1212					4848	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	12000
4	Determine Occupancy Charge	Limited Combustible										-15%	10200
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-4080
		Standard Water Supply										-10%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	20.1 to 30	8	4	21-49	Type I-II - Unprotected Openings		YES			0%	4080
		East	10.1 to 20	53	6	> 100	Type I-II - Unprotected Openings		YES			0%	
		South	3.1 to 10	23	6	> 100	Type V		NO			20%	
		West	3.1 to 10	53	6	> 100	Type V		NO			20%	
7	Determine Final Required Fire Flow	**Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min**											**10000**
		Total Required Fire Flow in L/s											**166.7**
		Required Duration of Fire Flow (hrs)											**2.00**
		Required Volume of Fire Flow (m^3)											**1200**

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FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'D-1/D-2', 15-Storey/9-Storey
Building Area: 1651 m^2 (9-Storey) / 753 m^2 (15-Storey)
Footprint areas as per NEUF Architects concept plan (2023-09-21)

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Eight Additional Floors					Vertical Openings Protected?					NO	-
		1651	1651	1651	1651	1651	1651	1651	1651	1651	753	9457	-
3	Determine Required Fire Flow	(F = 220 x C x $A^{1/2}$). Round to nearest 1000 L/min										-	17000
4	Determine Occupancy Charge	Limited Combustible										-15%	14450
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-5780
		Standard Water Supply										-10%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	> 30	0	0	0-20	Type V		NO			0%	0
		East	> 30	0	0	0-20	Type V		NO			0%	
		South	10.1 to 20	23	9	> 100	Type I-II - Unprotected Openings		YES			0%	
		West	> 30	0	0	0-20	Type V		NO			0%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min											9000
		Total Required Fire Flow in L/s											150.0
		Required Duration of Fire Flow (hrs)											2.00
		Required Volume of Fire Flow (m^3)											1080

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FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'D-3/D-4', 15-Storey/9-Storey
Building Area: 2164 m^2 (9-Storey) / 899 m^2 (15-Storey)
Footprint areas as per NEUF Architects concept plan (2023-09-21)

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Eight Additional Floors					Vertical Openings Protected?					NO	-
		2164	2164	2164	2164	2164	2164	2164	2164	2164	899	12351.5	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	20000
4	Determine Occupancy Charge	Limited Combustible										-15%	17000
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-6800
		Standard Water Supply										-10%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	10.1 to 20	23	9	> 100	Type I-II - Unprotected Openings		YES			0%	2550
		East	> 30	0	0	0-20	Type V		NO			0%	
		South	10.1 to 20	98	15	> 100	Type V		NO			15%	
		West	> 30	0	0	0-20	Type V		NO			0%	
7	Determine Final Required Fire Flow	**Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min**											**13000**
		Total Required Fire Flow in L/s											**216.7**
		Required Duration of Fire Flow (hrs)											**2.50**
		Required Volume of Fire Flow (m^3)											**1950**

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FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'D-5', 6-Storey
Building Area: 1212 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Eight Additional Floors					Vertical Openings Protected?					NO	-
		1212	1212	1212	1212	1212	1212					4848	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	12000
4	Determine Occupancy Charge	Limited Combustible										-15%	10200
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-4080
		Standard Water Supply										-10%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	> 30	0	0	0-20	Type V		NO			0%	0
		East	> 30	0	0	0-20	Type V		NO			0%	
		South	20.1 to 30	18	6	> 100	Type I-II - Unprotected Openings		YES			0%	
		West	> 30	0	0	0-20	Type V		NO			0%	
7	Determine Final Required Fire Flow	**Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min**											**6000**
		Total Required Fire Flow in L/s											**100.0**
		Required Duration of Fire Flow (hrs)											**2.00**
		Required Volume of Fire Flow (m^3)											**720**

C.3 Boundary Conditions (City of Ottawa)

From: Armstrong, Justin <justin.armstrong@ottawa.ca>
Sent: Thursday, November 2, 2023 11:01 AM
To: Johnson, Warren
Cc: Kilborn, Kris; Brandrick, Robert; Schaeffer, Gabrielle
Subject: RE: Brigil Kanata North - Water Boundary Conditions
Attachments: 927 March Rd_30Oct2023_rev3.docx

Hi Warren,

See attached the results of the boundary condition request.

You will see in the attached, the City modeler could not provide the hydraulic information for Novatech's design to the northwest, but has looped the prescribed 300mm watermain through the site from Old Carp Road back to March Road and provided BCs in the vicinity of the future tie-in to the northwest (Labelled as Connection 3).

Also, it was flagged by our Infrastructure Planning Unit that as per the MSS for Kanata North, a 300mm watermain should be extended through Brigil's lands between connections 3 & 4 as modeled in the attached. The Old Carp Road portion of this 300mm main is currently being indicated as "to be built by others" on Stantec's servicing plan. I recall that we had provided a comment related to this with the first Draft Submission review comments. Just as a reminder, the City maintains that Brigil or KN landowners are required to fund the Old Carp Road watermain, as the main was identified in the KN MSS which was led and funded by KN landowners and that this will need to be confirmed as part of this subdivision application and cannot be left to be done by others. The boundary conditions were therefore provided at Old Carp Road as well in the attached.

Thanks,
Justin

Justin Armstrong, P.Eng.
Project Manager
Planning, Real Estate and Economic Development Department – Direction générale de la planification, des biens immobiliers et du développement économique
Development Review - West Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 21746, justin.armstrong@ottawa.ca

From: Johnson, Warren <Warren.Johnson@stantec.com>
Sent: October 27, 2023 3:26 PM
To: Armstrong, Justin <justin.armstrong@ottawa.ca>
Cc: Kilborn, Kris <kris.kilborn@stantec.com>; Brandrick, Robert <Robert.Brandrick@stantec.com>
Subject: Brigil Kanata North - Water Boundary Conditions

Hi Justin,

I would like to request hydraulic boundary conditions for Brigil's proposed Kanata North Subdivision Development (Zone 2W). Please find attached the draft plan, the key map showing the location of the proposed development, our functional servicing drawing showing connection locations, domestic water demand calculations, and fire flow calculations.

A summary of the proposed site is provided below:

We anticipate a minimum of three (3) connections as follows:

➢Connection to the existing 300 mm stub from the 400 mm watermain on March Road along the proposed northern road.
➢Connection to the existing 200 mm stub from the 400 mm watermain on March Road along the proposed southern road.
➢Connection to the future 300 mm watermain stub on Street 12 from the CU Developments Inc. subdivision to the northwest (by Novatech).

*Please verify if hydraulic modelling information is available for the adjacent CU Developments Inc. subdivision. If not, we will contact Novatech directly to obtain hydraulic information.

For the purpose of the boundary conditions request, may you please provide us with the boundary conditions for the following servicing option:

- Watermain connections to the above listed connections; assuming a fire flow requirement of **13,000 L/min (216.7 L/s)** for the site in addition to the domestic water demands provided below.
- The intended land use is a combination of residential, institutional, commercial/mixed use, and park land dedication per the summary provided in the Domestic Demands spreadsheet. (See attached Draft Plan).
- Estimated fire flow demand per the FUS methodology: 14,000 L/min (233.3 L/s) for the worst-case scenario (6-unit Townhome row fronting the future CU Developments Inc. subdivision). However, as per ISDTB-2014-02 the fire flow requirement may be capped at 10,000 L/min provided the block is less than 600m2 and 7-units and there is a minimum 10m rear yard separation. Due to this, the actual worst-case scenario is 13,000L/min (216.7 L/s) for Zone D, buildings D-3/D-4.
- Domestic water demands for the entire development:
    - **Average day: 667.5 L/min (11.1 L/s)**
    - **Maximum day: 1617.7 L/min (27.0 L/s)**
    - **Maximum hour: 3528.2 L/min (58.8 L/s)**

Thanks for your time and please contact me at your earliest convenience if any additional information or clarification is required.

Warren Johnson C.E.T.
Civil Engineering Technologist

Direct: 613 784-2272
Warren.Johnson@stantec.com

Stantec

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Caution: This email originated from outside of Stantec. Please take extra precaution.

Attention: Ce courriel provient de l'extérieur de Stantec. Veuillez prendre des précautions supplémentaires.

Atención: Este correo electrónico proviene de fuera de Stantec. Por favor, tome precauciones adicionales.

Boundary Conditions
927 March Road

Provided Information

Demand Scenario	Demand	
	L/min	L/s
Average Daily Demand	666	11.10
Maximum Daily Demand	1,620	27.00
Peak Hour	3,528	58.80
Fire Flow Demand #1	13,002	216.70
Fire Flow Demand #2	13,998	233.30

Location

Results

Connection 1 – March Road North

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.7	70.2
Peak Hour	124.4	61.2
Max Day plus Fire 1	116.5	50.0

Max Day plus Fire 2	115.1	48.0

[1] Ground Elevation = 81.4 m

Connection 2 – March Road South

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.7	72.2
Peak Hour	124.3	63.1
Max Day plus Fire 1	109.9	42.5
Max Day plus Fire 2	107.6	39.2

[1] Ground Elevation = 80.0 m

Connection 3 – Subdivision to the northwest

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.7	65.3
Peak Hour	124.4	56.3
Max Day plus Fire 1	115.9	44.3
Max Day plus Fire 2	114.5	42.2

[1] Ground Elevation = 84.8 m

Future Tie-in to the Old Carp Road

	Head (m)	Pressure[1] (psi)
Maximum HGL	130.7	71.2
Peak Hour	124.5	62.4

[1] Ground Elevation = 80.6 m

Note: the boundary condition is provided to this future tie-in to the Old Carp Road to assist in subdivision modeling.

Disclaimer

The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

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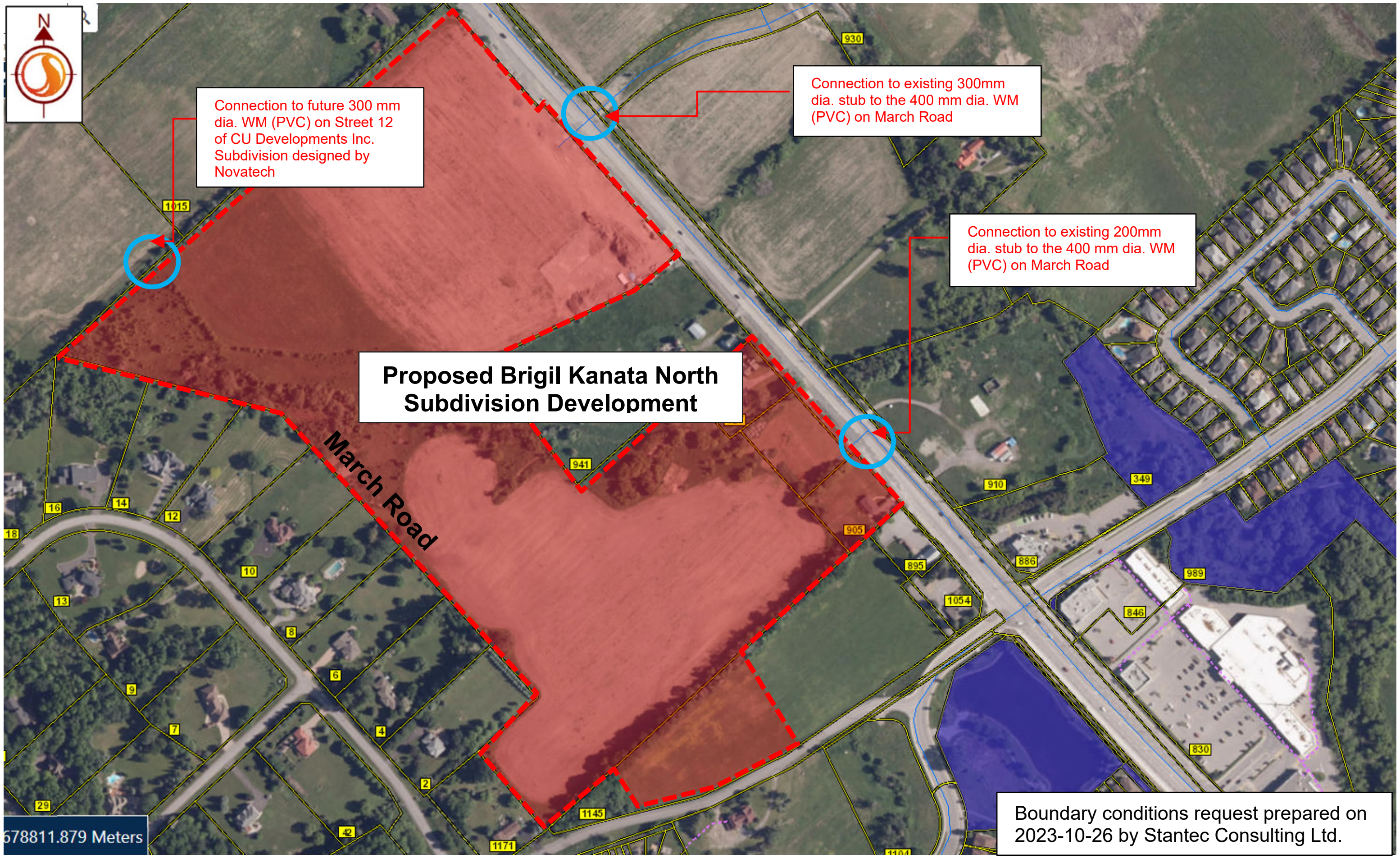

Design with community in mind

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes:
Townhomes (Assumed 3-Storey)
Building Area: 624 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)
8-unit townhouse ROW fronting proposed Street. 624m^2 Floorplate. Fire separation to to meet OBC Part 9 requirements with units separated in to two 4-unit clusters.

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type V - Wood Frame / Type IV-D - Mass Timber Construction										1.5	-
2	Determine Effective Floor Area	Sum of All Floor Areas										NO	-
		312	312	312								936	-
3	Determine Required Fire Flow	(F = 220 x C x $A^{1/2}$). Round to nearest 1000 L/min										-	10000
4	Determine Occupancy Charge	Limited Combustible										-15%	8500
5	Determine Sprinkler Reduction	None										0%	0
		Non-Standard Water Supply or N/A										0%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										0%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	0 to 3	13	3	21-49	Type V		NO			21%	1785
		East	> 30	0	0	0-20	Type V		NO			0%	
		South	0 to 3	13	3	21-49	Type V		YES			0%	
		West	> 30	0	0	0-20	Type V		NO			0%	
7	Determine Final Required Fire Flow	**Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min**											**10000**
		Total Required Fire Flow in L/s											**166.7**
		Required Duration of Fire Flow (hrs)											**2.00**
		Required Volume of Fire Flow (m^3)											**1200**

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FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Townhomes (Assumed 3-Storey)
Building Area: 468 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)
6-unit townhouse ROW fronting proposed Street. 468m^2 Floorplate.

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type V - Wood Frame / Type IV-D - Mass Timber Construction										1.5	-
2	Determine Effective Floor Area	Sum of All Floor Areas										NO	-
		468	468	468								1404	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	12000
4	Determine Occupancy Charge	Limited Combustible										-15%	10200
5	Determine Sprinkler Reduction	None										0%	0
		Non-Standard Water Supply or N/A										0%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										0%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	10.1 to 20	13	3	21-49	Type V		NO			11%	3264
		East	> 30	0	0	0-20	Type V		NO			0%	
		South	0 to 3	13	3	21-49	Type V		NO			21%	
		West	> 30	0	0	0-20	Type V		NO			0%	
7	Determine Final Required Fire Flow	**Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min**											**13000**
		Total Required Fire Flow in L/s											**216.7**
		Required Duration of Fire Flow (hrs)											**2.50**
		Required Volume of Fire Flow (m^3)											**1950**

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FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes:
Townhomes (Assumed 3-Storey)
Building Area: 468 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)
6-unit townhouse ROW fronting Future Resedential (by others). 468m^2 Floorplate.

Step	Task	Notes							Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type V - Wood Frame / Type IV-D - Mass Timber Construction							1.5	-
2	Determine Effective Floor Area	Sum of All Floor Areas							NO	-
		468	468	468					1404	-
3	Determine Required Fire Flow	(F = 220 x C x $A^{1/2}$). Round to nearest 1000 L/min							-	12000
4	Determine Occupancy Charge	Limited Combustible							-15%	10200
5	Determine Sprinkler Reduction	None							0%	0
		Non-Standard Water Supply or N/A							0%	
		Not Fully Supervised or N/A							0%	
		% Coverage of Sprinkler System							0%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall	Firewall / Sprinklered ?	-	-
		North	20.1 to 30	36	3	> 100	Type V	NO	10%	4284
		East	> 30	0	0	0-20	Type V	NO	0%	
		South	10.1 to 20	13	3	21-49	Type V	NO	11%	
		West	0 to 3	13	3	21-49	Type V	NO	21%	
7	Determine Final Required Fire Flow	**Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min**								**14000**
		Total Required Fire Flow in L/s								**233.3**
		Required Duration of Fire Flow (hrs)								**3.00**
		Required Volume of Fire Flow (m^3)								**2520**

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FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Single Family Homes (Assumed 3-Storey)
Building Area: 151 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)
Worst-case building location

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type V - Wood Frame / Type IV-D - Mass Timber Construction										1.5	-
2	Determine Effective Floor Area	Sum of All Floor Areas										NO	-
		151	151	151								453	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	7000
4	Determine Occupancy Charge	Limited Combustible										-15%	5950
5	Determine Sprinkler Reduction	None										0%	0
		Non-Standard Water Supply or N/A										0%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										0%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	0 to 3	12	3	21-49	Type V		NO			21%	2499
		East	> 30	0	0	0-20	Type V		NO			0%	
		South	0 to 3	12	3	21-49	Type V		NO			21%	
		West	> 30	0	0	0-20	Type V		NO			0%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min											8000
		Total Required Fire Flow in L/s											133.3
		Required Duration of Fire Flow (hrs)											2.00
		Required Volume of Fire Flow (m^3)											960

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Stantec

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'A-1', 4-Storey
Building Area: 1212 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Eight Additional Floors					Vertical Openings Protected?					NO	-
		1212	1212	1212	1212							3636	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	11000
4	Determine Occupancy Charge	Limited Combustible										-15%	9350
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-3740
		Standard Water Supply										-10%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	> 30	0	0	0-20	Type V		NO			0%	0
		East	> 30	0	0	0-20	Type V		NO			0%	
		South	10.1 to 20	53	4	> 100	Type I-II - Unprotected Openings		YES			0%	
		West	> 30	0	0	0-20	Type V		NO			0%	
7	Determine Final Required Fire Flow	**Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min**											**6000**
		Total Required Fire Flow in L/s											**100.0**
		Required Duration of Fire Flow (hrs)											**2.00**
		Required Volume of Fire Flow (m^3)											**720**

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FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'A-2', 4-Storey
Building Area: 1505 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)

<table>
<tr><th>Step</th><th>Task</th><th colspan="10">Notes</th><th>Value Used</th><th>Req'd Fire Flow (L/min)</th></tr>
<tr><td>1</td><td>Determine Type of Construction</td><td colspan="10">Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction</td><td>0.8</td><td>-</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Determine Effective Floor Area</td><td colspan="5">Sum of Two Largest Floors + 50% of Eight Additional Floors</td><td colspan="5">Vertical Openings Protected?</td><td>NO</td><td>-</td></tr>
<tr><td>1505</td><td>1505</td><td>1505</td><td>1505</td><td></td><td></td><td></td><td></td><td></td><td></td><td>4515</td><td>-</td></tr>
<tr><td>3</td><td>Determine Required Fire Flow</td><td colspan="10">(F = 220 x C x A$^{1/2}$). Round to nearest 1000 L/min</td><td>-</td><td>12000</td></tr>
<tr><td>4</td><td>Determine Occupancy Charge</td><td colspan="10">Limited Combustible</td><td>-15%</td><td>10200</td></tr>
<tr><td rowspan="4">5</td><td rowspan="4">Determine Sprinkler Reduction</td><td colspan="10">Conforms to NFPA 13</td><td>-30%</td><td rowspan="4">-4080</td></tr>
<tr><td colspan="10">Standard Water Supply</td><td>-10%</td></tr>
<tr><td colspan="10">Not Fully Supervised or N/A</td><td>0%</td></tr>
<tr><td colspan="10">% Coverage of Sprinkler System</td><td>100%</td></tr>
<tr><td rowspan="5">6</td><td rowspan="5">Determine Increase for Exposures (Max. 75%)</td><td>Direction</td><td>Exposure Distance (m)</td><td>Exposed Length (m)</td><td>Exposed Height (Stories)</td><td>Length-Height Factor (m x stories)</td><td colspan="2">Construction of Adjacent Wall</td><td colspan="3">Firewall / Sprinklered ?</td><td>-</td><td>-</td></tr>
<tr><td>North</td><td>10.1 to 20</td><td>53</td><td>4</td><td>> 100</td><td colspan="2">Type I-II - Unprotected Openings</td><td colspan="3">YES</td><td>0%</td><td rowspan="4">0</td></tr>
<tr><td>East</td><td>> 30</td><td>0</td><td>0</td><td>0-20</td><td colspan="2">Type V</td><td colspan="3">NO</td><td>0%</td></tr>
<tr><td>South</td><td>10.1 to 20</td><td>66</td><td>4</td><td>> 100</td><td colspan="2">Type I-II - Unprotected Openings</td><td colspan="3">YES</td><td>0%</td></tr>
<tr><td>West</td><td>> 30</td><td>0</td><td>0</td><td>0-20</td><td colspan="2">Type V</td><td colspan="3">NO</td><td>0%</td></tr>
<tr><td rowspan="4">7</td><td rowspan="4">Determine Final Required Fire Flow</td><td colspan="11">Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min</td><td>6000</td></tr>
<tr><td colspan="11">Total Required Fire Flow in L/s</td><td>100.0</td></tr>
<tr><td colspan="11">Required Duration of Fire Flow (hrs)</td><td>2.00</td></tr>
<tr><td colspan="11">Required Volume of Fire Flow (m^3)</td><td>720</td></tr>
</table>

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'A-3', 4-Storey
Building Area: 1505 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)

<table>
<tr><th>Step</th><th>Task</th><th colspan="10">Notes</th><th>Value Used</th><th>Req'd Fire Flow (L/min)</th></tr>
<tr><td>1</td><td>Determine Type of Construction</td><td colspan="10">Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction</td><td>0.8</td><td>-</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Determine Effective Floor Area</td><td colspan="5">Sum of Two Largest Floors + 50% of Eight Additional Floors</td><td colspan="5">Vertical Openings Protected?</td><td>NO</td><td>-</td></tr>
<tr><td>1505</td><td>1505</td><td>1505</td><td>1505</td><td></td><td></td><td></td><td></td><td></td><td></td><td>4515</td><td>-</td></tr>
<tr><td>3</td><td>Determine Required Fire Flow</td><td colspan="10">(F = 220 x C x $A^{1/2}$). Round to nearest 1000 L/min</td><td>-</td><td>12000</td></tr>
<tr><td>4</td><td>Determine Occupancy Charge</td><td colspan="10">Limited Combustible</td><td>-15%</td><td>10200</td></tr>
<tr><td rowspan="4">5</td><td rowspan="4">Determine Sprinkler Reduction</td><td colspan="10">Conforms to NFPA 13</td><td>-30%</td><td rowspan="4">-4080</td></tr>
<tr><td colspan="10">Standard Water Supply</td><td>-10%</td></tr>
<tr><td colspan="10">Not Fully Supervised or N/A</td><td>0%</td></tr>
<tr><td colspan="10">% Coverage of Sprinkler System</td><td>100%</td></tr>
<tr><td rowspan="5">6</td><td rowspan="5">Determine Increase for Exposures (Max. 75%)</td><td>Direction</td><td>Exposure Distance (m)</td><td>Exposed Length (m)</td><td>Exposed Height (Stories)</td><td>Length-Height Factor (m x stories)</td><td colspan="2">Construction of Adjacent Wall</td><td colspan="3">Firewall / Sprinklered ?</td><td>-</td><td>-</td></tr>
<tr><td>North</td><td>10.1 to 20</td><td>66</td><td>4</td><td>> 100</td><td colspan="2">Type I-II - Unprotected Openings</td><td colspan="3">YES</td><td>0%</td><td rowspan="4">0</td></tr>
<tr><td>East</td><td>20.1 to 30</td><td>23</td><td>4</td><td>81-100</td><td colspan="2">Type I-II - Unprotected Openings</td><td colspan="3">YES</td><td>0%</td></tr>
<tr><td>South</td><td>10.1 to 20</td><td>66</td><td>4</td><td>> 100</td><td colspan="2">Type I-II - Unprotected Openings</td><td colspan="3">YES</td><td>0%</td></tr>
<tr><td>West</td><td>> 30</td><td>0</td><td>0</td><td>0-20</td><td colspan="2">Type V</td><td colspan="3">NO</td><td>0%</td></tr>
<tr><td rowspan="4">7</td><td rowspan="4">Determine Final Required Fire Flow</td><td colspan="11">Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min</td><td>6000</td></tr>
<tr><td colspan="11">Total Required Fire Flow in L/s</td><td>100.0</td></tr>
<tr><td colspan="11">Required Duration of Fire Flow (hrs)</td><td>2.00</td></tr>
<tr><td colspan="11">Required Volume of Fire Flow (m^3)</td><td>720</td></tr>
</table>

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project:	**Kanata North - Brigil**		
Date:	October 2023	Notes:	Building 'A-4', 4-Storey
Revision:	0		Building Area: 1505 m^2
Designed:	WAJ		Footprint areas as per NEUF Architects concept plan (2023-09-21)
Checked:	RB		
File:	160401347		

Step	Task	Notes							Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction							0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Eight Additional Floors				Vertical Openings Protected?			NO	-
		1505	1505	1505	1505				4515	-
3	Determine Required Fire Flow	(F = 220 x C x $A^{1/2}$). Round to nearest 1000 L/min							-	12000
4	Determine Occupancy Charge	Limited Combustible							-15%	10200
5	Determine Sprinkler Reduction	Conforms to NFPA 13							-30%	-4080
		Standard Water Supply							-10%	
		Not Fully Supervised or N/A							0%	
		% Coverage of Sprinkler System							100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall	Firewall / Sprinklered ?	-	-
		North	10.1 to 20	66	4	> 100	Type I-II - Unprotected Openings	YES	0%	0
		East	> 30	0	0	0-20	Type V	NO	0%	
		South	10.1 to 20	56	4	> 100	Type I-II - Unprotected Openings	YES	0%	
		West	> 30	0	0	0-20	Type V	NO	0%	
7	Determine Final Required Fire Flow	**Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min**								**6000**
		Total Required Fire Flow in L/s								**100.0**
		Required Duration of Fire Flow (hrs)								**2.00**
		Required Volume of Fire Flow (m^3)								**720**

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'A-5', 4-Storey
Building Area: 1505 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Eight Additional Floors					Vertical Openings Protected?					NO	-
		1505	1505	1505	1505							4515	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	12000
4	Determine Occupancy Charge	Limited Combustible										-15%	10200
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-4080
		Standard Water Supply										-10%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	10.1 to 20	56	4	> 100	Type I-II - Unprotected Openings		YES			0%	0
		East	> 30	0	0	0-20	Type V		NO			0%	
		South	> 30	0	0	0-20	Type V		NO			0%	
		West	> 30	0	0	0-20	Type V		NO			0%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min											6000
		Total Required Fire Flow in L/s											100.0
		Required Duration of Fire Flow (hrs)											2.00
		Required Volume of Fire Flow (m^3)											720

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'B-1', 4-Storey
Building Area: 1212 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)

<table>
<tr><th>Step</th><th>Task</th><th colspan="10">Notes</th><th>Value Used</th><th>Req'd Fire Flow (L/min)</th></tr>
<tr><td>1</td><td>Determine Type of Construction</td><td colspan="10">Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction</td><td>0.8</td><td>-</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Determine Effective Floor Area</td><td colspan="5">Sum of Two Largest Floors + 50% of Eight Additional Floors</td><td colspan="5">Vertical Openings Protected?</td><td>NO</td><td>-</td></tr>
<tr><td>1212</td><td>1212</td><td>1212</td><td>1212</td><td></td><td></td><td></td><td></td><td></td><td></td><td>3636</td><td>-</td></tr>
<tr><td>3</td><td>Determine Required Fire Flow</td><td colspan="10">(F = 220 x C x A^1/2^). Round to nearest 1000 L/min</td><td>-</td><td>11000</td></tr>
<tr><td>4</td><td>Determine Occupancy Charge</td><td colspan="10">Limited Combustible</td><td>-15%</td><td>9350</td></tr>
<tr><td rowspan="4">5</td><td rowspan="4">Determine Sprinkler Reduction</td><td colspan="10">Conforms to NFPA 13</td><td>-30%</td><td rowspan="4">-3740</td></tr>
<tr><td colspan="10">Standard Water Supply</td><td>-10%</td></tr>
<tr><td colspan="10">Not Fully Supervised or N/A</td><td>0%</td></tr>
<tr><td colspan="10">% Coverage of Sprinkler System</td><td>100%</td></tr>
<tr><td rowspan="5">6</td><td rowspan="5">Determine Increase for Exposures (Max. 75%)</td><td>Direction</td><td>Exposure Distance (m)</td><td>Exposed Length (m)</td><td>Exposed Height (Stories)</td><td>Length-Height Factor (m x stories)</td><td colspan="2">Construction of Adjacent Wall</td><td colspan="3">Firewall / Sprinklered ?</td><td>-</td><td>-</td></tr>
<tr><td>North</td><td>> 30</td><td>0</td><td>0</td><td>0-20</td><td colspan="2">Type V</td><td colspan="3">NO</td><td>0%</td><td rowspan="4">0</td></tr>
<tr><td>East</td><td>> 30</td><td>0</td><td>0</td><td>0-20</td><td colspan="2">Type V</td><td colspan="3">NO</td><td>0%</td></tr>
<tr><td>South</td><td>10.1 to 20</td><td>36</td><td>4</td><td>> 100</td><td colspan="2">Type I-II - Unprotected Openings</td><td colspan="3">YES</td><td>0%</td></tr>
<tr><td>West</td><td>20.1 to 30</td><td>23</td><td>4</td><td>81-100</td><td colspan="2">Type I-II - Unprotected Openings</td><td colspan="3">YES</td><td>0%</td></tr>
<tr><td rowspan="4">7</td><td rowspan="4">Determine Final Required Fire Flow</td><td colspan="11">Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min</td><td>6000</td></tr>
<tr><td colspan="11">Total Required Fire Flow in L/s</td><td>100.0</td></tr>
<tr><td colspan="11">Required Duration of Fire Flow (hrs)</td><td>2.00</td></tr>
<tr><td colspan="11">Required Volume of Fire Flow (m^3^)</td><td>720</td></tr>
</table>

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FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'B-2', 4-Storey
Building Area: 1210 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Eight Additional Floors					Vertical Openings Protected?					NO	-
		1210	1210	1210	1210							3630	-
3	Determine Required Fire Flow	(F = 220 x C x $A^{1/2}$). Round to nearest 1000 L/min										-	11000
4	Determine Occupancy Charge	Limited Combustible										-15%	9350
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-3740
		Standard Water Supply										-10%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	20.1 to 30	36	4	> 100	Type I-II - Unprotected Openings		YES			0%	0
		East	> 30	0	0	0-20	Type V		NO			0%	
		South	20.1 to 30	49	4	> 100	Type I-II - Unprotected Openings		YES			0%	
		West	> 30	0	0	0-20	Type V		NO			0%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min											6000
		Total Required Fire Flow in L/s											100.0
		Required Duration of Fire Flow (hrs)											2.00
		Required Volume of Fire Flow (m^3)											720

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'B-3', 4-Storey
Building Area: 1212 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Eight Additional Floors					Vertical Openings Protected?					NO	-
		1212	1212	1212	1212							3636	-
3	Determine Required Fire Flow	(F = 220 x C x $A^{1/2}$). Round to nearest 1000 L/min										-	11000
4	Determine Occupancy Charge	Limited Combustible										-15%	9350
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-3740
		Standard Water Supply										-10%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	20.1 to 30	49	4	> 100	Type I-II - Unprotected Openings		YES			0%	0
		East	10.1 to 20	23	4	81-100	Type I-II - Unprotected Openings		YES			0%	
		South	20.1 to 30	8	4	21-49	Type I-II - Unprotected Openings		YES			0%	
		West	> 30	0	0	0-20	Type V		NO			0%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min											6000
		Total Required Fire Flow in L/s											100.0
		Required Duration of Fire Flow (hrs)											2.00
		Required Volume of Fire Flow (m^3)											720

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'B-4', 6-Storey
Building Area: 920 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)

<table>
<tr><th>Step</th><th>Task</th><th colspan="10">Notes</th><th>Value Used</th><th>Req'd Fire Flow (L/min)</th></tr>
<tr><td>1</td><td>Determine Type of Construction</td><td colspan="10">Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction</td><td>0.8</td><td>-</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Determine Effective Floor Area</td><td colspan="5">Sum of Two Largest Floors + 50% of Eight Additional Floors</td><td colspan="5">Vertical Openings Protected?</td><td>NO</td><td>-</td></tr>
<tr><td>920</td><td>920</td><td>920</td><td>920</td><td>920</td><td>920</td><td></td><td></td><td></td><td></td><td>3680</td><td>-</td></tr>
<tr><td>3</td><td>Determine Required Fire Flow</td><td colspan="10">($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min</td><td>-</td><td>11000</td></tr>
<tr><td>4</td><td>Determine Occupancy Charge</td><td colspan="10">Limited Combustible</td><td>-15%</td><td>9350</td></tr>
<tr><td rowspan="4">5</td><td rowspan="4">Determine Sprinkler Reduction</td><td colspan="10">Conforms to NFPA 13</td><td>-30%</td><td rowspan="4">-3740</td></tr>
<tr><td colspan="10">Standard Water Supply</td><td>-10%</td></tr>
<tr><td colspan="10">Not Fully Supervised or N/A</td><td>0%</td></tr>
<tr><td colspan="10">% Coverage of Sprinkler System</td><td>100%</td></tr>
<tr><td rowspan="5">6</td><td rowspan="5">Determine Increase for Exposures (Max. 75%)</td><td>Direction</td><td>Exposure Distance (m)</td><td>Exposed Length (m)</td><td>Exposed Height (Stories)</td><td>Length-Height Factor (m x stories)</td><td colspan="2">Construction of Adjacent Wall</td><td colspan="3">Firewall / Sprinklered ?</td><td>-</td><td>-</td></tr>
<tr><td>North</td><td>> 30</td><td>0</td><td>0</td><td>0-20</td><td colspan="2">Type V</td><td colspan="3">NO</td><td>0%</td><td rowspan="4">1403</td></tr>
<tr><td>East</td><td>10.1 to 20</td><td>23</td><td>6</td><td>> 100</td><td colspan="2">Type V</td><td colspan="3">NO</td><td>15%</td></tr>
<tr><td>South</td><td>10.1 to 20</td><td>21</td><td>6</td><td>> 100</td><td colspan="2">Type I-II - Unprotected Openings</td><td colspan="3">YES</td><td>0%</td></tr>
<tr><td>West</td><td>10.1 to 20</td><td>23</td><td>4</td><td>81-100</td><td colspan="2">Type I-II - Unprotected Openings</td><td colspan="3">YES</td><td>0%</td></tr>
<tr><td rowspan="4">7</td><td rowspan="4">Determine Final Required Fire Flow</td><td colspan="11">Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min</td><td>7000</td></tr>
<tr><td colspan="11">Total Required Fire Flow in L/s</td><td>116.7</td></tr>
<tr><td colspan="11">Required Duration of Fire Flow (hrs)</td><td>2.00</td></tr>
<tr><td colspan="11">Required Volume of Fire Flow (m^3)</td><td>840</td></tr>
</table>

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FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'C-1', 6-Storey
Building Area: 1212 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Eight Additional Floors					Vertical Openings Protected?					NO	-
		1212	1212	1212	1212	1212	1212					4848	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	12000
4	Determine Occupancy Charge	Limited Combustible										-15%	10200
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-4080
		Standard Water Supply										-10%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	20.1 to 30	21	6	> 100	Type I-II - Unprotected Openings		YES			0%	3570
		East	10.1 to 20	53	6	> 100	Type V		NO			15%	
		South	3.1 to 10	21	6	> 100	Type V		NO			20%	
		West	10.1 to 20	53	6	> 100	Type I-II - Unprotected Openings		YES			0%	
7	Determine Final Required Fire Flow	**Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min**											**10000**
		Total Required Fire Flow in L/s											**166.7**
		Required Duration of Fire Flow (hrs)											**2.00**
		Required Volume of Fire Flow (m^3)											**1200**

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FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'C-2', 6-Storey
Building Area: 1212 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Eight Additional Floors					Vertical Openings Protected?					NO	-
		1212	1212	1212	1212	1212	1212					4848	-
3	Determine Required Fire Flow	(F = 220 x C x $A^{1/2}$). Round to nearest 1000 L/min										-	12000
4	Determine Occupancy Charge	Limited Combustible										-15%	10200
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-4080
		Standard Water Supply										-10%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	20.1 to 30	8	4	21-49	Type I-II - Unprotected Openings		YES			0%	4080
		East	10.1 to 20	53	6	> 100	Type I-II - Unprotected Openings		YES			0%	
		South	3.1 to 10	23	6	> 100	Type V		NO			20%	
		West	3.1 to 10	53	6	> 100	Type V		NO			20%	
7	Determine Final Required Fire Flow	**Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min**											**10000**
		Total Required Fire Flow in L/s											**166.7**
		Required Duration of Fire Flow (hrs)											**2.00**
		Required Volume of Fire Flow (m^3)											**1200**

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project:	**Kanata North - Brigil**		
Date:	October 2023	Notes:	Building 'D-1/D-2', 15-Storey/9-Storey
Revision:	0		Building Area: 1651 m^2 (9-Storey) / 753 m^2 (15-Storey)
Designed:	WAJ		Footprint areas as per NEUF Architects concept plan (2023-09-21)
Checked:	RB		
File:	160401347		

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Eight Additional Floors					Vertical Openings Protected?					NO	-
		1651	1651	1651	1651	1651	1651	1651	1651	1651	753	9457	-
3	Determine Required Fire Flow	(F = 220 x C x $A^{1/2}$). Round to nearest 1000 L/min										-	17000
4	Determine Occupancy Charge	Limited Combustible										-15%	14450
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-5780
		Standard Water Supply										-10%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	> 30	0	0	0-20	Type V		NO			0%	0
		East	> 30	0	0	0-20	Type V		NO			0%	
		South	10.1 to 20	23	9	> 100	Type I-II - Unprotected Openings		YES			0%	
		West	> 30	0	0	0-20	Type V		NO			0%	
7	Determine Final Required Fire Flow	**Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min**											**9000**
		Total Required Fire Flow in L/s											**150.0**
		Required Duration of Fire Flow (hrs)											**2.00**
		Required Volume of Fire Flow (m^3)											**1080**

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'D-3/D-4', 15-Storey/9-Storey
Building Area: 2164 m^2 (9-Storey) / 899 m^2 (15-Storey)
Footprint areas as per NEUF Architects concept plan (2023-09-21)

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Eight Additional Floors					Vertical Openings Protected?					NO	-
		2164	2164	2164	2164	2164	2164	2164	2164	2164	899	12351.5	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	20000
4	Determine Occupancy Charge	Limited Combustible										-15%	17000
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-6800
		Standard Water Supply										-10%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	10.1 to 20	23	9	> 100	Type I-II - Unprotected Openings		YES			0%	2550
		East	> 30	0	0	0-20	Type V		NO			0%	
		South	10.1 to 20	98	15	> 100	Type V		NO			15%	
		West	> 30	0	0	0-20	Type V		NO			0%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min											13000
		Total Required Fire Flow in L/s											216.7
		Required Duration of Fire Flow (hrs)											2.50
		Required Volume of Fire Flow (m^3)											1950

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FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Project: **Kanata North - Brigil**
Date: October 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Notes: Building 'D-5', 6-Storey
Building Area: 1212 m^2
Footprint areas as per NEUF Architects concept plan (2023-09-21)

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Two Largest Floors + 50% of Eight Additional Floors					Vertical Openings Protected?					NO	-
		1212	1212	1212	1212	1212	1212					4848	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	12000
4	Determine Occupancy Charge	Limited Combustible										-15%	10200
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-4080
		Standard Water Supply										-10%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	> 30	0	0	0-20	Type V		NO			0%	0
		East	> 30	0	0	0-20	Type V		NO			0%	
		South	20.1 to 30	18	6	> 100	Type I-II - Unprotected Openings		YES			0%	
		West	> 30	0	0	0-20	Type V		NO			0%	
7	Determine Final Required Fire Flow	**Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min**											**6000**
		Total Required Fire Flow in L/s											**100.0**
		Required Duration of Fire Flow (hrs)											**2.00**
		Required Volume of Fire Flow (m^3)											**720**

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WATER DEMAND DESIGN SHEET - City of Ottawa

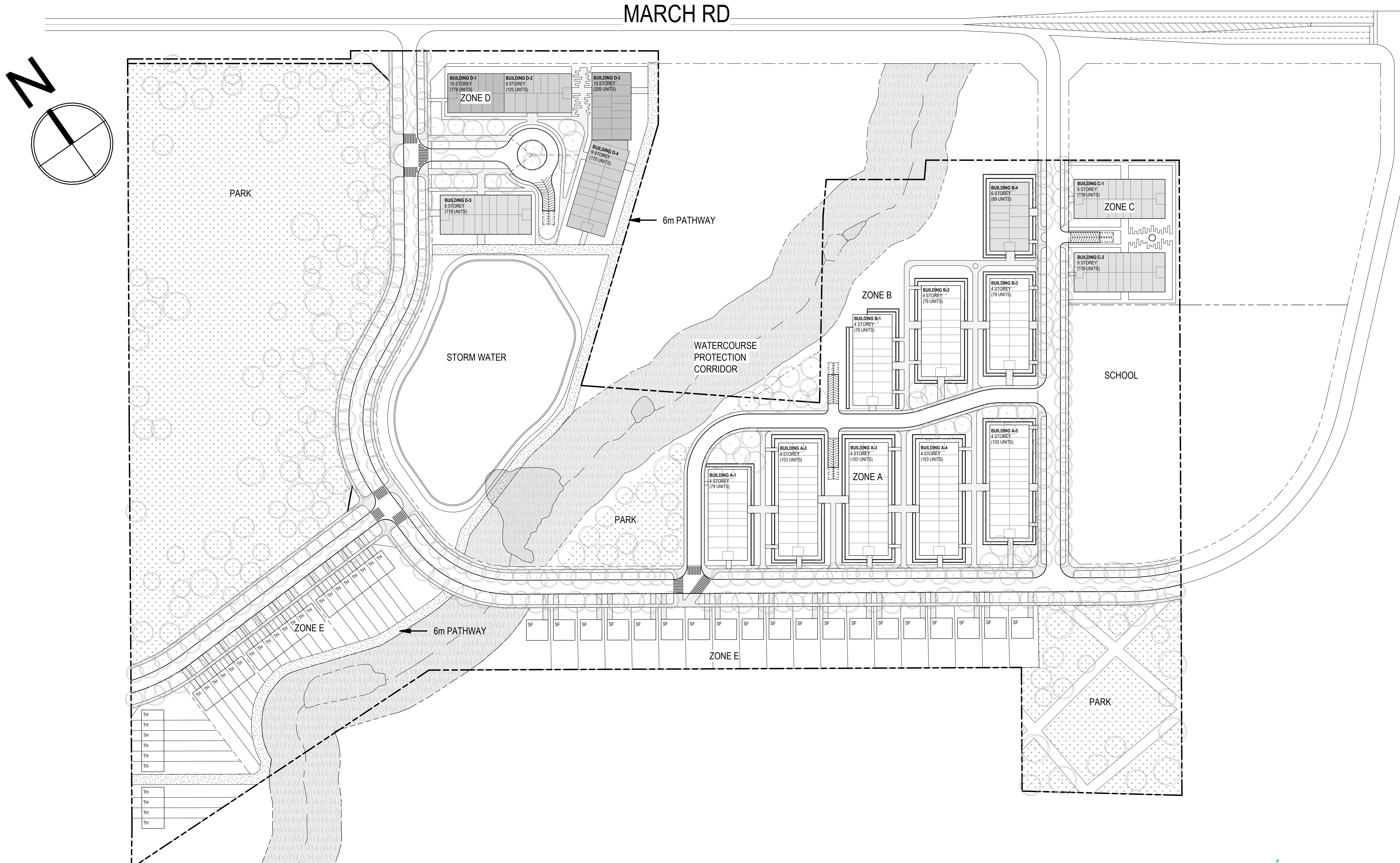
Project: **Kanata North - Brigil**
Date: October 26, 2023
Revision: 0
Designed: WAJ
Checked: RB
File: 160401347

Design Parameters

Persons / Single Family	3.4	Average Day Demand			Maximum Day Demand (rate x avg.day)		
Persons / Townhome	2.7	Residential	280	L/p/day	Residential	2.5	L/p/day
Persons / Gen/ Apt.	1.8	Commercial / Institutional	28000	L/ha/day	Commercial / Institutional	1.5	L/ha/day
Persons / 1-Bed Apt.	1.4				Maximum Hour Demand (rate x max.day)		
Persons / 2-Bed Apt.	2.1				Residential	2.2	L/p/day
Persons / 3-Bed Apt.	3.1				Commercial / Institutional	1.8	L/ha/day

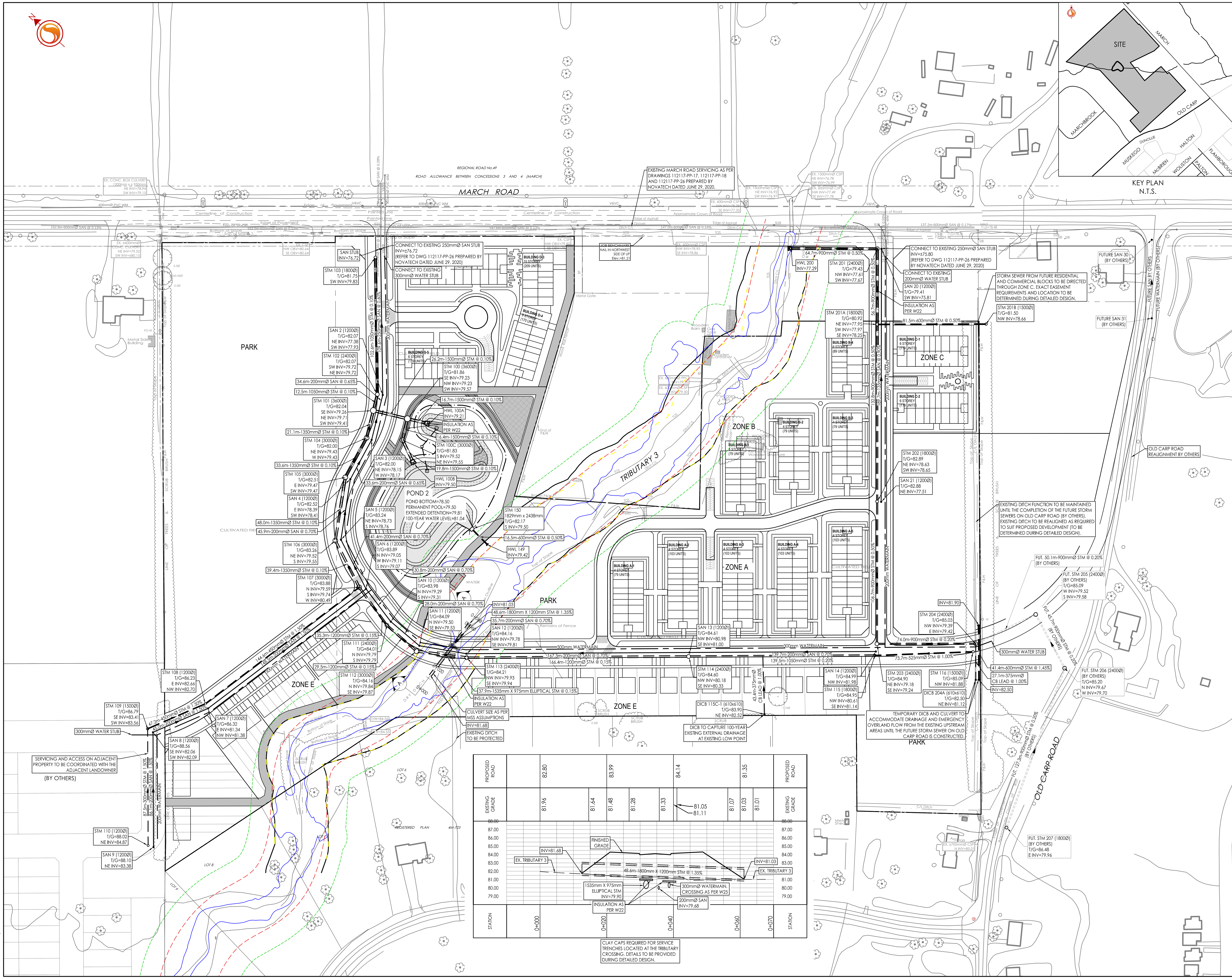
Location		Residential Popoulation							Commercial / Institutional	Average Day Demand (AVDY)		Maximum Day Demand (MXDY)		Maximum Hour Demand (PKHR)	
	Total Apartment Units	Single (units)	Town (units)	Gen. Apt. (units)	1-Bed Apt. (75% units)	2-Bed Apt. (20% units)	3-Bed Apt. (5% units)	Total Population	Area (ha)	(L/min)	(L/s)	(L/min)	(L/s)	(L/min)	(L/s)
Zone A - Residential Apartment	491				368	98	25	798		155.2	2.6	387.9	6.5	853.4	14.2
Zone B - Residential Apartment	326				245	65	16	530		103.1	1.7	257.6	4.3	566.8	9.4
Zone C - Residential Apartment	238				179	48	12	387		75.3	1.3	188.1	3.1	413.9	6.9
Zone D - Residential Apartment	802				602	160	40	1304		253.6	4.2	633.9	10.6	1394.6	23.2
Zone E - Residential		19	32					151		29.4	0.5	73.4	1.2	161.5	2.7
External Commercial								0	0.62	12.1	0.2	18.1	0.3	32.6	0.5
School Block								0	2.01	39.1	0.7	58.6	1.0	105.5	1.8
Total Site	**1857**	**19**	**32**	**0**	**1393**	**371**	**93**	**3170**	**2.63**	**667.5**	**11.1**	**1617.7**	**27.0**	**3528.2**	**58.8**

1. Design Parameters as per City of Ottawa guidelines



CONCEPT PLAN

ÉCHELLE = 1 : 2000



Stantec

Stantec Consulting Ltd.
400 - 1331 Clyde Avenue
Ottawa ON
Tel. 613.722.4420
www.stantec.com

Legend

- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- FUTURE WATERMAIN
- FUTURE SANITARY SEWER
- FUTURE STORM SEWER
- MVCA 100 YEAR FLOODPLAIN
- MVCA MEANDER BELT
- MVCA REGULATION LIMIT
- 40m CORRIDOR AS PER HABITAT COMPENSATION BY MATRIX SOLUTIONS, INC.

Notes

3	REVISED DRAFT PLAN	WAJ	KJK	23.10.27
2	REVISED CONCEPTS	WAJ	KJK	23.01.16
1	ISSUED FOR DRAFT PLAN APPROVAL	WAJ	AMP	20.08.18
Revision		By	Appd.	YY.MM.DD

File Name: 160401347-08.dwg	WAJ	AMP	WAJ	20.06.11
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

Client/Project

3223701 CANADA INC.

BRIGIL - KANATA NORTH

OTTAWA, ON

Title

CONCEPTUAL OVERALL SITE SERVICING PLAN

Project No. 160401347

Scale 1:1250

Drawing No. OSSP-1

Sheet 1 of 6

Revision 3

Appendix D Sanitary

D.1 MSS Data

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	REVISION	DATE	BY
3.	ISSUED WITH DRAFT MASTER SERVICING STUDY	MAY 20/16	JLS
2.	ISSUED WITH DRAFT MASTER SERVICING STUDY	APR 4/16	JLS
1.	ISSUED WITH DRAFT MASTER SERVICING STUDY	FEB 26/16	JLS

SCALE 1:3000

DESIGN ARM / TB
CHECKED ARM
DRAWN TB
CHECKED CJR
APPROVED JLS

FOR REVIEW ONLY

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
KANATA NORTH URBAN EXPANSION AREA
COMMUNITY DESIGN PLAN

DRAWING NAME
ONSITE SANITARY DRAINAGE AREA PLAN

PROJECT No. 112117-04
REV REV # 3
DRAWING No. 112117-SAN1

PLANB1.DWG - 1000mmx707mm

KANATA NORT URBAN E PANSION AREA
COMMUNITY DESIGN PLAN

TABLE C-6b:
SANITARY SEWER DESIGN SHEET

NOVATECH
Engineers, Planners & Landscape Architects

LOCATION			RESIDENTIAL AREA AND POPULATION											ICI								IN ILTRATION				LOW	PIPE					
									Cumulative					IND			COMM		INST													
Street	From	To	Total	Dwellings		Density (Net ha)		Pop.	Residential			Peak	Peak	Area	Accu.	Peak	Area	Accu.	Area	Accu.	Peak	Total	Accu. Area		Infiltration	Total	Dia	Dia	Slope	Velocity	Capacity	Ratio
	Node	Node	Area	SFH	SD/TH	Low[3]	High[4]		Area	Pop.		Factor	Flow		Area	Factor		Area		Area	Flow	Area	New	Exist	Flow	Flow	Act	Nom		(Full)	(Full)	Q/Qfull
			(ha)	3.4	2.7	101	161		(ha)	New	Exist		(l/s)	(ha)	(ha)		(ha)	(ha)	(ha)	(ha)	(l/s)	(ha)	(ha)		(l/s)	(l/s)	(mm)	(mm)	(%)	(m/s)	(l/s)	(%)
W-16	W-16	W-17	6.55			3.17	1.78	606.8	4.95	**60**		3.93	9.7								0.0	6.55	6.55		1.8	11.5	203	200	0.35	0.62	20.2	57%
W-17	W-17	MR-1	3.43					0.0	7.51	**865**		3.84	13.5				**3.05**	3.05		8.04	9.6	6.48	19.99		5.6	28.7	254	250	0.30	0.67	33.9	84%
MR-1 (MARCH ROAD)	MR-1	MR-2	1.36					0.0	30.73	**33 3**		3.40	46.4					3.40		8.04	9.9	1.36	47.42		13.3	69.6	610	600	0.10	0.69	202.4	34%
W-9	W-9	MR-2	7.17				1.13	181.9	1.13	**182**		4.00	2.9				**1.38**	1.38	**3.**	3.77	4.5	7.17	25.90		7.3	14.7	203	200	1.20	1.15	37.4	39%
MR-2 (MARCH ROAD)	MR-2	MR-3	1.37					0.0	33.23	**3555**		3.38	48.7					4.78		11.81	14.4	1.37	74.69		20.9	84.0	610	600	0.10	0.69	202.4	41%
W-10	W-10	W-11	1.53				0.78	125.6	0.78	**126**		4.00	2.0								0.0	1.53	1.53		0.4	2.5	203	200	0.70	0.88	28.6	9%
W-11	W-11	MR-3	3.55				1.64	264.0	2.42	**390**		4.00	6.3				**1.08**	1.08			0.9	3.55	5.08		1.4	8.7	203	200	0.70	0.88	28.6	30%
W-18	W-18	W-19	3.90			1.21	1.82	415.2	3.03	**415**		4.00	6.7								0.0	3.90	3.90		1.1	7.8	203	200	0.35	0.62	20.2	39%
W-19	W-19	MR-3	9.23					0.0	3.03	**415**		4.00	6.7				**8.83**	8.83			7.7	9.23	13.13		3.7	18.1	254	250	0.25	0.61	31.0	58%
MR-3 (MARCH ROAD)	MR-3	MR-4	4.74					0.0	38.68	**4360**		3.30	58.3				2.06	16.75		11.81	24.8	4.74	97.64		27.3	110.4	610	600	0.10	0.69	202.4	55%
W-12	W-12	X-12	11.62			2.24	6.98	1350.0	9.22	**1350**		3.71	20.3						**2.01**	2.01	1.7	11.62	11.62		3.3	25.3	254	250	0.30	0.67	33.9	75%
X-12 (BIDGOOD / HALTON TERRACE)	X-12	MR-4	3.54				0.79	127.2	10.01	**14**		3.68	22.0								0.0	3.54	15.16		4.2	26.3	254	250	1.00	1.22	62.0	42%
X-5 (760 & 788 March Road)	X-5	MR-4	1.76				1.76	283.4	1.76	**283**		4.00	4.6								0.0	1.76	1.76		0.5	5.1						
MR-4 (MARCH ROAD)	MR-4	*MH 186*	4.71					0.0	50.45	**6120**		3.16	78.4					16.75		13.82	26.5	4.71	119.27		33.4	138.3	610	600	0.10	0.69	202.4	68%
*X-6 (750 March Road, Blue Heron Co-op Homes)**** *	*X-6*	*X-8*	*1.29*		*83*			*224.1*	*1.29*		*224*	*4.00*	*2.1*								*0.0*	*1.29*		*1.29*	*0.5*	*2.5*						
			**** 83 units obtained from Co-op website (http://www.chaseo.ca/member/blue-heron-co-op/)																													
*X-7 (Morgans Grant) ***** *	*X-7*	*X-8*	*48.45*					*3188.0*	*49.74*		*3188*	*3.42*	*25.2*								*0.0*	*48.45*		*49.74*	*17.4*	*42.6*						
			***** Information obtained from JL Richards #24566, Sanitary Design Sheet, July 2012																													
X-8 (Inverary Drive)	*X-8*	*MH 186*	*4.31*	*39*	*49*			*264.9*	*54.05*		*3677*	*3.37*	*28.6*								*0.0*	*4.31*		*54.05*	*18.9*	*47.6*						
Shirley's Brooke Drive	*MH 186*	*MH 184*	*0.00*					*0.0*	*104.50*	**6120**	*3677*	*2.96*	*98.7*					*16.75*		*13.82*	*26.5*	*0.00*	*119.27*	*54.05*	*52.3*	*177.5*	610	600	0.10	0.69	202.4	88%
X-9 (Mckinley Drive)	*X-9*	*MH 184*	*7.84*		*117*			*315.9*			*316*	*4.00*	*2.9*				*2.73*	*2.73*			*2.4*	*7.84*		*7.84*	*2.7*	*8.0*						
Shirleys Brooke Drive	*MH 184*	*MH 182*	*0.00*					*0.0*	*104.50*	**6120**	*3993*	*2.95*	*100.4*					*19.48*		*13.82*	*28.9*	*0.00*	*119.27*	*61.89*	*55.1*	*184.4*	610	600	0.10	0.69	202.4	91%
Shirleys Brooke Drive	*MH 182*	*MH 1*	*0.00*					*0.0*	*104.50*	**6120**	*3993*	*2.95*	*100.4*					*19.48*		*13.82*	*28.9*	*0.00*	*119.27*	*61.89*	*55.1*	*184.4*	610	600	0.10	0.69	202.4	91%
X-10 (Sandhill Road)		*MH 1*	*11.62*	*9*	*60*		*5.32*	*1049.1*	*11.62*		*1049*	*3.79*	*9.2*						*2.11*	*2.11*	*1.8*	*11.62*		*11.62*	*4.1*	*15.1*						
X-11		*MH 1*	*0.87*				*0.87*	*140.1*	*0.87*		*140*	*4.00*	*1.3*								*0.0*	*0.87*		*0.87*	*0.3*	*1.6*						
Briar Ridge Pump Station	*PS*	*MH 1*							72.88	**3644**	6094	2.97	85.623	0	35.08	3.1	0.00	6.76	0.00	5.25	35.6	0.00	92.96	88.15	56.9	178.1						
EAST MARCH TRUNK	*MH 1*	*EMT*	0.00					0.0	189.87	**9 64**	11276	2.63	172.7		35.08	3.1		26.24		21.18	66.3	0.00	212.23	162.53	116.3	355.3	762	750	0.10	0.80	367.1	97%

DESIGN PARAMETERS

Average Daily Flow (Future)=	350 L/cap/day	Industrial Peak Factor= per MOE graph	
Average Daily Flow (Existing)=	200 L/cap/day	Extraneous Flow (Future)=	0.28 L/s/ha
Indust/Comm/Inst Flow (Future)=	50000 L/ha/day	Extraneous Flow (Existing)=	0.35 L/s/ha (Jan 2008 monitored event)
Indust/Comm/Inst Flow (Existing)=	20000 L/ha/day	Minimum Velocity=	0.60 m/s
Max Res Peak Factor=	4.00	Manning's n=	0.013
Comm/Inst Peak Factor=	1.50		

Designed:	Alex McAuley	PROJECT: Kanata North Community Design Plan
Checked:	CJR	CLIENT: Kanata North Land Owners
Dwg. Reference:	112117-SAN1 112117-SAN2	Date: May, 2016

Notes:
1. Existing sanitary sewers tributary to, and not receiving flow from the KNUEA Trunk sewer have not been analysed for capacity
2. Existing unit counts obtained from City of Ottawa geoOttawa (2014) parcel counts, unless otherwise indicated
3. Low Density based on (16.6 Singles/net ha * 3.4pers/unit) + (16.5 Towns/net ha * 2.7pers/unit)
4. High Density based on (35.8 Towns/net ha * 2.7pers/unit) + (35.8 Apartments/net ha * 1.8pers/unit)
5. Overall unit counts for the KNCDP are based on Demonstration Plan "A-24", plus 10% to allow for flexibility in unit type distribution

Upgraded Existing Sanitary Sewers

D.2 Sanitary Sewer Flow Review

Stantec

SUBDIVISION: **Brigil Kanata North**

DATE: 1/3/2024
REVISION: 4
DESIGNED BY: WAJ
CHECKED BY: RB

FILE NUMBER: 160401347

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	280 l/p/day	MINIMUM VELOCITY	0.60 m/s
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	28,000 l/ha/day	MAXIMUM VELOCITY	3.00 m/s
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000 l/ha/day	MANNINGS n	0.013
PEAKING FACTOR (ICI >20%):	1.5	INDUSTRIAL (LIGHT)	35,000 l/ha/day	BEDDING CLASS	B
PERSONS / SINGLE	3.4	INSTITUTIONAL	28,000 l/ha/day	MINIMUM COVER	2.50 m
PERSONS / TOWNHOME	2.7	INFILTRATION	0.33 l/s/Ha	HARMON CORRECTION FACTOR	0.8
PERSONS / 1-BEDROOM APARTMENT	1.4	PERSONS / 2-BEDROOM APARTMENT	2.1	PERSONS / 3-BEDROOM APARTMENT	3.1
PERSONS / AVERAGE APARTMENT	1.8				

LOCATION			RESIDENTIAL AREA AND POPULATION												COMMERCIAL		INDUSTRIAL (L)		INDUSTRIAL (H)		INSTITUTIONAL		GREEN / UNUSED		C+I+I	INFILTRATION			TOTAL	PIPE								
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA (ha)	SINGLE	TOWN	UNITS 1-BED APT 75%	2-BED APT 20%	3-BED APT 5%	AVERAGE APT	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	FLOW (l/s)	LENGTH (m)	DIA (mm)	MATERIAL	CLASS	SLOPE (%)	CAP. (FULL) (l/s)	CAP. V PEAK FLOW (%)	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
MSS Comparison - Direct To March Road																																						
C21D, C21E, R21F			0.00	0	0	0	0	0	0	0	0.00	0	3.80	0.0	0.61	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.11	0.3	0.72	0.72	0.2	0.5									
Area 'C21D', 'C21E', and 'R21A' intended to be included in contribution to intenral sanitary sewer but left out for comparison to MSS																																						
C-EX1, C-EX2			0.00	0	0	0	0	0	0	0	0.00	0	3.80	0.0	0.45	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.2	0.45	0.45	0.1	0.4									
MSS Comparison - North Outlet to March Road																																						
EXT-1 (941 March Road)			1.77	0	64	0	0	0	64	288	1.77	288	3.47	3.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	1.77	1.77	0.6	3.8									
Area 'EXT-1' is considered as a development area to accommodate the change in the Pond 2 SWM facility location																																						
Area 'EXT-1' assigned same density parameters as area 'W11' in MSS - High Density = 35.8 towns per net ha + 35.8 apartments per net ha																																						
Area 'EXT-1' assumed to tie directly to March Road sanitary sewer but is included in the comparison of flow conditions relative to the MSS for consistency																																						
R9A (Zone E)	9	8	1.81	0	32	0	0	0	0	86	1.81	86	3.61	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	1.81	1.81	0.6	1.6	79.6	200	PVC	SDR 35	1.70	43.6	3.69%	1.37	0.54
	8	7	0.00	0	0	0	0	0	0	0	1.81	86	3.61	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	1.81	0.6	1.6	47.8	200	PVC	SDR 35	1.70	43.6	3.69%	1.37	0.54
	7	6	0.00	0	0	0	0	0	0	0	1.81	86	3.61	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	1.81	0.6	1.6	147.7	200	PVC	SDR 35	1.70	43.6	3.69%	1.37	0.54
R14A (Zone A & Zone E) G14B	14	13	4.05	19	0	368	98	25	0	862	4.05	862	3.27	9.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.39	1.39	0.0	5.44	5.44	1.8	10.9	139.7	200	PVC	SDR 35	0.40	21.1	51.75%	0.67	0.57
	13	12	0.00	0	0	0	0	0	0	0	4.05	862	3.27	9.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.39	0.0	0.00	5.44	1.8	10.9	167.3	200	PVC	SDR 35	0.40	21.1	51.75%	0.67	0.57
	12	11	0.00	0	0	0	0	0	0	0	4.05	862	3.27	9.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.39	0.0	0.00	5.44	1.8	10.9	35.7	200	PVC	SDR 35	0.50	23.6	46.28%	0.74	0.62
	11	10	0.00	0	0	0	0	0	0	0	4.05	862	3.27	9.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.39	0.0	0.00	5.44	1.8	10.9	28.0	200	PVC	SDR 35	0.50	23.6	46.28%	0.74	0.62
	10	6	0.00	0	0	0	0	0	0	0	4.05	862	3.27	9.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.39	0.0	0.00	5.44	1.8	10.9	30.8	200	PVC	SDR 35	0.70	28.0	39.12%	0.88	0.70
R6A	6	5	0.00	0	0	0	0	0	0	0	5.86	949	3.25	10.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.78	2.17	0.0	0.78	8.03	2.7	12.7	41.4	200	PVC	SDR 35	0.70	28.0	45.22%	0.88	0.73
	5	4	0.00	0	0	0	0	0	0	0	5.86	949	3.25	10.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.17	0.0	0.00	8.03	2.7	12.7	45.9	200	PVC	SDR 35	0.70	28.0	45.22%	0.88	0.73
	4	3	0.00	0	0	0	0	0	0	0	5.86	949	3.25	10.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.17	0.0	0.00	8.03	2.7	12.7	33.6	200	PVC	SDR 35	0.65	27.0	46.93%	0.85	0.71
	3	2	0.00	0	0	0	0	0	0	0	5.86	949	3.25	10.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.17	0.0	0.00	8.03	2.7	12.7	34.6	200	PVC	SDR 35	0.65	27.0	46.93%	0.85	0.71
R2A (Zone D apartments + D1&D2 commercial)	2	1	1.26	0	0	602	160	40	0	1303	7.12	2252	3.04	22.2	0.502	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.17	0.2	1.76	9.80	3.2	25.6	109.6	250	PVC	SDR 35	0.60	47.0	54.41%	0.95	0.83
																															250							
MSS Comparison - South Outlet to March Road																																						
Via Internal Sanitary Sewer																																						
R21B (Zone B), R21C (Zone C) I21A	21	20	2.60	0	0	423	113	28	0	917	2.60	917	3.26	9.7	0.00	0.00	0.00	0.00	0.00	0.00	2.02	2.02	0.00	0.00	1.0	4.62	4.62	1.5	12.2	189.7	250	PVC	SDR 35	1.00	60.6	20.10%	1.22	0.79
																															250							
Via Old Carp Road																																						
R34A	34	33	0.43	8	8	0	0	0	0	49	0.43	49	3.65	0.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.43	0.43	0.1	0.7	59.7	200	PVC	SDR 35	0.80	29.9	2.41%	0.94	0.32
R33A	33	32	1.12	0	41	0	0	0	41	185	1.55	233	3.50	2.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	1.12	1.55	0.5	3.2	161.8	200	PVC	SDR 35	0.80	29.9	10.74%	0.94	0.51
	32	31	0.00	0	0	0	0	0	0	0	1.55	233	3.50	2.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	1.55	0.5	3.2	28.1	200	PVC	SDR 35	0.50	23.6	13.59%	0.74	0.43
	31	30	0.00	0	0	0	0	0	0	0	1.55	233	3.50	2.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	1.55	0.5	3.2	39.1	200	PVC	SDR 35	0.50	23.6	13.59%	0.74	0.43
Area 'R34A' assigned same density parameters as area 'W12' in MSS - Low Density = (16.6 Singles/net ha * 3.4pers/unit) + (16.5 Towns/net ha * 2.7pers/unit)																																						
Area 'R33A' assigned same density parameters as area 'W12' in MSS - High Density = 35.8 towns per net ha + 35.8 apartments per net ha																																						
																															250							

Notes:
1. As per KNMSS, 8.7L/s were assumed from the site to the northern outlet to March Road (Areas W-10 and W-11)
2. As per KNMSS, 25.3L/s were assumed from the site to the southern outlet to March Road (Area W-12)

44.8	Total Proposed Flow
34.0	Total Flow Per MSS
18.0	Residual Capacity per MSS
7.2	Remaining Residual Capacity

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: Monday, April 24, 2023 12:57 PM
To: Marc Rivet <mrivet@jlrichards.ca>
Cc: Kilborn, Kris <kris.kilborn@stantec.com>; Paerez, Ana <Ana.Paerez@stantec.com>; Johnson, Warren <Warren.Johnson@stantec.com>; Jean-Luc Rivard <jlrivard@brigil.com>; Armstrong, Justin <justin.armstrong@ottawa.ca>; Stern, Lisa <lisa.stern@ottawa.ca>
Subject: RE: 927 March Road - Sanitary Capacity

Hi Marc,

As discussed during our meeting April 6th, Brigil was requesting an exceedance of 17.7 L/s to their allocated sanitary release rate within the Kanata North MSS. I have discussed the proposal with Asset Management and Planning staff.

Given the 18 L/s of residual capacity within the new 600mm dia. March Road sanitary sewer, Brigil's draft plan approval with increased density can go forward. That said, residual capacity is generally allocated on a first come first serve basis and cannot be "reserved" for development applications. As stated previously, there is excess capacity within the sanitary sewer beyond what is noted within the MSS sanitary design sheet so I do not foresee capacity constraints in the future. This will of course depend on the construction timing of Brigil's development. At this point, Brigil is 'next in line' for development, however if Brigil intends to phase their development during construction the City cannot guarantee that excess capacity within the sanitary sewer will be available for them XX number of years later.

To summarize, Brigil's draft plan approval can move forward assuming the requested exceedance of 17.7 L/s, assuming the draft plan moves forward in relatively short order and the excess capacity is not 'used up' by another development in the interim. The sanitary release rates will be looked at further at the detailed design stage once the construction phasing (if any) is known, while also considering other development that may have occurred in the area between now and detailed design approval.

Happy to set up a short meeting if you need further clarification on this.

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Candow, Julie
Sent: April 17, 2023 3:23 PM
To: Marc Rivet <mrivet@jlrichards.ca>

Cc: Kilborn, Kris <kris.kilborn@stantec.com>; ana.paerez@stantec.com; Johnson, Warren <Warren.Johnson@stantec.com>; Jean-Luc Rivard <jlrivard@brigil.com>; Armstrong, Justin <justin.armstrong@ottawa.ca>; Stern, Lisa <lisa.stern@ottawa.ca>
Subject: 927 March Road

Hi Marc,

I just wanted to follow up from our meeting on April 6th regarding the additional sanitary demand at 927 March Road as I know I told you I would have a response by late last week.

I am still waiting on a response from John Bougadis and he is in training Mon/Tues this week. I did confirm that there is "excess" capacity in the March Road sanitary sewer as Minto and Claridge are both below their allowance as specified with the MSS. That said, I will wait to hear from John B. to ensure that Asset Management approves of the additional release rate proposed by Brigil.

Thanks for your patience,

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

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D.3 Sanitary Sewer Design Sheet

Stantec

SUBDIVISION: **Brigil Kanata North**

DATE: 1/3/2024
REVISION: 4
DESIGN BY: WAJ
CHECKED BY: RB

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 160401347

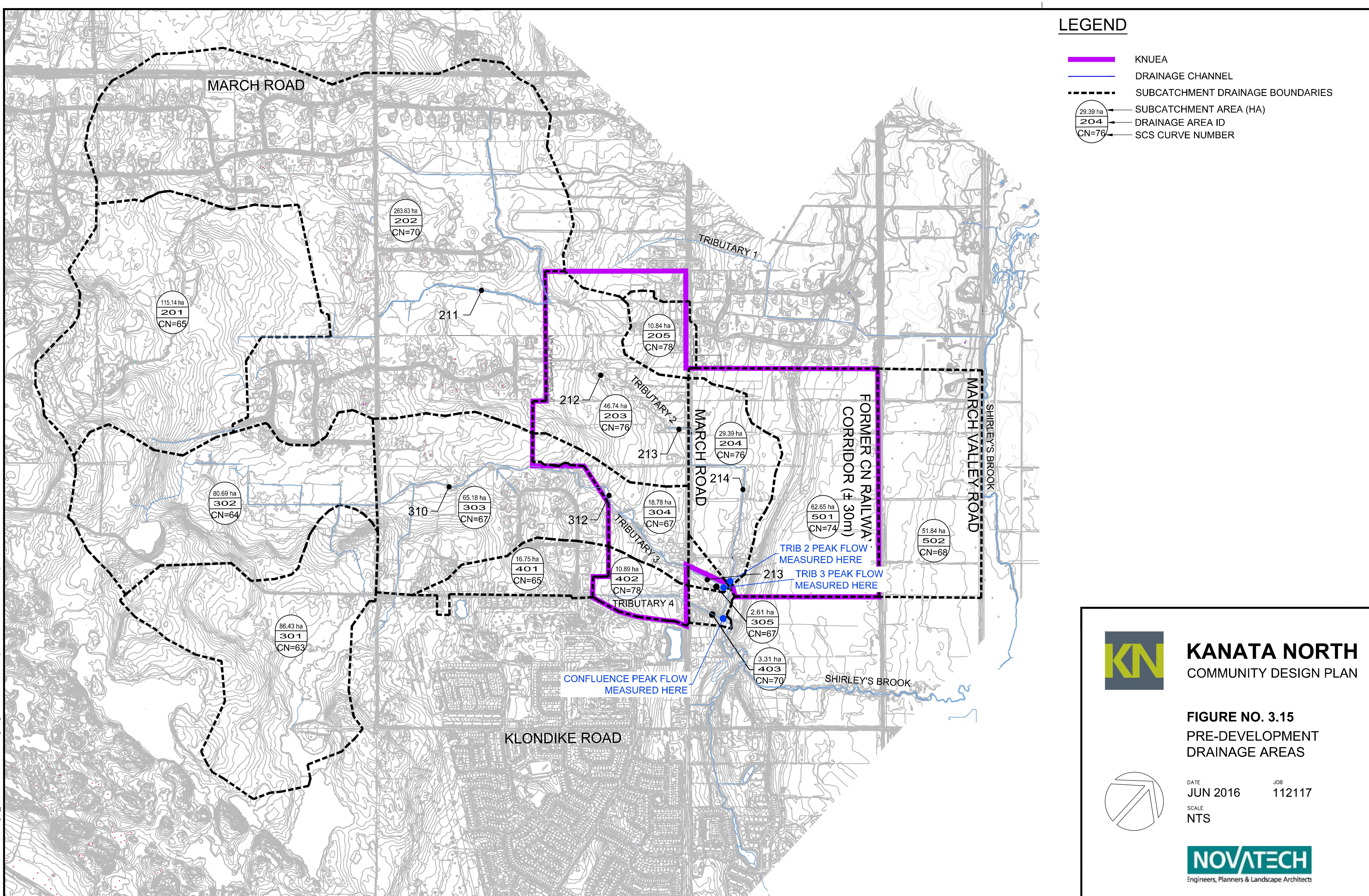
DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	280 l/p/day	MINIMUM VELOCITY	0.60 m/s
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	28,000 l/ha/day	MAXIMUM VELOCITY	3.00 m/s
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000 l/ha/day	MANNINGS n	0.013
PEAKING FACTOR (ICI >20%):	1.5	INDUSTRIAL (LIGHT)	35,000 l/ha/day	BEDDING CLASS	B
PERSONS / SINGLE	3.4	INSTITUTIONAL	28,000 l/ha/day	MINIMUM COVER	2.50 m
PERSONS / TOWNHOME	2.7	INFILTRATION	0.33 l/s/Ha	HARMON CORRECTION FACTOR	0.8
PERSONS / 1-BEDROOM APARTMENT	1.4	PERSONS / 2-BEDROOM APARTMENT	2.1	PERSONS / 3-BEDROOM APARTMENT	3.1
PERSONS / AVERAGE APARTMENT	1.8				

LOCATION			RESIDENTIAL AREA AND POPULATION												COMMERCIAL		INDUSTRIAL (L)		INDUSTRIAL (H)		INSTITUTIONAL		GREEN / UNUSED		C+I+I	INFILTRATION			TOTAL	PIPE								
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA (ha)	UNITS SINGLE	TOWN	1-BED APT 75%	2-BED APT 20%	3-BED APT 5%	AVERAGE APT	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	FLOW (l/s)	LENGTH (m)	DIA (mm)	MATERIAL	CLASS	SLOPE (%)	CAP. (FULL) (l/s)	CAP. V PEAK FLOW (%)	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
Direct To March Road																																						
EXT-1 (941 March Road)			1.77	0	64	0	0	0	64	288	1.77	288	3.47	3.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	1.77	1.77	0.6	3.8									
Area 'EXT-1' assigned same density parameters as area 'W11' in MSS - High Density = 35.8 towns per net ha + 35.8 apartments per net ha																																						
C-EX1, C-EX2			0.00	0	0	0	0	0	0	0	0.00	0	3.80	0.0	0.45	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.2	0.45	0.45	0.1	0.4									
External Areas to Old Carp Road																																						
R34A	34	33	0.43	8	8	0	0	0	0	49	0.43	49	3.65	0.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.43	0.43	0.1	0.7	59.7	200	PVC	SDR 35	0.80	29.9	**2.41%**	0.94	0.32
R33A	33	32	1.12	0	41	0	0	0	41	185	1.55	233	3.50	2.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	1.12	1.55	0.5	3.2	161.8	200	PVC	SDR 35	0.80	29.9	**10.56%**	0.94	0.50
	32	31	0.00	0	0	0	0	0	0	0	1.55	233	3.50	2.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	1.55	0.5	3.2	28.1	200	PVC	SDR 35	0.50	23.6	**13.35%**	0.74	0.43
	31	30	0.00	0	0	0	0	0	0	0	1.55	233	3.50	2.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	1.55	0.5	3.2	39.1	200	PVC	SDR 35	0.50	23.6	**13.35%**	0.74	0.43
Area 'R34A' assigned same density parameters as area 'W12' in MSS - Low Density = (16.6 Singles/net ha * 3.4pers/unit) + (16.5 Towns/net ha * 2.7pers/unit)																																						
Area 'R33A' assigned same density parameters as area 'W12' in MSS - High Density = 35.8 towns per net ha + 35.8 apartments per net ha																																						
																															250							
Southern Outlet to March Road																																						
I21A, R21B (Zone B), R21C (Zone C), C21D, C21E, R21F	21	20	2.60	0	0	423	113	28	0	917	2.60	917	3.26	9.7	0.61	0.61	0.00	0.00	0.00	0.00	2.02	2.02	0.11	0.11	1.3	5.34	5.34	1.8	12.7	189.7	250	PVC	SDR 35	1.00	60.6	**20.98%**	1.22	0.80
																															250							
Northern Outlet to March Road																																						
R9A (Zone E)	9	8	1.81	0	32	0	0	0	0	86	1.81	86	3.61	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	1.81	1.81	0.6	1.6	79.6	200	PVC	SDR 35	1.70	43.6	**3.69%**	1.37	0.54
	8	7	0.00	0	0	0	0	0	0	0	1.81	86	3.61	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	1.81	0.6	1.6	47.8	200	PVC	SDR 35	1.70	43.6	**3.69%**	1.37	0.54
	7	6	0.00	0	0	0	0	0	0	0	1.81	86	3.61	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	1.81	0.6	1.6	147.7	200	PVC	SDR 35	1.70	43.6	**3.69%**	1.37	0.54
R14A (Zone A & Zone E) G14B	14	13	4.05	19	0	368	98	25	0	862	4.05	862	3.27	9.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.39	1.39	0.0	5.44	5.44	1.8	10.9	139.7	200	PVC	SDR 35	0.40	21.1	**51.75%**	0.67	0.57
	13	12	0.00	0	0	0	0	0	0	0	4.05	862	3.27	9.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.39	0.0	0.00	5.44	1.8	10.9	167.3	200	PVC	SDR 35	0.40	21.1	**51.75%**	0.67	0.57
	12	11	0.00	0	0	0	0	0	0	0	4.05	862	3.27	9.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.39	0.0	0.00	5.44	1.8	10.9	35.7	200	PVC	SDR 35	0.50	23.6	**46.28%**	0.74	0.62
	11	10	0.00	0	0	0	0	0	0	0	4.05	862	3.27	9.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.39	0.0	0.00	5.44	1.8	10.9	28.0	200	PVC	SDR 35	0.50	23.6	**46.28%**	0.74	0.62
	10	6	0.00	0	0	0	0	0	0	0	4.05	862	3.27	9.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.39	0.0	0.00	5.44	1.8	10.9	30.8	200	PVC	SDR 35	0.70	28.0	**39.12%**	0.88	0.70
R6A	6	5	0.00	0	0	0	0	0	0	0	5.86	949	3.25	10.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.78	2.17	0.0	0.78	8.03	2.7	12.7	41.4	200	PVC	SDR 35	0.70	28.0	**45.22%**	0.88	0.73
	5	4	0.00	0	0	0	0	0	0	0	5.86	949	3.25	10.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.17	0.0	0.00	8.03	2.7	12.7	45.9	200	PVC	SDR 35	0.70	28.0	**45.22%**	0.88	0.73
	4	3	0.00	0	0	0	0	0	0	0	5.86	949	3.25	10.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.17	0.0	0.00	8.03	2.7	12.7	33.6	200	PVC	SDR 35	0.65	27.0	**46.93%**	0.85	0.71
	3	2	0.00	0	0	0	0	0	0	0	5.86	949	3.25	10.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.17	0.0	0.00	8.03	2.7	12.7	34.6	200	PVC	SDR 35	0.65	27.0	**46.93%**	0.85	0.71
R2A (Zone D apartments + D1&D2 commercial)	2	1	1.26	0	0	602	160	40	0	1303	7.12	2252	3.04	22.2	0.502	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.17	0.2	1.76	9.80	3.2	25.6	109.6	250	PVC	SDR 35	0.60	47.0	**54.41%**	0.95	0.83
																															250							

Appendix E Storm

E.1 EMP, MSS, and Copperwood Estate Data



KANATA NORTH
COMMUNITY DESIGN PLAN

FIGURE NO. 3.15
PRE-DEVELOPMENT DRAINAGE AREAS

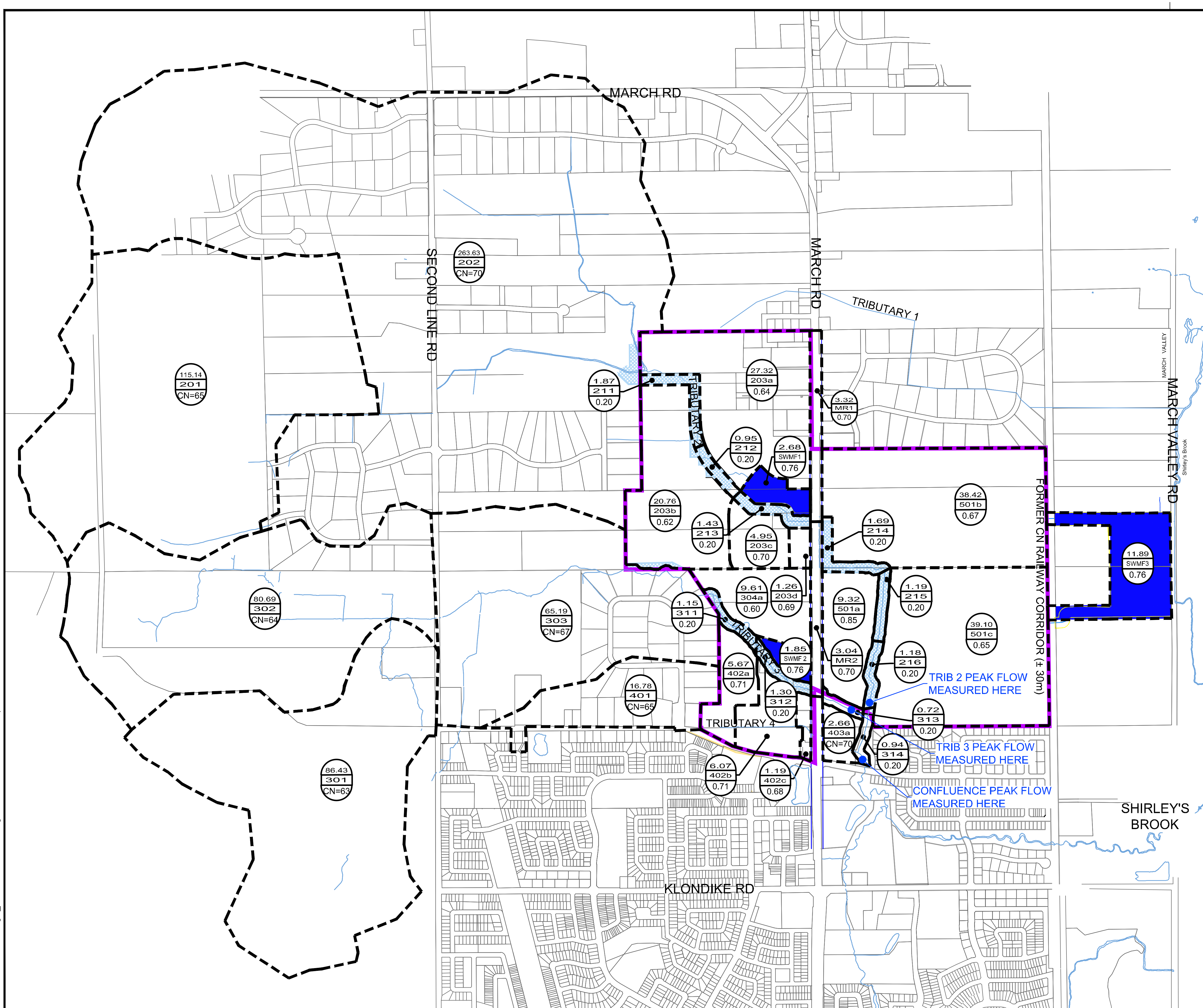
DATE
JUN 2016

JOB
112117

SCALE
NTS

NOVATECH
Engineers, Planners & Landscape Architects

M:\2012\112117\CAD\Design_EMP\112117-SWM.dwg, Figure 3.15 PreDevelopment, Jun 23, 2016 - 5:07pm, kbanks



LEGEND

- KNUEA
- DRAINAGE CHANNEL
- SUBCATCHMENT DRAINAGE AREA BOUNDARIES
- CREEK CORRIDOR
- PROPOSED SWMF BLOCK

2.68 — SUBCATCHMENT AREA (ha)
SWMF1 — SUBCATCHMENT NAME
0.76 — RUNOFF COEFFICIENT (c)

KANATA NORTH
COMMUNITY DESIGN PLAN

FIGURE NO. 7.1
POST-DEVELOPMENT DRAINAGE AREA PLAN

DATE JUN 2016 JOB 112117
SCALE NTS

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M:\2012\112117\CAD\Design_EMP\112117-POST.dwg, FIG-7.1, Jun 23, 2016 - 5:06pm, kbanks

SHT11x17.DWG - 279mmx432mm

Kanata North Community Design Plan
Pre-Development SWMHYMO Model Parameters

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Time to Peak Calculations Tc=0.605*(L/((S^0.2)(A^0.1)))
(Bransby-Williams Method)

Drainage Area ID	Area (m2)	Area (ha)	Area (km2)	Length of Channel (m)	Length of Channel (km)	Slope of Channel (m/m)	Tc (hours)
201	1,151,423	115.14	1.151	749	0.75	0.020	3.42
202	2,636,363	263.64	2.636	1065	1.07	0.010	5.14
203	467,369	46.74	0.467	1025	1.03	0.010	2.52
204	293,893	29.39	0.294	552	0.55	0.010	1.42
205	108,387	10.84	0.108	322	0.32	0.020	0.80
301	864,268	86.43	0.864	1047	1.05	0.017	1.24
302	806,913	80.69	0.807	1470	1.47	0.015	1.80
303	651,627	65.16	0.652	971	0.97	0.010	1.31
304	187,795	18.78	0.188	580	0.58	0.010	1.04
305	26,094	2.61	0.026	100	0.10	0.010	0.22
401	167,797	16.78	0.168	941	0.94	0.012	1.66
402	108,910	10.89	0.109	450	0.45	0.010	0.85
403	33,135	3.31	0.033	150	0.15	0.027	0.26
501	626,486	62.65	0.626	450	0.45	0.023	0.60
502	518,434	51.84	0.518	458	0.46	0.010	0.75

SCS Curve Numbers (AMC II, HSG 'B/C')

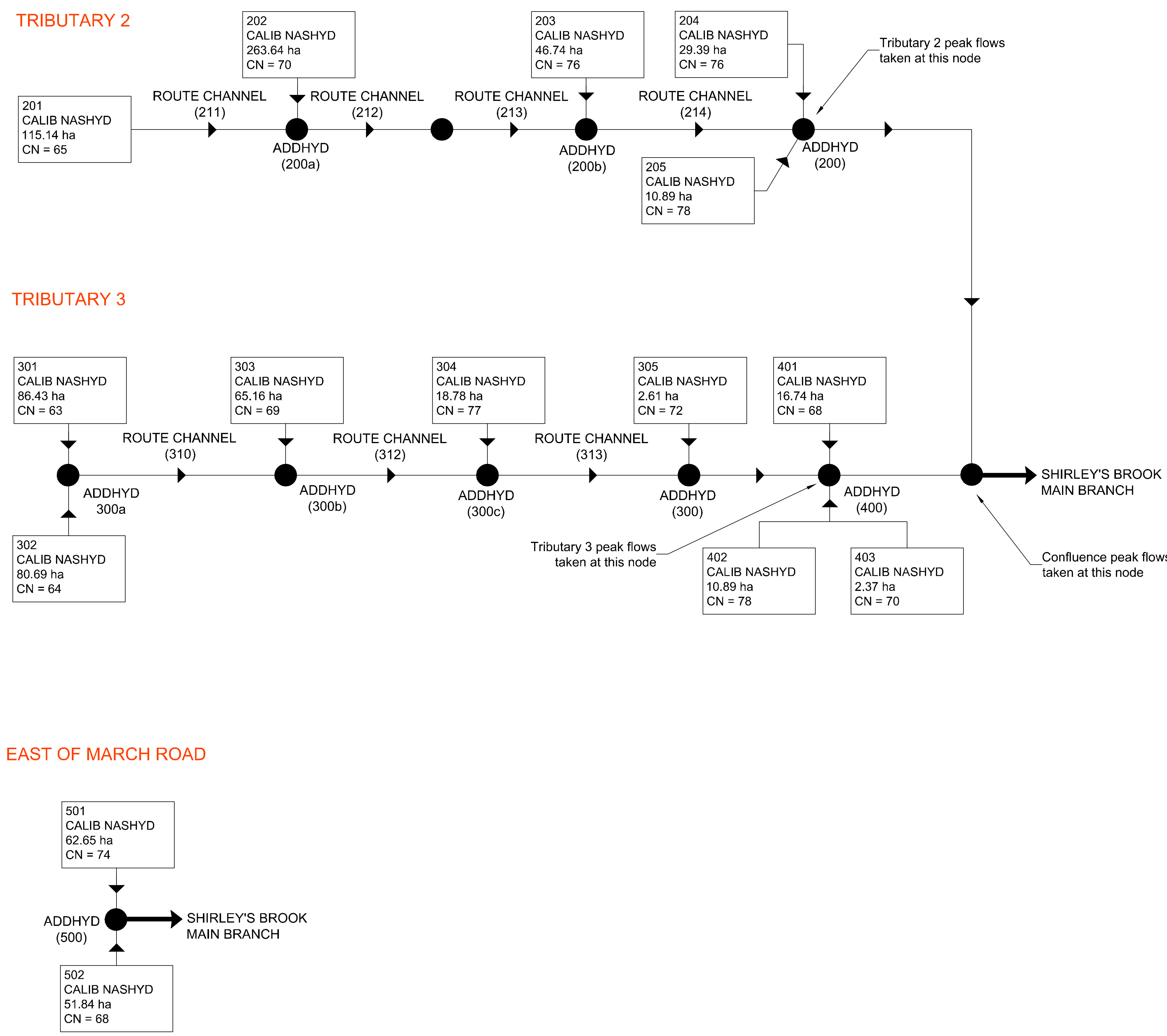
Area ID	Land Use 1	Area	CN	IA (mm)	Land Use 2	Area	CN	IA (mm)	Land Use 3	Area	CN	IA (mm)	Weighted CN	Weighted IA (mm)
201	Woods (good)	65%	63	12.5	Woods (fair)	25%	67	10.0	Open Space (good)	10%	68	8.0	65	11.4
202	Woods (good)	20%	63	12.5	Estate Residential	35%	70	4.0	50% pasture & 50% Row Crops (good)	45%	73	8.5	70	7.7
203	Cultivated Row Crops (Straight/Contour) (good)	70%	80	7.0	Pasture (good)	20%	65	9.0	Open Space (good)	10%	68	9.0	76	7.6
204	Cultivated Row Crops (Straight/Contour) (good)	70%	80	7.0	Pasture (good)	20%	65	9.0	Open Space (good)	10%	68	9.0	76	7.6
205	Industrial Districts (School/ Church area)	50%	88	4.0	Open Space (good)	50%	68	8.0	-	-	-	-	78	6.0
301	Woods (good)	95%	63	12.5	Open Space (good)	5%	68	8.0	-	-	-	-	63	
302	Woods (good)	60%	63	12.5	Estate Residential	5%	70	4.0	Pasture (good)	35%	65	9.0	64	10.9
303	Woods (good)	37%	63	12.5	Estate Residential	25%	70	4.0	50% pasture & 50% Row Crops (good)	38%	73	8.5	69	8.9
304	Cultivated Row Crops (Straight/Contour) (good)	78%	80	7.0	Estate Residential	5%	70	4.0	Open Space (good)	17%	68	8.0	77	7.0
305	Estate/ Rural Residential	45%	70	4.0	Open Space (fair)	50%	74	6.5	Woods (fair)	5%	67	10.0	72	5.6
401	Woods (good)	22%	63	12.5	Estate Residential	50%	70	4.0	Open Space (good)	28%	68	8.0	68	7.0
402	Cultivated Row Crops (Straight/Contour) (good)	85%	80	7.0	Estate Residential	10%	70	4.0	Open Space (good)	5%	68	8.0	78	6.8
403	Estate/ Rural Residential	90%	70	4.0	Open Space (fair)	10%	74	6.5	-	-	-	-	70	4.3
501	Woods (good)	20%	63	12.5	Pasture (good)	20%	65	9.0	Cultivated Row Crops (Straight/Contour) (good)	60%	80	7.0	74	8.5
502	Woods (good)	30%	63	12.5	Pasture (good)	45%	65	9.0	Cultivated Row Crops (Straight/Contour) (good)	25%	80	7.0	68	9.6

SCS Curve Numbers and Initial Abstration Values

Landuse	Condition	CN (HSG 'B')	CN (HSG 'C')	AVG. CN (HSG 'B/C')	IA (mm)
Woods	Poor	66	77	72	7.0
	Fair	60	73	67	10.0
	Good	55	70	63	12.5
Estate Residential (2 acre avg. lot size)	12% Impervious	65	77	71	4.0
Open Space (lawns, parks, etc.)	Grass Cover < 50% (Poor)	79	86	83	5.0
	Grass Cover 50% to 75% (Fair)	69	79	74	6.5
	Grass Cover > 75% (Good)	61	74	68	8.0
Agriculture (pasture, grassland or range)	Poor	67	77	72	5.0
	Fair	69	79	74	7.0
	Good	58	72	65	9.0
Agriculture (Cultivated Row Crops - Straight)	Poor	81	88	85	5.0
	Good	78	85	82	7.0
Agriculture (Cultivated Row Crops - Contoured)	Poor	79	84	82	5.0
	Good	75	82	79	7.0
Agriculture (Cultivated Row Crops - Avg. Straight / Contoured)	Poor	80	86	83	5.0
	Good	77	84	80	7.0

Initial Abstraction

Cover Type	IA (mm)	Min IA (mm)	Max IA (mm)
Open Water	0	0	0
Road (Asphalt/Concrete)	2.5	1.25	3.75
Gravel/Fill/Quarry	5	-	-
Estate Lot Residential	4	2.5	4
Open/Grass/Natural	8	5	12.5
Field/Crop (Cultivated)	8	5	12.5
Wood/Brush	10	5	15.2



KN

KANATA NORTH

COMMUNITY DESIGN PLAN

FIGURE NO. SWMHYMO-PRE

SWMHYMO PRE-DEVELOPMENT
SCHEMATIC

DATE
MAY 2016

JOB
112117

SCALE
NTS

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SHT11x17.DWG - 279mmx432mm

```
2     Metric units
*#*******************************************************************************
*#  Project Name: [Kanata North]    Project Number: [112117]
*#  Date        : 16-09-2015
*#  Modeller    : [Kallie Auld]
*#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
*#  License #   :  5320763
*#*******************************************************************************
*This model has been developed to match the peak flows of the Shirley's Brook
*Subwatershed Study from the City of Ottawa.
*Time to peak values have been altered to mimic flows.
*Shirleys Brook - Pre-Development Model
*Model parameters based on original AECOM model
*Model parameters are provided in Volume 2, Appendix D of the KNCDP EMP
*#*******************************************************************************
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[1]
                    C25mm-4.stm
*%-----------------|-----------------------------------------------------------|
READ STORM          STORM_FILENAME=["STORM.001"]
*%=================|===========================================================|
*************************PEAK FLOW FOR TRIBUTARY 2*****************************|
*%=================|===========================================================|
CALIB NASHYD        ID=[1], NHYD=["201"], DT=[5]min, AREA=[115.14](ha),
                    DWF=[0](cms), CN/C=[65], IA=[11.4](mm),
                    N=[1.1], TP=[3.42]hrs,
                    END=-1
*%-----------------|-----------------------------------------------------------|
ROUTE CHANNEL       IDout=[2], NHYD=["211"], IDin=[1],
                    RDT=[5](min),
                    CHLGTH=[557.6](m),  CHSLOPE=[0.89](%),
                                        FPSLOPE=[0.89](%),
                    SECNUM=[2096],       NSEG=[3]
                    ( SEGROUGH, SEGDIST (m))=[0.35,30.79 -0.040,51.78 0.35,96.66] NSEG times
                    ( DISTANCE (m), ELEVATION (m))=[   0    , 87.99 ]
                                                   [        11.43     , 86.90 ]
                                                   [        30.79     , 86.74 ]
                                                   [        34.09     , 86.37 ]
                                                   [        35.26     , 86.12 ]
                                                   [        39.56     , 86.12 ]
                                                   [        45.35     , 86.52 ]
                                                   [        51.78     , 86.75 ]
                                                   [        63.33     , 86.96 ]
                                                   [        65.76     , 86.99 ]
                                                   [        76.04     , 87.55 ]
                                                   [        96.66     , 87.99 ]
*%-----------------|-----------------------------------------------------------|
CALIB NASHYD        ID=[3], NHYD=["202"], DT=[5]min, AREA=[263.64](ha),
                    DWF=[0](cms), CN/C=[70], IA=[7.7](mm),
                    N=[1.1], TP=[5.14]hrs,
                    END=-1
*%-----------------|-----------------------------------------------------------|
ADD HYD             IDsum=[1], NHYD=["200a"], IDs to add=[2,3]
*%-----------------|-----------------------------------------------------------|
ROUTE CHANNEL       IDout=[2], NHYD=["212"], IDin=[1],
                    RDT=[5](min),
                    CHLGTH=[255.4](m),  CHSLOPE=[0.88](%),
                                        FPSLOPE=[0.88](%),
                    SECNUM=[1538],       NSEG=[3]
                    ( SEGROUGH, SEGDIST (m))=[0.35,17.84 -0.035,25.92 0.35,65.1] NSEG times
                    ( DISTANCE (m), ELEVATION (m))=[   0    ,  82.05 ]
                                                   [        11.78     , 81.45 ]
                                                   [        15.00   , 81.32 ]
                                                   [        17.21     , 80.82 ]
                                                   [        17.84     , 80.58 ]
                                                   [        19.57     , 79.94 ]
                                                   [        20.79     , 80.14 ]
                                                   [        22.02     , 80.27 ]
                                                   [        25.92     , 80.55 ]
                                                   [        39.31     , 80.79 ]
                                                   [        43.55     , 80.84 ]
                                                   [        48.04     , 80.82 ]
                                                   [        50.86     , 80.85 ]
                                                   [        65.10     , 81.47 ]
*%-----------------|-----------------------------------------------------------|
ROUTE CHANNEL       IDout=[1], NHYD=["213"], IDin=[2],
                    RDT=[5](min),
                    CHLGTH=[437.0](m),  CHSLOPE=[0.5](%),
                                        FPSLOPE=[0.5](%),
                    SECNUM=[1283],       NSEG=[3]
                    ( SEGROUGH, SEGDIST (m))=[0.35,36.15 -0.035,50.18 0.35,75.27] NSEG times
                    ( DISTANCE (m), ELEVATION (m))=[   0    , 78.59 ]
                                                   [        10.33     , 78.65 ]
                                                   [        29.43     , 78.60 ]
                                                   [        36.15     , 78.43 ]
                                                   [        37.26     , 78.27 ]
                                                   [        41.19     , 78.00 ]
                                                   [        45.62     , 78.00 ]
                                                   [        50.18     , 78.42 ]
                                                   [        51.67     , 78.43 ]
                                                   [        60.03     , 78.37 ]
                                                   [        60.89     , 78.34 ]
                                                   [        75.27     , 78.42 ]
*%-----------------|-----------------------------------------------------------|
CALIB NASHYD        ID=[2], NHYD=["203"], DT=[5]min, AREA=[46.74](ha),
                    DWF=[0](cms), CN/C=[76], IA=[7.6](mm),
                    N=[1.1], TP=[2.52]hrs,
                    END=-1
*%-----------------|-----------------------------------------------------------|
ADD HYD             IDsum=[3], NHYD=["200b"], IDs to add=[1,2]
*%-----------------|-----------------------------------------------------------|
ROUTE CHANNEL       IDout=[1], NHYD=["214"], IDin=[3],
                    RDT=[5](min),
                    CHLGTH=[542.6](m),  CHSLOPE=[0.52](%),
                                        FPSLOPE=[0.52](%),
                    SECNUM=[0808],       NSEG=[3]
                    ( SEGROUGH, SEGDIST (m))=[0.35,19.56 -0.035,32.26 0.35,49.77] NSEG times
                    ( DISTANCE (m), ELEVATION (m))=[   0    , 77.40 ]
                                                   [         9.26     , 77.00 ]
                                                   [        12.15     , 77.00 ]
                                                   [        13.67     , 76.75 ]
                                                   [        19.56     , 76.75 ]
                                                   [        22.86     , 76.51 ]
                                                   [        26.14     , 76.00 ]
                                                   [        29.07     , 76.00 ]
                                                   [        32.26     , 76.75 ]
                                                   [        33.60     , 76.98 ]
                                                   [        44.31     , 77.50 ]
                                                   [        49.77     , 77.74 ]
*%-----------------|-----------------------------------------------------------|
CALIB NASHYD        ID=[2], NHYD=["204"], DT=[5]min, AREA=[29.39](ha),
                    DWF=[0](cms), CN/C=[76], IA=[7.6](mm),
                    N=[1.1], TP=[1.42]hrs,
                    END=-1
*%-----------------|-----------------------------------------------------------|
CALIB NASHYD        ID=[3], NHYD=["205"], DT=[5]min, AREA=[10.89](ha),
                    DWF=[0](cms),  CN/C=[78], IA=[6](mm),
                    N=[3.0], TP=[0.80]hrs,
                    END=-1
*%-----------------|-----------------------------------------------------------|
ADD HYD             IDsum=[10], NHYD=["200"], IDs to add=[1,2,3]
*%-----------------|-----------------------------------------------------------|
*PRINT HYD           ID=[10],   # OF PCYCLES=[1]
*%-----------------|-----------------------------------------------------------|
*%=================|===========================================================|
*************************PEAK FLOW FOR TRIBUTARY 3*****************************|
*%=================|===========================================================|
CALIB NASHYD        ID=[1], NHYD=["301"], DT=[5]min, AREA=[86.43](ha),
                    DWF=[0](cms), CN/C=[63], IA=[12.3](mm),
                    N=[1.1], TP=[1.24]hrs,
                    END=-1
*%-----------------|-----------------------------------------------------------|
CALIB NASHYD        ID=[2], NHYD=["302"], DT=[5]min, AREA=[80.69](ha),
```

```
                    DWF=[0](cms), CN/C=[64], IA=[10.9](mm),
                    N=[1.1], TP=[1.80]hrs,
                    END=-1
*%-----------------|------------------------------------------------------------|
ADD HYD             IDsum=[3], NHYD=["300a"], IDs to add=[1,2]
*%-----------------|------------------------------------------------------------|
ROUTE CHANNEL       IDout=[1], NHYD=["310"], IDin=[3],
                    RDT=[5](min),
                    CHLGTH=[448.8](m),  CHSLOPE=[1.62](%),
                                        FPSLOPE=[1.62](%),
                    SECNUM=[4122],       NSEG=[3]
                    ( SEGROUGH, SEGDIST (m))=[0.35,36.85 -0.04,57.43 0.35,98.10] NSEG times
                    ( DISTANCE (m), ELEVATION (m))=[   0    , 85.97 ]
                                                   [        29.14     , 86.03 ]
                                                   [        35.73     , 85.88 ]
                                                   [        36.85     , 85.69 ]
                                                   [        39.63     , 85.47 ]
                                                   [        43.19     , 85.31 ]
                                                   [        47.24     , 84.78 ]
                                                   [        50.54     , 84.78 ]
                                                   [        54.28     , 84.94 ]
                                                   [        57.43     , 85.70 ]
                                                   [        65.07     , 85.80 ]
                                                   [        67.25     , 85.80 ]
                                                   [        70.81     , 85.80 ]
                                                   [        98.10     , 86.10 ]
*%-----------------|------------------------------------------------------------|
CALIB NASHYD        ID=[2], NHYD=["303"], DT=[5]min, AREA=[65.16](ha),
                    DWF=[0](cms), CN/C=[69], IA=[8.9](mm),
                    N=[1.1], TP=[1.31]hrs,
                    END=-1
*%-----------------|------------------------------------------------------------|
ADD HYD             IDsum=[3], NHYD=["300b"], IDs to add=[1,2]
*%-----------------|------------------------------------------------------------|
ROUTE CHANNEL       IDout=[1], NHYD=["312"], IDin=[3],
                    RDT=[5](min),
                    CHLGTH=[423.0](m),  CHSLOPE=[1.17](%),
                                        FPSLOPE=[1.17](%),
                    SECNUM=[3673],       NSEG=[3]
                    ( SEGROUGH, SEGDIST (m))=[0.35,43.21 -0.035,60.18 0.35,88.46] NSEG times
                    ( DISTANCE (m), ELEVATION (m))=[   0    , 81.92 ]
                                                   [        24.54     , 81.13 ]
                                                   [        30.36     , 81.05 ]
                                                   [        43.21     , 80.25 ]
                                                   [        50.74     , 79.70 ]
                                                   [        56.30     , 79.70 ]
                                                   [        60.18     , 80.25 ]
                                                   [        73.61     , 80.39 ]
                                                   [        88.46     , 80.79 ]
*%-----------------|------------------------------------------------------------|
CALIB NASHYD        ID=[2], NHYD=["304"], DT=[5]min, AREA=[18.78](ha),
                    DWF=[0](cms), CN/C=[77], IA=[7.0](mm),
                    N=[1.1], TP=[1.04]hrs,
                    END=-1
*%-----------------|------------------------------------------------------------|
ADD HYD             IDsum=[3], NHYD=["300c"], IDs to add=[1,2]
*%-----------------|------------------------------------------------------------|
ROUTE CHANNEL       IDout=[1], NHYD=["313"], IDin=[3],
                    RDT=[5](min),
                    CHLGTH=[219.4](m),  CHSLOPE=[1.28](%),
                                        FPSLOPE=[1.28](%),
                    SECNUM=[3250],       NSEG=[3]
                    ( SEGROUGH, SEGDIST (m))=[0.35,20.91 -0.035,30.21 0.35,49.15] NSEG times
                    ( DISTANCE (m), ELEVATION (m))=[   0    , 77.74 ]
                                                   [         9.02     , 77.11 ]
                                                   [        20.91     , 76.04 ]
                                                   [        24.36     , 75.70 ]
                                                   [        24.7      , 75.59 ]
                                                   [        26.13     , 75.58 ]
                                                   [        26.44     , 75.76 ]
                                                   [        30.21     , 76.02 ]
                                                   [        34.47     , 76.58 ]
                                                   [        35.79     , 76.66 ]
                                                   [        40.79     , 76.69 ]
                                                   [        45.14     , 76.99 ]
                                                   [        46.86     , 77.73 ]
                                                   [        49.15     , 78.01 ]
*%-----------------|------------------------------------------------------------|
CALIB NASHYD        ID=[2], NHYD=["305"], DT=[5]min, AREA=[2.61](ha),
                    DWF=[0](cms), CN/C=[72], IA=[5.6](mm),
                    N=[1.1], TP=[0.22]hrs,
                    END=-1
*%-----------------|------------------------------------------------------------|
ADD HYD             IDsum=[9], NHYD=["300"], IDs to add=[1,2]
*%-----------------|------------------------------------------------------------|
CALIB NASHYD        ID=[1], NHYD=["401"], DT=[5]min, AREA=[16.78](ha),
                    DWF=[0](cms), CN/C=[68], IA=[7.0](mm),
                    N=[1.1], TP=[1.66]hrs,
                    END=-1
*%-----------------|------------------------------------------------------------|
CALIB NASHYD        ID=[2], NHYD=["402"], DT=[5]min, AREA=[10.89](ha),
                    DWF=[0](cms), CN/C=[78], IA=[6.8](mm),
                    N=[1.1], TP=[0.85]hrs,
                    END=-1
*%-----------------|------------------------------------------------------------|
CALIB NASHYD        ID=[3], NHYD=["403"], DT=[5]min, AREA=[2.37](ha),
                    DWF=[0](cms), CN/C=[70], IA=[4.3](mm),
                    N=[1.1], TP=[0.27]hrs,
                    END=-1
*%-----------------|------------------------------------------------------------|
ADD HYD             IDsum=[8], NHYD=["400"], IDs to add=[1,2,3]
*%-----------------|------------------------------------------------------------|
********************************************************************************
**********************TRIBUTARY 3 PEAK FLOWS*************************************
********************************************************************************
ADD HYD             IDsum=[1], NHYD=["TRIB3"], IDs to add=[8,9]
*%-----------------|------------------------------------------------------------|
*PRINT HYD           ID=[1],    # OF PCYCLES=[1]
*%-----------------|------------------------------------------------------------|
*===============================================================================|
***************************PEAK FLOW AT CONFLUENCE******************************|
*===============================================================================|
ADD HYD             IDsum=[7], NHYD=["CONFL"], IDs to add=[10,1]
*%-----------------|------------------------------------------------------------|
*PRINT HYD           ID=[7],    # OF PCYCLES=[1]
*%-----------------|------------------------------------------------------------|
*%=================|============================================================|
**********************PEAK FLOW FROM EAST SIDE OF MARCH ROAD*******************|
*%=================|============================================================|
CALIB NASHYD        ID=[1], NHYD=["501"], DT=[5]min, AREA=[62.65](ha),
                   DWF=[0](cms), CN/C=[74], IA=[8.5](mm),
                   N=[1.1], TP=[0.60]hrs,
                   END=-1
*%-----------------|------------------------------------------------------------|
CALIB NASHYD        ID=[2], NHYD=["502"], DT=[5]min, AREA=[51.84](ha),
                    DWF=[0](cms), CN/C=[68], IA=[9.6](mm),
                    N=[1.1], TP=[0.75]hrs,
                    END=-1
*%-----------------|------------------------------------------------------------|
ADD HYD             IDsum=[6], NHYD=["500"], IDs to add=[1,2]
*%-----------------|------------------------------------------------------------|
*PRINT HYD           ID=[6],    # OF PCYCLES=[1]
*%-----------------|------------------------------------------------------------|
*===============================================================================|
*************************TOTAL PEAK FLOW FOR KNUEA*****************************|
*===============================================================================|
ADD HYD             IDsum=[5], NHYD=["TOTAL"], IDs to add=[7,6]
*%-----------------|------------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[2]
                    C2-4.stm
*%-----------------|------------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[3]
```

```
                    C5-4.stm
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[4]
                    C100-4.stm
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[5]
                    S12-25mm.stm
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[6]
                    S2-12.stm
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[7]
                    S5-12.stm
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[8]
                    S100-12.stm
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[9]
                    S24-25mm.stm
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[10]
                    S2-24.stm
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[11]
                    S5-24.stm
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[12]
                    S100-24.stm
*%-----------------|-------------------------------------------------------------|
FINISH
```

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

   SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
   S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
   SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
       S   W W   M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
   SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9   =========
                                                        9   9  9   9   # 5320763
        StormWater Management HYdrologic Model           999    999    =========

  *******************************************************************************
  ***************************** SWMHYMO Ver/4.05  *****************************
  *********  A single event and continuous hydrologic simulation model  *********
  *********     based on the principles of HYMO and its successors      *********
  *********                 OTTHYMO-83 and OTTHYMO-89.                  *********
  *******************************************************************************
  ********* Distributed by:  J.F. Sabourin and Associates Inc.          *********
  *********                 Ottawa,  Ontario: (613) 836-3884           *********
  *********                 Gatineau, Quebec: (819) 243-6858           *********
  *********                 E-Mail: swmhymo@jfsa.Com                   *********
  *******************************************************************************

  +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
  +++++++++ Licensed user: NOVATECH ENGINEERING CONSULTANTS LTD        +++++++++
  +++++++++                Nepean                SERIAL#:5320763        +++++++++
  +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

  *******************************************************************************
  *********           ++++++ PROGRAM ARRAY DIMENSIONS ++++++             *********
  *********           Maximum value for ID numbers  :     10             *********
  *********           Max. number of rainfall points: 105408             *********
  *********           Max. number of flow points    : 105408             *********
  *******************************************************************************

  ***** DESCRIPTION SUMMARY TABLE HEADERS (units depend on METOUT in START) *****
  *****-----------------------------------------------------------------------*****
  *****    ID:  Hydrograph IDentification numbers, (1-10).               *****
  *****  NHYD:  Hydrograph reference numbers, (6 digits or characters).  *****
  *****  AREA:  Drainage area associated with hydrograph, (ac.) or (ha.).  *****
  ***** QPEAK:  Peak flow of simulated hydrograph, (ft^3/s) or (m^3/s).  *****
  ***** TpeakDate_hh:mm is the date and time of the peak flow.           *****
  *****  R.V.:  Runoff Volume of simulated hydrograph, (in) or (mm).     *****
  *****  R.C.:  Runoff Coefficient of simulated hydrograph, (ratio).     *****
  *****     *:  see WARNING or NOTE message printed at end of run.       *****
  *****    **:  see  ERROR  message printed at end of run.               *****
  *******************************************************************************
  *******************************************************************************

:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::

  *******************************************************************************

  **********************   S U M M A R Y   O U T P U T   **********************
  *******************************************************************************
  *         DATE: 2016-05-20     TIME: 09:51:05     RUN COUNTER: 000056         *
  *******************************************************************************
  * Input   filename: M:\2012\112117\data\CALCUL~1\swmhymo\EXISTI~1\kn-pre.dat  *
  * Output  filename: M:\2012\112117\data\CALCUL~1\swmhymo\EXISTI~1\kn-pre.out  *
  * Summary filename: M:\2012\112117\data\CALCUL~1\swmhymo\EXISTI~1\kn-pre.sum  *
  * User comments:                                                              *
  * 1:__________________________________________________________________________*
  * 2:__________________________________________________________________________*
  * 3:__________________________________________________________________________*
  *******************************************************************************


#******************************************************************************
#  Project Name: [Kanata North]    Project Number: [112117]
#  Date        : 16-09-2015
#  Modeller    : [Kallie Auld]
#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
```

```
#  License #   :  5320763
#******************************************************************************
#******************************************************************************
 RUN:COMMAND#
 001:0001----------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   1 ]
 001:0002----------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=10.00:SDUR=   4.00:PTOT=  25.00]
 001:0003--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:201          115.14     .009 No_date    5:55    1.23 .049
      [CN= 65.0: N= 1.10]
      [Tp= 3.42:DT= 5.00]
 001:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:201          115.14     .009 No_date    5:55    1.23  n/a
      [RDT= 5.00] out<- 02:211          115.14     .009 No_date    6:20    1.23  n/a
      [L/S/n=  558./ .890/.040]
      {Vmax=  .423:Dmax=  .004}
 001:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:202          263.64     .027 No_date    7:25    2.37 .095
      [CN= 70.0: N= 1.10]
      [Tp= 5.14:DT= 5.00]
 001:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:211          115.14     .009 No_date    6:20    1.23  n/a
                      + 03:202          263.64     .027 No_date    7:25    2.37  n/a
      [DT= 5.00]  SUM=  01:200a         378.78     .036 No_date    7:00    2.02  n/a
 001:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:200a         378.78     .036 No_date    7:00    2.02  n/a
      [RDT= 5.00] out<- 02:212          378.78     .036 No_date    7:10    2.02  n/a
      [L/S/n=  255./ .880/.035]
      {Vmax=  .402:Dmax=  .130}
 001:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 02:212          378.78     .036 No_date    7:10    2.02  n/a
      [RDT= 5.00] out<- 01:213          378.78     .036 No_date    7:50    2.02  n/a
      [L/S/n=  437./ .500/.035]
      {Vmax=  .200:Dmax=  .035}
 001:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:203           46.74     .012 No_date    4:55    3.10 .124
      [CN= 76.0: N= 1.10]
      [Tp= 2.52:DT= 5.00]
 001:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:213          378.78     .036 No_date    7:50    2.02  n/a
                      + 02:203           46.74     .012 No_date    4:55    3.10  n/a
      [DT= 5.00]  SUM=  03:200b         425.52     .048 No_date    7:00    2.14  n/a
 001:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:200b         425.52     .048 No_date    7:00    2.14  n/a
      [RDT= 5.00] out<- 01:214          425.52     .048 No_date    7:40    2.14  n/a
      [L/S/n=  543./ .520/.035]
      {Vmax=  .320:Dmax=  .046}
 001:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:204           29.39     .014 No_date    4:05    3.10 .124
      [CN= 76.0: N= 1.10]
      [Tp= 1.42:DT= 5.00]
 001:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:205           10.89     .055 No_date    2:40    3.98 .159
      [CN= 78.0: N= 3.00]
      [Tp=  .80:DT= 5.00]
 001:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:214          425.52     .048 No_date    7:40    2.14  n/a
                      + 02:204           29.39     .014 No_date    4:05    3.10  n/a
                      + 03:205           10.89     .055 No_date    2:40    3.98  n/a
      [DT= 5.00]  SUM=  10:200          465.80     .082 No_date    3:05    2.25  n/a
 001:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:301           86.43     .015 No_date    4:05    1.00 .040
      [CN= 63.0: N= 1.10]
```

```
       [Tp= 1.24:DT= 5.00]
  001:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      CALIB NASHYD       02:302           80.69     .012 No_date     4:25    1.27 .051
       [CN= 64.0: N= 1.10]
       [Tp= 1.80:DT= 5.00]
  001:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            01:301           86.43     .015 No_date     4:05    1.00  n/a
                       + 02:302           80.69     .012 No_date     4:25    1.27  n/a
       [DT= 5.00]  SUM=  03:300a         167.12     .027 No_date     4:15    1.13  n/a
  001:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ROUTE CHANNEL   -> 03:300a         167.12     .027 No_date     4:15    1.13  n/a
       [RDT= 5.00] out<- 01:310          167.12     .026 No_date     4:45    1.13  n/a
       [L/S/n=  449./1.620/.040]
       {Vmax=  .430:Dmax=  .015}
  001:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      CALIB NASHYD       02:303           65.16     .021 No_date     4:05    1.99 .080
       [CN= 69.0: N= 1.10]
       [Tp= 1.31:DT= 5.00]
  001:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            01:310          167.12     .026 No_date     4:45    1.13  n/a
                       + 02:303           65.16     .021 No_date     4:05    1.99  n/a
       [DT= 5.00]  SUM=  03:300b         232.28     .047 No_date     4:35    1.37  n/a
  001:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ROUTE CHANNEL   -> 03:300b         232.28     .047 No_date     4:35    1.37  n/a
       [RDT= 5.00] out<- 01:312          232.28     .047 No_date     5:00    1.37  n/a
       [L/S/n=  423./1.170/.035]
       {Vmax=  .421:Dmax=  .018}
  001:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      CALIB NASHYD       02:304           18.78     .013 No_date     4:00    3.45 .138
       [CN= 77.0: N= 1.10]
       [Tp= 1.04:DT= 5.00]
  001:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            01:312          232.28     .047 No_date     5:00    1.37  n/a
                       + 02:304           18.78     .013 No_date     4:00    3.45  n/a
       [DT= 5.00]  SUM=  03:300c         251.06     .059 No_date     4:50    1.52  n/a
  001:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ROUTE CHANNEL   -> 03:300c         251.06     .059 No_date     4:50    1.52  n/a
       [RDT= 5.00] out<- 01:313          251.06     .059 No_date     4:55    1.52  n/a
       [L/S/n=  219./1.280/.035]
       {Vmax=  .645:Dmax=  .057}
  001:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      CALIB NASHYD       02:305            2.61     .005 No_date     2:45    3.18 .127
       [CN= 72.0: N= 1.10]
       [Tp=  .22:DT= 5.00]
  001:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            01:313          251.06     .059 No_date     4:55    1.52  n/a
                       + 02:305            2.61     .005 No_date     2:45    3.18  n/a
       [DT= 5.00]  SUM=  09:300          253.67     .063 No_date     4:40    1.54  n/a
  001:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      CALIB NASHYD       01:401           16.78     .005 No_date     4:15    2.35 .094
       [CN= 68.0: N= 1.10]
       [Tp= 1.66:DT= 5.00]
  001:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      CALIB NASHYD       02:402           10.89     .010 No_date     4:00    3.69 .147
       [CN= 78.0: N= 1.10]
       [Tp=  .85:DT= 5.00]
  001:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      CALIB NASHYD       03:403            2.37     .004 No_date     2:50    3.31 .132
       [CN= 70.0: N= 1.10]
       [Tp=  .27:DT= 5.00]
  001:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            01:401           16.78     .005 No_date     4:15    2.35  n/a
                       + 02:402           10.89     .010 No_date     4:00    3.69  n/a
                       + 03:403            2.37     .004 No_date     2:50    3.31  n/a
       [DT= 5.00]  SUM=  08:400           30.04     .019 No_date     4:00    2.91  n/a
  001:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            08:400           30.04     .019 No_date     4:00    2.91  n/a
                       + 09:300          253.67     .063 No_date     4:40    1.54  n/a
       [DT= 5.00]  SUM=  01:TRIB3        283.71     .080 No_date     4:30    1.69  n/a
  001:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            10:200          465.80     .082 No_date     3:05    2.25  n/a
```

```
                       + 01:TRIB3        283.71     .080 No_date     4:30    1.69  n/a
       [DT= 5.00]  SUM=  07:CONFL        749.51     .155 No_date     4:05    2.03  n/a
  001:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      CALIB NASHYD       01:501           62.65     .051 No_date     4:00    2.57 .103
       [CN= 74.0: N= 1.10]
       [Tp=  .60:DT= 5.00]
  001:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      CALIB NASHYD       02:502           51.84     .024 No_date     4:00    1.76 .070
       [CN= 68.0: N= 1.10]
       [Tp=  .75:DT= 5.00]
  001:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            01:501           62.65     .051 No_date     4:00    2.57  n/a
                       + 02:502           51.84     .024 No_date     4:00    1.76  n/a
       [DT= 5.00]  SUM=  06:500          114.49     .076 No_date     4:00    2.20  n/a
  001:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            07:CONFL        749.51     .155 No_date     4:05    2.03  n/a
                       + 06:500          114.49     .076 No_date     4:00    2.20  n/a
       [DT= 5.00]  SUM=  05:TOTAL        864.00     .231 No_date     4:00    2.06  n/a
   ** END OF RUN :    1

 *******************************************************************************




  RUN:COMMAND#
  002:0001-----------------------------------------------------------------------------
      START
       [TZERO =    .00 hrs on        0]
       [METOUT=   2    (1=imperial, 2=metric output)]
       [NSTORM=   1 ]
       [NRUN  =   2 ]
 #*******************************************************************************
 #  Project Name: [Kanata North]    Project Number: [112117]
 #  Date        : 16-09-2015
 #  Modeller    : [Kallie Auld]
 #  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
 #  License #   :  5320763
 #*******************************************************************************
 #*******************************************************************************
  002:0002-----------------------------------------------------------------------------
      READ STORM
       Filename = STORM.001
       Comment  =
       [SDT=10.00:SDUR=   4.00:PTOT=  33.89]
  002:0003---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      CALIB NASHYD       01:201          115.14     .023 No_date     5:45    3.18 .094
       [CN= 65.0: N= 1.10]
       [Tp= 3.42:DT= 5.00]
  002:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ROUTE CHANNEL   -> 01:201          115.14     .023 No_date     5:45    3.18  n/a
       [RDT= 5.00] out<- 02:211          115.14     .023 No_date     6:10    3.18  n/a
       [L/S/n=  558./ .890/.040]
       {Vmax=  .423:Dmax=  .011}
  002:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      CALIB NASHYD       03:202          263.64     .058 No_date     7:15    5.08 .150
       [CN= 70.0: N= 1.10]
       [Tp= 5.14:DT= 5.00]
  002:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            02:211          115.14     .023 No_date     6:10    3.18  n/a
                       + 03:202          263.64     .058 No_date     7:15    5.08  n/a
       [DT= 5.00]  SUM=  01:200a         378.78     .081 No_date     6:50    4.50  n/a
  002:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ROUTE CHANNEL   -> 01:200a         378.78     .081 No_date     6:50    4.50  n/a
       [RDT= 5.00] out<- 02:212          378.78     .081 No_date     6:55    4.50  n/a
       [L/S/n=  255./ .880/.035]
       {Vmax=  .513:Dmax=  .180}
  002:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ROUTE CHANNEL   -> 02:212          378.78     .081 No_date     6:55    4.50  n/a
       [RDT= 5.00] out<- 01:213          378.78     .081 No_date     7:15    4.50  n/a
```

```
     [L/S/n=  437./ .500/.035]
     {Vmax=  .259:Dmax=  .056}
 002:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:203          46.74     .026 No_date     4:50    6.49 .192
     [CN= 76.0: N= 1.10]
     [Tp= 2.52:DT= 5.00]
 002:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:213         378.78     .081 No_date     7:15    4.50  n/a
                    +  02:203          46.74     .026 No_date     4:50    6.49  n/a
     [DT= 5.00]  SUM=  03:200b        425.52     .107 No_date     6:05    4.72  n/a
 002:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:200b        425.52     .107 No_date     6:05    4.72  n/a
     [RDT= 5.00] out<- 01:214         425.52     .107 No_date     6:55    4.72  n/a
     [L/S/n=  543./ .520/.035]
     {Vmax=  .344:Dmax=  .082}
 002:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:204          29.39     .028 No_date     4:05    6.49 .192
     [CN= 76.0: N= 1.10]
     [Tp= 1.42:DT= 5.00]
 002:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:205          10.89     .107 No_date     2:30    7.82 .231
     [CN= 78.0: N= 3.00]
     [Tp=  .80:DT= 5.00]
 002:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:214         425.52     .107 No_date     6:55    4.72  n/a
                    +  02:204          29.39     .028 No_date     4:05    6.49  n/a
                    +  03:205          10.89     .107 No_date     2:30    7.82  n/a
     [DT= 5.00]  SUM=  10:200         465.80     .167 No_date     3:00    4.90  n/a
 002:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:301          86.43     .040 No_date     4:05    2.73 .081
     [CN= 63.0: N= 1.10]
     [Tp= 1.24:DT= 5.00]
 002:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:302          80.69     .030 No_date     4:20    3.19 .094
     [CN= 64.0: N= 1.10]
     [Tp= 1.80:DT= 5.00]
 002:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:301          86.43     .040 No_date     4:05    2.73  n/a
                    +  02:302          80.69     .030 No_date     4:20    3.19  n/a
     [DT= 5.00]  SUM=  03:300a        167.12     .070 No_date     4:05    2.95  n/a
 002:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300a        167.12     .070 No_date     4:05    2.95  n/a
     [RDT= 5.00] out<- 01:310         167.12     .069 No_date     4:40    2.95  n/a
     [L/S/n=  449./1.620/.040]
     {Vmax=  .430:Dmax=  .038}
 002:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:303          65.16     .047 No_date     4:00    4.49 .132
     [CN= 69.0: N= 1.10]
     [Tp= 1.31:DT= 5.00]
 002:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:310         167.12     .069 No_date     4:40    2.95  n/a
                    +  02:303          65.16     .047 No_date     4:00    4.49  n/a
     [DT= 5.00]  SUM=  03:300b        232.28     .116 No_date     4:30    3.38  n/a
 002:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300b        232.28     .116 No_date     4:30    3.38  n/a
     [RDT= 5.00] out<- 01:312         232.28     .115 No_date     4:55    3.38  n/a
     [L/S/n=  423./1.170/.035]
     {Vmax=  .421:Dmax=  .045}
 002:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:304          18.78     .026 No_date     4:00    7.04 .208
     [CN= 77.0: N= 1.10]
     [Tp= 1.04:DT= 5.00]
 002:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:312         232.28     .115 No_date     4:55    3.38  n/a
                    +  02:304          18.78     .026 No_date     4:00    7.04  n/a
     [DT= 5.00]  SUM=  03:300c        251.06     .140 No_date     4:45    3.66  n/a
 002:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300c        251.06     .140 No_date     4:45    3.66  n/a
     [RDT= 5.00] out<- 01:313         251.06     .140 No_date     4:50    3.66  n/a
     [L/S/n=  219./1.280/.035]
     {Vmax=  .658:Dmax=  .121}
```

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 002:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:305           2.61     .011 No_date     2:35    6.30 .186
     [CN= 72.0: N= 1.10]
     [Tp=  .22:DT= 5.00]
 002:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:313         251.06     .140 No_date     4:50    3.66  n/a
                    +  02:305           2.61     .011 No_date     2:35    6.30  n/a
     [DT= 5.00]  SUM=  09:300         253.67     .147 No_date     4:40    3.68  n/a
 002:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:401          16.78     .011 No_date     4:10    4.94 .146
     [CN= 68.0: N= 1.10]
     [Tp= 1.66:DT= 5.00]
 002:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:402          10.89     .019 No_date     4:00    7.44 .219
     [CN= 78.0: N= 1.10]
     [Tp=  .85:DT= 5.00]
 002:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:403           2.37     .008 No_date     2:50    6.33 .187
     [CN= 70.0: N= 1.10]
     [Tp=  .27:DT= 5.00]
 002:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:401          16.78     .011 No_date     4:10    4.94  n/a
                    +  02:402          10.89     .019 No_date     4:00    7.44  n/a
                    +  03:403           2.37     .008 No_date     2:50    6.33  n/a
     [DT= 5.00]  SUM=  08:400          30.04     .037 No_date     4:00    5.95  n/a
 002:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            08:400          30.04     .037 No_date     4:00    5.95  n/a
                    +  09:300         253.67     .147 No_date     4:40    3.68  n/a
     [DT= 5.00]  SUM=  01:TRIB3       283.71     .182 No_date     4:30    3.92  n/a
 002:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            10:200         465.80     .167 No_date     3:00    4.90  n/a
                    +  01:TRIB3       283.71     .182 No_date     4:30    3.92  n/a
     [DT= 5.00]  SUM=  07:CONFL       749.51     .343 No_date     4:10    4.53  n/a
 002:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:501          62.65     .111 No_date     4:00    5.63 .166
     [CN= 74.0: N= 1.10]
     [Tp=  .60:DT= 5.00]
 002:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:502          51.84     .056 No_date     4:00    4.10 .121
     [CN= 68.0: N= 1.10]
     [Tp=  .75:DT= 5.00]
 002:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:501          62.65     .111 No_date     4:00    5.63  n/a
                    +  02:502          51.84     .056 No_date     4:00    4.10  n/a
     [DT= 5.00]  SUM=  06:500         114.49     .167 No_date     4:00    4.94  n/a
 002:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            07:CONFL       749.51     .343 No_date     4:10    4.53  n/a
                    +  06:500         114.49     .167 No_date     4:00    4.94  n/a
     [DT= 5.00]  SUM=  05:TOTAL       864.00     .508 No_date     4:00    4.59  n/a
  ** END OF RUN :   2

********************************************************************************



 RUN:COMMAND#
 003:0001----------------------------------------------------------------------------
    START
     [TZERO =    .00 hrs on        0]
     [METOUT=   2    (1=imperial, 2=metric output)]
     [NSTORM=   1 ]
     [NRUN  =   3 ]
#*******************************************************************************
#  Project Name: [Kanata North]    Project Number: [112117]
#  Date        : 16-09-2015
#  Modeller    : [Kallie Auld]
#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
#  License #   :  5320763
#*******************************************************************************
```

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#****************************************************************************
 003:0002---------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=10.00:SDUR=   4.00:PTOT=  45.18]
 003:0003--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:201          115.14     .049 No_date    5:45    6.69 .148
      [CN= 65.0: N= 1.10]
      [Tp= 3.42:DT= 5.00]
 003:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:201          115.14     .049 No_date    5:45    6.69  n/a
      [RDT= 5.00] out<- 02:211          115.14     .049 No_date    6:10    6.69  n/a
      [L/S/n=  558./ .890/.040]
      {Vmax=  .423:Dmax=  .023}
 003:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:202          263.64     .110 No_date    7:20    9.60 .212
      [CN= 70.0: N= 1.10]
      [Tp= 5.14:DT= 5.00]
 003:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:211          115.14     .049 No_date    6:10    6.69  n/a
                      + 03:202          263.64     .110 No_date    7:20    9.60  n/a
      [DT= 5.00]  SUM=  01:200a         378.78     .159 No_date    6:50    8.71  n/a
 003:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:200a         378.78     .159 No_date    6:50    8.71  n/a
      [RDT= 5.00] out<- 02:212          378.78     .159 No_date    6:55    8.71  n/a
      [L/S/n=  255./ .880/.035]
      {Vmax=  .614:Dmax=  .237}
 003:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 02:212          378.78     .159 No_date    6:55    8.71  n/a
      [RDT= 5.00] out<- 01:213          378.78     .159 No_date    7:05    8.71  n/a
      [L/S/n=  437./ .500/.035]
      {Vmax=  .334:Dmax=  .083}
 003:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:203           46.74     .048 No_date    4:50   11.99 .265
      [CN= 76.0: N= 1.10]
      [Tp= 2.52:DT= 5.00]
 003:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:213          378.78     .159 No_date    7:05    8.71  n/a
                      + 02:203           46.74     .048 No_date    4:50   11.99  n/a
      [DT= 5.00]  SUM=  03:200b         425.52     .206 No_date    6:30    9.07  n/a
 003:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:200b         425.52     .206 No_date    6:30    9.07  n/a
      [RDT= 5.00] out<- 01:214          425.52     .206 No_date    6:40    9.07  n/a
      [L/S/n=  543./ .520/.035]
      {Vmax=  .436:Dmax=  .122}
 003:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:204           29.39     .052 No_date    4:00   11.99 .265
      [CN= 76.0: N= 1.10]
      [Tp= 1.42:DT= 5.00]
 003:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:205           10.89     .201 No_date    2:35   13.85 .307
      [CN= 78.0: N= 3.00]
      [Tp=  .80:DT= 5.00]
 003:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:214          425.52     .206 No_date    6:40    9.07  n/a
                      + 02:204           29.39     .052 No_date    4:00   11.99  n/a
                      + 03:205           10.89     .201 No_date    2:35   13.85  n/a
      [DT= 5.00]  SUM=  10:200          465.80     .338 No_date    3:15    9.37  n/a
 003:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:301           86.43     .086 No_date    4:00    5.94 .131
      [CN= 63.0: N= 1.10]
      [Tp= 1.24:DT= 5.00]
 003:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:302           80.69     .063 No_date    4:20    6.63 .147
      [CN= 64.0: N= 1.10]
      [Tp= 1.80:DT= 5.00]
 003:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:301           86.43     .086 No_date    4:00    5.94  n/a
                      + 02:302           80.69     .063 No_date    4:20    6.63  n/a
      [DT= 5.00]  SUM=  03:300a         167.12     .150 No_date    4:05    6.27  n/a
 003:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:300a         167.12     .150 No_date    4:05    6.27  n/a
      [RDT= 5.00] out<- 01:310          167.12     .149 No_date    4:35    6.27  n/a
      [L/S/n=  449./1.620/.040]
      {Vmax=  .449:Dmax=  .069}
 003:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:303           65.16     .091 No_date    4:00    8.75 .194
      [CN= 69.0: N= 1.10]
      [Tp= 1.31:DT= 5.00]
 003:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:310          167.12     .149 No_date    4:35    6.27  n/a
                      + 02:303           65.16     .091 No_date    4:00    8.75  n/a
      [DT= 5.00]  SUM=  03:300b         232.28     .239 No_date    4:25    6.97  n/a
 003:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:300b         232.28     .239 No_date    4:25    6.97  n/a
      [RDT= 5.00] out<- 01:312          232.28     .238 No_date    4:40    6.97  n/a
      [L/S/n=  423./1.170/.035]
      {Vmax=  .468:Dmax=  .071}
 003:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:304           18.78     .047 No_date    4:00   12.78 .283
      [CN= 77.0: N= 1.10]
      [Tp= 1.04:DT= 5.00]
 003:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:312          232.28     .238 No_date    4:40    6.97  n/a
                      + 02:304           18.78     .047 No_date    4:00   12.78  n/a
      [DT= 5.00]  SUM=  03:300c         251.06     .285 No_date    4:35    7.40  n/a
 003:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:300c         251.06     .285 No_date    4:35    7.40  n/a
      [RDT= 5.00] out<- 01:313          251.06     .285 No_date    4:40    7.40  n/a
      [L/S/n=  219./1.280/.035]
      {Vmax=  .741:Dmax=  .183}
 003:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:305            2.61     .020 No_date    2:35   11.32 .251
      [CN= 72.0: N= 1.10]
      [Tp=  .22:DT= 5.00]
 003:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:313          251.06     .285 No_date    4:40    7.40  n/a
                      + 02:305            2.61     .020 No_date    2:35   11.32  n/a
      [DT= 5.00]  SUM=  09:300          253.67     .298 No_date    4:35    7.44  n/a
 003:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:401           16.78     .020 No_date    4:10    9.24 .205
      [CN= 68.0: N= 1.10]
      [Tp= 1.66:DT= 5.00]
 003:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:402           10.89     .034 No_date    4:00   13.39 .296
      [CN= 78.0: N= 1.10]
      [Tp=  .85:DT= 5.00]
 003:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:403            2.37     .015 No_date    2:45   11.16 .247
      [CN= 70.0: N= 1.10]
      [Tp=  .27:DT= 5.00]
 003:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:401           16.78     .020 No_date    4:10    9.24  n/a
                      + 02:402           10.89     .034 No_date    4:00   13.39  n/a
                      + 03:403            2.37     .015 No_date    2:45   11.16  n/a
      [DT= 5.00]  SUM=  08:400           30.04     .068 No_date    4:00   10.90  n/a
 003:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            08:400           30.04     .068 No_date    4:00   10.90  n/a
                      + 09:300          253.67     .298 No_date    4:35    7.44  n/a
      [DT= 5.00]  SUM=  01:TRIB3        283.71     .363 No_date    4:20    7.81  n/a
 003:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            10:200          465.80     .338 No_date    3:15    9.37  n/a
                      + 01:TRIB3        283.71     .363 No_date    4:20    7.81  n/a
      [DT= 5.00]  SUM=  07:CONFL        749.51     .683 No_date    4:00    8.78  n/a
 003:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:501           62.65     .211 No_date    4:00   10.68 .236
      [CN= 74.0: N= 1.10]
      [Tp=  .60:DT= 5.00]
 003:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:502           51.84     .112 No_date    4:00    8.16 .181
      [CN= 68.0: N= 1.10]
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     [Tp=  .75:DT= 5.00]
 003:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:501          62.65     .211 No_date    4:00   10.68  n/a
                    + 02:502          51.84     .112 No_date    4:00    8.16  n/a
     [DT= 5.00]  SUM= 06:500         114.49     .323 No_date    4:00    9.54  n/a
 003:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           07:CONFL       749.51     .683 No_date    4:00    8.78  n/a
                    + 06:500         114.49     .323 No_date    4:00    9.54  n/a
     [DT= 5.00]  SUM= 05:TOTAL       864.00    1.006 No_date    4:00    8.88  n/a
  ** END OF RUN :   3

********************************************************************************




 RUN:COMMAND#
 004:0001---------------------------------------------------------------------------
    START
     [TZERO =    .00 hrs on        0]
     [METOUT=   2    (1=imperial, 2=metric output)]
     [NSTORM=   1 ]
     [NRUN  =   4 ]
#*******************************************************************************
#  Project Name: [Kanata North]    Project Number: [112117]
#  Date        : 16-09-2015
#  Modeller    : [Kallie Auld]
#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
#  License #   :  5320763
#*******************************************************************************
#*******************************************************************************
 004:0002---------------------------------------------------------------------------
    READ STORM
     Filename = STORM.001
     Comment  =
     [SDT=10.00:SDUR=   4.00:PTOT=  76.02]
 004:0003---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      01:201         115.14     .152 No_date    5:35   20.74 .273
     [CN= 65.0: N= 1.10]
     [Tp= 3.42:DT= 5.00]
 004:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:201         115.14     .152 No_date    5:35   20.74  n/a
     [RDT= 5.00] out<- 02:211         115.14     .152 No_date    6:05   20.74  n/a
     [L/S/n=  558./ .890/.040]
     {Vmax=  .423:Dmax=  .070}
 004:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      03:202         263.64     .301 No_date    7:15   26.35 .347
     [CN= 70.0: N= 1.10]
     [Tp= 5.14:DT= 5.00]
 004:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:211         115.14     .152 No_date    6:05   20.74  n/a
                    + 03:202         263.64     .301 No_date    7:15   26.35  n/a
     [DT= 5.00]  SUM= 01:200a        378.78     .453 No_date    6:40   24.64  n/a
 004:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:200a        378.78     .453 No_date    6:40   24.64  n/a
     [RDT= 5.00] out<- 02:212         378.78     .453 No_date    6:45   24.64  n/a
     [L/S/n=  255./ .880/.035]
     {Vmax=  .762:Dmax=  .349}
 004:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:212         378.78     .453 No_date    6:45   24.64  n/a
     [RDT= 5.00] out<- 01:213         378.78     .453 No_date    7:00   24.64  n/a
     [L/S/n=  437./ .500/.035]
     {Vmax=  .474:Dmax=  .149}
 004:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:203          46.74     .126 No_date    4:45   31.50 .414
     [CN= 76.0: N= 1.10]
     [Tp= 2.52:DT= 5.00]
 004:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:213         378.78     .453 No_date    7:00   24.64  n/a
                    + 02:203          46.74     .126 No_date    4:45   31.50  n/a
```

```
     [DT= 5.00]  SUM= 03:200b        425.52     .577 No_date    6:10   25.39  n/a
 004:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:200b        425.52     .577 No_date    6:10   25.39  n/a
     [RDT= 5.00] out<- 01:214         425.52     .577 No_date    6:30   25.39  n/a
     [L/S/n=  543./ .520/.035]
     {Vmax=  .627:Dmax=  .220}
 004:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:204          29.39     .137 No_date    4:00   31.50 .414
     [CN= 76.0: N= 1.10]
     [Tp= 1.42:DT= 5.00]
 004:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      03:205          10.89     .521 No_date    2:35   34.61 .455
     [CN= 78.0: N= 3.00]
     [Tp=  .80:DT= 5.00]
 004:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:214         425.52     .577 No_date    6:30   25.39  n/a
                    + 02:204          29.39     .137 No_date    4:00   31.50  n/a
                    + 03:205          10.89     .521 No_date    2:35   34.61  n/a
     [DT= 5.00]  SUM= 10:200         465.80     .977 No_date    3:00   26.00  n/a
 004:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      01:301          86.43     .277 No_date    4:00   19.07 .251
     [CN= 63.0: N= 1.10]
     [Tp= 1.24:DT= 5.00]
 004:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:302          80.69     .194 No_date    4:15   20.39 .268
     [CN= 64.0: N= 1.10]
     [Tp= 1.80:DT= 5.00]
 004:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:301          86.43     .277 No_date    4:00   19.07  n/a
                    + 02:302          80.69     .194 No_date    4:15   20.39  n/a
     [DT= 5.00]  SUM= 03:300a        167.12     .472 No_date    4:00   19.71  n/a
 004:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300a        167.12     .472 No_date    4:00   19.71  n/a
     [RDT= 5.00] out<- 01:310         167.12     .470 No_date    4:20   19.71  n/a
     [L/S/n=  449./1.620/.040]
     {Vmax=  .655:Dmax=  .130}
 004:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:303          65.16     .259 No_date    4:00   24.86 .327
     [CN= 69.0: N= 1.10]
     [Tp= 1.31:DT= 5.00]
 004:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:310         167.12     .470 No_date    4:20   19.71  n/a
                    + 02:303          65.16     .259 No_date    4:00   24.86  n/a
     [DT= 5.00]  SUM= 03:300b        232.28     .728 No_date    4:15   21.15  n/a
 004:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300b        232.28     .728 No_date    4:15   21.15  n/a
     [RDT= 5.00] out<- 01:312         232.28     .727 No_date    4:25   21.15  n/a
     [L/S/n=  423./1.170/.035]
     {Vmax=  .715:Dmax=  .138}
 004:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:304          18.78     .122 No_date    4:00   32.88 .433
     [CN= 77.0: N= 1.10]
     [Tp= 1.04:DT= 5.00]
 004:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:312         232.28     .727 No_date    4:25   21.15  n/a
                    + 02:304          18.78     .122 No_date    4:00   32.88  n/a
     [DT= 5.00]  SUM= 03:300c        251.06     .847 No_date    4:20   22.03  n/a
 004:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300c        251.06     .847 No_date    4:20   22.03  n/a
     [RDT= 5.00] out<- 01:313         251.06     .846 No_date    4:25   22.03  n/a
     [L/S/n=  219./1.280/.035]
     {Vmax=  .911:Dmax=  .309}
 004:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:305           2.61     .053 No_date    2:30   29.31 .386
     [CN= 72.0: N= 1.10]
     [Tp=  .22:DT= 5.00]
 004:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:313         251.06     .846 No_date    4:25   22.03  n/a
                    + 02:305           2.61     .053 No_date    2:30   29.31  n/a
     [DT= 5.00]  SUM= 09:300         253.67     .883 No_date    4:15   22.11  n/a
 004:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
```

```
    CALIB NASHYD       01:401           16.78     .054 No_date    4:05   25.27 .332
     [CN= 68.0: N= 1.10]
     [Tp= 1.66:DT= 5.00]
 004:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:402           10.89     .087 No_date    4:00   34.02 .447
     [CN= 78.0: N= 1.10]
     [Tp=  .85:DT= 5.00]
 004:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:403            2.37     .040 No_date    2:40   28.49 .375
     [CN= 70.0: N= 1.10]
     [Tp=  .27:DT= 5.00]
 004:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:401           16.78     .054 No_date    4:05   25.27  n/a
                     + 02:402           10.89     .087 No_date    4:00   34.02  n/a
                     + 03:403            2.37     .040 No_date    2:40   28.49  n/a
     [DT= 5.00]  SUM=  08:400           30.04     .175 No_date    4:00   28.69  n/a
 004:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            08:400           30.04     .175 No_date    4:00   28.69  n/a
                     + 09:300          253.67     .883 No_date    4:15   22.11  n/a
     [DT= 5.00]  SUM=  01:TRIB3        283.71    1.055 No_date    4:10   22.80  n/a
 004:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            10:200          465.80     .977 No_date    3:00   26.00  n/a
                     + 01:TRIB3        283.71    1.055 No_date    4:10   22.80  n/a
     [DT= 5.00]  SUM=  07:CONFL        749.51    1.943 No_date    3:25   24.79  n/a
 004:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:501           62.65     .570 No_date    3:50   29.08 .383
     [CN= 74.0: N= 1.10]
     [Tp=  .60:DT= 5.00]
 004:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:502           51.84     .322 No_date    4:00   23.73 .312
     [CN= 68.0: N= 1.10]
     [Tp=  .75:DT= 5.00]
 004:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:501           62.65     .570 No_date    3:50   29.08  n/a
                     + 02:502           51.84     .322 No_date    4:00   23.73  n/a
     [DT= 5.00]  SUM=  06:500          114.49     .892 No_date    4:00   26.66  n/a
 004:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            07:CONFL        749.51    1.943 No_date    3:25   24.79  n/a
                     + 06:500          114.49     .892 No_date    4:00   26.66  n/a
     [DT= 5.00]  SUM=  05:TOTAL        864.00    2.826 No_date    3:35   25.03  n/a
  ** END OF RUN :   4

*******************************************************************************





 RUN:COMMAND#
 005:0001------------------------------------------------------------------------
    START
     [TZERO =    .00 hrs on        0]
     [METOUT=   2    (1=imperial, 2=metric output)]
     [NSTORM=   1 ]
     [NRUN  =   5 ]
#******************************************************************************
#  Project Name: [Kanata North]    Project Number: [112117]
#  Date        : 16-09-2015
#  Modeller    : [Kallie Auld]
#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
#  License #   :  5320763
#******************************************************************************
#******************************************************************************
 005:0002------------------------------------------------------------------------
    READ STORM
     Filename = STORM.001
     Comment  =
     [SDT=30.00:SDUR=  12.00:PTOT=  25.00]
 005:0003---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:201          115.14     .009 No_date   12:25    1.23 .049
     [CN= 65.0: N= 1.10]
     [Tp= 3.42:DT= 5.00]
 005:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:201          115.14     .009 No_date   12:25    1.23  n/a
     [RDT= 5.00] out<- 02:211          115.14     .009 No_date   13:05    1.23  n/a
     [L/S/n=  558./ .890/.040]
     {Vmax=  .423:Dmax=  .004}
 005:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:202          263.64     .027 No_date   13:20    2.37 .095
     [CN= 70.0: N= 1.10]
     [Tp= 5.14:DT= 5.00]
 005:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:211          115.14     .009 No_date   13:05    1.23  n/a
                     + 03:202          263.64     .027 No_date   13:20    2.37  n/a
     [DT= 5.00]  SUM=  01:200a         378.78     .036 No_date   13:10    2.03  n/a
 005:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:200a         378.78     .036 No_date   13:10    2.03  n/a
     [RDT= 5.00] out<- 02:212          378.78     .036 No_date   13:00    2.03  n/a
     [L/S/n=  255./ .880/.035]
     {Vmax=  .400:Dmax=  .129}
 005:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:212          378.78     .036 No_date   13:00    2.03  n/a
     [RDT= 5.00] out<- 01:213          378.78     .036 No_date   14:10    2.03  n/a
     [L/S/n=  437./ .500/.035]
     {Vmax=  .199:Dmax=  .035}
 005:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:203           46.74     .012 No_date   12:00    3.10 .124
     [CN= 76.0: N= 1.10]
     [Tp= 2.52:DT= 5.00]
 005:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:213          378.78     .036 No_date   14:10    2.03  n/a
                     + 02:203           46.74     .012 No_date   12:00    3.10  n/a
     [DT= 5.00]  SUM=  03:200b         425.52     .047 No_date   13:30    2.14  n/a
 005:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:200b         425.52     .047 No_date   13:30    2.14  n/a
     [RDT= 5.00] out<- 01:214          425.52     .047 No_date   14:10    2.14  n/a
     [L/S/n=  543./ .520/.035]
     {Vmax=  .320:Dmax=  .045}
 005:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:204           29.39     .012 No_date   12:00    3.10 .124
     [CN= 76.0: N= 1.10]
     [Tp= 1.42:DT= 5.00]
 005:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:205           10.89     .041 No_date    6:55    3.98 .159
     [CN= 78.0: N= 3.00]
     [Tp=  .80:DT= 5.00]
 005:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:214          425.52     .047 No_date   14:10    2.14  n/a
                     + 02:204           29.39     .012 No_date   12:00    3.10  n/a
                     + 03:205           10.89     .041 No_date    6:55    3.98  n/a
     [DT= 5.00]  SUM=  10:200          465.80     .063 No_date   12:10    2.25  n/a
 005:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:301           86.43     .013 No_date   12:00    1.00 .040
     [CN= 63.0: N= 1.10]
     [Tp= 1.24:DT= 5.00]
 005:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:302           80.69     .011 No_date   12:00    1.27 .051
     [CN= 64.0: N= 1.10]
     [Tp= 1.80:DT= 5.00]
 005:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:301           86.43     .013 No_date   12:00    1.00  n/a
                     + 02:302           80.69     .011 No_date   12:00    1.27  n/a
     [DT= 5.00]  SUM=  03:300a         167.12     .024 No_date   12:00    1.13  n/a
 005:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300a         167.12     .024 No_date   12:00    1.13  n/a
     [RDT= 5.00] out<- 01:310          167.12     .024 No_date   12:15    1.13  n/a
     [L/S/n=  449./1.620/.040]
     {Vmax=  .430:Dmax=  .013}
 005:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:303           65.16     .018 No_date   12:00    1.99 .080
     [CN= 69.0: N= 1.10]
     [Tp= 1.31:DT= 5.00]
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005:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:310          167.12     .024 No_date   12:15    1.13  n/a
                     + 02:303           65.16     .018 No_date   12:00    1.99  n/a
     [DT= 5.00]  SUM=  03:300b         232.28     .043 No_date   12:05    1.37  n/a
005:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300b         232.28     .043 No_date   12:05    1.37  n/a
     [RDT= 5.00] out<- 01:312          232.28     .042 No_date   12:20    1.37  n/a
     [L/S/n=  423./1.170/.035]
     {Vmax=  .421:Dmax=  .017}
005:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:304           18.78     .011 No_date   11:00    3.45 .138
     [CN= 77.0: N= 1.10]
     [Tp= 1.04:DT= 5.00]
005:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:312          232.28     .042 No_date   12:20    1.37  n/a
                     + 02:304           18.78     .011 No_date   11:00    3.45  n/a
     [DT= 5.00]  SUM=  03:300c         251.06     .053 No_date   12:10    1.52  n/a
005:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300c         251.06     .053 No_date   12:10    1.52  n/a
     [RDT= 5.00] out<- 01:313          251.06     .053 No_date   12:15    1.52  n/a
     [L/S/n=  219./1.280/.035]
     {Vmax=  .645:Dmax=  .051}
005:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:305            2.61     .004 No_date    7:00    3.18 .127
     [CN= 72.0: N= 1.10]
     [Tp=  .22:DT= 5.00]
005:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:313          251.06     .053 No_date   12:15    1.52  n/a
                     + 02:305            2.61     .004 No_date    7:00    3.18  n/a
     [DT= 5.00]  SUM=  09:300          253.67     .055 No_date   12:10    1.54  n/a
005:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:401           16.78     .005 No_date   12:00    2.36 .094
     [CN= 68.0: N= 1.10]
     [Tp= 1.66:DT= 5.00]
005:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:402           10.89     .008 No_date   10:30    3.69 .147
     [CN= 78.0: N= 1.10]
     [Tp=  .85:DT= 5.00]
005:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:403            2.37     .003 No_date    7:00    3.31 .132
     [CN= 70.0: N= 1.10]
     [Tp=  .27:DT= 5.00]
005:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:401           16.78     .005 No_date   12:00    2.36  n/a
                     + 02:402           10.89     .008 No_date   10:30    3.69  n/a
                     + 03:403            2.37     .003 No_date    7:00    3.31  n/a
     [DT= 5.00]  SUM=  08:400           30.04     .014 No_date    9:30    2.91  n/a
005:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            08:400           30.04     .014 No_date    9:30    2.91  n/a
                     + 09:300          253.67     .055 No_date   12:10    1.54  n/a
     [DT= 5.00]  SUM=  01:TRIB3        283.71     .069 No_date   12:00    1.69  n/a
005:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            10:200          465.80     .063 No_date   12:10    2.25  n/a
                     + 01:TRIB3        283.71     .069 No_date   12:00    1.69  n/a
     [DT= 5.00]  SUM=  07:CONFL        749.51     .132 No_date   12:05    2.03  n/a
005:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:501           62.65     .039 No_date    9:30    2.57 .103
     [CN= 74.0: N= 1.10]
     [Tp=  .60:DT= 5.00]
005:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:502           51.84     .019 No_date   10:40    1.76 .070
     [CN= 68.0: N= 1.10]
     [Tp=  .75:DT= 5.00]
005:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:501           62.65     .039 No_date    9:30    2.57  n/a
                     + 02:502           51.84     .019 No_date   10:40    1.76  n/a
     [DT= 5.00]  SUM=  06:500          114.49     .058 No_date   10:30    2.20  n/a
005:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            07:CONFL        749.51     .132 No_date   12:05    2.03  n/a
                     + 06:500          114.49     .058 No_date   10:30    2.20  n/a
     [DT= 5.00]  SUM=  05:TOTAL        864.00     .187 No_date   12:00    2.06  n/a
```

```
  ** END OF RUN :   5

********************************************************************************




 RUN:COMMAND#
 006:0001-------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   6 ]
#*******************************************************************************
#  Project Name: [Kanata North]    Project Number: [112117]
#  Date        : 16-09-2015
#  Modeller    : [Kallie Auld]
#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
#  License #   :  5320763
#*******************************************************************************
#*******************************************************************************
 006:0002-------------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=30.00:SDUR=  12.00:PTOT=  42.34]
 006:0003---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:201          115.14     .041 No_date   12:10    5.71 .135
      [CN= 65.0: N= 1.10]
      [Tp= 3.42:DT= 5.00]
 006:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:201          115.14     .041 No_date   12:10    5.71  n/a
      [RDT= 5.00] out<- 02:211          115.14     .041 No_date   12:50    5.71  n/a
      [L/S/n=  558./ .890/.040]
      {Vmax=  .423:Dmax=  .019}
 006:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:202          263.64     .095 No_date   13:05    8.36 .197
      [CN= 70.0: N= 1.10]
      [Tp= 5.14:DT= 5.00]
 006:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:211          115.14     .041 No_date   12:50    5.71  n/a
                      + 03:202          263.64     .095 No_date   13:05    8.36  n/a
      [DT= 5.00]  SUM=  01:200a         378.78     .136 No_date   12:55    7.55  n/a
 006:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:200a         378.78     .136 No_date   12:55    7.55  n/a
      [RDT= 5.00] out<- 02:212          378.78     .136 No_date   13:00    7.55  n/a
      [L/S/n=  255./ .880/.035]
      {Vmax=  .597:Dmax=  .226}
 006:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 02:212          378.78     .136 No_date   13:00    7.55  n/a
      [RDT= 5.00] out<- 01:213          378.78     .136 No_date   13:25    7.55  n/a
      [L/S/n=  437./ .500/.035]
      {Vmax=  .318:Dmax=  .076}
 006:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:203           46.74     .040 No_date   12:00   10.50 .248
      [CN= 76.0: N= 1.10]
      [Tp= 2.52:DT= 5.00]
 006:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:213          378.78     .136 No_date   13:25    7.55  n/a
                      + 02:203           46.74     .040 No_date   12:00   10.50  n/a
      [DT= 5.00]  SUM=  03:200b         425.52     .176 No_date   12:50    7.88  n/a
 006:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:200b         425.52     .176 No_date   12:50    7.88  n/a
      [RDT= 5.00] out<- 01:214          425.52     .176 No_date   13:10    7.88  n/a
      [L/S/n=  543./ .520/.035]
      {Vmax=  .404:Dmax=  .110}
 006:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:204           29.39     .041 No_date   12:00   10.50 .248
      [CN= 76.0: N= 1.10]
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     [Tp= 1.42:DT= 5.00]
006:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:205           10.89     .135 No_date    6:50   12.23 .289
     [CN= 78.0: N= 3.00]
     [Tp=  .80:DT= 5.00]
006:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:214          425.52     .176 No_date   13:10    7.88  n/a
                     + 02:204           29.39     .041 No_date   12:00   10.50  n/a
                     + 03:205           10.89     .135 No_date    6:50   12.23  n/a
     [DT= 5.00]  SUM=  10:200          465.80     .229 No_date   12:05    8.14  n/a
006:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:301           86.43     .064 No_date   12:00    5.03 .119
     [CN= 63.0: N= 1.10]
     [Tp= 1.24:DT= 5.00]
006:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:302           80.69     .050 No_date   12:00    5.67 .134
     [CN= 64.0: N= 1.10]
     [Tp= 1.80:DT= 5.00]
006:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:301           86.43     .064 No_date   12:00    5.03  n/a
                     + 02:302           80.69     .050 No_date   12:00    5.67  n/a
     [DT= 5.00]  SUM=  03:300a         167.12     .114 No_date   12:00    5.34  n/a
006:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 03:300a         167.12     .114 No_date   12:00    5.34  n/a
     [RDT= 5.00] out<- 01:310          167.12     .114 No_date   12:05    5.34  n/a
     [L/S/n=  449./1.620/.040]
     {Vmax=  .431:Dmax=  .061}
006:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:303           65.16     .069 No_date   12:00    7.58 .179
     [CN= 69.0: N= 1.10]
     [Tp= 1.31:DT= 5.00]
006:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:310          167.12     .114 No_date   12:05    5.34  n/a
                     + 02:303           65.16     .069 No_date   12:00    7.58  n/a
     [DT= 5.00]  SUM=  03:300b         232.28     .183 No_date   12:00    5.97  n/a
006:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 03:300b         232.28     .183 No_date   12:00    5.97  n/a
     [RDT= 5.00] out<- 01:312          232.28     .183 No_date   12:10    5.97  n/a
     [L/S/n=  423./1.170/.035]
     {Vmax=  .440:Dmax=  .062}
006:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:304           18.78     .035 No_date   10:30   11.23 .265
     [CN= 77.0: N= 1.10]
     [Tp= 1.04:DT= 5.00]
006:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:312          232.28     .183 No_date   12:10    5.97  n/a
                     + 02:304           18.78     .035 No_date   10:30   11.23  n/a
     [DT= 5.00]  SUM=  03:300c         251.06     .217 No_date   12:00    6.36  n/a
006:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 03:300c         251.06     .217 No_date   12:00    6.36  n/a
     [RDT= 5.00] out<- 01:313          251.06     .217 No_date   12:05    6.36  n/a
     [L/S/n=  219./1.280/.035]
     {Vmax=  .700:Dmax=  .154}
006:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:305            2.61     .013 No_date    6:45    9.96 .235
     [CN= 72.0: N= 1.10]
     [Tp=  .22:DT= 5.00]
006:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:313          251.06     .217 No_date   12:05    6.36  n/a
                     + 02:305            2.61     .013 No_date    6:45    9.96  n/a
     [DT= 5.00]  SUM=  09:300          253.67     .222 No_date   12:00    6.40  n/a
006:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:401           16.78     .016 No_date   12:00    8.06 .190
     [CN= 68.0: N= 1.10]
     [Tp= 1.66:DT= 5.00]
006:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:402           10.89     .025 No_date    9:25   11.78 .278
     [CN= 78.0: N= 1.10]
     [Tp=  .85:DT= 5.00]
006:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:403            2.37     .011 No_date    7:00    9.85 .233
     [CN= 70.0: N= 1.10]
     [Tp=  .27:DT= 5.00]
006:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:401           16.78     .016 No_date   12:00    8.06  n/a
                     + 02:402           10.89     .025 No_date    9:25   11.78  n/a
                     + 03:403            2.37     .011 No_date    7:00    9.85  n/a
     [DT= 5.00]  SUM=  08:400           30.04     .048 No_date    9:00    9.55  n/a
006:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            08:400           30.04     .048 No_date    9:00    9.55  n/a
                     + 09:300          253.67     .222 No_date   12:00    6.40  n/a
     [DT= 5.00]  SUM=  01:TRIB3        283.71     .267 No_date   11:35    6.73  n/a
006:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            10:200          465.80     .229 No_date   12:05    8.14  n/a
                     + 01:TRIB3        283.71     .267 No_date   11:35    6.73  n/a
     [DT= 5.00]  SUM=  07:CONFL        749.51     .495 No_date   12:00    7.61  n/a
006:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:501           62.65     .144 No_date    9:00    9.30 .220
     [CN= 74.0: N= 1.10]
     [Tp=  .60:DT= 5.00]
006:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:502           51.84     .076 No_date    9:30    7.04 .166
     [CN= 68.0: N= 1.10]
     [Tp=  .75:DT= 5.00]
006:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:501           62.65     .144 No_date    9:00    9.30  n/a
                     + 02:502           51.84     .076 No_date    9:30    7.04  n/a
     [DT= 5.00]  SUM=  06:500          114.49     .220 No_date    9:00    8.28  n/a
006:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            07:CONFL        749.51     .495 No_date   12:00    7.61  n/a
                     + 06:500          114.49     .220 No_date    9:00    8.28  n/a
     [DT= 5.00]  SUM=  05:TOTAL        864.00     .699 No_date   11:00    7.70  n/a
 ** END OF RUN :   6

*******************************************************************************



 RUN:COMMAND#
 007:0001--------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   7 ]
#******************************************************************************
#  Project Name: [Kanata North]    Project Number: [112117]
#  Date        : 16-09-2015
#  Modeller    : [Kallie Auld]
#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
#  License #   :  5320763
#******************************************************************************
#******************************************************************************
 007:0002--------------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=30.00:SDUR=  12.00:PTOT=  56.18]
 007:0003---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:201          115.14     .080 No_date   12:05   11.05 .197
      [CN= 65.0: N= 1.10]
      [Tp= 3.42:DT= 5.00]
 007:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 01:201         115.14     .080 No_date   12:05   11.05  n/a
      [RDT= 5.00] out<- 02:211         115.14     .080 No_date   12:45   11.05  n/a
      [L/S/n=  558./ .890/.040]
      {Vmax=  .423:Dmax=  .037}
 007:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:202          263.64     .170 No_date   13:00   14.94 .266
      [CN= 70.0: N= 1.10]
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     [Tp= 5.14:DT= 5.00]
007:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD          02:211         115.14     .080 No_date   12:45   11.05  n/a
                   + 03:202         263.64     .170 No_date   13:00   14.94  n/a
     [DT= 5.00]  SUM= 01:200a        378.78     .249 No_date   12:50   13.75  n/a
007:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:200a        378.78     .249 No_date   12:50   13.75  n/a
     [RDT= 5.00] out<- 02:212         378.78     .249 No_date   12:55   13.75  n/a
     [L/S/n=  255./ .880/.035]
     {Vmax=  .672:Dmax=  .279}
007:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:212         378.78     .249 No_date   12:55   13.75  n/a
     [RDT= 5.00] out<- 01:213         378.78     .249 No_date   13:20   13.75  n/a
     [L/S/n=  437./ .500/.035]
     {Vmax=  .392:Dmax=  .107}
007:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:203          46.74     .071 No_date   12:00   18.32 .326
     [CN= 76.0: N= 1.10]
     [Tp= 2.52:DT= 5.00]
007:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD          01:213         378.78     .249 No_date   13:20   13.75  n/a
                   + 02:203          46.74     .071 No_date   12:00   18.32  n/a
     [DT= 5.00]  SUM= 03:200b        425.52     .319 No_date   12:50   14.26  n/a
007:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:200b        425.52     .319 No_date   12:50   14.26  n/a
     [RDT= 5.00] out<- 01:214         425.52     .319 No_date   13:05   14.26  n/a
     [L/S/n=  543./ .520/.035]
     {Vmax=  .514:Dmax=  .157}
007:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:204          29.39     .071 No_date   11:15   18.32 .326
     [CN= 76.0: N= 1.10]
     [Tp= 1.42:DT= 5.00]
007:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      03:205          10.89     .235 No_date    6:50   20.67 .368
     [CN= 78.0: N= 3.00]
     [Tp=  .80:DT= 5.00]
007:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD          01:214         425.52     .319 No_date   13:05   14.26  n/a
                   + 02:204          29.39     .071 No_date   11:15   18.32  n/a
                   + 03:205          10.89     .235 No_date    6:50   20.67  n/a
     [DT= 5.00]  SUM= 10:200         465.80     .417 No_date    7:20   14.66  n/a
007:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      01:301          86.43     .126 No_date   11:50    9.97 .178
     [CN= 63.0: N= 1.10]
     [Tp= 1.24:DT= 5.00]
007:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:302          80.69     .096 No_date   12:00   10.90 .194
     [CN= 64.0: N= 1.10]
     [Tp= 1.80:DT= 5.00]
007:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD          01:301          86.43     .126 No_date   11:50    9.97  n/a
                   + 02:302          80.69     .096 No_date   12:00   10.90  n/a
     [DT= 5.00]  SUM= 03:300a        167.12     .222 No_date   12:00   10.42  n/a
007:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300a        167.12     .222 No_date   12:00   10.42  n/a
     [RDT= 5.00] out<- 01:310         167.12     .222 No_date   12:00   10.42  n/a
     [L/S/n=  449./1.620/.040]
     {Vmax=  .491:Dmax=  .084}
007:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:303          65.16     .126 No_date   11:05   13.85 .247
     [CN= 69.0: N= 1.10]
     [Tp= 1.31:DT= 5.00]
007:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD          01:310         167.12     .222 No_date   12:00   10.42  n/a
                   + 02:303          65.16     .126 No_date   11:05   13.85  n/a
     [DT= 5.00]  SUM= 03:300b        232.28     .348 No_date   12:00   11.38  n/a
007:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300b        232.28     .348 No_date   12:00   11.38  n/a
     [RDT= 5.00] out<- 01:312         232.28     .348 No_date   12:00   11.38  n/a
     [L/S/n=  423./1.170/.035]
     {Vmax=  .535:Dmax=  .089}
007:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:304          18.78     .060 No_date   10:30   19.34 .344
     [CN= 77.0: N= 1.10]
     [Tp= 1.04:DT= 5.00]
007:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD          01:312         232.28     .348 No_date   12:00   11.38  n/a
                   + 02:304          18.78     .060 No_date   10:30   19.34  n/a
     [DT= 5.00]  SUM= 03:300c        251.06     .406 No_date   12:00   11.98  n/a
007:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300c        251.06     .406 No_date   12:00   11.98  n/a
     [RDT= 5.00] out<- 01:313         251.06     .406 No_date   12:00   11.98  n/a
     [L/S/n=  219./1.280/.035]
     {Vmax=  .809:Dmax=  .227}
007:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:305           2.61     .024 No_date    6:35   17.13 .305
     [CN= 72.0: N= 1.10]
     [Tp=  .22:DT= 5.00]
007:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD          01:313         251.06     .406 No_date   12:00   11.98  n/a
                   + 02:305           2.61     .024 No_date    6:35   17.13  n/a
     [DT= 5.00]  SUM= 09:300         253.67     .416 No_date   11:15   12.03  n/a
007:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      01:401          16.78     .028 No_date   12:00   14.34 .255
     [CN= 68.0: N= 1.10]
     [Tp= 1.66:DT= 5.00]
007:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:402          10.89     .043 No_date    9:00   20.15 .359
     [CN= 78.0: N= 1.10]
     [Tp=  .85:DT= 5.00]
007:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      03:403           2.37     .018 No_date    7:00   16.74 .298
     [CN= 70.0: N= 1.10]
     [Tp=  .27:DT= 5.00]
007:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD          01:401          16.78     .028 No_date   12:00   14.34  n/a
                   + 02:402          10.89     .043 No_date    9:00   20.15  n/a
                   + 03:403           2.37     .018 No_date    7:00   16.74  n/a
     [DT= 5.00]  SUM= 08:400          30.04     .083 No_date    9:00   16.63  n/a
007:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD          08:400          30.04     .083 No_date    9:00   16.63  n/a
                   + 09:300         253.67     .416 No_date   11:15   12.03  n/a
     [DT= 5.00]  SUM= 01:TRIB3       283.71     .494 No_date   11:10   12.52  n/a
007:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD          10:200         465.80     .417 No_date    7:20   14.66  n/a
                   + 01:TRIB3       283.71     .494 No_date   11:10   12.52  n/a
     [DT= 5.00]  SUM= 07:CONFL       749.51     .900 No_date   12:00   13.85  n/a
007:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      01:501          62.65     .259 No_date    9:00   16.60 .296
     [CN= 74.0: N= 1.10]
     [Tp=  .60:DT= 5.00]
007:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:502          51.84     .143 No_date    9:00   13.06 .233
     [CN= 68.0: N= 1.10]
     [Tp=  .75:DT= 5.00]
007:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD          01:501          62.65     .259 No_date    9:00   16.60  n/a
                   + 02:502          51.84     .143 No_date    9:00   13.06  n/a
     [DT= 5.00]  SUM= 06:500         114.49     .402 No_date    9:00   15.00  n/a
007:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD          07:CONFL       749.51     .900 No_date   12:00   13.85  n/a
                   + 06:500         114.49     .402 No_date    9:00   15.00  n/a
     [DT= 5.00]  SUM= 05:TOTAL       864.00    1.272 No_date   10:40   14.00  n/a
 ** END OF RUN :    7

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RUN:COMMAND#
```

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 008:0001---------------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   8 ]
#******************************************************************************
#  Project Name: [Kanata North]    Project Number: [112117]
#  Date        : 16-09-2015
#  Modeller    : [Kallie Auld]
#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
#  License #   :  5320763
#******************************************************************************
#******************************************************************************
 008:0002---------------------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=10.00:SDUR=  12.00:PTOT=  93.91]
 008:0003--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      01:201          115.14     .224 No_date   12:00   31.04 .331
      [CN= 65.0: N= 1.10]
      [Tp= 3.42:DT= 5.00]
 008:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:201          115.14     .224 No_date   12:00   31.04  n/a
      [RDT= 5.00] out<- 02:211          115.14     .224 No_date   12:35   31.04  n/a
      [L/S/n=  558./ .890/.040]
      {Vmax=  .432:Dmax=  .094}
 008:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      03:202          263.64     .433 No_date   12:50   38.10 .406
      [CN= 70.0: N= 1.10]
      [Tp= 5.14:DT= 5.00]
 008:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           02:211          115.14     .224 No_date   12:35   31.04  n/a
                     + 03:202          263.64     .433 No_date   12:50   38.10  n/a
      [DT= 5.00]  SUM=  01:200a         378.78     .656 No_date   12:40   35.95  n/a
 008:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:200a         378.78     .656 No_date   12:40   35.95  n/a
      [RDT= 5.00] out<- 02:212          378.78     .656 No_date   12:45   35.95  n/a
      [L/S/n=  255./ .880/.035]
      {Vmax=  .821:Dmax=  .400}
 008:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 02:212          378.78     .656 No_date   12:45   35.95  n/a
      [RDT= 5.00] out<- 01:213          378.78     .656 No_date   13:00   35.95  n/a
      [L/S/n=  437./ .500/.035]
      {Vmax=  .530:Dmax=  .182}
 008:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      02:203           46.74     .172 No_date   12:00   44.73 .476
      [CN= 76.0: N= 1.10]
      [Tp= 2.52:DT= 5.00]
 008:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:213          378.78     .656 No_date   13:00   35.95  n/a
                     + 02:203           46.74     .172 No_date   12:00   44.73  n/a
      [DT= 5.00]  SUM=  03:200b         425.52     .826 No_date   12:40   36.92  n/a
 008:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:200b         425.52     .826 No_date   12:40   36.92  n/a
      [RDT= 5.00] out<- 01:214          425.52     .825 No_date   12:50   36.92  n/a
      [L/S/n=  543./ .520/.035]
      {Vmax=  .703:Dmax=  .268}
 008:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      02:204           29.39     .172 No_date   10:40   44.73 .476
      [CN= 76.0: N= 1.10]
      [Tp= 1.42:DT= 5.00]
 008:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      03:205           10.89     .567 No_date    6:45   48.43 .516
      [CN= 78.0: N= 3.00]
      [Tp=  .80:DT= 5.00]
 008:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:214          425.52     .825 No_date   12:50   36.92  n/a
                     + 02:204           29.39     .172 No_date   10:40   44.73  n/a
                     + 03:205           10.89     .567 No_date    6:45   48.43  n/a
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      [DT= 5.00]  SUM=  10:200          465.80    1.129 No_date    7:10   37.68  n/a
 008:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      01:301           86.43     .363 No_date   10:40   28.86 .307
      [CN= 63.0: N= 1.10]
      [Tp= 1.24:DT= 5.00]
 008:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      02:302           80.69     .268 No_date   12:00   30.50 .325
      [CN= 64.0: N= 1.10]
      [Tp= 1.80:DT= 5.00]
 008:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:301           86.43     .363 No_date   10:40   28.86  n/a
                     + 02:302           80.69     .268 No_date   12:00   30.50  n/a
      [DT= 5.00]  SUM=  03:300a         167.12     .629 No_date   11:20   29.65  n/a
 008:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:300a         167.12     .629 No_date   11:20   29.65  n/a
      [RDT= 5.00] out<- 01:310          167.12     .629 No_date   11:30   29.65  n/a
      [L/S/n=  449./1.620/.040]
      {Vmax=  .705:Dmax=  .149}
 008:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      02:303           65.16     .330 No_date   10:35   36.29 .386
      [CN= 69.0: N= 1.10]
      [Tp= 1.31:DT= 5.00]
 008:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:310          167.12     .629 No_date   11:30   29.65  n/a
                     + 02:303           65.16     .330 No_date   10:35   36.29  n/a
      [DT= 5.00]  SUM=  03:300b         232.28     .958 No_date   11:05   31.51  n/a
 008:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:300b         232.28     .958 No_date   11:05   31.51  n/a
      [RDT= 5.00] out<- 01:312          232.28     .958 No_date   11:15   31.51  n/a
      [L/S/n=  423./1.170/.035]
      {Vmax=  .802:Dmax=  .164}
 008:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      02:304           18.78     .146 No_date    9:20   46.40 .494
      [CN= 77.0: N= 1.10]
      [Tp= 1.04:DT= 5.00]
 008:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:312          232.28     .958 No_date   11:15   31.51  n/a
                     + 02:304           18.78     .146 No_date    9:20   46.40  n/a
      [DT= 5.00]  SUM=  03:300c         251.06    1.101 No_date   10:45   32.63  n/a
 008:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:300c         251.06    1.101 No_date   10:45   32.63  n/a
      [RDT= 5.00] out<- 01:313          251.06    1.101 No_date   10:50   32.63  n/a
      [L/S/n=  219./1.280/.035]
      {Vmax=  .961:Dmax=  .344}
 008:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      02:305            2.61     .060 No_date    6:30   41.68 .444
      [CN= 72.0: N= 1.10]
      [Tp=  .22:DT= 5.00]
 008:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:313          251.06    1.101 No_date   10:50   32.63  n/a
                     + 02:305            2.61     .060 No_date    6:30   41.68  n/a
      [DT= 5.00]  SUM=  09:300          253.67    1.126 No_date   10:50   32.72  n/a
 008:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      01:401           16.78     .071 No_date   12:00   36.59 .390
      [CN= 68.0: N= 1.10]
      [Tp= 1.66:DT= 5.00]
 008:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      02:402           10.89     .102 No_date    9:00   47.79 .509
      [CN= 78.0: N= 1.10]
      [Tp=  .85:DT= 5.00]
 008:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      03:403            2.37     .045 No_date    6:45   40.46 .431
      [CN= 70.0: N= 1.10]
      [Tp=  .27:DT= 5.00]
 008:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:401           16.78     .071 No_date   12:00   36.59  n/a
                     + 02:402           10.89     .102 No_date    9:00   47.79  n/a
                     + 03:403            2.37     .045 No_date    6:45   40.46  n/a
      [DT= 5.00]  SUM=  08:400           30.04     .204 No_date    9:00   40.95  n/a
 008:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           08:400           30.04     .204 No_date    9:00   40.95  n/a
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                + 09:300          253.67    1.126 No_date   10:50    32.72  n/a
     [DT= 5.00]  SUM=  01:TRIB3      283.71    1.319 No_date   10:45    33.59  n/a
 008:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             10:200        465.80    1.129 No_date    7:10    37.68  n/a
                + 01:TRIB3        283.71    1.319 No_date   10:45    33.59  n/a
     [DT= 5.00]  SUM=  07:CONFL      749.51    2.345 No_date   11:10    36.13  n/a
 008:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        01:501         62.65     .665 No_date    8:00    41.76 .445
     [CN= 74.0: N= 1.10]
     [Tp=  .60:DT= 5.00]
 008:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        02:502         51.84     .387 No_date    9:00    34.87 .371
     [CN= 68.0: N= 1.10]
     [Tp=  .75:DT= 5.00]
 008:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:501         62.65     .665 No_date    8:00    41.76  n/a
                + 02:502           51.84     .387 No_date    9:00    34.87  n/a
     [DT= 5.00]  SUM=  06:500        114.49    1.045 No_date    8:20    38.64  n/a
 008:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             07:CONFL      749.51    2.345 No_date   11:10    36.13  n/a
                + 06:500          114.49    1.045 No_date    8:20    38.64  n/a
     [DT= 5.00]  SUM=  05:TOTAL      864.00    3.343 No_date    9:15    36.46  n/a
  ** END OF RUN :   8

*******************************************************************************




 RUN:COMMAND#
 009:0001------------------------------------------------------------------------
    START
     [TZERO =    .00 hrs on        0]
     [METOUT=   2    (1=imperial, 2=metric output)]
     [NSTORM=   1 ]
     [NRUN  =   9 ]
#*******************************************************************************
#  Project Name: [Kanata North]    Project Number: [112117]
#  Date        : 16-09-2015
#  Modeller    : [Kallie Auld]
#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
#  License #   :  5320763
#*******************************************************************************
#*******************************************************************************
 009:0002------------------------------------------------------------------------
    READ STORM
     Filename = STORM.001
     Comment  =
     [SDT=60.00:SDUR=  24.00:PTOT=  25.05]
 009:0003--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        01:201        115.14     .008 No_date   24:00     1.24 .049
     [CN= 65.0: N= 1.10]
     [Tp= 3.42:DT= 5.00]
 009:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:201         115.14     .008 No_date   24:00     1.24  n/a
     [RDT= 5.00] out<- 02:211         115.14     .008 No_date   24:25     1.24  n/a
     [L/S/n=  558./ .890/.040]
     {Vmax=  .423:Dmax=  .004}
 009:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        03:202        263.64     .026 No_date   24:00     2.39 .095
     [CN= 70.0: N= 1.10]
     [Tp= 5.14:DT= 5.00]
 009:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             02:211        115.14     .008 No_date   24:25     1.24  n/a
                + 03:202          263.64     .026 No_date   24:00     2.39  n/a
     [DT= 5.00]  SUM=  01:200a       378.78     .035 No_date   24:15     2.04  n/a
 009:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:200a        378.78     .035 No_date   24:15     2.04  n/a
     [RDT= 5.00] out<- 02:212         378.78     .035 No_date   24:25     2.04  n/a
     [L/S/n=  255./ .880/.035]
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     {Vmax=  .395:Dmax=  .127}
 009:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:212         378.78     .035 No_date   24:25     2.04  n/a
     [RDT= 5.00] out<- 01:213         378.78     .035 No_date   25:05     2.04  n/a
     [L/S/n=  437./ .500/.035]
     {Vmax=  .198:Dmax=  .034}
 009:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        02:203         46.74     .011 No_date   24:00     3.12 .124
     [CN= 76.0: N= 1.10]
     [Tp= 2.52:DT= 5.00]
 009:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:213        378.78     .035 No_date   25:05     2.04  n/a
                + 02:203           46.74     .011 No_date   24:00     3.12  n/a
     [DT= 5.00]  SUM=  03:200b       425.52     .045 No_date   24:35     2.16  n/a
 009:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:200b        425.52     .045 No_date   24:35     2.16  n/a
     [RDT= 5.00] out<- 01:214         425.52     .045 No_date   25:10     2.16  n/a
     [L/S/n=  543./ .520/.035]
     {Vmax=  .320:Dmax=  .043}
 009:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        02:204         29.39     .010 No_date   21:00     3.12 .124
     [CN= 76.0: N= 1.10]
     [Tp= 1.42:DT= 5.00]
 009:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        03:205         10.89     .031 No_date   12:45     4.00 .160
     [CN= 78.0: N= 3.00]
     [Tp=  .80:DT= 5.00]
 009:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:214        425.52     .045 No_date   25:10     2.16  n/a
                + 02:204           29.39     .010 No_date   21:00     3.12  n/a
                + 03:205           10.89     .031 No_date   12:45     4.00  n/a
     [DT= 5.00]  SUM=  10:200        465.80     .057 No_date   24:05     2.26  n/a
 009:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        01:301         86.43     .010 No_date   22:00     1.00 .040
     [CN= 63.0: N= 1.10]
     [Tp= 1.24:DT= 5.00]
 009:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        02:302         80.69     .010 No_date   24:00     1.28 .051
     [CN= 64.0: N= 1.10]
     [Tp= 1.80:DT= 5.00]
 009:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:301         86.43     .010 No_date   22:00     1.00  n/a
                + 02:302           80.69     .010 No_date   24:00     1.28  n/a
     [DT= 5.00]  SUM=  03:300a       167.12     .020 No_date   22:50     1.13  n/a
 009:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300a        167.12     .020 No_date   22:50     1.13  n/a
     [RDT= 5.00] out<- 01:310         167.12     .020 No_date   23:15     1.13  n/a
     [L/S/n=  449./1.620/.040]
     {Vmax=  .430:Dmax=  .011}
 009:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        02:303         65.16     .015 No_date   21:00     2.00 .080
     [CN= 69.0: N= 1.10]
     [Tp= 1.31:DT= 5.00]
 009:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:310        167.12     .020 No_date   23:15     1.13  n/a
                + 02:303           65.16     .015 No_date   21:00     2.00  n/a
     [DT= 5.00]  SUM=  03:300b       232.28     .035 No_date   22:00     1.38  n/a
 009:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300b        232.28     .035 No_date   22:00     1.38  n/a
     [RDT= 5.00] out<- 01:312         232.28     .035 No_date   22:10     1.38  n/a
     [L/S/n=  423./1.170/.035]
     {Vmax=  .421:Dmax=  .014}
 009:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        02:304         18.78     .009 No_date   18:00     3.47 .138
     [CN= 77.0: N= 1.10]
     [Tp= 1.04:DT= 5.00]
 009:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:312        232.28     .035 No_date   22:10     1.38  n/a
                + 02:304           18.78     .009 No_date   18:00     3.47  n/a
     [DT= 5.00]  SUM=  03:300c       251.06     .043 No_date   21:40     1.53  n/a
 009:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
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```
     ROUTE CHANNEL   -> 03:300c         251.06     .043 No_date   21:40    1.53  n/a
      [RDT= 5.00] out<- 01:313          251.06     .043 No_date   21:45    1.53  n/a
      [L/S/n=  219./1.280/.035]
      {Vmax=  .645:Dmax=  .042}
 009:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:305             2.61     .003 No_date   13:00    3.20 .128
      [CN= 72.0: N= 1.10]
      [Tp=  .22:DT= 5.00]
 009:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:313          251.06     .043 No_date   21:45    1.53  n/a
                     +  02:305             2.61     .003 No_date   13:00    3.20  n/a
      [DT= 5.00]  SUM=  09:300          253.67     .044 No_date   21:35    1.55  n/a
 009:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:401            16.78     .004 No_date   21:00    2.37 .095
      [CN= 68.0: N= 1.10]
      [Tp= 1.66:DT= 5.00]
 009:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:402            10.89     .006 No_date   16:15    3.70 .148
      [CN= 78.0: N= 1.10]
      [Tp=  .85:DT= 5.00]
 009:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:403             2.37     .003 No_date   13:00    3.32 .133
      [CN= 70.0: N= 1.10]
      [Tp=  .27:DT= 5.00]
 009:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:401            16.78     .004 No_date   21:00    2.37  n/a
                     +  02:402            10.89     .006 No_date   16:15    3.70  n/a
                     +  03:403             2.37     .003 No_date   13:00    3.32  n/a
      [DT= 5.00]  SUM=  08:400            30.04     .012 No_date   16:00    2.93  n/a
 009:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            08:400            30.04     .012 No_date   16:00    2.93  n/a
                     +  09:300          253.67     .044 No_date   21:35    1.55  n/a
      [DT= 5.00]  SUM=  01:TRIB3        283.71     .054 No_date   19:00    1.70  n/a
 009:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            10:200          465.80     .057 No_date   24:05    2.26  n/a
                     +  01:TRIB3        283.71     .054 No_date   19:00    1.70  n/a
      [DT= 5.00]  SUM=  07:CONFL        749.51     .110 No_date   21:55    2.05  n/a
 009:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:501            62.65     .030 No_date   16:00    2.59 .103
      [CN= 74.0: N= 1.10]
      [Tp=  .60:DT= 5.00]
 009:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:502            51.84     .015 No_date   18:00    1.77 .071
      [CN= 68.0: N= 1.10]
      [Tp=  .75:DT= 5.00]
 009:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:501            62.65     .030 No_date   16:00    2.59  n/a
                     +  02:502            51.84     .015 No_date   18:00    1.77  n/a
      [DT= 5.00]  SUM=  06:500          114.49     .045 No_date   16:00    2.22  n/a
 009:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            07:CONFL        749.51     .110 No_date   21:55    2.05  n/a
                     +  06:500          114.49     .045 No_date   16:00    2.22  n/a
      [DT= 5.00]  SUM=  05:TOTAL        864.00     .149 No_date   18:30    2.07  n/a
  ** END OF RUN :   9

*******************************************************************************




 RUN:COMMAND#
 010:0001------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =  10 ]
#******************************************************************************
#  Project Name: [Kanata North]    Project Number: [112117]
#  Date        : 16-09-2015
#  Modeller    : [Kallie Auld]
#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
#  License #   :  5320763
#******************************************************************************
#******************************************************************************
 010:0002------------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=60.00:SDUR=  24.00:PTOT=  48.02]
 010:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:201          115.14     .052 No_date   24:00    7.73 .161
      [CN= 65.0: N= 1.10]
      [Tp= 3.42:DT= 5.00]
 010:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:201          115.14     .052 No_date   24:00    7.73  n/a
      [RDT= 5.00] out<- 02:211          115.14     .052 No_date   24:15    7.73  n/a
      [L/S/n=  558./ .890/.040]
      {Vmax=  .423:Dmax=  .024}
 010:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:202          263.64     .120 No_date   24:00   10.90 .227
      [CN= 70.0: N= 1.10]
      [Tp= 5.14:DT= 5.00]
 010:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:211          115.14     .052 No_date   24:15    7.73  n/a
                     +  03:202          263.64     .120 No_date   24:00   10.90  n/a
      [DT= 5.00]  SUM=  01:200a         378.78     .172 No_date   24:05    9.94  n/a
 010:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:200a         378.78     .172 No_date   24:05    9.94  n/a
      [RDT= 5.00] out<- 02:212          378.78     .172 No_date   24:10    9.94  n/a
      [L/S/n=  255./ .880/.035]
      {Vmax=  .622:Dmax=  .244}
 010:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 02:212          378.78     .172 No_date   24:10    9.94  n/a
      [RDT= 5.00] out<- 01:213          378.78     .172 No_date   24:25    9.94  n/a
      [L/S/n=  437./ .500/.035]
      {Vmax=  .345:Dmax=  .087}
 010:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:203            46.74     .046 No_date   22:00   13.54 .282
      [CN= 76.0: N= 1.10]
      [Tp= 2.52:DT= 5.00]
 010:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:213          378.78     .172 No_date   24:25    9.94  n/a
                     +  02:203            46.74     .046 No_date   22:00   13.54  n/a
      [DT= 5.00]  SUM=  03:200b         425.52     .217 No_date   24:05   10.33  n/a
 010:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:200b         425.52     .217 No_date   24:05   10.33  n/a
      [RDT= 5.00] out<- 01:214          425.52     .218 No_date   24:10   10.33  n/a
      [L/S/n=  543./ .520/.035]
      {Vmax=  .451:Dmax=  .127}
 010:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:204            29.39     .044 No_date   18:00   13.54 .282
      [CN= 76.0: N= 1.10]
      [Tp= 1.42:DT= 5.00]
 010:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:205            10.89     .134 No_date   12:35   15.53 .324
      [CN= 78.0: N= 3.00]
      [Tp=  .80:DT= 5.00]
 010:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:214          425.52     .218 No_date   24:10   10.33  n/a
                     +  02:204            29.39     .044 No_date   18:00   13.54  n/a
                     +  03:205            10.89     .134 No_date   12:35   15.53  n/a
      [DT= 5.00]  SUM=  10:200          465.80     .266 No_date   24:05   10.66  n/a
 010:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:301            86.43     .072 No_date   18:00    6.90 .144
      [CN= 63.0: N= 1.10]
      [Tp= 1.24:DT= 5.00]
 010:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:302            80.69     .058 No_date   21:00    7.66 .159
      [CN= 64.0: N= 1.10]
      [Tp= 1.80:DT= 5.00]
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010:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:301           86.43     .072 No_date   18:00    6.90  n/a
                    +  02:302           80.69     .058 No_date   21:00    7.66  n/a
     [DT= 5.00]  SUM=  03:300a         167.12     .128 No_date   19:00    7.27  n/a
010:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300a         167.12     .128 No_date   19:00    7.27  n/a
     [RDT= 5.00] out<- 01:310          167.12     .128 No_date   19:05    7.27  n/a
     [L/S/n=  449./1.620/.040]
     {Vmax=  .438:Dmax=  .064}
010:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:303           65.16     .076 No_date   18:00    9.99 .208
     [CN= 69.0: N= 1.10]
     [Tp= 1.31:DT= 5.00]
010:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:310          167.12     .128 No_date   19:05    7.27  n/a
                    +  02:303           65.16     .076 No_date   18:00    9.99  n/a
     [DT= 5.00]  SUM=  03:300b         232.28     .204 No_date   18:30    8.03  n/a
010:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300b         232.28     .204 No_date   18:30    8.03  n/a
     [RDT= 5.00] out<- 01:312          232.28     .204 No_date   18:50    8.03  n/a
     [L/S/n=  423./1.170/.035]
     {Vmax=  .450:Dmax=  .065}
010:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:304           18.78     .038 No_date   16:00   14.40 .300
     [CN= 77.0: N= 1.10]
     [Tp= 1.04:DT= 5.00]
010:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:312          232.28     .204 No_date   18:50    8.03  n/a
                    +  02:304           18.78     .038 No_date   16:00   14.40  n/a
     [DT= 5.00]  SUM=  03:300c         251.06     .241 No_date   18:30    8.50  n/a
010:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300c         251.06     .241 No_date   18:30    8.50  n/a
     [RDT= 5.00] out<- 01:313          251.06     .240 No_date   18:35    8.50  n/a
     [L/S/n=  219./1.280/.035]
     {Vmax=  .714:Dmax=  .164}
010:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:305            2.61     .014 No_date   13:00   12.74 .265
     [CN= 72.0: N= 1.10]
     [Tp=  .22:DT= 5.00]
010:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:313          251.06     .240 No_date   18:35    8.50  n/a
                    +  02:305            2.61     .014 No_date   13:00   12.74  n/a
     [DT= 5.00]  SUM=  09:300          253.67     .245 No_date   18:30    8.55  n/a
010:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:401           16.78     .017 No_date   18:50   10.48 .218
     [CN= 68.0: N= 1.10]
     [Tp= 1.66:DT= 5.00]
010:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:402           10.89     .026 No_date   15:10   15.05 .314
     [CN= 78.0: N= 1.10]
     [Tp=  .85:DT= 5.00]
010:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:403            2.37     .011 No_date   13:00   12.53 .261
     [CN= 70.0: N= 1.10]
     [Tp=  .27:DT= 5.00]
010:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:401           16.78     .017 No_date   18:50   10.48  n/a
                    +  02:402           10.89     .026 No_date   15:10   15.05  n/a
                    +  03:403            2.37     .011 No_date   13:00   12.53  n/a
     [DT= 5.00]  SUM=  08:400           30.04     .051 No_date   14:15   12.30  n/a
010:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            08:400           30.04     .051 No_date   14:15   12.30  n/a
                    +  09:300          253.67     .245 No_date   18:30    8.55  n/a
     [DT= 5.00]  SUM=  01:TRIB3        283.71     .293 No_date   18:05    8.95  n/a
010:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            10:200          465.80     .266 No_date   24:05   10.66  n/a
                    +  01:TRIB3        283.71     .293 No_date   18:05    8.95  n/a
     [DT= 5.00]  SUM=  07:CONFL        749.51     .549 No_date   18:35   10.01  n/a
010:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:501           62.65     .156 No_date   14:00   12.13 .253
     [CN= 74.0: N= 1.10]
     [Tp=  .60:DT= 5.00]
010:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:502           51.84     .083 No_date   15:20    9.35 .195
     [CN= 68.0: N= 1.10]
     [Tp=  .75:DT= 5.00]
010:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:501           62.65     .156 No_date   14:00   12.13  n/a
                    +  02:502           51.84     .083 No_date   15:20    9.35  n/a
     [DT= 5.00]  SUM=  06:500          114.49     .237 No_date   14:25   10.87  n/a
010:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            07:CONFL        749.51     .549 No_date   18:35   10.01  n/a
                    +  06:500          114.49     .237 No_date   14:25   10.87  n/a
     [DT= 5.00]  SUM=  05:TOTAL        864.00     .762 No_date   18:00   10.12  n/a
 ** END OF RUN :  10

*******************************************************************************




 RUN:COMMAND#
 011:0001------------------------------------------------------------------------------
    START
     [TZERO =    .00 hrs on        0]
     [METOUT=   2    (1=imperial, 2=metric output)]
     [NSTORM=   1 ]
     [NRUN  =  11 ]
#******************************************************************************
#  Project Name: [Kanata North]    Project Number: [112117]
#  Date        : 16-09-2015
#  Modeller    : [Kallie Auld]
#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
#  License #   :  5320763
#******************************************************************************
#******************************************************************************
 011:0002------------------------------------------------------------------------------
    READ STORM
     Filename = STORM.001
     Comment  =
     [SDT=60.00:SDUR=  24.00:PTOT=  61.92]
 011:0003---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:201          115.14     .091 No_date   24:00   13.63 .220
     [CN= 65.0: N= 1.10]
     [Tp= 3.42:DT= 5.00]
 011:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:201          115.14     .091 No_date   24:00   13.63  n/a
     [RDT= 5.00] out<- 02:211          115.14     .091 No_date   24:10   13.63  n/a
     [L/S/n=  558./ .890/.040]
     {Vmax=  .423:Dmax=  .042}
 011:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:202          263.64     .198 No_date   24:00   18.03 .291
     [CN= 70.0: N= 1.10]
     [Tp= 5.14:DT= 5.00]
 011:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:211          115.14     .091 No_date   24:10   13.63  n/a
                    +  03:202          263.64     .198 No_date   24:00   18.03  n/a
     [DT= 5.00]  SUM=  01:200a         378.78     .289 No_date   24:00   16.69  n/a
 011:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:200a         378.78     .289 No_date   24:00   16.69  n/a
     [RDT= 5.00] out<- 02:212          378.78     .289 No_date   24:10   16.69  n/a
     [L/S/n=  255./ .880/.035]
     {Vmax=  .701:Dmax=  .298}
 011:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:212          378.78     .289 No_date   24:10   16.69  n/a
     [RDT= 5.00] out<- 01:213          378.78     .289 No_date   24:25   16.69  n/a
     [L/S/n=  437./ .500/.035]
     {Vmax=  .411:Dmax=  .116}
 011:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:203           46.74     .075 No_date   21:15   21.93 .354
     [CN= 76.0: N= 1.10]
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      [Tp= 2.52:DT= 5.00]
 011:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:213           378.78     .289 No_date   24:25   16.69  n/a
                     + 02:203            46.74     .075 No_date   21:15   21.93  n/a
      [DT= 5.00]  SUM=  03:200b         425.52     .363 No_date   24:10   17.27  n/a
 011:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:200b         425.52     .363 No_date   24:10   17.27  n/a
      [RDT= 5.00] out<- 01:214          425.52     .363 No_date   24:20   17.27  n/a
      [L/S/n=  543./ .520/.035]
      {Vmax=  .534:Dmax=  .169}
 011:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:204           29.39     .072 No_date   18:00   21.93 .354
      [CN= 76.0: N= 1.10]
      [Tp= 1.42:DT= 5.00]
 011:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:205           10.89     .216 No_date   12:35   24.51 .396
      [CN= 78.0: N= 3.00]
      [Tp=  .80:DT= 5.00]
 011:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:214           425.52     .363 No_date   24:20   17.27  n/a
                     + 02:204            29.39     .072 No_date   18:00   21.93  n/a
                     + 03:205            10.89     .216 No_date   12:35   24.51  n/a
      [DT= 5.00]  SUM=  10:200          465.80     .441 No_date   21:30   17.73  n/a
 011:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:301           86.43     .130 No_date   18:00   12.39 .200
      [CN= 63.0: N= 1.10]
      [Tp= 1.24:DT= 5.00]
 011:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:302           80.69     .101 No_date   21:00   13.42 .217
      [CN= 64.0: N= 1.10]
      [Tp= 1.80:DT= 5.00]
 011:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:301            86.43     .130 No_date   18:00   12.39  n/a
                     + 02:302            80.69     .101 No_date   21:00   13.42  n/a
      [DT= 5.00]  SUM=  03:300a         167.12     .230 No_date   18:05   12.89  n/a
 011:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:300a         167.12     .230 No_date   18:05   12.89  n/a
      [RDT= 5.00] out<- 01:310          167.12     .230 No_date   18:30   12.89  n/a
      [L/S/n=  449./1.620/.040]
      {Vmax=  .496:Dmax=  .086}
 011:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:303           65.16     .129 No_date   18:00   16.82 .272
      [CN= 69.0: N= 1.10]
      [Tp= 1.31:DT= 5.00]
 011:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:310           167.12     .230 No_date   18:30   12.89  n/a
                     + 02:303            65.16     .129 No_date   18:00   16.82  n/a
      [DT= 5.00]  SUM=  03:300b         232.28     .358 No_date   18:10   13.99  n/a
 011:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:300b         232.28     .358 No_date   18:10   13.99  n/a
      [RDT= 5.00] out<- 01:312          232.28     .358 No_date   18:25   13.99  n/a
      [L/S/n=  423./1.170/.035]
      {Vmax=  .543:Dmax=  .091}
 011:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:304           18.78     .061 No_date   16:00   23.06 .372
      [CN= 77.0: N= 1.10]
      [Tp= 1.04:DT= 5.00]
 011:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:312           232.28     .358 No_date   18:25   13.99  n/a
                     + 02:304            18.78     .061 No_date   16:00   23.06  n/a
      [DT= 5.00]  SUM=  03:300c         251.06     .418 No_date   18:10   14.67  n/a
 011:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:300c         251.06     .418 No_date   18:10   14.67  n/a
      [RDT= 5.00] out<- 01:313          251.06     .418 No_date   18:15   14.67  n/a
      [L/S/n=  219./1.280/.035]
      {Vmax=  .811:Dmax=  .229}
 011:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:305            2.61     .023 No_date   13:00   20.45 .330
      [CN= 72.0: N= 1.10]
      [Tp=  .22:DT= 5.00]
 011:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:313           251.06     .418 No_date   18:15   14.67  n/a
                     + 02:305             2.61     .023 No_date   13:00   20.45  n/a
      [DT= 5.00]  SUM=  09:300          253.67     .426 No_date   18:10   14.73  n/a
 011:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:401           16.78     .029 No_date   18:15   17.29 .279
      [CN= 68.0: N= 1.10]
      [Tp= 1.66:DT= 5.00]
 011:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:402           10.89     .043 No_date   15:00   23.97 .387
      [CN= 78.0: N= 1.10]
      [Tp=  .85:DT= 5.00]
 011:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:403            2.37     .018 No_date   13:00   19.94 .322
      [CN= 70.0: N= 1.10]
      [Tp=  .27:DT= 5.00]
 011:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:401            16.78     .029 No_date   18:15   17.29  n/a
                     + 02:402            10.89     .043 No_date   15:00   23.97  n/a
                     + 03:403             2.37     .018 No_date   13:00   19.94  n/a
      [DT= 5.00]  SUM=  08:400           30.04     .084 No_date   14:00   19.92  n/a
 011:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           08:400            30.04     .084 No_date   14:00   19.92  n/a
                     + 09:300           253.67     .426 No_date   18:10   14.73  n/a
      [DT= 5.00]  SUM=  01:TRIB3        283.71     .503 No_date   18:00   15.28  n/a
 011:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           10:200           465.80     .441 No_date   21:30   17.73  n/a
                     + 01:TRIB3         283.71     .503 No_date   18:00   15.28  n/a
      [DT= 5.00]  SUM=  07:CONFL        749.51     .929 No_date   18:20   16.80  n/a
 011:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:501           62.65     .264 No_date   14:00   20.00 .323
      [CN= 74.0: N= 1.10]
      [Tp=  .60:DT= 5.00]
 011:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:502           51.84     .144 No_date   15:00   15.93 .257
      [CN= 68.0: N= 1.10]
      [Tp=  .75:DT= 5.00]
 011:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:501            62.65     .264 No_date   14:00   20.00  n/a
                     + 02:502            51.84     .144 No_date   15:00   15.93  n/a
      [DT= 5.00]  SUM=  06:500          114.49     .407 No_date   14:05   18.16  n/a
 011:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           07:CONFL         749.51     .929 No_date   18:20   16.80  n/a
                     + 06:500           114.49     .407 No_date   14:05   18.16  n/a
      [DT= 5.00]  SUM=  05:TOTAL        864.00    1.289 No_date   16:15   16.98  n/a
  ** END OF RUN :  11

*******************************************************************************




 RUN:COMMAND#
 012:0001-----------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =  12 ]
#******************************************************************************
#  Project Name: [Kanata North]    Project Number: [112117]
#  Date        : 16-09-2015
#  Modeller    : [Kallie Auld]
#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
#  License #   :  5320763
#******************************************************************************
#******************************************************************************
 012:0002-----------------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  =
```

```
     [SDT=60.00:SDUR=  24.00:PTOT= 105.74]
012:0003--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      01:201          115.14     .257 No_date   24:00   38.51 .364
     [CN= 65.0: N= 1.10]
     [Tp= 3.42:DT= 5.00]
012:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:201          115.14     .257 No_date   24:00   38.51  n/a
     [RDT= 5.00] out<- 02:211          115.14     .257 No_date   24:05   38.51  n/a
     [L/S/n=  558./ .890/.040]
     {Vmax=  .442:Dmax=  .101}
012:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      03:202          263.64     .510 No_date   24:00   46.46 .439
     [CN= 70.0: N= 1.10]
     [Tp= 5.14:DT= 5.00]
012:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:211          115.14     .257 No_date   24:05   38.51  n/a
                    + 03:202          263.64     .510 No_date   24:00   46.46  n/a
     [DT= 5.00]  SUM= 01:200a         378.78     .766 No_date   24:00   44.04  n/a
012:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:200a         378.78     .766 No_date   24:00   44.04  n/a
     [RDT= 5.00] out<- 02:212          378.78     .766 No_date   24:05   44.04  n/a
     [L/S/n=  255./ .880/.035]
     {Vmax=  .846:Dmax=  .421}
012:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:212          378.78     .766 No_date   24:05   44.04  n/a
     [RDT= 5.00] out<- 01:213          378.78     .766 No_date   24:10   44.04  n/a
     [L/S/n=  437./ .500/.035]
     {Vmax=  .557:Dmax=  .198}
012:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:203           46.74     .184 No_date   21:00   54.00 .511
     [CN= 76.0: N= 1.10]
     [Tp= 2.52:DT= 5.00]
012:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:213          378.78     .766 No_date   24:10   44.04  n/a
                    + 02:203           46.74     .184 No_date   21:00   54.00  n/a
     [DT= 5.00]  SUM= 03:200b         425.52     .946 No_date   24:10   45.14  n/a
012:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:200b         425.52     .946 No_date   24:10   45.14  n/a
     [RDT= 5.00] out<- 01:214          425.52     .946 No_date   24:10   45.14  n/a
     [L/S/n=  543./ .520/.035]
     {Vmax=  .729:Dmax=  .287}
012:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:204           29.39     .180 No_date   17:50   54.00 .511
     [CN= 76.0: N= 1.10]
     [Tp= 1.42:DT= 5.00]
012:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      03:205           10.89     .532 No_date   12:30   58.05 .549
     [CN= 78.0: N= 3.00]
     [Tp=  .80:DT= 5.00]
012:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:214          425.52     .946 No_date   24:10   45.14  n/a
                    + 02:204           29.39     .180 No_date   17:50   54.00  n/a
                    + 03:205           10.89     .532 No_date   12:30   58.05  n/a
     [DT= 5.00]  SUM= 10:200          465.80    1.144 No_date   13:05   46.00  n/a
012:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      01:301           86.43     .383 No_date   18:00   35.99 .340
     [CN= 63.0: N= 1.10]
     [Tp= 1.24:DT= 5.00]
012:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:302           80.69     .287 No_date   18:25   37.84 .358
     [CN= 64.0: N= 1.10]
     [Tp= 1.80:DT= 5.00]
012:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:301           86.43     .383 No_date   18:00   35.99  n/a
                    + 02:302           80.69     .287 No_date   18:25   37.84  n/a
     [DT= 5.00]  SUM= 03:300a         167.12     .670 No_date   18:00   36.88  n/a
012:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300a         167.12     .670 No_date   18:00   36.88  n/a
     [RDT= 5.00] out<- 01:310          167.12     .669 No_date   18:05   36.88  n/a
     [L/S/n=  449./1.620/.040]
     {Vmax=  .720:Dmax=  .154}
012:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:303           65.16     .345 No_date   17:40   44.45 .420
     [CN= 69.0: N= 1.10]
     [Tp= 1.31:DT= 5.00]
012:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:310          167.12     .669 No_date   18:05   36.88  n/a
                    + 02:303           65.16     .345 No_date   17:40   44.45  n/a
     [DT= 5.00]  SUM= 03:300b         232.28    1.014 No_date   18:00   39.01  n/a
012:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300b         232.28    1.014 No_date   18:00   39.01  n/a
     [RDT= 5.00] out<- 01:312          232.28    1.014 No_date   18:05   39.01  n/a
     [L/S/n=  423./1.170/.035]
     {Vmax=  .815:Dmax=  .169}
012:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:304           18.78     .151 No_date   15:15   55.84 .528
     [CN= 77.0: N= 1.10]
     [Tp= 1.04:DT= 5.00]
012:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:312          232.28    1.014 No_date   18:05   39.01  n/a
                    + 02:304           18.78     .151 No_date   15:15   55.84  n/a
     [DT= 5.00]  SUM= 03:300c         251.06    1.159 No_date   18:00   40.26  n/a
012:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300c         251.06    1.159 No_date   18:00   40.26  n/a
     [RDT= 5.00] out<- 01:313          251.06    1.159 No_date   18:00   40.26  n/a
     [L/S/n=  219./1.280/.035]
     {Vmax=  .969:Dmax=  .350}
012:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:305            2.61     .059 No_date   13:00   50.41 .477
     [CN= 72.0: N= 1.10]
     [Tp=  .22:DT= 5.00]
012:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:313          251.06    1.159 No_date   18:00   40.26  n/a
                    + 02:305            2.61     .059 No_date   13:00   50.41  n/a
     [DT= 5.00]  SUM= 09:300          253.67    1.180 No_date   16:30   40.37  n/a
012:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      01:401           16.78     .075 No_date   18:00   44.67 .422
     [CN= 68.0: N= 1.10]
     [Tp= 1.66:DT= 5.00]
012:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:402           10.89     .106 No_date   14:20   57.39 .543
     [CN= 78.0: N= 1.10]
     [Tp=  .85:DT= 5.00]
012:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      03:403            2.37     .046 No_date   13:00   48.93 .463
     [CN= 70.0: N= 1.10]
     [Tp=  .27:DT= 5.00]
012:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:401           16.78     .075 No_date   18:00   44.67  n/a
                    + 02:402           10.89     .106 No_date   14:20   57.39  n/a
                    + 03:403            2.37     .046 No_date   13:00   48.93  n/a
     [DT= 5.00]  SUM= 08:400           30.04     .214 No_date   14:00   49.61  n/a
012:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           08:400           30.04     .214 No_date   14:00   49.61  n/a
                    + 09:300          253.67    1.180 No_date   16:30   40.37  n/a
     [DT= 5.00]  SUM= 01:TRIB3        283.71    1.382 No_date   16:20   41.35  n/a
012:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           10:200          465.80    1.144 No_date   13:05   46.00  n/a
                    + 01:TRIB3        283.71    1.382 No_date   16:20   41.35  n/a
     [DT= 5.00]  SUM= 07:CONFL        749.51    2.481 No_date   18:15   44.24  n/a
012:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      01:501           62.65     .698 No_date   14:00   50.70 .480
     [CN= 74.0: N= 1.10]
     [Tp=  .60:DT= 5.00]
012:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:502           51.84     .404 No_date   14:10   42.86 .405
     [CN= 68.0: N= 1.10]
     [Tp=  .75:DT= 5.00]
012:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:501           62.65     .698 No_date   14:00   50.70  n/a
                    + 02:502           51.84     .404 No_date   14:10   42.86  n/a
     [DT= 5.00]  SUM= 06:500          114.49    1.102 No_date   14:00   47.15  n/a
```

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 012:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           07:CONFL        749.51    2.481 No_date   18:15   44.24  n/a
                     + 06:500          114.49    1.102 No_date   14:00   47.15  n/a
      [DT= 5.00]  SUM=  05:TOTAL        864.00    3.507 No_date   14:00   44.62  n/a
 012:0002-----------------------------------------------------------------------------
      FINISH
--------------------------------------------------------------------------------------
**************************************************************************************
     WARNINGS / ERRORS / NOTES
     -------------------------
   Simulation ended on 2016-05-20     at 09:51:13
======================================================================================
```

Kanata North Community Design Plan
Post-Development SWMHYMO Model Parameters

NOVATECH
Engineers, Planners & Landscape Architects

Post-Development Parameters (STANDHYDs)

Drainage Area ID	Area (m2)	Area (ha)	Slope (%)	Runoff Coefficient	TIMP (%)	XIMP (%)
203a	273,150	27.32	2.3%	0.64	63%	50%
203b	207,574	20.76	2.3%	0.62	60%	48%
203c	49,457	4.95	2.3%	0.70	71%	57%
203d	12,565	1.26	2.3%	0.69	70%	56%
304a	96,118	9.61	1.6%	0.60	57%	46%
402a	56,768	5.68	2.1%	0.71	73%	58%
402b	60,670	6.07	2.1%	0.71	73%	58%
402c	11,860	1.19	2.1%	0.68	69%	55%
SWMF1	26,780	2.68	0.0%	0.76	80%	64%
SWMF2	18,531	1.85	0.0%	0.76	80%	64%
MR1	33,246	3.32	1.0%	0.90	100%	80%
MR2	30,444	3.04	1.0%	0.90	100%	80%
501a	93,236	9.32	2.3%	0.85	93%	74%
501b	384,172	38.42	2.3%	0.67	67%	54%
501c	391,019	39.10	2.3%	0.65	64%	51%
SWMF3	119,834	11.98	0.0%	0.76	80%	64%

*XIMP = 0.8 x TIMP

(Bransby-Williams Method)

Drainage Area ID	Area (m2)	Area (ha)	Area (km2)	Length of Channel (m)	Length of Channel (km)	Slope of Channel (m/m)	Tc (hours)
211	18,704	1.870	0.019	457	0.46	0.005	1.17
212	9,459	0.946	0.009	230	0.23	0.010	0.56
213	14,348	1.435	0.014	320	0.32	0.017	0.67
214	16,854	1.685	0.017	400	0.40	0.014	0.85
215	11,851	1.185	0.012	260	0.26	0.005	0.69
216	11,773	1.177	0.012	260	0.26	0.008	0.65
311	11,499	1.150	0.011	260	0.26	0.024	0.52
312	13,045	1.304	0.013	275	0.28	0.010	0.64
313	7,162	0.716	0.007	160	0.16	0.021	0.34
314	9,385	0.938	0.009	200	0.20	0.013	0.46
401	167,797	16.780	0.168	941	0.94	0.012	1.66
403a	26,583	2.66	0.027	150	0.15	0.027	0.27

Post-Development Parameters (NASHHYDs)

Area ID	Land Use 1	Area	CN	IA (mm)	Land Use 2	Area	CN	IA (mm)	Land Use 3	Area	CN	IA (mm)	Weighted CN	Weighted IA (mm)
211	Cultivated Row Crops (Straight/Contour) (good)	70%	80	7.0	Pasture (good)	25%	65	9.0	Open Space (good)	5%	68	8.0	76	7.6
212	Pasture (good)	75%	65	9.0	Open Space (good)	25%	68	8.0	-	-	-	-	66	8.8
213	Woods (good)	10%	63	12.5	Pasture (good)	50%	65	9.0	Open Space (good)	40%	68	8.0	66	9.0
214	Woods (good)	30%	63	12.5	Cultivated Row Crops (Straight/Contour) (good)	45%	80	7.0	Open Space (good)	25%	68	8.0	72	8.9
215	Woods (good)	60%	63	12.5	Cultivated Row Crops (Straight/Contour) (good)	10%	80	7.0	Open Space (good)	30%	68	8.0	66	10.6
216	Woods (good)	80%	63	12.5	Cultivated Row Crops (Straight/Contour) (good)	5%	80	7.0	Open Space (good)	15%	68	8.0	65	11.6
311	Woods (good)	15%	63	12.5	Pasture (good)	65%	65	9.0	Open Space (good)	20%	68	8.0	65	9.3
312	Woods (good)	5%	63	12.5	Cultivated Row Crops (Straight/Contour) (good)	70%	80	7.0	Open Space (good)	25%	68	8.0	76	7.5
313	Woods (good)	5%	63	12.5	Open Space (good)	95%	68	8.0	-	-	-	-	68	8.2
314	Woods (good)	5%	63	12.5	Open Space (good)	95%	68	8.0	-	-	-	-	68	8.2
401	Woods (good)	22%	63	12.5	Estate Residential	50%	70	4.0	Open Space (good)	28%	68	8.0	68	7.0
403a	Estate/ Rural Residential	90%	70	4.0	Open Space (fair)	10%	74	6.5	-	-	-	-	70	4.3

SCS Curve Numbers and Initial Abstration Values

Landuse	Condition	CN (HSG 'B')	CN (HSG 'C')	AVG. CN (HSG 'B/C')	IA (mm)
Woods	Poor	66	77	67	7.0
	Fair	60	73	63	10.0
	Good	55	70	71	12.5
Estate Residential (2 acre avg. lot size)	12% Impervious	65	77	83	4.0
Open Space (lawns, parks, etc.)	Grass Cover < 50% (Poor)	79	86	74	5.0
	Grass Cover 50% to 75% (Fair)	69	79	68	6.5
	Grass Cover > 75% (Good)	61	74	72	8.0
Agriculture (pasture, grassland or range)	Poor	67	77	74	5.0
	Fair	69	79	65	7.0
	Good	58	72	85	9.0
Agriculture (Cultivated Row Crops - Straight)	Poor	81	88	82	5.0
	Good	78	85	82	7.0
Agriculture (Cultivated Row Crops - Contoured)	Poor	79	84	79	5.0
	Good	75	82	83	7.0
Agriculture (Cultivated Row Crops - Avg. Straight / Contoured)	Poor	80	86	80	5.0
	Good	77	84	#DIV/0!	7.0

Initial Abstraction

Cover Type	IA (mm)	Min IA (mm)	Max IA (mm)
Open Water	0	0	0
Road (Asphalt/Concrete)	2.5	1.25	3.75
Gravel/Fill/Quarry	5	-	-
Estate Lot Residential	4	2.5	4
Open/Grass/Natural	8	5	12.5
Field/Crop (Cultivated)	8	5	12.5
Wood/Brush	10	5	15.2

Kanata North Community Design Plan
Drainage Area Weighted Runoff Coefficieint Calculations

NOVATECH
Engineers, Planners & Landscape Architects

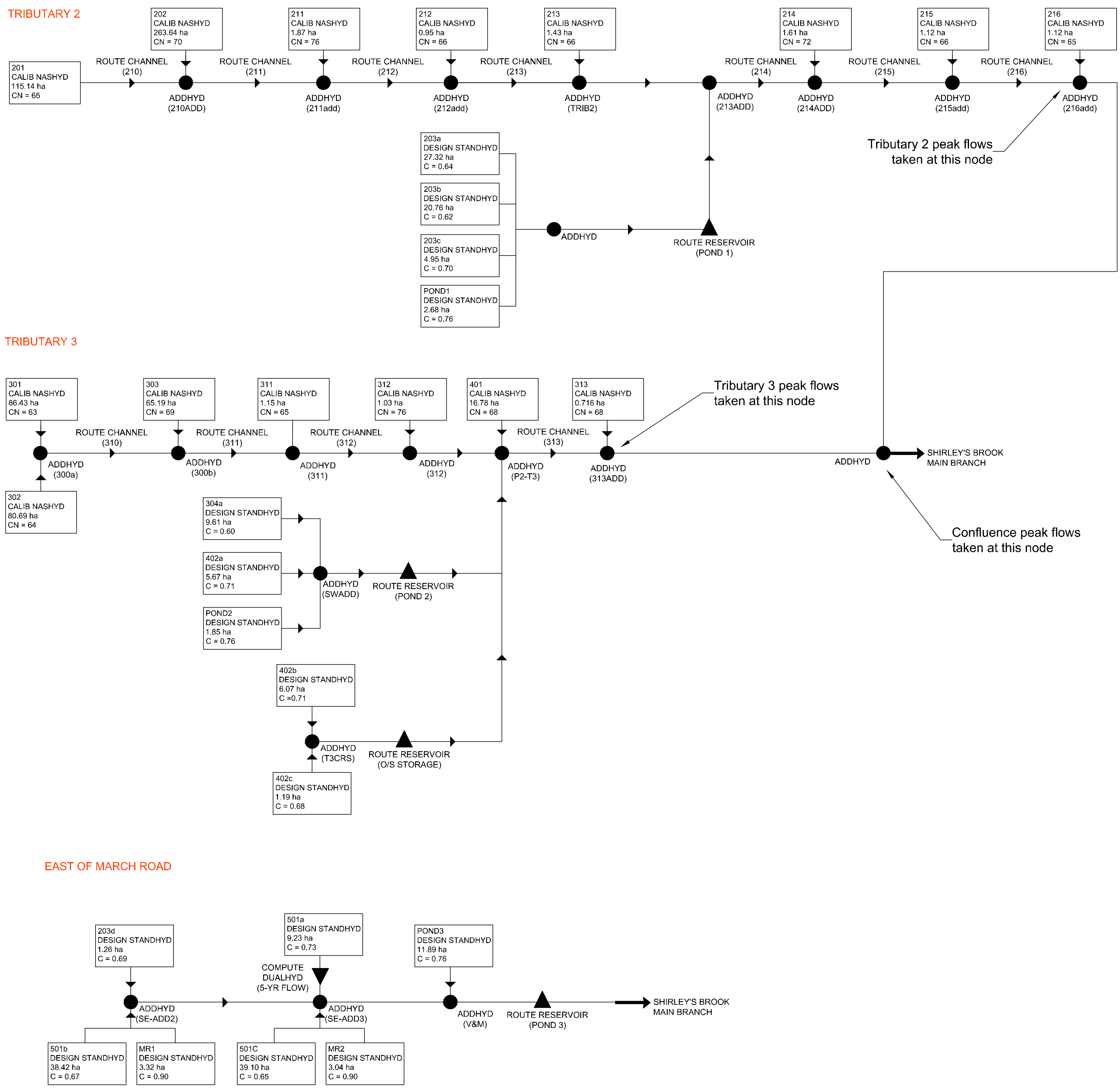
Runoff Coefficients

Land Use	Runoff Coeff.
Street-Oriented Residential	0.65
Multi-Unit Residential	0.70
School/ Church	0.65
Parks	0.40
Open Space	0.20
Mixed Use/ Commercial	0.85
Park and Ride	0.85
Arterial Roads/ Transitway	0.70
SWM Pond	0.76

Drainage Area	Receiving Pond	Land Use & Areas									Total Area (ha)	Weighted Runoff Coefficient	TIMP [1]	XIMP [2]
		Low-density	Medium-density	School/ Church	Parks	Open Space	Commercial	Park & Ride / Fire	ROW	SWM POND				
203a	Pond 1	12.47	2.70	5.10		2.40	0.35	3.30	1.00		27.32	0.64	63%	51%
203b	Pond 1	18.56			2.20						20.76	0.62	61%	48%
203c	Pond 1		1.20	2.94			0.20		0.61		4.95	0.68	68%	54%
203d	Pond 3			1.06					0.20		1.26	0.66	65%	52%
304a	Pond 2		3.10		4.50		0.67		1.34		9.61	0.57	53%	42%
401	Pond 2	RURAL SUBDIVISION									16.78	CN = 68	-	-
402a	Pond 2	2.65	2.10						0.93		5.68	0.68	68%	54%
402b	On-site		3.33	2.00					0.74		6.07	0.68	69%	55%
402c	On-site	1.06							0.13		1.19	0.66	65%	52%
403a	-	RURAL AREA									2.66	CN = 70	-	-
SWMF1	N/A									2.68	2.68	0.76	80%	64%
SWMF2	N/A									1.85	1.85	0.76	80%	64%
MR1	Pond 3								3.32		3.32	0.70	71%	57%
MR2	Pond 3								3.04		3.04	0.70	71%	57%
501a	Pond 3						8.80		0.52		9.32	0.84	92%	73%
502	Pond 3	26.78	1.80	2.80	1.70		2.96		2.38		38.42	0.66	66%	53%
503	Pond 3	30.65	2.66	2.30	2.10				1.39		39.10	0.64	63%	50%
SWMF3	N/A									11.98	11.98	0.76	80%	64%

[1] *TIMP = [(C-0.2)/0.7]*

[2] *XIMP = 0.8*TIMP*



M:\2012\112117\CAD\Design_EMP\112117-SWMHYMOSchem.dwg, POST, May 20, 2016 - 10:09am, kbanks

KANATA NORTH
COMMUNITY DESIGN PLAN

FIGURE NO. SWMHYMO-POST
SWMHYMO
POST-DEVELOPMENT
SCHEMATIC

DATE
MAY 2016

JOB
112117

SCALE
NTS

NOVATECH
Engineers, Planners & Landscape Architects

SHT11x17.DWG - 279mmx432mm

NOVATECH Engineers, Planners & Landscape Architects

```
2     Metric units
*#*****************************************************************************
*#  Project Name: [Kanata North]    Project Number: [112117]
*#  Date        : 03-30-2016
*#  Modeller    : [Kallie Auld]
*#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
*#  License #   :  5320763
*#*****************************************************************************
*Shirleys Brook - Post-Development Model
*Model parameters based on original AECOM model
*See "20150911 - Shirley's Brook Modeling Parameters.xlxs"
*#*****************************************************************************
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[1]
                     C25mm-4.stm
*%-----------------|-----------------------------------------------------------|
READ STORM           STORM_FILENAME=["STORM.001"]
*%-----------------|-----------------------------------------------------------|
DEFAULT VALUES       ICASEdef=[1],  read and print values
                     DEFVAL_FILENAME=["OTTAWA.DEF"]
*%-----------------|-----------------------------------------------------------|
*******************************************************************************|
**************************** FLOW TO TRIBUTARY 2 ******************************|
*******************************************************************************|
**FLOW FROM UPSTREAM AREA/ THROUGH TRIBUTARY 2 UP TO MARCH ROAD**
*%-----------------|-----------------------------------------------------------|
CALIB NASHYD         ID=[1], NHYD=["201"], DT=[5]min, AREA=[115.14](ha),
                     DWF=[0](cms), CN/C=[65], IA=[11.4](mm),
                     N=[1.1], TP=[3.42]hrs,
                     END=-1
*%-----------------|-----------------------------------------------------------|
ROUTE CHANNEL        IDout=[2], NHYD=["210"], IDin=[1],
                     RDT=[5](min),
                     CHLGTH=[557.6](m),  CHSLOPE=[0.89](%),
                                         FPSLOPE=[0.89](%),
                     SECNUM=[2096],       NSEG=[3]
                     ( SEGROUGH, SEGDIST (m))=[0.35,30.79 -0.040,51.78 0.35,96.66] NSEG times
                     ( DISTANCE (m), ELEVATION (m))=[   0.00   , 87.99 ]
                                                    [        11.43     , 86.90 ]
                                                    [        30.79     , 86.74 ]
                                                    [        34.09     , 86.37 ]
                                                    [        35.26     , 86.12 ]
                                                    [        39.56     , 86.12 ]
                                                    [        45.35     , 86.52 ]
                                                    [        51.78     , 86.75 ]
                                                    [        63.33     , 86.96 ]
                                                    [        65.76     , 86.99 ]
                                                    [        76.04     , 87.55 ]
                                                    [        96.66     , 87.99 ]
*%-----------------|-----------------------------------------------------------|
CALIB NASHYD         ID=[1], NHYD=["202"], DT=[5]min, AREA=[263.64](ha),
                     DWF=[0](cms), CN/C=[70], IA=[7.7](mm),
                     N=[1.1], TP=[5.14]hrs,
                     END=-1
*%-----------------|-----------------------------------------------------------|
ADD HYD              IDsum=[3], NHYD=["210add"], IDs to add=[1,2]
*%-----------------|-----------------------------------------------------------|
ROUTE CHANNEL        IDout=[1], NHYD=["211"], IDin=[3],
                     RDT=[5](min),
                     CHLGTH=[450](m),   CHSLOPE=[1.0](%),
                                        FPSLOPE=[1.0](%),
                     SECNUM=[1],        NSEG=[3]
                     ( SEGROUGH, SEGDIST (m))=[0.35,17.5 -0.1,22.5 0.35,40] NSEG times
                     ( DISTANCE (m), ELEVATION (m))=[    0.0    , 3.0 ]
                                                    [        17.0   , 1.0 ]
                                                    [        17.5   , 0.0 ]
                                                    [        22.5   , 0.0 ]
                                                    [        23.0   , 1.0 ]
                                                    [        40.0   , 3.0 ]
*%-----------------|-----------------------------------------------------------|
CALIB NASHYD         ID=[2], NHYD=["211"], DT=[5]min, AREA=[1.87](ha),
                     DWF=[0](cms), CN/C=[76], IA=[7.6](mm),
                     N=[1.1], TP=[1.17]hrs,
                     END=-1
*%-----------------|-----------------------------------------------------------|
ADD HYD              IDsum=[3], NHYD=["211add"], IDs to add=[1,2]
*%-----------------|-----------------------------------------------------------|
ROUTE CHANNEL        IDout=[1], NHYD=["212"], IDin=[3],
                     RDT=[5](min),
                     CHLGTH=[230](m),   CHSLOPE=[1.0](%),
                                        FPSLOPE=[1.0](%),
                     SECNUM=[1],        NSEG=[3]
                     ( SEGROUGH, SEGDIST (m))=[0.35,17.5 -0.1,22.5 0.35,40] NSEG times
                     ( DISTANCE (m), ELEVATION (m))=[     0.0    , 3.0 ]
                                                    [        17.0   , 1.0 ]
                                                    [        17.5   , 0.0 ]
                                                    [        22.5   , 0.0 ]
                                                    [        23.0   , 1.0 ]
                                                    [        40.0   , 3.0 ]
*%-----------------|-----------------------------------------------------------|
CALIB NASHYD         ID=[2], NHYD=["212"], DT=[5]min, AREA=[0.95](ha),
                     DWF=[0](cms), CN/C=[66], IA=[8.8](mm),
                     N=[1.1], TP=[0.56]hrs,
                     END=-1
*%-----------------|-----------------------------------------------------------|
ADD HYD              IDsum=[3], NHYD=["212add"], IDs to add=[1,2]
*%-----------------|-----------------------------------------------------------|
ROUTE CHANNEL        IDout=[1], NHYD=["213"], IDin=[3],
                     RDT=[5](min),
                     CHLGTH=[330](m),   CHSLOPE=[1.0](%),
                                        FPSLOPE=[1.0](%),
                     SECNUM=[1],        NSEG=[3]
                     ( SEGROUGH, SEGDIST (m))=[0.35,17.5 -0.1,22.5 0.35,40] NSEG times
                     ( DISTANCE (m), ELEVATION (m))=[    0.0    , 3.0 ]
                                                    [        17.0   , 1.0 ]
                                                    [        17.5   , 0.0 ]
                                                    [        22.5   , 0.0 ]
                                                    [        23.0   , 1.0 ]
                                                    [        40.0   , 3.0 ]
*%-----------------|-----------------------------------------------------------|
CALIB NASHYD         ID=[2], NHYD=["213"], DT=[5]min, AREA=[1.43](ha),
                     DWF=[0](cms), CN/C=[66], IA=[9.0](mm),
                     N=[1.1], TP=[0.67]hrs,
                     END=-1
*%-----------------|-----------------------------------------------------------|
*******************************************************************************|
*************Flow from upstream area in Trib 2 up to March Road****************|
*******************************************************************************|
ADD HYD              IDsum=[9], NHYD=["TRIB2"], IDs to add=[1,2]
*%-----------------|-----------------------------------------------------------|
*******************************************************************************|
******************** FLOW FROM DEVELOPMENT AREA TO POND 1 *******************|
*******************************************************************************|
*%-----------------|-----------------------------------------------------------|
DESIGN STANDHYD      ID=[1], NHYD=["203a"], DT=[5]min, AREA=[27.32](ha),
                     XIMP=[0.50], TIMP=[0.63], DWF=[0](cms),  LOSS=[1],
                     SLOPE=[2.3](%), END=-1
*%-----------------|-----------------------------------------------------------|
DESIGN STANDHYD      ID=[2], NHYD=["203b"], DT=[5]min, AREA=[20.76](ha),
                     XIMP=[0.48], TIMP=[0.60], DWF=[0](cms),  LOSS=[1],
                     SLOPE=[2.3](%), END=-1
*%-----------------|-----------------------------------------------------------|
DESIGN STANDHYD      ID=[3], NHYD=["203c"], DT=[5]min, AREA=[4.95](ha),
                     XIMP=[0.57], TIMP=[0.71], DWF=[0](cms),  LOSS=[1],
                     SLOPE=[2.3](%), END=-1
*%-----------------|-----------------------------------------------------------|
DESIGN STANDHYD      ID=[4], NHYD=["POND1"], DT=[5]min, AREA=[2.68](ha),
                     XIMP=[0.64], TIMP=[0.80], DWF=[0](cms),  LOSS=[1],
                     SLOPE=[0.1](%), END=-1
*%-----------------|-----------------------------------------------------------|
**Flow to cross under Tributary 2
ADD HYD              IDsum=[5], NHYD=["T2CRS"], IDs to add=[2,3]
*%-----------------|-----------------------------------------------------------|
```

```
*Total flow to Pond 1
ADD HYD            IDsum=[6], NHYD=["P1FLOW"], IDs to add=[1,4,5]
*%-----------------|------------------------------------------------------------|
*******************
***POND 1 SIZING***
*******************
ROUTE RESERVOIR    IDout=[1],   NHYD=["POND1"],  IDin=[6],
                    RDT=[5](min),
                         TABLE of ( OUTFLOW-STORAGE ) values
                                     (cms) - (ha-m)
                                   [ 0.000 , 0.000 ]
                                   [ 0.036 , 0.728 ]
                                   [ 0.089 , 1.182 ]
                                   [ 0.177 , 1.678 ]
                                   [ 0.346 , 3.115 ]
                                   [   -1  ,   -1  ]  (max twenty pts)
                         IDovf=[2], NHYDovf=["P1-OVF"]
*******************************************************************************|
*%-----------------|------------------------------------------------------------|
**************************************
**TOTAL FLOW IN TRIB 2 AT MARCH ROAD**
**************************************
ADD HYD            IDsum=[2], NHYD=["213ADD"], IDs to add=[1,9]
*%-----------------|------------------------------------------------------------|
ROUTE CHANNEL      IDout=[1], NHYD=["214"], IDin=[2],
                   RDT=[5](min),
                   CHLGTH=[390](m),   CHSLOPE=[1.7](%),
                                      FPSLOPE=[1.7](%),
                   SECNUM=[5],        NSEG=[3]
                   ( SEGROUGH, SEGDIST (m))=[0.35,17.5 -0.1,22.5 0.35,40] NSEG times
                   ( DISTANCE (m), ELEVATION (m))=[    0.0   , 3.0 ]
                                                  [       17.0   , 1.0 ]
                                                  [       17.5   , 0.0 ]
                                                  [       22.5   , 0.0 ]
                                                  [       23.0   , 1.0 ]
                                                  [       40.0   , 3.0 ]
*%-----------------|------------------------------------------------------------|
CALIB NASHYD       ID=[3], NHYD=["214"], DT=[5]min, AREA=[1.61](ha),
                   DWF=[0](cms), CN/C=[72], IA=[8.9](mm),
                   N=[1.1], TP=[0.17]hrs,
                   END=-1
*%-----------------|------------------------------------------------------------|
ADD HYD            IDsum=[2], NHYD=["214ADD"], IDs to add=[1,3]
*%-----------------|------------------------------------------------------------|
ROUTE CHANNEL      IDout=[1], NHYD=["215"], IDin=[2],
                   RDT=[5](min),
                   CHLGTH=[260](m),   CHSLOPE=[1.4](%),
                                      FPSLOPE=[1.4](%),
                   SECNUM=[6],        NSEG=[3]
                   ( SEGROUGH, SEGDIST (m))=[0.35,17.5 -0.1,22.5 0.35,40] NSEG times
                   ( DISTANCE (m), ELEVATION (m))=[    0.0   , 3.0 ]
                                                  [       17.0   , 1.0 ]
                                                  [       17.5   , 0.0 ]
                                                  [       22.5   , 0.0 ]
                                                  [       23.0   , 1.0 ]
                                                  [       40.0   , 3.0 ]
*%-----------------|------------------------------------------------------------|
CALIB NASHYD       ID=[2], NHYD=["TRB215"], DT=[5]min, AREA=[1.12](ha),
                   DWF=[0](cms), CN/C=[66], IA=[10.6](mm),
                   N=[1.1], TP=[0.17]hrs,
                   END=-1
*%-----------------|------------------------------------------------------------|
ADD HYD            IDsum=[3], NHYD=["215ADD"], IDs to add=[1,2]
*%-----------------|------------------------------------------------------------|
ROUTE CHANNEL      IDout=[1], NHYD=["216"], IDin=[3],
                   RDT=[5](min),
                   CHLGTH=[250](m),   CHSLOPE=[0.5](%),
                                      FPSLOPE=[0.5](%),
                   SECNUM=[7],        NSEG=[3]
                   ( SEGROUGH, SEGDIST (m))=[0.35,17.5 -0.1,22.5 0.35,40] NSEG times
                   ( DISTANCE (m), ELEVATION (m))=[    0.0   , 3.0 ]
```

```
                                                  [       17.0   , 1.0 ]
                                                  [       17.5   , 0.0 ]
                                                  [       22.5   , 0.0 ]
                                                  [       23.0   , 1.0 ]
                                                  [       40.0   , 3.0 ]
*%-----------------|------------------------------------------------------------|
CALIB NASHYD       ID=[2], NHYD=["TRB216"], DT=[5]min, AREA=[1.12](ha),
                   DWF=[0](cms), CN/C=[65], IA=[11.6](mm),
                   N=[1.1], TP=[0.17]hrs,
                   END=-1
*%-----------------|------------------------------------------------------------|
*****************************************
**FLOW IN TRIB 2 UPSTREAM OF CONFLUENCE**
*****************************************
ADD HYD            IDsum=[10], NHYD=["T2-US"], IDs to add=[1,2]
*%-----------------|------------------------------------------------------------|
*PRINT HYD          ID=[10],   # OF PCYCLES=[3]
*%-----------------|------------------------------------------------------------|
*
*
*
*******************************************************************************|
*************************PEAK FLOW TO TRIBUTARY 3*****************************|
*******************************************************************************|
**FLOW FROM UPSTREAM AREA/ THROUGH TRIBUTARY 3 UP TO MARCH ROAD**
*%-----------------|------------------------------------------------------------|
CALIB NASHYD       ID=[1], NHYD=["301"], DT=[5]min, AREA=[86.43](ha),
                   DWF=[0](cms), CN/C=[63], IA=[12.3](mm),
                   N=[1.1], TP=[1.24]hrs,
                   END=-1
*%-----------------|------------------------------------------------------------|
CALIB NASHYD       ID=[2], NHYD=["302"], DT=[5]min, AREA=[80.69](ha),
                   DWF=[0](cms), CN/C=[64], IA=[10.9](mm),
                   N=[1.1], TP=[1.80]hrs,
                   END=-1
*%-----------------|------------------------------------------------------------|
ADD HYD            IDsum=[3], NHYD=["300a"], IDs to add=[1,2]
*%-----------------|------------------------------------------------------------|
ROUTE CHANNEL      IDout=[1], NHYD=["310"], IDin=[3],
                   RDT=[5](min),
                   CHLGTH=[448.8](m),  CHSLOPE=[1.62](%),
                                       FPSLOPE=[1.62](%),
                   SECNUM=[4122],       NSEG=[3]
                   ( SEGROUGH, SEGDIST (m))=[0.35,36.85 -0.04,57.43 0.35,98.10] NSEG times
                   ( DISTANCE (m), ELEVATION (m))=[     0    , 85.97 ]
                                                  [       29.14     , 86.03 ]
                                                  [       35.73     , 85.88 ]
                                                  [       36.85     , 85.69 ]
                                                  [       39.63     , 85.47 ]
                                                  [       43.19     , 85.31 ]
                                                  [       47.24     , 84.78 ]
                                                  [       50.54     , 84.78 ]
                                                  [       54.28     , 84.94 ]
                                                  [       57.43     , 85.70 ]
                                                  [       65.07     , 85.80 ]
                                                  [       67.25     , 85.80 ]
                                                  [       70.81     , 85.80 ]
                                                  [       98.10     , 86.10 ]
*%-----------------|------------------------------------------------------------|
CALIB NASHYD       ID=[2], NHYD=["303"], DT=[5]min, AREA=[65.19](ha),
                   DWF=[0](cms), CN/C=[69], IA=[8.9](mm),
                   N=[1.1], TP=[1.31]hrs,
                   END=-1
*%-----------------|------------------------------------------------------------|
ADD HYD            IDsum=[3], NHYD=["300b"], IDs to add=[1,2]
*%-----------------|-------------------------------------------------------------|
ROUTE CHANNEL      IDout=[1], NHYD=["311"], IDin=[3],
                   RDT=[5](min),
                   CHLGTH=[270](m),  CHSLOPE=[1.17](%),
                                       FPSLOPE=[1.17](%),
                   SECNUM=[3673],       NSEG=[3]
```

```
                  ( SEGROUGH, SEGDIST (m))=[0.35,17.5 -0.1,22.5 0.35,40] NSEG times
                  ( DISTANCE (m), ELEVATION (m))=[    0.0    , 3.0 ]
                                               [        17.0    , 1.0 ]
                                               [        17.5    , 0.0 ]
                                               [        22.5    , 0.0 ]
                                               [        23.0    , 1.0 ]
                                               [        40.0    , 3.0 ]
*%-----------------|------------------------------------------------------------|
CALIB NASHYD       ID=[2], NHYD=["TRB311"], DT=[5]min, AREA=[1.15](ha),
                   DWF=[0](cms), CN/C=[65], IA=[9.3](mm),
                   N=[1.1], TP=[0.52]hrs,
                   END=-1
*%-----------------|------------------------------------------------------------|
ADD HYD            IDsum=[3], NHYD=["311ADD"], IDs to add=[1,2]
*%-----------------|-------------------------------------------------------------|
ROUTE CHANNEL      IDout=[1], NHYD=["312"], IDin=[3],
                   RDT=[5](min),
                   CHLGTH=[270](m),  CHSLOPE=[1.17](%),
                                     FPSLOPE=[1.17](%),
                   SECNUM=[3673],       NSEG=[3]
                   ( SEGROUGH, SEGDIST (m))=[0.35,17.5 -0.1,22.5 0.35,40] NSEG times
                   ( DISTANCE (m), ELEVATION (m))=[    0.0    , 3.0 ]
                                               [        17.0    , 1.0 ]
                                               [        17.5    , 0.0 ]
                                               [        22.5    , 0.0 ]
                                               [        23.0    , 1.0 ]
                                               [        40.0    , 3.0 ]
*%-----------------|------------------------------------------------------------|
CALIB NASHYD       ID=[2], NHYD=["TRB312"], DT=[5]min, AREA=[1.304](ha),
                   DWF=[0](cms), CN/C=[76], IA=[7.5](mm),
                   N=[1.1], TP=[0.64]hrs,
                   END=-1
*%-----------------|------------------------------------------------------------|
ADD HYD            IDsum=[9], NHYD=["312ADD"], IDs to add=[1,2]
*%-----------------|------------------------------------------------------------|
****************************************
**FLOW FROM DEVELOPMENT AREA TO POND 2**
****************************************
*%-----------------|------------------------------------------------------------|
DESIGN STANDHYD    ID=[1], NHYD=["304a"], DT=[5]min, AREA=[9.61](ha),
                   XIMP=[0.46], TIMP=[0.57], DWF=[0](cms),  LOSS=[1],
                   SLOPE=[1.6](%), END=-1
*%-----------------|------------------------------------------------------------|
DESIGN STANDHYD    ID=[2], NHYD=["402a"], DT=[5]min, AREA=[5.67](ha),
                   XIMP=[0.58], TIMP=[0.73], DWF=[0](cms),  LOSS=[1],
                   SLOPE=[2.1](%), END=-1
*%-----------------|------------------------------------------------------------|
DESIGN STANDHYD    ID=[3], NHYD=["POND2"], DT=[5]min, AREA=[1.85](ha),
                   XIMP=[0.64], TIMP=[0.80], DWF=[0](cms),  LOSS=[1],
                   SLOPE=[0.1](%), END=-1
*%-----------------|------------------------------------------------------------|
******************************FLOW TO POND 2***********************************|
*%-----------------|------------------------------------------------------------|
ADD HYD            IDsum=[4], NHYD=["P2FLOW"], IDs to add=[1,2,3]
*%-----------------|------------------------------------------------------------|
***********************
***SIZING FOR POND 2***
***********************
ROUTE RESERVOIR    IDout=[1],   NHYD=["POND2"],  IDin=[4],
                    RDT=[5](min),
                         TABLE of ( OUTFLOW-STORAGE ) values
                                     (cms) - (ha-m)
                                   [ 0.000 , 0.000 ]
                                   [ 0.003 , 0.240 ]
                                   [ 0.016 , 0.398 ]
                                   [ 0.031 , 0.560 ]
                                   [ 0.084 , 1.003 ]
                                   [   -1  ,   -1  ]  (max twenty pts)
                         IDovf=[2], NHYDovf=["P2OVF"]
*%-----------------|------------------------------------------------------------|
*************************************************
```

```
**FLOW FROM DEVELOPMENT AREA TO ON SITE STORAGE**
*************************************************
*%-----------------|------------------------------------------------------------|
DESIGN STANDHYD    ID=[2], NHYD=["402b"], DT=[5]min, AREA=[6.07](ha),
                   XIMP=[0.58], TIMP=[0.73], DWF=[0](cms),  LOSS=[1],
                   SLOPE=[2.1](%), END=-1
*%-----------------|------------------------------------------------------------|
DESIGN STANDHYD    ID=[3], NHYD=["402c"], DT=[5]min, AREA=[1.19](ha),
                   XIMP=[0.55], TIMP=[0.68], DWF=[0](cms),  LOSS=[1],
                   SLOPE=[2.1](%), END=-1
*%-----------------|------------------------------------------------------------|
**On-site storage for SouthWest area**
ADD HYD            IDsum=[4], NHYD=["400-OS"], IDs to add=[2,3]
*%-----------------|------------------------------------------------------------|
******************************
***On-Site Storage Required***
******************************
ROUTE RESERVOIR    IDout=[2],   NHYD=["OSSTOR"],  IDin=[4],
                   RDT=[5](min),
                         TABLE of ( OUTFLOW-STORAGE ) values
                                     (cms) - (ha-m)
                                   [ 0.000 , 0.000 ]
                                   [ 0.800 , 0.005 ]
                                   [ 0.816 , 0.200 ]
                                   [   -1  ,   -1  ]  (max twenty pts)
                         IDovf=[3], NHYDovf=["OSOVF"]
*%-----------------|------------------------------------------------------------|
***************************************
**FLOW FROM UPSTREAM AREA - MB CIRCLE**
***************************************
*%-----------------|------------------------------------------------------------|
CALIB NASHYD       ID=[3], NHYD=["401"], DT=[5]min, AREA=[16.78](ha),
                   DWF=[0](cms), CN/C=[68], IA=[7.0](mm),
                   N=[3.0], TP=[1.66]hrs,
                   END=-1
*%-----------------|------------------------------------------------------------|
**************************************
**TOTAL FLOW IN TRIB 3 AT MARCH ROAD**
**************************************
ADD HYD            IDsum=[4], NHYD=["P2-T3"], IDs to add=[1,2,3,9]
*%-----------------|------------------------------------------------------------|
ROUTE CHANNEL      IDout=[1], NHYD=["313"], IDin=[4],
                   RDT=[5](min),
                   CHLGTH=[423.0](m),  CHSLOPE=[1.17](%),
                                       FPSLOPE=[1.17](%),
                   SECNUM=[3673],       NSEG=[3]
                   ( SEGROUGH, SEGDIST (m))=[0.35,17.5 -0.1,22.5 0.35,40] NSEG times
                   ( DISTANCE (m), ELEVATION (m))=[    0.0    , 3.0 ]
                                               [        17.0    , 1.0 ]
                                               [        17.5    , 0.0 ]
                                               [        22.5    , 0.0 ]
                                               [        23.0    , 1.0 ]
                                               [        40.0    , 3.0 ]
*%-----------------|------------------------------------------------------------|
CALIB NASHYD       ID=[2], NHYD=["TRB313"], DT=[5]min, AREA=[0.716](ha),
                   DWF=[0](cms), CN/C=[68], IA=[8.2](mm),
                   N=[1.1], TP=[0.34]hrs,
                   END=-1
*%-----------------|------------------------------------------------------------|
*********************************************
**FLOW IN TRIBUTARY 3 UPSTREAM OF CONFLUENCE**
*********************************************
*%-----------------|------------------------------------------------------------|
ADD HYD            IDsum=[3], NHYD=["313ADD"], IDs to add=[1,2,]
*%-----------------|------------------------------------------------------------|
*PRINT HYD          ID=[3],   # OF PCYCLES=[3]
*%-----------------|------------------------------------------------------------|
CALIB NASHYD       ID=[4], NHYD=["TRB314"], DT=[5]min, AREA=[0.938](ha),
                   DWF=[0](cms), CN/C=[68], IA=[8.2](mm),
                   N=[1.1], TP=[0.46]hrs,
                   END=-1
```

```
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[3], NHYD=["313ADD"], IDs to add=[1,2]
*%-----------------|-------------------------------------------------------------|
**************************************
*******TOTAL FLOW AT CONFLUENCE*******
**************************************
*%-----------------|-------------------------------------------------------------|
CALIB NASHYD        ID=[4], NHYD=["403a"], DT=[5]min, AREA=[2.66](ha),
                    DWF=[0](cms), CN/C=[70], IA=[4.3](mm),
                    N=[1.1], TP=[0.27]hrs,
                    END=-1
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[1], NHYD=["CONFLU"], IDs to add=[10,3,4]
*%-----------------|-------------------------------------------------------------|
*PRINT HYD           ID=[1],   # OF PCYCLES=[3]
*%-----------------|-------------------------------------------------------------|
*
*
*
*
*********************************************************************************|
*********************PEAK FLOW FROM EAST SIDE OF MARCH ROAD*******************|
*********************************************************************************|
*%-----------------|-------------------------------------------------------------|
DESIGN STANDHYD     ID=[1], NHYD=["203d"], DT=[5]min, AREA=[1.26](ha),
                    XIMP=[0.56], TIMP=[0.70], DWF=[0](cms),  LOSS=[1],
                    SLOPE=[2.3](%), END=-1
*%-----------------|-------------------------------------------------------------|
DESIGN STANDHYD     ID=[2], NHYD=["501a"], DT=[5]min, AREA=[9.32](ha),
                    XIMP=[0.74], TIMP=[0.93], DWF=[0](cms),  LOSS=[1],
                    SLOPE=[0.80](%), END=-1
*%-----------------|-------------------------------------------------------------|
******************************
***5-year peak flow to pond***
******************************
COMPUTE DUALHYD     IDin=[2], CINLET=[2.06](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["OSSTOR"],
                    MINID=[4], MinNHYD=["TOPOND"],
                    TMJSTO=[890](cu-m)
*%-----------------|-------------------------------------------------------------|
DESIGN STANDHYD     ID=[5], NHYD=["501b"], DT=[5]min, AREA=[38.42](ha),
                    XIMP=[0.54], TIMP=[0.67], DWF=[0](cms),  LOSS=[1],
                    SLOPE=[2.3](%), END=-1
*%-----------------|-------------------------------------------------------------|
DESIGN STANDHYD     ID=[6], NHYD=["501c"], DT=[5]min, AREA=[39.10](ha),
                    XIMP=[0.51], TIMP=[0.64], DWF=[0](cms),  LOSS=[1],
                    SLOPE=[2.3](%), END=-1
*%-----------------|-------------------------------------------------------------|
DESIGN STANDHYD     ID=[7], NHYD=["MR1"], DT=[5]min, AREA=[3.32](ha),
                    XIMP=[0.80], TIMP=[0.99], DWF=[0](cms),  LOSS=[1],
                    SLOPE=[1.0](%), END=-1
*%-----------------|-------------------------------------------------------------|
DESIGN STANDHYD     ID=[8], NHYD=["MR2"], DT=[5]min, AREA=[3.04](ha),
                    XIMP=[0.80], TIMP=[0.99], DWF=[0](cms),  LOSS=[1],
                    SLOPE=[1.0](%), END=-1
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[10], NHYD=["VALE"], IDs to add=[1,5,7]
*%-----------------|---------------------------------------,---------------------|
ADD HYD             IDsum=[9], NHYD=["MET"], IDs to add=[4,6,8]
*%-----------------|-------------------------------------------------------------|
DESIGN STANDHYD     ID=[1], NHYD=["POND3"], DT=[5]min, AREA=[11.89](ha),
                    XIMP=[0.64], TIMP=[0.80], DWF=[0](cms),  LOSS=[1],
                    SLOPE=[0.1](%), END=-1
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[8], NHYD=["P3ADD"], IDs to add=[10,9,1]
*%-----------------|-------------------------------------------------------------|
**********************
***SIZING FOR POND 3***
**********************
ROUTE RESERVOIR     IDout=[1],   NHYD=["POND3"],  IDin=[8],
                     RDT=[5](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                      (cms) - (ha-m)
                                    [ 0.000 , 0.000 ]
                                    [ 0.058 , 1.610 ]
                                    [ 0.220 , 2.515 ]
                                    [ 0.402 , 3.488 ]
                                    [ 1.045 , 6.115 ]
                                    [   -1  ,   -1  ]  (max twenty pts)
                          IDovf=[2], NHYDovf=["E-OVF"]
*%-----------------|-------------------------------------------------------------|
*********************************
**TOTAL FLOW TO SHIRLEY'S BROOK**
*********************************
*%-----------------|-------------------------------------------------------------|
*PRINT HYD           ID=[1],   # OF PCYCLES=[3]
*%-----------------|-------------------------------------------------------------|
*********************************************************************************|
*********************************************************************************|
*********************************************************************************|
*********************************************************************************|
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[2]
                    C2-4.stm
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[3]
                    C5-4.stm
*%-----------------|-------------------------------------------------------------|
*START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[4]
*                    C10-4.stm
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[5]
                    C100-4.stm
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[6]
                    S12-25mm.stm
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[7]
                    S2-12.stm
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[8]
                    S5-12.stm
*%-----------------|-------------------------------------------------------------|
*START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[9]
*                    S10-12.stm
*%-----------------|-------------------------------------------------------------|
*START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[10]
*                    S25-12.stm
*%-----------------|-------------------------------------------------------------|
*START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[11]
*                    S50-12.stm
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[12]
                    S100-12.stm
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[13]
                    S24-25mm.stm
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[14]
                    S2-24.stm
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[15]
                    S5-24.stm
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[16]
                    S100-24.stm
*%-----------------|-------------------------------------------------------------|
FINISH
```

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

   SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO       999    999    =========
   S      W W W  MM MM  H   H   Y Y   MM MM  O   O     9   9  9   9
   SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
       S   W W   M   M  H   H    Y    M   M  O   O      9999   9999   Sept 2011
   SSSSS   W W   M   M  H   H    Y    M   M   OOO          9      9   =========
                                                       9   9  9   9   # 5320763
        StormWater Management HYdrologic Model          999    999    =========

 *******************************************************************************
 ***************************** SWMHYMO Ver/4.05  ******************************
 *********  A single event and continuous hydrologic simulation model  *********
 *********     based on the principles of HYMO and its successors      *********
 *********                 OTTHYMO-83 and OTTHYMO-89.                  *********
 *******************************************************************************
 ********* Distributed by:  J.F. Sabourin and Associates Inc.          *********
 *********                  Ottawa,  Ontario: (613) 836-3884           *********
 *********                  Gatineau, Quebec: (819) 243-6858           *********
 *********                  E-Mail: swmhymo@jfsa.Com                   *********
 *******************************************************************************

 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 +++++++++ Licensed user: NOVATECH ENGINEERING CONSULTANTS LTD         +++++++++
 +++++++++                Nepean              SERIAL#:5320763         +++++++++
 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 *******************************************************************************
 *********            ++++++ PROGRAM ARRAY DIMENSIONS ++++++           *********
 *********            Maximum value for ID numbers  :     10           *********
 *********            Max. number of rainfall points: 105408           *********
 *********            Max. number of flow points    : 105408           *********
 *******************************************************************************

 ***** DESCRIPTION SUMMARY TABLE HEADERS (units depend on METOUT in START) *****
 *****-------------------------------------------------------------------------*****
 *****    ID:  Hydrograph IDentification numbers, (1-10).                  *****
 *****  NHYD:  Hydrograph reference numbers, (6 digits or characters).     *****
 *****  AREA:  Drainage area associated with hydrograph, (ac.) or (ha.).   *****
 ***** QPEAK:  Peak flow of simulated hydrograph, (ft^3/s) or (m^3/s).     *****
 ***** TpeakDate_hh:mm is the date and time of the peak flow.              *****
 *****  R.V.:  Runoff Volume of simulated hydrograph, (in) or (mm).        *****
 *****  R.C.:  Runoff Coefficient of simulated hydrograph, (ratio).        *****
 *****     *:  see WARNING or NOTE message printed at end of run.          *****
 *****    **:  see  ERROR  message printed at end of run.                  *****
 *******************************************************************************
 *******************************************************************************

::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::

 *******************************************************************************

 **********************   S U M M A R Y   O U T P U T   **********************
 *******************************************************************************
 *         DATE: 2016-05-20     TIME: 09:55:27     RUN COUNTER: 000057         *
 *******************************************************************************
 * Input   filename: M:\2012\112117\data\CALCUL~1\swmhymo\POSTDE~1\knpost.dat  *
 * Output  filename: M:\2012\112117\data\CALCUL~1\swmhymo\POSTDE~1\knpost.out  *
 * Summary filename: M:\2012\112117\data\CALCUL~1\swmhymo\POSTDE~1\knpost.sum  *
 * User comments:                                                              *
 * 1:__________________________________________________________________________*
 * 2:__________________________________________________________________________*
 * 3:__________________________________________________________________________*
 *******************************************************************************


#******************************************************************************
#  Project Name: [Kanata North]    Project Number: [112117]
#  Date        : 03-30-2016
#  Modeller    : [Kallie Auld]
#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
```

```
#  License #   :  5320763
#******************************************************************************
#******************************************************************************
 RUN:COMMAND#
 001:0001------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   1 ]
 001:0002------------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=10.00:SDUR=   4.00:PTOT=  25.00]
 001:0003------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = M:\2012\112117\data\CALCUL~1\swmhymo\POSTDE~1\OTTAWA.DEF
      ICASEdv  = 1 (read and print data)
      FileTitle= ------ ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE ---
                 ------ PARAMETER VALUES MUST BE ENTERD AFTER COLUMN 60 ----_
      Horton's infiltration equation parameters:
      [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
      Parameters for PERVIOUS surfaces in STANDHYD:
      [IAper=   4.67 mm] [LGP=40.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .013]
      Parameters used in NASHYD:
      [Ia=   4.67 mm] [N= 3.00]
 001:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:201          115.14     .009 No_date    5:55    1.23 .049
      [CN= 65.0: N= 1.10]
      [Tp= 3.42:DT= 5.00]
 001:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:201          115.14     .009 No_date    5:55    1.23  n/a
      [RDT= 5.00] out<- 02:210          115.14     .009 No_date    6:20    1.23  n/a
      [L/S/n=  558./ .890/.040]
      {Vmax=  .423:Dmax=  .004}
 001:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:202          263.64     .027 No_date    7:25    2.37 .095
      [CN= 70.0: N= 1.10]
      [Tp= 5.14:DT= 5.00]
 001:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:202          263.64     .027 No_date    7:25    2.37  n/a
                      + 02:210          115.14     .009 No_date    6:20    1.23  n/a
      [DT= 5.00]  SUM=  03:210add       378.78     .036 No_date    7:00    2.02  n/a
 001:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:210add       378.78     .036 No_date    7:00    2.02  n/a
      [RDT= 5.00] out<- 01:211          378.78     .036 No_date    7:30    2.02  n/a
      [L/S/n=  450./1.000/.100]
      {Vmax=  .288:Dmax=  .025}
 001:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:211            1.87     .001 No_date    4:00    3.10 .124
      [CN= 76.0: N= 1.10]
      [Tp= 1.17:DT= 5.00]
 001:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:211          378.78     .036 No_date    7:30    2.02  n/a
                      + 02:211            1.87     .001 No_date    4:00    3.10  n/a
      [DT= 5.00]  SUM=  03:211add       380.65     .037 No_date    7:15    2.03  n/a
 001:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:211add       380.65     .037 No_date    7:15    2.03  n/a
      [RDT= 5.00] out<- 01:212          380.65     .037 No_date    7:30    2.03  n/a
      [L/S/n=  230./1.000/.100]
      {Vmax=  .288:Dmax=  .025}
 001:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:212             .95     .001 No_date    4:00    1.77 .071
      [CN= 66.0: N= 1.10]
      [Tp=  .56:DT= 5.00]
 001:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:212          380.65     .037 No_date    7:30    2.03  n/a
                      + 02:212             .95     .001 No_date    4:00    1.77  n/a
```

```
     [DT= 5.00]  SUM=  03:212add       381.60     .037 No_date    7:15    2.03  n/a
001:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:212add       381.60     .037 No_date    7:15    2.03  n/a
     [RDT= 5.00] out<- 01:213          381.60     .037 No_date    7:40    2.03  n/a
     [L/S/n=  330./1.000/.100]
     {Vmax=  .288:Dmax=  .026}
001:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:213            1.43     .001 No_date    4:00    1.74 .070
     [CN= 66.0: N= 1.10]
     [Tp=  .67:DT= 5.00]
001:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:213          381.60     .037 No_date    7:40    2.03  n/a
                     + 02:213            1.43     .001 No_date    4:00    1.74  n/a
     [DT= 5.00]  SUM=  09:TRIB2        383.03     .038 No_date    7:25    2.03  n/a
001:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    01:203a          27.32    2.004 No_date    1:40   13.51 .540
     [XIMP=.50:TIMP=.63]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
001:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    02:203b          20.76    1.491 No_date    1:40   12.93 .517
     [XIMP=.48:TIMP=.60]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
001:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    03:203c           4.95     .472 No_date    1:40   15.23 .609
     [XIMP=.57:TIMP=.71]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
001:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    04:POND1          2.68     .198 No_date    1:45   17.13 .685
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
001:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:203b          20.76    1.491 No_date    1:40   12.93  n/a
                     + 03:203c           4.95     .472 No_date    1:40   15.23  n/a
     [DT= 5.00]  SUM=  05:T2CRS         25.71    1.963 No_date    1:40   13.37  n/a
001:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:203a          27.32    2.004 No_date    1:40   13.51  n/a
                     + 04:POND1          2.68     .198 No_date    1:45   17.13  n/a
                     + 05:T2CRS         25.71    1.963 No_date    1:40   13.37  n/a
     [DT= 5.00]  SUM=  06:P1FLOW        55.71    4.157 No_date    1:40   13.62  n/a
001:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 06:P1FLOW        55.71    4.157 No_date    1:40   13.62  n/a
     [RDT= 5.00] out<- 01:POND1         55.71     .036 No_date    4:05   13.62  n/a
            overflow <= 02:P1-OVF         .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.7285E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
001:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:POND1         55.71     .036 No_date    4:05   13.62  n/a
                     + 09:TRIB2        383.03     .038 No_date    7:25    2.03  n/a
     [DT= 5.00]  SUM=  02:213ADD       438.74     .072 No_date    6:20    3.50  n/a
001:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:213ADD       438.74     .072 No_date    6:20    3.50  n/a
     [RDT= 5.00] out<- 01:214          438.74     .072 No_date    6:40    3.50  n/a
     [L/S/n=  390./1.700/.100]
     {Vmax=  .376:Dmax=  .038}
001:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:214            1.61     .003 No_date    2:40    2.25 .090
     [CN= 72.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
001:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:214          438.74     .072 No_date    6:40    3.50  n/a
                     + 03:214            1.61     .003 No_date    2:40    2.25  n/a
     [DT= 5.00]  SUM=  02:214ADD       440.35     .073 No_date    6:25    3.50  n/a
001:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:214ADD       440.35     .073 No_date    6:25    3.50  n/a
     [RDT= 5.00] out<- 01:215          440.35     .073 No_date    6:40    3.50  n/a
     [L/S/n=  260./1.400/.100]
     {Vmax=  .341:Dmax=  .042}
001:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
```

```
    CALIB NASHYD       02:TRB215         1.12     .001 No_date    2:55    1.42 .057
     [CN= 66.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
001:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:215          440.35     .073 No_date    6:40    3.50  n/a
                     + 02:TRB215         1.12     .001 No_date    2:55    1.42  n/a
     [DT= 5.00]  SUM=  03:215ADD       441.47     .073 No_date    6:30    3.49  n/a
001:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:215ADD       441.47     .073 No_date    6:30    3.49  n/a
     [RDT= 5.00] out<- 01:216          441.47     .073 No_date    7:00    3.49  n/a
     [L/S/n=  250./ .500/.100]
     {Vmax=  .204:Dmax=  .071}
001:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB216         1.12     .001 No_date    3:00    1.19 .048
     [CN= 65.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
001:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:216          441.47     .073 No_date    7:00    3.49  n/a
                     + 02:TRB216         1.12     .001 No_date    3:00    1.19  n/a
     [DT= 5.00]  SUM=  10:T2-US        442.59     .073 No_date    6:55    3.48  n/a
001:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:301           86.43     .015 No_date    4:05    1.00 .040
     [CN= 63.0: N= 1.10]
     [Tp= 1.24:DT= 5.00]
001:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:302           80.69     .012 No_date    4:25    1.27 .051
     [CN= 64.0: N= 1.10]
     [Tp= 1.80:DT= 5.00]
001:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:301           86.43     .015 No_date    4:05    1.00  n/a
                     + 02:302           80.69     .012 No_date    4:25    1.27  n/a
     [DT= 5.00]  SUM=  03:300a         167.12     .027 No_date    4:15    1.13  n/a
001:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300a         167.12     .027 No_date    4:15    1.13  n/a
     [RDT= 5.00] out<- 01:310          167.12     .026 No_date    4:45    1.13  n/a
     [L/S/n=  449./1.620/.040]
     {Vmax=  .430:Dmax=  .015}
001:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:303           65.19     .021 No_date    4:05    1.99 .080
     [CN= 69.0: N= 1.10]
     [Tp= 1.31:DT= 5.00]
001:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:310          167.12     .026 No_date    4:45    1.13  n/a
                     + 02:303           65.19     .021 No_date    4:05    1.99  n/a
     [DT= 5.00]  SUM=  03:300b         232.31     .047 No_date    4:35    1.37  n/a
001:0040---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300b         232.31     .047 No_date    4:35    1.37  n/a
     [RDT= 5.00] out<- 01:311          232.31     .047 No_date    4:55    1.37  n/a
     [L/S/n=  270./1.170/.100]
     {Vmax=  .312:Dmax=  .030}
001:0041---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB311         1.15     .001 No_date    4:00    1.61 .064
     [CN= 65.0: N= 1.10]
     [Tp=  .52:DT= 5.00]
001:0042---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:311          232.31     .047 No_date    4:55    1.37  n/a
                     + 02:TRB311         1.15     .001 No_date    4:00    1.61  n/a
     [DT= 5.00]  SUM=  03:311ADD       233.46     .047 No_date    4:55    1.37  n/a
001:0043---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:311ADD       233.46     .047 No_date    4:55    1.37  n/a
     [RDT= 5.00] out<- 01:312          233.46     .047 No_date    5:10    1.37  n/a
     [L/S/n=  270./1.170/.100]
     {Vmax=  .312:Dmax=  .030}
001:0044---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB312         1.30     .001 No_date    4:00    3.13 .125
     [CN= 76.0: N= 1.10]
     [Tp=  .64:DT= 5.00]
001:0045---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:312          233.46     .047 No_date    5:10    1.37  n/a
                     + 02:TRB312         1.30     .001 No_date    4:00    3.13  n/a
     [DT= 5.00]  SUM=  09:312ADD       234.76     .048 No_date    5:10    1.38  n/a
```

```
001:0046---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    01:304a           9.61     .670 No_date    1:40   12.36 .495
     [XIMP=.46:TIMP=.57]
     [SLP=1.60:DT= 5.00]
     [LOSS= 1 : HORTONS]
001:0047---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    02:402a           5.67     .547 No_date    1:40   15.57 .623
     [XIMP=.58:TIMP=.73]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
001:0048---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    03:POND2          1.85     .160 No_date    1:40   17.13 .685
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
001:0049---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:304a           9.61     .670 No_date    1:40   12.36  n/a
                     + 02:402a           5.67     .547 No_date    1:40   15.57  n/a
                     + 03:POND2          1.85     .160 No_date    1:40   17.13  n/a
     [DT= 5.00]  SUM=  04:P2FLOW        17.13    1.378 No_date    1:40   13.94  n/a
001:0050---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 04:P2FLOW        17.13    1.378 No_date    1:40   13.94  n/a
     [RDT= 5.00] out<- 01:POND2         17.13     .003 No_date    4:15   13.94  n/a
           overflow <= 02:P2OVF           .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.2360E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
001:0051---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    02:402b           6.07     .584 No_date    1:40   15.57 .623
     [XIMP=.58:TIMP=.73]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
001:0052---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    03:402c           1.19     .113 No_date    1:40   14.65 .586
     [XIMP=.55:TIMP=.68]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
001:0053---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:402b           6.07     .584 No_date    1:40   15.57  n/a
                     + 03:402c           1.19     .113 No_date    1:40   14.65  n/a
     [DT= 5.00]  SUM=  04:400-OS         7.26     .696 No_date    1:40   15.42  n/a
001:0054---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 04:400-OS         7.26     .696 No_date    1:40   15.42  n/a
 *   [RDT= 5.00] out<- 02:OSSTOR         7.26     .708 No_date    1:40   15.42  n/a
           overflow <= 03:OSOVF           .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.4596E-02, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
001:0055---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:401           16.78     .030 No_date    3:55    2.36 .094
     [CN= 68.0: N= 3.00]
     [Tp= 1.66:DT= 5.00]
001:0056---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:POND2         17.13     .003 No_date    4:15   13.94  n/a
                     + 02:OSSTOR         7.26     .708 No_date    1:40   15.42  n/a
                     + 03:401           16.78     .030 No_date    3:55    2.36  n/a
                     + 09:312ADD       234.76     .048 No_date    5:10    1.38  n/a
     [DT= 5.00]  SUM=  04:P2-T3        275.93     .710 No_date    1:40    2.59  n/a
001:0057---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 04:P2-T3        275.93     .710 No_date    1:40    2.59  n/a
     [RDT= 5.00] out<- 01:313          275.93     .315 No_date    1:45    2.59  n/a
     [L/S/n=  423./1.170/.100]
     {Vmax=  .448:Dmax=  .291}
001:0058---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB313          .72     .001 No_date    3:40    2.06 .082
     [CN= 68.0: N= 1.10]
     [Tp=  .34:DT= 5.00]
001:0059---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:313          275.93     .315 No_date    1:45    2.59  n/a
                     + 02:TRB313          .72     .001 No_date    3:40    2.06  n/a
     [DT= 5.00]  SUM=  03:313ADD       276.65     .315 No_date    1:45    2.59  n/a
001:0060---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       04:TRB314          .94     .001 No_date    4:00    2.06 .083
     [CN= 68.0: N= 1.10]
     [Tp=  .46:DT= 5.00]
```

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001:0061---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:313          275.93     .315 No_date    1:45    2.59  n/a
                     + 02:TRB313          .72     .001 No_date    3:40    2.06  n/a
     [DT= 5.00]  SUM=  03:313ADD       276.65     .315 No_date    1:45    2.59  n/a
001:0062---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       04:403a           2.66     .005 No_date    2:50    3.31 .132
     [CN= 70.0: N= 1.10]
     [Tp=  .27:DT= 5.00]
001:0063---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            10:T2-US        442.59     .073 No_date    6:55    3.48  n/a
                     + 03:313ADD       276.65     .315 No_date    1:45    2.59  n/a
                     + 04:403a           2.66     .005 No_date    2:50    3.31  n/a
     [DT= 5.00]  SUM=  01:CONFLU       721.90     .320 No_date    1:50    3.14  n/a
001:0064---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    01:203d           1.26     .122 No_date    1:40   15.00 .600
     [XIMP=.56:TIMP=.70]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
001:0065---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    02:501a           9.32    1.059 No_date    1:40   20.53 .821
     [XIMP=.74:TIMP=.93]
     [SLP= .80:DT= 5.00]
     [LOSS= 1 : HORTONS]
001:0066---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    COMPUTE DUALHYD    02:501a           9.32    1.059 No_date    1:40   20.53  n/a
       Major System /  03:OSSTOR          .00     .000 No_date    0:00     .00  n/a
       Minor System \  04:TOPOND         9.32    1.059 No_date    1:40   20.53  n/a
     {MjSysSto=.0000E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
001:0067---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    05:501b          38.42    2.941 No_date    1:40   14.42 .577
     [XIMP=.54:TIMP=.67]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
001:0068---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    06:501c          39.10    2.828 No_date    1:40   13.74 .549
     [XIMP=.51:TIMP=.64]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
001:0069---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    07:MR1            3.32     .491 No_date    1:40   23.05 .922
     [XIMP=.80:TIMP=.99]
     [SLP=1.00:DT= 5.00]
     [LOSS= 1 : HORTONS]
001:0070---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    08:MR2            3.04     .452 No_date    1:40   23.05 .922
     [XIMP=.80:TIMP=.99]
     [SLP=1.00:DT= 5.00]
     [LOSS= 1 : HORTONS]
001:0071---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:203d           1.26     .122 No_date    1:40   15.00  n/a
                     + 05:501b          38.42    2.941 No_date    1:40   14.42  n/a
                     + 07:MR1            3.32     .491 No_date    1:40   23.05  n/a
     [DT= 5.00]  SUM=  10:VALE          43.00    3.555 No_date    1:40   15.11  n/a
001:0072---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:TOPOND         9.32    1.059 No_date    1:40   20.53  n/a
                     + 06:501c          39.10    2.828 No_date    1:40   13.74  n/a
                     + 08:MR2            3.04     .452 No_date    1:40   23.05  n/a
     [DT= 5.00]  SUM=  09:MET           51.46    4.339 No_date    1:40   15.52  n/a
001:0073---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    01:POND3         11.89     .753 No_date    1:45   17.13 .685
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
001:0074---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            10:VALE          43.00    3.555 No_date    1:40   15.11  n/a
                     + 09:MET           51.46    4.339 No_date    1:40   15.52  n/a
                     + 01:POND3         11.89     .753 No_date    1:45   17.13  n/a
     [DT= 5.00]  SUM=  08:P3ADD        106.35    8.573 No_date    1:40   15.53  n/a
001:0075---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 08:P3ADD        106.35    8.573 No_date    1:40   15.53  n/a
     [RDT= 5.00] out<- 01:POND3        106.35     .058 No_date    4:10   15.53  n/a
```

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         overflow <= 02:E-OVF           .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.1600E+01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 ** END OF RUN :    1

*******************************************************************************




 RUN:COMMAND#
 002:0001---------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   2 ]
#******************************************************************************
#  Project Name: [Kanata North]    Project Number: [112117]
#  Date        : 03-30-2016
#  Modeller    : [Kallie Auld]
#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
#  License #   :  5320763
#******************************************************************************
#******************************************************************************
 002:0002---------------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=10.00:SDUR=   4.00:PTOT=  33.89]
 002:0003---------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = M:\2012\112117\data\CALCUL~1\swmhymo\POSTDE~1\OTTAWA.DEF
      ICASEdv  = 1 (read and print data)
      FileTitle= ------ ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE ---
                 ------ PARAMETER VALUES MUST BE ENTERD AFTER COLUMN 60 ----_
      Horton's infiltration equation parameters:
      [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
      Parameters for PERVIOUS surfaces in STANDHYD:
      [IAper=   4.67 mm] [LGP=40.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .013]
      Parameters used in NASHYD:
      [Ia=   4.67 mm] [N= 3.00]
 002:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:201          115.14     .023 No_date    5:45    3.18 .094
      [CN= 65.0: N= 1.10]
      [Tp= 3.42:DT= 5.00]
 002:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:201          115.14     .023 No_date    5:45    3.18  n/a
      [RDT= 5.00] out<- 02:210          115.14     .023 No_date    6:10    3.18  n/a
      [L/S/n=  558./ .890/.040]
      {Vmax=  .423:Dmax=  .011}
 002:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:202          263.64     .058 No_date    7:15    5.08 .150
      [CN= 70.0: N= 1.10]
      [Tp= 5.14:DT= 5.00]
 002:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:202          263.64     .058 No_date    7:15    5.08  n/a
                     +  02:210          115.14     .023 No_date    6:10    3.18  n/a
      [DT= 5.00]  SUM=  03:210add       378.78     .081 No_date    6:50    4.50  n/a
 002:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:210add       378.78     .081 No_date    6:50    4.50  n/a
      [RDT= 5.00] out<- 01:211          378.78     .081 No_date    7:20    4.50  n/a
      [L/S/n=  450./1.000/.100]
      {Vmax=  .288:Dmax=  .056}
 002:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:211            1.87     .002 No_date    4:00    6.49 .191
      [CN= 76.0: N= 1.10]
      [Tp= 1.17:DT= 5.00]
 002:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
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```
     ADD HYD            01:211          378.78     .081 No_date    7:20    4.50  n/a
                     +  02:211            1.87     .002 No_date    4:00    6.49  n/a
      [DT= 5.00]  SUM=  03:211add       380.65     .083 No_date    7:05    4.51  n/a
 002:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:211add       380.65     .083 No_date    7:05    4.51  n/a
      [RDT= 5.00] out<- 01:212          380.65     .083 No_date    7:20    4.51  n/a
      [L/S/n=  230./1.000/.100]
      {Vmax=  .288:Dmax=  .057}
 002:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:212             .95     .001 No_date    4:00    4.04 .119
      [CN= 66.0: N= 1.10]
      [Tp=  .56:DT= 5.00]
 002:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:212          380.65     .083 No_date    7:20    4.51  n/a
                     +  02:212             .95     .001 No_date    4:00    4.04  n/a
      [DT= 5.00]  SUM=  03:212add       381.60     .084 No_date    7:05    4.51  n/a
 002:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:212add       381.60     .084 No_date    7:05    4.51  n/a
      [RDT= 5.00] out<- 01:213          381.60     .084 No_date    7:30    4.51  n/a
      [L/S/n=  330./1.000/.100]
      {Vmax=  .288:Dmax=  .057}
 002:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:213            1.43     .002 No_date    4:00    3.98 .117
      [CN= 66.0: N= 1.10]
      [Tp=  .67:DT= 5.00]
 002:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:213          381.60     .084 No_date    7:30    4.51  n/a
                     +  02:213            1.43     .002 No_date    4:00    3.98  n/a
      [DT= 5.00]  SUM=  09:TRIB2        383.03     .085 No_date    7:15    4.51  n/a
 002:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    01:203a          27.32    2.924 No_date    1:30   19.94 .588
      [XIMP=.50:TIMP=.63]
      [SLP=2.30:DT= 5.00]
      [LOSS= 1 : HORTONS]
 002:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  DESIGN STANDHYD    02:203b          20.76    2.179 No_date    1:30   19.21 .567
      [XIMP=.48:TIMP=.60]
      [SLP=2.30:DT= 5.00]
      [LOSS= 1 : HORTONS]
 002:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  DESIGN STANDHYD    03:203c           4.95     .711 No_date    1:30   22.20 .655
      [XIMP=.57:TIMP=.71]
      [SLP=2.30:DT= 5.00]
      [LOSS= 1 : HORTONS]
 002:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    04:POND1          2.68     .307 No_date    1:30   24.68 .728
      [XIMP=.64:TIMP=.80]
      [SLP= .10:DT= 5.00]
      [LOSS= 1 : HORTONS]
 002:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:203b          20.76    2.179 No_date    1:30   19.21  n/a
                     +  03:203c           4.95     .711 No_date    1:30   22.20  n/a
      [DT= 5.00]  SUM=  05:T2CRS         25.71    2.890 No_date    1:30   19.78  n/a
 002:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:203a          27.32    2.924 No_date    1:30   19.94  n/a
                     +  04:POND1          2.68     .307 No_date    1:30   24.68  n/a
                     +  05:T2CRS         25.71    2.890 No_date    1:30   19.78  n/a
      [DT= 5.00]  SUM=  06:P1FLOW        55.71    6.121 No_date    1:30   20.10  n/a
 002:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 06:P1FLOW        55.71    6.121 No_date    1:30   20.10  n/a
      [RDT= 5.00] out<- 01:POND1         55.71     .075 No_date    4:05   20.10  n/a
            overflow <= 02:P1-OVF          .00     .000 No_date    0:00     .00  n/a
     {MxStoUsed=.1059E+01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 002:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:POND1         55.71     .075 No_date    4:05   20.10  n/a
                     +  09:TRIB2        383.03     .085 No_date    7:15    4.51  n/a
      [DT= 5.00]  SUM=  02:213ADD       438.74     .153 No_date    5:45    6.49  n/a
 002:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 02:213ADD       438.74     .153 No_date    5:45    6.49  n/a
      [RDT= 5.00] out<- 01:214          438.74     .153 No_date    6:05    6.49  n/a
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     [L/S/n=  390./1.700/.100]
     {Vmax=  .376:Dmax=  .080}
002:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:214            1.61     .006 No_date    2:30    5.05 .149
     [CN= 72.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
002:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:214          438.74     .153 No_date    6:05    6.49  n/a
                     + 03:214            1.61     .006 No_date    2:30    5.05  n/a
     [DT= 5.00]  SUM=  02:214ADD       440.35     .155 No_date    5:55    6.48  n/a
002:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:214ADD       440.35     .155 No_date    5:55    6.48  n/a
     [RDT= 5.00] out<- 01:215          440.35     .154 No_date    6:10    6.48  n/a
     [L/S/n=  260./1.400/.100]
     {Vmax=  .341:Dmax=  .089}
002:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB215         1.12     .003 No_date    2:40    3.52 .104
     [CN= 66.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
002:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:215          440.35     .154 No_date    6:10    6.48  n/a
                     + 02:TRB215         1.12     .003 No_date    2:40    3.52  n/a
     [DT= 5.00]  SUM=  03:215ADD       441.47     .155 No_date    6:05    6.48  n/a
002:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:215ADD       441.47     .155 No_date    6:05    6.48  n/a
     [RDT= 5.00] out<- 01:216          441.47     .155 No_date    6:30    6.48  n/a
     [L/S/n=  250./ .500/.100]
     {Vmax=  .204:Dmax=  .150}
002:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB216         1.12     .003 No_date    2:40    3.12 .092
     [CN= 65.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
002:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:216          441.47     .155 No_date    6:30    6.48  n/a
                     + 02:TRB216         1.12     .003 No_date    2:40    3.12  n/a
     [DT= 5.00]  SUM=  10:T2-US        442.59     .155 No_date    6:25    6.47  n/a
002:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:301           86.43     .040 No_date    4:05    2.73 .081
     [CN= 63.0: N= 1.10]
     [Tp= 1.24:DT= 5.00]
002:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:302           80.69     .030 No_date    4:20    3.19 .094
     [CN= 64.0: N= 1.10]
     [Tp= 1.80:DT= 5.00]
002:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:301           86.43     .040 No_date    4:05    2.73  n/a
                     + 02:302           80.69     .030 No_date    4:20    3.19  n/a
     [DT= 5.00]  SUM=  03:300a         167.12     .070 No_date    4:05    2.95  n/a
002:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300a         167.12     .070 No_date    4:05    2.95  n/a
     [RDT= 5.00] out<- 01:310          167.12     .069 No_date    4:40    2.95  n/a
     [L/S/n=  449./1.620/.040]
     {Vmax=  .430:Dmax=  .038}
002:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:303           65.19     .047 No_date    4:00    4.49 .132
     [CN= 69.0: N= 1.10]
     [Tp= 1.31:DT= 5.00]
002:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:310          167.12     .069 No_date    4:40    2.95  n/a
                     + 02:303           65.19     .047 No_date    4:00    4.49  n/a
     [DT= 5.00]  SUM=  03:300b         232.31     .116 No_date    4:30    3.38  n/a
002:0040---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300b         232.31     .116 No_date    4:30    3.38  n/a
     [RDT= 5.00] out<- 01:311          232.31     .115 No_date    4:50    3.38  n/a
     [L/S/n=  270./1.170/.100]
     {Vmax=  .312:Dmax=  .073}
002:0041---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB311         1.15     .002 No_date    4:00    3.75 .111
     [CN= 65.0: N= 1.10]
     [Tp=  .52:DT= 5.00]
002:0042---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:311          232.31     .115 No_date    4:50    3.38  n/a
                     + 02:TRB311         1.15     .002 No_date    4:00    3.75  n/a
     [DT= 5.00]  SUM=  03:311ADD       233.46     .117 No_date    4:50    3.39  n/a
002:0043---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:311ADD       233.46     .117 No_date    4:50    3.39  n/a
     [RDT= 5.00] out<- 01:312          233.46     .116 No_date    5:05    3.39  n/a
     [L/S/n=  270./1.170/.100]
     {Vmax=  .312:Dmax=  .074}
002:0044---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB312         1.30     .003 No_date    4:00    6.53 .193
     [CN= 76.0: N= 1.10]
     [Tp=  .64:DT= 5.00]
002:0045---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:312          233.46     .116 No_date    5:05    3.39  n/a
                     + 02:TRB312         1.30     .003 No_date    4:00    6.53  n/a
     [DT= 5.00]  SUM=  09:312ADD       234.76     .118 No_date    5:05    3.40  n/a
002:0046---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  * DESIGN STANDHYD    01:304a           9.61     .988 No_date    1:30   18.49 .545
     [XIMP=.46:TIMP=.57]
     [SLP=1.60:DT= 5.00]
     [LOSS= 1 : HORTONS]
002:0047---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  * DESIGN STANDHYD    02:402a           5.67     .823 No_date    1:30   22.67 .669
     [XIMP=.58:TIMP=.73]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
002:0048---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    03:POND2          1.85     .221 No_date    1:30   24.68 .728
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
002:0049---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:304a           9.61     .988 No_date    1:30   18.49  n/a
                     + 02:402a           5.67     .823 No_date    1:30   22.67  n/a
                     + 03:POND2          1.85     .221 No_date    1:30   24.68  n/a
     [DT= 5.00]  SUM=  04:P2FLOW        17.13    2.031 No_date    1:30   20.54  n/a
002:0050---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 04:P2FLOW        17.13    2.031 No_date    1:30   20.54  n/a
     [RDT= 5.00] out<- 01:POND2         17.13     .011 No_date    4:05   20.54  n/a
           overflow <= 02:P2OVF           .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.3433E+00, TotOvfVol=.0000E+00, N-Ovf=     0, TotDurOvf=     0.hrs}
002:0051---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  * DESIGN STANDHYD    02:402b           6.07     .879 No_date    1:30   22.67 .669
     [XIMP=.58:TIMP=.73]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
002:0052---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  * DESIGN STANDHYD    03:402c           1.19     .170 No_date    1:30   21.42 .632
     [XIMP=.55:TIMP=.68]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
002:0053---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:402b           6.07     .879 No_date    1:30   22.67  n/a
                     + 03:402c           1.19     .170 No_date    1:30   21.42  n/a
     [DT= 5.00]  SUM=  04:400-OS         7.26    1.049 No_date    1:30   22.46  n/a
002:0054---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 04:400-OS         7.26    1.049 No_date    1:30   22.46  n/a
     [RDT= 5.00] out<- 02:OSSTOR         7.26     .801 No_date    1:35   22.46  n/a
           overflow <= 03:OSOVF           .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.1404E-01, TotOvfVol=.0000E+00, N-Ovf=     0, TotDurOvf=     0.hrs}
002:0055---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:401           16.78     .062 No_date    3:45    4.94 .146
     [CN= 68.0: N= 3.00]
     [Tp= 1.66:DT= 5.00]
002:0056---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:POND2         17.13     .011 No_date    4:05   20.54  n/a
                     + 02:OSSTOR         7.26     .801 No_date    1:35   22.46  n/a
                     + 03:401           16.78     .062 No_date    3:45    4.94  n/a
                     + 09:312ADD       234.76     .118 No_date    5:05    3.40  n/a
     [DT= 5.00]  SUM=  04:P2-T3        275.93     .807 No_date    1:35    5.06  n/a
002:0057---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
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    ROUTE CHANNEL   -> 04:P2-T3        275.93     .807 No_date    1:35    5.06  n/a
     [RDT= 5.00] out<- 01:313          275.93     .556 No_date    1:40    5.06  n/a
     [L/S/n=  423./1.170/.100]
     {Vmax=  .490:Dmax=  .318}
002:0058---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB313          .72     .002 No_date    3:20    4.54 .134
     [CN= 68.0: N= 1.10]
     [Tp=  .34:DT= 5.00]
002:0059---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:313          275.93     .556 No_date    1:40    5.06  n/a
                  +  02:TRB313            .72     .002 No_date    3:20    4.54  n/a
     [DT= 5.00]  SUM=  03:313ADD       276.65     .557 No_date    1:40    5.06  n/a
002:0060---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       04:TRB314          .94     .002 No_date    4:00    4.54 .134
     [CN= 68.0: N= 1.10]
     [Tp=  .46:DT= 5.00]
002:0061---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:313          275.93     .556 No_date    1:40    5.06  n/a
                  +  02:TRB313            .72     .002 No_date    3:20    4.54  n/a
     [DT= 5.00]  SUM=  03:313ADD       276.65     .557 No_date    1:40    5.06  n/a
002:0062---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       04:403a           2.66     .009 No_date    2:50    6.33 .187
     [CN= 70.0: N= 1.10]
     [Tp=  .27:DT= 5.00]
002:0063---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            10:T2-US        442.59     .155 No_date    6:25    6.47  n/a
                  +  03:313ADD         276.65     .557 No_date    1:40    5.06  n/a
                  +  04:403a             2.66     .009 No_date    2:50    6.33  n/a
     [DT= 5.00]  SUM=  01:CONFLU       721.90     .569 No_date    1:40    5.93  n/a
002:0064---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  DESIGN STANDHYD   01:203d           1.26     .185 No_date    1:30   21.90 .646
     [XIMP=.56:TIMP=.70]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
002:0065---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    02:501a           9.32    1.537 No_date    1:30   28.94 .854
     [XIMP=.74:TIMP=.93]
     [SLP= .80:DT= 5.00]
     [LOSS= 1 : HORTONS]
002:0066---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    COMPUTE DUALHYD    02:501a           9.32    1.537 No_date    1:30   28.94  n/a
       Major System /  03:OSSTOR          .00     .000 No_date    0:00     .00  n/a
       Minor System \  04:TOPOND         9.32    1.537 No_date    1:30   28.94  n/a
     {MjSysSto=.0000E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
002:0067---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    05:501b          38.42    4.266 No_date    1:30   21.12 .623
     [XIMP=.54:TIMP=.67]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
002:0068---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    06:501c          39.10    4.131 No_date    1:30   20.22 .597
     [XIMP=.51:TIMP=.64]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
002:0069---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  DESIGN STANDHYD   07:MR1            3.32     .656 No_date    1:30   31.93 .942
     [XIMP=.80:TIMP=.99]
     [SLP=1.00:DT= 5.00]
     [LOSS= 1 : HORTONS]
002:0070---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  DESIGN STANDHYD   08:MR2            3.04     .603 No_date    1:30   31.93 .942
     [XIMP=.80:TIMP=.99]
     [SLP=1.00:DT= 5.00]
     [LOSS= 1 : HORTONS]
002:0071---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:203d           1.26     .185 No_date    1:30   21.90  n/a
                  +  05:501b            38.42    4.266 No_date    1:30   21.12  n/a
                  +  07:MR1              3.32     .656 No_date    1:30   31.93  n/a
     [DT= 5.00]  SUM=  10:VALE          43.00    5.107 No_date    1:30   21.98  n/a
002:0072---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:TOPOND         9.32    1.537 No_date    1:30   28.94  n/a
                  +  06:501c            39.10    4.131 No_date    1:30   20.22  n/a
                  +  08:MR2              3.04     .603 No_date    1:30   31.93  n/a
     [DT= 5.00]  SUM=  09:MET           51.46    6.271 No_date    1:30   22.50  n/a
002:0073---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    01:POND3         11.89    1.050 No_date    1:35   24.68 .728
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
002:0074---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            10:VALE          43.00    5.107 No_date    1:30   21.98  n/a
                  +  09:MET             51.46    6.271 No_date    1:30   22.50  n/a
                  +  01:POND3           11.89    1.050 No_date    1:35   24.68  n/a
     [DT= 5.00]  SUM=  08:P3ADD        106.35   12.330 No_date    1:30   22.53  n/a
002:0075---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 08:P3ADD        106.35   12.330 No_date    1:30   22.53  n/a
     [RDT= 5.00] out<- 01:POND3        106.35     .175 No_date    4:05   22.53  n/a
           overflow <= 02:E-OVF           .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.2262E+01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 ** END OF RUN :   2

*******************************************************************************



 RUN:COMMAND#
 003:0001-----------------------------------------------------------------------
    START
     [TZERO =    .00 hrs on        0]
     [METOUT=   2    (1=imperial, 2=metric output)]
     [NSTORM=   1 ]
     [NRUN  =   3 ]
#******************************************************************************
#  Project Name: [Kanata North]    Project Number: [112117]
#  Date        : 03-30-2016
#  Modeller    : [Kallie Auld]
#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
#  License #   :  5320763
#******************************************************************************
#******************************************************************************
 003:0002-----------------------------------------------------------------------
    READ STORM
     Filename = STORM.001
     Comment  =
     [SDT=10.00:SDUR=   4.00:PTOT=  45.18]
 003:0003-----------------------------------------------------------------------
    DEFAULT VALUES
     Filename = M:\2012\112117\data\CALCUL~1\swmhymo\POSTDE~1\OTTAWA.DEF
     ICASEdv  = 1 (read and print data)
     FileTitle= ------ ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE ---
                ------ PARAMETER VALUES MUST BE ENTERD AFTER COLUMN 60 ----_
     Horton's infiltration equation parameters:
     [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
     Parameters for PERVIOUS surfaces in STANDHYD:
     [IAper=   4.67 mm] [LGP=40.00 m] [MNP= .250]
     Parameters for IMPERVIOUS surfaces in STANDHYD:
     [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .013]
     Parameters used in NASHYD:
     [Ia=   4.67 mm] [N= 3.00]
 003:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:201          115.14     .049 No_date    5:45    6.69 .148
     [CN= 65.0: N= 1.10]
     [Tp= 3.42:DT= 5.00]
 003:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:201          115.14     .049 No_date    5:45    6.69  n/a
     [RDT= 5.00] out<- 02:210          115.14     .049 No_date    6:10    6.69  n/a
     [L/S/n=  558./ .890/.040]
     {Vmax=  .423:Dmax=  .023}
 003:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:202          263.64     .110 No_date    7:20    9.60 .212
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     [CN= 70.0: N= 1.10]
     [Tp= 5.14:DT= 5.00]
003:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:202          263.64     .110 No_date    7:20    9.60  n/a
                    + 02:210          115.14     .049 No_date    6:10    6.69  n/a
     [DT= 5.00]  SUM=  03:210add      378.78     .159 No_date    6:50    8.71  n/a
003:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:210add      378.78     .159 No_date    6:50    8.71  n/a
     [RDT= 5.00] out<- 01:211         378.78     .159 No_date    7:20    8.71  n/a
     [L/S/n=  450./1.000/.100]
     {Vmax=  .288:Dmax=  .109}
003:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:211            1.87     .004 No_date    4:00   11.99 .265
     [CN= 76.0: N= 1.10]
     [Tp= 1.17:DT= 5.00]
003:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:211          378.78     .159 No_date    7:20    8.71  n/a
                    + 02:211            1.87     .004 No_date    4:00   11.99  n/a
     [DT= 5.00]  SUM=  03:211add      380.65     .162 No_date    7:05    8.73  n/a
003:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:211add      380.65     .162 No_date    7:05    8.73  n/a
     [RDT= 5.00] out<- 01:212         380.65     .162 No_date    7:20    8.73  n/a
     [L/S/n=  230./1.000/.100]
     {Vmax=  .288:Dmax=  .111}
003:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:212             .95     .003 No_date    4:00    7.91 .175
     [CN= 66.0: N= 1.10]
     [Tp=  .56:DT= 5.00]
003:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:212          380.65     .162 No_date    7:20    8.73  n/a
                    + 02:212             .95     .003 No_date    4:00    7.91  n/a
     [DT= 5.00]  SUM=  03:212add      381.60     .164 No_date    7:05    8.73  n/a
003:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:212add      381.60     .164 No_date    7:05    8.73  n/a
     [RDT= 5.00] out<- 01:213         381.60     .164 No_date    7:30    8.73  n/a
     [L/S/n=  330./1.000/.100]
     {Vmax=  .288:Dmax=  .112}
003:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:213            1.43     .003 No_date    4:00    7.83 .173
     [CN= 66.0: N= 1.10]
     [Tp=  .67:DT= 5.00]
003:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:213          381.60     .164 No_date    7:30    8.73  n/a
                    + 02:213            1.43     .003 No_date    4:00    7.83  n/a
     [DT= 5.00]  SUM=  09:TRIB2       383.03     .166 No_date    7:15    8.72  n/a
003:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD   01:203a          27.32    4.933 No_date    1:40   29.52 .653
     [XIMP=.50:TIMP=.63]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
003:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD   02:203b          20.76    3.707 No_date    1:40   28.61 .633
     [XIMP=.48:TIMP=.60]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
003:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD   03:203c           4.95    1.053 No_date    1:40   32.10 .711
     [XIMP=.57:TIMP=.71]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
003:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD   04:POND1          2.68     .445 No_date    1:40   35.07 .776
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
003:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:203b          20.76    3.707 No_date    1:40   28.61  n/a
                    + 03:203c           4.95    1.053 No_date    1:40   32.10  n/a
     [DT= 5.00]  SUM=  05:T2CRS        25.71    4.760 No_date    1:40   29.28  n/a
003:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:203a          27.32    4.933 No_date    1:40   29.52  n/a
                    + 04:POND1          2.68     .445 No_date    1:40   35.07  n/a
                    + 05:T2CRS         25.71    4.760 No_date    1:40   29.28  n/a
     [DT= 5.00]  SUM=  06:P1FLOW       55.71   10.138 No_date    1:40   29.68  n/a
003:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 06:P1FLOW       55.71   10.138 No_date    1:40   29.68  n/a
     [RDT= 5.00] out<- 01:POND1        55.71     .152 No_date    4:00   29.68  n/a
           overflow <= 02:P1-OVF         .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.1536E+01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
003:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:POND1         55.71     .152 No_date    4:00   29.68  n/a
                    + 09:TRIB2        383.03     .166 No_date    7:15    8.72  n/a
     [DT= 5.00]  SUM=  02:213ADD      438.74     .300 No_date    5:25   11.38  n/a
003:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:213ADD      438.74     .300 No_date    5:25   11.38  n/a
     [RDT= 5.00] out<- 01:214         438.74     .299 No_date    5:45   11.38  n/a
     [L/S/n=  390./1.700/.100]
     {Vmax=  .376:Dmax=  .157}
003:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      03:214            1.61     .012 No_date    2:30    9.74 .216
     [CN= 72.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
003:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:214          438.74     .299 No_date    5:45   11.38  n/a
                    + 03:214            1.61     .012 No_date    2:30    9.74  n/a
     [DT= 5.00]  SUM=  02:214ADD      440.35     .303 No_date    5:35   11.38  n/a
003:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:214ADD      440.35     .303 No_date    5:35   11.38  n/a
     [RDT= 5.00] out<- 01:215         440.35     .303 No_date    5:50   11.38  n/a
     [L/S/n=  260./1.400/.100]
     {Vmax=  .347:Dmax=  .166}
003:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:TRB215         1.12     .006 No_date    2:30    7.23 .160
     [CN= 66.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
003:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:215          440.35     .303 No_date    5:50   11.38  n/a
                    + 02:TRB215         1.12     .006 No_date    2:30    7.23  n/a
     [DT= 5.00]  SUM=  03:215ADD      441.47     .304 No_date    5:45   11.37  n/a
003:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:215ADD      441.47     .304 No_date    5:45   11.37  n/a
     [RDT= 5.00] out<- 01:216         441.47     .304 No_date    6:00   11.37  n/a
     [L/S/n=  250./ .500/.100]
     {Vmax=  .238:Dmax=  .220}
003:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:TRB216         1.12     .006 No_date    2:30    6.62 .146
     [CN= 65.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
003:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:216          441.47     .304 No_date    6:00   11.37  n/a
                    + 02:TRB216         1.12     .006 No_date    2:30    6.62  n/a
     [DT= 5.00]  SUM=  10:T2-US       442.59     .306 No_date    5:55   11.36  n/a
003:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      01:301           86.43     .086 No_date    4:00    5.94 .131
     [CN= 63.0: N= 1.10]
     [Tp= 1.24:DT= 5.00]
003:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:302           80.69     .063 No_date    4:20    6.63 .147
     [CN= 64.0: N= 1.10]
     [Tp= 1.80:DT= 5.00]
003:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:301           86.43     .086 No_date    4:00    5.94  n/a
                    + 02:302           80.69     .063 No_date    4:20    6.63  n/a
     [DT= 5.00]  SUM=  03:300a        167.12     .150 No_date    4:05    6.27  n/a
003:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300a        167.12     .150 No_date    4:05    6.27  n/a
     [RDT= 5.00] out<- 01:310         167.12     .149 No_date    4:35    6.27  n/a
     [L/S/n=  449./1.620/.040]
     {Vmax=  .449:Dmax=  .069}
003:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:303           65.19     .091 No_date    4:00    8.75 .194
     [CN= 69.0: N= 1.10]
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    [Tp= 1.31:DT= 5.00]
003:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:310          167.12     .149 No_date    4:35    6.27  n/a
                     + 02:303           65.19     .091 No_date    4:00    8.75  n/a
     [DT= 5.00]  SUM=  03:300b         232.31     .239 No_date    4:25    6.97  n/a
003:0040---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300b         232.31     .239 No_date    4:25    6.97  n/a
     [RDT= 5.00] out<- 01:311          232.31     .238 No_date    4:45    6.97  n/a
     [L/S/n=  270./1.170/.100]
     {Vmax=  .312:Dmax=  .151}
003:0041---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB311          1.15     .003 No_date    4:00    7.45 .165
     [CN= 65.0: N= 1.10]
     [Tp=  .52:DT= 5.00]
003:0042---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:311          232.31     .238 No_date    4:45    6.97  n/a
                     + 02:TRB311          1.15     .003 No_date    4:00    7.45  n/a
     [DT= 5.00]  SUM=  03:311ADD       233.46     .241 No_date    4:45    6.97  n/a
003:0043---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:311ADD       233.46     .241 No_date    4:45    6.97  n/a
     [RDT= 5.00] out<- 01:312          233.46     .240 No_date    5:00    6.97  n/a
     [L/S/n=  270./1.170/.100]
     {Vmax=  .312:Dmax=  .152}
003:0044---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB312          1.30     .005 No_date    4:00   12.04 .267
     [CN= 76.0: N= 1.10]
     [Tp=  .64:DT= 5.00]
003:0045---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:312          233.46     .240 No_date    5:00    6.97  n/a
                     + 02:TRB312          1.30     .005 No_date    4:00   12.04  n/a
     [DT= 5.00]  SUM=  09:312ADD       234.76     .244 No_date    5:00    7.00  n/a
003:0046---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  * DESIGN STANDHYD    01:304a            9.61    1.683 No_date    1:40   27.75 .614
     [XIMP=.46:TIMP=.57]
     [SLP=1.60:DT= 5.00]
     [LOSS= 1 : HORTONS]
003:0047---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  * DESIGN STANDHYD    02:402a            5.67    1.215 No_date    1:40   32.68 .723
     [XIMP=.58:TIMP=.73]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
003:0048---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    03:POND2           1.85     .316 No_date    1:40   35.07 .776
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
003:0049---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:304a            9.61    1.683 No_date    1:40   27.75  n/a
                     + 02:402a            5.67    1.215 No_date    1:40   32.68  n/a
                     + 03:POND2           1.85     .316 No_date    1:40   35.07  n/a
     [DT= 5.00]  SUM=  04:P2FLOW         17.13    3.214 No_date    1:40   30.18  n/a
003:0050---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 04:P2FLOW         17.13    3.214 No_date    1:40   30.18  n/a
     [RDT= 5.00] out<- 01:POND2          17.13     .025 No_date    4:05   30.17  n/a
           overflow <= 02:P2OVF            .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.4981E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
003:0051---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  * DESIGN STANDHYD    02:402b            6.07    1.297 No_date    1:40   32.68 .723
     [XIMP=.58:TIMP=.73]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
003:0052---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  * DESIGN STANDHYD    03:402c            1.19     .253 No_date    1:40   31.21 .691
     [XIMP=.55:TIMP=.68]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
003:0053---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:402b            6.07    1.297 No_date    1:40   32.68  n/a
                     + 03:402c            1.19     .253 No_date    1:40   31.21  n/a
     [DT= 5.00]  SUM=  04:400-OS          7.26    1.550 No_date    1:40   32.44  n/a
003:0054---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 04:400-OS          7.26    1.550 No_date    1:40   32.44  n/a
     [RDT= 5.00] out<- 02:OSSTOR          7.26     .803 No_date    1:50   32.44  n/a
           overflow <= 03:OSOVF            .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.3891E-01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
003:0055---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:401            16.78     .119 No_date    3:45    9.24 .205
     [CN= 68.0: N= 3.00]
     [Tp= 1.66:DT= 5.00]
003:0056---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:POND2          17.13     .025 No_date    4:05   30.17  n/a
                     + 02:OSSTOR          7.26     .803 No_date    1:50   32.44  n/a
                     + 03:401            16.78     .119 No_date    3:45    9.24  n/a
                     + 09:312ADD        234.76     .244 No_date    5:00    7.00  n/a
     [DT= 5.00]  SUM=  04:P2-T3         275.93     .868 No_date    2:00    9.24  n/a
003:0057---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 04:P2-T3         275.93     .868 No_date    2:00    9.24  n/a
     [RDT= 5.00] out<- 01:313           275.93     .785 No_date    2:00    9.24  n/a
     [L/S/n=  423./1.170/.100]
     {Vmax=  .499:Dmax=  .331}
003:0058---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB313           .72     .003 No_date    3:10    8.73 .193
     [CN= 68.0: N= 1.10]
     [Tp=  .34:DT= 5.00]
003:0059---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:313           275.93     .785 No_date    2:00    9.24  n/a
                     + 02:TRB313           .72     .003 No_date    3:10    8.73  n/a
     [DT= 5.00]  SUM=  03:313ADD        276.65     .788 No_date    2:00    9.24  n/a
003:0060---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       04:TRB314           .94     .003 No_date    3:45    8.73 .193
     [CN= 68.0: N= 1.10]
     [Tp=  .46:DT= 5.00]
003:0061---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:313           275.93     .785 No_date    2:00    9.24  n/a
                     + 02:TRB313           .72     .003 No_date    3:10    8.73  n/a
     [DT= 5.00]  SUM=  03:313ADD        276.65     .788 No_date    2:00    9.24  n/a
003:0062---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       04:403a            2.66     .017 No_date    2:45   11.16 .247
     [CN= 70.0: N= 1.10]
     [Tp=  .27:DT= 5.00]
003:0063---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            10:T2-US         442.59     .306 No_date    5:55   11.36  n/a
                     + 03:313ADD        276.65     .788 No_date    2:00    9.24  n/a
                     + 04:403a            2.66     .017 No_date    2:45   11.16  n/a
     [DT= 5.00]  SUM=  01:CONFLU        721.90     .827 No_date    2:00   10.54  n/a
003:0064---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  * DESIGN STANDHYD    01:203d            1.26     .274 No_date    1:40   31.77 .703
     [XIMP=.56:TIMP=.70]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
003:0065---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  * DESIGN STANDHYD    02:501a            9.32    2.193 No_date    1:40   39.94 .884
     [XIMP=.74:TIMP=.93]
     [SLP= .80:DT= 5.00]
     [LOSS= 1 : HORTONS]
003:0066---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    COMPUTE DUALHYD    02:501a            9.32    2.193 No_date    1:40   39.94  n/a
       Major System /  03:OSSTOR           .00     .000 No_date    0:00     .00  n/a
       Minor System \  04:TOPOND          9.32    2.060 No_date    1:40   41.58  n/a
     {MjSysSto=.3980E+02, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
003:0067---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    05:501b           38.42    7.060 No_date    1:40   30.88 .684
     [XIMP=.54:TIMP=.67]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
003:0068---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    06:501c           39.10    6.947 No_date    1:40   29.85 .661
     [XIMP=.51:TIMP=.64]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
003:0069---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  * DESIGN STANDHYD    07:MR1             3.32     .908 No_date    1:40   43.21 .956
```

```
     [XIMP=.80:TIMP=.99]
     [SLP=1.00:DT= 5.00]
     [LOSS= 1 : HORTONS]
 003:0070---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  DESIGN STANDHYD    08:MR2           3.04     .834 No_date    1:40   43.21 .956
     [XIMP=.80:TIMP=.99]
     [SLP=1.00:DT= 5.00]
     [LOSS= 1 : HORTONS]
 003:0071---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:203d          1.26     .274 No_date    1:40   31.77  n/a
                     +  05:501b         38.42    7.060 No_date    1:40   30.88  n/a
                     +  07:MR1           3.32     .908 No_date    1:40   43.21  n/a
     [DT= 5.00]  SUM=  10:VALE          43.00    8.242 No_date    1:40   31.86  n/a
 003:0072---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             04:TOPOND        9.32    2.060 No_date    1:40   41.58  n/a
                     +  06:501c         39.10    6.947 No_date    1:40   29.85  n/a
                     +  08:MR2           3.04     .834 No_date    1:40   43.21  n/a
     [DT= 5.00]  SUM=  09:MET           51.46    9.841 No_date    1:40   32.76  n/a
 003:0073---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD     01:POND3        11.89    1.543 No_date    1:45   35.07 .776
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
 003:0074---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             10:VALE         43.00    8.242 No_date    1:40   31.86  n/a
                     +  09:MET          51.46    9.841 No_date    1:40   32.76  n/a
                     +  01:POND3        11.89    1.543 No_date    1:45   35.07  n/a
     [DT= 5.00]  SUM=  08:P3ADD        106.35   19.492 No_date    1:40   32.66  n/a
 003:0075---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 08:P3ADD        106.35   19.492 No_date    1:40   32.66  n/a
     [RDT= 5.00] out<- 01:POND3        106.35     .349 No_date    4:00   32.66  n/a
           overflow <= 02:E-OVF           .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.3205E+01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
  ** END OF RUN :    4

*******************************************************************************




 RUN:COMMAND#
 005:0001------------------------------------------------------------------------
    START
     [TZERO =    .00 hrs on        0]
     [METOUT=   2    (1=imperial, 2=metric output)]
     [NSTORM=   1 ]
     [NRUN  =   5 ]
#******************************************************************************
#  Project Name: [Kanata North]    Project Number: [112117]
#  Date        : 03-30-2016
#  Modeller    : [Kallie Auld]
#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
#  License #   :  5320763
#******************************************************************************
#******************************************************************************
 005:0002------------------------------------------------------------------------
    READ STORM
     Filename = STORM.001
     Comment  =
     [SDT=10.00:SDUR=   4.00:PTOT=  76.02]
 005:0003------------------------------------------------------------------------
    DEFAULT VALUES
     Filename = M:\2012\112117\data\CALCUL~1\swmhymo\POSTDE~1\OTTAWA.DEF
     ICASEdv  = 1 (read and print data)
     FileTitle= ------ ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE ---
               ------ PARAMETER VALUES MUST BE ENTERD AFTER COLUMN 60 ----_
     Horton's infiltration equation parameters:
     [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
     Parameters for PERVIOUS surfaces in STANDHYD:
     [IAper=   4.67 mm] [LGP=40.00 m] [MNP= .250]
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     Parameters for IMPERVIOUS surfaces in STANDHYD:
     [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .013]
     Parameters used in NASHYD:
     [Ia=   4.67 mm] [N= 3.00]
 005:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        01:201         115.14     .152 No_date    5:35   20.74 .273
     [CN= 65.0: N= 1.10]
     [Tp= 3.42:DT= 5.00]
 005:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:201          115.14     .152 No_date    5:35   20.74  n/a
     [RDT= 5.00] out<- 02:210          115.14     .152 No_date    6:05   20.74  n/a
     [L/S/n=  558./ .890/.040]
     {Vmax=  .423:Dmax=  .070}
 005:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        01:202         263.64     .301 No_date    7:15   26.35 .347
     [CN= 70.0: N= 1.10]
     [Tp= 5.14:DT= 5.00]
 005:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:202         263.64     .301 No_date    7:15   26.35  n/a
                     +  02:210         115.14     .152 No_date    6:05   20.74  n/a
     [DT= 5.00]  SUM=  03:210add       378.78     .453 No_date    6:40   24.64  n/a
 005:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:210add       378.78     .453 No_date    6:40   24.64  n/a
     [RDT= 5.00] out<- 01:211          378.78     .453 No_date    7:00   24.64  n/a
     [L/S/n=  450./1.000/.100]
     {Vmax=  .343:Dmax=  .228}
 005:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        02:211           1.87     .010 No_date    4:00   31.50 .414
     [CN= 76.0: N= 1.10]
     [Tp= 1.17:DT= 5.00]
 005:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:211         378.78     .453 No_date    7:00   24.64  n/a
                     +  02:211           1.87     .010 No_date    4:00   31.50  n/a
     [DT= 5.00]  SUM=  03:211add       380.65     .462 No_date    6:45   24.67  n/a
 005:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:211add       380.65     .462 No_date    6:45   24.67  n/a
     [RDT= 5.00] out<- 01:212          380.65     .462 No_date    6:55   24.67  n/a
     [L/S/n=  230./1.000/.100]
     {Vmax=  .345:Dmax=  .230}
 005:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        02:212            .95     .007 No_date    3:50   22.81 .300
     [CN= 66.0: N= 1.10]
     [Tp=  .56:DT= 5.00]
 005:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:212         380.65     .462 No_date    6:55   24.67  n/a
                     +  02:212            .95     .007 No_date    3:50   22.81  n/a
     [DT= 5.00]  SUM=  03:212add       381.60     .467 No_date    6:35   24.67  n/a
 005:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:212add       381.60     .467 No_date    6:35   24.67  n/a
     [RDT= 5.00] out<- 01:213          381.60     .467 No_date    6:20   24.67  n/a
     [L/S/n=  330./1.000/.100]
     {Vmax=  .347:Dmax=  .232}
 005:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        02:213           1.43     .009 No_date    4:00   22.70 .299
     [CN= 66.0: N= 1.10]
     [Tp=  .67:DT= 5.00]
 005:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:213         381.60     .467 No_date    6:20   24.67  n/a
                     +  02:213           1.43     .009 No_date    4:00   22.70  n/a
     [DT= 5.00]  SUM=  09:TRIB2        383.03     .474 No_date    6:20   24.66  n/a
 005:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  DESIGN STANDHYD    01:203a         27.32    9.900 No_date    1:40   57.11 .751
     [XIMP=.50:TIMP=.63]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
 005:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  DESIGN STANDHYD    02:203b         20.76    7.490 No_date    1:40   55.97 .736
     [XIMP=.48:TIMP=.60]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
 005:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
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 *  DESIGN STANDHYD    03:203c          4.95    2.148 No_date    1:40   60.48 .795
     [XIMP=.57:TIMP=.71]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
005:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    04:POND1         2.68     .853 No_date    1:40   64.18 .844
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
005:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:203b         20.76    7.490 No_date    1:40   55.97  n/a
                     + 03:203c          4.95    2.148 No_date    1:40   60.48  n/a
     [DT= 5.00]  SUM=  05:T2CRS        25.71    9.638 No_date    1:40   56.84  n/a
005:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:203a         27.32    9.900 No_date    1:40   57.11  n/a
                     + 04:POND1         2.68     .853 No_date    1:40   64.18  n/a
                     + 05:T2CRS        25.71    9.638 No_date    1:40   56.84  n/a
     [DT= 5.00]  SUM=  06:P1FLOW       55.71   20.391 No_date    1:40   57.33  n/a
005:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 06:P1FLOW       55.71   20.391 No_date    1:40   57.33  n/a
     [RDT= 5.00] out<- 01:POND1        55.71     .324 No_date    3:50   57.32  n/a
           overflow <= 02:P1-OVF         .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.2929E+01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
005:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:POND1        55.71     .324 No_date    3:50   57.32  n/a
                     + 09:TRIB2       383.03     .474 No_date    6:20   24.66  n/a
     [DT= 5.00]  SUM=  02:213ADD      438.74     .777 No_date    5:10   28.81  n/a
005:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:213ADD      438.74     .777 No_date    5:10   28.81  n/a
     [RDT= 5.00] out<- 01:214         438.74     .776 No_date    5:30   28.81  n/a
     [L/S/n=  390./1.700/.100]
     {Vmax=  .509:Dmax=  .272}
005:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:214           1.61     .036 No_date    2:20   27.16 .357
     [CN= 72.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
005:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:214         438.74     .776 No_date    5:30   28.81  n/a
                     + 03:214           1.61     .036 No_date    2:20   27.16  n/a
     [DT= 5.00]  SUM=  02:214ADD      440.35     .789 No_date    5:10   28.80  n/a
005:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:214ADD      440.35     .789 No_date    5:10   28.80  n/a
     [RDT= 5.00] out<- 01:215         440.35     .790 No_date    4:55   28.80  n/a
     [L/S/n=  260./1.400/.100]
     {Vmax=  .496:Dmax=  .294}
005:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB215        1.12     .020 No_date    2:20   21.81 .287
     [CN= 66.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
005:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:215         440.35     .790 No_date    4:55   28.80  n/a
                     + 02:TRB215        1.12     .020 No_date    2:20   21.81  n/a
     [DT= 5.00]  SUM=  03:215ADD      441.47     .798 No_date    4:55   28.79  n/a
005:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:215ADD      441.47     .798 No_date    4:55   28.79  n/a
     [RDT= 5.00] out<- 01:216         441.47     .797 No_date    5:00   28.79  n/a
     [L/S/n=  250./ .500/.100]
     {Vmax=  .365:Dmax=  .403}
005:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB216        1.12     .019 No_date    2:20   20.63 .271
     [CN= 65.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
005:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:216         441.47     .797 No_date    5:00   28.79  n/a
                     + 02:TRB216        1.12     .019 No_date    2:20   20.63  n/a
     [DT= 5.00]  SUM=  10:T2-US       442.59     .805 No_date    5:00   28.77  n/a
005:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:301          86.43     .277 No_date    4:00   19.07 .251
     [CN= 63.0: N= 1.10]
     [Tp= 1.24:DT= 5.00]
005:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:302          80.69     .194 No_date    4:15   20.39 .268
     [CN= 64.0: N= 1.10]
     [Tp= 1.80:DT= 5.00]
005:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:301          86.43     .277 No_date    4:00   19.07  n/a
                     + 02:302          80.69     .194 No_date    4:15   20.39  n/a
     [DT= 5.00]  SUM=  03:300a        167.12     .472 No_date    4:00   19.71  n/a
005:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300a        167.12     .472 No_date    4:00   19.71  n/a
     [RDT= 5.00] out<- 01:310         167.12     .470 No_date    4:20   19.71  n/a
     [L/S/n=  449./1.620/.040]
     {Vmax=  .655:Dmax=  .130}
005:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:303          65.19     .259 No_date    4:00   24.86 .327
     [CN= 69.0: N= 1.10]
     [Tp= 1.31:DT= 5.00]
005:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:310         167.12     .470 No_date    4:20   19.71  n/a
                     + 02:303          65.19     .259 No_date    4:00   24.86  n/a
     [DT= 5.00]  SUM=  03:300b        232.31     .728 No_date    4:15   21.15  n/a
005:0040---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300b        232.31     .728 No_date    4:15   21.15  n/a
     [RDT= 5.00] out<- 01:311         232.31     .728 No_date    4:20   21.15  n/a
     [L/S/n=  270./1.170/.100]
     {Vmax=  .456:Dmax=  .296}
005:0041---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB311        1.15     .009 No_date    3:40   21.88 .288
     [CN= 65.0: N= 1.10]
     [Tp=  .52:DT= 5.00]
005:0042---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:311         232.31     .728 No_date    4:20   21.15  n/a
                     + 02:TRB311        1.15     .009 No_date    3:40   21.88  n/a
     [DT= 5.00]  SUM=  03:311ADD      233.46     .736 No_date    4:15   21.16  n/a
005:0043---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:311ADD      233.46     .736 No_date    4:15   21.16  n/a
     [RDT= 5.00] out<- 01:312         233.46     .736 No_date    4:15   21.16  n/a
     [L/S/n=  270./1.170/.100]
     {Vmax=  .460:Dmax=  .299}
005:0044---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB312        1.30     .012 No_date    4:00   31.57 .415
     [CN= 76.0: N= 1.10]
     [Tp=  .64:DT= 5.00]
005:0045---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:312         233.46     .736 No_date    4:15   21.16  n/a
                     + 02:TRB312        1.30     .012 No_date    4:00   31.57  n/a
     [DT= 5.00]  SUM=  09:312ADD      234.76     .748 No_date    4:15   21.22  n/a
005:0046---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    01:304a          9.61    3.414 No_date    1:40   54.79 .721
     [XIMP=.46:TIMP=.57]
     [SLP=1.60:DT= 5.00]
     [LOSS= 1 : HORTONS]
005:0047---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    02:402a          5.67    2.462 No_date    1:40   61.23 .805
     [XIMP=.58:TIMP=.73]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
005:0048---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    03:POND2         1.85     .626 No_date    1:40   64.18 .844
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
005:0049---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:304a          9.61    3.414 No_date    1:40   54.79  n/a
                     + 02:402a          5.67    2.462 No_date    1:40   61.23  n/a
                     + 03:POND2         1.85     .626 No_date    1:40   64.18  n/a
     [DT= 5.00]  SUM=  04:P2FLOW       17.13    6.502 No_date    1:40   57.94  n/a
005:0050---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 04:P2FLOW       17.13    6.502 No_date    1:40   57.94  n/a
     [RDT= 5.00] out<- 01:POND2        17.13     .076 No_date    4:00   57.93  n/a
           overflow <= 02:P2OVF          .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.9335E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
```

```
005:0051---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    02:402b           6.07    2.631 No_date    1:40   61.23 .805
     [XIMP=.58:TIMP=.73]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
005:0052---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    03:402c           1.19     .519 No_date    1:40   59.28 .780
     [XIMP=.55:TIMP=.68]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
005:0053---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:402b           6.07    2.631 No_date    1:40   61.23  n/a
                     + 03:402c           1.19     .519 No_date    1:40   59.28  n/a
     [DT= 5.00]  SUM=  04:400-OS         7.26    3.150 No_date    1:40   60.91  n/a
005:0054---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 04:400-OS         7.26    3.150 No_date    1:40   60.91  n/a
     [RDT= 5.00] out<- 02:OSSTOR         7.26     .813 No_date    1:55   60.92  n/a
            overflow <= 03:OSOVF          .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.1611E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
005:0055---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:401           16.78     .329 No_date    3:40   25.27 .332
     [CN= 68.0: N= 3.00]
     [Tp= 1.66:DT= 5.00]
005:0056---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:POND2         17.13     .076 No_date    4:00   57.93  n/a
                     + 02:OSSTOR         7.26     .813 No_date    1:55   60.92  n/a
                     + 03:401           16.78     .329 No_date    3:40   25.27  n/a
                     + 09:312ADD       234.76     .748 No_date    4:15   21.22  n/a
     [DT= 5.00]  SUM=  04:P2-T3        275.93    1.618 No_date    2:40   24.79  n/a
005:0057---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 04:P2-T3        275.93    1.618 No_date    2:40   24.79  n/a
     [RDT= 5.00] out<- 01:313          275.93    1.537 No_date    2:40   24.79  n/a
     [L/S/n=  423./1.170/.100]
     {Vmax=  .636:Dmax=  .482}
005:0058---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB313          .72     .009 No_date    3:00   24.55 .323
     [CN= 68.0: N= 1.10]
     [Tp=  .34:DT= 5.00]
005:0059---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:313          275.93    1.537 No_date    2:40   24.79  n/a
                     + 02:TRB313          .72     .009 No_date    3:00   24.55  n/a
     [DT= 5.00]  SUM=  03:313ADD       276.65    1.545 No_date    2:40   24.78  n/a
005:0060---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       04:TRB314          .94     .009 No_date    3:25   24.55 .323
     [CN= 68.0: N= 1.10]
     [Tp=  .46:DT= 5.00]
005:0061---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:313          275.93    1.537 No_date    2:40   24.79  n/a
                     + 02:TRB313          .72     .009 No_date    3:00   24.55  n/a
     [DT= 5.00]  SUM=  03:313ADD       276.65    1.545 No_date    2:40   24.78  n/a
005:0062---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       04:403a           2.66     .044 No_date    2:40   28.49 .375
     [CN= 70.0: N= 1.10]
     [Tp=  .27:DT= 5.00]
005:0063---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            10:T2-US        442.59     .805 No_date    5:00   28.77  n/a
                     + 03:313ADD       276.65    1.545 No_date    2:40   24.78  n/a
                     + 04:403a           2.66     .044 No_date    2:40   28.49  n/a
     [DT= 5.00]  SUM=  01:CONFLU       721.90    1.974 No_date    4:05   27.24  n/a
005:0064---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    01:203d           1.26     .556 No_date    1:40   60.03 .790
     [XIMP=.56:TIMP=.70]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
005:0065---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    02:501a           9.32    3.992 No_date    1:40   70.35 .925
     [XIMP=.74:TIMP=.93]
     [SLP= .80:DT= 5.00]
     [LOSS= 1 : HORTONS]
005:0066---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    COMPUTE DUALHYD    02:501a           9.32    3.992 No_date    1:40   70.35  n/a
        Major System /  03:OSSTOR          .15     .315 No_date    1:45   70.35  n/a
        Minor System \  04:TOPOND         9.17    2.060 No_date    2:05   73.73  n/a
     {MjSysSto=.8900E+03, TotOvfVol=.1037E+03, N-Ovf=    1, TotDurOvf=    0.hrs}
005:0067---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    05:501b          38.42   14.036 No_date    1:40   58.84 .774
     [XIMP=.54:TIMP=.67]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
005:0068---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    06:501c          39.10   13.973 No_date    1:40   57.56 .757
     [XIMP=.51:TIMP=.64]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
005:0069---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    07:MR1            3.32    1.596 No_date    1:40   74.05 .974
     [XIMP=.80:TIMP=.99]
     [SLP=1.00:DT= 5.00]
     [LOSS= 1 : HORTONS]
005:0070---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    08:MR2            3.04    1.464 No_date    1:40   74.05 .974
     [XIMP=.80:TIMP=.99]
     [SLP=1.00:DT= 5.00]
     [LOSS= 1 : HORTONS]
005:0071---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:203d           1.26     .556 No_date    1:40   60.03  n/a
                     + 05:501b          38.42   14.036 No_date    1:40   58.84  n/a
                     + 07:MR1            3.32    1.596 No_date    1:40   74.05  n/a
     [DT= 5.00]  SUM=  10:VALE          43.00   16.188 No_date    1:40   60.05  n/a
005:0072---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:TOPOND         9.17    2.060 No_date    2:05   73.73  n/a
                     + 06:501c          39.10   13.973 No_date    1:40   57.56  n/a
                     + 08:MR2            3.04    1.464 No_date    1:40   74.05  n/a
     [DT= 5.00]  SUM=  09:MET           51.31   17.497 No_date    1:40   61.43  n/a
005:0073---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    01:POND3         11.89    3.139 No_date    1:45   64.18 .844
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
005:0074---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            10:VALE          43.00   16.188 No_date    1:40   60.05  n/a
                     + 09:MET           51.31   17.497 No_date    1:40   61.43  n/a
                     + 01:POND3         11.89    3.139 No_date    1:45   64.18  n/a
     [DT= 5.00]  SUM=  08:P3ADD        106.20   36.560 No_date    1:40   61.18  n/a
005:0075---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 08:P3ADD        106.20   36.560 No_date    1:40   61.18  n/a
     [RDT= 5.00] out<- 01:POND3        106.20     .962 No_date    3:20   61.18  n/a
           overflow <= 02:E-OVF           .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.5776E+01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 ** END OF RUN :    5

********************************************************************************




 RUN:COMMAND#
 006:0001------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   6 ]
#*******************************************************************************
#  Project Name: [Kanata North]    Project Number: [112117]
#  Date        : 03-30-2016
#  Modeller    : [Kallie Auld]
#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
#  License #   :  5320763
#*******************************************************************************
#*******************************************************************************
```

```
006:0002---------------------------------------------------------------------------------
    READ STORM
     Filename = STORM.001
     Comment  =
     [SDT=30.00:SDUR=  12.00:PTOT=  25.00]
006:0003---------------------------------------------------------------------------------
    DEFAULT VALUES
     Filename = M:\2012\112117\data\CALCUL~1\swmhymo\POSTDE~1\OTTAWA.DEF
     ICASEdv  = 1 (read and print data)
     FileTitle= ------ ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE ---
                ------ PARAMETER VALUES MUST BE ENTERD AFTER COLUMN 60 ----_
     Horton's infiltration equation parameters:
     [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
     Parameters for PERVIOUS surfaces in STANDHYD:
     [IAper=   4.67 mm] [LGP=40.00 m] [MNP= .250]
     Parameters for IMPERVIOUS surfaces in STANDHYD:
     [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .013]
     Parameters used in NASHYD:
     [Ia=   4.67 mm] [N= 3.00]
006:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:201          115.14     .009 No_date   12:25    1.23 .049
     [CN= 65.0: N= 1.10]
     [Tp= 3.42:DT= 5.00]
006:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:201          115.14     .009 No_date   12:25    1.23  n/a
     [RDT= 5.00] out<- 02:210          115.14     .009 No_date   13:05    1.23  n/a
     [L/S/n=  558./ .890/.040]
     {Vmax=  .423:Dmax=  .004}
006:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:202          263.64     .027 No_date   13:20    2.37 .095
     [CN= 70.0: N= 1.10]
     [Tp= 5.14:DT= 5.00]
006:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:202          263.64     .027 No_date   13:20    2.37  n/a
                     + 02:210          115.14     .009 No_date   13:05    1.23  n/a
     [DT= 5.00]  SUM=  03:210add       378.78     .036 No_date   13:10    2.03  n/a
006:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:210add       378.78     .036 No_date   13:10    2.03  n/a
     [RDT= 5.00] out<- 01:211          378.78     .036 No_date   13:50    2.03  n/a
     [L/S/n=  450./1.000/.100]
     {Vmax=  .288:Dmax=  .025}
006:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:211            1.87     .001 No_date   12:00    3.10 .124
     [CN= 76.0: N= 1.10]
     [Tp= 1.17:DT= 5.00]
006:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:211          378.78     .036 No_date   13:50    2.03  n/a
                     + 02:211            1.87     .001 No_date   12:00    3.10  n/a
     [DT= 5.00]  SUM=  03:211add       380.65     .037 No_date   13:40    2.03  n/a
006:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:211add       380.65     .037 No_date   13:40    2.03  n/a
     [RDT= 5.00] out<- 01:212          380.65     .037 No_date   13:55    2.03  n/a
     [L/S/n=  230./1.000/.100]
     {Vmax=  .288:Dmax=  .025}
006:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:212             .95     .000 No_date    9:20    1.78 .071
     [CN= 66.0: N= 1.10]
     [Tp=  .56:DT= 5.00]
006:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:212          380.65     .037 No_date   13:55    2.03  n/a
                     + 02:212             .95     .000 No_date    9:20    1.78  n/a
     [DT= 5.00]  SUM=  03:212add       381.60     .037 No_date   13:50    2.03  n/a
006:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:212add       381.60     .037 No_date   13:50    2.03  n/a
     [RDT= 5.00] out<- 01:213          381.60     .037 No_date   14:15    2.03  n/a
     [L/S/n=  330./1.000/.100]
     {Vmax=  .288:Dmax=  .025}
006:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:213            1.43     .001 No_date   10:30    1.74 .070
     [CN= 66.0: N= 1.10]
     [Tp=  .67:DT= 5.00]
006:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:213          381.60     .037 No_date   14:15    2.03  n/a
                     + 02:213            1.43     .001 No_date   10:30    1.74  n/a
     [DT= 5.00]  SUM=  09:TRIB2        383.03     .037 No_date   14:05    2.03  n/a
006:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    01:203a          27.32     .778 No_date    6:00   11.76 .470
     [XIMP=.50:TIMP=.63]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
006:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  * DESIGN STANDHYD    02:203b          20.76     .573 No_date    6:00   11.25 .450
     [XIMP=.48:TIMP=.60]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
006:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    03:203c           4.95     .168 No_date    6:00   13.60 .544
     [XIMP=.57:TIMP=.71]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
006:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    04:POND1          2.68     .094 No_date    6:00   15.80 .632
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
006:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:203b          20.76     .573 No_date    6:00   11.25  n/a
                     + 03:203c           4.95     .168 No_date    6:00   13.60  n/a
     [DT= 5.00]  SUM=  05:T2CRS         25.71     .741 No_date    6:00   11.70  n/a
006:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:203a          27.32     .778 No_date    6:00   11.76  n/a
                     + 04:POND1          2.68     .094 No_date    6:00   15.80  n/a
                     + 05:T2CRS         25.71     .741 No_date    6:00   11.70  n/a
     [DT= 5.00]  SUM=  06:P1FLOW        55.71    1.613 No_date    6:00   11.93  n/a
006:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 06:P1FLOW        55.71    1.613 No_date    6:00   11.93  n/a
     [RDT= 5.00] out<- 01:POND1         55.71     .030 No_date   12:05   11.93  n/a
           overflow <= 02:P1-OVF          .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.5992E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
006:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:POND1         55.71     .030 No_date   12:05   11.93  n/a
                     + 09:TRIB2        383.03     .037 No_date   14:05    2.03  n/a
     [DT= 5.00]  SUM=  02:213ADD       438.74     .066 No_date   13:25    3.29  n/a
006:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:213ADD       438.74     .066 No_date   13:25    3.29  n/a
     [RDT= 5.00] out<- 01:214          438.74     .066 No_date   13:45    3.29  n/a
     [L/S/n=  390./1.700/.100]
     {Vmax=  .376:Dmax=  .035}
006:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:214            1.61     .002 No_date    7:00    2.25 .090
     [CN= 72.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
006:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:214          438.74     .066 No_date   13:45    3.29  n/a
                     + 03:214            1.61     .002 No_date    7:00    2.25  n/a
     [DT= 5.00]  SUM=  02:214ADD       440.35     .066 No_date   13:30    3.28  n/a
006:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:214ADD       440.35     .066 No_date   13:30    3.28  n/a
     [RDT= 5.00] out<- 01:215          440.35     .066 No_date   13:45    3.28  n/a
     [L/S/n=  260./1.400/.100]
     {Vmax=  .341:Dmax=  .038}
006:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB215         1.12     .001 No_date    7:00    1.42 .057
     [CN= 66.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
006:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:215          440.35     .066 No_date   13:45    3.28  n/a
                     + 02:TRB215         1.12     .001 No_date    7:00    1.42  n/a
     [DT= 5.00]  SUM=  03:215ADD       441.47     .067 No_date   13:40    3.28  n/a
006:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:215ADD       441.47     .067 No_date   13:40    3.28  n/a
     [RDT= 5.00] out<- 01:216          441.47     .067 No_date   14:05    3.28  n/a
```

```
     [L/S/n=  250./ .500/.100]
     {Vmax=  .204:Dmax=  .064}
006:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB216         1.12     .001 No_date    7:30    1.19 .048
     [CN= 65.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
006:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:216          441.47     .067 No_date   14:05    3.28  n/a
                    +  02:TRB216         1.12     .001 No_date    7:30    1.19  n/a
     [DT= 5.00]  SUM=  10:T2-US        442.59     .067 No_date   14:00    3.27  n/a
006:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:301           86.43     .013 No_date   12:00    1.00 .040
     [CN= 63.0: N= 1.10]
     [Tp= 1.24:DT= 5.00]
006:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:302           80.69     .011 No_date   12:00    1.27 .051
     [CN= 64.0: N= 1.10]
     [Tp= 1.80:DT= 5.00]
006:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:301           86.43     .013 No_date   12:00    1.00  n/a
                    +  02:302           80.69     .011 No_date   12:00    1.27  n/a
     [DT= 5.00]  SUM=  03:300a         167.12     .024 No_date   12:00    1.13  n/a
006:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300a         167.12     .024 No_date   12:00    1.13  n/a
     [RDT= 5.00] out<- 01:310          167.12     .024 No_date   12:15    1.13  n/a
     [L/S/n=  449./1.620/.040]
     {Vmax=  .430:Dmax=  .013}
006:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:303           65.19     .018 No_date   12:00    1.99 .080
     [CN= 69.0: N= 1.10]
     [Tp= 1.31:DT= 5.00]
006:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:310          167.12     .024 No_date   12:15    1.13  n/a
                    +  02:303           65.19     .018 No_date   12:00    1.99  n/a
     [DT= 5.00]  SUM=  03:300b         232.31     .043 No_date   12:05    1.37  n/a
006:0040---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300b         232.31     .043 No_date   12:05    1.37  n/a
     [RDT= 5.00] out<- 01:311          232.31     .043 No_date   12:20    1.37  n/a
     [L/S/n=  270./1.170/.100]
     {Vmax=  .312:Dmax=  .027}
006:0041---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB311         1.15     .000 No_date    9:10    1.61 .064
     [CN= 65.0: N= 1.10]
     [Tp=  .52:DT= 5.00]
006:0042---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:311          232.31     .043 No_date   12:20    1.37  n/a
                    +  02:TRB311         1.15     .000 No_date    9:10    1.61  n/a
     [DT= 5.00]  SUM=  03:311ADD       233.46     .043 No_date   12:20    1.37  n/a
006:0043---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:311ADD       233.46     .043 No_date   12:20    1.37  n/a
     [RDT= 5.00] out<- 01:312          233.46     .043 No_date   12:30    1.37  n/a
     [L/S/n=  270./1.170/.100]
     {Vmax=  .312:Dmax=  .027}
006:0044---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB312         1.30     .001 No_date    9:25    3.13 .125
     [CN= 76.0: N= 1.10]
     [Tp=  .64:DT= 5.00]
006:0045---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:312          233.46     .043 No_date   12:30    1.37  n/a
                    +  02:TRB312         1.30     .001 No_date    9:25    3.13  n/a
     [DT= 5.00]  SUM=  09:312ADD       234.76     .044 No_date   12:30    1.38  n/a
006:0046---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    01:304a           9.61     .259 No_date    6:00   10.78 .431
     [XIMP=.46:TIMP=.57]
     [SLP=1.60:DT= 5.00]
     [LOSS= 1 : HORTONS]
006:0047---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    02:402a           5.67     .196 No_date    6:00   13.96 .558
     [XIMP=.58:TIMP=.73]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
006:0048---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    03:POND2          1.85     .066 No_date    6:00   15.80 .632
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
006:0049---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:304a           9.61     .259 No_date    6:00   10.78  n/a
                    +  02:402a           5.67     .196 No_date    6:00   13.96  n/a
                    +  03:POND2          1.85     .066 No_date    6:00   15.80  n/a
     [DT= 5.00]  SUM=  04:P2FLOW        17.13     .521 No_date    6:00   12.37  n/a
006:0050---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 04:P2FLOW        17.13     .521 No_date    6:00   12.37  n/a
     [RDT= 5.00] out<- 01:POND2         17.13     .003 No_date   12:10   12.37  n/a
            overflow <= 02:P2OVF          .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.2063E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
006:0051---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    02:402b           6.07     .209 No_date    6:00   13.96 .558
     [XIMP=.58:TIMP=.73]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
006:0052---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    03:402c           1.19     .039 No_date    6:00   13.00 .520
     [XIMP=.55:TIMP=.68]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
006:0053---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:402b           6.07     .209 No_date    6:00   13.96  n/a
                    +  03:402c           1.19     .039 No_date    6:00   13.00  n/a
     [DT= 5.00]  SUM=  04:400-OS         7.26     .248 No_date    6:00   13.80  n/a
006:0054---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 04:400-OS         7.26     .248 No_date    6:00   13.80  n/a
     [RDT= 5.00] out<- 02:OSSTOR         7.26     .248 No_date    6:00   13.80  n/a
            overflow <= 03:OSOVF          .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.1554E-02, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
006:0055---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:401           16.78     .022 No_date    8:10    2.36 .094
     [CN= 68.0: N= 3.00]
     [Tp= 1.66:DT= 5.00]
006:0056---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:POND2         17.13     .003 No_date   12:10   12.37  n/a
                    +  02:OSSTOR         7.26     .248 No_date    6:00   13.80  n/a
                    +  03:401           16.78     .022 No_date    8:10    2.36  n/a
                    +  09:312ADD       234.76     .044 No_date   12:30    1.38  n/a
     [DT= 5.00]  SUM=  04:P2-T3        275.93     .252 No_date    6:00    2.45  n/a
006:0057---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 04:P2-T3        275.93     .252 No_date    6:00    2.45  n/a
     [RDT= 5.00] out<- 01:313          275.93     .177 No_date    6:05    2.45  n/a
     [L/S/n=  423./1.170/.100]
     {Vmax=  .312:Dmax=  .158}
006:0058---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB313          .72     .001 No_date    8:00    2.06 .082
     [CN= 68.0: N= 1.10]
     [Tp=  .34:DT= 5.00]
006:0059---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:313          275.93     .177 No_date    6:05    2.45  n/a
                    +  02:TRB313          .72     .001 No_date    8:00    2.06  n/a
     [DT= 5.00]  SUM=  03:313ADD       276.65     .177 No_date    6:05    2.45  n/a
006:0060---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       04:TRB314          .94     .001 No_date    9:00    2.06 .083
     [CN= 68.0: N= 1.10]
     [Tp=  .46:DT= 5.00]
006:0061---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:313          275.93     .177 No_date    6:05    2.45  n/a
                    +  02:TRB313          .72     .001 No_date    8:00    2.06  n/a
     [DT= 5.00]  SUM=  03:313ADD       276.65     .177 No_date    6:05    2.45  n/a
006:0062---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       04:403a           2.66     .004 No_date    7:00    3.31 .132
     [CN= 70.0: N= 1.10]
     [Tp=  .27:DT= 5.00]
006:0063---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            10:T2-US        442.59     .067 No_date   14:00    3.27  n/a
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                 +  03:313ADD       276.65      .177 No_date     6:05    2.45  n/a
                 +  04:403a           2.66      .004 No_date     7:00    3.31  n/a
     [DT= 5.00]  SUM=  01:CONFLU       721.90      .186 No_date     6:05    2.96  n/a
 006:0064---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  DESIGN STANDHYD    01:203d           1.26      .042 No_date     6:00   13.34 .534
     [XIMP=.56:TIMP=.70]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
 006:0065---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD     02:501a           9.32      .464 No_date     6:00   19.69 .788
     [XIMP=.74:TIMP=.93]
     [SLP= .80:DT= 5.00]
     [LOSS= 1 : HORTONS]
 006:0066---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    COMPUTE DUALHYD     02:501a           9.32      .464 No_date     6:00   19.69  n/a
       Major System /   03:OSSTOR          .00      .000 No_date     0:00     .00  n/a
       Minor System \   04:TOPOND         9.32      .464 No_date     6:00   19.69  n/a
     {MjSysSto=.0000E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 006:0067---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD     05:501b          38.42     1.166 No_date     6:00   12.76 .510
     [XIMP=.54:TIMP=.67]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
 006:0068---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD     06:501c          39.10     1.119 No_date     6:00   12.01 .480
     [XIMP=.51:TIMP=.64]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
 006:0069---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD     07:MR1            3.32      .192 No_date     6:00   22.21 .889
     [XIMP=.80:TIMP=.99]
     [SLP=1.00:DT= 5.00]
     [LOSS= 1 : HORTONS]
 006:0070---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD     08:MR2            3.04      .176 No_date     6:00   22.21 .889
     [XIMP=.80:TIMP=.99]
     [SLP=1.00:DT= 5.00]
     [LOSS= 1 : HORTONS]
 006:0071---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:203d           1.26      .042 No_date     6:00   13.34  n/a
                 +  05:501b          38.42     1.166 No_date     6:00   12.76  n/a
                 +  07:MR1            3.32      .192 No_date     6:00   22.21  n/a
     [DT= 5.00]  SUM=  10:VALE          43.00     1.400 No_date     6:00   13.50  n/a
 006:0072---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             04:TOPOND         9.32      .464 No_date     6:00   19.69  n/a
                 +  06:501c          39.10     1.119 No_date     6:00   12.01  n/a
                 +  08:MR2            3.04      .176 No_date     6:00   22.21  n/a
     [DT= 5.00]  SUM=  09:MET           51.46     1.759 No_date     6:00   14.01  n/a
 006:0073---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD     01:POND3         11.89      .346 No_date     6:05   15.80 .632
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
 006:0074---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             10:VALE          43.00     1.400 No_date     6:00   13.50  n/a
                 +  09:MET           51.46     1.759 No_date     6:00   14.01  n/a
                 +  01:POND3         11.89      .346 No_date     6:05   15.80  n/a
     [DT= 5.00]  SUM=  08:P3ADD        106.35     3.488 No_date     6:00   14.00  n/a
 006:0075---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 08:P3ADD        106.35     3.488 No_date     6:00   14.00  n/a
     [RDT= 5.00] out<- 01:POND3        106.35      .050 No_date    12:10   14.00  n/a
           overflow <= 02:E-OVF           .00      .000 No_date     0:00     .00  n/a
    {MxStoUsed=.1380E+01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
  ** END OF RUN :    6

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```
 RUN:COMMAND#
 007:0001------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   7 ]
#******************************************************************************
#  Project Name: [Kanata North]    Project Number: [112117]
#  Date        : 03-30-2016
#  Modeller    : [Kallie Auld]
#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
#  License #   :  5320763
#******************************************************************************
#******************************************************************************
 007:0002------------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=30.00:SDUR=  12.00:PTOT=  42.34]
 007:0003------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = M:\2012\112117\data\CALCUL~1\swmhymo\POSTDE~1\OTTAWA.DEF
      ICASEdv  = 1 (read and print data)
      FileTitle= ------ ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE ---
                 ------ PARAMETER VALUES MUST BE ENTERD AFTER COLUMN 60 ----_
      Horton's infiltration equation parameters:
      [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
      Parameters for PERVIOUS surfaces in STANDHYD:
      [IAper=   4.67 mm] [LGP=40.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .013]
      Parameters used in NASHYD:
      [Ia=   4.67 mm] [N= 3.00]
 007:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:201          115.14      .041 No_date    12:10    5.71 .135
      [CN= 65.0: N= 1.10]
      [Tp= 3.42:DT= 5.00]
 007:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:201          115.14      .041 No_date    12:10    5.71  n/a
      [RDT= 5.00] out<- 02:210          115.14      .041 No_date    12:50    5.71  n/a
      [L/S/n=  558./ .890/.040]
      {Vmax=  .423:Dmax=  .019}
 007:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:202          263.64      .095 No_date    13:05    8.36 .197
      [CN= 70.0: N= 1.10]
      [Tp= 5.14:DT= 5.00]
 007:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:202          263.64      .095 No_date    13:05    8.36  n/a
                   +  02:210          115.14      .041 No_date    12:50    5.71  n/a
      [DT= 5.00]  SUM=  03:210add       378.78      .136 No_date    12:55    7.55  n/a
 007:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:210add       378.78      .136 No_date    12:55    7.55  n/a
      [RDT= 5.00] out<- 01:211          378.78      .136 No_date    13:35    7.55  n/a
      [L/S/n=  450./1.000/.100]
      {Vmax=  .288:Dmax=  .093}
 007:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:211            1.87      .003 No_date    10:50   10.49 .248
      [CN= 76.0: N= 1.10]
      [Tp= 1.17:DT= 5.00]
 007:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:211          378.78      .136 No_date    13:35    7.55  n/a
                   +  02:211            1.87      .003 No_date    10:50   10.49  n/a
      [DT= 5.00]  SUM=  03:211add       380.65      .139 No_date    13:25    7.57  n/a
 007:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:211add       380.65      .139 No_date    13:25    7.57  n/a
      [RDT= 5.00] out<- 01:212          380.65      .139 No_date    13:40    7.57  n/a
      [L/S/n=  230./1.000/.100]
      {Vmax=  .288:Dmax=  .095}
 007:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:212             .95      .002 No_date     9:00    6.83 .161
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      [CN= 66.0: N= 1.10]
      [Tp=  .56:DT= 5.00]
 007:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:212         380.65     .139 No_date   13:40     7.57  n/a
                     + 02:212            .95     .002 No_date    9:00     6.83  n/a
      [DT= 5.00]  SUM= 03:212add      381.60     .140 No_date   13:35     7.57  n/a
 007:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:212add     381.60     .140 No_date   13:35     7.57  n/a
      [RDT= 5.00] out<- 01:213        381.60     .140 No_date   14:00     7.57  n/a
      [L/S/n=  330./1.000/.100]
      {Vmax=  .288:Dmax=  .095}
 007:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      02:213           1.43     .002 No_date    9:00     6.76 .160
      [CN= 66.0: N= 1.10]
      [Tp=  .67:DT= 5.00]
 007:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:213         381.60     .140 No_date   14:00     7.57  n/a
                     + 02:213           1.43     .002 No_date    9:00     6.76  n/a
      [DT= 5.00]  SUM= 09:TRIB2       383.03     .141 No_date   13:55     7.56  n/a
 007:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD   01:203a         27.32    1.734 No_date    6:00    24.30 .574
      [XIMP=.50:TIMP=.63]
      [SLP=2.30:DT= 5.00]
      [LOSS= 1 : HORTONS]
 007:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD   02:203b         20.76    1.259 No_date    6:00    23.23 .549
      [XIMP=.48:TIMP=.60]
      [SLP=2.30:DT= 5.00]
      [LOSS= 1 : HORTONS]
 007:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  DESIGN STANDHYD   03:203c          4.95     .375 No_date    6:00    27.22 .643
      [XIMP=.57:TIMP=.71]
      [SLP=2.30:DT= 5.00]
      [LOSS= 1 : HORTONS]
 007:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD   04:POND1         2.68     .182 No_date    6:00    30.58 .722
      [XIMP=.64:TIMP=.80]
      [SLP= .10:DT= 5.00]
      [LOSS= 1 : HORTONS]
 007:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           02:203b         20.76    1.259 No_date    6:00    23.23  n/a
                     + 03:203c          4.95     .375 No_date    6:00    27.22  n/a
      [DT= 5.00]  SUM= 05:T2CRS        25.71    1.634 No_date    6:00    24.00  n/a
 007:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:203a         27.32    1.734 No_date    6:00    24.30  n/a
                     + 04:POND1         2.68     .182 No_date    6:00    30.58  n/a
                     + 05:T2CRS        25.71    1.634 No_date    6:00    24.00  n/a
      [DT= 5.00]  SUM= 06:P1FLOW       55.71    3.549 No_date    6:00    24.46  n/a
 007:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 06:P1FLOW      55.71    3.549 No_date    6:00    24.46  n/a
      [RDT= 5.00] out<- 01:POND1       55.71     .089 No_date   10:35    24.46  n/a
             overflow <= 02:P1-OVF       .00     .000 No_date    0:00      .00  n/a
     {MxStoUsed=.1181E+01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 007:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:POND1        55.71     .089 No_date   10:35    24.46  n/a
                     + 09:TRIB2       383.03     .141 No_date   13:55     7.56  n/a
      [DT= 5.00]  SUM= 02:213ADD      438.74     .225 No_date   12:50     9.71  n/a
 007:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 02:213ADD     438.74     .225 No_date   12:50     9.71  n/a
      [RDT= 5.00] out<- 01:214        438.74     .224 No_date   13:10     9.71  n/a
      [L/S/n=  390./1.700/.100]
      {Vmax=  .376:Dmax=  .118}
 007:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      03:214           1.61     .008 No_date    6:30     8.45 .200
      [CN= 72.0: N= 1.10]
      [Tp=  .17:DT= 5.00]
 007:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:214         438.74     .224 No_date   13:10     9.71  n/a
                     + 03:214           1.61     .008 No_date    6:30     8.45  n/a
      [DT= 5.00]  SUM= 02:214ADD      440.35     .226 No_date   13:00     9.70  n/a
 007:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
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     ROUTE CHANNEL   -> 02:214ADD     440.35     .226 No_date   13:00     9.70  n/a
      [RDT= 5.00] out<- 01:215        440.35     .226 No_date   13:10     9.70  n/a
      [L/S/n=  260./1.400/.100]
      {Vmax=  .341:Dmax=  .131}
 007:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      02:TRB215        1.12     .004 No_date    6:40     6.19 .146
      [CN= 66.0: N= 1.10]
      [Tp=  .17:DT= 5.00]
 007:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:215         440.35     .226 No_date   13:10     9.70  n/a
                     + 02:TRB215        1.12     .004 No_date    6:40     6.19  n/a
      [DT= 5.00]  SUM= 03:215ADD      441.47     .227 No_date   13:05     9.69  n/a
 007:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:215ADD     441.47     .227 No_date   13:05     9.69  n/a
      [RDT= 5.00] out<- 01:216        441.47     .226 No_date   13:20     9.69  n/a
      [L/S/n=  250./ .500/.100]
      {Vmax=  .218:Dmax=  .186}
 007:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      02:TRB216        1.12     .004 No_date    7:00     5.64 .133
      [CN= 65.0: N= 1.10]
      [Tp=  .17:DT= 5.00]
 007:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:216         441.47     .226 No_date   13:20     9.69  n/a
                     + 02:TRB216        1.12     .004 No_date    7:00     5.64  n/a
      [DT= 5.00]  SUM= 10:T2-US       442.59     .227 No_date   13:15     9.68  n/a
 007:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      01:301          86.43     .064 No_date   12:00     5.03 .119
      [CN= 63.0: N= 1.10]
      [Tp= 1.24:DT= 5.00]
 007:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      02:302          80.69     .050 No_date   12:00     5.67 .134
      [CN= 64.0: N= 1.10]
      [Tp= 1.80:DT= 5.00]
 007:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:301          86.43     .064 No_date   12:00     5.03  n/a
                     + 02:302          80.69     .050 No_date   12:00     5.67  n/a
      [DT= 5.00]  SUM= 03:300a        167.12     .114 No_date   12:00     5.34  n/a
 007:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:300a       167.12     .114 No_date   12:00     5.34  n/a
      [RDT= 5.00] out<- 01:310        167.12     .114 No_date   12:05     5.34  n/a
      [L/S/n=  449./1.620/.040]
      {Vmax=  .431:Dmax=  .061}
 007:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      02:303          65.19     .069 No_date   12:00     7.58 .179
      [CN= 69.0: N= 1.10]
      [Tp= 1.31:DT= 5.00]
 007:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:310         167.12     .114 No_date   12:05     5.34  n/a
                     + 02:303          65.19     .069 No_date   12:00     7.58  n/a
      [DT= 5.00]  SUM= 03:300b        232.31     .183 No_date   12:00     5.97  n/a
 007:0040--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:300b       232.31     .183 No_date   12:00     5.97  n/a
      [RDT= 5.00] out<- 01:311        232.31     .183 No_date   12:10     5.97  n/a
      [L/S/n=  270./1.170/.100]
      {Vmax=  .312:Dmax=  .116}
 007:0041--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      02:TRB311        1.15     .002 No_date    9:00     6.42 .152
      [CN= 65.0: N= 1.10]
      [Tp=  .52:DT= 5.00]
 007:0042--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:311         232.31     .183 No_date   12:10     5.97  n/a
                     + 02:TRB311        1.15     .002 No_date    9:00     6.42  n/a
      [DT= 5.00]  SUM= 03:311ADD      233.46     .184 No_date   12:05     5.97  n/a
 007:0043--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:311ADD     233.46     .184 No_date   12:05     5.97  n/a
      [RDT= 5.00] out<- 01:312        233.46     .184 No_date   12:20     5.97  n/a
      [L/S/n=  270./1.170/.100]
      {Vmax=  .312:Dmax=  .117}
 007:0044--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      02:TRB312        1.30     .003 No_date    9:00    10.54 .249
      [CN= 76.0: N= 1.10]
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     [Tp=  .64:DT= 5.00]
007:0045---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:312          233.46     .184 No_date   12:20     5.97  n/a
                    + 02:TRB312         1.30     .003 No_date    9:00    10.54  n/a
     [DT= 5.00]  SUM= 09:312ADD       234.76     .187 No_date   12:15     6.00  n/a
007:0046---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD   01:304a           9.61     .557 No_date    6:00    22.29 .527
     [XIMP=.46:TIMP=.57]
     [SLP=1.60:DT= 5.00]
     [LOSS= 1 : HORTONS]
007:0047---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD   02:402a           5.67     .438 No_date    6:00    27.85 .658
     [XIMP=.58:TIMP=.73]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
007:0048---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD   03:POND2          1.85     .127 No_date    6:00    30.58 .722
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
007:0049---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:304a           9.61     .557 No_date    6:00    22.29  n/a
                    + 02:402a           5.67     .438 No_date    6:00    27.85  n/a
                    + 03:POND2          1.85     .127 No_date    6:00    30.58  n/a
     [DT= 5.00]  SUM= 04:P2FLOW        17.13    1.122 No_date    6:00    25.03  n/a
007:0050---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 04:P2FLOW       17.13    1.122 No_date    6:00    25.03  n/a
     [RDT= 5.00] out<- 01:POND2        17.13     .016 No_date   12:00    25.03  n/a
           overflow <= 02:P2OVF          .00     .000 No_date    0:00      .00  n/a
    {MxStoUsed=.3975E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
007:0051---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD   02:402b           6.07     .469 No_date    6:00    27.85 .658
     [XIMP=.58:TIMP=.73]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
007:0052---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD   03:402c           1.19     .088 No_date    6:00    26.27 .621
     [XIMP=.55:TIMP=.68]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
007:0053---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:402b           6.07     .469 No_date    6:00    27.85  n/a
                    + 03:402c           1.19     .088 No_date    6:00    26.27  n/a
     [DT= 5.00]  SUM= 04:400-OS         7.26     .557 No_date    6:00    27.59  n/a
007:0054---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 04:400-OS        7.26     .557 No_date    6:00    27.59  n/a
     [RDT= 5.00] out<- 02:OSSTOR        7.26     .552 No_date    6:00    27.59  n/a
           overflow <= 03:OSOVF          .00     .000 No_date    0:00      .00  n/a
    {MxStoUsed=.3518E-02, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
007:0055---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      03:401           16.78     .079 No_date    8:00     8.06 .190
     [CN= 68.0: N= 3.00]
     [Tp= 1.66:DT= 5.00]
007:0056---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:POND2         17.13     .016 No_date   12:00    25.03  n/a
                    + 02:OSSTOR         7.26     .552 No_date    6:00    27.59  n/a
                    + 03:401           16.78     .079 No_date    8:00     8.06  n/a
                    + 09:312ADD       234.76     .187 No_date   12:15     6.00  n/a
     [DT= 5.00]  SUM= 04:P2-T3        275.93     .570 No_date    6:00     7.87  n/a
007:0057---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 04:P2-T3       275.93     .570 No_date    6:00     7.87  n/a
     [RDT= 5.00] out<- 01:313         275.93     .408 No_date    6:05     7.87  n/a
     [L/S/n=  423./1.170/.100]
     {Vmax=  .396:Dmax=  .251}
007:0058---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:TRB313          .72     .002 No_date    7:30     7.57 .179
     [CN= 68.0: N= 1.10]
     [Tp=  .34:DT= 5.00]
007:0059---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:313          275.93     .408 No_date    6:05     7.87  n/a
                    + 02:TRB313          .72     .002 No_date    7:30     7.57  n/a
     [DT= 5.00]  SUM= 03:313ADD       276.65     .410 No_date    6:05     7.87  n/a
007:0060---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      04:TRB314          .94     .002 No_date    8:00     7.58 .179
     [CN= 68.0: N= 1.10]
     [Tp=  .46:DT= 5.00]
007:0061---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:313          275.93     .408 No_date    6:05     7.87  n/a
                    + 02:TRB313          .72     .002 No_date    7:30     7.57  n/a
     [DT= 5.00]  SUM= 03:313ADD       276.65     .410 No_date    6:05     7.87  n/a
007:0062---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      04:403a           2.66     .012 No_date    7:00     9.85 .233
     [CN= 70.0: N= 1.10]
     [Tp=  .27:DT= 5.00]
007:0063---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           10:T2-US        442.59     .227 No_date   13:15     9.68  n/a
                    + 03:313ADD       276.65     .410 No_date    6:05     7.87  n/a
                    + 04:403a           2.66     .012 No_date    7:00     9.85  n/a
     [DT= 5.00]  SUM= 01:CONFLU       721.90     .474 No_date   10:35     8.99  n/a
007:0064---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD   01:203d           1.26     .095 No_date    6:00    26.84 .634
     [XIMP=.56:TIMP=.70]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
007:0065---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD   02:501a           9.32     .858 No_date    6:00    35.29 .834
     [XIMP=.74:TIMP=.93]
     [SLP= .80:DT= 5.00]
     [LOSS= 1 : HORTONS]
007:0066---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    COMPUTE DUALHYD   02:501a           9.32     .858 No_date    6:00    35.29  n/a
       Major System / 03:OSSTOR          .00     .000 No_date    0:00      .00  n/a
       Minor System \ 04:TOPOND         9.32     .858 No_date    6:00    35.29  n/a
     {MjSysSto=.0000E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
007:0067---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD   05:501b          38.42    2.546 No_date    6:00    25.88 .611
     [XIMP=.54:TIMP=.67]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
007:0068---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD   06:501c          39.10    2.474 No_date    6:00    24.70 .583
     [XIMP=.51:TIMP=.64]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
007:0069---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD   07:MR1            3.32     .330 No_date    6:00    39.40 .931
     [XIMP=.80:TIMP=.99]
     [SLP=1.00:DT= 5.00]
     [LOSS= 1 : HORTONS]
007:0070---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD   08:MR2            3.04     .302 No_date    6:00    39.40 .931
     [XIMP=.80:TIMP=.99]
     [SLP=1.00:DT= 5.00]
     [LOSS= 1 : HORTONS]
007:0071---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:203d           1.26     .095 No_date    6:00    26.84  n/a
                    + 05:501b          38.42    2.546 No_date    6:00    25.88  n/a
                    + 07:MR1            3.32     .330 No_date    6:00    39.40  n/a
     [DT= 5.00]  SUM= 10:VALE          43.00    2.971 No_date    6:00    26.95  n/a
007:0072---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           04:TOPOND         9.32     .858 No_date    6:00    35.29  n/a
                    + 06:501c          39.10    2.474 No_date    6:00    24.70  n/a
                    + 08:MR2            3.04     .302 No_date    6:00    39.40  n/a
     [DT= 5.00]  SUM= 09:MET           51.46    3.634 No_date    6:00    27.48  n/a
007:0073---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD   01:POND3         11.89     .707 No_date    6:05    30.58 .722
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
007:0074---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           10:VALE          43.00    2.971 No_date    6:00    26.95  n/a
                    + 09:MET           51.46    3.634 No_date    6:00    27.48  n/a
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                + 01:POND3         11.89     .707 No_date    6:05   30.58  n/a
     [DT= 5.00]  SUM=  08:P3ADD        106.35    7.300 No_date    6:00   27.61  n/a
 007:0075--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 08:P3ADD        106.35    7.300 No_date    6:00   27.61  n/a
     [RDT= 5.00] out<- 01:POND3        106.35     .220 No_date    9:30   27.61  n/a
           overflow <= 02:E-OVF           .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.2515E+01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
  ** END OF RUN :   7

*******************************************************************************




 RUN:COMMAND#
 008:0001-----------------------------------------------------------------------
    START
     [TZERO =    .00 hrs on        0]
     [METOUT=   2   (1=imperial, 2=metric output)]
     [NSTORM=   1 ]
     [NRUN  =   8 ]
#******************************************************************************
#  Project Name: [Kanata North]    Project Number: [112117]
#  Date        : 03-30-2016
#  Modeller    : [Kallie Auld]
#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
#  License #   :  5320763
#******************************************************************************
#******************************************************************************
 008:0002-----------------------------------------------------------------------
    READ STORM
     Filename = STORM.001
     Comment  =
     [SDT=30.00:SDUR=  12.00:PTOT=  56.18]
 008:0003-----------------------------------------------------------------------
    DEFAULT VALUES
     Filename = M:\2012\112117\data\CALCUL~1\swmhymo\POSTDE~1\OTTAWA.DEF
     ICASEdv  = 1 (read and print data)
     FileTitle= ------ ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE ---
                ------ PARAMETER VALUES MUST BE ENTERD AFTER COLUMN 60 ----_
     Horton's infiltration equation parameters:
     [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
     Parameters for PERVIOUS surfaces in STANDHYD:
     [IAper=   4.67 mm] [LGP=40.00 m] [MNP= .250]
     Parameters for IMPERVIOUS surfaces in STANDHYD:
     [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .013]
     Parameters used in NASHYD:
     [Ia=   4.67 mm] [N= 3.00]
 008:0004--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:201          115.14     .080 No_date   12:05   11.05 .197
     [CN= 65.0: N= 1.10]
     [Tp= 3.42:DT= 5.00]
 008:0005--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:201          115.14     .080 No_date   12:05   11.05  n/a
     [RDT= 5.00] out<- 02:210          115.14     .080 No_date   12:45   11.05  n/a
     [L/S/n=  558./ .890/.040]
     {Vmax=  .423:Dmax=  .037}
 008:0006--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:202          263.64     .170 No_date   13:00   14.94 .266
     [CN= 70.0: N= 1.10]
     [Tp= 5.14:DT= 5.00]
 008:0007--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:202          263.64     .170 No_date   13:00   14.94  n/a
                     + 02:210          115.14     .080 No_date   12:45   11.05  n/a
     [DT= 5.00]  SUM=  03:210add       378.78     .249 No_date   12:50   13.75  n/a
 008:0008--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:210add       378.78     .249 No_date   12:50   13.75  n/a
     [RDT= 5.00] out<- 01:211          378.78     .249 No_date   13:25   13.75  n/a
     [L/S/n=  450./1.000/.100]
     {Vmax=  .292:Dmax=  .164}
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008:0009--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:211            1.87     .005 No_date   10:30   18.32 .326
     [CN= 76.0: N= 1.10]
     [Tp= 1.17:DT= 5.00]
008:0010--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:211          378.78     .249 No_date   13:25   13.75  n/a
                     + 02:211            1.87     .005 No_date   10:30   18.32  n/a
     [DT= 5.00]  SUM=  03:211add       380.65     .254 No_date   13:15   13.78  n/a
008:0011--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:211add       380.65     .254 No_date   13:15   13.78  n/a
     [RDT= 5.00] out<- 01:212          380.65     .254 No_date   13:25   13.78  n/a
     [L/S/n=  230./1.000/.100]
     {Vmax=  .293:Dmax=  .165}
008:0012--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:212             .95     .003 No_date    9:00   12.59 .224
     [CN= 66.0: N= 1.10]
     [Tp=  .56:DT= 5.00]
008:0013--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:212          380.65     .254 No_date   13:25   13.78  n/a
                     + 02:212             .95     .003 No_date    9:00   12.59  n/a
     [DT= 5.00]  SUM=  03:212add       381.60     .256 No_date   13:15   13.77  n/a
008:0014--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:212add       381.60     .256 No_date   13:15   13.77  n/a
     [RDT= 5.00] out<- 01:213          381.60     .256 No_date   13:40   13.77  n/a
     [L/S/n=  330./1.000/.100]
     {Vmax=  .293:Dmax=  .166}
008:0015--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:213            1.43     .004 No_date    9:00   12.50 .223
     [CN= 66.0: N= 1.10]
     [Tp=  .67:DT= 5.00]
008:0016--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:213          381.60     .256 No_date   13:40   13.77  n/a
                     + 02:213            1.43     .004 No_date    9:00   12.50  n/a
     [DT= 5.00]  SUM=  09:TRIB2        383.03     .259 No_date   13:35   13.77  n/a
008:0017--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    01:203a          27.32    2.754 No_date    6:00   35.54 .633
     [XIMP=.50:TIMP=.63]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
008:0018--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    02:203b          20.76    2.048 No_date    6:00   34.32 .611
     [XIMP=.48:TIMP=.60]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
008:0019--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    03:203c           4.95     .561 No_date    6:00   39.04 .695
     [XIMP=.57:TIMP=.71]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
008:0020--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    04:POND1          2.68     .263 No_date    6:00   42.73 .761
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
008:0021--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:203b          20.76    2.048 No_date    6:00   34.32  n/a
                     + 03:203c           4.95     .561 No_date    6:00   39.04  n/a
     [DT= 5.00]  SUM=  05:T2CRS         25.71    2.609 No_date    6:00   35.23  n/a
008:0022--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:203a          27.32    2.754 No_date    6:00   35.54  n/a
                     + 04:POND1          2.68     .263 No_date    6:00   42.73  n/a
                     + 05:T2CRS         25.71    2.609 No_date    6:00   35.23  n/a
     [DT= 5.00]  SUM=  06:P1FLOW        55.71    5.626 No_date    6:00   35.74  n/a
008:0023--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 06:P1FLOW        55.71    5.626 No_date    6:00   35.74  n/a
     [RDT= 5.00] out<- 01:POND1         55.71     .177 No_date    9:05   35.74  n/a
          overflow <= 02:P1-OVF           .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.1677E+01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
008:0024--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:POND1         55.71     .177 No_date    9:05   35.74  n/a
                     + 09:TRIB2        383.03     .259 No_date   13:35   13.77  n/a
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     [DT= 5.00]  SUM=  02:213ADD       438.74     .417 No_date   12:15   16.56  n/a
008:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:213ADD       438.74     .417 No_date   12:15   16.56  n/a
     [RDT= 5.00] out<- 01:214          438.74     .416 No_date   12:30   16.56  n/a
     [L/S/n=  390./1.700/.100]
     {Vmax=  .401:Dmax=  .186}
008:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:214            1.61     .016 No_date    6:30   15.30 .272
     [CN= 72.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
008:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:214          438.74     .416 No_date   12:30   16.56  n/a
                     + 03:214            1.61     .016 No_date    6:30   15.30  n/a
     [DT= 5.00]  SUM=  02:214ADD       440.35     .420 No_date   12:20   16.55  n/a
008:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:214ADD       440.35     .420 No_date   12:20   16.55  n/a
     [RDT= 5.00] out<- 01:215          440.35     .420 No_date   12:25   16.55  n/a
     [L/S/n=  260./1.400/.100]
     {Vmax=  .374:Dmax=  .197}
008:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB215         1.12     .008 No_date    6:30   11.77 .210
     [CN= 66.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
008:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:215          440.35     .420 No_date   12:25   16.55  n/a
                     + 02:TRB215         1.12     .008 No_date    6:30   11.77  n/a
     [DT= 5.00]  SUM=  03:215ADD       441.47     .422 No_date   12:20   16.54  n/a
008:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:215ADD       441.47     .422 No_date   12:20   16.54  n/a
     [RDT= 5.00] out<- 01:216          441.47     .422 No_date   12:30   16.54  n/a
     [L/S/n=  250./ .500/.100]
     {Vmax=  .276:Dmax=  .272}
008:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB216         1.12     .007 No_date    6:30   10.96 .195
     [CN= 65.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
008:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:216          441.47     .422 No_date   12:30   16.54  n/a
                     + 02:TRB216         1.12     .007 No_date    6:30   10.96  n/a
     [DT= 5.00]  SUM=  10:T2-US        442.59     .424 No_date   12:30   16.53  n/a
008:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:301           86.43     .126 No_date   11:50    9.97 .178
     [CN= 63.0: N= 1.10]
     [Tp= 1.24:DT= 5.00]
008:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:302           80.69     .096 No_date   12:00   10.90 .194
     [CN= 64.0: N= 1.10]
     [Tp= 1.80:DT= 5.00]
008:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:301           86.43     .126 No_date   11:50    9.97  n/a
                     + 02:302           80.69     .096 No_date   12:00   10.90  n/a
     [DT= 5.00]  SUM=  03:300a         167.12     .222 No_date   12:00   10.42  n/a
008:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300a         167.12     .222 No_date   12:00   10.42  n/a
     [RDT= 5.00] out<- 01:310          167.12     .222 No_date   12:00   10.42  n/a
     [L/S/n=  449./1.620/.040]
     {Vmax=  .491:Dmax=  .084}
008:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:303           65.19     .126 No_date   11:05   13.85 .247
     [CN= 69.0: N= 1.10]
     [Tp= 1.31:DT= 5.00]
008:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:310          167.12     .222 No_date   12:00   10.42  n/a
                     + 02:303           65.19     .126 No_date   11:05   13.85  n/a
     [DT= 5.00]  SUM=  03:300b         232.31     .348 No_date   12:00   11.38  n/a
008:0040---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300b         232.31     .348 No_date   12:00   11.38  n/a
     [RDT= 5.00] out<- 01:311          232.31     .348 No_date   12:05   11.38  n/a
     [L/S/n=  270./1.170/.100]
     {Vmax=  .333:Dmax=  .186}
008:0041---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
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    CALIB NASHYD       02:TRB311         1.15     .004 No_date    8:10   11.96 .213
     [CN= 65.0: N= 1.10]
     [Tp=  .52:DT= 5.00]
008:0042---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:311          232.31     .348 No_date   12:05   11.38  n/a
                     + 02:TRB311         1.15     .004 No_date    8:10   11.96  n/a
     [DT= 5.00]  SUM=  03:311ADD       233.46     .351 No_date   12:00   11.38  n/a
008:0043---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:311ADD       233.46     .351 No_date   12:00   11.38  n/a
     [RDT= 5.00] out<- 01:312          233.46     .350 No_date   12:05   11.39  n/a
     [L/S/n=  270./1.170/.100]
     {Vmax=  .334:Dmax=  .187}
008:0044---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB312         1.30     .006 No_date    9:00   18.38 .327
     [CN= 76.0: N= 1.10]
     [Tp=  .64:DT= 5.00]
008:0045---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:312          233.46     .350 No_date   12:05   11.39  n/a
                     + 02:TRB312         1.30     .006 No_date    9:00   18.38  n/a
     [DT= 5.00]  SUM=  09:312ADD       234.76     .355 No_date   12:05   11.42  n/a
008:0046---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    01:304a           9.61     .918 No_date    6:00   33.13 .590
     [XIMP=.46:TIMP=.57]
     [SLP=1.60:DT= 5.00]
     [LOSS= 1 : HORTONS]
008:0047---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    02:402a           5.67     .638 No_date    6:00   39.76 .708
     [XIMP=.58:TIMP=.73]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
008:0048---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    03:POND2          1.85     .190 No_date    6:00   42.73 .761
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
008:0049---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:304a           9.61     .918 No_date    6:00   33.13  n/a
                     + 02:402a           5.67     .638 No_date    6:00   39.76  n/a
                     + 03:POND2          1.85     .190 No_date    6:00   42.73  n/a
     [DT= 5.00]  SUM=  04:P2FLOW        17.13    1.746 No_date    6:00   36.36  n/a
008:0050---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 04:P2FLOW        17.13    1.746 No_date    6:00   36.36  n/a
     [RDT= 5.00] out<- 01:POND2         17.13     .031 No_date   10:50   36.36  n/a
           overflow <= 02:P2OVF           .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.5598E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
008:0051---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    02:402b           6.07     .683 No_date    6:00   39.76 .708
     [XIMP=.58:TIMP=.73]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
008:0052---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    03:402c           1.19     .133 No_date    6:00   37.86 .674
     [XIMP=.55:TIMP=.68]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
008:0053---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:402b           6.07     .683 No_date    6:00   39.76  n/a
                     + 03:402c           1.19     .133 No_date    6:00   37.86  n/a
     [DT= 5.00]  SUM=  04:400-OS         7.26     .816 No_date    6:00   39.45  n/a
008:0054---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 04:400-OS         7.26     .816 No_date    6:00   39.45  n/a
     [RDT= 5.00] out<- 02:OSSTOR         7.26     .800 No_date    6:00   39.45  n/a
           overflow <= 03:OSOVF           .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.5466E-02, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
008:0055---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:401           16.78     .144 No_date    7:55   14.34 .255
     [CN= 68.0: N= 3.00]
     [Tp= 1.66:DT= 5.00]
008:0056---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:POND2         17.13     .031 No_date   10:50   36.36  n/a
                     + 02:OSSTOR         7.26     .800 No_date    6:00   39.45  n/a
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                 + 03:401          16.78     .144 No_date    7:55   14.34  n/a
                 + 09:312ADD      234.76     .355 No_date   12:05   11.42  n/a
   [DT= 5.00]  SUM= 04:P2-T3      275.93     .847 No_date    6:00   13.88  n/a
008:0057---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 04:P2-T3      275.93     .847 No_date    6:00   13.88  n/a
     [RDT= 5.00] out<- 01:313        275.93     .680 No_date    6:05   13.88  n/a
     [L/S/n=  423./1.170/.100]
     {Vmax=  .496:Dmax=  .327}
008:0058---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB313        .72     .004 No_date    7:10   13.74 .245
     [CN= 68.0: N= 1.10]
     [Tp=  .34:DT= 5.00]
008:0059---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:313         275.93     .680 No_date    6:05   13.88  n/a
                 + 02:TRB313          .72     .004 No_date    7:10   13.74  n/a
     [DT= 5.00]  SUM= 03:313ADD       276.65     .682 No_date    6:05   13.88  n/a
008:0060---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       04:TRB314        .94     .004 No_date    8:00   13.74 .245
     [CN= 68.0: N= 1.10]
     [Tp=  .46:DT= 5.00]
008:0061---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:313         275.93     .680 No_date    6:05   13.88  n/a
                 + 02:TRB313          .72     .004 No_date    7:10   13.74  n/a
     [DT= 5.00]  SUM= 03:313ADD       276.65     .682 No_date    6:05   13.88  n/a
008:0062---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       04:403a         2.66     .020 No_date    7:00   16.74 .298
     [CN= 70.0: N= 1.10]
     [Tp=  .27:DT= 5.00]
008:0063---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            10:T2-US       442.59     .424 No_date   12:30   16.53  n/a
                 + 03:313ADD        276.65     .682 No_date    6:05   13.88  n/a
                 + 04:403a            2.66     .020 No_date    7:00   16.74  n/a
     [DT= 5.00]  SUM= 01:CONFLU       721.90     .898 No_date   10:30   15.52  n/a
008:0064---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  DESIGN STANDHYD    01:203d         1.26     .143 No_date    6:00   38.59 .687
     [XIMP=.56:TIMP=.70]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
008:0065---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    02:501a         9.32    1.162 No_date    6:00   47.91 .853
     [XIMP=.74:TIMP=.93]
     [SLP= .80:DT= 5.00]
     [LOSS= 1 : HORTONS]
008:0066---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    COMPUTE DUALHYD    02:501a         9.32    1.162 No_date    6:00   47.91  n/a
       Major System /  03:OSSTOR        .00     .000 No_date    0:00     .00  n/a
       Minor System \  04:TOPOND       9.32    1.162 No_date    6:00   47.91  n/a
     {MjSysSto=.0000E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
008:0067---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    05:501b        38.42    3.980 No_date    6:00   37.40 .666
     [XIMP=.54:TIMP=.67]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
008:0068---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    06:501c        39.10    3.939 No_date    6:00   36.01 .641
     [XIMP=.51:TIMP=.64]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
008:0069---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  DESIGN STANDHYD    07:MR1          3.32     .439 No_date    6:00   53.21 .947
     [XIMP=.80:TIMP=.99]
     [SLP=1.00:DT= 5.00]
     [LOSS= 1 : HORTONS]
008:0070---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  DESIGN STANDHYD    08:MR2          3.04     .402 No_date    6:00   53.21 .947
     [XIMP=.80:TIMP=.99]
     [SLP=1.00:DT= 5.00]
     [LOSS= 1 : HORTONS]
008:0071---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:203d         1.26     .143 No_date    6:00   38.59  n/a
                 + 05:501b           38.42    3.980 No_date    6:00   37.40  n/a
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                 + 07:MR1            3.32     .439 No_date    6:00   53.21  n/a
     [DT= 5.00]  SUM= 10:VALE          43.00    4.563 No_date    6:00   38.66  n/a
008:0072---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:TOPOND       9.32    1.162 No_date    6:00   47.91  n/a
                 + 06:501c           39.10    3.939 No_date    6:00   36.01  n/a
                 + 08:MR2             3.04     .402 No_date    6:00   53.21  n/a
     [DT= 5.00]  SUM= 09:MET           51.46    5.503 No_date    6:00   39.18  n/a
008:0073---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    01:POND3       11.89    1.031 No_date    6:05   42.73 .761
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
008:0074---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            10:VALE        43.00    4.563 No_date    6:00   38.66  n/a
                 + 09:MET            51.46    5.503 No_date    6:00   39.18  n/a
                 + 01:POND3          11.89    1.031 No_date    6:05   42.73  n/a
     [DT= 5.00]  SUM= 08:P3ADD        106.35   11.074 No_date    6:00   39.36  n/a
008:0075---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 08:P3ADD       106.35   11.074 No_date    6:00   39.36  n/a
     [RDT= 5.00] out<- 01:POND3       106.35     .402 No_date    9:05   39.36  n/a
           overflow <= 02:E-OVF          .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.3489E+01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 ** END OF RUN :  11

*******************************************************************************




 RUN:COMMAND#
 012:0001-----------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =  12 ]
#******************************************************************************
#  Project Name: [Kanata North]    Project Number: [112117]
#  Date        : 03-30-2016
#  Modeller    : [Kallie Auld]
#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
#  License #   :  5320763
#******************************************************************************
#******************************************************************************
 012:0002-----------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=10.00:SDUR=  12.00:PTOT=  93.91]
 012:0003-----------------------------------------------------------------------
     DEFAULT VALUES
      Filename = M:\2012\112117\data\CALCUL~1\swmhymo\POSTDE~1\OTTAWA.DEF
      ICASEdv  = 1 (read and print data)
      FileTitle= ------ ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE ---
                 ------ PARAMETER VALUES MUST BE ENTERD AFTER COLUMN 60 ----_
      Horton's infiltration equation parameters:
      [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
      Parameters for PERVIOUS surfaces in STANDHYD:
      [IAper=   4.67 mm] [LGP=40.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .013]
      Parameters used in NASHYD:
      [Ia=   4.67 mm] [N= 3.00]
 012:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:201         115.14     .224 No_date   12:00   31.04 .331
      [CN= 65.0: N= 1.10]
      [Tp= 3.42:DT= 5.00]
 012:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:201         115.14     .224 No_date   12:00   31.04  n/a
      [RDT= 5.00] out<- 02:210         115.14     .224 No_date   12:35   31.04  n/a
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     [L/S/n=  558./ .890/.040]
     {Vmax=  .432:Dmax=  .094}
012:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:202         263.64     .433 No_date   12:50   38.10 .406
     [CN= 70.0: N= 1.10]
     [Tp= 5.14:DT= 5.00]
012:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:202         263.64     .433 No_date   12:50   38.10  n/a
                     + 02:210         115.14     .224 No_date   12:35   31.04  n/a
     [DT= 5.00]  SUM=  03:210add      378.78     .656 No_date   12:40   35.95  n/a
012:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:210add      378.78     .656 No_date   12:40   35.95  n/a
     [RDT= 5.00] out<- 01:211         378.78     .657 No_date   12:35   35.95  n/a
     [L/S/n=  450./1.000/.100]
     {Vmax=  .415:Dmax=  .291}
012:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:211           1.87     .013 No_date   10:30   44.73 .476
     [CN= 76.0: N= 1.10]
     [Tp= 1.17:DT= 5.00]
012:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:211         378.78     .657 No_date   12:35   35.95  n/a
                     + 02:211           1.87     .013 No_date   10:30   44.73  n/a
     [DT= 5.00]  SUM=  03:211add      380.65     .669 No_date   12:35   36.00  n/a
012:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:211add      380.65     .669 No_date   12:35   36.00  n/a
     [RDT= 5.00] out<- 01:212         380.65     .669 No_date   12:40   36.00  n/a
     [L/S/n=  230./1.000/.100]
     {Vmax=  .420:Dmax=  .295}
012:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:212            .95     .008 No_date    8:00   33.54 .357
     [CN= 66.0: N= 1.10]
     [Tp=  .56:DT= 5.00]
012:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:212         380.65     .669 No_date   12:40   36.00  n/a
                     + 02:212            .95     .008 No_date    8:00   33.54  n/a
     [DT= 5.00]  SUM=  03:212add      381.60     .675 No_date   12:40   35.99  n/a
012:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:212add      381.60     .675 No_date   12:40   35.99  n/a
     [RDT= 5.00] out<- 01:213         381.60     .676 No_date   12:45   35.99  n/a
     [L/S/n=  330./1.000/.100]
     {Vmax=  .423:Dmax=  .297}
012:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:213           1.43     .011 No_date    9:00   33.41 .356
     [CN= 66.0: N= 1.10]
     [Tp=  .67:DT= 5.00]
012:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:213         381.60     .676 No_date   12:45   35.99  n/a
                     + 02:213           1.43     .011 No_date    9:00   33.41  n/a
     [DT= 5.00]  SUM=  09:TRIB2       383.03     .685 No_date   12:45   35.98  n/a
012:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    01:203a         27.32    5.412 No_date    6:00   66.29 .706
     [XIMP=.50:TIMP=.63]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
012:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  DESIGN STANDHYD    02:203b         20.76    4.089 No_date    6:00   64.96 .692
     [XIMP=.48:TIMP=.60]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
012:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  DESIGN STANDHYD    03:203c          4.95    1.025 No_date    6:00   70.45 .750
     [XIMP=.57:TIMP=.71]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
012:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    04:POND1          2.68     .501 No_date    6:00   75.32 .802
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
012:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:203b         20.76    4.089 No_date    6:00   64.96  n/a
                     + 03:203c          4.95    1.025 No_date    6:00   70.45  n/a
     [DT= 5.00]  SUM=  05:T2CRS        25.71    5.114 No_date    6:00   66.02  n/a
012:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:203a         27.32    5.412 No_date    6:00   66.29  n/a
                     + 04:POND1         2.68     .501 No_date    6:00   75.32  n/a
                     + 05:T2CRS        25.71    5.114 No_date    6:00   66.02  n/a
     [DT= 5.00]  SUM=  06:P1FLOW       55.71   11.026 No_date    6:00   66.60  n/a
012:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 06:P1FLOW       55.71   11.026 No_date    6:00   66.60  n/a
     [RDT= 5.00] out<- 01:POND1        55.71     .346 No_date    8:10   66.59  n/a
          overflow <= 02:P1-OVF          .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.3114E+01, TotOvfVol=.0000E+00, N-Ovf=     0, TotDurOvf=    0.hrs}
012:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:POND1        55.71     .346 No_date    8:10   66.59  n/a
                     + 09:TRIB2       383.03     .685 No_date   12:45   35.98  n/a
     [DT= 5.00]  SUM=  02:213ADD      438.74    1.006 No_date   12:05   39.87  n/a
012:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:213ADD      438.74    1.006 No_date   12:05   39.87  n/a
     [RDT= 5.00] out<- 01:214         438.74    1.005 No_date   12:15   39.87  n/a
     [L/S/n=  390./1.700/.100]
     {Vmax=  .595:Dmax=  .324}
012:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:214           1.61     .042 No_date    6:30   39.32 .419
     [CN= 72.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
012:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:214         438.74    1.005 No_date   12:15   39.87  n/a
                     + 03:214           1.61     .042 No_date    6:30   39.32  n/a
     [DT= 5.00]  SUM=  02:214ADD      440.35    1.014 No_date   12:10   39.87  n/a
012:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:214ADD      440.35    1.014 No_date   12:10   39.87  n/a
     [RDT= 5.00] out<- 01:215         440.35    1.013 No_date   12:20   39.86  n/a
     [L/S/n=  260./1.400/.100]
     {Vmax=  .555:Dmax=  .343}
012:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB215        1.12     .024 No_date    6:30   32.40 .345
     [CN= 66.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
012:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:215         440.35    1.013 No_date   12:20   39.86  n/a
                     + 02:TRB215        1.12     .024 No_date    6:30   32.40  n/a
     [DT= 5.00]  SUM=  03:215ADD      441.47    1.019 No_date   12:15   39.85  n/a
012:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:215ADD      441.47    1.019 No_date   12:15   39.85  n/a
     [RDT= 5.00] out<- 01:216         441.47    1.018 No_date   12:20   39.85  n/a
     [L/S/n=  250./ .500/.100]
     {Vmax=  .411:Dmax=  .472}
012:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB216        1.12     .023 No_date    6:30   30.92 .329
     [CN= 65.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
012:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:216         441.47    1.018 No_date   12:20   39.85  n/a
                     + 02:TRB216        1.12     .023 No_date    6:30   30.92  n/a
     [DT= 5.00]  SUM=  10:T2-US       442.59    1.023 No_date   12:15   39.82  n/a
012:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:301          86.43     .363 No_date   10:40   28.86 .307
     [CN= 63.0: N= 1.10]
     [Tp= 1.24:DT= 5.00]
012:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:302          80.69     .268 No_date   12:00   30.50 .325
     [CN= 64.0: N= 1.10]
     [Tp= 1.80:DT= 5.00]
012:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:301          86.43     .363 No_date   10:40   28.86  n/a
                     + 02:302          80.69     .268 No_date   12:00   30.50  n/a
     [DT= 5.00]  SUM=  03:300a        167.12     .629 No_date   11:20   29.65  n/a
012:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300a        167.12     .629 No_date   11:20   29.65  n/a
     [RDT= 5.00] out<- 01:310         167.12     .629 No_date   11:30   29.65  n/a
     [L/S/n=  449./1.620/.040]
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     {Vmax=  .705:Dmax=  .149}
012:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:303          65.19      .330 No_date    10:35   36.29 .386
     [CN= 69.0: N= 1.10]
     [Tp= 1.31:DT= 5.00]
012:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:310         167.12      .629 No_date    11:30   29.65  n/a
                    +  02:303          65.19      .330 No_date    10:35   36.29  n/a
     [DT= 5.00]  SUM=  03:300b        232.31      .958 No_date    11:05   31.51  n/a
012:0040---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300b        232.31      .958 No_date    11:05   31.51  n/a
     [RDT= 5.00] out<- 01:311         232.31      .958 No_date    11:15   31.51  n/a
     [L/S/n=  270./1.170/.100]
     {Vmax=  .512:Dmax=  .349}
012:0041---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB311        1.15      .010 No_date     8:00   32.33 .344
     [CN= 65.0: N= 1.10]
     [Tp=  .52:DT= 5.00]
012:0042---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:311         232.31      .958 No_date    11:15   31.51  n/a
                    +  02:TRB311        1.15      .010 No_date     8:00   32.33  n/a
     [DT= 5.00]  SUM=  03:311ADD      233.46      .966 No_date    11:10   31.52  n/a
012:0043---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:311ADD      233.46      .966 No_date    11:10   31.52  n/a
     [RDT= 5.00] out<- 01:312         233.46      .966 No_date    11:20   31.52  n/a
     [L/S/n=  270./1.170/.100]
     {Vmax=  .514:Dmax=  .351}
012:0044---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB312        1.30      .014 No_date     8:00   44.81 .477
     [CN= 76.0: N= 1.10]
     [Tp=  .64:DT= 5.00]
012:0045---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:312         233.46      .966 No_date    11:20   31.52  n/a
                    +  02:TRB312        1.30      .014 No_date     8:00   44.81  n/a
     [DT= 5.00]  SUM=  09:312ADD      234.76      .979 No_date    11:15   31.59  n/a
012:0046---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    01:304a          9.61     1.869 No_date     6:00   63.63 .678
     [XIMP=.46:TIMP=.57]
     [SLP=1.60:DT= 5.00]
     [LOSS= 1 : HORTONS]
012:0047---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    02:402a          5.67     1.177 No_date     6:00   71.32 .760
     [XIMP=.58:TIMP=.73]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
012:0048---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    03:POND2         1.85      .348 No_date     6:00   75.32 .802
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
012:0049---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:304a          9.61     1.869 No_date     6:00   63.63  n/a
                    +  02:402a          5.67     1.177 No_date     6:00   71.32  n/a
                    +  03:POND2         1.85      .348 No_date     6:00   75.32  n/a
     [DT= 5.00]  SUM=  04:P2FLOW       17.13     3.394 No_date     6:00   67.44  n/a
012:0050---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 04:P2FLOW       17.13     3.394 No_date     6:00   67.44  n/a
     [RDT= 5.00] out<- 01:POND2        17.13      .084 No_date     9:05   67.43  n/a
           overflow <= 02:P2OVF          .00      .000 No_date     0:00     .00  n/a
    {MxStoUsed=.1002E+01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
012:0051---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    02:402b          6.07     1.259 No_date     6:00   71.32 .760
     [XIMP=.58:TIMP=.73]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
012:0052---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    03:402c          1.19      .246 No_date     6:00   69.12 .736
     [XIMP=.55:TIMP=.68]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
012:0053---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
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    ADD HYD            02:402b          6.07     1.259 No_date     6:00   71.32  n/a
                    +  03:402c          1.19      .246 No_date     6:00   69.12  n/a
     [DT= 5.00]  SUM=  04:400-OS        7.26     1.505 No_date     6:00   70.96  n/a
012:0054---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 04:400-OS        7.26     1.505 No_date     6:00   70.96  n/a
     [RDT= 5.00] out<- 02:OSSTOR        7.26      .808 No_date     6:05   71.11  n/a
           overflow <= 03:OSOVF          .00      .000 No_date     0:00     .00  n/a
    {MxStoUsed=.9819E-01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
012:0055---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:401          16.78      .379 No_date     7:50   36.59 .390
     [CN= 68.0: N= 3.00]
     [Tp= 1.66:DT= 5.00]
012:0056---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:POND2        17.13      .084 No_date     9:05   67.43  n/a
                    +  02:OSSTOR        7.26      .808 No_date     6:05   71.11  n/a
                    +  03:401          16.78      .379 No_date     7:50   36.59  n/a
                    +  09:312ADD      234.76      .979 No_date    11:15   31.59  n/a
     [DT= 5.00]  SUM=  04:P2-T3       275.93     1.671 No_date     6:40   35.16  n/a
012:0057---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 04:P2-T3       275.93     1.671 No_date     6:40   35.16  n/a
     [RDT= 5.00] out<- 01:313         275.93     1.581 No_date     6:45   35.16  n/a
     [L/S/n=  423./1.170/.100]
     {Vmax=  .642:Dmax=  .491}
012:0058---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB313         .72      .010 No_date     7:00   35.79 .381
     [CN= 68.0: N= 1.10]
     [Tp=  .34:DT= 5.00]
012:0059---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:313         275.93     1.581 No_date     6:45   35.16  n/a
                    +  02:TRB313         .72      .010 No_date     7:00   35.79  n/a
     [DT= 5.00]  SUM=  03:313ADD      276.65     1.591 No_date     6:45   35.16  n/a
012:0060---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       04:TRB314         .94      .010 No_date     7:30   35.79 .381
     [CN= 68.0: N= 1.10]
     [Tp=  .46:DT= 5.00]
012:0061---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:313         275.93     1.581 No_date     6:45   35.16  n/a
                    +  02:TRB313         .72      .010 No_date     7:00   35.79  n/a
     [DT= 5.00]  SUM=  03:313ADD      276.65     1.591 No_date     6:45   35.16  n/a
012:0062---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       04:403a          2.66      .051 No_date     6:45   40.46 .431
     [CN= 70.0: N= 1.10]
     [Tp=  .27:DT= 5.00]
012:0063---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            10:T2-US       442.59     1.023 No_date    12:15   39.82  n/a
                    +  03:313ADD      276.65     1.591 No_date     6:45   35.16  n/a
                    +  04:403a          2.66      .051 No_date     6:45   40.46  n/a
     [DT= 5.00]  SUM=  01:CONFLU      721.90     2.367 No_date     9:00   38.04  n/a
012:0064---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    01:203d          1.26      .262 No_date     6:00   69.86 .744
     [XIMP=.56:TIMP=.70]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
012:0065---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    02:501a          9.32     2.009 No_date     6:00   83.38 .888
     [XIMP=.74:TIMP=.93]
     [SLP= .80:DT= 5.00]
     [LOSS= 1 : HORTONS]
012:0066---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    COMPUTE DUALHYD    02:501a          9.32     2.009 No_date     6:00   83.38  n/a
       Major System /  03:OSSTOR         .00      .000 No_date     0:00     .00  n/a
       Minor System \  04:TOPOND        9.32     2.009 No_date     6:00   83.38  n/a
     {MjSysSto=.0000E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
012:0067---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    05:501b         38.42     7.538 No_date     6:00   68.56 .730
     [XIMP=.54:TIMP=.67]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
012:0068---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    06:501c         39.10     7.579 No_date     6:00   66.85 .712
     [XIMP=.51:TIMP=.64]
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     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
012:0069---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    07:MR1            3.32     .739 No_date    6:00   90.88 .968
     [XIMP=.80:TIMP=.99]
     [SLP=1.00:DT= 5.00]
     [LOSS= 1 : HORTONS]
012:0070---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    08:MR2            3.04     .677 No_date    6:00   90.88 .968
     [XIMP=.80:TIMP=.99]
     [SLP=1.00:DT= 5.00]
     [LOSS= 1 : HORTONS]
012:0071---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:203d           1.26     .262 No_date    6:00   69.86  n/a
                     + 05:501b          38.42    7.538 No_date    6:00   68.56  n/a
                     + 07:MR1            3.32     .739 No_date    6:00   90.88  n/a
     [DT= 5.00]  SUM=  10:VALE          43.00    8.539 No_date    6:00   70.32  n/a
012:0072---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:TOPOND         9.32    2.009 No_date    6:00   83.38  n/a
                     + 06:501c          39.10    7.579 No_date    6:00   66.85  n/a
                     + 08:MR2            3.04     .677 No_date    6:00   90.88  n/a
     [DT= 5.00]  SUM=  09:MET           51.46   10.265 No_date    6:00   71.26  n/a
012:0073---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    01:POND3         11.89    2.029 No_date    6:00   75.32 .802
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
012:0074---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            10:VALE          43.00    8.539 No_date    6:00   70.32  n/a
                     + 09:MET           51.46   10.265 No_date    6:00   71.26  n/a
                     + 01:POND3         11.89    2.029 No_date    6:00   75.32  n/a
     [DT= 5.00]  SUM=  08:P3ADD        106.35   20.833 No_date    6:00   71.34  n/a
012:0075---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 08:P3ADD        106.35   20.833 No_date    6:00   71.34  n/a
     [RDT= 5.00] out<- 01:POND3        106.35    1.043 No_date    7:35   71.33  n/a
           overflow <= 02:E-OVF           .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.6107E+01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 ** END OF RUN :  12

*******************************************************************************




 RUN:COMMAND#
 013:0001------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =  13 ]
#******************************************************************************
#  Project Name: [Kanata North]    Project Number: [112117]
#  Date        : 03-30-2016
#  Modeller    : [Kallie Auld]
#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
#  License #   :  5320763
#******************************************************************************
#******************************************************************************
 013:0002------------------------------------------------------------------------
     READ STORM

      Filename = STORM.001
      Comment  =
      [SDT=60.00:SDUR=  24.00:PTOT=  25.05]
 013:0003------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = M:\2012\112117\data\CALCUL~1\swmhymo\POSTDE~1\OTTAWA.DEF
      ICASEdv  = 1 (read and print data)
      FileTitle= ------ ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE ---
            ------ PARAMETER VALUES MUST BE ENTERD AFTER COLUMN 60 ----_
     Horton's infiltration equation parameters:
     [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
     Parameters for PERVIOUS surfaces in STANDHYD:
     [IAper=   4.67 mm] [LGP=40.00 m] [MNP= .250]
     Parameters for IMPERVIOUS surfaces in STANDHYD:
     [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .013]
     Parameters used in NASHYD:
     [Ia=   4.67 mm] [N= 3.00]
013:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:201          115.14     .008 No_date   24:00    1.24 .049
     [CN= 65.0: N= 1.10]
     [Tp= 3.42:DT= 5.00]
013:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:201          115.14     .008 No_date   24:00    1.24  n/a
     [RDT= 5.00] out<- 02:210          115.14     .008 No_date   24:25    1.24  n/a
     [L/S/n=  558./ .890/.040]
     {Vmax=  .423:Dmax=  .004}
013:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:202          263.64     .026 No_date   24:00    2.39 .095
     [CN= 70.0: N= 1.10]
     [Tp= 5.14:DT= 5.00]
013:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:202          263.64     .026 No_date   24:00    2.39  n/a
                     + 02:210          115.14     .008 No_date   24:25    1.24  n/a
     [DT= 5.00]  SUM=  03:210add       378.78     .035 No_date   24:15    2.04  n/a
013:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:210add       378.78     .035 No_date   24:15    2.04  n/a
     [RDT= 5.00] out<- 01:211          378.78     .035 No_date   24:50    2.04  n/a
     [L/S/n=  450./1.000/.100]
     {Vmax=  .288:Dmax=  .024}
013:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:211            1.87     .001 No_date   18:05    3.11 .124
     [CN= 76.0: N= 1.10]
     [Tp= 1.17:DT= 5.00]
013:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:211          378.78     .035 No_date   24:50    2.04  n/a
                     + 02:211            1.87     .001 No_date   18:05    3.11  n/a
     [DT= 5.00]  SUM=  03:211add       380.65     .035 No_date   24:45    2.04  n/a
013:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:211add       380.65     .035 No_date   24:45    2.04  n/a
     [RDT= 5.00] out<- 01:212          380.65     .035 No_date   25:00    2.04  n/a
     [L/S/n=  230./1.000/.100]
     {Vmax=  .288:Dmax=  .024}
013:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:212             .95     .000 No_date   16:00    1.78 .071
     [CN= 66.0: N= 1.10]
     [Tp=  .56:DT= 5.00]
013:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:212          380.65     .035 No_date   25:00    2.04  n/a
                     + 02:212             .95     .000 No_date   16:00    1.78  n/a
     [DT= 5.00]  SUM=  03:212add       381.60     .036 No_date   24:55    2.04  n/a
013:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:212add       381.60     .036 No_date   24:55    2.04  n/a
     [RDT= 5.00] out<- 01:213          381.60     .035 No_date   25:20    2.04  n/a
     [L/S/n=  330./1.000/.100]
     {Vmax=  .288:Dmax=  .024}
013:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:213            1.43     .000 No_date   18:00    1.74 .070
     [CN= 66.0: N= 1.10]
     [Tp=  .67:DT= 5.00]
013:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:213          381.60     .035 No_date   25:20    2.04  n/a
                     + 02:213            1.43     .000 No_date   18:00    1.74  n/a
     [DT= 5.00]  SUM=  09:TRIB2        383.03     .036 No_date   25:15    2.04  n/a
013:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    01:203a          27.32     .403 No_date   12:00   11.74 .469
     [XIMP=.50:TIMP=.63]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
013:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
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 *  DESIGN STANDHYD    02:203b          20.76     .295 No_date   12:00   11.27 .450
     [XIMP=.48:TIMP=.60]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
013:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    03:203c           4.95     .084 No_date   12:00   13.38 .534
     [XIMP=.57:TIMP=.71]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
013:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    04:POND1          2.68     .050 No_date   12:00   15.11 .603
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
013:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:203b          20.76     .295 No_date   12:00   11.27  n/a
                     + 03:203c           4.95     .084 No_date   12:00   13.38  n/a
     [DT= 5.00]  SUM=  05:T2CRS         25.71     .379 No_date   12:00   11.68  n/a
013:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:203a          27.32     .403 No_date   12:00   11.74  n/a
                     + 04:POND1          2.68     .050 No_date   12:00   15.11  n/a
                     + 05:T2CRS         25.71     .379 No_date   12:00   11.68  n/a
     [DT= 5.00]  SUM=  06:P1FLOW        55.71     .832 No_date   12:00   11.87  n/a
013:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 06:P1FLOW        55.71     .832 No_date   12:00   11.87  n/a
     [RDT= 5.00] out<- 01:POND1         55.71     .027 No_date   21:10   11.87  n/a
           overflow <= 02:P1-OVF          .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.5459E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
013:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:POND1         55.71     .027 No_date   21:10   11.87  n/a
                     + 09:TRIB2        383.03     .036 No_date   25:15    2.04  n/a
     [DT= 5.00]  SUM=  02:213ADD       438.74     .062 No_date   24:35    3.29  n/a
013:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:213ADD       438.74     .062 No_date   24:35    3.29  n/a
     [RDT= 5.00] out<- 01:214          438.74     .062 No_date   24:55    3.29  n/a
     [L/S/n=  390./1.700/.100]
     {Vmax=  .376:Dmax=  .033}
013:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:214            1.61     .002 No_date   13:00    2.27 .090
     [CN= 72.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
013:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:214          438.74     .062 No_date   24:55    3.29  n/a
                     + 03:214            1.61     .002 No_date   13:00    2.27  n/a
     [DT= 5.00]  SUM=  02:214ADD       440.35     .062 No_date   24:45    3.28  n/a
013:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:214ADD       440.35     .062 No_date   24:45    3.28  n/a
     [RDT= 5.00] out<- 01:215          440.35     .062 No_date   24:55    3.28  n/a
     [L/S/n=  260./1.400/.100]
     {Vmax=  .341:Dmax=  .036}
013:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB215         1.12     .001 No_date   13:00    1.43 .057
     [CN= 66.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
013:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:215          440.35     .062 No_date   24:55    3.28  n/a
                     + 02:TRB215         1.12     .001 No_date   13:00    1.43  n/a
     [DT= 5.00]  SUM=  03:215ADD       441.47     .062 No_date   24:50    3.28  n/a
013:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:215ADD       441.47     .062 No_date   24:50    3.28  n/a
     [RDT= 5.00] out<- 01:216          441.47     .062 No_date   25:10    3.28  n/a
     [L/S/n=  250./ .500/.100]
     {Vmax=  .204:Dmax=  .060}
013:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB216         1.12     .000 No_date   13:05    1.20 .048
     [CN= 65.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
013:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:216          441.47     .062 No_date   25:10    3.28  n/a
                     + 02:TRB216         1.12     .000 No_date   13:05    1.20  n/a
     [DT= 5.00]  SUM=  10:T2-US        442.59     .062 No_date   25:05    3.27  n/a
```

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013:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:301           86.43     .010 No_date   22:00    1.00 .040
     [CN= 63.0: N= 1.10]
     [Tp= 1.24:DT= 5.00]
013:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:302           80.69     .010 No_date   24:00    1.28 .051
     [CN= 64.0: N= 1.10]
     [Tp= 1.80:DT= 5.00]
013:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:301           86.43     .010 No_date   22:00    1.00  n/a
                     + 02:302           80.69     .010 No_date   24:00    1.28  n/a
     [DT= 5.00]  SUM=  03:300a         167.12     .020 No_date   22:50    1.13  n/a
013:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300a         167.12     .020 No_date   22:50    1.13  n/a
     [RDT= 5.00] out<- 01:310          167.12     .020 No_date   23:15    1.13  n/a
     [L/S/n=  449./1.620/.040]
     {Vmax=  .430:Dmax=  .011}
013:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:303           65.19     .015 No_date   21:00    2.00 .080
     [CN= 69.0: N= 1.10]
     [Tp= 1.31:DT= 5.00]
013:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:310          167.12     .020 No_date   23:15    1.13  n/a
                     + 02:303           65.19     .015 No_date   21:00    2.00  n/a
     [DT= 5.00]  SUM=  03:300b         232.31     .035 No_date   22:00    1.38  n/a
013:0040---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300b         232.31     .035 No_date   22:00    1.38  n/a
     [RDT= 5.00] out<- 01:311          232.31     .035 No_date   22:10    1.38  n/a
     [L/S/n=  270./1.170/.100]
     {Vmax=  .312:Dmax=  .022}
013:0041---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB311         1.15     .000 No_date   16:00    1.62 .065
     [CN= 65.0: N= 1.10]

     [Tp=  .52:DT= 5.00]
013:0042---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:311          232.31     .035 No_date   22:10    1.38  n/a
                     + 02:TRB311         1.15     .000 No_date   16:00    1.62  n/a
     [DT= 5.00]  SUM=  03:311ADD       233.46     .035 No_date   22:05    1.38  n/a
013:0043---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:311ADD       233.46     .035 No_date   22:05    1.38  n/a
     [RDT= 5.00] out<- 01:312          233.46     .035 No_date   22:20    1.38  n/a
     [L/S/n=  270./1.170/.100]
     {Vmax=  .312:Dmax=  .022}
013:0044---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB312         1.30     .001 No_date   16:00    3.14 .125
     [CN= 76.0: N= 1.10]
     [Tp=  .64:DT= 5.00]
013:0045---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:312          233.46     .035 No_date   22:20    1.38  n/a
                     + 02:TRB312         1.30     .001 No_date   16:00    3.14  n/a
     [DT= 5.00]  SUM=  09:312ADD       234.76     .036 No_date   22:15    1.39  n/a
013:0046---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    01:304a           9.61     .131 No_date   12:00   10.80 .431
     [XIMP=.46:TIMP=.57]
     [SLP=1.60:DT= 5.00]
     [LOSS= 1 : HORTONS]
013:0047---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    02:402a           5.67     .098 No_date   12:00   13.62 .544
     [XIMP=.58:TIMP=.73]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
013:0048---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    03:POND2          1.85     .035 No_date   12:00   15.11 .603
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
013:0049---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:304a           9.61     .131 No_date   12:00   10.80  n/a
                     + 02:402a           5.67     .098 No_date   12:00   13.62  n/a
                     + 03:POND2          1.85     .035 No_date   12:00   15.11  n/a
```

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     [DT= 5.00]  SUM=  04:P2FLOW        17.13     .263 No_date   12:00   12.20  n/a
013:0050---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 04:P2FLOW        17.13     .263 No_date   12:00   12.20  n/a
     [RDT= 5.00] out<- 01:POND2         17.13     .002 No_date   24:10   12.20  n/a
           overflow <= 02:P2OVF           .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.1982E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
013:0051---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  DESIGN STANDHYD    02:402b          6.07     .105 No_date   12:00   13.62 .544
     [XIMP=.58:TIMP=.73]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
013:0052---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  DESIGN STANDHYD    03:402c          1.19     .019 No_date   11:55   12.91 .516
     [XIMP=.55:TIMP=.68]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
013:0053---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             02:402b          6.07     .105 No_date   12:00   13.62  n/a
                     +  03:402c          1.19     .019 No_date   11:55   12.91  n/a
     [DT= 5.00]  SUM=  04:400-OS         7.26     .124 No_date   12:00   13.50  n/a
013:0054---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 04:400-OS         7.26     .124 No_date   12:00   13.50  n/a
     [RDT= 5.00] out<- 02:OSSTOR         7.26     .124 No_date   12:00   13.50  n/a
           overflow <= 03:OSOVF           .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.7753E-03, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
013:0055---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        03:401          16.78     .017 No_date   14:05    2.37 .095
     [CN= 68.0: N= 3.00]
     [Tp= 1.66:DT= 5.00]
013:0056---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:POND2        17.13     .002 No_date   24:10   12.20  n/a
                     +  02:OSSTOR        7.26     .124 No_date   12:00   13.50  n/a
                     +  03:401          16.78     .017 No_date   14:05    2.37  n/a
                     +  09:312ADD      234.76     .036 No_date   22:15    1.39  n/a
     [DT= 5.00]  SUM=  04:P2-T3       275.93     .130 No_date   12:00    2.44  n/a
013:0057---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 04:P2-T3       275.93     .130 No_date   12:00    2.44  n/a
     [RDT= 5.00] out<- 01:313          275.93     .115 No_date   12:05    2.44  n/a
     [L/S/n=  423./1.170/.100]
     {Vmax=  .312:Dmax=  .082}
013:0058---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        02:TRB313         .72     .000 No_date   14:00    2.07 .083
     [CN= 68.0: N= 1.10]
     [Tp=  .34:DT= 5.00]
013:0059---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:313         275.93     .115 No_date   12:05    2.44  n/a
                     +  02:TRB313         .72     .000 No_date   14:00    2.07  n/a
     [DT= 5.00]  SUM=  03:313ADD      276.65     .115 No_date   12:05    2.44  n/a
013:0060---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        04:TRB314         .94     .000 No_date   14:20    2.07 .083
     [CN= 68.0: N= 1.10]
     [Tp=  .46:DT= 5.00]
013:0061---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:313         275.93     .115 No_date   12:05    2.44  n/a
                     +  02:TRB313         .72     .000 No_date   14:00    2.07  n/a
     [DT= 5.00]  SUM=  03:313ADD      276.65     .115 No_date   12:05    2.44  n/a
013:0062---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        04:403a          2.66     .003 No_date   13:00    3.32 .133
     [CN= 70.0: N= 1.10]
     [Tp=  .27:DT= 5.00]
013:0063---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             10:T2-US       442.59     .062 No_date   25:05    3.27  n/a
                     +  03:313ADD      276.65     .115 No_date   12:05    2.44  n/a
                     +  04:403a          2.66     .003 No_date   13:00    3.32  n/a
     [DT= 5.00]  SUM=  01:CONFLU       721.90     .127 No_date   12:05    2.95  n/a
013:0064---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  DESIGN STANDHYD    01:203d          1.26     .021 No_date   11:55   13.15 .525
     [XIMP=.56:TIMP=.70]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
013:0065---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    02:501a          9.32     .240 No_date   12:00   19.01 .759
      [XIMP=.74:TIMP=.93]
      [SLP= .80:DT= 5.00]
      [LOSS= 1 : HORTONS]
 013:0066---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:501a          9.32     .240 No_date   12:00   19.01  n/a
        Major System /  03:OSSTOR         .00     .000 No_date    0:00     .00  n/a
        Minor System \  04:TOPOND        9.32     .240 No_date   12:00   19.01  n/a
      {MjSysSto=.0000E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 013:0067---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
   *  DESIGN STANDHYD    05:501b         38.42     .608 No_date   12:00   12.68 .506
      [XIMP=.54:TIMP=.67]
      [SLP=2.30:DT= 5.00]
      [LOSS= 1 : HORTONS]
 013:0068---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
   *  DESIGN STANDHYD    06:501c         39.10     .584 No_date   12:00   11.97 .478
      [XIMP=.51:TIMP=.64]
      [SLP=2.30:DT= 5.00]
      [LOSS= 1 : HORTONS]
 013:0069---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    07:MR1           3.32     .097 No_date   12:00   21.53 .859
      [XIMP=.80:TIMP=.99]
      [SLP=1.00:DT= 5.00]
      [LOSS= 1 : HORTONS]
 013:0070---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    08:MR2           3.04     .089 No_date   12:00   21.53 .859
      [XIMP=.80:TIMP=.99]
      [SLP=1.00:DT= 5.00]
      [LOSS= 1 : HORTONS]
 013:0071---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:203d          1.26     .021 No_date   11:55   13.15  n/a
                     +  05:501b         38.42     .608 No_date   12:00   12.68  n/a
                     +  07:MR1           3.32     .097 No_date   12:00   21.53  n/a
      [DT= 5.00]  SUM=  10:VALE         43.00     .726 No_date   12:00   13.38  n/a
 013:0072---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:TOPOND        9.32     .240 No_date   12:00   19.01  n/a
                     +  06:501c         39.10     .584 No_date   12:00   11.97  n/a
                     +  08:MR2           3.04     .089 No_date   12:00   21.53  n/a
      [DT= 5.00]  SUM=  09:MET          51.46     .913 No_date   12:00   13.81  n/a
 013:0073---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    01:POND3        11.89     .201 No_date   12:05   15.11 .603
      [XIMP=.64:TIMP=.80]
      [SLP= .10:DT= 5.00]
      [LOSS= 1 : HORTONS]
 013:0074---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            10:VALE         43.00     .726 No_date   12:00   13.38  n/a
                     +  09:MET          51.46     .913 No_date   12:00   13.81  n/a
                     +  01:POND3        11.89     .201 No_date   12:05   15.11  n/a
      [DT= 5.00]  SUM=  08:P3ADD       106.35    1.840 No_date   12:00   13.78  n/a
 013:0075---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 08:P3ADD       106.35    1.840 No_date   12:00   13.78  n/a
      [RDT= 5.00] out<- 01:POND3       106.35     .046 No_date   22:15   13.78  n/a
            overflow <= 02:E-OVF          .00     .000 No_date    0:00     .00  n/a
     {MxStoUsed=.1264E+01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
  ** END OF RUN :  13

*******************************************************************************




 RUN:COMMAND#
 014:0001-----------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =  14 ]
#******************************************************************************
#  Project Name: [Kanata North]    Project Number: [112117]
```

```
#  Date        : 03-30-2016
#  Modeller    : [Kallie Auld]
#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
#  License #   :  5320763
#*******************************************************************************
#*******************************************************************************
 014:0002-------------------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=60.00:SDUR=  24.00:PTOT=  48.02]
 014:0003-------------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = M:\2012\112117\data\CALCUL~1\swmhymo\POSTDE~1\OTTAWA.DEF
      ICASEdv  = 1 (read and print data)
      FileTitle= ------ ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE ---
                 ------ PARAMETER VALUES MUST BE ENTERD AFTER COLUMN 60 ----_
      Horton's infiltration equation parameters:
      [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
      Parameters for PERVIOUS surfaces in STANDHYD:
      [IAper=   4.67 mm] [LGP=40.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .013]
      Parameters used in NASHYD:
      [Ia=   4.67 mm] [N= 3.00]
 014:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:201          115.14     .052 No_date   24:00    7.73 .161
      [CN= 65.0: N= 1.10]
      [Tp= 3.42:DT= 5.00]
 014:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:201          115.14     .052 No_date   24:00    7.73  n/a
      [RDT= 5.00] out<- 02:210          115.14     .052 No_date   24:15    7.73  n/a
      [L/S/n=  558./ .890/.040]
      {Vmax=  .423:Dmax=  .024}
 014:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:202          263.64     .120 No_date   24:00   10.90 .227
      [CN= 70.0: N= 1.10]
      [Tp= 5.14:DT= 5.00]
 014:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:202          263.64     .120 No_date   24:00   10.90  n/a
                      + 02:210          115.14     .052 No_date   24:15    7.73  n/a
      [DT= 5.00]  SUM=  03:210add       378.78     .172 No_date   24:05    9.94  n/a
 014:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:210add       378.78     .172 No_date   24:05    9.94  n/a
      [RDT= 5.00] out<- 01:211          378.78     .172 No_date   24:35    9.94  n/a
      [L/S/n=  450./1.000/.100]
      {Vmax=  .288:Dmax=  .117}
 014:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:211            1.87     .003 No_date   18:00   13.54 .282
      [CN= 76.0: N= 1.10]
      [Tp= 1.17:DT= 5.00]
 014:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:211          378.78     .172 No_date   24:35    9.94  n/a
                      + 02:211            1.87     .003 No_date   18:00   13.54  n/a
      [DT= 5.00]  SUM=  03:211add       380.65     .174 No_date   24:30    9.95  n/a
 014:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:211add       380.65     .174 No_date   24:30    9.95  n/a
      [RDT= 5.00] out<- 01:212          380.65     .174 No_date   24:45    9.95  n/a
      [L/S/n=  230./1.000/.100]
      {Vmax=  .288:Dmax=  .119}
 014:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:212             .95     .002 No_date   14:00    9.03 .188
      [CN= 66.0: N= 1.10]
      [Tp=  .56:DT= 5.00]
 014:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:212          380.65     .174 No_date   24:45    9.95  n/a
                      + 02:212             .95     .002 No_date   14:00    9.03  n/a
      [DT= 5.00]  SUM=  03:212add       381.60     .175 No_date   24:40    9.95  n/a
 014:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:212add       381.60     .175 No_date   24:40    9.95  n/a
      [RDT= 5.00] out<- 01:213          381.60     .175 No_date   25:00    9.95  n/a
      [L/S/n=  330./1.000/.100]
      {Vmax=  .288:Dmax=  .120}
 014:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:213            1.43     .002 No_date   15:00    8.96 .187
      [CN= 66.0: N= 1.10]
      [Tp=  .67:DT= 5.00]
 014:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:213          381.60     .175 No_date   25:00    9.95  n/a
                      + 02:213            1.43     .002 No_date   15:00    8.96  n/a
      [DT= 5.00]  SUM=  09:TRIB2        383.03     .176 No_date   24:55    9.95  n/a
 014:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    01:203a          27.32    1.005 No_date   12:00   26.23 .546
      [XIMP=.50:TIMP=.63]
      [SLP=2.30:DT= 5.00]
      [LOSS= 1 : HORTONS]
 014:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    02:203b          20.76     .730 No_date   12:00   25.11 .523
      [XIMP=.48:TIMP=.60]
      [SLP=2.30:DT= 5.00]
      [LOSS= 1 : HORTONS]
 014:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    03:203c           4.95     .212 No_date   12:00   29.74 .619
      [XIMP=.57:TIMP=.71]
      [SLP=2.30:DT= 5.00]
      [LOSS= 1 : HORTONS]
 014:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    04:POND1          2.68     .113 No_date   12:00   33.72 .702
      [XIMP=.64:TIMP=.80]
      [SLP= .10:DT= 5.00]
      [LOSS= 1 : HORTONS]
 014:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:203b          20.76     .730 No_date   12:00   25.11  n/a
                      + 03:203c           4.95     .212 No_date   12:00   29.74  n/a
      [DT= 5.00]  SUM=  05:T2CRS         25.71     .941 No_date   12:00   26.00  n/a
 014:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:203a          27.32    1.005 No_date   12:00   26.23  n/a
                      + 04:POND1          2.68     .113 No_date   12:00   33.72  n/a
                      + 05:T2CRS         25.71     .941 No_date   12:00   26.00  n/a
      [DT= 5.00]  SUM=  06:P1FLOW        55.71    2.059 No_date   12:00   26.48  n/a
 014:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 06:P1FLOW        55.71    2.059 No_date   12:00   26.48  n/a
      [RDT= 5.00] out<- 01:POND1         55.71     .088 No_date   16:15   26.48  n/a
            overflow <= 02:P1-OVF          .00     .000 No_date    0:00     .00  n/a
     {MxStoUsed=.1170E+01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 014:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:POND1         55.71     .088 No_date   16:15   26.48  n/a
                      + 09:TRIB2        383.03     .176 No_date   24:55    9.95  n/a
      [DT= 5.00]  SUM=  02:213ADD       438.74     .254 No_date   24:05   12.05  n/a
 014:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 02:213ADD       438.74     .254 No_date   24:05   12.05  n/a
      [RDT= 5.00] out<- 01:214          438.74     .254 No_date   24:15   12.05  n/a
      [L/S/n=  390./1.700/.100]
      {Vmax=  .376:Dmax=  .133}
 014:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:214            1.61     .009 No_date   13:00   11.10 .231
      [CN= 72.0: N= 1.10]
      [Tp=  .17:DT= 5.00]
 014:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:214          438.74     .254 No_date   24:15   12.05  n/a
                      + 03:214            1.61     .009 No_date   13:00   11.10  n/a
      [DT= 5.00]  SUM=  02:214ADD       440.35     .255 No_date   24:00   12.04  n/a
 014:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 02:214ADD       440.35     .255 No_date   24:00   12.04  n/a
      [RDT= 5.00] out<- 01:215          440.35     .255 No_date   24:10   12.04  n/a
      [L/S/n=  260./1.400/.100]
      {Vmax=  .341:Dmax=  .147}
 014:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:TRB215         1.12     .004 No_date   13:00    8.32 .173
      [CN= 66.0: N= 1.10]
      [Tp=  .17:DT= 5.00]
 014:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
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    ADD HYD            01:215         440.35     .255 No_date   24:10   12.04  n/a
                     + 02:TRB215        1.12     .004 No_date   13:00    8.32  n/a
     [DT= 5.00]  SUM=  03:215ADD      441.47     .255 No_date   24:00   12.03  n/a
014:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:215ADD      441.47     .255 No_date   24:00   12.03  n/a
     [RDT= 5.00] out<- 01:216         441.47     .255 No_date   24:10   12.03  n/a
     [L/S/n=  250./ .500/.100]
     {Vmax=  .225:Dmax=  .199}
014:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB216        1.12     .004 No_date   13:00    7.65 .159
     [CN= 65.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
014:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:216         441.47     .255 No_date   24:10   12.03  n/a
                     + 02:TRB216        1.12     .004 No_date   13:00    7.65  n/a
     [DT= 5.00]  SUM=  10:T2-US       442.59     .256 No_date   24:05   12.02  n/a
014:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:301          86.43     .072 No_date   18:00    6.90 .144
     [CN= 63.0: N= 1.10]
     [Tp= 1.24:DT= 5.00]
014:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:302          80.69     .058 No_date   21:00    7.66 .159
     [CN= 64.0: N= 1.10]
     [Tp= 1.80:DT= 5.00]
014:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:301          86.43     .072 No_date   18:00    6.90  n/a
                     + 02:302          80.69     .058 No_date   21:00    7.66  n/a
     [DT= 5.00]  SUM=  03:300a        167.12     .128 No_date   19:00    7.27  n/a
014:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300a        167.12     .128 No_date   19:00    7.27  n/a
     [RDT= 5.00] out<- 01:310         167.12     .128 No_date   19:05    7.27  n/a
     [L/S/n=  449./1.620/.040]
     {Vmax=  .438:Dmax=  .064}
014:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:303          65.19     .076 No_date   18:00    9.99 .208
     [CN= 69.0: N= 1.10]
     [Tp= 1.31:DT= 5.00]
014:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:310         167.12     .128 No_date   19:05    7.27  n/a
                     + 02:303          65.19     .076 No_date   18:00    9.99  n/a
     [DT= 5.00]  SUM=  03:300b        232.31     .204 No_date   18:30    8.03  n/a
014:0040--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300b        232.31     .204 No_date   18:30    8.03  n/a
     [RDT= 5.00] out<- 01:311         232.31     .204 No_date   18:55    8.03  n/a
     [L/S/n=  270./1.170/.100]
     {Vmax=  .312:Dmax=  .129}
014:0041--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB311        1.15     .002 No_date   14:00    8.54 .178
     [CN= 65.0: N= 1.10]
     [Tp=  .52:DT= 5.00]
014:0042--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:311         232.31     .204 No_date   18:55    8.03  n/a
                     + 02:TRB311        1.15     .002 No_date   14:00    8.54  n/a
     [DT= 5.00]  SUM=  03:311ADD      233.46     .206 No_date   18:50    8.03  n/a
014:0043--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:311ADD      233.46     .206 No_date   18:50    8.03  n/a
     [RDT= 5.00] out<- 01:312         233.46     .205 No_date   19:05    8.03  n/a
     [L/S/n=  270./1.170/.100]
     {Vmax=  .312:Dmax=  .130}
014:0044--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB312        1.30     .004 No_date   14:05   13.59 .283
     [CN= 76.0: N= 1.10]
     [Tp=  .64:DT= 5.00]
014:0045--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:312         233.46     .205 No_date   19:05    8.03  n/a
                     + 02:TRB312        1.30     .004 No_date   14:05   13.59  n/a
     [DT= 5.00]  SUM=  09:312ADD      234.76     .208 No_date   19:05    8.06  n/a
014:0046--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    01:304a          9.61     .320 No_date   12:00   23.99 .500
     [XIMP=.46:TIMP=.57]
     [SLP=1.60:DT= 5.00]
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     [LOSS= 1 : HORTONS]
014:0047--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    02:402a          5.67     .248 No_date   12:00   30.47 .634
     [XIMP=.58:TIMP=.73]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
014:0048--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    03:POND2         1.85     .079 No_date   12:00   33.72 .702
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
014:0049--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:304a          9.61     .320 No_date   12:00   23.99  n/a
                     + 02:402a          5.67     .248 No_date   12:00   30.47  n/a
                     + 03:POND2         1.85     .079 No_date   12:00   33.72  n/a
     [DT= 5.00]  SUM=  04:P2FLOW       17.13     .647 No_date   12:00   27.18  n/a
014:0050--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 04:P2FLOW       17.13     .647 No_date   12:00   27.18  n/a
     [RDT= 5.00] out<- 01:POND2        17.13     .016 No_date   21:05   27.18  n/a
           overflow <= 02:P2OVF          .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.4018E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
014:0051--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    02:402b          6.07     .266 No_date   12:00   30.47 .634
     [XIMP=.58:TIMP=.73]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
014:0052--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    03:402c          1.19     .049 No_date   12:00   28.56 .595
     [XIMP=.55:TIMP=.68]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
014:0053--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:402b          6.07     .266 No_date   12:00   30.47  n/a
                     + 03:402c          1.19     .049 No_date   12:00   28.56  n/a
     [DT= 5.00]  SUM=  04:400-OS        7.26     .315 No_date   12:00   30.15  n/a
014:0054--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 04:400-OS        7.26     .315 No_date   12:00   30.15  n/a
     [RDT= 5.00] out<- 02:OSSTOR        7.26     .314 No_date   12:00   30.15  n/a
           overflow <= 03:OSOVF          .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.1978E-02, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
014:0055--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:401          16.78     .085 No_date   13:50   10.48 .218
     [CN= 68.0: N= 3.00]
     [Tp= 1.66:DT= 5.00]
014:0056--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:POND2        17.13     .016 No_date   21:05   27.18  n/a
                     + 02:OSSTOR        7.26     .314 No_date   12:00   30.15  n/a
                     + 03:401          16.78     .085 No_date   13:50   10.48  n/a
                     + 09:312ADD      234.76     .208 No_date   19:05    8.06  n/a
     [DT= 5.00]  SUM=  04:P2-T3       275.93     .370 No_date   12:00    9.98  n/a
014:0057--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 04:P2-T3       275.93     .370 No_date   12:00    9.98  n/a
     [RDT= 5.00] out<- 01:313         275.93     .305 No_date   12:05    9.98  n/a
     [L/S/n=  423./1.170/.100]
     {Vmax=  .338:Dmax=  .193}
014:0058--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB313         .72     .002 No_date   13:00    9.94 .207
     [CN= 68.0: N= 1.10]
     [Tp=  .34:DT= 5.00]
014:0059--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:313         275.93     .305 No_date   12:05    9.98  n/a
                     + 02:TRB313         .72     .002 No_date   13:00    9.94  n/a
     [DT= 5.00]  SUM=  03:313ADD      276.65     .307 No_date   12:05    9.98  n/a
014:0060--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       04:TRB314         .94     .002 No_date   14:00    9.94 .207
     [CN= 68.0: N= 1.10]
     [Tp=  .46:DT= 5.00]
014:0061--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:313         275.93     .305 No_date   12:05    9.98  n/a
                     + 02:TRB313         .72     .002 No_date   13:00    9.94  n/a
     [DT= 5.00]  SUM=  03:313ADD      276.65     .307 No_date   12:05    9.98  n/a
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014:0062---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      04:403a          2.66     .013 No_date   13:00   12.53 .261
     [CN= 70.0: N= 1.10]
     [Tp=  .27:DT= 5.00]
014:0063---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           10:T2-US        442.59     .256 No_date   24:05   12.02  n/a
                    + 03:313ADD       276.65     .307 No_date   12:05    9.98  n/a
                    + 04:403a           2.66     .013 No_date   13:00   12.53  n/a
     [DT= 5.00]  SUM= 01:CONFLU       721.90     .509 No_date   18:05   11.24  n/a
014:0064---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD   01:203d          1.26     .054 No_date   12:00   29.26 .609
     [XIMP=.56:TIMP=.70]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
014:0065---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD   02:501a          9.32     .498 No_date   12:00   39.23 .817
     [XIMP=.74:TIMP=.93]
     [SLP= .80:DT= 5.00]
     [LOSS= 1 : HORTONS]
014:0066---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    COMPUTE DUALHYD   02:501a          9.32     .498 No_date   12:00   39.23  n/a
       Major System / 03:OSSTOR         .00     .000 No_date    0:00     .00  n/a
       Minor System \ 04:TOPOND        9.32     .498 No_date   12:00   39.23  n/a
     {MjSysSto=.0000E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
014:0067---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD   05:501b         38.42    1.494 No_date   12:00   28.10 .585
     [XIMP=.54:TIMP=.67]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
014:0068---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD   06:501c         39.10    1.453 No_date   12:00   26.70 .556
     [XIMP=.51:TIMP=.64]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
014:0069---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD   07:MR1           3.32     .188 No_date   12:00   43.77 .912
     [XIMP=.80:TIMP=.99]
     [SLP=1.00:DT= 5.00]
     [LOSS= 1 : HORTONS]
014:0070---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD   08:MR2           3.04     .172 No_date   12:00   43.77 .912
     [XIMP=.80:TIMP=.99]
     [SLP=1.00:DT= 5.00]
     [LOSS= 1 : HORTONS]
014:0071---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:203d          1.26     .054 No_date   12:00   29.26  n/a
                    + 05:501b         38.42    1.494 No_date   12:00   28.10  n/a
                    + 07:MR1           3.32     .188 No_date   12:00   43.77  n/a
     [DT= 5.00]  SUM= 10:VALE         43.00    1.736 No_date   12:00   29.34  n/a
014:0072---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           04:TOPOND        9.32     .498 No_date   12:00   39.23  n/a
                    + 06:501c         39.10    1.453 No_date   12:00   26.70  n/a
                    + 08:MR2           3.04     .172 No_date   12:00   43.77  n/a
     [DT= 5.00]  SUM= 09:MET          51.46    2.123 No_date   12:00   29.98  n/a
014:0073---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD   01:POND3        11.89     .471 No_date   12:00   33.72 .702
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
014:0074---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           10:VALE         43.00    1.736 No_date   12:00   29.34  n/a
                    + 09:MET          51.46    2.123 No_date   12:00   29.98  n/a
                    + 01:POND3        11.89     .471 No_date   12:00   33.72  n/a
     [DT= 5.00]  SUM= 08:P3ADD       106.35    4.330 No_date   12:00   30.14  n/a
014:0075---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 08:P3ADD       106.35    4.330 No_date   12:00   30.14  n/a
     [RDT= 5.00] out<- 01:POND3       106.35     .220 No_date   16:05   30.14  n/a
           overflow <= 02:E-OVF          .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.2517E+01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 ** END OF RUN :  14
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*******************************************************************************




 RUN:COMMAND#
 015:0001------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =  15 ]
#*******************************************************************************
#  Project Name: [Kanata North]    Project Number: [112117]
#  Date        : 03-30-2016
#  Modeller    : [Kallie Auld]
#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
#  License #   :  5320763
#*******************************************************************************
#*******************************************************************************
 015:0002------------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=60.00:SDUR=  24.00:PTOT=  61.92]
 015:0003------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = M:\2012\112117\data\CALCUL~1\swmhymo\POSTDE~1\OTTAWA.DEF
      ICASEdv  = 1 (read and print data)
      FileTitle= ------ ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE ---
                 ------ PARAMETER VALUES MUST BE ENTERD AFTER COLUMN 60 ----_
      Horton's infiltration equation parameters:
      [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
      Parameters for PERVIOUS surfaces in STANDHYD:
      [IAper=   4.67 mm] [LGP=40.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .013]
      Parameters used in NASHYD:
      [Ia=   4.67 mm] [N= 3.00]
 015:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      01:201         115.14     .091 No_date   24:00   13.63 .220
      [CN= 65.0: N= 1.10]
      [Tp= 3.42:DT= 5.00]
 015:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:201         115.14     .091 No_date   24:00   13.63  n/a
      [RDT= 5.00] out<- 02:210         115.14     .091 No_date   24:10   13.63  n/a
      [L/S/n=  558./ .890/.040]
      {Vmax=  .423:Dmax=  .042}
 015:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      01:202         263.64     .198 No_date   24:00   18.03 .291
      [CN= 70.0: N= 1.10]
      [Tp= 5.14:DT= 5.00]
 015:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:202         263.64     .198 No_date   24:00   18.03  n/a
                     + 02:210         115.14     .091 No_date   24:10   13.63  n/a
      [DT= 5.00]  SUM= 03:210add      378.78     .289 No_date   24:00   16.69  n/a
 015:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:210add      378.78     .289 No_date   24:00   16.69  n/a
      [RDT= 5.00] out<- 01:211         378.78     .289 No_date   24:25   16.69  n/a
      [L/S/n=  450./1.000/.100]
      {Vmax=  .301:Dmax=  .176}
 015:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      02:211           1.87     .005 No_date   16:20   21.93 .354
      [CN= 76.0: N= 1.10]
      [Tp= 1.17:DT= 5.00]
 015:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:211         378.78     .289 No_date   24:25   16.69  n/a
                     + 02:211           1.87     .005 No_date   16:20   21.93  n/a
      [DT= 5.00]  SUM= 03:211add      380.65     .293 No_date   24:25   16.72  n/a
 015:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
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    ROUTE CHANNEL   -> 03:211add       380.65     .293 No_date   24:25   16.72  n/a
     [RDT= 5.00] out<- 01:212          380.65     .293 No_date   24:35   16.72  n/a
     [L/S/n=  230./1.000/.100]
     {Vmax=  .302:Dmax=  .177}
015:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:212             .95     .003 No_date   14:00   15.33 .248
     [CN= 66.0: N= 1.10]
     [Tp=  .56:DT= 5.00]
015:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:212          380.65     .293 No_date   24:35   16.72  n/a
                    +  02:212             .95     .003 No_date   14:00   15.33  n/a
     [DT= 5.00]  SUM=  03:212add       381.60     .295 No_date   24:30   16.71  n/a
015:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:212add       381.60     .295 No_date   24:30   16.71  n/a
     [RDT= 5.00] out<- 01:213          381.60     .295 No_date   24:45   16.71  n/a
     [L/S/n=  330./1.000/.100]
     {Vmax=  .302:Dmax=  .178}
015:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:213            1.43     .004 No_date   14:20   15.23 .246
     [CN= 66.0: N= 1.10]
     [Tp=  .67:DT= 5.00]
015:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:213          381.60     .295 No_date   24:45   16.71  n/a
                    +  02:213            1.43     .004 No_date   14:20   15.23  n/a
     [DT= 5.00]  SUM=  09:TRIB2        383.03     .297 No_date   24:40   16.71  n/a
015:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    01:203a          27.32    1.537 No_date   12:00   37.07 .599
     [XIMP=.50:TIMP=.63]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
015:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    02:203b          20.76    1.136 No_date   12:00   35.67 .576
     [XIMP=.48:TIMP=.60]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
015:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  * DESIGN STANDHYD    03:203c           4.95     .305 No_date   12:00   41.02 .663
     [XIMP=.57:TIMP=.71]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
015:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    04:POND1          2.68     .161 No_date   12:00   45.30 .732
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
015:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:203b          20.76    1.136 No_date   12:00   35.67  n/a
                    +  03:203c           4.95     .305 No_date   12:00   41.02  n/a
     [DT= 5.00]  SUM=  05:T2CRS         25.71    1.441 No_date   12:00   36.70  n/a
015:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:203a          27.32    1.537 No_date   12:00   37.07  n/a
                    +  04:POND1          2.68     .161 No_date   12:00   45.30  n/a
                    +  05:T2CRS         25.71    1.441 No_date   12:00   36.70  n/a
     [DT= 5.00]  SUM=  06:P1FLOW        55.71    3.138 No_date   12:00   37.29  n/a
015:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 06:P1FLOW        55.71    3.138 No_date   12:00   37.29  n/a
     [RDT= 5.00] out<- 01:POND1         55.71     .166 No_date   14:20   37.29  n/a
           overflow <= 02:P1-OVF          .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.1614E+01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
015:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:POND1         55.71     .166 No_date   14:20   37.29  n/a
                    +  09:TRIB2        383.03     .297 No_date   24:40   16.71  n/a
     [DT= 5.00]  SUM=  02:213ADD       438.74     .427 No_date   21:40   19.32  n/a
015:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:213ADD       438.74     .427 No_date   21:40   19.32  n/a
     [RDT= 5.00] out<- 01:214          438.74     .427 No_date   21:55   19.32  n/a
     [L/S/n=  390./1.700/.100]
     {Vmax=  .403:Dmax=  .188}
015:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:214            1.61     .015 No_date   13:00   18.52 .299
     [CN= 72.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
015:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:214          438.74     .427 No_date   21:55   19.32  n/a
                    +  03:214            1.61     .015 No_date   13:00   18.52  n/a
     [DT= 5.00]  SUM=  02:214ADD       440.35     .429 No_date   21:55   19.32  n/a
015:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:214ADD       440.35     .429 No_date   21:55   19.32  n/a
     [RDT= 5.00] out<- 01:215          440.35     .429 No_date   22:00   19.32  n/a
     [L/S/n=  260./1.400/.100]
     {Vmax=  .376:Dmax=  .199}
015:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB215         1.12     .008 No_date   13:00   14.45 .233
     [CN= 66.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
015:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:215          440.35     .429 No_date   22:00   19.32  n/a
                    +  02:TRB215         1.12     .008 No_date   13:00   14.45  n/a
     [DT= 5.00]  SUM=  03:215ADD       441.47     .430 No_date   22:00   19.30  n/a
015:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:215ADD       441.47     .430 No_date   22:00   19.30  n/a
     [RDT= 5.00] out<- 01:216          441.47     .431 No_date   22:05   19.30  n/a
     [L/S/n=  250./ .500/.100]
     {Vmax=  .279:Dmax=  .276}
015:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB216         1.12     .007 No_date   13:00   13.53 .219
     [CN= 65.0: N= 1.10]
     [Tp=  .17:DT= 5.00]
015:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:216          441.47     .431 No_date   22:05   19.30  n/a
                    +  02:TRB216         1.12     .007 No_date   13:00   13.53  n/a
     [DT= 5.00]  SUM=  10:T2-US        442.59     .432 No_date   22:05   19.29  n/a
015:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:301           86.43     .130 No_date   18:00   12.39 .200
     [CN= 63.0: N= 1.10]
     [Tp= 1.24:DT= 5.00]
015:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:302           80.69     .101 No_date   21:00   13.42 .217
     [CN= 64.0: N= 1.10]
     [Tp= 1.80:DT= 5.00]
015:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:301           86.43     .130 No_date   18:00   12.39  n/a
                    +  02:302           80.69     .101 No_date   21:00   13.42  n/a
     [DT= 5.00]  SUM=  03:300a         167.12     .230 No_date   18:05   12.89  n/a
015:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300a         167.12     .230 No_date   18:05   12.89  n/a
     [RDT= 5.00] out<- 01:310          167.12     .230 No_date   18:30   12.89  n/a
     [L/S/n=  449./1.620/.040]
     {Vmax=  .496:Dmax=  .086}
015:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:303           65.19     .129 No_date   18:00   16.82 .272
     [CN= 69.0: N= 1.10]
     [Tp= 1.31:DT= 5.00]
015:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:310          167.12     .230 No_date   18:30   12.89  n/a
                    +  02:303           65.19     .129 No_date   18:00   16.82  n/a
     [DT= 5.00]  SUM=  03:300b         232.31     .359 No_date   18:10   13.99  n/a
015:0040---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:300b         232.31     .359 No_date   18:10   13.99  n/a
     [RDT= 5.00] out<- 01:311          232.31     .358 No_date   18:25   13.99  n/a
     [L/S/n=  270./1.170/.100]
     {Vmax=  .336:Dmax=  .189}
015:0041---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB311         1.15     .004 No_date   14:00   14.61 .236
     [CN= 65.0: N= 1.10]
     [Tp=  .52:DT= 5.00]
015:0042---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:311          232.31     .358 No_date   18:25   13.99  n/a
                    +  02:TRB311         1.15     .004 No_date   14:00   14.61  n/a
     [DT= 5.00]  SUM=  03:311ADD       233.46     .361 No_date   18:25   13.99  n/a
015:0043---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:311ADD       233.46     .361 No_date   18:25   13.99  n/a
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     [RDT= 5.00] out<- 01:312          233.46     .361 No_date   18:40   13.99  n/a
     [L/S/n=  270./1.170/.100]
     {Vmax=  .336:Dmax=  .190}
015:0044--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:TRB312          1.30     .006 No_date   14:00   21.99 .355
     [CN= 76.0: N= 1.10]
     [Tp=  .64:DT= 5.00]
015:0045--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:312           233.46     .361 No_date   18:40   13.99  n/a
                    + 02:TRB312          1.30     .006 No_date   14:00   21.99  n/a
     [DT= 5.00]  SUM= 09:312ADD        234.76     .366 No_date   18:35   14.04  n/a
015:0046--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD   01:304a            9.61     .507 No_date   12:00   34.23 .553
     [XIMP=.46:TIMP=.57]
     [SLP=1.60:DT= 5.00]
     [LOSS= 1 : HORTONS]
015:0047--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD   02:402a            5.67     .354 No_date   12:00   41.82 .675
     [XIMP=.58:TIMP=.73]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
015:0048--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD   03:POND2           1.85     .111 No_date   12:00   45.30 .732
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
015:0049--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:304a            9.61     .507 No_date   12:00   34.23  n/a
                    + 02:402a            5.67     .354 No_date   12:00   41.82  n/a
                    + 03:POND2           1.85     .111 No_date   12:00   45.30  n/a
     [DT= 5.00]  SUM= 04:P2FLOW         17.13     .972 No_date   12:00   37.94  n/a
015:0050--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 04:P2FLOW        17.13     .972 No_date   12:00   37.94  n/a
     [RDT= 5.00] out<- 01:POND2         17.13     .030 No_date   18:05   37.93  n/a
           overflow <= 02:P2OVF           .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.5445E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
015:0051--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD   02:402b            6.07     .379 No_date   12:00   41.82 .675
     [XIMP=.58:TIMP=.73]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
015:0052--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD   03:402c            1.19     .072 No_date   12:00   39.70 .641
     [XIMP=.55:TIMP=.68]
     [SLP=2.10:DT= 5.00]
     [LOSS= 1 : HORTONS]
015:0053--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:402b            6.07     .379 No_date   12:00   41.82  n/a
                    + 03:402c            1.19     .072 No_date   12:00   39.70  n/a
     [DT= 5.00]  SUM= 04:400-OS          7.26     .451 No_date   12:00   41.47  n/a
015:0054--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 04:400-OS         7.26     .451 No_date   12:00   41.47  n/a
     [RDT= 5.00] out<- 02:OSSTOR         7.26     .450 No_date   12:00   41.47  n/a
           overflow <= 03:OSOVF           .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.2824E-02, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
015:0055--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      03:401            16.78     .144 No_date   13:45   17.29 .279
     [CN= 68.0: N= 3.00]
     [Tp= 1.66:DT= 5.00]
015:0056--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:POND2          17.13     .030 No_date   18:05   37.93  n/a
                    + 02:OSSTOR          7.26     .450 No_date   12:00   41.47  n/a
                    + 03:401            16.78     .144 No_date   13:45   17.29  n/a
                    + 09:312ADD        234.76     .366 No_date   18:35   14.04  n/a
     [DT= 5.00]  SUM= 04:P2-T3         275.93     .566 No_date   12:00   16.44  n/a
015:0057--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 04:P2-T3        275.93     .566 No_date   12:00   16.44  n/a
     [RDT= 5.00] out<- 01:313          275.93     .502 No_date   14:45   16.44  n/a
     [L/S/n=  423./1.170/.100]
     {Vmax=  .394:Dmax=  .250}
015:0058--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:TRB313           .72     .004 No_date   13:00   16.65 .269
     [CN= 68.0: N= 1.10]
     [Tp=  .34:DT= 5.00]
015:0059--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:313           275.93     .502 No_date   14:45   16.44  n/a
                    + 02:TRB313           .72     .004 No_date   13:00   16.65  n/a
     [DT= 5.00]  SUM= 03:313ADD        276.65     .505 No_date   14:45   16.44  n/a
015:0060--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      04:TRB314           .94     .004 No_date   13:55   16.65 .269
     [CN= 68.0: N= 1.10]
     [Tp=  .46:DT= 5.00]
015:0061--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:313           275.93     .502 No_date   14:45   16.44  n/a
                    + 02:TRB313           .72     .004 No_date   13:00   16.65  n/a
     [DT= 5.00]  SUM= 03:313ADD        276.65     .505 No_date   14:45   16.44  n/a
015:0062--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      04:403a            2.66     .020 No_date   13:00   19.94 .322
     [CN= 70.0: N= 1.10]
     [Tp=  .27:DT= 5.00]
015:0063--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           10:T2-US         442.59     .432 No_date   22:05   19.29  n/a
                    + 03:313ADD        276.65     .505 No_date   14:45   16.44  n/a
                    + 04:403a            2.66     .020 No_date   13:00   19.94  n/a
     [DT= 5.00]  SUM= 01:CONFLU        721.90     .895 No_date   16:00   18.20  n/a
015:0064--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD   01:203d            1.26     .077 No_date   12:00   40.48 .654
     [XIMP=.56:TIMP=.70]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
015:0065--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD   02:501a            9.32     .658 No_date   12:00   51.52 .832
     [XIMP=.74:TIMP=.93]
     [SLP= .80:DT= 5.00]
     [LOSS= 1 : HORTONS]
015:0066--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    COMPUTE DUALHYD   02:501a            9.32     .658 No_date   12:00   51.52  n/a
       Major System / 03:OSSTOR           .00     .000 No_date    0:00     .00  n/a
       Minor System \ 04:TOPOND          9.32     .658 No_date   12:00   51.52  n/a
     {MjSysSto=.0000E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
015:0067--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD   05:501b           38.42    2.229 No_date   12:00   39.17 .633
     [XIMP=.54:TIMP=.67]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
015:0068--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD   06:501c           39.10    2.208 No_date   12:00   37.60 .607
     [XIMP=.51:TIMP=.64]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
015:0069--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD   07:MR1             3.32     .245 No_date   12:00   57.57 .930
     [XIMP=.80:TIMP=.99]
     [SLP=1.00:DT= 5.00]
     [LOSS= 1 : HORTONS]
015:0070--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD   08:MR2             3.04     .224 No_date   12:00   57.57 .930
     [XIMP=.80:TIMP=.99]
     [SLP=1.00:DT= 5.00]
     [LOSS= 1 : HORTONS]
015:0071--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:203d            1.26     .077 No_date   12:00   40.48  n/a
                    + 05:501b           38.42    2.229 No_date   12:00   39.17  n/a
                    + 07:MR1             3.32     .245 No_date   12:00   57.57  n/a
     [DT= 5.00]  SUM= 10:VALE           43.00    2.551 No_date   12:00   40.63  n/a
015:0072--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           04:TOPOND          9.32     .658 No_date   12:00   51.52  n/a
                    + 06:501c           39.10    2.208 No_date   12:00   37.60  n/a
                    + 08:MR2             3.04     .224 No_date   12:00   57.57  n/a
     [DT= 5.00]  SUM= 09:MET            51.46    3.091 No_date   12:00   41.30  n/a
015:0073--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD   01:POND3          11.89     .670 No_date   12:00   45.30 .732
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      [XIMP=.64:TIMP=.80]
      [SLP= .10:DT= 5.00]
      [LOSS= 1 : HORTONS]
 015:0074---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            10:VALE          43.00    2.551 No_date   12:00   40.63  n/a
                      + 09:MET           51.46    3.091 No_date   12:00   41.30  n/a
                      + 01:POND3         11.89     .670 No_date   12:00   45.30  n/a
      [DT= 5.00]  SUM=  08:P3ADD        106.35    6.312 No_date   12:00   41.47  n/a
 015:0075---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 08:P3ADD        106.35    6.312 No_date   12:00   41.47  n/a
      [RDT= 5.00] out<- 01:POND3        106.35     .383 No_date   14:20   41.47  n/a
            overflow <= 02:E-OVF           .00     .000 No_date    0:00     .00  n/a
     {MxStoUsed=.3389E+01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
  ** END OF RUN :  15

*******************************************************************************

 RUN:COMMAND#
 016:0001------------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =  16 ]
#******************************************************************************
#  Project Name: [Kanata North]    Project Number: [112117]
#  Date        : 03-30-2016
#  Modeller    : [Kallie Auld]
#  Company     : NOVATECH ENGINEERING CONSULTANTS LTD
#  License #   :  5320763
#******************************************************************************
#******************************************************************************
 016:0002------------------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  =
      [SDT=60.00:SDUR=  24.00:PTOT= 105.74]
 016:0003------------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = M:\2012\112117\data\CALCUL~1\swmhymo\POSTDE~1\OTTAWA.DEF
      ICASEdv  = 1 (read and print data)
      FileTitle= ------ ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE ---
                 ------ PARAMETER VALUES MUST BE ENTERD AFTER COLUMN 60 ----_
      Horton's infiltration equation parameters:
      [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
      Parameters for PERVIOUS surfaces in STANDHYD:
      [IAper=   4.67 mm] [LGP=40.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .013]
      Parameters used in NASHYD:
      [Ia=   4.67 mm] [N= 3.00]
 016:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:201          115.14     .257 No_date   24:00   38.51 .364
      [CN= 65.0: N= 1.10]
      [Tp= 3.42:DT= 5.00]
 016:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:201          115.14     .257 No_date   24:00   38.51  n/a
      [RDT= 5.00] out<- 02:210          115.14     .257 No_date   24:05   38.51  n/a
      [L/S/n=  558./ .890/.040]
      {Vmax=  .442:Dmax=  .101}
 016:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:202          263.64     .510 No_date   24:00   46.46 .439
      [CN= 70.0: N= 1.10]
      [Tp= 5.14:DT= 5.00]
 016:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:202          263.64     .510 No_date   24:00   46.46  n/a
                      + 02:210          115.14     .257 No_date   24:05   38.51  n/a
      [DT= 5.00]  SUM=  03:210add       378.78     .766 No_date   24:00   44.04  n/a
 016:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:210add       378.78     .766 No_date   24:00   44.04  n/a
      [RDT= 5.00] out<- 01:211          378.78     .766 No_date   24:10   44.04  n/a
      [L/S/n=  450./1.000/.100]
      {Vmax=  .456:Dmax=  .323}
 016:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:211            1.87     .013 No_date   16:00   54.00 .511
      [CN= 76.0: N= 1.10]
      [Tp= 1.17:DT= 5.00]
 016:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:211          378.78     .766 No_date   24:10   44.04  n/a
                      + 02:211            1.87     .013 No_date   16:00   54.00  n/a
      [DT= 5.00]  SUM=  03:211add       380.65     .777 No_date   24:10   44.09  n/a
 016:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:211add       380.65     .777 No_date   24:10   44.09  n/a
      [RDT= 5.00] out<- 01:212          380.65     .776 No_date   24:15   44.09  n/a
      [L/S/n=  230./1.000/.100]
      {Vmax=  .457:Dmax=  .325}
 016:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:212             .95     .009 No_date   14:00   41.25 .390
      [CN= 66.0: N= 1.10]
      [Tp=  .56:DT= 5.00]
 016:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:212          380.65     .776 No_date   24:15   44.09  n/a
                      + 02:212             .95     .009 No_date   14:00   41.25  n/a
      [DT= 5.00]  SUM=  03:212add       381.60     .780 No_date   24:15   44.08  n/a
 016:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:212add       381.60     .780 No_date   24:15   44.08  n/a
      [RDT= 5.00] out<- 01:213          381.60     .780 No_date   24:25   44.08  n/a
      [L/S/n=  330./1.000/.100]
      {Vmax=  .458:Dmax=  .326}
 016:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:213            1.43     .012 No_date   14:00   41.12 .389
      [CN= 66.0: N= 1.10]
      [Tp=  .67:DT= 5.00]
 016:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:213          381.60     .780 No_date   24:25   44.08  n/a
                      + 02:213            1.43     .012 No_date   14:00   41.12  n/a
      [DT= 5.00]  SUM=  09:TRIB2        383.03     .786 No_date   24:20   44.07  n/a
 016:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    01:203a          27.32    3.051 No_date   12:00   70.88 .670
      [XIMP=.50:TIMP=.63]
      [SLP=2.30:DT= 5.00]
      [LOSS= 1 : HORTONS]
 016:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    02:203b          20.76    2.296 No_date   12:00   69.11 .654
      [XIMP=.48:TIMP=.60]
      [SLP=2.30:DT= 5.00]
      [LOSS= 1 : HORTONS]
 016:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  DESIGN STANDHYD    03:203c           4.95     .572 No_date   12:00   76.34 .722
      [XIMP=.57:TIMP=.71]
      [SLP=2.30:DT= 5.00]
      [LOSS= 1 : HORTONS]
 016:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    04:POND1          2.68     .299 No_date   12:00   82.03 .776
      [XIMP=.64:TIMP=.80]
      [SLP= .10:DT= 5.00]
      [LOSS= 1 : HORTONS]
 016:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:203b          20.76    2.296 No_date   12:00   69.11  n/a
                      + 03:203c           4.95     .572 No_date   12:00   76.34  n/a
      [DT= 5.00]  SUM=  05:T2CRS         25.71    2.868 No_date   12:00   70.50  n/a
 016:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:203a          27.32    3.051 No_date   12:00   70.88  n/a
                      + 04:POND1          2.68     .299 No_date   12:00   82.03  n/a
                      + 05:T2CRS         25.71    2.868 No_date   12:00   70.50  n/a
      [DT= 5.00]  SUM=  06:P1FLOW        55.71    6.218 No_date   12:00   71.24  n/a
 016:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 06:P1FLOW        55.71    6.218 No_date   12:00   71.24  n/a
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      [RDT= 5.00] out<- 01:POND1         55.71     .344 No_date   14:05   71.24  n/a
            overflow <= 02:P1-OVF          .00     .000 No_date    0:00     .00  n/a
     {MxStoUsed=.3100E+01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 016:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:POND1         55.71     .344 No_date   14:05   71.24  n/a
                     +  09:TRIB2        383.03     .786 No_date   24:20   44.07  n/a
      [DT= 5.00]  SUM=  02:213ADD       438.74    1.068 No_date   22:00   47.52  n/a
 016:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 02:213ADD       438.74    1.068 No_date   22:00   47.52  n/a
      [RDT= 5.00] out<- 01:214          438.74    1.068 No_date   22:05   47.52  n/a
      [L/S/n=  390./1.700/.100]
      {Vmax=  .604:Dmax=  .335}
 016:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:214            1.61     .041 No_date   12:10   47.94 .453
      [CN= 72.0: N= 1.10]
      [Tp=  .17:DT= 5.00]
 016:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:214          438.74    1.068 No_date   22:05   47.52  n/a
                     +  03:214            1.61     .041 No_date   12:10   47.94  n/a
      [DT= 5.00]  SUM=  02:214ADD       440.35    1.073 No_date   21:15   47.52  n/a
 016:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 02:214ADD       440.35    1.073 No_date   21:15   47.52  n/a
      [RDT= 5.00] out<- 01:215          440.35    1.073 No_date   21:30   47.52  n/a
      [L/S/n=  260./1.400/.100]
      {Vmax=  .565:Dmax=  .354}
 016:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:TRB215         1.12     .023 No_date   12:15   40.05 .379
      [CN= 66.0: N= 1.10]
      [Tp=  .17:DT= 5.00]
 016:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:215          440.35    1.073 No_date   21:30   47.52  n/a
                     +  02:TRB215         1.12     .023 No_date   12:15   40.05  n/a
      [DT= 5.00]  SUM=  03:215ADD       441.47    1.077 No_date   21:25   47.50  n/a
 016:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:215ADD       441.47    1.077 No_date   21:25   47.50  n/a
      [RDT= 5.00] out<- 01:216          441.47    1.077 No_date   21:35   47.50  n/a
      [L/S/n=  250./ .500/.100]
      {Vmax=  .418:Dmax=  .487}
 016:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:TRB216         1.12     .022 No_date   12:15   38.38 .363
      [CN= 65.0: N= 1.10]
      [Tp=  .17:DT= 5.00]
 016:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:216          441.47    1.077 No_date   21:35   47.50  n/a
                     +  02:TRB216         1.12     .022 No_date   12:15   38.38  n/a
      [DT= 5.00]  SUM=  10:T2-US        442.59    1.080 No_date   21:35   47.48  n/a
 016:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:301           86.43     .383 No_date   18:00   35.99 .340
      [CN= 63.0: N= 1.10]
      [Tp= 1.24:DT= 5.00]
 016:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:302           80.69     .287 No_date   18:25   37.84 .358
      [CN= 64.0: N= 1.10]
      [Tp= 1.80:DT= 5.00]
 016:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:301           86.43     .383 No_date   18:00   35.99  n/a
                     +  02:302           80.69     .287 No_date   18:25   37.84  n/a
      [DT= 5.00]  SUM=  03:300a         167.12     .670 No_date   18:00   36.88  n/a
 016:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:300a         167.12     .670 No_date   18:00   36.88  n/a
      [RDT= 5.00] out<- 01:310          167.12     .669 No_date   18:05   36.88  n/a
      [L/S/n=  449./1.620/.040]
      {Vmax=  .720:Dmax=  .154}
 016:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:303           65.19     .346 No_date   17:40   44.45 .420
      [CN= 69.0: N= 1.10]
      [Tp= 1.31:DT= 5.00]
 016:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:310          167.12     .669 No_date   18:05   36.88  n/a
                     +  02:303           65.19     .346 No_date   17:40   44.45  n/a
      [DT= 5.00]  SUM=  03:300b         232.31    1.015 No_date   18:00   39.01  n/a
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 016:0040---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:300b         232.31    1.015 No_date   18:00   39.01  n/a
      [RDT= 5.00] out<- 01:311          232.31    1.014 No_date   18:05   39.01  n/a
      [L/S/n=  270./1.170/.100]
      {Vmax=  .522:Dmax=  .361}
 016:0041---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:TRB311         1.15     .011 No_date   14:00   39.88 .377
      [CN= 65.0: N= 1.10]
      [Tp=  .52:DT= 5.00]
 016:0042---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:311          232.31    1.014 No_date   18:05   39.01  n/a
                     +  02:TRB311         1.15     .011 No_date   14:00   39.88  n/a
      [DT= 5.00]  SUM=  03:311ADD       233.46    1.022 No_date   18:05   39.01  n/a
 016:0043---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:311ADD       233.46    1.022 No_date   18:05   39.01  n/a
      [RDT= 5.00] out<- 01:312          233.46    1.022 No_date   18:10   39.01  n/a
      [L/S/n=  270./1.170/.100]
      {Vmax=  .523:Dmax=  .363}
 016:0044---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:TRB312         1.30     .015 No_date   14:00   54.08 .511
      [CN= 76.0: N= 1.10]
      [Tp=  .64:DT= 5.00]
 016:0045---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:312          233.46    1.022 No_date   18:10   39.01  n/a
                     +  02:TRB312         1.30     .015 No_date   14:00   54.08  n/a
      [DT= 5.00]  SUM=  09:312ADD       234.76    1.034 No_date   18:10   39.09  n/a
 016:0046---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    01:304a           9.61    1.049 No_date   12:00   67.31 .637
      [XIMP=.46:TIMP=.57]
      [SLP=1.60:DT= 5.00]
      [LOSS= 1 : HORTONS]
 016:0047---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
   * DESIGN STANDHYD    02:402a           5.67     .660 No_date   12:00   77.35 .732
      [XIMP=.58:TIMP=.73]
      [SLP=2.10:DT= 5.00]
      [LOSS= 1 : HORTONS]
 016:0048---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    03:POND2          1.85     .207 No_date   12:00   82.03 .776
      [XIMP=.64:TIMP=.80]
      [SLP= .10:DT= 5.00]
      [LOSS= 1 : HORTONS]
 016:0049---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:304a           9.61    1.049 No_date   12:00   67.31  n/a
                     +  02:402a           5.67     .660 No_date   12:00   77.35  n/a
                     +  03:POND2          1.85     .207 No_date   12:00   82.03  n/a
      [DT= 5.00]  SUM=  04:P2FLOW        17.13    1.916 No_date   12:00   72.22  n/a
 016:0050---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 04:P2FLOW        17.13    1.916 No_date   12:00   72.22  n/a
      [RDT= 5.00] out<- 01:POND2         17.13     .083 No_date   15:00   72.21  n/a
            overflow <= 02:P2OVF           .00     .000 No_date    0:00     .00  n/a
     {MxStoUsed=.9986E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 016:0051---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
   * DESIGN STANDHYD    02:402b           6.07     .706 No_date   12:00   77.35 .732
      [XIMP=.58:TIMP=.73]
      [SLP=2.10:DT= 5.00]
      [LOSS= 1 : HORTONS]
 016:0052---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
   * DESIGN STANDHYD    03:402c           1.19     .137 No_date   12:00   74.58 .705
      [XIMP=.55:TIMP=.68]
      [SLP=2.10:DT= 5.00]
      [LOSS= 1 : HORTONS]
 016:0053---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:402b           6.07     .706 No_date   12:00   77.35  n/a
                     +  03:402c           1.19     .137 No_date   12:00   74.58  n/a
      [DT= 5.00]  SUM=  04:400-OS         7.26     .843 No_date   12:00   76.90  n/a
 016:0054---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 04:400-OS         7.26     .843 No_date   12:00   76.90  n/a
      [RDT= 5.00] out<- 02:OSSTOR         7.26     .800 No_date   12:00   76.90  n/a
            overflow <= 03:OSOVF           .00     .000 No_date    0:00     .00  n/a
     {MxStoUsed=.1074E-01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 016:0055---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
```

```
    CALIB NASHYD       03:401           16.78     .386 No_date   13:40   44.67 .422
     [CN= 68.0: N= 3.00]
     [Tp= 1.66:DT= 5.00]
016:0056---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:POND2         17.13     .083 No_date   15:00   72.21  n/a
                   +  02:OSSTOR         7.26     .800 No_date   12:00   76.90  n/a
                   +  03:401           16.78     .386 No_date   13:40   44.67  n/a
                   +  09:312ADD       234.76    1.034 No_date   18:10   39.09  n/a
     [DT= 5.00]  SUM=  04:P2-T3        275.93    1.449 No_date   14:00   42.48  n/a
016:0057---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 04:P2-T3        275.93    1.449 No_date   14:00   42.48  n/a
     [RDT= 5.00] out<- 01:313          275.93    1.443 No_date   14:05   42.48  n/a
     [L/S/n=  423./1.170/.100]
     {Vmax=  .604:Dmax=  .450}
016:0058---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:TRB313          .72     .011 No_date   13:00   43.82 .414
     [CN= 68.0: N= 1.10]
     [Tp=  .34:DT= 5.00]
016:0059---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:313          275.93    1.443 No_date   14:05   42.48  n/a
                   +  02:TRB313           .72     .011 No_date   13:00   43.82  n/a
     [DT= 5.00]  SUM=  03:313ADD       276.65    1.452 No_date   14:05   42.48  n/a
016:0060---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       04:TRB314          .94     .011 No_date   13:10   43.82 .414
     [CN= 68.0: N= 1.10]
     [Tp=  .46:DT= 5.00]
016:0061---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:313          275.93    1.443 No_date   14:05   42.48  n/a
                   +  02:TRB313           .72     .011 No_date   13:00   43.82  n/a
     [DT= 5.00]  SUM=  03:313ADD       276.65    1.452 No_date   14:05   42.48  n/a
016:0062---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       04:403a           2.66     .051 No_date   13:00   48.93 .463
     [CN= 70.0: N= 1.10]
     [Tp=  .27:DT= 5.00]
016:0063---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            10:T2-US        442.59    1.080 No_date   21:35   47.48  n/a
                   +  03:313ADD       276.65    1.452 No_date   14:05   42.48  n/a
                   +  04:403a           2.66     .051 No_date   13:00   48.93  n/a
     [DT= 5.00]  SUM=  01:CONFLU       721.90    2.457 No_date   14:50   45.57  n/a
016:0064---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    01:203d           1.26     .146 No_date   12:00   75.60 .715
     [XIMP=.56:TIMP=.70]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
016:0065---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    02:501a           9.32    1.153 No_date   12:00   91.14 .862
     [XIMP=.74:TIMP=.93]
     [SLP= .80:DT= 5.00]
     [LOSS= 1 : HORTONS]
016:0066---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    COMPUTE DUALHYD    02:501a           9.32    1.153 No_date   12:00   91.14  n/a
       Major System /  03:OSSTOR          .00     .000 No_date    0:00     .00  n/a
       Minor System \  04:TOPOND         9.32    1.153 No_date   12:00   91.14  n/a
     {MjSysSto=.0000E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
016:0067---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    05:501b          38.42    4.345 No_date   12:00   73.84 .698
     [XIMP=.54:TIMP=.67]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
016:0068---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    06:501c          39.10    4.372 No_date   12:00   71.62 .677
     [XIMP=.51:TIMP=.64]
     [SLP=2.30:DT= 5.00]
     [LOSS= 1 : HORTONS]
016:0069---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    07:MR1            3.32     .420 No_date   12:00  101.30 .958
     [XIMP=.80:TIMP=.99]
     [SLP=1.00:DT= 5.00]
     [LOSS= 1 : HORTONS]
016:0070---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  DESIGN STANDHYD    08:MR2            3.04     .385 No_date   12:00  101.30 .958
     [XIMP=.80:TIMP=.99]
     [SLP=1.00:DT= 5.00]
     [LOSS= 1 : HORTONS]
016:0071---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:203d           1.26     .146 No_date   12:00   75.60  n/a
                   +  05:501b          38.42    4.345 No_date   12:00   73.84  n/a
                   +  07:MR1            3.32     .420 No_date   12:00  101.30  n/a
     [DT= 5.00]  SUM=  10:VALE          43.00    4.911 No_date   12:00   76.01  n/a
016:0072---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:TOPOND         9.32    1.153 No_date   12:00   91.14  n/a
                   +  06:501c          39.10    4.372 No_date   12:00   71.62  n/a
                   +  08:MR2            3.04     .385 No_date   12:00  101.30  n/a
     [DT= 5.00]  SUM=  09:MET           51.46    5.909 No_date   12:00   76.91  n/a
016:0073---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    DESIGN STANDHYD    01:POND3         11.89    1.279 No_date   12:00   82.03 .776
     [XIMP=.64:TIMP=.80]
     [SLP= .10:DT= 5.00]
     [LOSS= 1 : HORTONS]
016:0074---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            10:VALE          43.00    4.911 No_date   12:00   76.01  n/a
                   +  09:MET           51.46    5.909 No_date   12:00   76.91  n/a
                   +  01:POND3         11.89    1.279 No_date   12:00   82.03  n/a
     [DT= 5.00]  SUM=  08:P3ADD        106.35   12.099 No_date   12:00   77.12  n/a
016:0075---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 08:P3ADD        106.35   12.099 No_date   12:00   77.12  n/a
     [RDT= 5.00] out<- 01:POND3        106.35    1.044 No_date   13:35   77.12  n/a
           overflow <= 02:E-OVF           .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.6111E+01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
016:0002-------------------------------------------------------------------------------
     FINISH
-------------------------------------------------------------------------------------
*************************************************************************************
    WARNINGS / ERRORS / NOTES
    -------------------------
001:0019 DESIGN STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
001:0046 DESIGN STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
001:0047 DESIGN STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
001:0051 DESIGN STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
001:0052 DESIGN STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
001:0054 ROUTE RESERVOIR
     *** WARNING: Inflow peak was not reduced!
                  Check OUTFLOW/STORAGE table or reduce DT.
001:0064 DESIGN STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
001:0069 DESIGN STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
001:0070 DESIGN STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
002:0018 DESIGN STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
002:0019 DESIGN STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
002:0046 DESIGN STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
002:0047 DESIGN STANDHYD
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KANATA NORTH
COMMUNITY DESIGN PLAN

FIGURE NO. H-2

PROPOSED CONDITIONS
HEC-RAS MODEL
SCHEMATIC

DATE
MAY 2016

JOB
112117

SCALE
NTS

NOVATECH
Engineers, Planners & Landscape Architects

M:\2012\112117\CAD\Design_EMP\MEMO (CS)\HECRAS Figs.dwg, H-2 PropCond, Apr 04, 2016 - 11:46am, bthurber

SHT11x17.DWG - 279mmx432mm

HEC-RAS Output: Proposed Conditions

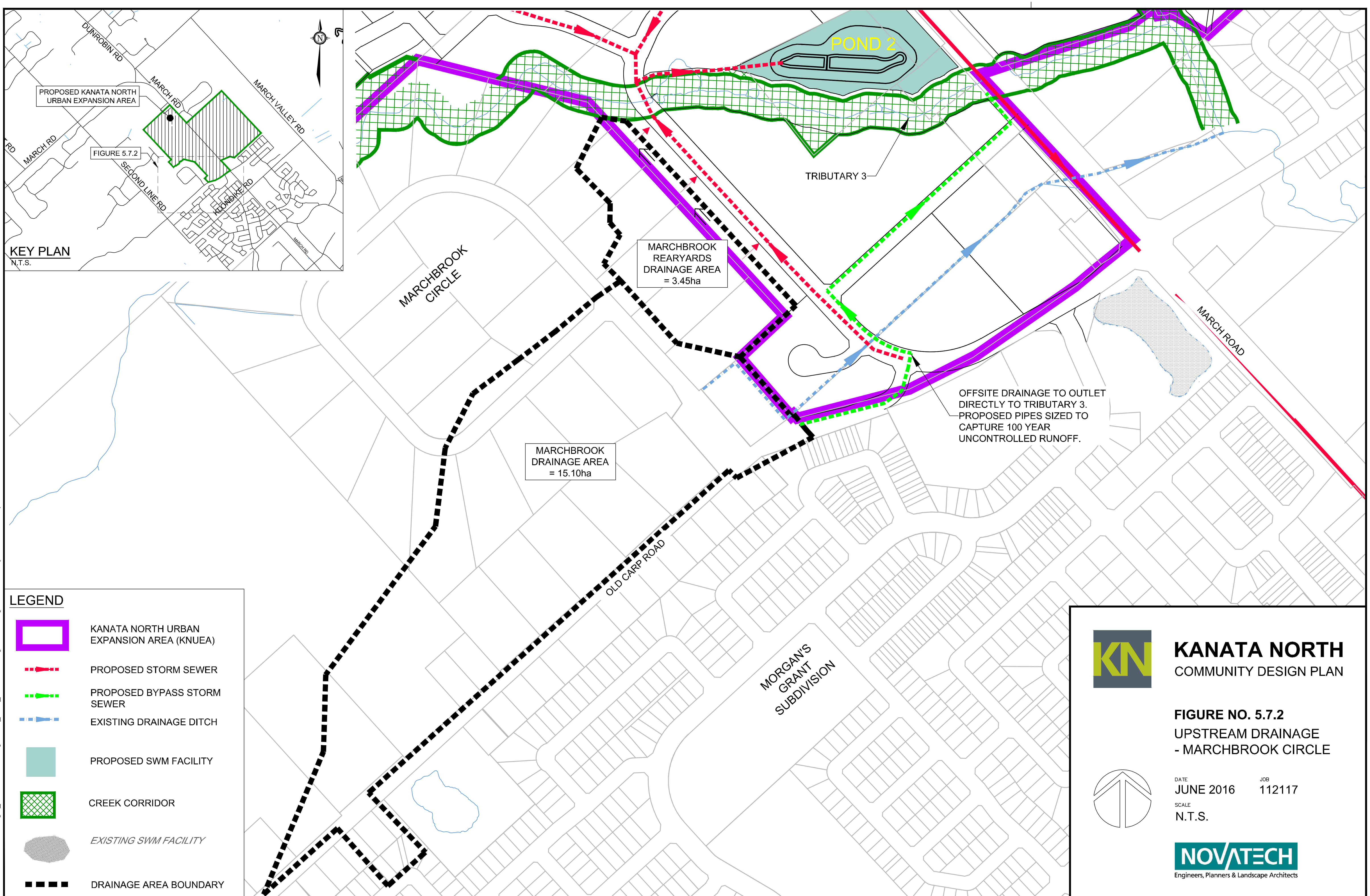
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Tributary 3	3710.92*	100yr-24hrSCS	1.02	81.74	82.12		82.12	0.001311	0.34	2.98	15.11	0.24
Tributary 3	3710.92*	5yr-24hrSCS	0.36	81.74	81.88	81.88	81.91	0.02159	0.77	0.47	5.68	0.86
Tributary 3	3710.92*	2yr-24hrSCS	0.2	81.74	81.85	81.84	81.87	0.017747	0.62	0.33	4.71	0.76
Tributary 3	3701.66*	100yr-24hrSCS	1.02	81.62	82.11		82.12	0.000549	0.27	3.74	13.29	0.16
Tributary 3	3701.66*	5yr-24hrSCS	0.36	81.62	81.8	81.72	81.81	0.005234	0.49	0.73	5.82	0.44
Tributary 3	3701.66*	2yr-24hrSCS	0.2	81.62	81.72		81.74	0.013654	0.59	0.35	4.27	0.66
Tributary 3	3692.41*	100yr-24hrSCS	1.45	81.49	82.11		82.11	0.000497	0.31	4.66	11.94	0.16
Tributary 3	3692.41*	5yr-24hrSCS	0.57	81.49	81.78		81.78	0.001585	0.37	1.53	7.19	0.26
Tributary 3	3692.41*	2yr-24hrSCS	0.37	81.49	81.69		81.69	0.002834	0.4	0.92	5.93	0.33
Tributary 3	3683.15*	100yr-24hrSCS	1.45	81.37	82.1	81.57	82.11	0.000238	0.25	5.7	10.88	0.11
Tributary 3	3683.15*	5yr-24hrSCS	0.57	81.37	81.78	81.48	81.78	0.000334	0.22	2.59	8.04	0.12
Tributary 3	3683.15*	2yr-24hrSCS	0.37	81.37	81.68	81.45	81.68	0.00036	0.2	1.88	7.25	0.12
Tributary 3	3676		Culvert									
Tributary 3	3664.25*	100yr-24hrSCS	1.45	81.25	81.49		81.49	0.001528	0.36	3.99	17.48	0.24
Tributary 3	3664.25*	5yr-24hrSCS	0.57	81.25	81.37		81.37	0.002392	0.29	1.95	16.86	0.27
Tributary 3	3664.25*	2yr-24hrSCS	0.37	81.25	81.34		81.35	0.002117	0.24	1.56	16.74	0.25
Tributary 3	3654.60*	100yr-24hrSCS	1.45	81.25	81.48		81.48	0.000638	0.23	6.24	27.86	0.16
Tributary 3	3654.60*	5yr-24hrSCS	0.57	81.25	81.35		81.35	0.00155	0.21	2.68	26.98	0.21
Tributary 3	3654.60*	2yr-24hrSCS	0.37	81.25	81.33		81.33	0.001548	0.18	2.07	26.82	0.2
Tributary 3	3644.95*	100yr-24hrSCS	1.45	81.25	81.48		81.48	0.000352	0.17	8.46	38.28	0.12
Tributary 3	3644.95*	5yr-24hrSCS	0.57	81.25	81.34		81.34	0.001272	0.18	3.23	37.11	0.19
Tributary 3	3644.95*	2yr-24hrSCS	0.37	81.25	81.32		81.32	0.001405	0.15	2.43	36.91	0.19
Tributary 3	3635.31	100yr-24hrSCS	1.45	81.25	81.47		81.48	0.000223	0.14	10.69	48.74	0.09
Tributary 3	3635.31	5yr-24hrSCS	0.57	81.25	81.32		81.32	0.001439	0.17	3.43	47.18	0.2
Tributary 3	3635.31	2yr-24hrSCS	0.37	81.25	81.28		81.28	0.010286	0.25	1.47	46.7	0.45
Tributary 3	3625.37*	100yr-24hrSCS	1.45	81.19	81.47		81.47	0.000169	0.14	10.32	37.6	0.09
Tributary 3	3625.37*	5yr-24hrSCS	0.57	81.19	81.32		81.32	0.000361	0.12	4.6	36.11	0.11
Tributary 3	3625.37*	2yr-24hrSCS	0.37	81.19	81.27		81.27	0.000804	0.13	2.79	35.67	0.15
Tributary 3	3615.43*	100yr-24hrSCS	1.45	81.12	81.47		81.47	0.000183	0.17	8.66	26.72	0.09
Tributary 3	3615.43*	5yr-24hrSCS	0.57	81.12	81.31		81.32	0.000209	0.12	4.62	25.15	0.09
Tributary 3	3615.43*	2yr-24hrSCS	0.37	81.12	81.26		81.26	0.000259	0.11	3.33	24.7	0.1
Tributary 3	3605.49*	100yr-24hrSCS	1.45	81.06	81.47		81.47	0.00034	0.25	5.72	16.37	0.14
Tributary 3	3605.49*	5yr-24hrSCS	0.57	81.06	81.31		81.31	0.000273	0.17	3.32	14.63	0.11
Tributary 3	3605.49*	2yr-24hrSCS	0.37	81.06	81.26		81.26	0.000254	0.14	2.58	14	0.11
Tributary 3	3595.55	100yr-24hrSCS	1.45	81	81.38		81.45	0.01233	1.18	1.23	5.3	0.79
Tributary 3	3595.55	5yr-24hrSCS	0.57	81	81.26		81.3	0.011479	0.87	0.65	4.28	0.71
Tributary 3	3595.55	2yr-24hrSCS	0.37	81	81.22		81.25	0.011362	0.77	0.48	3.74	0.69
Tributary 3	3585.28*	100yr-24hrSCS	1.45	80.9	81.28		81.34	0.010685	1.02	1.42	6.69	0.7
Tributary 3	3585.28*	5yr-24hrSCS	0.57	80.9	81.17		81.2	0.009785	0.76	0.74	5.04	0.63
Tributary 3	3585.28*	2yr-24hrSCS	0.37	80.9	81.13		81.15	0.009512	0.68	0.54	4.28	0.61
Tributary 3	3575.02*	100yr-24hrSCS	1.45	80.8	81.18		81.23	0.010873	0.94	1.54	7.67	0.67
Tributary 3	3575.02*	5yr-24hrSCS	0.57	80.8	81.06		81.09	0.010826	0.73	0.77	5.55	0.63
Tributary 3	3575.02*	2yr-24hrSCS	0.37	80.8	81.02		81.04	0.010707	0.66	0.56	4.58	0.61
Tributary 3	3564.75*	100yr-24hrSCS	1.45	80.71	81.1	81.01	81.13	0.008199	0.79	1.82	9.07	0.57
Tributary 3	3564.75*	5yr-24hrSCS	0.57	80.71	80.98	80.91	81	0.007259	0.6	0.94	6.52	0.5
Tributary 3	3564.75*	2yr-24hrSCS	0.37	80.71	80.94		80.96	0.007002	0.54	0.69	5.47	0.48
Tributary 3	3554.49	100yr-24hrSCS	1.45	80.61	80.91	80.91	80.98	0.029812	1.23	1.18	7.77	1
Tributary 3	3554.49	5yr-24hrSCS	0.57	80.61	80.81	80.81	80.86	0.032698	1.04	0.54	4.88	1
Tributary 3	3554.49	2yr-24hrSCS	0.37	80.61	80.76	80.76	80.82	0.037403	1.03	0.36	3.67	1.04
Tributary 3	3548.69*	100yr-24hrSCS	1.45	80.55	80.91	80.71	80.92	0.001624	0.4	3.64	14.58	0.25
Tributary 3	3548.69*	5yr-24hrSCS	0.57	80.55	80.73	80.64	80.74	0.003559	0.41	1.39	9.7	0.34
Tributary 3	3548.69*	2yr-24hrSCS	0.37	80.55	80.67	80.63	80.68	0.006965	0.44	0.84	8.58	0.45
Tributary 3	3542.89	100yr-24hrSCS	1.45	80.5	80.92		80.92	0.000293	0.21	7.03	20.95	0.11
Tributary 3	3542.89	5yr-24hrSCS	0.57	80.5	80.73		80.73	0.000408	0.17	3.31	16.76	0.12
Tributary 3	3542.89	2yr-24hrSCS	0.37	80.5	80.67		80.67	0.000521	0.16	2.31	15.6	0.13
Tributary 3	3534.04	100yr-24hrSCS	1.45	80.25	80.79	80.77	80.9	0.018139	1.48	0.98	3.93	0.95
Tributary 3	3534.04	5yr-24hrSCS	0.57	80.25	80.66	80.61	80.71	0.012886	1.05	0.54	2.76	0.76
Tributary 3	3534.04	2yr-24hrSCS	0.37	80.25	80.61	80.55	80.65	0.010096	0.87	0.42	2.41	0.66

HEC-RAS Output: Proposed Conditions

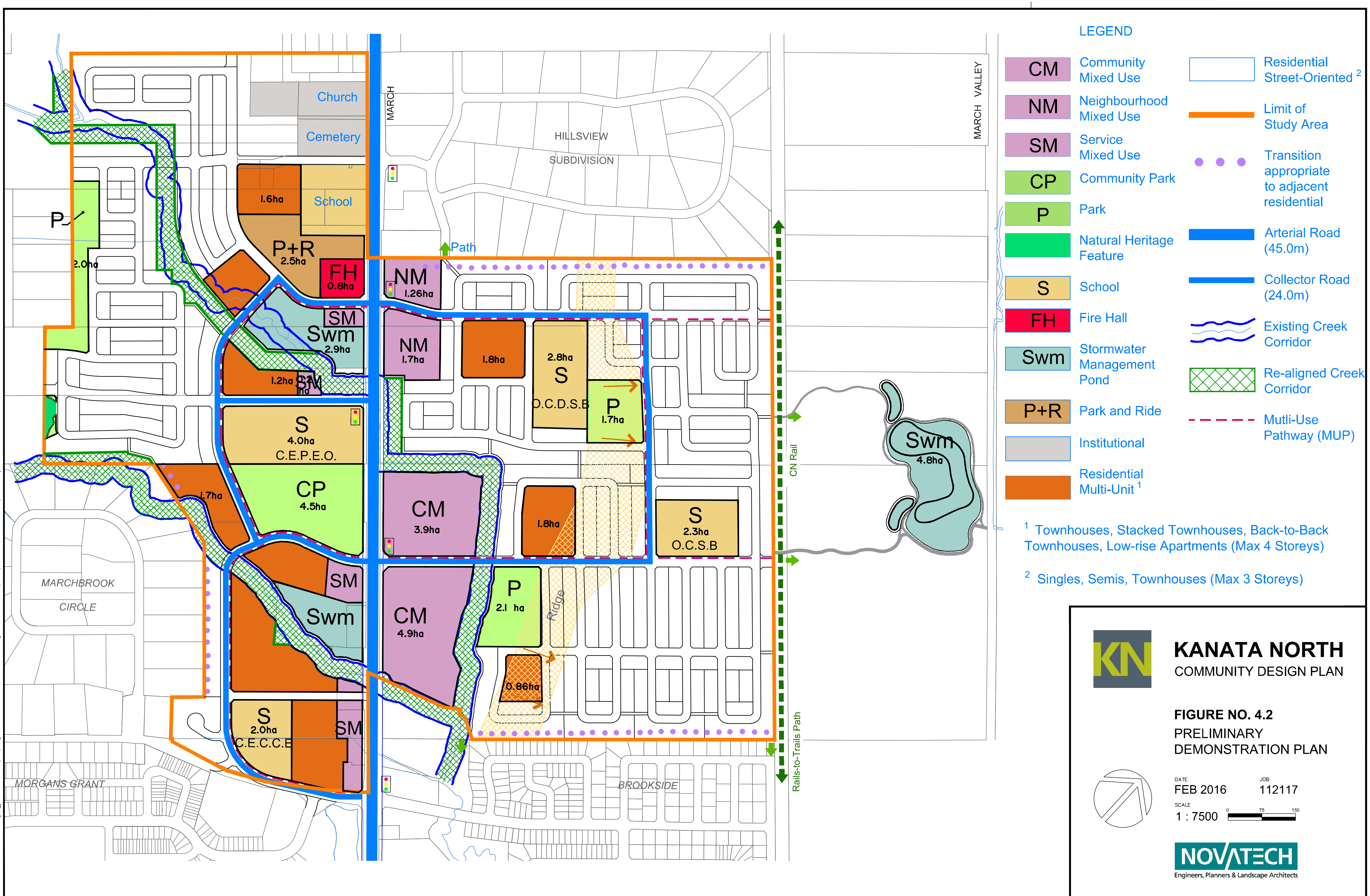
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Tributary 3	3526.39*	100yr-24hrSCS	1.45	80.2	80.64	80.64	80.75	0.020125	1.5	0.97	4.19	1
Tributary 3	3526.39*	5yr-24hrSCS	0.57	80.2	80.51	80.51	80.58	0.02328	1.19	0.48	3.28	1
Tributary 3	3526.39*	2yr-24hrSCS	0.37	80.2	80.46	80.46	80.53	0.028861	1.17	0.32	2.64	1.07
Tributary 3	3518.74	100yr-24hrSCS	1.45	80.16	80.58	80.49	80.64	0.006869	1.05	1.39	4.59	0.61
Tributary 3	3518.74	5yr-24hrSCS	0.57	80.16	80.43	80.36	80.46	0.006952	0.78	0.73	3.82	0.57
Tributary 3	3518.74	2yr-24hrSCS	0.37	80.16	80.26	80.33	80.52	0.29102	2.26	0.16	2.91	3.04
Tributary 3	3509.46*	100yr-24hrSCS	1.45	80.09	80.52		80.58	0.006688	1.03	1.41	4.72	0.6
Tributary 3	3509.46*	5yr-24hrSCS	0.57	80.09	80.37		80.4	0.006664	0.76	0.74	3.88	0.56
Tributary 3	3509.46*	2yr-24hrSCS	0.37	80.09	80.32	80.26	80.34	0.006812	0.67	0.55	3.61	0.55
Tributary 3	3500.18*	100yr-24hrSCS	1.45	80.02	80.47		80.52	0.006195	0.99	1.47	4.92	0.58
Tributary 3	3500.18*	5yr-24hrSCS	0.57	80.02	80.31		80.34	0.005854	0.73	0.78	3.98	0.53
Tributary 3	3500.18*	2yr-24hrSCS	0.37	80.02	80.26		80.28	0.005978	0.64	0.58	3.67	0.51
Tributary 3	3490.90*	100yr-24hrSCS	1.45	79.96	80.42		80.47	0.005331	0.92	1.57	5.23	0.54
Tributary 3	3490.90*	5yr-24hrSCS	0.57	79.96	80.27		80.3	0.00432	0.65	0.87	4.22	0.46
Tributary 3	3490.90*	2yr-24hrSCS	0.37	79.96	80.22		80.24	0.00399	0.55	0.67	3.87	0.43
Tributary 3	3481.62*	100yr-24hrSCS	1.45	79.89	80.38		80.42	0.004321	0.82	1.76	5.93	0.48
Tributary 3	3481.62*	5yr-24hrSCS	0.57	79.89	80.25		80.26	0.002657	0.54	1.05	4.65	0.36
Tributary 3	3481.62*	2yr-24hrSCS	0.37	79.89	80.2		80.21	0.002119	0.44	0.84	4.28	0.32
Tributary 3	3472.34*	100yr-24hrSCS	1.45	79.82	80.36		80.38	0.003069	0.69	2.11	7.3	0.41
Tributary 3	3472.34*	5yr-24hrSCS	0.57	79.82	80.23		80.24	0.001484	0.43	1.32	5.37	0.28
Tributary 3	3472.34*	2yr-24hrSCS	0.37	79.82	80.19		80.2	0.001046	0.34	1.1	4.95	0.23
Tributary 3	3463.06*	100yr-24hrSCS	1.45	79.76	80.35		80.36	0.001777	0.54	2.69	8.89	0.31
Tributary 3	3463.06*	5yr-24hrSCS	0.57	79.76	80.23		80.23	0.00082	0.32	1.75	7.02	0.21
Tributary 3	3463.06*	2yr-24hrSCS	0.37	79.76	80.19		80.19	0.000541	0.25	1.48	6.37	0.17
Tributary 3	3453.78*	100yr-24hrSCS	1.45	79.69	80.34		80.35	0.001099	0.39	3.67	13.6	0.24
Tributary 3	3453.78*	5yr-24hrSCS	0.57	79.69	80.22		80.23	0.000394	0.24	2.4	8.92	0.14
Tributary 3	3453.78*	2yr-24hrSCS	0.37	79.69	80.19		80.19	0.000251	0.18	2.06	8.22	0.11
Tributary 3	3444.51	100yr-24hrSCS	1.45	79.62	80.33		80.34	0.000449	0.27	5.44	18.57	0.16
Tributary 3	3444.51	5yr-24hrSCS	0.57	79.62	80.22		80.22	0.000201	0.16	3.57	14.48	0.1
Tributary 3	3444.51	2yr-24hrSCS	0.37	79.62	80.18		80.18	0.000126	0.12	3.03	12.87	0.08
Tributary 3	3435.9*	100yr-24hrSCS	1.45	79.81	80.33		80.33	0.00092	0.36	4.07	15.37	0.22
Tributary 3	3435.9*	5yr-24hrSCS	0.57	79.81	80.22		80.22	0.000498	0.22	2.55	12.4	0.16
Tributary 3	3435.9*	2yr-24hrSCS	0.37	79.81	80.18		80.18	0.000336	0.18	2.11	10.89	0.13
Tributary 3	3427.29	100yr-24hrSCS	1.45	80	80.3		80.32	0.003656	0.6	2.47	14.78	0.42
Tributary 3	3427.29	5yr-24hrSCS	0.57	80	80.2		80.21	0.003168	0.43	1.33	9.74	0.37
Tributary 3	3427.29	2yr-24hrSCS	0.37	80	80.17		80.18	0.002768	0.36	1.02	8.59	0.34
Tributary 3	3419.8*	100yr-24hrSCS	1.45	80	80.28		80.29	0.003394	0.55	2.64	15.39	0.4
Tributary 3	3419.8*	5yr-24hrSCS	0.57	80	80.18		80.19	0.002798	0.39	1.45	11.04	0.34
Tributary 3	3419.8*	2yr-24hrSCS	0.37	80	80.15		80.16	0.002433	0.33	1.12	9.94	0.31
Tributary 3	3412.31*	100yr-24hrSCS	1.45	80	80.25		80.26	0.003403	0.52	2.77	15.75	0.4
Tributary 3	3412.31*	5yr-24hrSCS	0.57	80	80.16		80.17	0.002771	0.37	1.52	12.34	0.34
Tributary 3	3412.31*	2yr-24hrSCS	0.37	80	80.13		80.14	0.002421	0.31	1.18	11.29	0.31
Tributary 3	3404.82*	100yr-24hrSCS	1.45	80	80.22		80.24	0.003644	0.52	2.8	16.99	0.41
Tributary 3	3404.82*	5yr-24hrSCS	0.57	80	80.14		80.15	0.003258	0.38	1.5	13.51	0.36
Tributary 3	3404.82*	2yr-24hrSCS	0.37	80	80.11		80.12	0.002911	0.32	1.17	12.49	0.33
Tributary 3	3397.33	100yr-24hrSCS	1.45	80	80.19		80.21	0.005105	0.56	2.57	17.71	0.47
Tributary 3	3397.33	5yr-24hrSCS	0.57	80	80.09		80.1	0.01316	0.58	0.98	13.21	0.68
Tributary 3	3397.33	2yr-24hrSCS	0.37	80	80.07		80.08	0.011061	0.47	0.78	12.55	0.6
Tributary 3	3387.68*	100yr-24hrSCS	1.45	79.85	80.17		80.18	0.001262	0.38	3.78	16.24	0.25
Tributary 3	3387.68*	5yr-24hrSCS	0.57	79.85	79.94		79.97	0.017637	0.71	0.8	9.81	0.8
Tributary 3	3387.68*	2yr-24hrSCS	0.37	79.85	79.92	79.92	79.94	0.02047	0.64	0.58	9.27	0.82
Tributary 3	3378.03*	100yr-24hrSCS	1.45	79.7	80.17		80.17	0.000599	0.32	4.55	14.73	0.18
Tributary 3	3378.03*	5yr-24hrSCS	0.57	79.7	79.92		79.93	0.001367	0.34	1.68	9.32	0.25
Tributary 3	3378.03*	2yr-24hrSCS	0.37	79.7	79.71	79.79	83.18	55.98469	8.25	0.04	5.91	30.24
Tributary 3	3368.39*	100yr-24hrSCS	1.45	79.55	80.16		80.17	0.000446	0.31	4.75	13.09	0.16
Tributary 3	3368.39*	5yr-24hrSCS	0.57	79.55	79.92		79.92	0.000459	0.25	2.23	8.23	0.16
Tributary 3	3368.39*	2yr-24hrSCS	0.37	79.55	79.83	79.63	79.84	0.000516	0.23	1.58	7.18	0.16
Tributary 3	3358.74*	100yr-24hrSCS	1.45	79.4	80.16		80.16	0.000504	0.33	4.33	11.34	0.17
Tributary 3	3358.74*	5yr-24hrSCS	0.57	79.4	79.91		79.92	0.00035	0.25	2.24	6.74	0.14
Tributary 3	3358.74*	2yr-24hrSCS	0.37	79.4	79.83		79.83	0.000305	0.22	1.71	5.85	0.13

HEC-RAS Output: Proposed Conditions

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Tributary 3	3349.1	100yr-24hrSCS	1.45	79.25	80.15		80.16	0.001041	0.45	3.25	9.43	0.24
Tributary 3	3349.1	5yr-24hrSCS	0.57	79.25	79.91		79.91	0.000655	0.34	1.65	4.94	0.19
Tributary 3	3349.1	2yr-24hrSCS	0.37	79.25	79.82		79.83	0.00055	0.29	1.27	4.25	0.17
Tributary 3	3342.86*	100yr-24hrSCS	1.45	79.33	80.13		80.15	0.001665	0.58	2.49	6.88	0.31
Tributary 3	3342.86*	5yr-24hrSCS	0.57	79.33	79.89		79.91	0.001684	0.48	1.17	4.28	0.29
Tributary 3	3342.86*	2yr-24hrSCS	0.37	79.33	79.81		79.82	0.001498	0.43	0.86	3.42	0.27
Tributary 3	3336.63	100yr-24hrSCS	1.45	79.4	79.96	79.96	80.11	0.019774	1.74	0.83	2.71	1
Tributary 3	3336.63	5yr-24hrSCS	0.57	79.4	79.77	79.77	79.87	0.022949	1.43	0.39	1.93	1.01
Tributary 3	3336.63	2yr-24hrSCS	0.37	79.4	79.71	79.71	79.79	0.02348	1.29	0.29	1.68	1
Tributary 3	3327.51*	100yr-24hrSCS	1.45	79.24	79.65	79.71	79.87	0.035047	2.1	0.69	2.64	1.31
Tributary 3	3327.51*	5yr-24hrSCS	0.57	79.24	79.51	79.53	79.63	0.031877	1.56	0.36	2.03	1.18
Tributary 3	3327.51*	2yr-24hrSCS	0.37	79.24	79.46	79.48	79.56	0.031123	1.38	0.27	1.77	1.13
Tributary 3	3318.4*	100yr-24hrSCS	1.45	79.07	79.46	79.47	79.61	0.022379	1.73	0.84	3.03	1.05
Tributary 3	3318.4*	5yr-24hrSCS	0.57	79.07	79.3	79.31	79.4	0.027193	1.42	0.4	2.26	1.08
Tributary 3	3318.4*	2yr-24hrSCS	0.37	79.07	79.23	79.25	79.33	0.037791	1.4	0.26	1.99	1.23
Tributary 3	3309.28*	100yr-24hrSCS	1.45	78.91	79.21	79.25	79.39	0.029461	1.85	0.79	3.19	1.19
Tributary 3	3309.28*	5yr-24hrSCS	0.57	78.91	79.11	79.1	79.18	0.018948	1.18	0.48	2.77	0.91
Tributary 3	3309.28*	2yr-24hrSCS	0.37	78.91	78.97	79.05	79.37	0.437216	2.8	0.13	2.26	3.71
Tributary 3	3300.17	100yr-24hrSCS	1.45	78.75	79.04	79.04	79.16	0.021442	1.58	0.92	3.74	1.02
Tributary 3	3300.17	5yr-24hrSCS	0.57	78.75	78.91	78.91	78.98	0.025303	1.21	0.47	3.25	1.02
Tributary 3	3300.17	2yr-24hrSCS	0.37	78.75	78.87	78.87	78.93	0.026094	1.05	0.35	3.13	1
Tributary 3	3291.61*	100yr-24hrSCS	1.45	78.38	78.6	78.68	78.87	0.058997	2.29	0.63	3.22	1.65
Tributary 3	3291.61*	5yr-24hrSCS	0.57	78.38	78.5	78.54	78.65	0.062588	1.68	0.34	2.87	1.57
Tributary 3	3291.61*	2yr-24hrSCS	0.37	78.38	78.47	78.52	78.58	0.070128	1.5	0.25	2.76	1.6
Tributary 3	3283.05	100yr-24hrSCS	1.45	78	78.28	78.32	78.46	0.034769	1.91	0.76	3.41	1.29
Tributary 3	3283.05	5yr-24hrSCS	0.57	78	78.16	78.18	78.26	0.031699	1.37	0.41	2.88	1.15
Tributary 3	3283.05	2yr-24hrSCS	0.37	78	78.13	78.14	78.2	0.028891	1.15	0.32	2.73	1.07
Tributary 3	3277.27*	100yr-24hrSCS	1.45	77.87	78.3	78.16	78.35	0.004884	0.91	1.59	5.03	0.52
Tributary 3	3277.27*	5yr-24hrSCS	0.57	77.87	78.02	78.04	78.11	0.03242	1.3	0.43	3.34	1.15
Tributary 3	3277.27*	2yr-24hrSCS	0.37	77.87	77.98	78	78.06	0.039662	1.2	0.31	3.12	1.22
Tributary 3	3271.49	100yr-24hrSCS	1.45	77.75	78.31		78.32	0.001286	0.55	2.63	6.47	0.28
Tributary 3	3271.49	5yr-24hrSCS	0.57	77.75	77.97	77.9	78	0.006179	0.71	0.8	4.37	0.53
Tributary 3	3271.49	2yr-24hrSCS	0.37	77.75	77.81	77.86	77.99	0.179642	1.85	0.2	3.32	2.41
Tributary 3	3261.21*	100yr-24hrSCS	1.45	77.64	78.3		78.31	0.000706	0.44	3.26	7.03	0.21
Tributary 3	3261.21*	5yr-24hrSCS	0.57	77.64	77.95		77.96	0.001969	0.49	1.16	4.78	0.31
Tributary 3	3261.21*	2yr-24hrSCS	0.37	77.64	77.85	77.75	77.87	0.003248	0.51	0.73	4.12	0.38
Tributary 3	3250.94*	100yr-24hrSCS	1.45	77.52	78.3	77.81	78.31	0.000415	0.37	3.96	7.63	0.16
Tributary 3	3250.94*	5yr-24hrSCS	0.51	77.52	77.95	77.67	77.95	0.000585	0.31	1.64	5.36	0.18
Tributary 3	3250.94*	2yr-24hrSCS	0.31	77.52	77.85	77.63	77.85	0.000595	0.27	1.15	4.71	0.17
Tributary 3	3246.09		Culvert									
Tributary 3	3209.85*	100yr-24hrSCS	1.45	77.07	77.47		77.54	0.010651	1.18	1.24	4.76	0.74
Tributary 3	3209.85*	5yr-24hrSCS	0.51	77.07	77.31		77.35	0.010865	0.9	0.56	3.29	0.69
Tributary 3	3209.85*	2yr-24hrSCS	0.31	77.07	77.25		77.28	0.011134	0.82	0.38	2.58	0.68
Tributary 3	3199.58*	100yr-24hrSCS	1.45	76.95	77.38		77.45	0.010707	1.17	1.24	4.79	0.74
Tributary 3	3199.58*	5yr-24hrSCS	0.51	76.95	77.21		77.25	0.010877	0.9	0.56	3.25	0.69
Tributary 3	3199.58*	2yr-24hrSCS	0.31	76.95	77.14		77.18	0.01118	0.83	0.37	2.43	0.68
Tributary 3	3189.31*	100yr-24hrSCS	1.45	76.84	77.28		77.35	0.010708	1.17	1.24	4.84	0.74
Tributary 3	3189.31*	5yr-24hrSCS	0.51	76.84	77.11		77.15	0.010765	0.9	0.56	3.22	0.69
Tributary 3	3189.31*	2yr-24hrSCS	0.31	76.84	77.04		77.08	0.011256	0.86	0.36	2.27	0.69
Tributary 3	3179.04*	100yr-24hrSCS	1.45	76.73	77.19		77.25	0.010434	1.14	1.27	4.99	0.72
Tributary 3	3179.04*	5yr-24hrSCS	0.51	76.73	77.02		77.06	0.010531	0.89	0.57	3.24	0.68
Tributary 3	3179.04*	2yr-24hrSCS	0.31	76.73	76.94		76.98	0.010664	0.86	0.36	2.14	0.67
Tributary 3	3168.77*	100yr-24hrSCS	1.45	76.61	77.1		77.16	0.009089	1.06	1.37	5.47	0.67
Tributary 3	3168.77*	5yr-24hrSCS	0.51	76.61	76.94		76.97	0.008322	0.8	0.63	3.51	0.61
Tributary 3	3168.77*	2yr-24hrSCS	0.31	76.61	76.86		76.89	0.008334	0.77	0.4	2.33	0.6
Tributary 3	3158.5	100yr-24hrSCS	1.45	76.5	76.93	76.93	77.03	0.021911	1.41	1.03	5.15	1.01
Tributary 3	3158.5	5yr-24hrSCS	0.51	76.5	76.76	76.76	76.85	0.023249	1.31	0.39	2.17	0.99
Tributary 3	3158.5	2yr-24hrSCS	0.31	76.5	76.69	76.69	76.76	0.025089	1.2	0.26	1.76	1



M:\2012\112117\CAD\Design_MSS\FIGURES\Figure 5.1_5.7.1_5.7.2 - Drainage Areas.dwg, FIG 5.7.2, May 26, 2016 - 1:12pm, tbrooks



M:\2012\112117\CAD\Design_EMP\MEMO (CS)\Figure 9.1 Demonstration Plan.dwg, DEMO PLAN (MSS), Feb 23, 2016 - 2:00pm, lseely

APPENDIX C

REFER TO 116132-NL FOR ADDITIONAL NOTES

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

PRELIMINARY NOT FOR CONSTRUCTION

No.	REVISION	DATE	BY
7.	REVISED AS PER CITY OF OTTAWA COMMENTS	MAY 4/22	SAZ
6.	ISSUED FOR CITY OF OTTAWA REVIEW	DEC 23/21	MSP
5.	ISSUED TO MISSISSIPPI VALLEY CONSERVATION AUTHORITY FOR REVIEW	DEC 22/21	SAZ
4.	REVISED AS PER CITY OF OTTAWA COMMENTS	NOV 13/20	MSP
3.	REVISED AS PER CITY OF OTTAWA COMMENTS	MAY 8/20	MSP
2.	REVISED AS PER CITY OF OTTAWA COMMENTS	MAY 13/19	MSP
1.	ISSUED FOR DRAFT PLAN OF SUBDIVISION APPLICATION	JULY 23/18	MSP

SCALE
1:1500
1:1500
0 15 30 45 60

DESIGN SAZ
CHECKED DDB
DRAWN RBG
CHECKED SAZ
APPROVED MSP

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
S.A.N. ZORGEL
100191487
May 4/22
PROVINCE OF ONTARIO

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CITY OF OTTAWA
COPPERWOOD ESTATE
1053, 1075 AND 1145 MARCH ROAD

DRAWING NAME
STORM DRAINAGE AREA PLAN
PHASE 1

PROJECT No. 116132-00
REV REV # 7
DRAWING No. 116132-STM

D07-16-18-0023

PLANB1.DWG - 1000mmx707mm
#17801

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E.2 PCSWMM Methodology

PCSWMM Methodology

The use of PCSWMM for modeling of the site hydrology and hydraulics allows for an analysis of the systems response during various design storm events. It also allows for the analysis to use a dual conduit system to represent the minor and major drainage systems, with 1) closed circular and rectangular conduits representing the sewers; 2) irregular conduits using street-shaped cross-sections (as transects) to represent the saw-toothed overland road network from high-point to low-point; 3) storage or junction nodes representing maintenance holes (MH), catch basins (CB), connections between the road conduits, and internal storage conditions within site blocks where separate runoff storage control is required..

The dual conduit systems are connected via orifice or outlet objects (which represent Inlet control devices) from CB to MH. Subcatchments, defining the contributing surface runoff to the drainage system, are linked to the storage node representing the CB to direct runoff hydrographs to the minor system. The following figure offers a schematic representation of a typical dual drainage analysis configuration in PCSWMM.

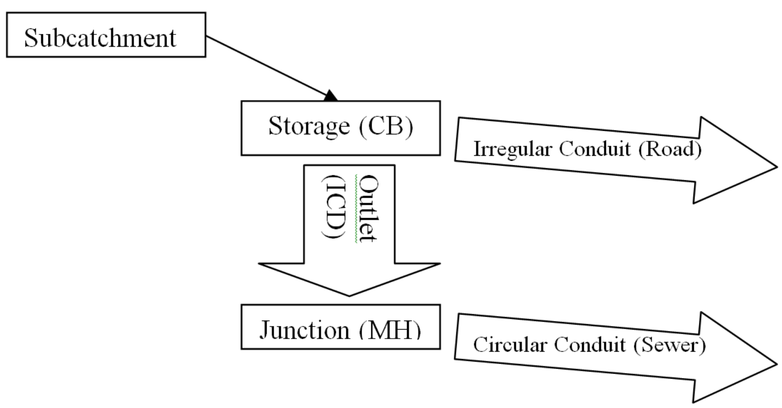

Figure: Schematic Representing PCSWMM Object Roles

The following describes the general conditions typically applied for each of the primary model inputs. Where non-typical conditions are needed, additional detail is provided with the project specific PCSWMM input information provided.

<u>Design Storms</u>

The typical storm distributions, as described by the City of Ottawa Sewer Design Guidelines (OSDG), are assessed: 3-hour Chicago Storm distribution for the 100-year return period, the 4-hour Chicago storm distribution for a 25 mm storm event, the 12-hour SCS Storm distribution for the 100-year return period, the 24-hour SCS Storm distribution for a 25 mm event and the 2, 5, and 100-year return period.

To ‘stress test’ the system a ‘climate change’ scenario is created by adding 20% of the individual intensity values of the 100-year Chicago design storm event and the 100-year SCS design storm at each specified time step.

Subcatchments

General parameters are applied to each subcatchment based on the OSDG. These include parameters for the infiltration method and associated values, Manning's 'n' for pervious and impervious surfaces, and depression storage values for pervious and impervious surface.

The following summarizes the general subcatchment parameters applied to PCSWM analyses.

Parameter	Value
Infiltration Method	Horton
Max. Infiltration Rate (mm/hr)	76.2
Min. Infiltration Rate (mm/hr)	13.2
Decay Constant (1/hr)	4.14
Drying Time (d)	7
N Impervious	0.013
N Pervious	0.25
Dstore Imperv. (mm)	1.57
Dstore Perv. (mm)	4.67
Zero Imperv. (%)	0

Subcatchment areas are defined from high-point to high-point where sags occur. Subcatchment width is determined by calculating 2.0 x primary flow segment length (length of overland flow path measured from high-point to high-point) for street (double-sided) catchments, 1.5 x primary flow segment length for single-loaded roads, 1.0 x primary flow segment length for single-sided catchments, or by multiplying the subcatchment area by 225 m where a street segment flow path has not otherwise been defined.

Subcatchment imperviousness is calculated based on the project conditions related to grading and anticipated finished surface treatments. Where applicable imperviousness is converted to or from the equivalent Rational Method runoff coefficient, the relationship C = (Imp. x 0.7) + 0.2 is used.

Note that recent changes in interpretation of the OSDG introduced the requirement to determine the proposed subcatchment imperviousness based on maximum zoning constraints rather than those of the builder anticipated maximum building size or based on other prevailing criteria such as minimum tree setbacks.

Subcatchment slope is applied based on the project grading condition applicable to each area defined.

Subcatchment routing is generally applied at 100% routed to the outlet assigned. Routing to pervious are within the subcatchment is applied at select catchments as appropriate.

Junctions

Junctions are used to join conduits where the details of the hydraulic analysis by the model are less sensitive to potential irregularity. The use of storage nodes rather than junctions for conduit connections is generally considered to allow for a more stable hydraulic modeling condition, even with no specific storage condition applied to a storage node.

Storage Nodes – Catch Basins (Sags) – Not applicable for this functional review.

For storage nodes representing CBs, the invert elevation of the storage node represents the invert of the CB. The rim elevation used on the CB storage nodes is not directly representative of a design value. The rim elevation of the storage node is set at an elevation to allow for representation of depth of surface water over the adjacent road high point storage node to allow routing from one surface storage to the next.

The functional storage curve values are set to zero for each CB. This allows the storage at each road sag supported by the CB to be represented by the transect defined for the roadway cross-section.

Where additional detail is needed to define a storage condition at a road sag or other low point, a tabular storage condition with a defined storage curve may be used. A tabular storage curve is defined by a depth and corresponding surface area that is derived from the associated design condition.

Storage Nodes – Road High Points – Not applicable for this functional review.

The invert elevation of the storage node used to represent a road high point is set based on the design spill elevation at the curb line. The rim elevation is set at a fixed distance above the invert elevation (typically 0.5 m) to allow for representation of depth of surface water over the storage node to allow routing from one surface storage to the next. The volume stored within the road sags then includes the total static volume and the ponded depth above the node representing the dynamic flow depth.

The functional storage curve values are set to zero for each high point nodes to disable storage being considered at the high points. In this manner, storage accumulates according to the actual ponding depths, from sag elevation to high point elevation. Runoff exceeding the sag storage available in the roadway (transect) will spill at the associated high/spill point into the next sag and continue routing through the system until ultimately flows either re-enter the minor system or reach the outfall of the major system.

Storage Nodes – Maintenance Holes

The invert and rim elevations for the MH storage nodes represent the design elevations. The functional storage curve values for the ‘coefficient’ and ‘exponent’ are set to zero. The functional storage curve value for the ‘constant’ is set to 1.13 m^2 to represent the volume available within a typical MH.

Where ‘Fixed’ outfall conditions are applied based on anticipated downstream water levels in a storm sewer system, ‘Initial Depth’ values may be applied. The ‘Initial Depth’ value is set to match the static downstream water level elevation at the applicable outfall.

Storage Nodes – Site Storage and Stormwater Management Facilities

Where additional detail is needed to define a storage condition within an existing or proposed adjacent development, site plan area, open space, stormwater management facility, or any other relevant storage feature, a tabular storage condition with a defined storage curve is used. A tabular storage curve is defined by a depth and corresponding surface area that is derived from the associated design condition or set based on a generic condition.

The use of tabular storage curves generally allows storage volumes to be defined for the applicable subcatchment area draining to the associated storage feature. They also work well for generic storage areas applied across multiple subcatchments.

For stormwater management facilities, the storage node is set using the Normal Water Level (elevation) as the base elevation.

<u>Conduit – Storm Sewer (Minor System)</u> – Hydraulic losses not applicable to this functional review.

Conduit parameters for the storm sewer system are set from the design conditions. The roughness is set based on the Manning's n conditions defined by the OSDG. Hydraulic loss through the minor system under surcharge conditions is represented by assigning an 'Exit Loss Coefficient' value to each applicable conduit. The loss coefficients applied are assigned based on the deflection angle between the upstream and downstream segments. Based on Appendix 6-B of the OSDG, assuming no flow deflector in the MH, the following typical values are used.

Deflection Angle	Value
0	0.022
15	0.094
45	0.384
90	1.344

<u>Conduit – Roads (Major System)</u> – Not applicable for this functional review

Conduit parameters for the road segments are set from the design conditions. The roughness is set based on the Manning's n conditions defined by the OSDG. There are no hydraulic losses considered.

The conduit cross-section is defined with an irregular condition. The transect applied is based on the cross-section of the associated road type and width (i.e., residential, collector, etc.).

Conduits for natural flow paths may be applied either based on the ground surface condition or as a simple geometry open section, often trapezoidal. Simple geometry conduits are generally used when the specific characteristics of the natural flow path are not meaningful to the analysis.

<u>Orifice and Outlet</u> – Catch basin ICD conditions are not applicable to this functional review.

To maintain target inflow rates to the storm sewer, CB inflow is restricted with inlet-control devices (ICDs). ICDs as represented by orifice and/or outlet links with a user-specified diameter and discharge coefficient or functional head relationship taken from manufacturer's specifications for the chosen ICD model. Orifice sizes are chosen as needed at each CB to achieve the desired design objectives.

All orifices are generally assigned as Type = 'Side', Cross-Section = 'Circular', and with a discharge coefficient of 0.572 to correspond to manufacturer supplied discharge curves for IPEX Tempest HF/MHF models. The value for a flap gate is set to ‘No’. Invert elevations are set to correspond to the invert of the associated CB elevation.

The height of the orifice is also set to correspond to the IPEX Tempest HF/MHF models. The following orifice size/heights are the most common.

Typical Orifice Height (m)
0.083
0.095
0.102
0.108
0.127
0.152
0.178

Where additional detail is needed to define a controlled flow condition (e.g., to define an outflow condition from an existing or proposed adjacent development, site plan area, open space, stormwater management facility, or any other relevant feature), an outlet with an associated rating curve may be used. An outlet rating curve is defined by a head and corresponding outflow that is derived from the associated design condition or set based on a desired condition.

The use of outlets with rating curves is generally paired with tabular storage curves and allows for defined flow limits to be applied either as inputs to the minor system or as outflow from a storm pond.

SWM Facility Orifice and Weir

To manage the discharge from a SWM facility, orifice and weir control is used. A weir is also generally applied to define the emergency overland escape conditions from the SWM facility. Depending on the nature of the control requirements, more than one orifice and/or weir may be used. Sizes and elevations assigned to each orifice and weir are based on the target allowable discharge conditions.

Outfall

Outfalls are used to define the end of a series of conduit segments representing either the storm sewer (minor) or roadway (major) systems. Invert and rim elevations are generally set to represent the design condition. The type of outfall is generally set to ‘Free’ for major system outlets.

For minor system outlets the type of outfall is set to correspond with the anticipated condition at the system end point considered. A ‘Fixed’ outfall type is often used where a downstream water level will influence the hydraulic grade line (HGL) within the storm sewer system. The applicable downstream water elevation is assigned with the ‘Fixed’ outfall condition. A ‘Fixed’ outfall condition maintains a static water level through the dynamic model analysis. A ‘Free’ outfall condition is applied to minor system outfalls when HGL analysis is not considered or applicable.

E.3 Project Specific PCSWMM Data

The following tables summarize the input parameters for the components of the storm drainage systems applied to the PCSWMM analysis.

Design Storms

Model File: 01347_2023-12_emp-sim

SCS – 24 Hour	
Time (H:M)	**Intensity (mm/hr)** **105.74 mm (100-Year)** From EMP Analysis
0:00	0.00
1:00	1.59
2:00	0.74
3:00	1.37
4:00	1.37
5:00	1.80
6:00	1.59
7:00	2.11
8:00	2.11
9:00	2.85
10:00	3.60
11:00	5.71
12:00	45.26
13:00	11.53
14:00	5.08
15:00	3.38
16:00	2.96
17:00	2.33
18:00	2.43
19:00	1.59
20:00	1.27
21:00	1.80
22:00	1.16
23:00	1.06
24:00	1.06

Model File: 01347_2024-01_fsr

SCS – 24-Hour						SCS – 12 Hour	
Time (H:M)	Intensity (mm/hr)					Time (H:M)	Intensity (mm/hr)
	25 mm	48.0 mm (2-Year)	62.4 mm (5-Year)	103.2 mm (100-Year)	103.2 mm + 20%		96.0 mm (100-Year)
0:00	0.00	0.00	0.00	0.00	0.00	0:00	0
1:00	0.38	0.72	0.94	1.55	1.86	0:30	2.88
2:00	0.18	0.34	0.44	0.72	0.87	1:00	1.34
3:00	0.33	0.62	0.81	1.34	1.61	1:30	2.50
4:00	0.33	0.62	0.81	1.34	1.61	2:00	2.50
5:00	0.43	0.82	1.06	1.75	2.11	2:30	3.26
6:00	0.38	0.72	0.94	1.55	1.86	3:00	2.88
7:00	0.50	0.96	1.25	2.06	2.48	3:30	3.84
8:00	0.50	0.96	1.25	2.06	2.48	4:00	3.84
9:00	0.68	1.30	1.68	2.79	3.34	4:30	5.18
10:00	0.85	1.63	2.12	3.51	4.21	5:00	6.53
11:00	1.35	2.59	3.37	5.57	6.69	5:30	10.37
12:00	10.70	20.54	26.71	44.17	53.00	6:00	82.18
13:00	2.73	5.23	6.80	11.25	13.50	6:30	20.93
14:00	1.20	2.30	3.00	4.95	5.94	7:00	9.22
15:00	0.80	1.54	2.00	3.30	3.96	7:30	6.14
16:00	0.70	1.34	1.75	2.89	3.47	8:00	5.38
17:00	0.55	1.06	1.37	2.27	2.72	8:30	4.22
18:00	0.57	1.10	1.44	2.37	2.85	9:00	4.42
19:00	0.38	0.72	0.94	1.55	1.86	9:30	2.88
20:00	0.30	0.58	0.75	1.24	1.49	10:00	2.30
21:00	0.43	0.82	1.06	1.75	2.11	10:30	3.26
22:00	0.28	0.53	0.69	1.14	1.36	11:00	2.11
23:00	0.25	0.48	0.62	1.03	1.24	11:30	1.92
24:00	0.25	0.48	0.62	1.03	1.24	12:00	1.92

Chicago			
Time (H:M)	Intensity (mm/hr)		
	100-Year 3-Hour	100-Year 3-Hour +20%	25mm 4-Hour
0:00	0	0	0
0:10	6.05	7.26	1.516
0:20	7.54	9.048	1.749
0:30	10.17	12.192	2.079
0:40	15.98	19.164	2.584
0:50	40.76	48.78	3.462
1:00	178.56	214.272	5.395
1:10	54.04	64.86	13.448
1:20	27.31	32.784	56.724
1:30	18.23	21.888	17.784
1:40	13.73	16.488	9.131
1:50	11.05	13.272	6.148
2:00	9.28	11.148	4.656
2:10	8.02	9.624	3.763
2:20	7.08	8.496	3.169
2:30	6.34	7.62	2.746
2:40	5.76	6.912	2.428
2:50	5.28	6.336	2.181
3:00	4.88	5.856	1.982
3:10			1.819
3:20			1.683
3:30			1.568
3:40			1.468
3:50			1.382
4:00			1.306

<u>Subcatchment Parameters</u>

Model File: 01347_2024-01_fsr

Name	Outlet	Area (ha)	Width (m)	Slope (%)	Imperviousness (%)
C103A	103	0.31	250	2	64
C103B	C103B-S	1.26	504	2	86
C107A	107	0.3	250	2	64
C109A	109	0.63	263	2	64
C113A	113	0.31	240	2	64
C114A	114	0.65	255	2	64
C114B	C114B-S	0.98	392	2	71
C115A	115	0.63	350	2	64
C115B	C115B-S	0.94	376	2	71
C117A	117	0.23	70	2	64
C117B	117	0.55	140	2	64
C147A	147	0.07	230	2	64
C201AA	C201AA-S	0.26	104	2	93
C201AB	C201AB-S	0.35	140	2	93
C201BA	C201BA-S	0.19	95	2	93
C201BB	C201BB-S	0.26	130	2	93
C201BC	C201BC-S	1.12	448	2	71
C202B	C202B-S	0.49	196	2	71
C202C	C202C-S	0.54	216	2	71
C203B	C203B-S	2.02	202	2	64
C203C	C203C-S	1.08	432	2	71
EXT-1	EXT1-S	1.77	708	2	86
EXT-3	T3-A	1	215	2	64
F112A	112	0.46	230	2	29
F307A	307	4.2	940	2	25
F308A	308	0.19	380	2	0
L103C	L103C-S	4.26	284	2	29
L110A	L110A-S	0.77	188	2	64
L115C	115	0.59	245	2	29
L116A	L116A-S	0.78	150	2	29
L202A	202	0.26	140	2	64
L203A	203	0.28	155	2	64
POND	POND_2	1.6	500	25	43
UNC-2	T3-B	0.15	75	2.5	21.5

Name	Outlet	Area (ha)	Width (m)	Slope (%)	Imperviousness (%)
UNC-3	T3-A	0.14	230	2	86
UNC-4	T3-C	0.08	200	33	0
UNC-5	T3-D	0.07	175	33	0
UNC-6	T3-E	0.03	75	33	0

The subcatchment width for the private development blocks are based on the concept scheme anticipating a 25m flow length.

The subcatchment width for the park space and school site blocks are based on a generalized flow length across the site given the proposed grading scheme

<u>ARM Subcatchment Parameters</u>

Model File: 01347_2023-12_emp-sim

Parameter	301-EMP	302-EMP	401-EMP	303-EMP	311-EMP	304-EMP	312-EMP
Outlet	OF-301	OF-302	OF-401	OF-303	OF-311	OF-304	OF-312
Area (ha)	86.43	80.69	16.78	65.19	1.15	18.78	1.3
Flow Length (m)	1	1	1	1	1	1	1
Slope (%)	1	1	1	1	1	1	1
Impervious (%)	0	0	0	0	0	0	0
TC Method	User	User	User	User	User	User	User
Time of Concentration (min)	111.04	161.19	148.66	117.31	46.56	122.69	58.21
IA Value (mm)	27.2	26.5	7	20	1	10.2	18
SCS Curve Number	30	30	68	30	30	35	38

Model File: 01347_2024-01_fsr

Parameter	301	302	303	311	F115D	F308B	EXT-2	312
Outlet	300a	300a	T3-A	T3-A	115	308	L103C-S	T3-C
Area (ha)	86.43	80.69	55.03	0.55	2.51	22.98	1.05	1.95
Flow Length (m)	1	1	1	1	125	1	160	1
Slope (%)	1	1	1	1	1.6	1	1	1
Impervious (%)	0	0	0	0	5.5	0	0	0
TC Method	User	User	User	User	SCS	User	SCS	User
Time of Concentration (min)	111.04	161.19	117.31	11	17.335	148.66	63.309	50.3
IA Value (mm)	27.2	26.5	20	18	7	7	10.2	18
SCS Curve Number	30	30	30	30	68	68	35	38

Storage Node Parameters

Model File: 01347_2024-01_fsr

Name	Invert (m)	Rim (m)	Depth (m)	Initial Depth (m)	Storage Curve	Curve Name
100	79.23	81.64	2.41	0.27	FUNCTIONAL	
100C	79.52	81.64	2.12	0	FUNCTIONAL	
101	79.26	82.04	2.78	0.24	FUNCTIONAL	
102	79.72	82.07	2.35	0	FUNCTIONAL	
103	79.83	81.75	1.92	0	FUNCTIONAL	
104	79.43	82.00	2.57	0.07	FUNCTIONAL	
105	79.47	82.51	3.04	0.03	FUNCTIONAL	
106	79.52	83.26	3.74	0	FUNCTIONAL	
107	79.59	83.94	4.35	0	FUNCTIONAL	
108	82.91	86.29	3.38	0	FUNCTIONAL	
109	83.80	88.49	4.69	0	FUNCTIONAL	
110	85.33	89.05	3.72	0	FUNCTIONAL	
111	79.79	84.01	4.22	0	FUNCTIONAL	
112	79.83	84.16	4.33	0	FUNCTIONAL	
113	80.12	84.21	4.09	0	FUNCTIONAL	
114	80.37	84.60	4.23	0	FUNCTIONAL	
115	80.8	84.95	4.15	0	FUNCTIONAL	
116	81.98	85.09	3.11	0	FUNCTIONAL	
117	82.52	85.10	2.58	0	FUNCTIONAL	
147	78.93	80.49	1.56	0	FUNCTIONAL	
148	79.07	81.75	2.68	0	FUNCTIONAL	
149	79.40	81.00	1.6	0	FUNCTIONAL	
150	79.50	80.90	1.4	0	FUNCTIONAL	
201	77.39	79.43	2.04	0	FUNCTIONAL	
201A	77.54	80.47	2.93	0	FUNCTIONAL	
201B	78.11	80.4	2.29	0	FUNCTIONAL	
202	79.39	82.88	3.49	0	FUNCTIONAL	
203	80.46	84.90	4.44	0	FUNCTIONAL	
301	76.99	79.82	2.83	0	FUNCTIONAL	
302	77.24	80.20	2.96	0	FUNCTIONAL	
303X	77.60	80.69	3.09	0	FUNCTIONAL	
304	78.97	83.97	5	0	FUNCTIONAL	
305	79.51	84.88	5.37	0	FUNCTIONAL	
306	80.11	85.20	5.09	0	FUNCTIONAL	

Name	Invert (m)	Rim (m)	Depth (m)	Initial Depth (m)	Storage Curve	Curve Name
307	81.42	86.48	5.06	0	FUNCTIONAL	
308	80.31	85.08	4.77	0	FUNCTIONAL	
C103B-S	81.15	83.75	2.6	0	TABULAR	site-storage
C114B-S	81.00	83.60	2.6	0	TABULAR	site-storage
C115B-S	81.40	84.00	2.6	0	TABULAR	site-storage
C201AA-S	78.70	81.30	2.6	0	TABULAR	site-storage
C201AB-S	78.70	81.30	2.6	0	TABULAR	site-storage
C201BA-S	79.40	82.00	2.6	0	TABULAR	site-storage
C201BB-S	79.40	82.00	2.6	0	TABULAR	site-storage
C201BC-S	79.40	82.00	2.6	0	TABULAR	site-storage
C202B-S	79.40	82.00	2.6	0	TABULAR	site-storage
C202C-S	79.40	82.00	2.6	0	TABULAR	site-storage
C203B-S	81.25	83.85	2.6	0	TABULAR	site-storage
C203C-S	80.70	83.3	2.6	0	TABULAR	site-storage
EXT1-S	79.00	81.60	2.6	0	TABULAR	site-storage
L103C-S	80.20	82.80	2.6	0	TABULAR	site-storage
L110A-S	86.75	89.35	2.6	0	TABULAR	site-storage
L116A-S	82.00	84.60	2.6	0	TABULAR	site-storage
POND_2	79.50	81.60	2.1	0	TABULAR	Pond-Active

Storage Curves

Model File: 01347_2024-01_fsr

Name	Head	Outflow (m^3/s)
SiteStorage	0.0	1
	1.29	1
	1.6	1100
	2.6	1100
Pond-Active	0.0	4683
	0.6	6595
	1.4	8057
	1.5	8169
	1.8	8509
	2.1	8509

Orifice Parameters

Model File: 01347_2024-01_fsr

Name	Inlet	Outlet	Inlet Elev. (m)	Type	Diameter (m)	Coefficient
Pond-OR	POND_2	150	79.50	Side – Circular	0.169	0.62

Weir Parameters

Model File: 01347_2024-01_fsr

Name	Inlet	Outlet	Inlet Elev. (m)	Type	Height (m)	Length (m)	Side Slope	Coeff.
OVERFLOW	POND_2	Pond-Escape	81.60	Transverse	0.2	10	3	1.74

Outlet Parameters

Model File: 01347_2024-01_fsr

Name	Inlet	Outlet	Inlet Elev. (m)	Curve Type	Curve Name
C103B-IC	C103B-S	103	81.15	TABULAR/DEPTH	103B
C114B-IC	C114B-S	114	81.00	TABULAR/DEPTH	114B
C115B-IC	C115B-S	115	81.40	TABULAR/DEPTH	115B
C201AA-IC	C201AA-S	201A	78.70	TABULAR/DEPTH	201AA
C201AB-IC	C201AB-S	201A	78.70	TABULAR/DEPTH	201AB
C201BA-IC	C201BA-S	201B	79.40	TABULAR/DEPTH	201BA
C201BB-IC	C201BB-S	201B	79.40	TABULAR/DEPTH	201BB
C201BC-IC	C201BC-S	201B	79.40	TABULAR/DEPTH	201BC
C202B-IC	C202B-S	202	79.40	TABULAR/DEPTH	202B
C202C-IC	C202C-S	202	79.40	TABULAR/DEPTH	202C
C203B-IC	C203B-S	203	81.25	TABULAR/DEPTH	203B
C203C-IC	C203C-S	203	80.70	TABULAR/DEPTH	203C
EXT1-IC	EXT1-S	147	79.00	TABULAR/DEPTH	EXT-1
L103C-IC	L103C-S	103	80.20	TABULAR/DEPTH	103C
L110A-IC	L110A-S	110	86.75	TABULAR/DEPTH	110A
L116A-IC	L116A-S	116	82.00	TABULAR/DEPTH	116A

<u>Rating Curves</u>

Model File: 01347_2024-01_fsr

Name	Head	Outflow (L/s)	Name	Head	Outflow (L/s)
103B	0.0	0	201BA	0.0	0
	1.3	292		1.3	21.3
	1.6	292		1.6	21.3
	2.6	292		2.6	21.3
103C	0.0	0	201BB	0.0	0
	1.3	364		1.3	29.1
	1.6	364		1.6	29.1
	2.6	364		2.6	29.1
110A	0.0	0	201BC	0.0	0
	1.3	103		1.3	125.4
	1.6	103		1.6	125.4
	2.6	103		2.6	125.4
114B	0.0	0	202B	0.0	0
	1.3	199		1.3	54.9
	1.6	199		1.6	54.9
	2.6	199		2.6	54.9
115B	0.0	0	202C	0.0	0
	1.3	191		1.3	60.5
	1.6	191		1.6	60.5
	2.6	191		2.6	60.5
116A	0.0	0	203B	0.0	0
	1.3	67		1.3	226.2
	1.6	67		1.6	226.2
	2.6	67		2.6	226.2
201AA	0.0	0	203C	0.0	0
	1.3	29.1		1.3	121
	1.6	29.1		1.6	121
	2.6	29.1		2.6	121
201AB	0.0	0	EXT-1	0.0	0
	1.3	39.2		1.3	7.8
	1.6	39.2		1.6	7.8
	2.6	39.2		2.6	7.8

Junction Parameters

Model File: 01347_2024-01_fsr

Name	Invert (m)	Rim (m)
CUL-1	81.68	83.68
CUL-2	81.03	83.03
300a	95.35	97.35
T3-A	85.00	87
T3-B	82.155	84.155
T3-C	80.517	82.517
T3-D	79.09	81.09
T3-E	78.131	80.131
T3-F	77.15	79.30

Conduit Parameters

Model File: 01347_2024-01_fsr

Name	Inlet Node	Outlet Node	Length (m)	Rough	Inlet Elev. (m)	Outlet Elev. (m)	Section	Size (m)
100-100C	100	100C	16.4	0.013	79.57	79.55	CIRCULAR	1.5
100C-pond	100C	POND_2	19.8	0.013	79.52	79.5	CIRCULAR	1.5
100-pond	100	POND_2	16.7	0.013	79.23	79.21	CIRCULAR	1.5
101-100	101	100	26.2	0.013	79.26	79.23	CIRCULAR	1.5
102-101	102	101	12.5	0.013	79.72	79.71	CIRCULAR	1.05
103-102	103	102	102.6	0.013	79.83	79.72	CIRCULAR	1.05
104-101	104	101	21.076	0.013	79.43	79.41	CIRCULAR	1.35
105-104	105	104	33.6	0.013	79.47	79.43	CIRCULAR	1.35
106-105	106	105	48	0.013	79.52	79.47	CIRCULAR	1.35
107-106	107	106	46.4	0.013	79.59	79.55	CIRCULAR	1.35
108-107	108	107	142.2	0.013	82.91	80.49	CIRCULAR	0.45
109-108	109	108	49.3	0.013	83.8	82.96	CIRCULAR	0.45
110-109	110	109	81.3	0.013	85.33	83.95	CIRCULAR	0.3
111-107	111	107	28.2	0.013	79.79	79.74	CIRCULAR	1.2
112-111	112	111	29.5	0.013	79.83	79.79	CIRCULAR	1.2
113-112	113	112	37.9	0.013	80.12	80.06	HORIZ_ELLIPSE	0.975x1.5
114-113	114	113	166.4	0.013	80.37	80.12	CIRCULAR	1.2

Name	Inlet Node	Outlet Node	Length (m)	Rough	Inlet Elev. (m)	Outlet Elev. (m)	Section	Size (m)
115-114	115	114	139.5	0.013	80.8	80.52	CIRCULAR	1.05
116-115	116	115	65	0.013	81.98	81.33	CIRCULAR	0.525
117-116	117	116	46.9	0.013	82.52	82.05	CIRCULAR	0.45
147-146	147	HWL-146	159	0.013	78.93	78.62	CIRCULAR	0.45
148-147	148	147	38.7	0.013	79.07	78.99	CIRCULAR	0.45
149-148	149	148	158.9	0.013	79.4	79.08	CIRCULAR	0.45
150-149	150	149	37.3	0.013	79.5	79.43	CIRCULAR	0.45
201-200	201	HWL-200	64.7	0.013	77.39	77.29	CIRCULAR	1.2
201A-201	201A	201	56.7	0.013	77.54	77.45	CIRCULAR	1.2
201B-201A	201B	201A	81.5	0.013	78.11	77.99	CIRCULAR	0.75
202-201A	202	201A	132.8	0.013	79.31	77.99	CIRCULAR	0.75
203-202	203	202	106.7	0.013	80.46	79.39	CIRCULAR	0.675
301-300	301	HWL-300	20.7	0.013	76.99	76.96	CIRCULAR	1.05
302-301	302	301	127.9	0.013	77.24	77.05	CIRCULAR	1.05
303X-302	303X	302	27.6	0.013	77.6	77.46	CIRCULAR	0.825
304-303X	304	303X	162	0.013	78.97	77.68	CIRCULAR	0.75
305-304	305	304	63.4	0.013	79.51	79	CIRCULAR	0.75
306-305	306	305	45.7	0.013	80.19	79.73	CIRCULAR	0.525
307-306	307	306	127.3	0.013	81.42	80.22	CIRCULAR	0.525
308-305	308	305	50.1	0.013	80.16	79.66	CIRCULAR	0.6
CUL1-2	CUL-1	CUL-2	48.6	0.013	81.68	81.03	RECT_CLOSED	1.8x.2
T3-0	300a	T3-A	1200	0.04	95.35	85	TRAPEZOIDAL	2 / 5 / 3 /3
T3-1	T3-A	T3-B	120	0.10	85	82.155	TRAPEZOIDAL	2 / 5 / 3 /3
T3-2	T3-B	CUL-1	20	0.10	82.155	81.68	TRAPEZOIDAL	2 / 5 / 3 /3
T3-3	CUL-2	T3-C	45.7	0.10	81.03	80.517	TRAPEZOIDAL	2 / 5 / 3 /3
T3-4	T3-C	T3-D	154.9	0.10	80.517	79.09	TRAPEZOIDAL	2 / 5 / 3 /3
T3-5	T3-D	T3-E	104.1	0.10	79	78.131	TRAPEZOIDAL	2 / 5 / 3 /3
T3-6	T3-E	T3-F	91.3	0.10	78.131	77.29	TRAPEZOIDAL	2 / 5 / 3 /3
T3-7	T3-F	P2-T3	9	0.10	77.15	76.95	TRAPEZOIDAL	2 / 5 / 3 /3

Roughness coefficients for Tributary 3 are based on the values applied in the EMP. There is no attempt to quantify anything related to the nature of the flow or flood conditions within the natural channel of Tributary 3 so only a generalized trapezoidal section is used to support a flow conveyance.

Outfall Parameters

Model File: 01347_2023-12_emp-sim

Name	Invert (m)	Rim (m)	Type
OF-301	0	0	FREE
OF-302	0	0	FREE
OF-303	0	0	FREE
OF-304	0	0	FREE
OF-311	0	0	FREE
OF-312	0	0	FREE
OF-401	0	0	FREE

Model File: 01347_2024-01_fsr

Name	Invert (m)	Rim (m)	Type
HWL-146	78.62	80.62	FREE
HWL-200	77.29	79.29	FREE
HWL-300	76.96	79.8	FREE
P2-T3	76.95	78.95	FREE
Pond-Escape	81.5	81.7	FREE

E.4 PCSWMM Output

Model File: 01347_2023-12_emp-sim

ALTERNATIVE RUNOFF METHOD (ARM) - PCSWMM VERSION 7.5.3406

This is a new version of ARM - your feedback and suggestions are solicited.
Create a ticket, post on the PCSWMM feature request forum, or email us directly!

Simulation start time:	06/01/2023 00:00:00
Simulation end time:	06/05/2023 00:00:00
Runoff wet weather time steps:	300 seconds
Report time steps:	300 seconds
Number of data points:	1153

****
Unit Hydrographs Runoff Method
****

Subcatchment	Runoff Method	Raingage	Area (ha)	Time of Concentration (min)	Time to Peak (min)	Time after Peak (min)	Peak UH Flow (m³/s/mm)	UH Depth (mm)
401-EMP	Nash IUH	SCS_100yr24hr_emp	16.78	148.66	99.11	555.89	0.01528	1
303-EMP	Nash IUH	SCS_100yr24hr_emp	65.19	117.31	58.66	671.34	0.06814	0.999
311-EMP	Nash IUH	SCS_100yr24hr_emp	1.15	46.56	23.28	191.72	0.00303	0.995
304-EMP	Nash IUH	SCS_100yr24hr_emp	18.78	122.69	61.34	618.66	0.01877	0.999
312-EMP	Nash IUH	SCS_100yr24hr_emp	1.3	58.21	29.1	235.9	0.00274	0.996
301-EMP	Nash IUH	SCS_100yr24hr_emp	86.43	111.04	55.52	659.48	0.09545	0.999
302-EMP	Nash IUH	SCS_100yr24hr_emp	80.69	161.19	80.6	914.4	0.06139	1

****
ARM Runoff Summary
****

Subcatchment	Total Precip (mm)	Total Losses (mm)	Total Runoff (mm)	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff (fraction)
401-EMP	105.75	61.075	44.666	7.495	386.212	0.422
303-EMP	105.75	94.911	10.831	7.061	346.107	0.102
311-EMP	105.75	94.433	11.261	0.13	11.077	0.106

304-EMP	105.75	89.656	16.081	3.02	151.083	0.152
312-EMP	105.75	90.416	15.277	0.199	15.019	0.144
301-EMP	105.75	96.558	9.185	7.939	383.152	0.087
302-EMP	105.75	96.403	9.343	7.539	287.182	0.088

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.015)
--------------------------------------------------------------


*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... NO
  Water Quality .......... NO
Surcharge Method ......... EXTRAN
Starting Date ............ 06/01/2023 00:00:00
Ending Date .............. 06/05/2023 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:05:00


**************************        Volume         Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------      ---------
Dry Weather Inflow .......         0.000          0.000
Wet Weather Inflow .......         0.000          0.000
Groundwater Inflow .......         0.000          0.000
RDII Inflow ..............         0.000          0.000
External Inflow ..........         3.338         33.383
External Outflow .........         3.338         33.383
Flooding Loss ............         0.000          0.000
Evaporation Loss .........         0.000          0.000
Exfiltration Loss ........         0.000          0.000
Initial Stored Volume ....         0.000          0.000
Final Stored Volume ......         0.000          0.000
Continuity Error (%) .....         0.000
```

```
Analysis begun on:  Sat Jan 20 19:34:51 2024
Analysis ended on:  Sat Jan 20 19:34:51 2024
Total elapsed time: < 1 sec
```

Model File: 01347_2024-01_fsr

Design Storm: (103.2 mm) 100-Year 24-Hour SCS

```
ALTERNATIVE RUNOFF METHOD (ARM) - PCSWMM VERSION 7.5.3406
---------------------------------------------------------

This is a new version of ARM - your feedback and suggestions are solicited.
Create a ticket, post on the PCSWMM feature request forum, or email us directly!

Simulation start time:                06/01/2023 00:00:00
Simulation end time:                  06/05/2023 00:00:00
Runoff wet weather time steps:        300 seconds
Report time steps:                    300 seconds
Number of data points:                1153


******************************
Unit Hydrographs Runoff Method
******************************
```

Subcatchment	Runoff Method	Raingage	Area (ha)	Time of Concentration (min)	Time to Peak (min)	Time after Peak (min)	Peak UH Flow (m³/s/mm)	UH Depth (mm)
303	Nash IUH	SCS_100yr24hr	55.03	117.31	58.66	661.34	0.05752	0.999
311	Nash IUH	SCS_100yr24hr	0.55	11	5.5	54.5	0.00613	0.933
F115D	Nash IUH	SCS_100yr24hr	2.51	17.34	11.56	73.44	0.0196	0.998
F308B	Nash IUH	SCS_100yr24hr	22.98	148.66	99.11	575.89	0.02092	1
EXT-2	Nash IUH	SCS_100yr24hr	1.05	63.31	31.65	243.35	0.00203	0.996
312	Nash IUH	SCS_100yr24hr	1.95	50.3	25.15	219.85	0.00475	0.996
301	Nash IUH	SCS_100yr24hr	86.43	111.04	55.52	659.48	0.09545	0.999
302	Nash IUH	SCS_100yr24hr	80.69	161.19	80.6	914.4	0.06139	1

```
******************
ARM Runoff Summary
******************
```

Subcatchment	Total Precip (mm)	Total Losses (mm)	Total Runoff (mm)	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff (fraction)
303	103.18	92.943	10.231	5.63	275.008	0.099
311	103.18	92.476	9.991	0.055	8.008	0.097
F115D	103.18	56.979	46.096	1.157	159.434	0.447

F308B	103.18	60.295	42.876	9.853	507.193	0.416
EXT-2	103.18	87.87	15.248	0.16	11.882	0.148
312	103.18	88.657	14.462	0.282	23.257	0.14
301	103.18	94.546	8.628	7.457	357.845	0.084
302	103.18	94.396	8.781	7.085	268.616	0.085

```
WARNING ARM01: Computed UH depth for ARM subcatchment 311 is not unity. Consider reducing wet weather time step.



EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.015)
--------------------------------------------------------------

WARNING 03: negative offset ignored for Link 100-pond

*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Infiltration Method ...... HORTON
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 06/01/2023 00:00:00
Ending Date .............. 06/05/2023 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:05:00
Wet Time Step ............ 00:05:00
Dry Time Step ............ 00:05:00
Routing Time Step ........ 5.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 4
Head Tolerance ........... 0.001500 m
```

```
**************************        Volume         Depth
Runoff Quantity Continuity      hectare-m            mm
**************************      ---------       -------
Total Precipitation ......          3.075       103.180
Evaporation Loss .........          0.000         0.000
Infiltration Loss ........          1.155        38.751
Surface Runoff ...........          1.899        63.724
Final Storage ............          0.025         0.845
Continuity Error (%) .....         -0.135


**************************        Volume        Volume
Flow Routing Continuity         hectare-m      10^6 ltr
**************************      ---------     ---------
Dry Weather Inflow .......          0.000         0.000
Wet Weather Inflow .......          1.899        18.987
Groundwater Inflow .......          0.000         0.000
RDII Inflow ..............          0.000         0.000
External Inflow ..........          3.168        31.681
External Outflow .........          5.032        50.319
Flooding Loss ............          0.000         0.000
Evaporation Loss .........          0.000         0.000
Exfiltration Loss ........          0.000         0.000
Initial Stored Volume ....          0.001         0.009
Final Stored Volume ......          0.036         0.364
Continuity Error (%) .....         -0.011


*************************
Highest Continuity Errors
*************************
Node 103 (-5.54%)


***************************
Time-Step Critical Elements
***************************
Link T3-7 (10.06%)
Link 102-101 (5.66%)


********************************
Highest Flow Instability Indexes
********************************
Link L103C-IC (14)
Link 103-102 (11)
Link EXT1-IC (8)
Link 102-101 (3)
Link 104-101 (2)
```

```
*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     2.40 sec
Average Time Step           :     4.79 sec
Maximum Time Step           :     5.00 sec
Percent in Steady State     :    -0.00
Average Iterations per Step :     3.29
Percent Not Converging      :    16.28
Time Step Frequencies       :
    5.000 -  3.155 sec      :    94.73 %
    3.155 -  1.991 sec      :     5.27 %
    1.991 -  1.256 sec      :     0.00 %
    1.256 -  0.792 sec      :     0.00 %
    0.792 -  0.500 sec      :     0.00 %


***************************
Subcatchment Runoff Summary
***************************
```

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
C103A	103.18	0.00	0.00	28.26	65.07	8.97	74.04	0.23	33.92	0.718
C103B	103.18	0.00	0.00	10.97	87.52	3.51	91.03	1.15	148.10	0.882
C107A	103.18	0.00	0.00	28.25	65.07	8.98	74.05	0.22	32.83	0.718
C109A	103.18	0.00	0.00	28.41	65.11	8.80	73.90	0.47	68.92	0.716
C113A	103.18	0.00	0.00	28.26	65.07	8.96	74.03	0.23	33.91	0.717
C114A	103.18	0.00	0.00	28.43	65.11	8.78	73.89	0.48	71.09	0.716
C114B	103.18	0.00	0.00	22.85	72.24	7.13	79.37	0.78	109.74	0.769
C115A	103.18	0.00	0.00	28.34	65.09	8.88	73.97	0.47	68.94	0.717
C115B	103.18	0.00	0.00	22.85	72.24	7.13	79.37	0.75	105.26	0.769
C117A	103.18	0.00	0.00	28.51	65.13	8.69	73.82	0.17	25.15	0.715
C117B	103.18	0.00	0.00	28.58	65.14	8.62	73.76	0.41	60.12	0.715
C147A	103.18	0.00	0.00	28.07	65.03	9.18	74.20	0.05	7.65	0.719
C201AA	103.18	0.00	0.00	5.47	94.65	1.78	96.43	0.25	31.23	0.935
C201AB	103.18	0.00	0.00	5.47	94.65	1.78	96.43	0.34	42.04	0.935
C201BA	103.18	0.00	0.00	5.46	94.63	1.78	96.41	0.18	22.82	0.934
C201BB	103.18	0.00	0.00	5.46	94.63	1.78	96.41	0.25	31.23	0.934
C201BC	103.18	0.00	0.00	22.85	72.24	7.13	79.37	0.89	125.42	0.769
C202B	103.18	0.00	0.00	22.85	72.24	7.13	79.37	0.39	54.87	0.769
C202C	103.18	0.00	0.00	22.85	72.24	7.13	79.37	0.43	60.47	0.769
C203B	103.18	0.00	0.00	29.11	65.15	8.07	73.22	1.48	217.63	0.710
C203C	103.18	0.00	0.00	22.85	72.24	7.13	79.37	0.86	120.94	0.769
EXT-1	103.18	0.00	0.00	10.97	87.52	3.51	91.03	1.61	208.04	0.882
EXT-3	103.18	0.00	0.00	57.32	65.15	45.16	45.16	0.45	109.49	0.438
F112A	103.18	0.00	0.00	70.48	29.48	32.46	32.46	0.15	44.43	0.315
F307A	103.18	0.00	0.00	60.52	25.42	16.94	42.36	1.78	386.65	0.411

F308A	103.18	0.00	0.00	78.56	0.00	24.85	24.85	0.05	16.31	0.241
L103C	103.18	0.00	0.00	60.00	29.52	13.28	42.81	1.82	332.32	0.415
L110A	103.18	0.00	0.00	28.59	65.14	8.60	73.74	0.57	84.16	0.715
L115C	103.18	0.00	0.00	70.62	29.48	32.30	32.30	0.19	56.95	0.313
L116A	103.18	0.00	0.00	57.45	29.50	15.88	45.38	0.35	72.54	0.440
L202A	103.18	0.00	0.00	28.34	65.09	8.87	73.96	0.19	28.45	0.717
L203A	103.18	0.00	0.00	28.34	65.09	8.88	73.97	0.21	30.64	0.717
POND	103.18	0.00	0.00	44.78	43.70	14.15	57.86	0.93	162.69	0.561
UNC-2	103.18	0.00	0.00	62.31	21.85	18.79	40.64	0.06	14.03	0.394
UNC-3	103.18	0.00	0.00	10.91	87.41	3.60	91.01	0.13	16.45	0.882
UNC-4	103.18	0.00	0.00	77.95	0.00	25.51	25.51	0.02	6.86	0.247
UNC-5	103.18	0.00	0.00	77.95	0.00	25.51	25.51	0.02	6.01	0.247
UNC-6	103.18	0.00	0.00	77.95	0.00	25.51	25.51	0.01	2.57	0.247

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days	hr:min	Reported Max Depth Meters
300a	JUNCTION	0.02	0.17	95.52	0	14:43	0.17
CUL-1	JUNCTION	0.07	0.60	82.28	0	14:50	0.60
CUL-2	JUNCTION	0.04	0.33	81.36	0	14:51	0.33
T3-A	JUNCTION	0.03	0.26	85.26	0	14:47	0.26
T3-B	JUNCTION	0.03	0.26	82.42	0	14:49	0.26
T3-C	JUNCTION	0.06	0.41	80.93	0	14:50	0.41
T3-D	JUNCTION	0.05	0.36	79.36	0	14:54	0.36
T3-E	JUNCTION	0.07	0.46	78.59	0	14:57	0.46
T3-F	JUNCTION	0.04	0.32	77.47	0	14:58	0.32
HWL-146	OUTFALL	0.12	0.18	78.80	0	17:00	0.18
HWL-200	OUTFALL	0.03	0.47	77.76	0	13:00	0.47
HWL-300	OUTFALL	0.05	0.42	77.38	0	13:02	0.41
P2-T3	OUTFALL	0.02	0.14	77.09	0	14:58	0.14
Pond-Escape	OUTFALL	0.00	0.00	81.50	0	00:00	0.00
100	STORAGE	0.79	1.47	80.70	0	17:16	1.47
100C	STORAGE	0.50	1.18	80.70	0	17:16	1.18
101	STORAGE	0.76	1.44	80.70	0	17:11	1.44
102	STORAGE	0.35	0.98	80.70	0	17:11	0.98
103	STORAGE	0.29	0.87	80.70	0	19:14	0.87
104	STORAGE	0.59	1.27	80.70	0	17:11	1.27
105	STORAGE	0.55	1.23	80.70	0	17:13	1.23
106	STORAGE	0.51	1.18	80.70	0	17:13	1.18
107	STORAGE	0.44	1.11	80.70	0	17:21	1.11
108	STORAGE	0.01	0.20	83.11	0	13:00	0.20
109	STORAGE	0.01	0.20	84.00	0	13:00	0.20
110	STORAGE	0.01	0.18	85.51	0	13:00	0.18
111	STORAGE	0.31	0.91	80.70	0	17:23	0.91

112	STORAGE	0.29	0.87	80.70	0	17:23	0.87
113	STORAGE	0.15	0.58	80.70	0	17:12	0.58
114	STORAGE	0.08	0.57	80.94	0	13:00	0.57
115	STORAGE	0.03	0.49	81.29	0	13:00	0.49
116	STORAGE	0.01	0.22	82.20	0	13:00	0.22
117	STORAGE	0.01	0.17	82.69	0	13:00	0.17
147	STORAGE	0.17	0.25	79.18	0	17:00	0.25
148	STORAGE	0.14	0.21	79.28	0	17:20	0.21
149	STORAGE	0.14	0.22	79.62	0	17:19	0.22
150	STORAGE	0.14	0.22	79.72	0	17:17	0.22
201	STORAGE	0.04	0.54	77.93	0	13:00	0.54
201A	STORAGE	0.04	0.54	78.08	0	13:00	0.54
201B	STORAGE	0.03	0.33	78.44	0	13:00	0.33
202	STORAGE	0.03	0.36	79.67	0	13:00	0.36
203	STORAGE	0.02	0.31	80.77	0	13:00	0.31
301	STORAGE	0.06	0.45	77.44	0	13:02	0.45
302	STORAGE	0.07	0.52	77.76	0	13:02	0.52
303X	STORAGE	0.06	0.44	78.04	0	13:01	0.43
304	STORAGE	0.05	0.40	79.37	0	13:01	0.40
305	STORAGE	0.05	0.40	79.91	0	13:00	0.40
306	STORAGE	0.02	0.39	80.58	0	13:00	0.39
307	STORAGE	0.02	0.40	81.82	0	13:00	0.40
308	STORAGE	0.05	0.42	80.58	0	14:40	0.42
C103B-S	STORAGE	0.02	0.66	81.81	0	13:00	0.66
C114B-S	STORAGE	0.02	0.72	81.72	0	13:00	0.72
C115B-S	STORAGE	0.02	0.72	82.12	0	13:00	0.72
C201AA-S	STORAGE	0.04	1.30	80.00	0	13:00	1.30
C201AB-S	STORAGE	0.04	1.30	80.00	0	13:00	1.30
C201BA-S	STORAGE	0.04	1.30	80.70	0	13:00	1.30
C201BB-S	STORAGE	0.04	1.30	80.70	0	13:00	1.30
C201BC-S	STORAGE	0.04	1.29	80.69	0	13:00	1.29
C202B-S	STORAGE	0.04	1.29	80.69	0	13:00	1.29
C202C-S	STORAGE	0.04	1.29	80.69	0	13:00	1.29
C203B-S	STORAGE	0.03	1.25	82.50	0	13:00	1.25
C203C-S	STORAGE	0.04	1.29	81.99	0	13:00	1.29
EXT1-S	STORAGE	1.12	2.25	81.25	0	19:04	2.25
L103C-S	STORAGE	0.13	1.22	81.42	0	13:00	1.22
L110A-S	STORAGE	0.03	1.06	87.81	0	13:00	1.06
L116A-S	STORAGE	0.03	1.30	83.30	0	13:00	1.30
POND_2	STORAGE	0.52	1.20	80.70	0	17:17	1.20

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Node Inflow Summary
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                                Maximum  Maximum                  Lateral       Total        Flow
                                Lateral    Total  Time of Max      Inflow      Inflow     Balance
                                 Inflow   Inflow   Occurrence      Volume      Volume       Error
Node                 Type           LPS      LPS  days hr:min    10^6 ltr    10^6 ltr     Percent
```

300a	JUNCTION	615.62	615.62	0	14:30	14.5	14.5	0.011	
CUL-1	JUNCTION	0.00	879.38	0	14:49	0	20.9	0.000	
CUL-2	JUNCTION	0.00	879.35	0	14:50	0	20.9	-0.001	
T3-A	JUNCTION	292.30	885.46	0	14:34	6.26	20.8	-0.006	
T3-B	JUNCTION	14.03	879.45	0	14:48	0.061	20.9	0.001	
T3-C	JUNCTION	26.44	890.00	0	14:50	0.302	21.2	0.052	
T3-D	JUNCTION	6.01	890.21	0	14:52	0.0179	21.2	0.009	
T3-E	JUNCTION	2.57	889.99	0	14:54	0.00765	21.2	0.014	
T3-F	JUNCTION	0.00	889.77	0	14:57	0	21.2	-0.002	
HWL-146	OUTFALL	0.00	69.06	0	17:00	0	12	0.000	
HWL-200	OUTFALL	0.00	754.89	0	13:00	0	5.46	0.000	
HWL-300	OUTFALL	0.00	558.59	0	13:02	0	11.7	0.000	
P2-T3	OUTFALL	0.00	889.74	0	14:58	0	21.2	0.000	
Pond-Escape	OUTFALL	0.00	0.00	0	00:00	0	0	0.000	ltr
100	STORAGE	0.00	1425.31	0	12:59	0	9.82	0.012	
100C	STORAGE	0.00	805.56	0	13:00	0	5.16	-0.027	
101	STORAGE	0.00	1432.18	0	12:59	0	9.75	-0.028	
102	STORAGE	0.00	515.21	0	13:00	0	3.36	0.081	
103	STORAGE	33.92	523.75	0	13:00	0.229	4.01	-5.247	
104	STORAGE	0.00	937.01	0	13:01	0	6.39	0.022	
105	STORAGE	0.00	946.61	0	12:59	0	6.39	0.028	
106	STORAGE	0.00	957.76	0	12:59	0	6.38	-0.171	
107	STORAGE	32.83	965.95	0	12:58	0.222	6.38	-0.081	
108	STORAGE	0.00	153.05	0	13:00	0	1.03	0.105	
109	STORAGE	68.92	153.06	0	13:00	0.465	1.03	-0.001	
110	STORAGE	0.00	84.15	0	13:00	0	0.568	0.001	
111	STORAGE	0.00	785.71	0	12:58	0	5.13	0.040	
112	STORAGE	44.43	792.07	0	12:59	0.149	5.12	-0.179	
113	STORAGE	33.91	753.02	0	13:00	0.229	4.98	0.248	
114	STORAGE	71.09	722.59	0	13:00	0.48	4.74	-0.121	
115	STORAGE	285.32	542.71	0	13:00	1.81	3.49	0.070	
116	STORAGE	0.00	152.14	0	13:00	0	0.929	-0.000	
117	STORAGE	85.28	85.28	0	13:00	0.575	0.575	-0.002	
147	STORAGE	7.65	69.06	0	17:00	0.0519	12	0.018	
148	STORAGE	0.00	60.93	0	17:20	0	10.3	0.003	
149	STORAGE	0.00	60.93	0	17:18	0	10.3	0.010	
150	STORAGE	0.00	60.93	0	17:17	0	10.3	0.004	
201	STORAGE	0.00	754.92	0	13:00	0	5.46	-0.015	
201A	STORAGE	0.00	754.93	0	13:00	0	5.46	0.023	
201B	STORAGE	0.00	175.19	0	13:00	0	1.32	-0.002	
202	STORAGE	28.45	511.63	0	13:00	0.192	3.55	-0.001	
203	STORAGE	30.64	368.64	0	13:00	0.207	2.54	0.001	
301	STORAGE	0.00	558.47	0	13:02	0	11.7	0.000	
302	STORAGE	0.00	560.79	0	13:01	0	11.7	-0.001	
303X	STORAGE	0.00	560.61	0	13:01	0	11.7	0.000	
304	STORAGE	0.00	562.43	0	13:00	0	11.7	-0.000	
305	STORAGE	0.00	562.61	0	13:00	0	11.7	-0.004	
306	STORAGE	0.00	385.69	0	13:00	0	1.78	0.037	
307	STORAGE	386.65	386.65	0	13:00	1.78	1.78	-0.001	
308	STORAGE	507.19	507.19	0	14:40	9.9	9.9	-0.014	

C103B-S	STORAGE	148.10	148.10	0	13:00	1.15	1.15	-0.004
C114B-S	STORAGE	109.74	109.74	0	13:00	0.778	0.778	-0.004
C115B-S	STORAGE	105.26	105.26	0	13:00	0.746	0.746	-0.004
C201AA-S	STORAGE	31.23	31.23	0	13:00	0.251	0.251	-0.003
C201AB-S	STORAGE	42.04	42.04	0	13:00	0.337	0.337	-0.002
C201BA-S	STORAGE	22.82	22.82	0	13:00	0.183	0.183	-0.010
C201BB-S	STORAGE	31.23	31.23	0	13:00	0.251	0.251	0.007
C201BC-S	STORAGE	125.42	125.42	0	13:00	0.889	0.889	0.002
C202B-S	STORAGE	54.87	54.87	0	13:00	0.389	0.389	0.002
C202C-S	STORAGE	60.47	60.47	0	13:00	0.428	0.428	0.001
C203B-S	STORAGE	217.63	217.63	0	13:00	1.48	1.48	-0.004
C203C-S	STORAGE	120.94	120.94	0	13:00	0.857	0.857	-0.003
EXT1-S	STORAGE	208.04	208.04	0	13:00	1.61	1.61	-0.078
L103C-S	STORAGE	341.88	341.88	0	13:00	1.98	2.85	8.382
L110A-S	STORAGE	84.16	84.16	0	13:00	0.568	0.568	-0.003
L116A-S	STORAGE	72.54	72.54	0	13:00	0.354	0.354	-0.003
POND_2	STORAGE	162.69	1574.38	0	12:59	0.926	10.7	0.020

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Node Surcharge Summary
****

No nodes were surcharged.

****
Node Flooding Summary
****

No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
100	0.001	33	0	0	0.002	61	0 17:16	1417.38
100C	0.001	24	0	0	0.001	55	0 17:16	799.80
101	0.001	27	0	0	0.002	52	0 17:11	1425.31
102	0.000	15	0	0	0.001	42	0 17:11	505.39
103	0.000	15	0	0	0.001	45	0 19:14	515.21
104	0.001	23	0	0	0.001	49	0 17:11	934.15
105	0.001	18	0	0	0.001	40	0 17:13	937.01
106	0.001	14	0	0	0.001	31	0 17:13	946.61
107	0.001	10	0	0	0.001	25	0 17:21	957.76

108	0.000	0	0	0	0.000	6	0	13:00	153.04
109	0.000	0	0	0	0.000	4	0	13:00	153.05
110	0.000	0	0	0	0.000	5	0	13:00	84.14
111	0.000	7	0	0	0.001	21	0	17:23	780.12
112	0.000	7	0	0	0.001	20	0	17:23	785.71
113	0.000	4	0	0	0.001	14	0	17:12	747.64
114	0.000	2	0	0	0.001	14	0	13:00	719.46
115	0.000	1	0	0	0.001	12	0	13:00	541.89
116	0.000	0	0	0	0.000	7	0	13:00	152.13
117	0.000	0	0	0	0.000	7	0	13:00	85.27
147	0.000	11	0	0	0.000	16	0	17:00	69.06
148	0.000	5	0	0	0.000	8	0	17:20	60.93
149	0.000	9	0	0	0.000	14	0	17:19	60.93
150	0.000	10	0	0	0.000	16	0	17:17	60.93
201	0.000	2	0	0	0.001	26	0	13:00	754.89
201A	0.000	1	0	0	0.001	18	0	13:00	754.92
201B	0.000	1	0	0	0.000	14	0	13:00	175.19
202	0.000	1	0	0	0.000	10	0	13:00	511.44
203	0.000	0	0	0	0.000	7	0	13:00	368.46
301	0.000	2	0	0	0.001	16	0	13:02	558.59
302	0.000	2	0	0	0.001	18	0	13:02	558.47
303X	0.000	2	0	0	0.000	14	0	13:01	560.79
304	0.000	1	0	0	0.000	9	0	13:01	560.61
305	0.000	1	0	0	0.000	8	0	13:00	562.43
306	0.000	0	0	0	0.000	8	0	13:00	385.56
307	0.000	0	0	0	0.000	8	0	13:00	385.69
308	0.000	1	0	0	0.000	8	0	14:40	507.18
C103B-S	0.000	0	0	0	0.001	0	0	13:00	148.09
C114B-S	0.000	0	0	0	0.001	0	0	13:00	109.74
C115B-S	0.000	0	0	0	0.001	0	0	13:00	105.26
C201AA-S	0.000	0	0	0	0.008	1	0	13:00	29.10
C201AB-S	0.000	0	0	0	0.010	1	0	13:00	39.20
C201BA-S	0.000	0	0	0	0.006	0	0	13:00	21.29
C201BB-S	0.000	0	0	0	0.008	1	0	13:00	29.10
C201BC-S	0.000	0	0	0	0.002	0	0	13:00	124.81
C202B-S	0.000	0	0	0	0.002	0	0	13:00	54.59
C202C-S	0.000	0	0	0	0.002	0	0	13:00	60.16
C203B-S	0.000	0	0	0	0.001	0	0	13:00	217.60
C203C-S	0.000	0	0	0	0.002	0	0	13:00	120.40
EXT1-S	0.347	24	0	0	1.055	73	0	19:04	7.80
L103C-S	0.000	0	0	0	0.001	0	0	13:00	341.74
L110A-S	0.000	0	0	0	0.001	0	0	13:00	84.15
L116A-S	0.000	0	0	0	0.005	0	0	13:00	66.88
POND_2	3.072	20	0	0	7.642	51	0	17:17	66.41

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
HWL-146	97.89	36.81	69.06	11.994
HWL-200	31.24	71.00	754.89	5.463
HWL-300	37.13	130.10	558.59	11.681
P2-T3	77.01	105.48	889.74	21.180
Pond-Escape	0.00	0.00	0.00	0.000
System	48.66	343.39	1543.82	50.318

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Link Flow Summary
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Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
100-100C	CONDUIT	805.56	0 13:00	1.26	0.33	0.76
100C-pond	CONDUIT	799.80	0 13:00	1.22	0.36	0.79
100-pond	CONDUIT	613.16	0 12:31	0.89	0.07	0.89
101-100	CONDUIT	1425.31	0 12:59	1.22	0.60	0.97
102-101	CONDUIT	505.39	0 13:00	1.46	0.65	0.93
103-102	CONDUIT	515.21	0 13:00	1.20	0.58	0.88
104-101	CONDUIT	934.15	0 13:01	1.19	0.57	0.95
105-104	CONDUIT	937.01	0 13:01	1.20	0.51	0.92
106-105	CONDUIT	946.61	0 12:59	1.21	0.55	0.89
107-106	CONDUIT	957.76	0 12:59	1.26	0.61	0.83
108-107	CONDUIT	153.04	0 13:00	2.22	0.41	0.45
109-108	CONDUIT	153.05	0 13:00	2.23	0.41	0.45
110-109	CONDUIT	84.14	0 13:00	1.91	0.67	0.60
111-107	CONDUIT	780.12	0 12:58	1.48	0.48	0.78
112-111	CONDUIT	785.71	0 12:58	1.42	0.55	0.74
113-112	CONDUIT	747.64	0 12:59	1.58	0.45	0.62
114-113	CONDUIT	719.46	0 13:00	1.61	0.48	0.43
115-114	CONDUIT	541.89	0 13:00	1.51	0.44	0.43
116-115	CONDUIT	152.13	0 13:00	1.82	0.35	0.41
117-116	CONDUIT	85.27	0 13:00	1.57	0.30	0.37
147-146	CONDUIT	69.06	0 17:00	0.91	0.55	0.48
148-147	CONDUIT	60.93	0 17:20	0.87	0.47	0.45
149-148	CONDUIT	60.93	0 17:20	0.82	0.48	0.48
150-149	CONDUIT	60.93	0 17:18	0.86	0.49	0.46
201-200	CONDUIT	754.89	0 13:00	1.68	0.49	0.42
201A-201	CONDUIT	754.92	0 13:00	1.65	0.49	0.43
201B-201A	CONDUIT	175.19	0 13:00	1.12	0.41	0.38
202-201A	CONDUIT	511.44	0 13:00	2.46	0.46	0.48
203-202	CONDUIT	368.46	0 13:00	2.28	0.44	0.46

301-300	CONDUIT	558.59	0	13:02	1.65	0.54	0.41
302-301	CONDUIT	558.47	0	13:02	1.49	0.53	0.45
303X-302	CONDUIT	560.79	0	13:01	1.96	0.55	0.53
304-303X	CONDUIT	560.61	0	13:01	2.32	0.56	0.54
305-304	CONDUIT	562.43	0	13:00	2.33	0.56	0.54
306-305	CONDUIT	385.56	0	13:00	2.26	0.89	0.74
307-306	CONDUIT	385.69	0	13:00	2.20	0.92	0.76
308-305	CONDUIT	507.18	0	14:40	2.42	0.83	0.69
CUL1-2	CONDUIT	879.35	0	14:50	1.57	0.09	0.26
T3-0	CONDUIT	612.05	0	14:43	0.50	0.01	0.11
T3-1	CONDUIT	879.01	0	14:48	0.58	0.02	0.13
T3-2	CONDUIT	879.38	0	14:49	0.32	0.02	0.22
T3-3	CONDUIT	879.33	0	14:51	0.39	0.03	0.18
T3-4	CONDUIT	890.21	0	14:52	0.44	0.04	0.17
T3-5	CONDUIT	889.99	0	14:54	0.35	0.04	0.21
T3-6	CONDUIT	889.77	0	14:57	0.46	0.04	0.16
T3-7	CONDUIT	889.74	0	14:58	0.67	0.02	0.12
Pond-OR	ORIFICE	60.93	0	17:17			1.00
OVERFLOW	WEIR	0.00	0	00:00			0.00
C103B-IC	DUMMY	148.09	0	13:00			
C114B-IC	DUMMY	109.74	0	13:00			
C115B-IC	DUMMY	105.26	0	13:00			
C201AA-IC	DUMMY	29.10	0	12:54			
C201AB-IC	DUMMY	39.20	0	12:43			
C201BA-IC	DUMMY	21.29	0	13:00			
C201BB-IC	DUMMY	29.10	0	12:53			
C201BC-IC	DUMMY	124.81	0	13:00			
C202B-IC	DUMMY	54.59	0	13:00			
C202C-IC	DUMMY	60.16	0	13:00			
C203B-IC	DUMMY	217.60	0	13:00			
C203C-IC	DUMMY	120.40	0	13:00			
EXT1-IC	DUMMY	7.80	0	08:48			
L103C-IC	DUMMY	341.74	0	13:00			
L110A-IC	DUMMY	84.15	0	13:00			
L116A-IC	DUMMY	66.88	0	13:00			

```
***************************
Flow Classification Summary
***************************
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Conduit	Adjusted /Actual Length	---------- Fraction of Time in Flow Class ---------- Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
100-100C	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.01	0.00
100C-pond	1.00	0.02	0.02	0.00	0.96	0.00	0.00	0.00	0.00	0.00
100-pond	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.00	0.00	0.00
101-100	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
102-101	1.00	0.03	0.01	0.00	0.62	0.00	0.00	0.34	0.02	0.00

103-102	1.00	0.02	0.25	0.00	0.73	0.00	0.00	0.00	0.35	0.00
104-101	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
105-104	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
106-105	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.00	0.04	0.00
107-106	1.00	0.01	0.06	0.00	0.90	0.00	0.00	0.02	0.07	0.00
108-107	1.00	0.02	0.00	0.00	0.20	0.01	0.00	0.78	0.18	0.00
109-108	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
110-109	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
111-107	1.00	0.01	0.03	0.00	0.58	0.00	0.00	0.38	0.04	0.00
112-111	1.00	0.01	0.18	0.00	0.81	0.00	0.00	0.00	0.33	0.00
113-112	1.00	0.45	0.02	0.00	0.39	0.00	0.00	0.14	0.03	0.00
114-113	1.00	0.01	0.02	0.00	0.97	0.00	0.00	0.00	0.14	0.00
115-114	1.00	0.01	0.00	0.00	0.19	0.00	0.00	0.80	0.16	0.00
116-115	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
117-116	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
147-146	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
148-147	1.00	0.03	0.00	0.00	0.58	0.00	0.00	0.40	0.01	0.00
149-148	1.00	0.02	0.00	0.00	0.95	0.00	0.00	0.02	0.00	0.00
150-149	1.00	0.02	0.00	0.00	0.62	0.00	0.00	0.36	0.00	0.00
201-200	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
201A-201	1.00	0.02	0.00	0.00	0.02	0.00	0.00	0.96	0.00	0.00
201B-201A	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
202-201A	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
203-202	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
301-300	1.00	0.02	0.00	0.00	0.97	0.01	0.00	0.00	0.00	0.00
302-301	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
303X-302	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
304-303X	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
305-304	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
306-305	1.00	0.02	0.00	0.00	0.05	0.01	0.00	0.92	0.04	0.00
307-306	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
308-305	1.00	0.06	0.00	0.00	0.00	0.01	0.00	0.93	0.01	0.00
CUL1-2	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.97
T3-0	1.00	0.02	0.10	0.00	0.88	0.00	0.00	0.00	0.87	0.00
T3-1	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.95	0.00
T3-2	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.96	0.00
T3-3	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.00	0.91	0.00
T3-4	1.00	0.02	0.00	0.00	0.16	0.00	0.00	0.82	0.00	0.00
T3-5	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.00	0.86	0.00
T3-6	1.00	0.07	0.00	0.00	0.07	0.00	0.00	0.87	0.00	0.00
T3-7	1.00	0.06	0.00	0.00	0.93	0.00	0.00	0.00	0.00	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Tue Jan 23 09:18:19 2024

Analysis ended on: Tue Jan 23 09:18:23 2024
Total elapsed time: 00:00:04

Design Storm: 25 mm 24-Hour SCS

ALTERNATIVE RUNOFF METHOD (ARM) - PCSWMM VERSION 7.5.3406

This is a new version of ARM - your feedback and suggestions are solicited.
Create a ticket, post on the PCSWMM feature request forum, or email us directly!

Simulation start time:	06/01/2023 00:00:00
Simulation end time:	06/05/2023 00:00:00
Runoff wet weather time steps:	300 seconds
Report time steps:	300 seconds
Number of data points:	1153

****
Unit Hydrographs Runoff Method
****

Subcatchment	Runoff Method	Raingage	Area (ha)	Time of Concentration (min)	Time to Peak (min)	Time after Peak (min)	Peak UH Flow (m³/s/mm)	UH Depth (mm)
303	Nash IUH	SCS_25mm24hr	55.03	117.31	58.66	661.34	0.05752	0.999
311	Nash IUH	SCS_25mm24hr	0.55	11	5.5	54.5	0.00613	0.933
F115D	Nash IUH	SCS_25mm24hr	2.51	17.34	11.56	73.44	0.0196	0.998
F308B	Nash IUH	SCS_25mm24hr	22.98	148.66	99.11	575.89	0.02092	1
EXT-2	Nash IUH	SCS_25mm24hr	1.05	63.31	31.65	243.35	0.00203	0.996
312	Nash IUH	SCS_25mm24hr	1.95	50.3	25.15	219.85	0.00475	0.996
301	Nash IUH	SCS_25mm24hr	86.43	111.04	55.52	659.48	0.09545	0.999
302	Nash IUH	SCS_25mm24hr	80.69	161.19	80.6	914.4	0.06139	1

****
ARM Runoff Summary
****

Subcatchment	Total Precip (mm)	Total Losses (mm)	Total Runoff (mm)	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff (fraction)
303	25.05	25.007	0.043	0.023	0.785	0.002

311	25.05	24.967	0.077	0	0.036	0.003
F115D	25.05	21.434	3.607	0.091	11.27	0.144
F308B	25.05	22.682	2.368	0.544	23.663	0.095
EXT-2	25.05	24.597	0.451	0.005	0.255	0.018
312	25.05	24.932	0.117	0.002	0.072	0.005
301	25.05	25.05	0	0	0	0
302	25.05	25.05	0	0	0	0

```
WARNING ARM01: Computed UH depth for ARM subcatchment 311 is not unity. Consider reducing wet weather time step.



EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.015)
--------------------------------------------------------------

WARNING 03: negative offset ignored for Link 100-pond

*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Infiltration Method ...... HORTON
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 06/01/2023 00:00:00
Ending Date .............. 06/05/2023 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:05:00
Wet Time Step ............ 00:05:00
Dry Time Step ............ 00:05:00
Routing Time Step ........ 5.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 4
Head Tolerance ........... 0.001500 m
```

```
  **************************        Volume         Depth
  Runoff Quantity Continuity     hectare-m            mm
  **************************     ---------       -------
  Total Precipitation ......         0.746        25.050
  Evaporation Loss .........         0.000         0.000
  Infiltration Loss ........         0.366        12.271
  Surface Runoff ...........         0.356        11.958
  Final Storage ............         0.025         0.845
  Continuity Error (%) .....        -0.092


  **************************        Volume        Volume
  Flow Routing Continuity        hectare-m      10^6 ltr
  **************************     ---------     ---------
  Dry Weather Inflow .......         0.000         0.000
  Wet Weather Inflow .......         0.356         3.564
  Groundwater Inflow .......         0.000         0.000
  RDII Inflow ..............         0.000         0.000
  External Inflow ..........         0.067         0.666
  External Outflow .........         0.410         4.098
  Flooding Loss ............         0.000         0.000
  Evaporation Loss .........         0.000         0.000
  Exfiltration Loss ........         0.000         0.000
  Initial Stored Volume ....         0.001         0.009
  Final Stored Volume ......         0.014         0.140
  Continuity Error (%) .....        -0.007


  ***************************
  Time-Step Critical Elements
  ***************************
  None


  ********************************
  Highest Flow Instability Indexes
  ********************************
  Link EXT1-IC (5)
  Link T3-6 (1)


  *************************
  Routing Time Step Summary
  *************************
  Minimum Time Step           :     1.87 sec
  Average Time Step           :     5.00 sec
  Maximum Time Step           :     5.00 sec
  Percent in Steady State     :     0.00
  Average Iterations per Step :     2.00
```

```
Percent Not Converging      :     0.00
Time Step Frequencies       :
    5.000 -  3.155 sec      :   100.00 %
    3.155 -  1.991 sec      :     0.00 %
    1.991 -  1.256 sec      :     0.00 %
    1.256 -  0.792 sec      :     0.00 %
    0.792 -  0.500 sec      :     0.00 %
```

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
C103A	25.05	0.00	0.00	9.02	15.05	0.00	15.05	0.05	5.89	0.601
C103B	25.05	0.00	0.00	3.51	20.23	0.00	20.23	0.25	32.21	0.808
C107A	25.05	0.00	0.00	9.02	15.05	0.00	15.05	0.05	5.70	0.601
C109A	25.05	0.00	0.00	9.02	15.06	0.00	15.06	0.09	11.98	0.601
C113A	25.05	0.00	0.00	9.02	15.05	0.00	15.05	0.05	5.90	0.601
C114A	25.05	0.00	0.00	9.02	15.06	0.00	15.06	0.10	12.36	0.601
C114B	25.05	0.00	0.00	7.26	16.70	0.00	16.70	0.16	20.68	0.667
C115A	25.05	0.00	0.00	9.02	15.06	0.00	15.06	0.09	11.98	0.601
C115B	25.05	0.00	0.00	7.26	16.70	0.00	16.70	0.16	19.84	0.667
C117A	25.05	0.00	0.00	9.02	15.06	0.00	15.06	0.03	4.38	0.601
C117B	25.05	0.00	0.00	9.02	15.06	0.00	15.06	0.08	10.46	0.601
C147A	25.05	0.00	0.00	9.02	15.03	0.00	15.03	0.01	1.33	0.600
C201AA	25.05	0.00	0.00	1.75	21.88	0.00	21.88	0.06	7.19	0.873
C201AB	25.05	0.00	0.00	1.75	21.88	0.00	21.88	0.08	9.67	0.873
C201BA	25.05	0.00	0.00	1.75	21.88	0.00	21.88	0.04	5.25	0.873
C201BB	25.05	0.00	0.00	1.75	21.88	0.00	21.88	0.06	7.19	0.873
C201BC	25.05	0.00	0.00	7.26	16.70	0.00	16.70	0.19	23.64	0.667
C202B	25.05	0.00	0.00	7.26	16.70	0.00	16.70	0.08	10.34	0.667
C202C	25.05	0.00	0.00	7.26	16.70	0.00	16.70	0.09	11.40	0.667
C203B	25.05	0.00	0.00	9.02	15.05	0.00	15.05	0.30	38.42	0.601
C203C	25.05	0.00	0.00	7.26	16.70	0.00	16.70	0.18	22.79	0.667
EXT-1	25.05	0.00	0.00	3.51	20.23	0.00	20.23	0.36	45.24	0.808
EXT-3	25.05	0.00	0.00	22.61	15.05	1.48	1.48	0.01	10.82	0.059
F112A	25.05	0.00	0.00	24.60	6.82	0.00	0.00	0.00	0.00	0.000
F307A	25.05	0.00	0.00	18.79	5.88	0.00	5.88	0.25	31.21	0.235
F308A	25.05	0.00	0.00	25.05	0.00	0.00	0.00	0.00	0.00	0.000
L103C	25.05	0.00	0.00	17.79	6.82	0.00	6.82	0.29	36.72	0.272
L110A	25.05	0.00	0.00	9.02	15.06	0.00	15.06	0.12	14.65	0.601
L115C	25.05	0.00	0.00	24.60	6.82	0.00	0.00	0.00	0.00	0.000
L116A	25.05	0.00	0.00	17.79	6.82	0.00	6.82	0.05	6.72	0.272
L202A	25.05	0.00	0.00	9.02	15.06	0.00	15.06	0.04	4.95	0.601
L203A	25.05	0.00	0.00	9.02	15.06	0.00	15.06	0.04	5.33	0.601
POND	25.05	0.00	0.00	14.28	10.10	0.00	10.10	0.16	20.45	0.403

UNC-2	25.05	0.00	0.00	19.66	5.05	0.00	5.05	0.01	0.96	0.202
UNC-3	25.05	0.00	0.00	3.51	20.21	0.00	20.21	0.03	3.58	0.807
UNC-4	25.05	0.00	0.00	25.05	0.00	0.00	0.00	0.00	0.00	0.000
UNC-5	25.05	0.00	0.00	25.05	0.00	0.00	0.00	0.00	0.00	0.000
UNC-6	25.05	0.00	0.00	25.05	0.00	0.00	0.00	0.00	0.00	0.000

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days	Time of Max Occurrence hr:min	Reported Max Depth Meters
300a	JUNCTION	0.00	0.00	95.35	0	00:00	0.00
CUL-1	JUNCTION	0.00	0.01	81.69	0	13:39	0.01
CUL-2	JUNCTION	0.00	0.01	81.04	0	13:32	0.01
T3-A	JUNCTION	0.00	0.01	85.01	0	13:20	0.01
T3-B	JUNCTION	0.00	0.01	82.16	0	13:34	0.01
T3-C	JUNCTION	0.00	0.01	80.53	0	15:22	0.01
T3-D	JUNCTION	0.00	0.01	79.01	0	15:00	0.01
T3-E	JUNCTION	0.00	0.01	78.14	0	17:26	0.01
T3-F	JUNCTION	0.00	0.01	77.16	0	17:28	0.01
HWL-146	OUTFALL	0.04	0.11	78.73	0	15:22	0.11
HWL-200	OUTFALL	0.01	0.20	77.49	0	13:00	0.20
HWL-300	OUTFALL	0.01	0.10	77.06	0	13:03	0.10
P2-T3	OUTFALL	0.00	0.00	76.95	0	17:28	0.00
Pond-Escape	OUTFALL	0.00	0.00	81.50	0	00:00	0.00
100	STORAGE	0.35	0.51	79.74	0	15:15	0.51
100C	STORAGE	0.06	0.22	79.74	0	15:17	0.22
101	STORAGE	0.32	0.48	79.74	0	15:17	0.48
102	STORAGE	0.01	0.17	79.89	0	13:00	0.17
103	STORAGE	0.01	0.21	80.04	0	13:00	0.21
104	STORAGE	0.15	0.31	79.74	0	15:17	0.31
105	STORAGE	0.11	0.28	79.75	0	13:01	0.28
106	STORAGE	0.07	0.27	79.79	0	13:01	0.26
107	STORAGE	0.03	0.26	79.85	0	13:00	0.26
108	STORAGE	0.01	0.08	82.99	0	13:00	0.08
109	STORAGE	0.01	0.08	83.88	0	13:00	0.08
110	STORAGE	0.00	0.07	85.40	0	13:00	0.07
111	STORAGE	0.01	0.19	79.98	0	13:01	0.19
112	STORAGE	0.01	0.21	80.04	0	13:00	0.21
113	STORAGE	0.01	0.18	80.30	0	13:00	0.18
114	STORAGE	0.01	0.22	80.59	0	13:00	0.22
115	STORAGE	0.01	0.17	80.97	0	13:00	0.17
116	STORAGE	0.01	0.08	82.06	0	13:00	0.08
117	STORAGE	0.00	0.07	82.59	0	13:00	0.07
147	STORAGE	0.06	0.16	79.09	0	15:21	0.16
148	STORAGE	0.05	0.12	79.19	0	15:20	0.12

149	STORAGE	0.05	0.13	79.53	0	15:18	0.13
150	STORAGE	0.05	0.13	79.63	0	15:17	0.13
201	STORAGE	0.02	0.25	77.64	0	13:00	0.25
201A	STORAGE	0.02	0.24	77.78	0	13:00	0.24
201B	STORAGE	0.01	0.15	78.26	0	13:00	0.15
202	STORAGE	0.01	0.15	79.46	0	13:00	0.15
203	STORAGE	0.01	0.13	80.59	0	13:00	0.13
301	STORAGE	0.02	0.12	77.11	0	13:03	0.12
302	STORAGE	0.02	0.14	77.38	0	13:03	0.14
303X	STORAGE	0.01	0.10	77.70	0	13:01	0.10
304	STORAGE	0.01	0.09	79.06	0	13:01	0.09
305	STORAGE	0.01	0.09	79.60	0	13:00	0.09
306	STORAGE	0.01	0.10	80.29	0	13:00	0.10
307	STORAGE	0.01	0.10	81.52	0	13:00	0.10
308	STORAGE	0.01	0.08	80.24	0	15:06	0.08
C103B-S	STORAGE	0.00	0.14	81.29	0	13:00	0.14
C114B-S	STORAGE	0.00	0.14	81.14	0	13:00	0.14
C115B-S	STORAGE	0.00	0.14	81.54	0	13:00	0.14
C201AA-S	STORAGE	0.01	0.32	79.02	0	13:00	0.32
C201AB-S	STORAGE	0.01	0.32	79.02	0	13:00	0.32
C201BA-S	STORAGE	0.01	0.32	79.72	0	13:00	0.32
C201BB-S	STORAGE	0.01	0.32	79.72	0	13:00	0.32
C201BC-S	STORAGE	0.01	0.25	79.65	0	13:00	0.25
C202B-S	STORAGE	0.01	0.24	79.64	0	13:00	0.24
C202C-S	STORAGE	0.01	0.24	79.64	0	13:00	0.24
C203B-S	STORAGE	0.01	0.22	81.47	0	13:00	0.22
C203C-S	STORAGE	0.01	0.24	80.94	0	13:00	0.24
EXT1-S	STORAGE	0.18	1.43	80.43	0	14:04	1.43
L103C-S	STORAGE	0.00	0.13	80.33	0	13:00	0.13
L110A-S	STORAGE	0.00	0.18	86.93	0	13:00	0.18
L116A-S	STORAGE	0.00	0.13	82.13	0	13:00	0.13
POND_2	STORAGE	0.08	0.24	79.74	0	15:16	0.24

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
300a	JUNCTION	0.00	0.00	0 00:00	0	0	0.000 ltr
CUL-1	JUNCTION	0.00	2.76	0 13:34	0	0.0742	0.002
CUL-2	JUNCTION	0.00	2.75	0 13:39	0	0.0742	0.019
T3-A	JUNCTION	14.40	14.40	0 13:00	0.067	0.067	0.397
T3-B	JUNCTION	0.96	2.90	0 13:24	0.00758	0.0743	0.052
T3-C	JUNCTION	0.07	3.02	0 13:53	0.00229	0.0765	0.448
T3-D	JUNCTION	0.00	1.68	0 15:22	0	0.0762	0.119

T3-E	JUNCTION	0.00	2.06	0	15:42	0	0.0761	0.543	
T3-F	JUNCTION	0.00	1.37	0	17:26	0	0.0757	0.020	
HWL-146	OUTFALL	0.00	28.68	0	15:22	0	2.07	0.000	
HWL-200	OUTFALL	0.00	146.16	0	13:00	0	1.16	0.000	
HWL-300	OUTFALL	0.00	33.56	0	13:03	0	0.791	0.000	
P2-T3	OUTFALL	0.00	1.37	0	17:28	0	0.0757	0.000	
Pond-Escape	OUTFALL	0.00	0.00	0	00:00	0	0	0.000	ltr
100	STORAGE	0.00	207.41	0	13:00	0	1.67	0.048	
100C	STORAGE	0.00	58.59	0	13:01	0	0.396	-0.134	
101	STORAGE	0.00	208.02	0	13:00	0	1.67	0.035	
102	STORAGE	0.00	74.92	0	13:00	0	0.597	0.030	
103	STORAGE	5.89	74.92	0	13:00	0.0466	0.597	-0.027	
104	STORAGE	0.00	133.76	0	13:01	0	1.08	0.046	
105	STORAGE	0.00	134.38	0	13:00	0	1.08	0.061	
106	STORAGE	0.00	134.64	0	13:00	0	1.08	-0.050	
107	STORAGE	5.70	134.72	0	13:00	0.0451	1.08	0.055	
108	STORAGE	0.00	26.63	0	13:00	0	0.211	-0.002	
109	STORAGE	11.98	26.63	0	13:00	0.0949	0.211	-0.001	
110	STORAGE	0.00	14.65	0	13:00	0	0.116	0.001	
111	STORAGE	0.00	102.60	0	13:00	0	0.821	0.001	
112	STORAGE	0.00	102.60	0	13:00	0	0.821	-0.002	
113	STORAGE	5.90	102.81	0	13:00	0.0467	0.822	0.030	
114	STORAGE	12.36	97.16	0	13:00	0.0979	0.775	-0.033	
115	STORAGE	23.11	64.51	0	13:00	0.185	0.513	-0.006	
116	STORAGE	0.00	21.56	0	13:00	0	0.171	0.000	
117	STORAGE	14.84	14.84	0	13:00	0.117	0.117	-0.003	
147	STORAGE	1.33	28.68	0	15:20	0.0105	2.08	0.044	
148	STORAGE	0.00	20.78	0	15:19	0	1.71	0.004	
149	STORAGE	0.00	20.78	0	15:17	0	1.71	0.018	
150	STORAGE	0.00	20.78	0	15:16	0	1.71	0.006	
201	STORAGE	0.00	146.16	0	13:00	0	1.16	-0.002	
201A	STORAGE	0.00	146.16	0	13:00	0	1.16	-0.003	
201B	STORAGE	0.00	36.07	0	13:00	0	0.286	-0.003	
202	STORAGE	4.95	93.22	0	13:00	0.0391	0.738	-0.002	
203	STORAGE	5.33	66.54	0	13:00	0.0422	0.527	0.001	
301	STORAGE	0.00	33.56	0	13:03	0	0.791	-0.000	
302	STORAGE	0.00	33.83	0	13:02	0	0.791	-0.002	
303X	STORAGE	0.00	33.83	0	13:01	0	0.791	-0.000	
304	STORAGE	0.00	34.03	0	13:01	0	0.791	-0.001	
305	STORAGE	0.00	34.09	0	13:00	0	0.791	-0.000	
306	STORAGE	0.00	31.21	0	13:00	0	0.247	-0.001	
307	STORAGE	31.21	31.21	0	13:00	0.247	0.247	-0.003	
308	STORAGE	23.66	23.66	0	15:05	0.544	0.544	-0.000	
C103B-S	STORAGE	32.21	32.21	0	13:00	0.255	0.255	-0.002	
C114B-S	STORAGE	20.68	20.68	0	13:00	0.164	0.164	-0.002	
C115B-S	STORAGE	19.84	19.84	0	13:00	0.157	0.157	-0.002	
C201AA-S	STORAGE	7.19	7.19	0	13:00	0.0569	0.0569	-0.001	
C201AB-S	STORAGE	9.67	9.67	0	13:00	0.0766	0.0766	-0.001	
C201BA-S	STORAGE	5.25	5.25	0	13:00	0.0416	0.0416	-0.001	
C201BB-S	STORAGE	7.19	7.19	0	13:00	0.0569	0.0569	-0.001	
C201BC-S	STORAGE	23.64	23.64	0	13:00	0.187	0.187	-0.001	

C202B-S	STORAGE	10.34	10.34	0	13:00	0.0819	0.0819	-0.001
C202C-S	STORAGE	11.40	11.40	0	13:00	0.0902	0.0902	-0.001
C203B-S	STORAGE	38.42	38.42	0	13:00	0.304	0.304	-0.003
C203C-S	STORAGE	22.79	22.79	0	13:00	0.18	0.18	-0.001
EXT1-S	STORAGE	45.24	45.24	0	13:00	0.358	0.358	-0.095
L103C-S	STORAGE	36.82	36.82	0	13:00	0.295	0.295	-0.004
L110A-S	STORAGE	14.65	14.65	0	13:00	0.116	0.116	-0.002
L116A-S	STORAGE	6.72	6.72	0	13:00	0.0532	0.0532	-0.002
POND_2	STORAGE	20.45	226.61	0	13:00	0.162	1.83	0.026

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Node Surcharge Summary
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No nodes were surcharged.

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Node Flooding Summary
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No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days	hr:min	Maximum Outflow LPS
100	0.000	14	0	0	0.001	21	0	15:15	206.66
100C	0.000	3	0	0	0.000	10	0	15:17	58.30
101	0.000	11	0	0	0.001	17	0	15:17	207.41
102	0.000	1	0	0	0.000	7	0	13:00	74.91
103	0.000	1	0	0	0.000	11	0	13:00	74.92
104	0.000	6	0	0	0.000	12	0	15:17	133.62
105	0.000	4	0	0	0.000	9	0	13:01	133.76
106	0.000	2	0	0	0.000	7	0	13:01	134.38
107	0.000	1	0	0	0.000	6	0	13:00	134.64
108	0.000	0	0	0	0.000	2	0	13:00	26.63
109	0.000	0	0	0	0.000	2	0	13:00	26.63
110	0.000	0	0	0	0.000	2	0	13:00	14.65
111	0.000	0	0	0	0.000	5	0	13:01	102.58
112	0.000	0	0	0	0.000	5	0	13:00	102.60
113	0.000	0	0	0	0.000	4	0	13:00	102.60
114	0.000	0	0	0	0.000	5	0	13:00	96.94
115	0.000	0	0	0	0.000	4	0	13:00	64.15

116	0.000	0	0	0	0.000	3	0	13:00	21.56
117	0.000	0	0	0	0.000	3	0	13:00	14.84
147	0.000	4	0	0	0.000	10	0	15:21	28.68
148	0.000	2	0	0	0.000	5	0	15:20	20.78
149	0.000	3	0	0	0.000	8	0	15:18	20.78
150	0.000	4	0	0	0.000	9	0	15:17	20.78
201	0.000	1	0	0	0.000	12	0	13:00	146.16
201A	0.000	1	0	0	0.000	8	0	13:00	146.16
201B	0.000	0	0	0	0.000	7	0	13:00	36.07
202	0.000	0	0	0	0.000	4	0	13:00	93.22
203	0.000	0	0	0	0.000	3	0	13:00	66.54
301	0.000	1	0	0	0.000	4	0	13:03	33.56
302	0.000	1	0	0	0.000	5	0	13:03	33.56
303X	0.000	0	0	0	0.000	3	0	13:01	33.83
304	0.000	0	0	0	0.000	2	0	13:01	33.83
305	0.000	0	0	0	0.000	2	0	13:00	34.03
306	0.000	0	0	0	0.000	2	0	13:00	31.21
307	0.000	0	0	0	0.000	2	0	13:00	31.21
308	0.000	0	0	0	0.000	2	0	15:06	23.66
C103B-S	0.000	0	0	0	0.000	0	0	13:00	32.21
C114B-S	0.000	0	0	0	0.000	0	0	13:00	20.68
C115B-S	0.000	0	0	0	0.000	0	0	13:00	19.84
C201AA-S	0.000	0	0	0	0.000	0	0	13:00	7.19
C201AB-S	0.000	0	0	0	0.000	0	0	13:00	9.67
C201BA-S	0.000	0	0	0	0.000	0	0	13:00	5.25
C201BB-S	0.000	0	0	0	0.000	0	0	13:00	7.19
C201BC-S	0.000	0	0	0	0.000	0	0	13:00	23.64
C202B-S	0.000	0	0	0	0.000	0	0	13:00	10.34
C202C-S	0.000	0	0	0	0.000	0	0	13:00	11.40
C203B-S	0.000	0	0	0	0.000	0	0	13:00	38.42
C203C-S	0.000	0	0	0	0.000	0	0	13:00	22.79
EXT1-S	0.009	1	0	0	0.149	10	0	14:04	7.80
L103C-S	0.000	0	0	0	0.000	0	0	13:00	36.82
L110A-S	0.000	0	0	0	0.000	0	0	13:00	14.65
L116A-S	0.000	0	0	0	0.000	0	0	13:00	6.72
POND_2	0.383	3	0	0	1.215	8	0	15:16	20.78

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
HWL-146	93.81	6.40	28.68	2.074
HWL-200	23.90	14.16	146.16	1.157
HWL-300	27.98	8.21	33.56	0.791
P2-T3	52.51	0.41	1.37	0.076

Pond-Escape	0.00	0.00	0.00	0.000
System	39.64	29.18	204.04	4.098

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Link Flow Summary
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Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
100-100C	CONDUIT	58.59	0	13:01	0.74	0.02	0.12
100C-pond	CONDUIT	58.30	0	13:01	0.79	0.03	0.15
100-pond	CONDUIT	156.83	0	12:31	0.70	0.02	0.25
101-100	CONDUIT	207.41	0	13:00	0.45	0.09	0.33
102-101	CONDUIT	74.91	0	13:00	0.89	0.10	0.15
103-102	CONDUIT	74.92	0	13:00	0.69	0.08	0.18
104-101	CONDUIT	133.62	0	13:02	0.58	0.08	0.24
105-104	CONDUIT	133.76	0	13:01	0.62	0.07	0.22
106-105	CONDUIT	134.38	0	13:00	0.67	0.08	0.20
107-106	CONDUIT	134.64	0	13:00	0.76	0.09	0.18
108-107	CONDUIT	26.63	0	13:00	1.36	0.07	0.18
109-108	CONDUIT	26.63	0	13:00	1.36	0.07	0.18
110-109	CONDUIT	14.65	0	13:00	1.19	0.12	0.23
111-107	CONDUIT	102.58	0	13:01	0.97	0.06	0.15
112-111	CONDUIT	102.60	0	13:00	0.82	0.07	0.17
113-112	CONDUIT	102.60	0	13:00	0.86	0.06	0.16
114-113	CONDUIT	96.94	0	13:00	0.81	0.06	0.16
115-114	CONDUIT	64.15	0	13:00	0.82	0.05	0.15
116-115	CONDUIT	21.56	0	13:00	1.04	0.05	0.15
117-116	CONDUIT	14.84	0	13:00	0.95	0.05	0.15
147-146	CONDUIT	28.68	0	15:22	0.70	0.23	0.30
148-147	CONDUIT	20.78	0	15:20	0.68	0.16	0.25
149-148	CONDUIT	20.78	0	15:19	0.61	0.16	0.27
150-149	CONDUIT	20.78	0	15:17	0.68	0.17	0.25
201-200	CONDUIT	146.16	0	13:00	1.01	0.10	0.19
201A-201	CONDUIT	146.16	0	13:00	1.02	0.09	0.18
201B-201A	CONDUIT	36.07	0	13:00	0.68	0.08	0.18
202-201A	CONDUIT	93.22	0	13:00	1.53	0.08	0.20
203-202	CONDUIT	66.54	0	13:00	1.40	0.08	0.19
301-300	CONDUIT	33.56	0	13:03	0.70	0.03	0.10
302-301	CONDUIT	33.56	0	13:03	0.62	0.03	0.11
303X-302	CONDUIT	33.83	0	13:02	0.88	0.03	0.12
304-303X	CONDUIT	33.83	0	13:01	1.05	0.03	0.13
305-304	CONDUIT	34.03	0	13:01	1.05	0.03	0.13
306-305	CONDUIT	31.21	0	13:00	1.16	0.07	0.18
307-306	CONDUIT	31.21	0	13:00	1.13	0.07	0.18
308-305	CONDUIT	23.66	0	15:06	1.05	0.04	0.13

CUL1-2	CONDUIT	2.75	0	13:39	0.18	0.00	0.01
T3-0	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
T3-1	CONDUIT	2.66	0	13:24	0.06	0.00	0.00
T3-2	CONDUIT	2.76	0	13:34	0.05	0.00	0.01
T3-3	CONDUIT	3.02	0	13:52	0.05	0.00	0.01
T3-4	CONDUIT	1.68	0	15:22	0.04	0.00	0.00
T3-5	CONDUIT	2.06	0	15:42	0.04	0.00	0.01
T3-6	CONDUIT	1.37	0	17:26	0.04	0.00	0.00
T3-7	CONDUIT	1.37	0	17:28	0.05	0.00	0.00
Pond-OR	ORIFICE	20.78	0	15:16			1.00
OVERFLOW	WEIR	0.00	0	00:00			0.00
C103B-IC	DUMMY	32.21	0	13:00			
C114B-IC	DUMMY	20.68	0	13:00			
C115B-IC	DUMMY	19.84	0	13:00			
C201AA-IC	DUMMY	7.19	0	13:00			
C201AB-IC	DUMMY	9.67	0	13:00			
C201BA-IC	DUMMY	5.25	0	13:00			
C201BB-IC	DUMMY	7.19	0	13:00			
C201BC-IC	DUMMY	23.64	0	13:00			
C202B-IC	DUMMY	10.34	0	13:00			
C202C-IC	DUMMY	11.40	0	13:00			
C203B-IC	DUMMY	38.42	0	13:00			
C203C-IC	DUMMY	22.79	0	13:00			
EXT1-IC	DUMMY	7.80	0	12:06			
L103C-IC	DUMMY	36.82	0	13:00			
L110A-IC	DUMMY	14.65	0	13:00			
L116A-IC	DUMMY	6.72	0	13:00			

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Flow Classification Summary
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	Adjusted	----------	Fraction of Time	in Flow Class	----------				
	/Actual		Up	Down	Sub	Sup	Up	Down	Norm	Inlet
Conduit	Length	Dry	Dry	Dry	Crit	Crit	Crit	Crit	Ltd	Ctrl
100-100C	1.00	0.49	0.13	0.00	0.37	0.00	0.00	0.00	0.00	0.00
100C-pond	1.00	0.03	0.07	0.00	0.91	0.00	0.00	0.00	0.00	0.00
100-pond	1.00	0.00	0.02	0.00	0.98	0.00	0.00	0.00	0.00	0.00
101-100	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
102-101	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00
103-102	1.00	0.06	0.38	0.00	0.56	0.00	0.00	0.00	0.76	0.00
104-101	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
105-104	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.01	0.00
106-105	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.00	0.10	0.00
107-106	1.00	0.01	0.11	0.00	0.41	0.00	0.00	0.47	0.21	0.00
108-107	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00
109-108	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00
110-109	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00

111-107	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
112-111	1.00	0.01	0.35	0.00	0.64	0.00	0.00	0.00	0.80	0.00
113-112	1.00	0.57	0.00	0.00	0.00	0.00	0.00	0.43	0.00	0.00
114-113	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.19	0.00
115-114	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
116-115	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00
117-116	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00
147-146	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.00	0.00
148-147	1.00	0.07	0.00	0.00	0.09	0.00	0.00	0.84	0.00	0.00
149-148	1.00	0.06	0.00	0.00	0.91	0.00	0.00	0.03	0.00	0.00
150-149	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
201-200	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.00	0.00
201A-201	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00
201B-201A	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00
202-201A	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00
203-202	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00
301-300	1.00	0.06	0.00	0.00	0.89	0.04	0.00	0.00	0.00	0.00
302-301	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00
303X-302	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00
304-303X	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00
305-304	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00
306-305	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00
307-306	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00
308-305	1.00	0.13	0.00	0.00	0.00	0.00	0.00	0.87	0.00	0.00
CUL1-2	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.00	0.93
T3-0	1.00	0.06	0.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T3-1	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.93	0.00
T3-2	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.72	0.00
T3-3	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.86	0.00
T3-4	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00
T3-5	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.84	0.00
T3-6	1.00	0.13	0.00	0.00	0.00	0.00	0.00	0.87	0.00	0.00
T3-7	1.00	0.12	0.00	0.00	0.88	0.00	0.00	0.00	0.00	0.00

```
*************************
Conduit Surcharge Summary
*************************

No conduits were surcharged.


Analysis begun on:  Tue Jan 23 09:12:21 2024
Analysis ended on:  Tue Jan 23 09:12:24 2024
Total elapsed time: 00:00:03
```

ALTERNATIVE RUNOFF METHOD (ARM) - PCSWMM VERSION 7.5.3406

This is a new version of ARM - your feedback and suggestions are solicited.
Create a ticket, post on the PCSWMM feature request forum, or email us directly!

Simulation start time:	06/01/2023 00:00:00
Simulation end time:	06/05/2023 00:00:00
Runoff wet weather time steps:	300 seconds
Report time steps:	300 seconds
Number of data points:	1153

****
Unit Hydrographs Runoff Method
****

Subcatchment	Runoff Method	Raingage	Area (ha)	Time of Concentration (min)	Time to Peak (min)	Time after Peak (min)	Peak UH Flow ($m^3/s/mm$)	UH Depth (mm)
303	Nash IUH	SCS_2yr24hr	55.03	117.31	58.66	661.34	0.05752	0.999
311	Nash IUH	SCS_2yr24hr	0.55	11	5.5	54.5	0.00613	0.933
F115D	Nash IUH	SCS_2yr24hr	2.51	17.34	11.56	73.44	0.0196	0.998
F308B	Nash IUH	SCS_2yr24hr	22.98	148.66	99.11	575.89	0.02092	1
EXT-2	Nash IUH	SCS_2yr24hr	1.05	63.31	31.65	243.35	0.00203	0.996
312	Nash IUH	SCS_2yr24hr	1.95	50.3	25.15	219.85	0.00475	0.996
301	Nash IUH	SCS_2yr24hr	86.43	111.04	55.52	659.48	0.09545	0.999
302	Nash IUH	SCS_2yr24hr	80.69	161.19	80.6	914.4	0.06139	1

****
ARM Runoff Summary
****

Subcatchment	Total Precip (mm)	Total Losses (mm)	Total Runoff (mm)	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff (fraction)
303	48	46.737	1.262	0.695	26.849	0.026
311	48	46.555	1.349	0.007	0.945	0.028
F115D	48	35.464	12.506	0.314	41.942	0.261
F308B	48	37.528	10.47	2.406	116.959	0.218
EXT-2	48	45.196	2.793	0.029	1.967	0.058
312	48	45.975	2.017	0.039	2.393	0.042
301	48	47.295	0.705	0.609	19.075	0.015
302	48	47.247	0.752	0.607	16.626	0.016

```
WARNING ARM01: Computed UH depth for ARM subcatchment 311 is not unity. Consider reducing wet weather time step.



EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.015)
--------------------------------------------------------------

WARNING 03: negative offset ignored for Link 100-pond

*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Infiltration Method ...... HORTON
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 06/01/2023 00:00:00
Ending Date .............. 06/05/2023 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:05:00
Wet Time Step ............ 00:05:00
Dry Time Step ............ 00:05:00
Routing Time Step ........ 5.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 4
Head Tolerance ........... 0.001500 m


**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         1.430        48.000
Evaporation Loss .........         0.000         0.000
```

```
  Infiltration Loss ........         0.688        23.074
  Surface Runoff ...........         0.719        24.127
  Final Storage ............         0.025         0.845
  Continuity Error (%) .....        -0.095


  **************************        Volume        Volume
  Flow Routing Continuity        hectare-m      10^6 ltr
  **************************     ---------     ---------
  Dry Weather Inflow .......         0.000         0.000
  Wet Weather Inflow .......         0.719         7.190
  Groundwater Inflow .......         0.000         0.000
  RDII Inflow ..............         0.000         0.000
  External Inflow ..........         0.471         4.707
  External Outflow .........         1.174        11.737
  Flooding Loss ............         0.000         0.000
  Evaporation Loss .........         0.000         0.000
  Exfiltration Loss ........         0.000         0.000
  Initial Stored Volume ....         0.001         0.009
  Final Stored Volume ......         0.017         0.173
  Continuity Error (%) .....        -0.035


  ***************************
  Time-Step Critical Elements
  ***************************
  Link 102-101 (1.28%)


  ********************************
  Highest Flow Instability Indexes
  ********************************
  Link EXT1-IC (6)
  Link T3-6 (1)


  *************************
  Routing Time Step Summary
  *************************
  Minimum Time Step           :     2.00 sec
  Average Time Step           :     4.99 sec
  Maximum Time Step           :     5.00 sec
  Percent in Steady State     :     0.00
  Average Iterations per Step :     2.00
  Percent Not Converging      :     0.00
  Time Step Frequencies       :
      5.000 -  3.155 sec      :   100.00 %
      3.155 -  1.991 sec      :     0.00 %
      1.991 -  1.256 sec      :     0.00 %
      1.256 -  0.792 sec      :     0.00 %
      0.792 -  0.500 sec      :     0.00 %
```

```
***************************
Subcatchment Runoff Summary
***************************
```

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
C103A	48.00	0.00	0.00	17.28	29.74	0.00	29.74	0.09	11.32	0.620
C103B	48.00	0.00	0.00	6.72	40.01	0.00	40.01	0.50	61.83	0.833
C107A	48.00	0.00	0.00	17.28	29.74	0.00	29.74	0.09	10.95	0.620
C109A	48.00	0.00	0.00	17.28	29.77	0.00	29.77	0.19	23.00	0.620
C113A	48.00	0.00	0.00	17.28	29.75	0.00	29.75	0.09	11.32	0.620
C114A	48.00	0.00	0.00	17.28	29.77	0.00	29.77	0.19	23.74	0.620
C114B	48.00	0.00	0.00	13.92	33.03	0.00	33.03	0.32	39.70	0.688
C115A	48.00	0.00	0.00	17.28	29.76	0.00	29.76	0.19	23.00	0.620
C115B	48.00	0.00	0.00	13.92	33.03	0.00	33.03	0.31	38.08	0.688
C117A	48.00	0.00	0.00	17.28	29.77	0.00	29.77	0.07	8.40	0.620
C117B	48.00	0.00	0.00	17.28	29.77	0.00	29.77	0.16	20.08	0.620
C147A	48.00	0.00	0.00	17.28	29.72	0.00	29.72	0.02	2.56	0.619
C201AA	48.00	0.00	0.00	3.36	43.26	0.00	43.26	0.11	13.80	0.901
C201AB	48.00	0.00	0.00	3.36	43.26	0.00	43.26	0.15	18.57	0.901
C201BA	48.00	0.00	0.00	3.36	43.26	0.00	43.26	0.08	10.08	0.901
C201BB	48.00	0.00	0.00	3.36	43.26	0.00	43.26	0.11	13.80	0.901
C201BC	48.00	0.00	0.00	13.92	33.03	0.00	33.03	0.37	45.37	0.688
C202B	48.00	0.00	0.00	13.92	33.03	0.00	33.03	0.16	19.85	0.688
C202C	48.00	0.00	0.00	13.92	33.03	0.00	33.03	0.18	21.88	0.688
C203B	48.00	0.00	0.00	17.28	29.76	0.00	29.76	0.60	73.76	0.620
C203C	48.00	0.00	0.00	13.92	33.03	0.00	33.03	0.36	43.75	0.688
EXT-1	48.00	0.00	0.00	6.72	40.01	0.00	40.01	0.71	86.85	0.833
EXT-3	48.00	0.00	0.00	33.15	29.77	13.98	13.98	0.14	43.71	0.291
F112A	48.00	0.00	0.00	44.30	13.47	3.30	3.30	0.02	11.47	0.069
F307A	48.00	0.00	0.00	36.00	11.62	0.00	11.62	0.49	59.90	0.242
F308A	48.00	0.00	0.00	48.00	0.00	0.00	0.00	0.00	0.00	0.000
L103C	48.00	0.00	0.00	34.08	13.49	0.00	13.49	0.57	70.49	0.281
L110A	48.00	0.00	0.00	17.28	29.77	0.00	29.77	0.23	28.12	0.620
L115C	48.00	0.00	0.00	44.46	13.48	3.13	3.13	0.02	13.81	0.065
L116A	48.00	0.00	0.00	34.08	13.49	0.00	13.49	0.11	12.91	0.281
L202A	48.00	0.00	0.00	17.28	29.76	0.00	29.76	0.08	9.49	0.620
L203A	48.00	0.00	0.00	17.28	29.76	0.00	29.76	0.08	10.22	0.620
POND	48.00	0.00	0.00	27.36	19.98	0.00	19.98	0.32	39.25	0.416
UNC-2	48.00	0.00	0.00	37.68	9.99	0.00	9.99	0.01	1.84	0.208
UNC-3	48.00	0.00	0.00	6.72	39.95	0.00	39.95	0.06	6.87	0.832
UNC-4	48.00	0.00	0.00	48.00	0.00	0.00	0.00	0.00	0.00	0.000
UNC-5	48.00	0.00	0.00	48.00	0.00	0.00	0.00	0.00	0.00	0.000
UNC-6	48.00	0.00	0.00	48.00	0.00	0.00	0.00	0.00	0.00	0.000

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******************
Node Depth Summary
******************
```

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days	Time of Max Occurrence hr:min	Reported Max Depth Meters
300a	JUNCTION	0.00	0.03	95.38	0	16:36	0.03
CUL-1	JUNCTION	0.01	0.10	81.78	0	16:38	0.10
CUL-2	JUNCTION	0.01	0.06	81.09	0	16:40	0.06
T3-A	JUNCTION	0.01	0.05	85.05	0	16:31	0.05
T3-B	JUNCTION	0.01	0.05	82.21	0	16:36	0.05
T3-C	JUNCTION	0.02	0.11	80.63	0	17:02	0.11
T3-D	JUNCTION	0.01	0.07	79.07	0	17:06	0.07
T3-E	JUNCTION	0.02	0.11	78.24	0	17:23	0.11
T3-F	JUNCTION	0.01	0.08	77.23	0	17:24	0.08
HWL-146	OUTFALL	0.06	0.14	78.76	0	16:00	0.14
HWL-200	OUTFALL	0.02	0.28	77.57	0	12:48	0.28
HWL-300	OUTFALL	0.02	0.19	77.15	0	14:54	0.19
P2-T3	OUTFALL	0.00	0.02	76.97	0	17:24	0.02
Pond-Escape	OUTFALL	0.00	0.00	81.50	0	00:00	0.00
100	STORAGE	0.42	0.74	79.97	0	16:09	0.74
100C	STORAGE	0.13	0.45	79.97	0	16:10	0.45
101	STORAGE	0.39	0.71	79.97	0	16:09	0.71
102	STORAGE	0.05	0.25	79.97	0	16:08	0.25
103	STORAGE	0.03	0.29	80.12	0	13:00	0.29
104	STORAGE	0.22	0.54	79.97	0	16:09	0.54
105	STORAGE	0.18	0.50	79.97	0	16:09	0.50
106	STORAGE	0.14	0.45	79.97	0	16:09	0.45
107	STORAGE	0.09	0.39	79.98	0	13:00	0.39
108	STORAGE	0.01	0.11	83.02	0	13:00	0.11
109	STORAGE	0.01	0.11	83.91	0	13:00	0.11
110	STORAGE	0.01	0.10	85.43	0	13:00	0.10
111	STORAGE	0.03	0.29	80.08	0	13:00	0.29
112	STORAGE	0.03	0.31	80.14	0	13:00	0.31
113	STORAGE	0.02	0.25	80.37	0	13:00	0.25
114	STORAGE	0.02	0.32	80.69	0	13:00	0.32
115	STORAGE	0.02	0.26	81.06	0	13:00	0.26
116	STORAGE	0.01	0.11	82.09	0	13:00	0.11
117	STORAGE	0.01	0.10	82.62	0	13:00	0.10
147	STORAGE	0.09	0.19	79.12	0	16:00	0.19
148	STORAGE	0.08	0.16	79.23	0	16:13	0.16
149	STORAGE	0.08	0.16	79.56	0	16:12	0.16
150	STORAGE	0.08	0.16	79.66	0	16:11	0.16
201	STORAGE	0.02	0.33	77.72	0	12:48	0.33
201A	STORAGE	0.02	0.33	77.87	0	12:47	0.33
201B	STORAGE	0.02	0.21	78.32	0	13:00	0.21
202	STORAGE	0.01	0.20	79.51	0	12:47	0.20
203	STORAGE	0.01	0.18	80.64	0	12:46	0.18

301	STORAGE	0.03	0.22	77.21	0 14:54	0.22
302	STORAGE	0.03	0.25	77.49	0 14:53	0.25
303X	STORAGE	0.02	0.19	77.79	0 14:52	0.19
304	STORAGE	0.02	0.18	79.15	0 14:51	0.18
305	STORAGE	0.02	0.18	79.69	0 14:50	0.18
306	STORAGE	0.01	0.13	80.32	0 12:37	0.13
307	STORAGE	0.01	0.13	81.55	0 12:37	0.13
308	STORAGE	0.02	0.18	80.34	0 14:50	0.18
C103B-S	STORAGE	0.01	0.28	81.43	0 13:00	0.28
C114B-S	STORAGE	0.01	0.26	81.26	0 13:00	0.26
C115B-S	STORAGE	0.01	0.26	81.66	0 13:00	0.26
C201AA-S	STORAGE	0.02	0.62	79.32	0 13:00	0.62
C201AB-S	STORAGE	0.02	0.62	79.32	0 13:00	0.62
C201BA-S	STORAGE	0.02	0.62	80.02	0 13:00	0.62
C201BB-S	STORAGE	0.02	0.62	80.02	0 13:00	0.62
C201BC-S	STORAGE	0.01	0.47	79.87	0 13:00	0.47
C202B-S	STORAGE	0.01	0.47	79.87	0 13:00	0.47
C202C-S	STORAGE	0.01	0.47	79.87	0 13:00	0.47
C203B-S	STORAGE	0.01	0.42	81.67	0 13:00	0.42
C203C-S	STORAGE	0.01	0.47	81.17	0 13:00	0.47
EXT1-S	STORAGE	0.39	1.62	80.62	0 15:04	1.62
L103C-S	STORAGE	0.01	0.26	80.46	0 13:00	0.26
L110A-S	STORAGE	0.01	0.35	87.10	0 13:00	0.35
L116A-S	STORAGE	0.01	0.25	82.25	0 13:00	0.25
POND_2	STORAGE	0.15	0.47	79.97	0 16:11	0.47

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
300a	JUNCTION	35.12	35.12	0 15:55	1.22	1.22	0.043
CUL-1	JUNCTION	0.00	56.15	0 16:36	0	2.13	0.000
CUL-2	JUNCTION	0.00	56.15	0 16:38	0	2.13	-0.002
T3-A	JUNCTION	56.88	57.49	0 15:55	0.898	2.11	0.008
T3-B	JUNCTION	1.84	56.17	0 16:32	0.015	2.13	0.005
T3-C	JUNCTION	2.39	56.98	0 16:39	0.0393	2.17	0.030
T3-D	JUNCTION	0.00	56.46	0 17:02	0	2.17	-0.002
T3-E	JUNCTION	0.00	56.45	0 17:06	0	2.17	0.036
T3-F	JUNCTION	0.00	56.16	0 17:23	0	2.17	0.001
HWL-146	OUTFALL	0.00	42.20	0 16:00	0	4.39	0.000
HWL-200	OUTFALL	0.00	280.56	0 12:48	0	2.29	0.000
HWL-300	OUTFALL	0.00	123.63	0 14:54	0	2.89	0.000
P2-T3	OUTFALL	0.00	56.16	0 17:24	0	2.17	0.000
Pond-Escape	OUTFALL	0.00	0.00	0 00:00	0	0	0.000 ltr

100	STORAGE	0.00	438.52	0	13:00	0	3.5	0.020
100C	STORAGE	0.00	200.85	0	13:01	0	1.35	-0.055
101	STORAGE	0.00	440.44	0	13:00	0	3.5	0.004
102	STORAGE	0.00	145.00	0	13:00	0	1.2	0.138
103	STORAGE	11.32	145.03	0	13:00	0.0922	1.2	-0.081
104	STORAGE	0.00	298.04	0	13:01	0	2.3	0.027
105	STORAGE	0.00	300.47	0	13:00	0	2.3	0.035
106	STORAGE	0.00	301.62	0	13:00	0	2.3	-0.165
107	STORAGE	10.95	302.17	0	13:00	0.0892	2.3	-0.046
108	STORAGE	0.00	51.12	0	13:00	0	0.417	-0.002
109	STORAGE	23.00	51.12	0	13:00	0.188	0.417	-0.001
110	STORAGE	0.00	28.12	0	13:00	0	0.229	0.000
111	STORAGE	0.00	240.93	0	13:00	0	1.79	0.090
112	STORAGE	11.47	240.86	0	13:00	0.0152	1.79	-0.008
113	STORAGE	11.32	230.51	0	13:00	0.0922	1.78	0.018
114	STORAGE	23.74	220.12	0	13:00	0.193	1.68	-0.020
115	STORAGE	78.74	158.21	0	13:00	0.52	1.17	-0.005
116	STORAGE	0.00	41.39	0	13:00	0	0.337	-0.000
117	STORAGE	28.48	28.48	0	13:00	0.232	0.232	-0.002
147	STORAGE	2.56	42.20	0	16:00	0.0208	4.39	0.036
148	STORAGE	0.00	34.22	0	16:13	0	3.66	0.002
149	STORAGE	0.00	34.22	0	16:11	0	3.66	0.010
150	STORAGE	0.00	34.22	0	16:11	0	3.66	0.005
201	STORAGE	0.00	280.56	0	12:48	0	2.29	-0.002
201A	STORAGE	0.00	280.56	0	12:47	0	2.29	-0.003
201B	STORAGE	0.00	69.25	0	13:00	0	0.565	-0.003
202	STORAGE	9.49	178.95	0	12:46	0.0774	1.46	-0.002
203	STORAGE	10.22	127.73	0	12:45	0.0833	1.04	-0.000
301	STORAGE	0.00	123.63	0	14:54	0	2.89	-0.000
302	STORAGE	0.00	123.64	0	14:52	0	2.89	-0.001
303X	STORAGE	0.00	123.64	0	14:52	0	2.89	-0.000
304	STORAGE	0.00	123.66	0	14:51	0	2.89	-0.000
305	STORAGE	0.00	123.66	0	14:50	0	2.89	-0.000
306	STORAGE	0.00	59.90	0	12:37	0	0.488	-0.001
307	STORAGE	59.90	59.90	0	12:35	0.488	0.488	-0.003
308	STORAGE	116.96	116.96	0	14:50	2.41	2.41	0.000
C103B-S	STORAGE	61.83	61.83	0	13:00	0.504	0.504	-0.002
C114B-S	STORAGE	39.70	39.70	0	13:00	0.324	0.324	-0.002
C115B-S	STORAGE	38.08	38.08	0	13:00	0.31	0.31	-0.002
C201AA-S	STORAGE	13.80	13.80	0	13:00	0.112	0.112	-0.001
C201AB-S	STORAGE	18.57	18.57	0	13:00	0.151	0.151	-0.001
C201BA-S	STORAGE	10.08	10.08	0	13:00	0.0822	0.0822	-0.001
C201BB-S	STORAGE	13.80	13.80	0	13:00	0.112	0.112	-0.001
C201BC-S	STORAGE	45.37	45.37	0	13:00	0.37	0.37	-0.001
C202B-S	STORAGE	19.85	19.85	0	13:00	0.162	0.162	-0.001
C202C-S	STORAGE	21.88	21.88	0	13:00	0.178	0.178	-0.001
C203B-S	STORAGE	73.76	73.76	0	13:00	0.601	0.601	-0.002
C203C-S	STORAGE	43.75	43.75	0	13:00	0.357	0.357	-0.001
EXT1-S	STORAGE	86.85	86.85	0	13:00	0.708	0.708	-0.152
L103C-S	STORAGE	71.90	71.90	0	13:00	0.604	0.604	-0.002
L110A-S	STORAGE	28.12	28.12	0	13:00	0.229	0.229	-0.002

L116A-S	STORAGE	12.91	12.91	0	13:00	0.105	0.105	-0.002
POND_2	STORAGE	39.25	472.61	0	13:00	0.32	3.82	0.021

```
**********************
Node Surcharge Summary
**********************
```

No nodes were surcharged.

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*********************
Node Flooding Summary
*********************
```

No nodes were flooded.

```
**********************
Storage Volume Summary
**********************
```

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days	hr:min	Maximum Outflow LPS
100	0.000	18	0	0	0.001	31	0	16:09	436.01
100C	0.000	6	0	0	0.001	21	0	16:10	199.38
101	0.000	14	0	0	0.001	26	0	16:09	438.52
102	0.000	2	0	0	0.000	11	0	16:08	144.97
103	0.000	1	0	0	0.000	15	0	13:00	145.00
104	0.000	9	0	0	0.001	21	0	16:09	297.08
105	0.000	6	0	0	0.001	16	0	16:09	298.04
106	0.000	4	0	0	0.001	12	0	16:09	300.47
107	0.000	2	0	0	0.000	9	0	13:00	301.62
108	0.000	0	0	0	0.000	3	0	13:00	51.12
109	0.000	0	0	0	0.000	2	0	13:00	51.12
110	0.000	0	0	0	0.000	3	0	13:00	28.12
111	0.000	1	0	0	0.000	7	0	13:00	240.90
112	0.000	1	0	0	0.000	7	0	13:00	240.93
113	0.000	0	0	0	0.000	6	0	13:00	229.83
114	0.000	0	0	0	0.000	8	0	13:00	219.41
115	0.000	0	0	0	0.000	6	0	13:00	156.94
116	0.000	0	0	0	0.000	4	0	13:00	41.39
117	0.000	0	0	0	0.000	4	0	13:00	28.48
147	0.000	6	0	0	0.000	12	0	16:00	42.20
148	0.000	3	0	0	0.000	6	0	16:13	34.22
149	0.000	5	0	0	0.000	10	0	16:12	34.22
150	0.000	6	0	0	0.000	12	0	16:11	34.22
201	0.000	1	0	0	0.000	16	0	12:48	280.56

201A	0.000	1	0	0	0.000	11	0	12:47	280.56
201B	0.000	1	0	0	0.000	9	0	13:00	69.25
202	0.000	0	0	0	0.000	6	0	12:47	178.95
203	0.000	0	0	0	0.000	4	0	12:46	127.73
301	0.000	1	0	0	0.000	8	0	14:54	123.63
302	0.000	1	0	0	0.000	8	0	14:53	123.63
303X	0.000	1	0	0	0.000	6	0	14:52	123.64
304	0.000	0	0	0	0.000	4	0	14:51	123.64
305	0.000	0	0	0	0.000	3	0	14:50	123.66
306	0.000	0	0	0	0.000	3	0	12:37	59.90
307	0.000	0	0	0	0.000	3	0	12:37	59.90
308	0.000	0	0	0	0.000	4	0	14:50	116.95
C103B-S	0.000	0	0	0	0.000	0	0	13:00	61.83
C114B-S	0.000	0	0	0	0.000	0	0	13:00	39.70
C115B-S	0.000	0	0	0	0.000	0	0	13:00	38.08
C201AA-S	0.000	0	0	0	0.001	0	0	13:00	13.80
C201AB-S	0.000	0	0	0	0.001	0	0	13:00	18.57
C201BA-S	0.000	0	0	0	0.001	0	0	13:00	10.08
C201BB-S	0.000	0	0	0	0.001	0	0	13:00	13.80
C201BC-S	0.000	0	0	0	0.000	0	0	13:00	45.37
C202B-S	0.000	0	0	0	0.000	0	0	13:00	19.85
C202C-S	0.000	0	0	0	0.000	0	0	13:00	21.88
C203B-S	0.000	0	0	0	0.000	0	0	13:00	73.76
C203C-S	0.000	0	0	0	0.000	0	0	13:00	43.75
EXT1-S	0.048	3	0	0	0.356	25	0	15:04	7.80
L103C-S	0.000	0	0	0	0.000	0	0	13:00	71.90
L110A-S	0.000	0	0	0	0.000	0	0	13:00	28.12
L116A-S	0.000	0	0	0	0.000	0	0	13:00	12.91
POND_2	0.779	5	0	0	2.550	17	0	16:11	34.22

```
***********************
Outfall Loading Summary
***********************
```

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
HWL-146	95.92	13.28	42.20	4.389
HWL-200	26.31	27.52	280.56	2.287
HWL-300	31.50	27.00	123.63	2.894
P2-T3	69.88	8.94	56.16	2.166
Pond-Escape	0.00	0.00	0.00	0.000
System	44.72	76.75	401.62	11.737

```
********************
Link Flow Summary
```

****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
100-100C	CONDUIT	200.85	0	13:01	1.00	0.08	0.27
100C-pond	CONDUIT	199.38	0	13:01	1.04	0.09	0.31
100-pond	CONDUIT	257.51	0	12:26	0.80	0.03	0.40
101-100	CONDUIT	438.52	0	13:00	0.69	0.18	0.48
102-101	CONDUIT	144.97	0	13:00	1.09	0.19	0.24
103-102	CONDUIT	145.00	0	13:00	0.86	0.16	0.25
104-101	CONDUIT	297.08	0	13:01	0.77	0.18	0.41
105-104	CONDUIT	298.04	0	13:01	0.80	0.16	0.38
106-105	CONDUIT	300.47	0	13:00	0.83	0.17	0.35
107-106	CONDUIT	301.62	0	13:00	0.91	0.19	0.30
108-107	CONDUIT	51.12	0	13:00	1.64	0.14	0.25
109-108	CONDUIT	51.12	0	13:00	1.64	0.14	0.25
110-109	CONDUIT	28.12	0	13:00	1.44	0.22	0.32
111-107	CONDUIT	240.90	0	13:01	1.24	0.15	0.23
112-111	CONDUIT	240.93	0	13:00	1.09	0.17	0.25
113-112	CONDUIT	229.83	0	13:00	1.12	0.14	0.25
114-113	CONDUIT	219.41	0	13:00	1.07	0.15	0.24
115-114	CONDUIT	156.94	0	13:00	1.07	0.13	0.23
116-115	CONDUIT	41.39	0	13:00	1.26	0.10	0.21
117-116	CONDUIT	28.48	0	13:00	1.15	0.10	0.21
147-146	CONDUIT	42.20	0	16:00	0.79	0.34	0.37
148-147	CONDUIT	34.22	0	16:13	0.77	0.26	0.32
149-148	CONDUIT	34.22	0	16:13	0.70	0.27	0.35
150-149	CONDUIT	34.22	0	16:11	0.75	0.28	0.33
201-200	CONDUIT	280.56	0	12:48	1.23	0.18	0.26
201A-201	CONDUIT	280.56	0	12:48	1.24	0.18	0.25
201B-201A	CONDUIT	69.25	0	13:00	0.84	0.16	0.24
202-201A	CONDUIT	178.95	0	12:47	1.84	0.16	0.27
203-202	CONDUIT	127.73	0	12:47	1.70	0.15	0.26
301-300	CONDUIT	123.63	0	14:54	1.04	0.12	0.20
302-301	CONDUIT	123.63	0	14:54	0.93	0.12	0.21
303X-302	CONDUIT	123.64	0	14:52	1.29	0.12	0.23
304-303X	CONDUIT	123.64	0	14:52	1.53	0.12	0.24
305-304	CONDUIT	123.66	0	14:51	1.54	0.12	0.24
306-305	CONDUIT	59.90	0	12:37	1.40	0.14	0.25
307-306	CONDUIT	59.90	0	12:37	1.37	0.14	0.26
308-305	CONDUIT	116.95	0	14:50	1.67	0.19	0.30
CUL1-2	CONDUIT	56.15	0	16:38	0.58	0.01	0.04
T3-0	CONDUIT	34.41	0	16:36	0.16	0.00	0.02
T3-1	CONDUIT	56.05	0	16:32	0.21	0.00	0.03
T3-2	CONDUIT	56.15	0	16:36	0.15	0.00	0.04
T3-3	CONDUIT	56.14	0	16:40	0.13	0.00	0.04
T3-4	CONDUIT	56.46	0	17:02	0.16	0.00	0.03
T3-5	CONDUIT	56.45	0	17:06	0.12	0.00	0.05

T3-6	CONDUIT	56.16	0	17:23	0.16	0.00	0.03
T3-7	CONDUIT	56.16	0	17:24	0.22	0.00	0.02
Pond-OR	ORIFICE	34.22	0	16:11			1.00
OVERFLOW	WEIR	0.00	0	00:00			0.00
C103B-IC	DUMMY	61.83	0	13:00			
C114B-IC	DUMMY	39.70	0	13:00			
C115B-IC	DUMMY	38.08	0	13:00			
C201AA-IC	DUMMY	13.80	0	13:00			
C201AB-IC	DUMMY	18.57	0	13:00			
C201BA-IC	DUMMY	10.08	0	13:00			
C201BB-IC	DUMMY	13.80	0	13:00			
C201BC-IC	DUMMY	45.37	0	13:00			
C202B-IC	DUMMY	19.85	0	13:00			
C202C-IC	DUMMY	21.88	0	13:00			
C203B-IC	DUMMY	73.76	0	13:00			
C203C-IC	DUMMY	43.75	0	13:00			
EXT1-IC	DUMMY	7.80	0	11:35			
L103C-IC	DUMMY	71.90	0	13:00			
L110A-IC	DUMMY	28.12	0	13:00			
L116A-IC	DUMMY	12.91	0	13:00			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
		---------- Fraction of Time in Flow Class ----------								
100-100C	1.00	0.30	0.14	0.00	0.56	0.00	0.00	0.00	0.01	0.00
100C-pond	1.00	0.02	0.04	0.00	0.94	0.00	0.00	0.00	0.00	0.00
100-pond	1.00	0.00	0.02	0.00	0.98	0.00	0.00	0.00	0.00	0.00
101-100	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
102-101	1.00	0.04	0.00	0.00	0.26	0.00	0.00	0.70	0.01	0.00
103-102	1.00	0.04	0.36	0.00	0.60	0.00	0.00	0.00	0.71	0.00
104-101	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
105-104	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.01	0.00
106-105	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.00	0.07	0.00
107-106	1.00	0.01	0.17	0.00	0.51	0.00	0.00	0.30	0.21	0.00
108-107	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00
109-108	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00
110-109	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00
111-107	1.00	0.01	0.00	0.00	0.23	0.00	0.00	0.75	0.04	0.00
112-111	1.00	0.01	0.36	0.00	0.63	0.00	0.00	0.00	0.69	0.00
113-112	1.00	0.57	0.00	0.00	0.00	0.00	0.00	0.43	0.00	0.00
114-113	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.09	0.00
115-114	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
116-115	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00
117-116	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00

147-146	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.00	0.00
148-147	1.00	0.04	0.00	0.00	0.22	0.00	0.00	0.74	0.00	0.00
149-148	1.00	0.04	0.00	0.00	0.94	0.00	0.00	0.02	0.00	0.00
150-149	1.00	0.03	0.00	0.00	0.24	0.00	0.00	0.73	0.00	0.00
201-200	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.00	0.00
201A-201	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00
201B-201A	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00
202-201A	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00
203-202	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00
301-300	1.00	0.04	0.00	0.00	0.94	0.02	0.00	0.00	0.00	0.00
302-301	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00
303X-302	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00
304-303X	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00
305-304	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00
306-305	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00
307-306	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00
308-305	1.00	0.11	0.00	0.00	0.00	0.00	0.00	0.89	0.00	0.00
CUL1-2	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.00	0.95
T3-0	1.00	0.04	0.10	0.00	0.86	0.00	0.00	0.00	0.87	0.00
T3-1	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.92	0.00
T3-2	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.94	0.00
T3-3	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.86	0.00
T3-4	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00
T3-5	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.85	0.00
T3-6	1.00	0.10	0.00	0.00	0.00	0.00	0.00	0.90	0.00	0.00
T3-7	1.00	0.09	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00

```
*************************
Conduit Surcharge Summary
*************************

No conduits were surcharged.


Analysis begun on:  Tue Jan 23 09:06:18 2024
Analysis ended on:  Tue Jan 23 09:06:21 2024
Total elapsed time: 00:00:03
```

Design Storm: 62.4 mm (5-Year) 24-Hour SCS

```
ALTERNATIVE RUNOFF METHOD (ARM) - PCSWMM VERSION 7.5.3406
---------------------------------------------------------

This is a new version of ARM - your feedback and suggestions are solicited.
Create a ticket, post on the PCSWMM feature request forum, or email us directly!

Simulation start time:                  06/01/2023 00:00:00
```

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Simulation end time:                06/05/2023 00:00:00
Runoff wet weather time steps:      300 seconds
Report time steps:                  300 seconds
Number of data points:              1153
```

****
Unit Hydrographs Runoff Method
****

Subcatchment	Runoff Method	Raingage	Area (ha)	Time of Concentration (min)	Time to Peak (min)	Time after Peak (min)	Peak UH Flow (m³/s/mm)	UH Depth (mm)
303	Nash IUH	SCS_5yr24hr	55.03	117.31	58.66	661.34	0.05752	0.999
311	Nash IUH	SCS_5yr24hr	0.55	11	5.5	54.5	0.00613	0.933
F115D	Nash IUH	SCS_5yr24hr	2.51	17.34	11.56	73.44	0.0196	0.998
F308B	Nash IUH	SCS_5yr24hr	22.98	148.66	99.11	575.89	0.02092	1
EXT-2	Nash IUH	SCS_5yr24hr	1.05	63.31	31.65	243.35	0.00203	0.996
312	Nash IUH	SCS_5yr24hr	1.95	50.3	25.15	219.85	0.00475	0.996
301	Nash IUH	SCS_5yr24hr	86.43	111.04	55.52	659.48	0.09545	0.999
302	Nash IUH	SCS_5yr24hr	80.69	161.19	80.6	914.4	0.06139	1

****
ARM Runoff Summary
****

Subcatchment	Total Precip (mm)	Total Losses (mm)	Total Runoff (mm)	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff (fraction)
303	62.42	59.587	2.831	1.558	67.64	0.045
311	62.42	59.323	2.891	0.016	2.228	0.046
F115D	62.42	42.397	19.976	0.501	67.986	0.32
F308B	62.42	44.864	17.554	4.034	200.904	0.281
EXT-2	62.42	57.215	5.184	0.054	3.83	0.083
312	62.42	58.12	4.283	0.084	5.934	0.069
301	62.42	60.444	1.974	1.706	66.486	0.032
302	62.42	60.367	2.052	1.656	53.306	0.033

WARNING ARM01: Computed UH depth for ARM subcatchment 311 is not unity. Consider reducing wet weather time step.

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.015)

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

  WARNING 03: negative offset ignored for Link 100-pond

  *********************************************************
  NOTE: The summary statistics displayed in this report are
  based on results found at every computational time step,
  not just on results from each reporting time step.
  *********************************************************

  ****************
  Analysis Options
  ****************
  Flow Units ............... LPS
  Process Models:
    Rainfall/Runoff ........ YES
    RDII ................... NO
    Snowmelt ............... NO
    Groundwater ............ NO
    Flow Routing ........... YES
    Ponding Allowed ........ NO
    Water Quality .......... NO
  Infiltration Method ...... HORTON
  Flow Routing Method ...... DYNWAVE
  Surcharge Method ......... EXTRAN
  Starting Date ............ 06/01/2023 00:00:00
  Ending Date .............. 06/05/2023 00:00:00
  Antecedent Dry Days ...... 0.0
  Report Time Step ......... 00:05:00
  Wet Time Step ............ 00:05:00
  Dry Time Step ............ 00:05:00
  Routing Time Step ........ 5.00 sec
  Variable Time Step ....... YES
  Maximum Trials ........... 8
  Number of Threads ........ 4
  Head Tolerance ........... 0.001500 m


  **************************        Volume         Depth
  Runoff Quantity Continuity     hectare-m            mm
  **************************     ---------       -------
  Total Precipitation ......         1.860        62.420
  Evaporation Loss .........         0.000         0.000
  Infiltration Loss ........         0.859        28.824
  Surface Runoff ...........         0.978        32.834
  Final Storage ............         0.025         0.845
  Continuity Error (%) .....        -0.131


  **************************        Volume        Volume
  Flow Routing Continuity        hectare-m      10^6 ltr
```

```
  *************************     ---------     ---------
  Dry Weather Inflow .......        0.000         0.000
  Wet Weather Inflow .......        0.978         9.784
  Groundwater Inflow .......        0.000         0.000
  RDII Inflow ..............        0.000         0.000
  External Inflow ..........        0.961         9.609
  External Outflow .........        1.921        19.208
  Flooding Loss ............        0.000         0.000
  Evaporation Loss .........        0.000         0.000
  Exfiltration Loss ........        0.000         0.000
  Initial Stored Volume ....        0.001         0.009
  Final Stored Volume ......        0.020         0.201
  Continuity Error (%) .....       -0.035


  ***************************
  Time-Step Critical Elements
  ***************************
  Link 102-101 (1.42%)


  ********************************
  Highest Flow Instability Indexes
  ********************************
  Link EXT1-IC (7)


  *************************
  Routing Time Step Summary
  *************************
  Minimum Time Step           :     1.04 sec
  Average Time Step           :     4.98 sec
  Maximum Time Step           :     5.00 sec
  Percent in Steady State     :     0.00
  Average Iterations per Step :     2.00
  Percent Not Converging      :     0.00
  Time Step Frequencies       :
      5.000 -  3.155 sec      :   100.00 %
      3.155 -  1.991 sec      :     0.00 %
      1.991 -  1.256 sec      :     0.00 %
      1.256 -  0.792 sec      :     0.00 %
      0.792 -  0.500 sec      :     0.00 %


  ***************************
  Subcatchment Runoff Summary
  ***************************

  ------------------------------------------------------------------------------------------------------------------------------
                              Total      Total      Total      Total     Imperv       Perv      Total       Total     Peak   Runoff
                             Precip      Runon       Evap      Infil     Runoff     Runoff     Runoff      Runoff   Runoff    Coeff
```

Subcatchment	mm	mm	mm	mm	mm	mm	mm	10^6 ltr	LPS	
C103A	62.42	0.00	0.00	21.27	38.98	1.25	40.22	0.12	18.59	0.644
C103B	62.42	0.00	0.00	8.26	52.43	0.51	52.94	0.67	86.65	0.848
C107A	62.42	0.00	0.00	21.26	38.98	1.25	40.23	0.12	18.00	0.644
C109A	62.42	0.00	0.00	21.45	39.01	1.05	40.06	0.25	36.81	0.642
C113A	62.42	0.00	0.00	21.28	38.98	1.23	40.21	0.12	18.57	0.644
C114A	62.42	0.00	0.00	21.47	39.01	1.03	40.04	0.26	37.85	0.641
C114B	62.42	0.00	0.00	17.24	43.28	0.89	44.17	0.43	60.68	0.708
C115A	62.42	0.00	0.00	21.37	38.99	1.14	40.13	0.25	37.31	0.643
C115B	62.42	0.00	0.00	17.24	43.28	0.89	44.17	0.42	58.20	0.708
C117A	62.42	0.00	0.00	21.55	39.02	0.95	39.96	0.09	13.18	0.640
C117B	62.42	0.00	0.00	21.61	39.02	0.88	39.90	0.22	31.12	0.639
C147A	62.42	0.00	0.00	21.02	38.94	1.53	40.47	0.03	4.24	0.648
C201AA	62.42	0.00	0.00	4.10	56.70	0.28	56.98	0.15	18.60	0.913
C201AB	62.42	0.00	0.00	4.10	56.70	0.28	56.98	0.20	25.04	0.913
C201BA	62.42	0.00	0.00	4.09	56.69	0.29	56.98	0.11	13.59	0.913
C201BB	62.42	0.00	0.00	4.09	56.69	0.29	56.98	0.15	18.60	0.913
C201BC	62.42	0.00	0.00	17.24	43.28	0.89	44.17	0.49	69.34	0.708
C202B	62.42	0.00	0.00	17.24	43.28	0.89	44.17	0.22	30.34	0.708
C202C	62.42	0.00	0.00	17.24	43.28	0.89	44.17	0.24	33.43	0.708
C203B	62.42	0.00	0.00	21.92	39.01	0.56	39.57	0.80	106.42	0.634
C203C	62.42	0.00	0.00	17.24	43.28	0.89	44.17	0.48	66.87	0.708
EXT-1	62.42	0.00	0.00	8.26	52.43	0.51	52.94	0.94	121.73	0.848
EXT-3	62.42	0.00	0.00	39.91	39.02	21.69	21.69	0.22	60.95	0.347
F112A	62.42	0.00	0.00	51.09	17.66	10.97	10.97	0.05	21.62	0.176
F307A	62.42	0.00	0.00	45.62	15.23	1.22	16.45	0.69	125.74	0.263
F308A	62.42	0.00	0.00	59.15	0.00	3.38	3.38	0.01	6.49	0.054
L103C	62.42	0.00	0.00	43.80	17.68	0.52	18.20	0.78	109.62	0.292
L110A	62.42	0.00	0.00	21.62	39.02	0.87	39.89	0.31	43.43	0.639
L115C	62.42	0.00	0.00	51.27	17.66	10.78	10.78	0.06	27.43	0.173
L116A	62.42	0.00	0.00	43.25	17.67	1.09	18.76	0.15	24.63	0.301
L202A	62.42	0.00	0.00	21.38	38.99	1.13	40.12	0.10	15.38	0.643
L203A	62.42	0.00	0.00	21.37	38.99	1.14	40.13	0.11	16.58	0.643
POND	62.42	0.00	0.00	33.73	26.17	1.91	28.08	0.45	82.06	0.450
UNC-2	62.42	0.00	0.00	47.12	13.09	1.93	15.02	0.02	5.38	0.241
UNC-3	62.42	0.00	0.00	8.17	52.35	0.61	52.96	0.07	9.65	0.848
UNC-4	62.42	0.00	0.00	58.37	0.00	4.28	4.28	0.00	2.92	0.069
UNC-5	62.42	0.00	0.00	58.37	0.00	4.28	4.28	0.00	2.55	0.069
UNC-6	62.42	0.00	0.00	58.37	0.00	4.28	4.28	0.00	1.09	0.069

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Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters

300a	JUNCTION	0.01	0.06	95.41	0	15:26	0.06
CUL-1	JUNCTION	0.02	0.21	81.89	0	15:37	0.21
CUL-2	JUNCTION	0.02	0.13	81.16	0	15:38	0.13
T3-A	JUNCTION	0.01	0.10	85.10	0	15:31	0.10
T3-B	JUNCTION	0.01	0.10	82.26	0	15:36	0.10
T3-C	JUNCTION	0.03	0.21	80.73	0	15:46	0.21
T3-D	JUNCTION	0.02	0.14	79.14	0	15:54	0.14
T3-E	JUNCTION	0.03	0.21	78.34	0	16:03	0.21
T3-F	JUNCTION	0.02	0.14	77.29	0	16:03	0.14
HWL-146	OUTFALL	0.08	0.15	78.77	0	17:00	0.15
HWL-200	OUTFALL	0.02	0.34	77.63	0	13:01	0.34
HWL-300	OUTFALL	0.03	0.25	77.21	0	14:49	0.25
P2-T3	OUTFALL	0.01	0.05	77.00	0	16:03	0.05
Pond-Escape	OUTFALL	0.00	0.00	81.50	0	00:00	0.00
100	STORAGE	0.49	0.90	80.13	0	17:03	0.90
100C	STORAGE	0.20	0.61	80.13	0	17:03	0.61
101	STORAGE	0.46	0.87	80.13	0	17:00	0.87
102	STORAGE	0.09	0.41	80.13	0	17:00	0.41
103	STORAGE	0.06	0.35	80.18	0	13:00	0.35
104	STORAGE	0.29	0.70	80.13	0	17:00	0.70
105	STORAGE	0.25	0.66	80.13	0	17:00	0.66
106	STORAGE	0.20	0.61	80.13	0	17:00	0.61
107	STORAGE	0.15	0.54	80.13	0	17:00	0.54
108	STORAGE	0.01	0.14	83.05	0	13:00	0.14
109	STORAGE	0.01	0.14	83.94	0	13:00	0.14
110	STORAGE	0.01	0.12	85.45	0	13:00	0.12
111	STORAGE	0.07	0.38	80.17	0	13:01	0.38
112	STORAGE	0.06	0.40	80.23	0	13:00	0.40
113	STORAGE	0.02	0.32	80.44	0	13:00	0.32
114	STORAGE	0.03	0.40	80.77	0	13:00	0.40
115	STORAGE	0.02	0.33	81.13	0	13:00	0.33
116	STORAGE	0.01	0.14	82.12	0	13:00	0.14
117	STORAGE	0.01	0.12	82.64	0	13:00	0.12
147	STORAGE	0.11	0.21	79.14	0	17:00	0.21
148	STORAGE	0.09	0.17	79.24	0	17:02	0.17
149	STORAGE	0.09	0.18	79.58	0	17:05	0.18
150	STORAGE	0.09	0.18	79.68	0	17:03	0.18
201	STORAGE	0.03	0.40	77.79	0	13:00	0.40
201A	STORAGE	0.03	0.39	77.93	0	13:00	0.39
201B	STORAGE	0.02	0.25	78.36	0	13:00	0.25
202	STORAGE	0.02	0.25	79.56	0	13:00	0.25
203	STORAGE	0.01	0.22	80.68	0	13:00	0.22
301	STORAGE	0.03	0.28	77.27	0	14:49	0.28
302	STORAGE	0.04	0.32	77.56	0	14:49	0.32
303X	STORAGE	0.03	0.25	77.85	0	14:47	0.25
304	STORAGE	0.03	0.23	79.20	0	14:47	0.23
305	STORAGE	0.03	0.23	79.74	0	14:45	0.23
306	STORAGE	0.01	0.19	80.38	0	13:00	0.19
307	STORAGE	0.01	0.20	81.62	0	13:00	0.20
308	STORAGE	0.02	0.24	80.40	0	14:45	0.24
C103B-S	STORAGE	0.01	0.39	81.54	0	13:00	0.39

C114B-S	STORAGE	0.01	0.40	81.40	0	13:00	0.40
C115B-S	STORAGE	0.01	0.40	81.80	0	13:00	0.40
C201AA-S	STORAGE	0.02	0.83	79.53	0	13:00	0.83
C201AB-S	STORAGE	0.02	0.83	79.53	0	13:00	0.83
C201BA-S	STORAGE	0.02	0.83	80.23	0	13:00	0.83
C201BB-S	STORAGE	0.02	0.83	80.23	0	13:00	0.83
C201BC-S	STORAGE	0.02	0.72	80.12	0	13:00	0.72
C202B-S	STORAGE	0.02	0.72	80.12	0	13:00	0.72
C202C-S	STORAGE	0.02	0.72	80.12	0	13:00	0.72
C203B-S	STORAGE	0.02	0.61	81.86	0	13:00	0.61
C203C-S	STORAGE	0.02	0.72	81.42	0	13:00	0.72
EXT1-S	STORAGE	0.55	1.76	80.76	0	16:04	1.76
L103C-S	STORAGE	0.01	0.40	80.60	0	13:00	0.40
L110A-S	STORAGE	0.01	0.55	87.30	0	13:00	0.55
L116A-S	STORAGE	0.01	0.48	82.48	0	13:00	0.47
POND_2	STORAGE	0.22	0.63	80.13	0	17:03	0.63

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days	Time of Max Occurrence hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
300a	JUNCTION	118.27	118.27	0	15:05	3.36	3.36	0.030
CUL-1	JUNCTION	0.00	177.22	0	15:36	0	5.25	0.000
CUL-2	JUNCTION	0.00	177.21	0	15:37	0	5.25	-0.002
T3-A	JUNCTION	94.38	180.27	0	15:09	1.87	5.23	-0.007
T3-B	JUNCTION	5.38	177.25	0	15:33	0.0225	5.25	0.003
T3-C	JUNCTION	7.30	179.41	0	15:37	0.087	5.34	0.037
T3-D	JUNCTION	2.55	178.92	0	15:49	0.003	5.34	-0.011
T3-E	JUNCTION	1.09	178.55	0	15:54	0.00129	5.34	0.019
T3-F	JUNCTION	0.00	177.70	0	16:03	0	5.34	0.001
HWL-146	OUTFALL	0.00	49.65	0	17:00	0	6.09	0.000
HWL-200	OUTFALL	0.00	411.84	0	13:01	0	3.05	0.000
HWL-300	OUTFALL	0.00	209.61	0	14:49	0	4.73	0.000
P2-T3	OUTFALL	0.00	177.70	0	16:03	0	5.34	0.000
Pond-Escape	OUTFALL	0.00	0.00	0	00:00	0	0	0.000 ltr
100	STORAGE	0.00	682.23	0	13:00	0	4.88	0.014
100C	STORAGE	0.00	349.11	0	13:01	0	2.16	-0.039
101	STORAGE	0.00	685.51	0	13:00	0	4.86	-0.003
102	STORAGE	0.00	216.70	0	13:00	0	1.62	0.144
103	STORAGE	18.59	217.67	0	13:00	0.125	1.62	-0.083
104	STORAGE	0.00	477.54	0	13:01	0	3.25	0.023
105	STORAGE	0.00	480.83	0	13:00	0	3.25	0.029
106	STORAGE	0.00	484.64	0	13:00	0	3.24	-0.228
107	STORAGE	18.00	485.49	0	13:00	0.121	3.24	-0.078

108	STORAGE	0.00	79.82	0	13:00	0	0.559	-0.002
109	STORAGE	36.81	79.96	0	13:00	0.252	0.559	-0.001
110	STORAGE	0.00	43.35	0	13:00	0	0.307	-0.000
111	STORAGE	0.00	390.39	0	13:00	0	2.56	0.136
112	STORAGE	21.62	390.60	0	13:00	0.0505	2.56	-0.022
113	STORAGE	18.57	370.95	0	13:00	0.125	2.51	0.033
114	STORAGE	37.85	354.52	0	13:00	0.26	2.38	-0.015
115	STORAGE	132.71	259.04	0	13:00	0.818	1.69	-0.005
116	STORAGE	0.00	68.65	0	13:00	0	0.458	-0.001
117	STORAGE	44.30	44.30	0	13:00	0.311	0.311	-0.002
147	STORAGE	4.24	49.66	0	17:00	0.0283	6.09	0.026
148	STORAGE	0.00	41.64	0	17:04	0	5.13	0.003
149	STORAGE	0.00	41.64	0	17:03	0	5.13	0.010
150	STORAGE	0.00	41.64	0	17:03	0	5.13	0.004
201	STORAGE	0.00	411.80	0	13:00	0	3.05	-0.002
201A	STORAGE	0.00	412.02	0	13:00	0	3.05	-0.003
201B	STORAGE	0.00	101.48	0	13:00	0	0.751	-0.004
202	STORAGE	15.38	268.07	0	13:00	0.104	1.95	-0.002
203	STORAGE	16.58	189.73	0	13:00	0.112	1.39	-0.001
301	STORAGE	0.00	209.61	0	14:49	0	4.73	-0.000
302	STORAGE	0.00	209.63	0	14:47	0	4.73	-0.001
303X	STORAGE	0.00	209.63	0	14:47	0	4.73	-0.000
304	STORAGE	0.00	209.65	0	14:46	0	4.73	-0.000
305	STORAGE	0.00	209.65	0	14:45	0	4.73	-0.000
306	STORAGE	0.00	123.63	0	13:00	0	0.691	-0.001
307	STORAGE	125.74	125.74	0	13:00	0.691	0.691	-0.003
308	STORAGE	200.90	200.90	0	14:45	4.04	4.04	0.000
C103B-S	STORAGE	86.65	86.65	0	13:00	0.667	0.667	-0.002
C114B-S	STORAGE	60.68	60.68	0	13:00	0.433	0.433	-0.001
C115B-S	STORAGE	58.20	58.20	0	13:00	0.415	0.415	-0.001
C201AA-S	STORAGE	18.60	18.60	0	13:00	0.148	0.148	-0.001
C201AB-S	STORAGE	25.04	25.04	0	13:00	0.199	0.199	-0.001
C201BA-S	STORAGE	13.59	13.59	0	13:00	0.108	0.108	-0.001
C201BB-S	STORAGE	18.60	18.60	0	13:00	0.148	0.148	-0.001
C201BC-S	STORAGE	69.34	69.34	0	13:00	0.495	0.495	-0.001
C202B-S	STORAGE	30.34	30.34	0	13:00	0.216	0.216	-0.001
C202C-S	STORAGE	33.43	33.43	0	13:00	0.239	0.239	-0.001
C203B-S	STORAGE	106.42	106.42	0	13:00	0.799	0.799	-0.001
C203C-S	STORAGE	66.87	66.87	0	13:00	0.477	0.477	-0.001
EXT1-S	STORAGE	121.73	121.73	0	13:00	0.937	0.937	-0.121
L103C-S	STORAGE	112.54	112.54	0	13:00	0.83	0.83	-0.001
L110A-S	STORAGE	43.43	43.43	0	13:00	0.307	0.307	-0.001
L116A-S	STORAGE	24.63	24.63	0	13:00	0.146	0.146	-0.001
POND_2	STORAGE	82.06	753.91	0	13:00	0.449	5.33	0.020

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Node Surcharge Summary
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No nodes were surcharged.

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Node Flooding Summary
****

No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
100	0.001	20	0	0	0.001	38	0 17:03	678.15
100C	0.000	9	0	0	0.001	29	0 17:03	346.61
101	0.001	16	0	0	0.001	31	0 17:00	682.23
102	0.000	4	0	0	0.000	18	0 17:00	212.54
103	0.000	3	0	0	0.000	18	0 13:00	216.70
104	0.000	11	0	0	0.001	27	0 17:00	477.19
105	0.000	8	0	0	0.001	22	0 17:00	477.54
106	0.000	5	0	0	0.001	16	0 17:00	480.83
107	0.000	4	0	0	0.001	13	0 17:00	484.64
108	0.000	0	0	0	0.000	4	0 13:00	79.48
109	0.000	0	0	0	0.000	3	0 13:00	79.82
110	0.000	0	0	0	0.000	3	0 13:00	43.21
111	0.000	2	0	0	0.000	9	0 13:01	390.38
112	0.000	1	0	0	0.000	9	0 13:00	390.39
113	0.000	1	0	0	0.000	8	0 13:00	370.09
114	0.000	1	0	0	0.000	9	0 13:00	353.16
115	0.000	1	0	0	0.000	8	0 13:00	256.72
116	0.000	0	0	0	0.000	5	0 13:00	68.41
117	0.000	0	0	0	0.000	5	0 13:00	44.17
147	0.000	7	0	0	0.000	14	0 17:00	49.65
148	0.000	3	0	0	0.000	7	0 17:02	41.64
149	0.000	6	0	0	0.000	11	0 17:05	41.64
150	0.000	7	0	0	0.000	13	0 17:03	41.64
201	0.000	1	0	0	0.000	20	0 13:00	411.84
201A	0.000	1	0	0	0.000	13	0 13:00	411.80
201B	0.000	1	0	0	0.000	11	0 13:00	101.20
202	0.000	0	0	0	0.000	7	0 13:00	267.42
203	0.000	0	0	0	0.000	5	0 13:00	189.21
301	0.000	1	0	0	0.000	10	0 14:49	209.61
302	0.000	1	0	0	0.000	11	0 14:49	209.61
303X	0.000	1	0	0	0.000	8	0 14:47	209.63
304	0.000	1	0	0	0.000	5	0 14:47	209.63
305	0.000	1	0	0	0.000	4	0 14:45	209.65

306	0.000	0	0	0	0.000	4	0	13:00	123.48
307	0.000	0	0	0	0.000	4	0	13:00	123.63
308	0.000	0	0	0	0.000	5	0	14:45	200.90
C103B-S	0.000	0	0	0	0.000	0	0	13:00	86.65
C114B-S	0.000	0	0	0	0.000	0	0	13:00	60.64
C115B-S	0.000	0	0	0	0.000	0	0	13:00	58.16
C201AA-S	0.000	0	0	0	0.001	0	0	13:00	18.60
C201AB-S	0.000	0	0	0	0.001	0	0	13:00	25.04
C201BA-S	0.000	0	0	0	0.001	0	0	13:00	13.59
C201BB-S	0.000	0	0	0	0.001	0	0	13:00	18.60
C201BC-S	0.000	0	0	0	0.001	0	0	13:00	69.28
C202B-S	0.000	0	0	0	0.001	0	0	13:00	30.28
C202C-S	0.000	0	0	0	0.001	0	0	13:00	33.38
C203B-S	0.000	0	0	0	0.001	0	0	13:00	106.34
C203C-S	0.000	0	0	0	0.001	0	0	13:00	66.81
EXT1-S	0.093	6	0	0	0.513	36	0	16:04	7.80
L103C-S	0.000	0	0	0	0.000	0	0	13:00	112.43
L110A-S	0.000	0	0	0	0.001	0	0	13:00	43.35
L116A-S	0.000	0	0	0	0.000	0	0	13:00	24.48
POND_2	1.150	8	0	0	3.614	24	0	17:03	41.64

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
HWL-146	96.55	18.32	49.65	6.093
HWL-200	27.06	36.97	411.84	3.047
HWL-300	32.62	42.84	209.61	4.731
P2-T3	71.87	21.41	177.70	5.338
Pond-Escape	0.00	0.00	0.00	0.000
System	45.62	119.54	627.98	19.208

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
100-100C	CONDUIT	349.11	0 13:01	1.12	0.14	0.38
100C-pond	CONDUIT	346.61	0 13:01	1.13	0.15	0.42

100-pond	CONDUIT	329.82	0	13:00	0.82	0.04	0.51
101-100	CONDUIT	682.23	0	13:00	0.81	0.29	0.59
102-101	CONDUIT	212.54	0	13:00	1.21	0.28	0.40
103-102	CONDUIT	216.70	0	13:00	0.97	0.24	0.34
104-101	CONDUIT	477.19	0	13:02	0.85	0.29	0.53
105-104	CONDUIT	477.54	0	13:01	0.88	0.26	0.51
106-105	CONDUIT	480.83	0	13:00	0.92	0.28	0.47
107-106	CONDUIT	484.64	0	13:00	1.00	0.31	0.42
108-107	CONDUIT	79.48	0	13:00	1.86	0.21	0.31
109-108	CONDUIT	79.82	0	13:00	1.86	0.21	0.31
110-109	CONDUIT	43.21	0	13:00	1.62	0.34	0.40
111-107	CONDUIT	390.38	0	13:01	1.36	0.24	0.31
112-111	CONDUIT	390.39	0	13:00	1.22	0.27	0.33
113-112	CONDUIT	370.09	0	13:00	1.29	0.22	0.31
114-113	CONDUIT	353.16	0	13:00	1.25	0.23	0.30
115-114	CONDUIT	256.72	0	13:00	1.24	0.21	0.29
116-115	CONDUIT	68.41	0	13:00	1.45	0.16	0.27
117-116	CONDUIT	44.17	0	13:00	1.30	0.15	0.27
147-146	CONDUIT	49.65	0	17:00	0.83	0.39	0.40
148-147	CONDUIT	41.64	0	17:05	0.80	0.32	0.36
149-148	CONDUIT	41.64	0	17:04	0.74	0.33	0.38
150-149	CONDUIT	41.64	0	17:03	0.79	0.34	0.37
201-200	CONDUIT	411.84	0	13:01	1.39	0.27	0.31
201A-201	CONDUIT	411.80	0	13:00	1.40	0.27	0.31
201B-201A	CONDUIT	101.20	0	13:00	0.94	0.24	0.29
202-201A	CONDUIT	267.42	0	13:00	2.07	0.24	0.33
203-202	CONDUIT	189.21	0	13:00	1.90	0.22	0.32
301-300	CONDUIT	209.61	0	14:49	1.21	0.20	0.25
302-301	CONDUIT	209.61	0	14:49	1.10	0.20	0.27
303X-302	CONDUIT	209.63	0	14:47	1.50	0.21	0.31
304-303X	CONDUIT	209.63	0	14:47	1.78	0.21	0.31
305-304	CONDUIT	209.65	0	14:46	1.79	0.21	0.31
306-305	CONDUIT	123.48	0	13:00	1.72	0.29	0.37
307-306	CONDUIT	123.63	0	13:00	1.68	0.30	0.37
308-305	CONDUIT	200.90	0	14:45	1.94	0.33	0.39
CUL1-2	CONDUIT	177.21	0	15:37	0.88	0.02	0.09
T3-0	CONDUIT	116.52	0	15:26	0.27	0.00	0.04
T3-1	CONDUIT	177.07	0	15:33	0.32	0.00	0.05
T3-2	CONDUIT	177.22	0	15:36	0.21	0.00	0.08
T3-3	CONDUIT	177.20	0	15:38	0.19	0.01	0.09
T3-4	CONDUIT	178.92	0	15:49	0.25	0.01	0.07
T3-5	CONDUIT	178.55	0	15:54	0.18	0.01	0.09
T3-6	CONDUIT	177.70	0	16:03	0.25	0.01	0.06
T3-7	CONDUIT	177.70	0	16:03	0.35	0.00	0.05
Pond-OR	ORIFICE	41.64	0	17:03			1.00
OVERFLOW	WEIR	0.00	0	00:00			0.00
C103B-IC	DUMMY	86.65	0	13:00			
C114B-IC	DUMMY	60.64	0	13:00			
C115B-IC	DUMMY	58.16	0	13:00			
C201AA-IC	DUMMY	18.60	0	13:00			
C201AB-IC	DUMMY	25.04	0	13:00			

C201BA-IC	DUMMY	13.59	0	13:00
C201BB-IC	DUMMY	18.60	0	13:00
C201BC-IC	DUMMY	69.28	0	13:00
C202B-IC	DUMMY	30.28	0	13:00
C202C-IC	DUMMY	33.38	0	13:00
C203B-IC	DUMMY	106.34	0	13:00
C203C-IC	DUMMY	66.81	0	13:00
EXT1-IC	DUMMY	7.80	0	11:08
L103C-IC	DUMMY	112.43	0	13:00
L110A-IC	DUMMY	43.35	0	13:00
L116A-IC	DUMMY	24.48	0	13:00

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	---------- Fraction of Time in Flow Class ---------- Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
100-100C	1.00	0.20	0.13	0.00	0.67	0.00	0.00	0.00	0.02	0.00
100C-pond	1.00	0.02	0.03	0.00	0.95	0.00	0.00	0.00	0.00	0.00
100-pond	1.00	0.00	0.02	0.00	0.98	0.00	0.00	0.00	0.00	0.00
101-100	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
102-101	1.00	0.03	0.00	0.00	0.35	0.00	0.00	0.61	0.01	0.00
103-102	1.00	0.03	0.36	0.00	0.61	0.00	0.00	0.00	0.60	0.00
104-101	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
105-104	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
106-105	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.00	0.06	0.00
107-106	1.00	0.01	0.18	0.00	0.60	0.00	0.00	0.20	0.23	0.00
108-107	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
109-108	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
110-109	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
111-107	1.00	0.01	0.02	0.00	0.32	0.00	0.00	0.66	0.04	0.00
112-111	1.00	0.01	0.30	0.00	0.69	0.00	0.00	0.00	0.59	0.00
113-112	1.00	0.57	0.00	0.00	0.07	0.00	0.00	0.36	0.03	0.00
114-113	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.05	0.00
115-114	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
116-115	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
117-116	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
147-146	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.00	0.00
148-147	1.00	0.04	0.00	0.00	0.29	0.00	0.00	0.67	0.00	0.00
149-148	1.00	0.04	0.00	0.00	0.94	0.00	0.00	0.02	0.00	0.00
150-149	1.00	0.03	0.00	0.00	0.34	0.00	0.00	0.64	0.00	0.00
201-200	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.00	0.00
201A-201	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
201B-201A	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
202-201A	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
203-202	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00

301-300	1.00	0.03	0.00	0.00	0.95	0.01	0.00	0.00	0.00	0.00
302-301	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
303X-302	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
304-303X	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
305-304	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
306-305	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
307-306	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
308-305	1.00	0.09	0.00	0.00	0.00	0.00	0.00	0.91	0.00	0.00
CUL1-2	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.00	0.96
T3-0	1.00	0.03	0.10	0.00	0.87	0.00	0.00	0.00	0.87	0.00
T3-1	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.93	0.00
T3-2	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.95	0.00
T3-3	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.88	0.00
T3-4	1.00	0.04	0.00	0.00	0.01	0.00	0.00	0.96	0.00	0.00
T3-5	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.86	0.00
T3-6	1.00	0.09	0.00	0.00	0.00	0.00	0.00	0.91	0.00	0.00
T3-7	1.00	0.08	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00

```
*************************
Conduit Surcharge Summary
*************************

No conduits were surcharged.


Analysis begun on:  Tue Jan 23 09:00:50 2024
Analysis ended on:  Tue Jan 23 09:00:52 2024
Total elapsed time: 00:00:02
```

Design Storm: 100-Year 3-Hour Chicago

```
ALTERNATIVE RUNOFF METHOD (ARM) - PCSWMM VERSION 7.5.3406
---------------------------------------------------------

This is a new version of ARM - your feedback and suggestions are solicited.
Create a ticket, post on the PCSWMM feature request forum, or email us directly!

Simulation start time:                06/01/2023 00:00:00
Simulation end time:                  06/05/2023 00:00:00
Runoff wet weather time steps:        300 seconds
Report time steps:                    300 seconds
Number of data points:                1153


******************************
Unit Hydrographs Runoff Method
******************************
```

Subcatchment	Runoff Method	Raingage	Area (ha)	Time of Concentration (min)	Time to Peak (min)	Time after Peak (min)	Peak UH Flow ($m^3/s/mm$)	UH Depth (mm)
303	Nash IUH	Chicago_100yr3hr	55.03	117.31	58.66	661.34	0.05752	0.999
311	Nash IUH	Chicago_100yr3hr	0.55	11	5.5	54.5	0.00613	0.933
F115D	Nash IUH	Chicago_100yr3hr	2.51	17.34	11.56	73.44	0.0196	0.998
F308B	Nash IUH	Chicago_100yr3hr	22.98	148.66	99.11	575.89	0.02092	1
EXT-2	Nash IUH	Chicago_100yr3hr	1.05	63.31	31.65	243.35	0.00203	0.996
312	Nash IUH	Chicago_100yr3hr	1.95	50.3	25.15	219.85	0.00475	0.996
301	Nash IUH	Chicago_100yr3hr	86.43	111.04	55.52	659.48	0.09545	0.999
302	Nash IUH	Chicago_100yr3hr	80.69	161.19	80.6	914.4	0.06139	1

****
ARM Runoff Summary
****

Subcatchment	Total Precip (mm)	Total Losses (mm)	Total Runoff (mm)	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff (fraction)
303	71.677	67.532	4.141	2.279	191.677	0.058
311	71.677	67.219	4.16	0.023	7.272	0.058
F115D	71.677	46.275	25.343	0.636	214.851	0.354
F308B	71.677	48.968	22.707	5.218	417.179	0.317
EXT-2	71.677	64.588	7.06	0.074	9.573	0.098
312	71.677	65.522	6.128	0.12	17.269	0.085
301	71.677	68.572	3.103	2.682	234.149	0.043
302	71.677	68.477	3.199	2.581	175.946	0.045

WARNING ARM01: Computed UH depth for ARM subcatchment 311 is not unity. Consider reducing wet weather time step.

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.015)

WARNING 03: negative offset ignored for Link 100-pond

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

```
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Infiltration Method ...... HORTON
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 06/01/2023 00:00:00
Ending Date .............. 06/05/2023 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:05:00
Wet Time Step ............ 00:05:00
Dry Time Step ............ 00:05:00
Routing Time Step ........ 5.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 4
Head Tolerance ........... 0.001500 m


**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         2.136        71.677
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.650        21.807
Surface Runoff ...........         1.481        49.714
Final Storage ............         0.025         0.845
Continuity Error (%) .....        -0.961


**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         1.481        14.810
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         1.361        13.614
External Outflow .........         2.823        28.234
Flooding Loss ............         0.003         0.026
Evaporation Loss .........         0.000         0.000
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Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.001         0.009
Final Stored Volume ......         0.021         0.210
Continuity Error (%) .....        -0.132


***************************
Time-Step Critical Elements
***************************
Link 102-101 (4.06%)
Link T3-7 (3.94%)


********************************
Highest Flow Instability Indexes
********************************
Link L103C-IC (15)
Link 103-102 (9)
Link EXT1-IC (7)
Link 102-101 (2)
Link 101-100 (1)


*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     2.18 sec
Average Time Step           :     4.87 sec
Maximum Time Step           :     5.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.79
Percent Not Converging      :    10.05
Time Step Frequencies       :
    5.000 -  3.155 sec      :    96.11 %
    3.155 -  1.991 sec      :     3.89 %
    1.991 -  1.256 sec      :     0.00 %
    1.256 -  0.792 sec      :     0.00 %
    0.792 -  0.500 sec      :     0.00 %


***************************
Subcatchment Runoff Summary
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Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
C103A	71.68	0.00	0.00	15.89	44.92	10.86	55.78	0.17	143.63	0.778
C103B	71.68	0.00	0.00	6.17	60.49	4.29	64.78	0.82	610.40	0.904

C107A	71.68	0.00	0.00	15.89	44.92	10.88	55.81	0.17	139.14	0.779
C109A	71.68	0.00	0.00	16.04	44.97	10.39	55.35	0.35	281.35	0.772
C113A	71.68	0.00	0.00	15.90	44.92	10.83	55.75	0.17	143.42	0.778
C114A	71.68	0.00	0.00	16.06	44.98	10.34	55.32	0.36	288.79	0.772
C114B	71.68	0.00	0.00	12.88	49.91	8.47	58.37	0.57	451.62	0.814
C115A	71.68	0.00	0.00	15.96	44.94	10.59	55.53	0.35	286.99	0.775
C115B	71.68	0.00	0.00	12.88	49.91	8.47	58.37	0.55	433.18	0.814
C117A	71.68	0.00	0.00	16.15	45.01	10.15	55.17	0.13	99.78	0.770
C117B	71.68	0.00	0.00	16.22	45.04	10.02	55.06	0.30	234.05	0.768
C147A	71.68	0.00	0.00	15.77	44.94	11.68	56.63	0.04	32.87	0.790
C201AA	71.68	0.00	0.00	3.07	65.43	2.23	67.67	0.18	127.61	0.944
C201AB	71.68	0.00	0.00	3.07	65.43	2.23	67.67	0.24	171.79	0.944
C201BA	71.68	0.00	0.00	3.07	65.38	2.26	67.64	0.13	93.26	0.944
C201BB	71.68	0.00	0.00	3.07	65.38	2.26	67.64	0.18	127.62	0.944
C201BC	71.68	0.00	0.00	12.88	49.91	8.47	58.37	0.65	516.13	0.814
C202B	71.68	0.00	0.00	12.88	49.91	8.47	58.37	0.29	225.81	0.814
C202C	71.68	0.00	0.00	12.88	49.91	8.47	58.37	0.32	248.85	0.814
C203B	71.68	0.00	0.00	16.88	45.22	9.14	54.36	1.10	766.60	0.758
C203C	71.68	0.00	0.00	12.88	49.91	8.47	58.37	0.63	497.70	0.814
EXT-1	71.68	0.00	0.00	6.17	60.49	4.29	64.78	1.15	857.47	0.904
EXT-3	71.68	0.00	0.00	20.34	45.08	51.25	51.25	0.51	398.53	0.715
F112A	71.68	0.00	0.00	35.11	20.35	37.23	37.23	0.17	160.48	0.519
F307A	71.68	0.00	0.00	35.02	17.55	19.20	36.76	1.54	1097.06	0.513
F308A	71.68	0.00	0.00	44.20	0.00	29.94	29.94	0.06	75.98	0.418
L103C	71.68	0.00	0.00	36.20	20.46	14.85	35.31	1.50	830.64	0.493
L110A	71.68	0.00	0.00	16.24	45.05	9.99	55.04	0.42	326.14	0.768
L115C	71.68	0.00	0.00	35.27	20.35	36.97	36.97	0.22	191.58	0.516
L116A	71.68	0.00	0.00	33.33	20.38	17.96	38.34	0.30	206.81	0.535
L202A	71.68	0.00	0.00	15.97	44.94	10.57	55.51	0.14	118.22	0.774
L203A	71.68	0.00	0.00	15.97	44.94	10.59	55.53	0.16	127.53	0.775
POND	71.68	0.00	0.00	25.20	30.18	17.03	47.21	0.76	704.44	0.659
UNC-2	71.68	0.00	0.00	35.37	15.09	21.86	36.95	0.06	51.47	0.515
UNC-3	71.68	0.00	0.00	6.13	60.35	4.56	64.92	0.09	68.00	0.906
UNC-4	71.68	0.00	0.00	43.78	0.00	32.52	32.52	0.03	33.83	0.454
UNC-5	71.68	0.00	0.00	43.78	0.00	32.52	32.52	0.02	29.60	0.454
UNC-6	71.68	0.00	0.00	43.78	0.00	32.52	32.52	0.01	12.69	0.454

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Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
300a	JUNCTION	0.01	0.13	95.48	0 03:21	0.13
CUL-1	JUNCTION	0.03	0.46	82.14	0 03:28	0.46
CUL-2	JUNCTION	0.02	0.26	81.29	0 03:29	0.26
T3-A	JUNCTION	0.02	0.21	85.21	0 03:25	0.21

T3-B	JUNCTION	0.02	0.21	82.36	0	03:27	0.21
T3-C	JUNCTION	0.03	0.34	80.86	0	03:27	0.34
T3-D	JUNCTION	0.02	0.28	79.28	0	03:33	0.28
T3-E	JUNCTION	0.03	0.39	78.52	0	03:35	0.39
T3-F	JUNCTION	0.02	0.26	77.41	0	03:37	0.26
HWL-146	OUTFALL	0.10	0.18	78.80	0	03:10	0.18
HWL-200	OUTFALL	0.02	0.53	77.82	0	01:11	0.52
HWL-300	OUTFALL	0.03	0.52	77.48	0	01:15	0.52
P2-T3	OUTFALL	0.01	0.11	77.06	0	03:37	0.11
Pond-Escape	OUTFALL	0.00	0.00	81.50	0	00:00	0.00
100	STORAGE	0.65	1.39	80.62	0	03:16	1.39
100C	STORAGE	0.36	1.10	80.62	0	03:16	1.10
101	STORAGE	0.62	1.36	80.62	0	03:19	1.36
102	STORAGE	0.22	0.90	80.62	0	03:19	0.90
103	STORAGE	0.17	0.79	80.62	0	03:25	0.79
104	STORAGE	0.45	1.19	80.62	0	03:19	1.19
105	STORAGE	0.41	1.15	80.62	0	03:20	1.15
106	STORAGE	0.36	1.10	80.62	0	03:21	1.10
107	STORAGE	0.30	1.09	80.68	0	01:11	1.07
108	STORAGE	0.01	0.37	83.28	0	01:10	0.37
109	STORAGE	0.01	0.38	84.18	0	01:10	0.38
110	STORAGE	0.01	0.21	85.54	0	01:11	0.21
111	STORAGE	0.19	0.97	80.76	0	01:11	0.94
112	STORAGE	0.18	1.01	80.84	0	01:11	0.98
113	STORAGE	0.08	0.78	80.90	0	01:11	0.75
114	STORAGE	0.03	0.94	81.31	0	01:10	0.92
115	STORAGE	0.02	0.80	81.60	0	01:10	0.79
116	STORAGE	0.01	0.39	82.37	0	01:10	0.39
117	STORAGE	0.01	0.52	83.04	0	01:10	0.51
147	STORAGE	0.14	0.25	79.18	0	03:10	0.25
148	STORAGE	0.12	0.21	79.28	0	03:13	0.21
149	STORAGE	0.12	0.22	79.62	0	03:18	0.22
150	STORAGE	0.12	0.21	79.71	0	03:17	0.21
201	STORAGE	0.02	0.61	78.00	0	01:10	0.61
201A	STORAGE	0.02	0.61	78.15	0	01:10	0.61
201B	STORAGE	0.01	0.33	78.44	0	01:03	0.33
202	STORAGE	0.01	0.43	79.74	0	01:10	0.43
203	STORAGE	0.01	0.36	80.82	0	01:10	0.36
301	STORAGE	0.03	0.57	77.56	0	01:14	0.57
302	STORAGE	0.04	0.67	77.91	0	01:14	0.67
303X	STORAGE	0.03	0.57	78.17	0	01:13	0.57
304	STORAGE	0.03	0.54	79.51	0	01:13	0.54
305	STORAGE	0.03	0.54	80.05	0	01:12	0.53
306	STORAGE	0.01	1.70	81.89	0	01:13	1.63
307	STORAGE	0.03	5.06	86.48	0	01:09	5.06
308	STORAGE	0.02	0.36	80.52	0	03:20	0.36
C103B-S	STORAGE	0.02	1.44	82.59	0	01:13	1.43
C114B-S	STORAGE	0.02	1.40	82.40	0	01:14	1.40
C115B-S	STORAGE	0.02	1.40	82.80	0	01:14	1.40
C201AA-S	STORAGE	0.04	1.35	80.05	0	01:22	1.35
C201AB-S	STORAGE	0.04	1.37	80.07	0	01:22	1.37

C201BA-S	STORAGE	0.04	1.34	80.74	0	01:22	1.34
C201BB-S	STORAGE	0.04	1.35	80.75	0	01:22	1.35
C201BC-S	STORAGE	0.04	1.51	80.91	0	01:22	1.51
C202B-S	STORAGE	0.03	1.39	80.79	0	01:22	1.39
C202C-S	STORAGE	0.03	1.40	80.80	0	01:22	1.39
C203B-S	STORAGE	0.03	1.59	82.84	0	01:22	1.59
C203C-S	STORAGE	0.04	1.50	82.20	0	01:22	1.49
EXT1-S	STORAGE	0.82	2.27	81.27	0	03:14	2.27
L103C-S	STORAGE	0.07	1.52	81.72	0	01:22	1.51
L110A-S	STORAGE	0.03	1.40	88.15	0	01:20	1.40
L116A-S	STORAGE	0.03	1.37	83.37	0	01:25	1.37
POND_2	STORAGE	0.37	1.12	80.62	0	03:17	1.12

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
300a	JUNCTION	407.27	407.27	0 03:10	5.26	5.26	0.045
CUL-1	JUNCTION	0.00	584.64	0 03:27	0	8.22	0.001
CUL-2	JUNCTION	0.00	584.61	0 03:28	0	8.22	-0.005
T3-A	JUNCTION	476.67	593.64	0 03:10	2.91	8.17	-0.024
T3-B	JUNCTION	51.47	584.73	0 03:26	0.0554	8.22	0.001
T3-C	JUNCTION	35.77	591.54	0 03:27	0.146	8.37	-0.048
T3-D	JUNCTION	29.60	591.87	0 03:30	0.0228	8.4	0.030
T3-E	JUNCTION	12.69	591.55	0 03:33	0.00975	8.4	0.033
T3-F	JUNCTION	0.00	591.32	0 03:36	0	8.4	-0.004
HWL-146	OUTFALL	0.00	66.85	0 03:10	0	9.04	0.000
HWL-200	OUTFALL	0.00	947.49	0 01:11	0	4.01	0.000
HWL-300	OUTFALL	0.00	870.71	0 01:15	0	6.78	0.000
P2-T3	OUTFALL	0.00	591.27	0 03:37	0	8.4	0.000
Pond-Escape	OUTFALL	0.00	0.00	0 00:00	0	0	0.000 ltr
100	STORAGE	0.00	3312.41	0 01:12	0	8.04	0.020
100C	STORAGE	0.00	1182.80	0 01:17	0	4.21	-0.088
101	STORAGE	0.00	3156.86	0 01:13	0	7.29	-0.055
102	STORAGE	0.00	798.55	0 01:10	0	2.58	0.136
103	STORAGE	143.63	799.63	0 01:10	0.173	3.07	-0.520
104	STORAGE	0.00	2343.73	0 01:12	0	4.72	0.025
105	STORAGE	0.00	2338.02	0 01:11	0	4.73	0.022
106	STORAGE	0.00	2336.86	0 01:11	0	4.72	-0.186
107	STORAGE	139.14	2337.09	0 01:11	0.167	4.72	-0.183
108	STORAGE	0.00	381.03	0 01:10	0	0.773	0.128
109	STORAGE	281.35	384.35	0 01:10	0.349	0.773	0.001
110	STORAGE	0.00	103.00	0 01:03	0	0.425	0.002
111	STORAGE	0.00	1855.51	0 01:11	0	3.78	0.097

112	STORAGE	160.48	1854.20	0	01:11	0.171	3.77	-0.219
113	STORAGE	143.42	1722.48	0	01:10	0.173	3.62	0.401
114	STORAGE	288.79	1609.80	0	01:10	0.359	3.43	-0.109
115	STORAGE	579.21	1151.46	0	01:10	1.2	2.48	-0.051
116	STORAGE	0.00	392.52	0	01:10	0	0.732	-0.027
117	STORAGE	333.83	333.83	0	01:10	0.43	0.43	0.069
147	STORAGE	32.87	66.88	0	03:10	0.0396	9.04	0.022
148	STORAGE	0.00	58.57	0	03:19	0	7.84	-0.002
149	STORAGE	0.00	58.57	0	03:17	0	7.84	0.027
150	STORAGE	0.00	58.57	0	03:17	0	7.84	0.004
201	STORAGE	0.00	947.69	0	01:10	0	4.01	-0.072
201A	STORAGE	0.00	947.41	0	01:10	0	4.01	0.090
201B	STORAGE	0.00	175.80	0	01:03	0	0.972	-0.003
202	STORAGE	118.22	706.02	0	01:10	0.144	2.63	-0.028
203	STORAGE	127.53	474.73	0	01:10	0.155	1.88	0.024
301	STORAGE	0.00	870.58	0	01:14	0	6.78	-0.000
302	STORAGE	0.00	870.24	0	01:13	0	6.78	-0.003
303X	STORAGE	0.00	870.06	0	01:13	0	6.78	-0.000
304	STORAGE	0.00	871.45	0	01:12	0	6.78	-0.001
305	STORAGE	0.00	871.26	0	01:12	0	6.78	0.012
306	STORAGE	0.00	837.92	0	01:10	0	1.51	-0.063
307	STORAGE	1097.06	1097.06	0	01:10	1.54	1.54	0.643
308	STORAGE	417.18	417.18	0	03:20	5.28	5.28	-0.024
C103B-S	STORAGE	610.40	610.40	0	01:10	0.816	0.816	0.030
C114B-S	STORAGE	451.62	451.62	0	01:10	0.572	0.572	0.048
C115B-S	STORAGE	433.18	433.18	0	01:10	0.548	0.548	0.005
C201AA-S	STORAGE	127.61	127.61	0	01:10	0.176	0.176	0.103
C201AB-S	STORAGE	171.79	171.79	0	01:10	0.237	0.237	0.135
C201BA-S	STORAGE	93.26	93.26	0	01:10	0.128	0.128	-1.018
C201BB-S	STORAGE	127.62	127.62	0	01:10	0.176	0.176	-0.877
C201BC-S	STORAGE	516.13	516.13	0	01:10	0.654	0.654	-1.665
C202B-S	STORAGE	225.81	225.81	0	01:10	0.286	0.286	0.025
C202C-S	STORAGE	248.85	248.85	0	01:10	0.315	0.315	0.033
C203B-S	STORAGE	766.60	766.60	0	01:10	1.1	1.1	-0.156
C203C-S	STORAGE	497.70	497.70	0	01:10	0.63	0.63	0.054
EXT1-S	STORAGE	857.47	857.47	0	01:10	1.15	1.15	-1.130
L103C-S	STORAGE	831.87	831.87	0	01:10	1.58	2.09	0.662
L110A-S	STORAGE	326.14	326.14	0	01:10	0.424	0.424	-0.249
L116A-S	STORAGE	206.81	206.81	0	01:10	0.299	0.299	-1.175
POND_2	STORAGE	704.44	3840.98	0	01:11	0.755	8.8	0.022

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Node Surcharge Summary
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No nodes were surcharged.

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Node Flooding Summary

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Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate LPS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
307	0.05	259.01	0 01:10	0.026	0.000

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
100	0.001	27	0	0	0.002	58	0 03:16	3434.49
100C	0.000	17	0	0	0.001	52	0 03:16	1165.93
101	0.001	22	0	0	0.002	49	0 03:19	3312.41
102	0.000	10	0	0	0.001	38	0 03:19	905.39
103	0.000	9	0	0	0.001	41	0 03:25	798.55
104	0.001	17	0	0	0.001	46	0 03:19	2350.42
105	0.000	13	0	0	0.001	38	0 03:20	2343.73
106	0.000	10	0	0	0.001	29	0 03:21	2338.02
107	0.000	7	0	0	0.001	25	0 01:11	2336.86
108	0.000	0	0	0	0.000	11	0 01:10	380.05
109	0.000	0	0	0	0.000	8	0 01:10	381.03
110	0.000	0	0	0	0.000	6	0 01:11	103.00
111	0.000	5	0	0	0.001	23	0 01:11	1863.17
112	0.000	4	0	0	0.001	23	0 01:11	1855.51
113	0.000	2	0	0	0.001	19	0 01:11	1708.05
114	0.000	1	0	0	0.001	22	0 01:10	1596.59
115	0.000	0	0	0	0.001	19	0 01:10	1140.77
116	0.000	0	0	0	0.000	13	0 01:10	390.73
117	0.000	0	0	0	0.001	20	0 01:10	325.52
147	0.000	9	0	0	0.000	16	0 03:10	66.85
148	0.000	4	0	0	0.000	8	0 03:13	58.57
149	0.000	8	0	0	0.000	14	0 03:18	58.57
150	0.000	9	0	0	0.000	15	0 03:17	58.57
201	0.000	1	0	0	0.001	30	0 01:10	947.49
201A	0.000	1	0	0	0.001	21	0 01:10	947.69
201B	0.000	1	0	0	0.000	14	0 01:03	176.05
202	0.000	0	0	0	0.000	12	0 01:10	703.31
203	0.000	0	0	0	0.000	8	0 01:10	473.16
301	0.000	1	0	0	0.001	20	0 01:14	870.71
302	0.000	1	0	0	0.001	23	0 01:14	870.58

303X	0.000	1	0	0	0.001	19	0	01:13	870.24
304	0.000	1	0	0	0.001	12	0	01:13	870.06
305	0.000	1	0	0	0.001	10	0	01:12	871.45
306	0.000	0	0	0	0.002	34	0	01:13	813.17
307	0.000	1	0	0	0.006	100	0	01:09	837.92
308	0.000	0	0	0	0.000	7	0	03:20	417.17
C103B-S	0.001	0	0	0	0.156	11	0	01:13	292.00
C114B-S	0.001	0	0	0	0.118	8	0	01:14	199.00
C115B-S	0.001	0	0	0	0.113	8	0	01:14	191.00
C201AA-S	0.001	0	0	0	0.065	4	0	01:22	29.10
C201AB-S	0.001	0	0	0	0.086	6	0	01:22	39.20
C201BA-S	0.001	0	0	0	0.049	3	0	01:22	21.30
C201BB-S	0.001	0	0	0	0.066	5	0	01:22	29.10
C201BC-S	0.003	0	0	0	0.242	17	0	01:22	125.40
C202B-S	0.001	0	0	0	0.101	7	0	01:22	54.90
C202C-S	0.001	0	0	0	0.112	8	0	01:22	60.50
C203B-S	0.004	0	0	0	0.326	23	0	01:22	226.20
C203C-S	0.003	0	0	0	0.222	15	0	01:22	121.00
EXT1-S	0.255	18	0	0	1.076	75	0	03:14	7.80
L103C-S	0.003	0	0	0	0.245	17	0	01:22	364.00
L110A-S	0.001	0	0	0	0.121	8	0	01:20	103.00
L116A-S	0.001	0	0	0	0.087	6	0	01:25	67.00
POND_2	2.150	14	0	0	7.041	47	0	03:17	96.94

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
HWL-146	99.59	27.11	66.85	9.036
HWL-200	9.73	204.05	947.49	4.013
HWL-300	16.95	169.62	870.71	6.784
P2-T3	65.41	47.18	591.27	8.401
Pond-Escape	0.00	0.00	0.00	0.000
System	38.34	447.97	1796.57	28.234

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Link Flow Summary
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Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth

100-100C	CONDUIT	1182.80	0	01:17	1.79	0.48	0.71
100C-pond	CONDUIT	1165.93	0	01:18	2.33	0.52	0.74
100-pond	CONDUIT	2562.10	0	01:13	3.96	0.29	0.84
101-100	CONDUIT	3312.41	0	01:12	3.06	1.38	0.92
102-101	CONDUIT	905.39	0	01:14	1.96	1.17	0.86
103-102	CONDUIT	798.55	0	01:10	1.55	0.89	0.80
104-101	CONDUIT	2350.42	0	01:11	2.48	1.43	0.89
105-104	CONDUIT	2343.73	0	01:12	2.27	1.27	0.87
106-105	CONDUIT	2338.02	0	01:11	2.06	1.36	0.83
107-106	CONDUIT	2336.86	0	01:11	1.95	1.49	0.78
108-107	CONDUIT	380.05	0	01:10	2.70	1.02	0.87
109-108	CONDUIT	381.03	0	01:10	2.69	1.02	0.88
110-109	CONDUIT	103.00	0	01:11	2.02	0.82	0.73
111-107	CONDUIT	1863.17	0	01:11	1.95	1.13	0.80
112-111	CONDUIT	1855.51	0	01:11	1.87	1.29	0.82
113-112	CONDUIT	1708.05	0	01:11	1.73	1.04	0.80
114-113	CONDUIT	1596.59	0	01:11	1.86	1.06	0.71
115-114	CONDUIT	1140.77	0	01:10	1.63	0.93	0.75
116-115	CONDUIT	390.73	0	01:10	2.26	0.91	0.75
117-116	CONDUIT	325.52	0	01:10	2.11	1.14	0.94
147-146	CONDUIT	66.85	0	03:10	0.90	0.53	0.48
148-147	CONDUIT	58.57	0	03:19	0.86	0.45	0.44
149-148	CONDUIT	58.57	0	03:19	0.81	0.46	0.47
150-149	CONDUIT	58.57	0	03:17	0.85	0.47	0.45
201-200	CONDUIT	947.49	0	01:11	1.80	0.62	0.47
201A-201	CONDUIT	947.69	0	01:10	1.75	0.61	0.48
201B-201A	CONDUIT	176.05	0	01:04	1.13	0.41	0.39
202-201A	CONDUIT	703.31	0	01:10	2.66	0.63	0.58
203-202	CONDUIT	473.16	0	01:10	2.42	0.56	0.54
301-300	CONDUIT	870.71	0	01:15	1.91	0.84	0.52
302-301	CONDUIT	870.58	0	01:14	1.71	0.83	0.57
303X-302	CONDUIT	870.24	0	01:13	2.21	0.85	0.69
304-303X	CONDUIT	870.06	0	01:13	2.54	0.88	0.73
305-304	CONDUIT	871.45	0	01:12	2.55	0.87	0.72
306-305	CONDUIT	813.17	0	01:13	3.76	1.88	1.00
307-306	CONDUIT	837.92	0	01:10	3.87	2.01	1.00
308-305	CONDUIT	417.17	0	03:20	2.33	0.68	0.61
CUL1-2	CONDUIT	584.61	0	03:28	1.36	0.06	0.20
T3-0	CONDUIT	402.77	0	03:22	0.43	0.01	0.08
T3-1	CONDUIT	584.73	0	03:26	0.50	0.01	0.10
T3-2	CONDUIT	584.64	0	03:27	0.29	0.01	0.17
T3-3	CONDUIT	584.58	0	03:29	0.33	0.02	0.15
T3-4	CONDUIT	591.87	0	03:30	0.38	0.02	0.13
T3-5	CONDUIT	591.55	0	03:33	0.29	0.03	0.17
T3-6	CONDUIT	591.32	0	03:36	0.40	0.02	0.13
T3-7	CONDUIT	591.27	0	03:37	0.57	0.02	0.09
Pond-OR	ORIFICE	58.57	0	03:17			1.00
OVERFLOW	WEIR	0.00	0	00:00			0.00
C103B-IC	DUMMY	292.00	0	01:03			
C114B-IC	DUMMY	199.00	0	01:03			

C115B-IC	DUMMY	191.00	0	01:03
C201AA-IC	DUMMY	29.10	0	01:03
C201AB-IC	DUMMY	39.20	0	01:02
C201BA-IC	DUMMY	21.30	0	01:03
C201BB-IC	DUMMY	29.10	0	01:02
C201BC-IC	DUMMY	125.40	0	01:00
C202B-IC	DUMMY	54.90	0	01:03
C202C-IC	DUMMY	60.50	0	01:02
C203B-IC	DUMMY	226.20	0	01:02
C203C-IC	DUMMY	121.00	0	01:02
EXT1-IC	DUMMY	7.80	0	00:29
L103C-IC	DUMMY	364.00	0	01:03
L110A-IC	DUMMY	103.00	0	01:03
L116A-IC	DUMMY	67.00	0	01:03

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
100-100C	1.00	0.10	0.12	0.00	0.77	0.00	0.00	0.01	0.00	0.00
100C-pond	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.00	0.00	0.00
100-pond	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.00	0.00	0.00
101-100	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
102-101	1.00	0.01	0.01	0.00	0.50	0.00	0.00	0.48	0.01	0.00
103-102	1.00	0.00	0.45	0.00	0.55	0.00	0.00	0.00	0.58	0.00
104-101	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
105-104	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
106-105	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
107-106	1.00	0.01	0.19	0.00	0.71	0.00	0.00	0.09	0.25	0.00
108-107	1.00	0.00	0.00	0.00	0.07	0.01	0.00	0.92	0.07	0.00
109-108	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
110-109	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
111-107	1.00	0.00	0.03	0.00	0.46	0.00	0.00	0.51	0.04	0.00
112-111	1.00	0.00	0.36	0.00	0.64	0.00	0.00	0.00	0.56	0.00
113-112	1.00	0.67	0.02	0.00	0.27	0.00	0.00	0.03	0.03	0.00
114-113	1.00	0.00	0.02	0.00	0.98	0.00	0.00	0.00	0.13	0.00
115-114	1.00	0.00	0.00	0.00	0.06	0.00	0.00	0.94	0.04	0.00
116-115	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
117-116	1.00	0.00	0.00	0.00	0.00	0.01	0.00	0.99	0.00	0.00
147-146	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
148-147	1.00	0.01	0.00	0.00	0.44	0.00	0.00	0.55	0.01	0.00
149-148	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.01	0.00	0.00
150-149	1.00	0.00	0.00	0.00	0.49	0.00	0.00	0.51	0.00	0.00
201-200	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
201A-201	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.97	0.00	0.00

201B-201A	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
202-201A	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
203-202	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
301-300	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.00	0.00	0.00
302-301	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
303X-302	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
304-303X	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
305-304	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
306-305	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.95	0.03	0.00
307-306	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
308-305	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.98	0.01	0.00
CUL1-2	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.99
T3-0	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.00	0.99	0.00
T3-1	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.98	0.00
T3-2	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.85	0.00
T3-3	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.99	0.00
T3-4	1.00	0.01	0.00	0.00	0.07	0.00	0.00	0.93	0.00	0.00
T3-5	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.98	0.00
T3-6	1.00	0.01	0.00	0.00	0.02	0.00	0.00	0.97	0.00	0.00
T3-7	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00

****
Conduit Surcharge Summary
****

	Hours Full			Hours Above Full	Hours Capacity
Conduit	Both Ends	Upstream	Dnstream	Normal Flow	Limited
101-100	0.01	0.01	0.01	0.16	0.01
102-101	0.01	0.01	0.01	0.12	0.01
104-101	0.01	0.01	0.01	0.17	0.01
105-104	0.01	0.01	0.01	0.15	0.01
106-105	0.01	0.01	0.01	0.17	0.01
107-106	0.01	0.01	0.01	0.19	0.01
108-107	0.01	0.01	0.01	0.02	0.01
109-108	0.01	0.01	0.01	0.03	0.01
111-107	0.01	0.01	0.01	0.10	0.01
112-111	0.01	0.01	0.01	0.15	0.01
113-112	0.01	0.01	0.01	0.05	0.01
114-113	0.01	0.01	0.01	0.06	0.01
117-116	0.01	0.03	0.01	0.09	0.01
306-305	0.16	0.33	0.16	0.37	0.16
307-306	0.32	0.36	0.32	0.37	0.32

Analysis begun on: Tue Jan 23 08:45:41 2024
Analysis ended on: Tue Jan 23 08:45:43 2024
Total elapsed time: 00:00:02

Design Storm: 96.0 mm (100-Year) 12-Hour SCS

ALTERNATIVE RUNOFF METHOD (ARM) - PCSWMM VERSION 7.5.3406

This is a new version of ARM - your feedback and suggestions are solicited.
Create a ticket, post on the PCSWMM feature request forum, or email us directly!

Simulation start time:	06/01/2023 00:00:00
Simulation end time:	06/05/2023 00:00:00
Runoff wet weather time steps:	300 seconds
Report time steps:	300 seconds
Number of data points:	1153

****
Unit Hydrographs Runoff Method
****

Subcatchment	Runoff Method	Raingage	Area (ha)	Time of Concentration (min)	Time to Peak (min)	Time after Peak (min)	Peak UH Flow ($m^3/s/mm$)	UH Depth (mm)
303	Nash IUH	SCS_100yr12hr	55.03	117.31	58.66	661.34	0.05752	0.999
311	Nash IUH	SCS_100yr12hr	0.55	11	5.5	54.5	0.00613	0.933
F115D	Nash IUH	SCS_100yr12hr	2.51	17.34	11.56	73.44	0.0196	0.998
F308B	Nash IUH	SCS_100yr12hr	22.98	148.66	99.11	575.89	0.02092	1
EXT-2	Nash IUH	SCS_100yr12hr	1.05	63.31	31.65	243.35	0.00203	0.996
312	Nash IUH	SCS_100yr12hr	1.95	50.3	25.15	219.85	0.00475	0.996
301	Nash IUH	SCS_100yr12hr	86.43	111.04	55.52	659.48	0.09545	0.999
302	Nash IUH	SCS_100yr12hr	80.69	161.19	80.6	914.4	0.06139	1

****
ARM Runoff Summary
****

Subcatchment	Total Precip (mm)	Total Losses (mm)	Total Runoff (mm)	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff (fraction)
303	96	87.362	8.632	4.75	286.624	0.09
311	96	86.928	8.467	0.047	10.837	0.088
F115D	96	54.824	41.076	1.031	238.738	0.428

F308B	96	58.015	37.981	8.728	540.995	0.396
EXT-2	96	82.796	13.152	0.138	13.469	0.137
312	96	83.645	12.308	0.24	26.1	0.128
301	96	88.844	7.15	6.18	370.388	0.074
302	96	88.705	7.292	5.884	276.581	0.076

WARNING ARM01: Computed UH depth for ARM subcatchment 311 is not unity. Consider reducing wet weather time step.

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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.015)
--------------------------------------------------------------

WARNING 03: negative offset ignored for Link 100-pond

*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Infiltration Method ...... HORTON
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 06/01/2023 00:00:00
Ending Date .............. 06/05/2023 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:05:00
Wet Time Step ............ 00:05:00
Dry Time Step ............ 00:05:00
Routing Time Step ........ 5.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 4
Head Tolerance ........... 0.001500 m
```

```
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         2.861        96.000
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.952        31.963
Surface Runoff ...........         1.891        63.450
Final Storage ............         0.025         0.845
Continuity Error (%) .....        -0.268


**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         1.890        18.904
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         2.700        27.000
External Outflow .........         4.565        45.650
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.001         0.009
Final Stored Volume ......         0.030         0.300
Continuity Error (%) .....        -0.079


*************************
Highest Continuity Errors
*************************
Node 103 (-2.70%)


***************************
Time-Step Critical Elements
***************************
Link T3-7 (8.64%)
Link 102-101 (4.91%)


********************************
Highest Flow Instability Indexes
********************************
Link L103C-IC (20)
Link 103-102 (15)
Link EXT1-IC (7)
Link 102-101 (7)
Link 104-101 (5)
```

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*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     1.32 sec
Average Time Step           :     4.77 sec
Maximum Time Step           :     5.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     3.29
Percent Not Converging      :    16.43
Time Step Frequencies       :
    5.000 -  3.155 sec      :    95.54 %
    3.155 -  1.991 sec      :     3.33 %
    1.991 -  1.256 sec      :     1.13 %
    1.256 -  0.792 sec      :     0.00 %
    0.792 -  0.500 sec      :     0.00 %


***************************
Subcatchment Runoff Summary
***************************
```

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
C103A	96.00	0.00	0.00	23.14	60.47	11.62	72.10	0.22	66.44	0.751
C103B	96.00	0.00	0.00	8.98	81.40	4.54	85.94	1.08	280.78	0.895
C107A	96.00	0.00	0.00	23.13	60.47	11.63	72.10	0.22	64.30	0.751
C109A	96.00	0.00	0.00	23.31	60.53	11.41	71.94	0.45	134.81	0.749
C113A	96.00	0.00	0.00	23.15	60.48	11.61	72.09	0.22	66.44	0.751
C114A	96.00	0.00	0.00	23.33	60.54	11.39	71.93	0.47	139.04	0.749
C114B	96.00	0.00	0.00	18.73	67.17	9.25	76.42	0.75	212.56	0.796
C115A	96.00	0.00	0.00	23.22	60.50	11.51	72.02	0.45	134.96	0.750
C115B	96.00	0.00	0.00	18.73	67.17	9.25	76.42	0.72	203.88	0.796
C117A	96.00	0.00	0.00	23.42	60.57	11.28	71.85	0.17	49.06	0.748
C117B	96.00	0.00	0.00	23.50	60.59	11.19	71.78	0.39	116.99	0.748
C147A	96.00	0.00	0.00	22.95	60.44	11.88	72.32	0.05	15.01	0.753
C201AA	96.00	0.00	0.00	4.47	88.04	2.29	90.33	0.23	58.64	0.941
C201AB	96.00	0.00	0.00	4.47	88.04	2.29	90.33	0.32	78.94	0.941
C201BA	96.00	0.00	0.00	4.47	87.99	2.30	90.29	0.17	42.86	0.941
C201BB	96.00	0.00	0.00	4.47	87.99	2.30	90.29	0.23	58.64	0.941
C201BC	96.00	0.00	0.00	18.73	67.17	9.25	76.42	0.86	242.92	0.796
C202B	96.00	0.00	0.00	18.73	67.17	9.25	76.42	0.37	106.28	0.796
C202C	96.00	0.00	0.00	18.73	67.17	9.25	76.42	0.41	117.12	0.796
C203B	96.00	0.00	0.00	24.16	60.66	10.48	71.14	1.44	410.47	0.741
C203C	96.00	0.00	0.00	18.73	67.17	9.25	76.42	0.83	234.25	0.796
EXT-1	96.00	0.00	0.00	8.98	81.40	4.54	85.94	1.52	394.43	0.895
EXT-3	96.00	0.00	0.00	43.19	60.62	52.24	52.24	0.52	214.70	0.544
F112A	96.00	0.00	0.00	57.49	27.40	38.46	38.46	0.18	92.13	0.401

F307A	96.00	0.00	0.00	50.18	23.63	21.98	45.62	1.92	749.52	0.475
F308A	96.00	0.00	0.00	64.35	0.00	32.20	32.20	0.06	36.00	0.335
L103C	96.00	0.00	0.00	50.70	27.48	17.53	45.02	1.92	570.50	0.469
L110A	96.00	0.00	0.00	23.52	60.60	11.16	71.76	0.55	163.60	0.748
L115C	96.00	0.00	0.00	57.66	27.40	38.27	38.27	0.23	117.31	0.399
L116A	96.00	0.00	0.00	47.69	27.43	20.61	48.04	0.37	138.83	0.500
L202A	96.00	0.00	0.00	23.23	60.50	11.50	72.01	0.19	55.69	0.750
L203A	96.00	0.00	0.00	23.22	60.50	11.51	72.01	0.20	59.98	0.750
POND	96.00	0.00	0.00	36.69	40.61	18.34	58.95	0.94	329.82	0.614
UNC-2	96.00	0.00	0.00	51.24	20.31	24.40	44.71	0.07	29.16	0.466
UNC-3	96.00	0.00	0.00	8.92	81.24	4.64	85.88	0.12	31.20	0.895
UNC-4	96.00	0.00	0.00	63.74	0.00	33.06	33.06	0.03	15.18	0.344
UNC-5	96.00	0.00	0.00	63.74	0.00	33.06	33.06	0.02	13.28	0.344
UNC-6	96.00	0.00	0.00	63.74	0.00	33.06	33.06	0.01	5.69	0.344

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
300a	JUNCTION	0.02	0.17	95.52	0 08:22	0.17
CUL-1	JUNCTION	0.06	0.62	82.30	0 08:29	0.62
CUL-2	JUNCTION	0.04	0.33	81.36	0 08:29	0.33
T3-A	JUNCTION	0.03	0.27	85.27	0 08:25	0.27
T3-B	JUNCTION	0.03	0.27	82.42	0 08:28	0.27
T3-C	JUNCTION	0.05	0.42	80.93	0 08:28	0.42
T3-D	JUNCTION	0.04	0.37	79.37	0 08:33	0.37
T3-E	JUNCTION	0.06	0.47	78.60	0 08:35	0.47
T3-F	JUNCTION	0.04	0.33	77.48	0 08:36	0.33
HWL-146	OUTFALL	0.12	0.18	78.80	0 11:00	0.18
HWL-200	OUTFALL	0.03	0.49	77.78	0 06:30	0.49
HWL-300	OUTFALL	0.05	0.50	77.46	0 06:34	0.50
P2-T3	OUTFALL	0.01	0.15	77.10	0 08:36	0.15
Pond-Escape	OUTFALL	0.00	0.00	81.50	0 00:00	0.00
100	STORAGE	0.80	1.56	80.79	0 11:09	1.56
100C	STORAGE	0.51	1.27	80.79	0 11:09	1.27
101	STORAGE	0.77	1.53	80.79	0 11:09	1.53
102	STORAGE	0.36	1.07	80.79	0 11:09	1.07
103	STORAGE	0.29	0.97	80.80	0 11:34	0.96
104	STORAGE	0.60	1.36	80.79	0 11:28	1.36
105	STORAGE	0.56	1.32	80.79	0 10:58	1.32
106	STORAGE	0.51	1.27	80.79	0 11:22	1.27
107	STORAGE	0.45	1.20	80.79	0 11:11	1.20
108	STORAGE	0.01	0.26	83.17	0 06:30	0.26
109	STORAGE	0.01	0.26	84.06	0 06:30	0.26
110	STORAGE	0.01	0.21	85.54	0 06:27	0.21

111	STORAGE	0.32	1.00	80.79	0	11:22	1.00
112	STORAGE	0.30	0.96	80.79	0	11:10	0.96
113	STORAGE	0.16	0.67	80.79	0	11:10	0.67
114	STORAGE	0.09	0.78	81.15	0	06:30	0.77
115	STORAGE	0.03	0.66	81.46	0	06:30	0.66
116	STORAGE	0.01	0.28	82.26	0	06:30	0.28
117	STORAGE	0.01	0.25	82.77	0	06:30	0.25
147	STORAGE	0.16	0.26	79.19	0	11:00	0.26
148	STORAGE	0.14	0.22	79.29	0	11:04	0.22
149	STORAGE	0.14	0.23	79.63	0	11:09	0.23
150	STORAGE	0.14	0.22	79.72	0	11:08	0.22
201	STORAGE	0.03	0.56	77.95	0	06:30	0.56
201A	STORAGE	0.03	0.57	78.11	0	06:30	0.57
201B	STORAGE	0.02	0.33	78.44	0	06:06	0.33
202	STORAGE	0.02	0.38	79.69	0	06:30	0.38
203	STORAGE	0.02	0.33	80.79	0	06:30	0.33
301	STORAGE	0.05	0.54	77.53	0	06:34	0.54
302	STORAGE	0.06	0.64	77.88	0	06:33	0.64
303X	STORAGE	0.05	0.55	78.15	0	06:32	0.54
304	STORAGE	0.05	0.51	79.48	0	06:32	0.50
305	STORAGE	0.05	0.51	80.02	0	06:31	0.50
306	STORAGE	0.02	1.28	81.47	0	06:31	1.21
307	STORAGE	0.03	3.51	84.93	0	06:30	3.46
308	STORAGE	0.04	0.44	80.60	0	08:20	0.44
C103B-S	STORAGE	0.02	1.25	82.40	0	06:30	1.25
C114B-S	STORAGE	0.02	1.31	82.31	0	06:30	1.30
C115B-S	STORAGE	0.02	1.30	82.70	0	06:30	1.30
C201AA-S	STORAGE	0.05	1.34	80.04	0	06:33	1.34
C201AB-S	STORAGE	0.05	1.36	80.06	0	06:33	1.36
C201BA-S	STORAGE	0.05	1.33	80.73	0	06:33	1.33
C201BB-S	STORAGE	0.05	1.34	80.74	0	06:33	1.34
C201BC-S	STORAGE	0.04	1.45	80.85	0	06:33	1.45
C202B-S	STORAGE	0.04	1.36	80.76	0	06:33	1.36
C202C-S	STORAGE	0.04	1.37	80.77	0	06:33	1.37
C203B-S	STORAGE	0.04	1.49	82.74	0	06:34	1.49
C203C-S	STORAGE	0.04	1.45	82.15	0	06:33	1.44
EXT1-S	STORAGE	1.11	2.39	81.39	0	12:30	2.39
L103C-S	STORAGE	0.15	1.41	81.61	0	06:34	1.41
L110A-S	STORAGE	0.03	1.36	88.11	0	06:32	1.36
L116A-S	STORAGE	0.04	1.35	83.35	0	06:37	1.35
POND_2	STORAGE	0.53	1.29	80.79	0	11:06	1.29

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Node Inflow Summary
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                               Maximum  Maximum                   Lateral       Total        Flow
                               Lateral    Total  Time of Max       Inflow      Inflow     Balance
                                Inflow   Inflow   Occurrence       Volume      Volume       Error
```

Node	Type	LPS	LPS	days	hr:min	10^6 ltr	10^6 ltr	Percent
300a	JUNCTION	634.52	634.52	0	08:10	12.1	12.1	0.020
CUL-1	JUNCTION	0.00	910.82	0	08:28	0	17.6	0.000
CUL-2	JUNCTION	0.00	910.79	0	08:29	0	17.6	-0.002
T3-A	JUNCTION	322.94	916.95	0	08:12	5.44	17.5	-0.012
T3-B	JUNCTION	29.16	910.89	0	08:26	0.0671	17.6	0.001
T3-C	JUNCTION	29.16	921.89	0	08:28	0.266	17.8	-0.046
T3-D	JUNCTION	13.28	922.09	0	08:30	0.0231	17.9	0.035
T3-E	JUNCTION	5.69	921.87	0	08:33	0.00992	17.9	0.018
T3-F	JUNCTION	0.00	921.65	0	08:36	0	17.9	-0.002
HWL-146	OUTFALL	0.00	71.82	0	11:00	0	11.8	0.000
HWL-200	OUTFALL	0.00	822.29	0	06:30	0	5.27	0.000
HWL-300	OUTFALL	0.00	800.83	0	06:34	0	10.7	0.000
P2-T3	OUTFALL	0.00	921.62	0	08:36	0	17.9	0.000
Pond-Escape	OUTFALL	0.00	0.00	0	00:00	0	0	0.000 ltr
100	STORAGE	0.00	2319.61	0	06:30	0	9.77	0.007
100C	STORAGE	0.00	1257.39	0	06:30	0	5.05	-0.060
101	STORAGE	0.00	2326.15	0	06:30	0	9.6	-0.043
102	STORAGE	0.00	708.29	0	06:17	0	3.39	0.083
103	STORAGE	66.44	711.22	0	06:30	0.223	4.5	-2.627
104	STORAGE	0.00	1646.42	0	06:30	0	6.22	0.019
105	STORAGE	0.00	1655.35	0	06:30	0	6.22	0.022
106	STORAGE	0.00	1662.86	0	06:30	0	6.21	-0.213
107	STORAGE	64.30	1667.22	0	06:30	0.216	6.2	-0.174
108	STORAGE	0.00	237.78	0	06:30	0	1.01	0.207
109	STORAGE	134.81	237.81	0	06:30	0.453	1.01	-0.001
110	STORAGE	0.00	103.00	0	06:10	0	0.552	0.001
111	STORAGE	0.00	1370.91	0	06:30	0	4.99	0.042
112	STORAGE	92.13	1372.22	0	06:30	0.177	4.98	-0.155
113	STORAGE	66.44	1291.80	0	06:30	0.223	4.82	0.298
114	STORAGE	139.04	1233.51	0	06:30	0.467	4.58	-0.113
115	STORAGE	476.55	900.33	0	06:30	1.71	3.36	-0.078
116	STORAGE	0.00	232.94	0	06:30	0	0.934	-0.019
117	STORAGE	166.05	166.05	0	06:30	0.56	0.56	0.048
147	STORAGE	15.01	71.82	0	11:00	0.0506	11.8	0.020
148	STORAGE	0.00	63.65	0	11:09	0	10.2	0.001
149	STORAGE	0.00	63.65	0	11:06	0	10.2	0.011
150	STORAGE	0.00	63.65	0	11:06	0	10.2	0.003
201	STORAGE	0.00	822.31	0	06:30	0	5.26	-0.058
201A	STORAGE	0.00	822.31	0	06:30	0	5.27	0.088
201B	STORAGE	0.00	175.80	0	06:05	0	1.27	-0.004
202	STORAGE	55.69	578.25	0	06:30	0.187	3.44	-0.001
203	STORAGE	59.98	407.18	0	06:30	0.202	2.47	0.001
301	STORAGE	0.00	800.73	0	06:34	0	10.7	0.000
302	STORAGE	0.00	803.14	0	06:33	0	10.7	-0.002
303X	STORAGE	0.00	802.87	0	06:33	0	10.7	-0.000
304	STORAGE	0.00	805.25	0	06:32	0	10.7	-0.000
305	STORAGE	0.00	805.30	0	06:31	0	10.7	0.009
306	STORAGE	0.00	712.16	0	06:30	0	1.91	-0.059
307	STORAGE	749.52	749.52	0	06:30	1.92	1.92	0.469

308	STORAGE	540.99	540.99	0	08:20	8.79	8.79	-0.017
C103B-S	STORAGE	280.78	280.78	0	06:30	1.08	1.08	-0.002
C114B-S	STORAGE	212.56	212.56	0	06:30	0.749	0.749	0.016
C115B-S	STORAGE	203.88	203.88	0	06:30	0.718	0.718	-0.002
C201AA-S	STORAGE	58.64	58.64	0	06:30	0.235	0.235	-1.221
C201AB-S	STORAGE	78.94	78.94	0	06:30	0.316	0.316	-1.144
C201BA-S	STORAGE	42.86	42.86	0	06:30	0.172	0.172	-2.325
C201BB-S	STORAGE	58.64	58.64	0	06:30	0.235	0.235	-1.577
C201BC-S	STORAGE	242.92	242.92	0	06:30	0.856	0.856	0.015
C202B-S	STORAGE	106.28	106.28	0	06:30	0.374	0.374	-0.006
C202C-S	STORAGE	117.12	117.12	0	06:30	0.413	0.413	-0.002
C203B-S	STORAGE	410.47	410.47	0	06:30	1.44	1.44	-0.001
C203C-S	STORAGE	234.25	234.25	0	06:30	0.825	0.825	-0.353
EXT1-S	STORAGE	394.43	394.43	0	06:30	1.52	1.52	-0.078
L103C-S	STORAGE	577.37	577.37	0	06:30	2.06	3.3	3.782
L110A-S	STORAGE	163.60	163.60	0	06:30	0.552	0.552	0.012
L116A-S	STORAGE	138.83	138.83	0	06:30	0.375	0.375	0.045
POND_2	STORAGE	329.82	2627.08	0	06:29	0.943	10.7	0.020

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Node Surcharge Summary
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No nodes were surcharged.

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Node Flooding Summary
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No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
100	0.001	33	0	0	0.002	65	0 11:09	2308.72
100C	0.001	24	0	0	0.001	60	0 11:09	1248.52
101	0.001	28	0	0	0.002	55	0 11:09	2319.61
102	0.000	15	0	0	0.001	46	0 11:09	707.75
103	0.000	15	0	0	0.001	50	0 11:34	708.29
104	0.001	23	0	0	0.002	53	0 11:28	1644.59
105	0.001	18	0	0	0.001	43	0 10:58	1646.42
106	0.001	14	0	0	0.001	34	0 11:22	1655.35

107	0.001	10	0	0	0.001	28	0	11:11	1662.86
108	0.000	0	0	0	0.000	8	0	06:30	237.69
109	0.000	0	0	0	0.000	6	0	06:30	237.78
110	0.000	0	0	0	0.000	6	0	06:26	103.00
111	0.000	8	0	0	0.001	24	0	11:22	1368.38
112	0.000	7	0	0	0.001	22	0	11:10	1370.91
113	0.000	4	0	0	0.001	16	0	11:10	1284.13
114	0.000	2	0	0	0.001	18	0	06:30	1228.18
115	0.000	1	0	0	0.001	16	0	06:30	896.95
116	0.000	0	0	0	0.000	9	0	06:30	232.84
117	0.000	0	0	0	0.000	10	0	06:30	165.94
147	0.000	11	0	0	0.000	17	0	11:00	71.82
148	0.000	5	0	0	0.000	8	0	11:04	63.65
149	0.000	9	0	0	0.000	14	0	11:09	63.65
150	0.000	10	0	0	0.000	16	0	11:08	63.65
201	0.000	2	0	0	0.001	28	0	06:30	822.29
201A	0.000	1	0	0	0.001	19	0	06:30	822.31
201B	0.000	1	0	0	0.000	14	0	06:06	176.11
202	0.000	1	0	0	0.000	11	0	06:30	578.21
203	0.000	0	0	0	0.000	7	0	06:30	407.16
301	0.000	2	0	0	0.001	19	0	06:34	800.83
302	0.000	2	0	0	0.001	22	0	06:33	800.73
303X	0.000	2	0	0	0.001	18	0	06:32	803.14
304	0.000	1	0	0	0.001	11	0	06:32	802.87
305	0.000	1	0	0	0.001	10	0	06:31	805.25
306	0.000	0	0	0	0.001	25	0	06:31	700.24
307	0.000	1	0	0	0.004	69	0	06:30	712.16
308	0.000	1	0	0	0.000	9	0	08:20	540.99
C103B-S	0.000	0	0	0	0.001	0	0	06:30	280.78
C114B-S	0.000	0	0	0	0.012	1	0	06:30	199.00
C115B-S	0.000	0	0	0	0.012	1	0	06:30	191.00
C201AA-S	0.001	0	0	0	0.053	4	0	06:33	29.10
C201AB-S	0.001	0	0	0	0.070	5	0	06:33	39.20
C201BA-S	0.001	0	0	0	0.041	3	0	06:33	21.30
C201BB-S	0.001	0	0	0	0.054	4	0	06:33	29.10
C201BC-S	0.002	0	0	0	0.172	12	0	06:33	125.40
C202B-S	0.001	0	0	0	0.076	5	0	06:33	54.90
C202C-S	0.001	0	0	0	0.083	6	0	06:33	60.50
C203B-S	0.002	0	0	0	0.215	15	0	06:34	226.20
C203C-S	0.002	0	0	0	0.168	12	0	06:33	121.00
EXT1-S	0.379	26	0	0	1.204	84	0	12:30	7.80
L103C-S	0.001	0	0	0	0.133	9	0	06:34	364.00
L110A-S	0.001	0	0	0	0.072	5	0	06:32	103.00
L116A-S	0.001	0	0	0	0.063	4	0	06:37	67.00
POND_2	3.137	21	0	0	8.378	55	0	11:06	80.27

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
HWL-146	98.85	36.17	71.82	11.815
HWL-200	20.05	123.93	822.29	5.266
HWL-300	26.54	183.68	800.83	10.698
P2-T3	69.55	106.24	921.62	17.871
Pond-Escape	0.00	0.00	0.00	0.000
System	43.00	450.02	1671.54	45.650

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Link Flow Summary
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Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
100-100C	CONDUIT	1257.39	0	06:30	1.90	0.51	0.82
100C-pond	CONDUIT	1248.52	0	06:31	1.96	0.56	0.85
100-pond	CONDUIT	1489.43	0	06:14	2.41	0.17	0.93
101-100	CONDUIT	2319.61	0	06:30	2.09	0.97	1.00
102-101	CONDUIT	707.75	0	06:17	1.80	0.92	1.00
103-102	CONDUIT	708.29	0	06:17	1.49	0.79	0.96
104-101	CONDUIT	1644.59	0	06:31	1.80	1.00	1.00
105-104	CONDUIT	1646.42	0	06:30	1.70	0.89	0.99
106-105	CONDUIT	1655.35	0	06:30	1.61	0.96	0.96
107-106	CONDUIT	1662.86	0	06:30	1.59	1.06	0.90
108-107	CONDUIT	237.69	0	06:30	2.48	0.64	0.58
109-108	CONDUIT	237.78	0	06:30	2.48	0.64	0.58
110-109	CONDUIT	103.00	0	06:37	2.01	0.82	0.69
111-107	CONDUIT	1368.38	0	06:30	1.70	0.83	0.86
112-111	CONDUIT	1370.91	0	06:30	1.65	0.95	0.82
113-112	CONDUIT	1284.13	0	06:30	1.70	0.78	0.72
114-113	CONDUIT	1228.18	0	06:30	1.81	0.81	0.58
115-114	CONDUIT	896.95	0	06:30	1.61	0.73	0.61
116-115	CONDUIT	232.84	0	06:30	2.03	0.54	0.52
117-116	CONDUIT	165.94	0	06:30	1.87	0.58	0.55
147-146	CONDUIT	71.82	0	11:00	0.92	0.57	0.49
148-147	CONDUIT	63.65	0	11:10	0.87	0.49	0.47
149-148	CONDUIT	63.65	0	11:09	0.82	0.50	0.49
150-149	CONDUIT	63.65	0	11:06	0.86	0.52	0.47
201-200	CONDUIT	822.29	0	06:30	1.72	0.54	0.44
201A-201	CONDUIT	822.31	0	06:30	1.69	0.53	0.45
201B-201A	CONDUIT	176.11	0	06:06	1.13	0.41	0.39
202-201A	CONDUIT	578.21	0	06:30	2.54	0.52	0.51

203-202	CONDUIT	407.16	0	06:30	2.33	0.48	0.49
301-300	CONDUIT	800.83	0	06:34	1.86	0.77	0.50
302-301	CONDUIT	800.73	0	06:34	1.67	0.76	0.54
303X-302	CONDUIT	803.14	0	06:33	2.15	0.79	0.66
304-303X	CONDUIT	802.87	0	06:33	2.50	0.81	0.68
305-304	CONDUIT	805.25	0	06:32	2.52	0.81	0.68
306-305	CONDUIT	700.24	0	06:31	3.23	1.62	1.00
307-306	CONDUIT	712.16	0	06:30	3.29	1.71	1.00
308-305	CONDUIT	540.99	0	08:20	2.45	0.88	0.73
CUL1-2	CONDUIT	910.79	0	08:29	1.60	0.09	0.26
T3-0	CONDUIT	631.24	0	08:22	0.51	0.01	0.11
T3-1	CONDUIT	910.41	0	08:26	0.58	0.02	0.13
T3-2	CONDUIT	910.82	0	08:28	0.32	0.02	0.22
T3-3	CONDUIT	910.77	0	08:29	0.40	0.03	0.19
T3-4	CONDUIT	922.09	0	08:30	0.44	0.04	0.17
T3-5	CONDUIT	921.87	0	08:33	0.35	0.04	0.21
T3-6	CONDUIT	921.65	0	08:36	0.47	0.04	0.16
T3-7	CONDUIT	921.62	0	08:36	0.68	0.02	0.12
Pond-OR	ORIFICE	63.65	0	11:06			1.00
OVERFLOW	WEIR	0.00	0	00:00			0.00
C103B-IC	DUMMY	280.78	0	06:30			
C114B-IC	DUMMY	199.00	0	06:23			
C115B-IC	DUMMY	191.00	0	06:23			
C201AA-IC	DUMMY	29.10	0	06:05			
C201AB-IC	DUMMY	39.20	0	06:04			
C201BA-IC	DUMMY	21.30	0	06:05			
C201BB-IC	DUMMY	29.10	0	06:05			
C201BC-IC	DUMMY	125.40	0	06:05			
C202B-IC	DUMMY	54.90	0	06:07			
C202C-IC	DUMMY	60.50	0	06:07			
C203B-IC	DUMMY	226.20	0	06:07			
C203C-IC	DUMMY	121.00	0	06:05			
EXT1-IC	DUMMY	7.80	0	02:12			
L103C-IC	DUMMY	364.00	0	06:17			
L110A-IC	DUMMY	103.00	0	06:10			
L116A-IC	DUMMY	67.00	0	06:16			

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Flow Classification Summary
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Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
		Fraction of Time in Flow Class								
100-100C	1.00	0.02	0.06	0.00	0.91	0.00	0.00	0.01	0.00	0.00
100C-pond	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.00	0.00
100-pond	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.00	0.00	0.00
101-100	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00

102-101	1.00	0.02	0.01	0.00	0.62	0.00	0.00	0.36	0.02	0.00
103-102	1.00	0.01	0.32	0.00	0.67	0.00	0.00	0.00	0.42	0.00
104-101	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
105-104	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
106-105	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.00	0.01	0.00
107-106	1.00	0.01	0.13	0.00	0.86	0.00	0.00	0.01	0.14	0.00
108-107	1.00	0.01	0.00	0.00	0.21	0.00	0.00	0.78	0.19	0.00
109-108	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
110-109	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
111-107	1.00	0.01	0.03	0.00	0.57	0.00	0.00	0.39	0.04	0.00
112-111	1.00	0.01	0.30	0.00	0.69	0.00	0.00	0.00	0.40	0.00
113-112	1.00	0.52	0.03	0.00	0.39	0.00	0.00	0.07	0.03	0.00
114-113	1.00	0.01	0.04	0.00	0.95	0.00	0.00	0.00	0.13	0.00
115-114	1.00	0.01	0.00	0.00	0.20	0.00	0.00	0.80	0.16	0.00
116-115	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
117-116	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
147-146	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
148-147	1.00	0.01	0.00	0.00	0.57	0.00	0.00	0.41	0.02	0.00
149-148	1.00	0.01	0.00	0.00	0.97	0.00	0.00	0.02	0.00	0.00
150-149	1.00	0.01	0.00	0.00	0.61	0.00	0.00	0.38	0.00	0.00
201-200	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
201A-201	1.00	0.01	0.00	0.00	0.02	0.00	0.00	0.97	0.00	0.00
201B-201A	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
202-201A	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
203-202	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
301-300	1.00	0.01	0.00	0.00	0.98	0.01	0.00	0.00	0.00	0.00
302-301	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
303X-302	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
304-303X	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
305-304	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
306-305	1.00	0.01	0.00	0.00	0.05	0.01	0.00	0.93	0.04	0.00
307-306	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.98	0.00	0.00
308-305	1.00	0.03	0.00	0.00	0.01	0.00	0.00	0.95	0.01	0.00
CUL1-2	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.98
T3-0	1.00	0.01	0.05	0.00	0.94	0.00	0.00	0.00	0.94	0.00
T3-1	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.97	0.00
T3-2	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.93	0.00
T3-3	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.93	0.00
T3-4	1.00	0.01	0.00	0.00	0.12	0.00	0.00	0.86	0.00	0.00
T3-5	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.93	0.00
T3-6	1.00	0.04	0.00	0.00	0.07	0.00	0.00	0.88	0.00	0.00
T3-7	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.00	0.00

```
*************************
Conduit Surcharge Summary
*************************

-----------------------------------------------------------------------------
                                                          Hours        Hours
                       --------- Hours Full --------   Above Full   Capacity
```

Conduit	Both Ends	Upstream	Dnstream	Normal Flow	Limited
100-pond	0.01	0.01	6.96	0.01	0.01
101-100	5.08	5.08	6.96	0.01	0.01
102-101	4.28	4.28	5.08	0.01	0.01
103-102	0.01	0.01	4.28	0.01	0.01
104-101	3.43	3.43	5.08	0.01	0.01
105-104	0.01	0.01	3.43	0.01	0.01
107-106	0.01	0.01	0.01	0.19	0.01
306-305	0.06	0.32	0.06	0.40	0.06
307-306	0.31	0.37	0.31	0.40	0.31

Analysis begun on: Tue Jan 23 08:38:26 2024
Analysis ended on: Tue Jan 23 08:38:29 2024
Total elapsed time: 00:00:03

Design Storm: (103.2 mm + 20%) 24-Hour SCS

ALTERNATIVE RUNOFF METHOD (ARM) - PCSWMM VERSION 7.5.3406

This is a new version of ARM - your feedback and suggestions are solicited.
Create a ticket, post on the PCSWMM feature request forum, or email us directly!

Simulation start time: 06/01/2023 00:00:00
Simulation end time: 06/05/2023 00:00:00
Runoff wet weather time steps: 300 seconds
Report time steps: 300 seconds
Number of data points: 1153

****
Unit Hydrographs Runoff Method
****

Subcatchment	Runoff Method	Raingage	Area (ha)	Time of Concentration (min)	Time to Peak (min)	Time after Peak (min)	Peak UH Flow ($m^3/s/mm$)	UH Depth (mm)
303	Nash IUH	SCS_100yr24hr+20%	55.03	117.31	58.66	661.34	0.05752	0.999
311	Nash IUH	SCS_100yr24hr+20%	0.55	11	5.5	54.5	0.00613	0.933
F115D	Nash IUH	SCS_100yr24hr+20%	2.51	17.34	11.56	73.44	0.0196	0.998
F308B	Nash IUH	SCS_100yr24hr+20%	22.98	148.66	99.11	575.89	0.02092	1
EXT-2	Nash IUH	SCS_100yr24hr+20%	1.05	63.31	31.65	243.35	0.00203	0.996
312	Nash IUH	SCS_100yr24hr+20%	1.95	50.3	25.15	219.85	0.00475	0.996

301	Nash IUH	SCS_100yr24hr+20%	86.43	111.04	55.52	659.48	0.09545	0.999
302	Nash IUH	SCS_100yr24hr+20%	80.69	161.19	80.6	914.4	0.06139	1

```
******************
ARM Runoff Summary
******************
```

Subcatchment	Total Precip (mm)	Total Losses (mm)	Total Runoff (mm)	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff (fraction)
303	123.86	108.373	15.477	8.517	426.479	0.125
311	123.86	107.817	14.975	0.082	12.026	0.121
F115D	123.86	62.455	61.275	1.538	212.35	0.495
F308B	123.86	66.09	57.746	13.27	689.242	0.466
EXT-2	123.86	101.791	21.981	0.231	17.344	0.177
312	123.86	102.321	21.451	0.418	35.527	0.173
301	123.86	110.306	13.549	11.71	585.092	0.109
302	123.86	110.123	13.732	11.08	434.377	0.111

WARNING ARM01: Computed UH depth for ARM subcatchment 311 is not unity. Consider reducing wet weather time step.

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.015)
--------------------------------------------------------------

WARNING 03: negative offset ignored for Link 100-pond

*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
```

```
  Infiltration Method ...... HORTON
  Flow Routing Method ...... DYNWAVE
  Surcharge Method ......... EXTRAN
  Starting Date ............ 06/01/2023 00:00:00
  Ending Date .............. 06/05/2023 00:00:00
  Antecedent Dry Days ...... 0.0
  Report Time Step ......... 00:05:00
  Wet Time Step ............ 00:05:00
  Dry Time Step ............ 00:05:00
  Routing Time Step ........ 5.00 sec
  Variable Time Step ....... YES
  Maximum Trials ........... 8
  Number of Threads ........ 4
  Head Tolerance ........... 0.001500 m


  **************************        Volume         Depth
  Runoff Quantity Continuity     hectare-m            mm
  **************************     ---------       -------
  Total Precipitation ......         3.691       123.860
  Evaporation Loss .........         0.000         0.000
  Infiltration Loss ........         1.301        43.673
  Surface Runoff ...........         2.370        79.539
  Final Storage ............         0.025         0.845
  Continuity Error (%) .....        -0.159


  **************************        Volume        Volume
  Flow Routing Continuity        hectare-m      10^6 ltr
  **************************     ---------     ---------
  Dry Weather Inflow .......         0.000         0.000
  Wet Weather Inflow .......         2.370        23.697
  Groundwater Inflow .......         0.000         0.000
  RDII Inflow ..............         0.000         0.000
  External Inflow ..........         4.685        46.849
  External Outflow .........         7.003        70.027
  Flooding Loss ............         0.000         0.000
  Evaporation Loss .........         0.000         0.000
  Exfiltration Loss ........         0.000         0.000
  Initial Stored Volume ....         0.001         0.009
  Final Stored Volume ......         0.053         0.535
  Continuity Error (%) .....        -0.010


  *************************
  Highest Continuity Errors
  *************************
  Node 103 (-2.74%)


  ***************************
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```
Time-Step Critical Elements
***************************
Link T3-7 (14.40%)
Link 102-101 (2.51%)
Link 100-100C (1.49%)
Link 100-pond (1.35%)


********************************
Highest Flow Instability Indexes
********************************
Link L103C-IC (24)
Link 103-102 (19)
Link 102-101 (16)
Link 100-100C (14)
Link 104-101 (13)


*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     4.68 sec
Maximum Time Step           :     5.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     3.59
Percent Not Converging      :    18.36
Time Step Frequencies       :
    5.000 -  3.155 sec      :    91.26 %
    3.155 -  1.991 sec      :     7.70 %
    1.991 -  1.256 sec      :     0.45 %
    1.256 -  0.792 sec      :     0.33 %
    0.792 -  0.500 sec      :     0.27 %


***************************
Subcatchment Runoff Summary
***************************
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Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
C103A	123.86	0.00	0.00	31.99	78.31	12.76	91.08	0.28	41.54	0.735
C103B	123.86	0.00	0.00	12.43	105.32	4.98	110.30	1.39	178.99	0.891
C107A	123.86	0.00	0.00	31.99	78.30	12.77	91.07	0.27	40.20	0.735
C109A	123.86	0.00	0.00	32.07	78.35	12.63	90.98	0.57	84.41	0.735
C113A	123.86	0.00	0.00	31.99	78.31	12.76	91.07	0.28	41.54	0.735
C114A	123.86	0.00	0.00	32.09	78.36	12.62	90.97	0.59	87.10	0.734
C114B	123.86	0.00	0.00	25.81	86.93	10.21	97.14	0.95	133.84	0.784

C115A	123.86	0.00	0.00	32.03	78.33	12.69	91.02	0.57	84.42	0.735
C115B	123.86	0.00	0.00	25.81	86.93	10.21	97.14	0.91	128.37	0.784
C117A	123.86	0.00	0.00	32.14	78.38	12.54	90.92	0.21	30.81	0.734
C117B	123.86	0.00	0.00	32.19	78.39	12.48	90.88	0.50	73.68	0.734
C147A	123.86	0.00	0.00	31.93	78.28	13.02	91.29	0.06	9.38	0.737
C201AA	123.86	0.00	0.00	6.21	113.91	2.51	116.42	0.30	37.61	0.940
C201AB	123.86	0.00	0.00	6.21	113.91	2.51	116.42	0.41	50.63	0.940
C201BA	123.86	0.00	0.00	6.21	113.88	2.52	116.40	0.22	27.48	0.940
C201BB	123.86	0.00	0.00	6.21	113.88	2.52	116.40	0.30	37.61	0.940
C201BC	123.86	0.00	0.00	25.81	86.93	10.21	97.14	1.09	152.96	0.784
C202B	123.86	0.00	0.00	25.81	86.93	10.21	97.14	0.48	66.92	0.784
C202C	123.86	0.00	0.00	25.81	86.93	10.21	97.14	0.52	73.75	0.784
C203B	123.86	0.00	0.00	32.70	78.41	11.94	90.35	1.83	268.46	0.729
C203C	123.86	0.00	0.00	25.81	86.93	10.21	97.14	1.05	147.49	0.784
EXT-1	123.86	0.00	0.00	12.43	105.32	4.98	110.30	1.95	251.44	0.891
EXT-3	123.86	0.00	0.00	64.94	78.40	58.25	58.25	0.58	134.02	0.470
F112A	123.86	0.00	0.00	80.28	35.48	43.42	43.42	0.20	55.73	0.351
F307A	123.86	0.00	0.00	68.00	30.60	24.99	55.59	2.33	494.73	0.449
F308A	123.86	0.00	0.00	88.89	0.00	35.40	35.40	0.07	21.00	0.286
L103C	123.86	0.00	0.00	67.29	35.53	20.70	56.23	2.40	441.83	0.454
L110A	123.86	0.00	0.00	32.20	78.40	12.47	90.86	0.70	103.15	0.734
L115C	123.86	0.00	0.00	80.43	35.48	43.24	43.24	0.26	71.46	0.349
L116A	123.86	0.00	0.00	64.53	35.50	23.50	59.00	0.46	92.66	0.476
L202A	123.86	0.00	0.00	32.03	78.33	12.69	91.02	0.24	34.84	0.735
L203A	123.86	0.00	0.00	32.03	78.33	12.69	91.02	0.25	37.52	0.735
POND	123.86	0.00	0.00	50.67	52.60	20.17	72.77	1.16	202.05	0.588
UNC-2	123.86	0.00	0.00	70.18	26.30	27.22	53.53	0.08	17.75	0.432
UNC-3	123.86	0.00	0.00	12.42	105.20	5.08	110.28	0.15	19.89	0.890
UNC-4	123.86	0.00	0.00	88.69	0.00	36.21	36.21	0.03	8.83	0.292
UNC-5	123.86	0.00	0.00	88.69	0.00	36.21	36.21	0.03	7.73	0.292
UNC-6	123.86	0.00	0.00	88.69	0.00	36.21	36.21	0.01	3.31	0.292

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days	hr:min	Reported Max Depth Meters
300a	JUNCTION	0.03	0.22	95.57	0	14:36	0.22
CUL-1	JUNCTION	0.10	0.83	82.51	0	14:44	0.83
CUL-2	JUNCTION	0.06	0.43	81.46	0	14:45	0.43
T3-A	JUNCTION	0.05	0.35	85.35	0	14:40	0.35
T3-B	JUNCTION	0.05	0.40	82.56	0	14:44	0.40
T3-C	JUNCTION	0.08	0.51	81.03	0	14:44	0.51
T3-D	JUNCTION	0.06	0.47	79.47	0	14:48	0.47
T3-E	JUNCTION	0.09	0.58	78.71	0	14:50	0.58
T3-F	JUNCTION	0.06	0.41	77.56	0	14:51	0.41

HWL-146	OUTFALL	0.14	0.19	78.81	0	19:00	0.19
HWL-200	OUTFALL	0.04	0.48	77.77	0	13:00	0.48
HWL-300	OUTFALL	0.07	0.48	77.44	0	13:03	0.48
P2-T3	OUTFALL	0.02	0.19	77.14	0	14:51	0.19
Pond-Escape	OUTFALL	0.00	0.00	81.50	0	00:00	0.00
100	STORAGE	0.98	1.75	80.98	0	19:00	1.75
100C	STORAGE	0.68	1.46	80.98	0	19:00	1.46
101	STORAGE	0.95	1.72	80.98	0	18:55	1.72
102	STORAGE	0.52	1.26	80.98	0	18:57	1.26
103	STORAGE	0.45	1.16	80.99	0	19:14	1.15
104	STORAGE	0.78	1.55	80.98	0	18:55	1.55
105	STORAGE	0.74	1.51	80.98	0	18:55	1.51
106	STORAGE	0.69	1.46	80.98	0	19:08	1.46
107	STORAGE	0.63	1.39	80.98	0	18:54	1.39
108	STORAGE	0.02	0.23	83.14	0	13:00	0.23
109	STORAGE	0.02	0.23	84.03	0	13:00	0.23
110	STORAGE	0.01	0.21	85.54	0	13:00	0.21
111	STORAGE	0.47	1.19	80.98	0	18:54	1.19
112	STORAGE	0.45	1.15	80.98	0	19:00	1.15
113	STORAGE	0.28	0.86	80.98	0	19:10	0.86
114	STORAGE	0.17	0.65	81.02	0	13:00	0.65
115	STORAGE	0.05	0.55	81.35	0	13:00	0.55
116	STORAGE	0.02	0.23	82.21	0	13:00	0.23
117	STORAGE	0.01	0.19	82.71	0	13:00	0.19
147	STORAGE	0.19	0.27	79.20	0	19:00	0.27
148	STORAGE	0.16	0.23	79.30	0	19:01	0.23
149	STORAGE	0.17	0.24	79.64	0	19:07	0.24
150	STORAGE	0.16	0.23	79.73	0	19:05	0.23
201	STORAGE	0.05	0.55	77.94	0	13:00	0.55
201A	STORAGE	0.05	0.55	78.09	0	13:00	0.55
201B	STORAGE	0.03	0.33	78.44	0	12:22	0.33
202	STORAGE	0.03	0.37	79.68	0	13:00	0.37
203	STORAGE	0.03	0.32	80.78	0	13:00	0.32
301	STORAGE	0.08	0.52	77.51	0	13:03	0.52
302	STORAGE	0.09	0.61	77.85	0	13:03	0.60
303X	STORAGE	0.07	0.52	78.12	0	13:02	0.51
304	STORAGE	0.07	0.48	79.45	0	13:02	0.48
305	STORAGE	0.07	0.48	79.99	0	13:01	0.48
306	STORAGE	0.02	0.59	80.78	0	13:00	0.58
307	STORAGE	0.03	1.02	82.44	0	13:00	1.02
308	STORAGE	0.07	0.65	80.81	0	14:40	0.65
C103B-S	STORAGE	0.03	0.80	81.95	0	12:50	0.80
C114B-S	STORAGE	0.03	0.87	81.87	0	13:00	0.87
C115B-S	STORAGE	0.03	0.87	82.27	0	13:00	0.87
C201AA-S	STORAGE	0.07	1.32	80.02	0	13:01	1.32
C201AB-S	STORAGE	0.07	1.33	80.03	0	13:01	1.33
C201BA-S	STORAGE	0.07	1.31	80.71	0	13:01	1.31
C201BB-S	STORAGE	0.07	1.32	80.72	0	13:01	1.32
C201BC-S	STORAGE	0.05	1.36	80.76	0	13:01	1.36
C202B-S	STORAGE	0.05	1.32	80.72	0	13:01	1.32
C202C-S	STORAGE	0.05	1.33	80.73	0	13:01	1.33

C203B-S	STORAGE	0.05	1.36	82.61	0	13:01	1.36
C203C-S	STORAGE	0.05	1.36	82.06	0	13:01	1.36
EXT1-S	STORAGE	1.46	2.52	81.52	0	20:00	2.52
L103C-S	STORAGE	0.25	1.36	81.56	0	13:02	1.35
L110A-S	STORAGE	0.04	1.29	88.04	0	13:00	1.29
L116A-S	STORAGE	0.05	1.33	83.33	0	13:03	1.33
POND_2	STORAGE	0.70	1.48	80.98	0	19:03	1.48

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
300a	JUNCTION	1003.10	1003.10	0 14:25	22.8	22.8	0.007
CUL-1	JUNCTION	0.00	1415.45	0 14:43	0	32.2	0.000
CUL-2	JUNCTION	0.00	1415.41	0 14:44	0	32.2	-0.001
T3-A	JUNCTION	450.97	1425.98	0 14:28	9.34	32.1	-0.004
T3-B	JUNCTION	17.75	1416.48	0 14:40	0.0803	32.2	0.001
T3-C	JUNCTION	39.32	1432.01	0 14:43	0.447	32.7	-0.015
T3-D	JUNCTION	7.73	1432.16	0 14:46	0.0253	32.7	0.028
T3-E	JUNCTION	3.31	1431.92	0 14:48	0.0109	32.7	0.012
T3-F	JUNCTION	0.00	1431.51	0 14:50	0	32.7	-0.001
HWL-146	OUTFALL	0.00	76.81	0 19:00	0	15	0.000
HWL-200	OUTFALL	0.00	779.06	0 13:00	0	6.69	0.000
HWL-300	OUTFALL	0.00	739.39	0 13:03	0	15.7	0.000
P2-T3	OUTFALL	0.00	1431.49	0 14:51	0	32.7	0.000
Pond-Escape	OUTFALL	0.00	0.00	0 00:00	0	0	0.000 ltr
100	STORAGE	0.00	1690.38	0 13:00	0	12.4	0.018
100C	STORAGE	0.00	947.55	0 12:51	0	6.04	-0.021
101	STORAGE	0.00	1696.07	0 13:00	0	12.4	-0.028
102	STORAGE	0.00	577.28	0 12:40	0	4.33	-0.038
103	STORAGE	41.54	584.53	0 12:50	0.282	6.86	-2.669
104	STORAGE	0.00	1138.09	0 13:01	0	8.04	0.029
105	STORAGE	0.00	1146.10	0 13:00	0	8.04	0.034
106	STORAGE	0.00	1157.66	0 12:52	0	8.03	-0.127
107	STORAGE	40.20	1166.71	0 12:51	0.273	8.04	-0.114
108	STORAGE	0.00	186.87	0 13:00	0	1.27	0.328
109	STORAGE	84.41	186.87	0 13:00	0.573	1.27	-0.001
110	STORAGE	0.00	102.49	0 13:00	0	0.7	0.001
111	STORAGE	0.00	946.57	0 12:51	0	6.51	0.023
112	STORAGE	55.73	955.21	0 12:59	0.2	6.51	-0.157
113	STORAGE	41.54	925.47	0 13:00	0.282	6.31	0.216
114	STORAGE	87.10	887.91	0 13:00	0.591	5.99	-0.173
115	STORAGE	368.21	668.07	0 13:00	2.37	4.45	0.194
116	STORAGE	0.00	171.49	0 13:00	0	1.17	-0.010

117	STORAGE	104.49	104.49	0	13:00	0.709	0.709	0.019
147	STORAGE	9.38	76.81	0	19:00	0.0639	15	0.017
148	STORAGE	0.00	68.67	0	19:04	0	13	0.005
149	STORAGE	0.00	68.67	0	19:03	0	13	0.013
150	STORAGE	0.00	68.67	0	19:03	0	13	0.005
201	STORAGE	0.00	779.06	0	13:00	0	6.69	-0.023
201A	STORAGE	0.00	779.06	0	13:00	0	6.69	0.036
201B	STORAGE	0.00	175.80	0	12:21	0	1.61	-0.002
202	STORAGE	34.84	534.96	0	13:00	0.237	4.37	-0.001
203	STORAGE	37.52	384.72	0	13:00	0.255	3.13	0.002
301	STORAGE	0.00	739.29	0	13:03	0	15.7	0.000
302	STORAGE	0.00	740.92	0	13:02	0	15.7	-0.001
303X	STORAGE	0.00	740.75	0	13:02	0	15.7	0.000
304	STORAGE	0.00	742.12	0	13:01	0	15.7	-0.000
305	STORAGE	0.00	742.24	0	13:01	0	15.7	0.005
306	STORAGE	0.00	491.89	0	13:00	0	2.33	-0.036
307	STORAGE	494.73	494.73	0	13:00	2.33	2.33	0.343
308	STORAGE	689.24	689.24	0	14:40	13.3	13.3	-0.015
C103B-S	STORAGE	178.99	178.99	0	12:50	1.39	1.39	-0.003
C114B-S	STORAGE	133.84	133.84	0	13:00	0.952	0.952	-0.003
C115B-S	STORAGE	128.37	128.37	0	13:00	0.913	0.913	-0.003
C201AA-S	STORAGE	37.61	37.61	0	13:00	0.303	0.303	-0.546
C201AB-S	STORAGE	50.63	50.63	0	13:00	0.407	0.407	0.019
C201BA-S	STORAGE	27.48	27.48	0	12:50	0.221	0.221	0.018
C201BB-S	STORAGE	37.61	37.61	0	12:50	0.303	0.303	-0.631
C201BC-S	STORAGE	152.96	152.96	0	13:00	1.09	1.09	-0.004
C202B-S	STORAGE	66.92	66.92	0	13:00	0.476	0.476	0.005
C202C-S	STORAGE	73.75	73.75	0	13:00	0.524	0.524	0.004
C203B-S	STORAGE	268.46	268.46	0	13:00	1.82	1.82	-0.006
C203C-S	STORAGE	147.49	147.49	0	13:00	1.05	1.05	-0.006
EXT1-S	STORAGE	251.44	251.44	0	12:50	1.95	1.95	-0.059
L103C-S	STORAGE	455.98	455.98	0	13:00	2.63	5.36	3.783
L110A-S	STORAGE	103.15	103.15	0	13:00	0.699	0.699	-0.005
L116A-S	STORAGE	92.66	92.66	0	13:00	0.46	0.46	0.003
POND_2	STORAGE	202.05	1877.83	0	13:00	1.16	13.5	0.020

****
Node Surcharge Summary
****

No nodes were surcharged.

****
Node Flooding Summary
****

No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days	hr:min	Maximum Outflow LPS
100	0.001	40	0	0	0.002	72	0	19:00	1683.33
100C	0.001	32	0	0	0.002	69	0	19:00	940.94
101	0.001	34	0	0	0.002	62	0	18:55	1690.38
102	0.001	22	0	0	0.001	54	0	18:57	565.53
103	0.001	23	0	0	0.001	60	0	19:14	577.28
104	0.001	30	0	0	0.002	60	0	18:55	1134.32
105	0.001	24	0	0	0.002	50	0	18:55	1138.09
106	0.001	18	0	0	0.002	39	0	19:08	1146.10
107	0.001	14	0	0	0.002	32	0	18:54	1157.66
108	0.000	0	0	0	0.000	7	0	13:00	186.86
109	0.000	0	0	0	0.000	5	0	13:00	186.87
110	0.000	0	0	0	0.000	6	0	13:00	102.48
111	0.001	11	0	0	0.001	28	0	18:54	939.85
112	0.001	10	0	0	0.001	27	0	19:00	946.57
113	0.000	7	0	0	0.001	21	0	19:10	899.80
114	0.000	4	0	0	0.001	15	0	13:00	884.14
115	0.000	1	0	0	0.001	13	0	13:00	667.11
116	0.000	1	0	0	0.000	7	0	13:00	171.49
117	0.000	1	0	0	0.000	7	0	13:00	104.49
147	0.000	12	0	0	0.000	17	0	19:00	76.81
148	0.000	6	0	0	0.000	9	0	19:01	68.67
149	0.000	10	0	0	0.000	15	0	19:07	68.67
150	0.000	12	0	0	0.000	17	0	19:05	68.67
201	0.000	3	0	0	0.001	27	0	13:00	779.06
201A	0.000	2	0	0	0.001	19	0	13:00	779.06
201B	0.000	1	0	0	0.000	14	0	12:22	175.80
202	0.000	1	0	0	0.000	10	0	13:00	534.96
203	0.000	1	0	0	0.000	7	0	13:00	384.72
301	0.000	3	0	0	0.001	18	0	13:03	739.39
302	0.000	3	0	0	0.001	21	0	13:03	739.29
303X	0.000	2	0	0	0.001	17	0	13:02	740.92
304	0.000	1	0	0	0.001	10	0	13:02	740.75
305	0.000	1	0	0	0.001	9	0	13:01	742.12
306	0.000	0	0	0	0.001	12	0	13:00	490.83
307	0.000	1	0	0	0.001	20	0	13:00	491.89
308	0.000	1	0	0	0.001	13	0	14:40	689.20
C103B-S	0.000	0	0	0	0.001	0	0	12:50	178.99
C114B-S	0.000	0	0	0	0.001	0	0	13:00	133.84
C115B-S	0.000	0	0	0	0.001	0	0	13:00	128.37
C201AA-S	0.001	0	0	0	0.031	2	0	13:01	29.10
C201AB-S	0.001	0	0	0	0.039	3	0	13:01	39.20
C201BA-S	0.000	0	0	0	0.021	1	0	13:01	21.30

C201BB-S	0.001	0	0	0	0.031	2	0	13:01	29.10
C201BC-S	0.001	0	0	0	0.074	5	0	13:01	125.40
C202B-S	0.000	0	0	0	0.033	2	0	13:01	54.90
C202C-S	0.000	0	0	0	0.036	3	0	13:01	60.50
C203B-S	0.001	0	0	0	0.070	5	0	13:01	226.20
C203C-S	0.001	0	0	0	0.071	5	0	13:01	121.00
EXT1-S	0.543	38	0	0	1.352	94	0	20:00	7.80
L103C-S	0.001	0	0	0	0.070	5	0	13:02	364.00
L110A-S	0.000	0	0	0	0.002	0	0	13:00	102.49
L116A-S	0.000	0	0	0	0.040	3	0	13:03	67.00
POND_2	4.356	29	0	0	9.860	65	0	19:03	85.81

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
HWL-146	98.16	46.16	76.81	14.988
HWL-200	33.06	96.71	779.06	6.689
HWL-300	39.03	183.52	739.39	15.670
P2-T3	78.79	172.45	1431.49	32.680
Pond-Escape	0.00	0.00	0.00	0.000
System	49.81	498.84	2293.11	70.027

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Link Flow Summary
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Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
100-100C	CONDUIT	947.55	0 12:51	1.34	0.38	0.94
100C-pond	CONDUIT	940.94	0 12:51	1.28	0.42	0.98
100-pond	CONDUIT	744.94	0 13:00	0.92	0.08	0.99
101-100	CONDUIT	1690.38	0 13:00	1.37	0.71	1.00
102-101	CONDUIT	565.53	0 12:42	1.54	0.73	1.00
103-102	CONDUIT	577.28	0 12:40	1.27	0.65	1.00
104-101	CONDUIT	1134.32	0 13:01	1.29	0.69	1.00
105-104	CONDUIT	1138.09	0 13:01	1.29	0.62	1.00
106-105	CONDUIT	1146.10	0 13:00	1.30	0.67	1.00
107-106	CONDUIT	1157.66	0 12:52	1.34	0.74	1.00
108-107	CONDUIT	186.86	0 13:00	2.34	0.50	0.57

109-108	CONDUIT	186.87	0	13:00	2.34	0.50	0.50
110-109	CONDUIT	102.48	0	13:00	1.99	0.81	0.68
111-107	CONDUIT	939.85	0	13:00	1.51	0.57	1.00
112-111	CONDUIT	946.57	0	12:51	1.48	0.66	0.97
113-112	CONDUIT	899.80	0	13:00	1.65	0.55	0.91
114-113	CONDUIT	884.14	0	13:00	1.69	0.59	0.61
115-114	CONDUIT	667.11	0	13:00	1.55	0.55	0.50
116-115	CONDUIT	171.49	0	13:00	1.88	0.40	0.44
117-116	CONDUIT	104.49	0	13:00	1.66	0.37	0.42
147-146	CONDUIT	76.81	0	19:00	0.93	0.61	0.51
148-147	CONDUIT	68.67	0	19:05	0.89	0.53	0.49
149-148	CONDUIT	68.67	0	19:04	0.84	0.54	0.51
150-149	CONDUIT	68.67	0	19:03	0.88	0.56	0.49
201-200	CONDUIT	779.06	0	13:00	1.69	0.51	0.43
201A-201	CONDUIT	779.06	0	13:00	1.66	0.50	0.43
201B-201A	CONDUIT	175.80	0	12:23	1.13	0.41	0.39
202-201A	CONDUIT	534.96	0	13:00	2.49	0.48	0.49
203-202	CONDUIT	384.72	0	13:00	2.30	0.46	0.47
301-300	CONDUIT	739.39	0	13:03	1.81	0.71	0.48
302-301	CONDUIT	739.29	0	13:03	1.62	0.70	0.52
303X-302	CONDUIT	740.92	0	13:02	2.09	0.72	0.63
304-303X	CONDUIT	740.75	0	13:02	2.47	0.75	0.64
305-304	CONDUIT	742.12	0	13:01	2.48	0.74	0.64
306-305	CONDUIT	490.83	0	13:00	2.33	1.14	0.94
307-306	CONDUIT	491.89	0	13:00	2.27	1.18	1.00
308-305	CONDUIT	689.20	0	14:40	2.51	1.12	0.94
CUL1-2	CONDUIT	1415.41	0	14:44	1.88	0.15	0.35
T3-0	CONDUIT	998.41	0	14:36	0.60	0.02	0.14
T3-1	CONDUIT	1415.95	0	14:40	0.64	0.04	0.19
T3-2	CONDUIT	1415.45	0	14:43	0.34	0.04	0.31
T3-3	CONDUIT	1415.38	0	14:45	0.47	0.05	0.24
T3-4	CONDUIT	1432.16	0	14:46	0.51	0.06	0.22
T3-5	CONDUIT	1431.92	0	14:48	0.42	0.06	0.26
T3-6	CONDUIT	1431.51	0	14:50	0.54	0.06	0.21
T3-7	CONDUIT	1431.49	0	14:51	0.81	0.04	0.15
Pond-OR	ORIFICE	68.67	0	19:03			1.00
OVERFLOW	WEIR	0.00	0	00:00			0.00
C103B-IC	DUMMY	178.99	0	12:50			
C114B-IC	DUMMY	133.84	0	13:00			
C115B-IC	DUMMY	128.37	0	13:00			
C201AA-IC	DUMMY	29.10	0	12:14			
C201AB-IC	DUMMY	39.20	0	12:14			
C201BA-IC	DUMMY	21.30	0	12:21			
C201BB-IC	DUMMY	29.10	0	12:13			
C201BC-IC	DUMMY	125.40	0	12:18			
C202B-IC	DUMMY	54.90	0	12:23			
C202C-IC	DUMMY	60.50	0	12:22			
C203B-IC	DUMMY	226.20	0	12:30			
C203C-IC	DUMMY	121.00	0	12:18			
EXT1-IC	DUMMY	7.80	0	07:13			
L103C-IC	DUMMY	364.00	0	12:45			

L110A-IC	DUMMY	102.49	0	13:00
L116A-IC	DUMMY	67.00	0	12:36

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Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
100-100C	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.01	0.00
100C-pond	1.00	0.02	0.01	0.00	0.97	0.00	0.00	0.00	0.00	0.00
100-pond	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.00	0.00	0.00
101-100	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
102-101	1.00	0.03	0.01	0.00	0.74	0.00	0.00	0.23	0.02	0.00
103-102	1.00	0.02	0.16	0.00	0.83	0.00	0.00	0.00	0.24	0.00
104-101	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
105-104	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
106-105	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.00	0.03	0.00
107-106	1.00	0.01	0.00	0.00	0.97	0.00	0.00	0.02	0.00	0.00
108-107	1.00	0.02	0.01	0.00	0.32	0.00	0.00	0.65	0.31	0.00
109-108	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
110-109	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
111-107	1.00	0.01	0.03	0.00	0.69	0.00	0.00	0.26	0.04	0.00
112-111	1.00	0.01	0.12	0.00	0.86	0.00	0.00	0.00	0.23	0.00
113-112	1.00	0.35	0.03	0.00	0.50	0.00	0.00	0.12	0.03	0.00
114-113	1.00	0.01	0.05	0.00	0.94	0.00	0.00	0.00	0.13	0.00
115-114	1.00	0.01	0.00	0.00	0.32	0.00	0.00	0.66	0.14	0.00
116-115	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
117-116	1.00	0.02	0.00	0.00	0.00	0.01	0.00	0.97	0.00	0.00
147-146	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
148-147	1.00	0.02	0.00	0.00	0.72	0.00	0.00	0.26	0.02	0.00
149-148	1.00	0.02	0.00	0.00	0.96	0.00	0.00	0.02	0.00	0.00
150-149	1.00	0.02	0.00	0.00	0.73	0.00	0.00	0.25	0.00	0.00
201-200	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
201A-201	1.00	0.02	0.00	0.00	0.03	0.00	0.00	0.96	0.00	0.00
201B-201A	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
202-201A	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
203-202	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
301-300	1.00	0.02	0.00	0.00	0.97	0.01	0.00	0.00	0.00	0.00
302-301	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
303X-302	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
304-303X	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
305-304	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
306-305	1.00	0.02	0.00	0.00	0.06	0.01	0.00	0.91	0.05	0.00
307-306	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
308-305	1.00	0.06	0.00	0.00	0.00	0.01	0.00	0.93	0.01	0.00
CUL1-2	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.98

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T3-0                   1.00   0.02  0.10  0.00  0.88  0.00  0.00  0.00  0.88  0.00
T3-1                   1.00   0.02  0.00  0.00  0.98  0.00  0.00  0.00  0.96  0.00
T3-2                   1.00   0.02  0.00  0.00  0.98  0.00  0.00  0.00  0.94  0.00
T3-3                   1.00   0.02  0.00  0.00  0.98  0.00  0.00  0.00  0.92  0.00
T3-4                   1.00   0.02  0.00  0.00  0.19  0.00  0.00  0.78  0.00  0.00
T3-5                   1.00   0.02  0.00  0.00  0.98  0.00  0.00  0.00  0.87  0.00
T3-6                   1.00   0.06  0.00  0.00  0.11  0.00  0.00  0.83  0.00  0.00
T3-7                   1.00   0.06  0.00  0.00  0.94  0.00  0.00  0.00  0.00  0.00


*************************
Conduit Surcharge Summary
*************************

----------------------------------------------------------------------------
                                                           Hours        Hours
                       --------- Hours Full --------   Above Full   Capacity
Conduit                Both Ends  Upstream  Dnstream   Normal Flow   Limited
----------------------------------------------------------------------------
100-pond                    0.01      0.01     18.63       0.01          0.01
101-100                    17.42     17.42     18.63       0.01          0.01
102-101                    17.01     17.01     17.42       0.01          0.01
103-102                    12.40     12.40     17.02       0.01          0.01
104-101                    16.60     16.60     17.42       0.01          0.01
105-104                    14.91     14.91     16.60       0.01          0.01
106-105                    12.78     12.78     14.91       0.01          0.01
107-106                     8.10      8.10     11.43       0.01          0.01
108-107                     0.01      0.01      8.10       0.01          0.01
111-107                     0.01      0.01      8.10       0.01          0.01
306-305                     0.01      0.17      0.01       0.46          0.01
307-306                     0.12      0.35      0.12       0.49          0.12
308-305                     0.01      0.69      0.01       1.50          0.01


Analysis begun on:  Tue Jan 23 08:32:45 2024
Analysis ended on:  Tue Jan 23 08:32:49 2024
Total elapsed time: 00:00:04
```

Design Storm: 100-Year + 20% 3-Hour Chicago

```
ALTERNATIVE RUNOFF METHOD (ARM) - PCSWMM VERSION 7.5.3406
---------------------------------------------------------

This is a new version of ARM - your feedback and suggestions are solicited.
Create a ticket, post on the PCSWMM feature request forum, or email us directly!

Simulation start time:                  06/01/2023 00:00:00
Simulation end time:                    06/05/2023 00:00:00
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Runoff wet weather time steps:          300 seconds
Report time steps:                      300 seconds
Number of data points:                  1153
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****
Unit Hydrographs Runoff Method
****

Subcatchment	Runoff Method	Raingage	Area (ha)	Time of Concentration (min)	Time to Peak (min)	Time after Peak (min)	Peak UH Flow (m³/s/mm)	UH Depth (mm)
303	Nash IUH	Chicago_100yr3hr+20%	55.03	117.31	58.66	661.34	0.05752	0.999
311	Nash IUH	Chicago_100yr3hr+20%	0.55	11	5.5	54.5	0.00613	0.933
F115D	Nash IUH	Chicago_100yr3hr+20%	2.51	17.34	11.56	73.44	0.0196	0.998
F308B	Nash IUH	Chicago_100yr3hr+20%	22.98	148.66	99.11	575.89	0.02092	1
EXT-2	Nash IUH	Chicago_100yr3hr+20%	1.05	63.31	31.65	243.35	0.00203	0.996
312	Nash IUH	Chicago_100yr3hr+20%	1.95	50.3	25.15	219.85	0.00475	0.996
301	Nash IUH	Chicago_100yr3hr+20%	86.43	111.04	55.52	659.48	0.09545	0.999
302	Nash IUH	Chicago_100yr3hr+20%	80.69	161.19	80.6	914.4	0.06139	1

****
ARM Runoff Summary
****

Subcatchment	Total Precip (mm)	Total Losses (mm)	Total Runoff (mm)	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff (fraction)
303	86	79.387	6.609	3.637	306.292	0.077
311	86	79.001	6.533	0.036	11.958	0.076
F115D	86	51.563	34.359	0.862	297.378	0.4
F308B	86	54.564	31.432	7.223	578.629	0.365
EXT-2	86	75.506	10.457	0.11	14.3	0.122
312	86	76.415	9.549	0.186	27.386	0.111
301	86	80.693	5.304	4.584	399.026	0.062
302	86	80.572	5.427	4.379	297.874	0.063

WARNING ARM01: Computed UH depth for ARM subcatchment 311 is not unity. Consider reducing wet weather time step.

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.015)

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WARNING 03: negative offset ignored for Link 100-pond

*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Infiltration Method ...... HORTON
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 06/01/2023 00:00:00
Ending Date .............. 06/05/2023 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:05:00
Wet Time Step ............ 00:05:00
Dry Time Step ............ 00:05:00
Routing Time Step ........ 5.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 4
Head Tolerance ........... 0.001500 m


**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         2.563        86.000
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.682        22.902
Surface Runoff ...........         1.881        63.119
Final Storage ............         0.025         0.845
Continuity Error (%) .....        -1.006


**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
```

```
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         1.880        18.804
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         2.102        21.019
External Outflow .........         3.942        39.416
Flooding Loss ............         0.020         0.198
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.001         0.009
Final Stored Volume ......         0.026         0.260
Continuity Error (%) .....        -0.107


*************************
Highest Continuity Errors
*************************
Node 103 (-1.41%)


***************************
Time-Step Critical Elements
***************************
Link T3-7 (5.17%)
Link 102-101 (2.65%)
Link 100-100C (1.17%)
Link 100-pond (1.04%)


********************************
Highest Flow Instability Indexes
********************************
Link L103C-IC (8)
Link EXT1-IC (7)
Link 103-102 (5)
Link 102-101 (5)
Link 100-100C (4)


*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     4.80 sec
Maximum Time Step           :     5.00 sec
Percent in Steady State     :    -0.00
Average Iterations per Step :     2.81
Percent Not Converging      :     4.92
Time Step Frequencies       :
    5.000 -  3.155 sec      :    95.13 %
    3.155 -  1.991 sec      :     3.93 %
```

```
    1.991 -  1.256 sec      :     0.39 %
    1.256 -  0.792 sec      :     0.29 %
    0.792 -  0.500 sec      :     0.26 %
```

```
***************************
Subcatchment Runoff Summary
***************************
```

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
C103A	86.00	0.00	0.00	16.79	54.19	15.30	69.49	0.22	175.88	0.808
C103B	86.00	0.00	0.00	6.52	72.85	6.00	78.86	0.99	737.22	0.917
C107A	86.00	0.00	0.00	16.78	54.19	15.32	69.51	0.21	170.30	0.808
C109A	86.00	0.00	0.00	16.92	54.18	14.86	69.04	0.43	349.09	0.803
C113A	86.00	0.00	0.00	16.80	54.18	15.28	69.46	0.22	175.75	0.808
C114A	86.00	0.00	0.00	16.94	54.19	14.81	69.00	0.45	358.81	0.802
C114B	86.00	0.00	0.00	13.60	60.12	12.07	72.19	0.71	554.79	0.839
C115A	86.00	0.00	0.00	16.85	54.18	15.06	69.24	0.44	353.87	0.805
C115B	86.00	0.00	0.00	13.60	60.12	12.07	72.19	0.68	532.15	0.839
C117A	86.00	0.00	0.00	17.02	54.21	14.62	68.83	0.16	124.63	0.800
C117B	86.00	0.00	0.00	17.09	54.24	14.47	68.72	0.38	293.29	0.799
C147A	86.00	0.00	0.00	16.68	54.27	15.63	69.90	0.05	39.96	0.813
C201AA	86.00	0.00	0.00	3.25	78.80	3.04	81.84	0.21	153.52	0.952
C201AB	86.00	0.00	0.00	3.25	78.80	3.04	81.84	0.29	206.66	0.952
C201BA	86.00	0.00	0.00	3.24	78.76	3.04	81.80	0.16	112.19	0.951
C201BB	86.00	0.00	0.00	3.24	78.76	3.04	81.80	0.21	153.52	0.951
C201BC	86.00	0.00	0.00	13.60	60.12	12.07	72.19	0.81	634.05	0.839
C202B	86.00	0.00	0.00	13.60	60.12	12.07	72.19	0.35	277.40	0.839
C202C	86.00	0.00	0.00	13.60	60.12	12.07	72.19	0.39	305.70	0.839
C203B	86.00	0.00	0.00	17.70	54.45	13.56	68.01	1.37	963.45	0.791
C203C	86.00	0.00	0.00	13.60	60.12	12.07	72.19	0.78	611.40	0.839
EXT-1	86.00	0.00	0.00	6.52	72.85	6.00	78.86	1.40	1035.62	0.917
EXT-3	86.00	0.00	0.00	20.86	54.27	65.13	65.13	0.65	503.76	0.757
F112A	86.00	0.00	0.00	36.65	24.56	50.12	50.12	0.23	213.94	0.583
F307A	86.00	0.00	0.00	36.74	21.16	28.43	49.59	2.08	1507.23	0.577
F308A	86.00	0.00	0.00	46.68	0.00	42.32	42.32	0.08	97.72	0.492
L103C	86.00	0.00	0.00	37.97	24.63	23.33	47.96	2.04	1092.42	0.558
L110A	86.00	0.00	0.00	17.11	54.25	14.44	68.69	0.53	408.94	0.799
L115C	86.00	0.00	0.00	36.79	24.56	49.89	49.89	0.29	259.65	0.580
L116A	86.00	0.00	0.00	34.96	24.58	26.69	51.26	0.40	280.62	0.596
L202A	86.00	0.00	0.00	16.86	54.18	15.04	69.22	0.18	145.86	0.805
L203A	86.00	0.00	0.00	16.86	54.18	15.06	69.24	0.19	157.25	0.805
POND	86.00	0.00	0.00	26.62	36.44	24.09	60.53	0.97	877.47	0.704
UNC-2	86.00	0.00	0.00	37.25	18.22	31.58	49.80	0.07	69.14	0.579
UNC-3	86.00	0.00	0.00	6.48	72.85	6.07	78.92	0.11	82.00	0.918
UNC-4	86.00	0.00	0.00	46.31	0.00	43.40	43.40	0.03	42.20	0.505
UNC-5	86.00	0.00	0.00	46.31	0.00	43.40	43.40	0.03	36.93	0.505

UNC-6	86.00	0.00	0.00	46.31	0.00	43.40	43.40	0.01	15.83	0.505

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days	hr:min	Reported Max Depth Meters
300a	JUNCTION	0.01	0.18	95.53	0	03:16	0.18
CUL-1	JUNCTION	0.05	0.65	82.33	0	03:20	0.65
CUL-2	JUNCTION	0.03	0.35	81.38	0	03:21	0.35
T3-A	JUNCTION	0.02	0.28	85.28	0	03:17	0.28
T3-B	JUNCTION	0.02	0.28	82.44	0	03:19	0.28
T3-C	JUNCTION	0.04	0.43	80.95	0	03:20	0.43
T3-D	JUNCTION	0.03	0.38	79.38	0	03:24	0.38
T3-E	JUNCTION	0.04	0.49	78.62	0	03:26	0.49
T3-F	JUNCTION	0.03	0.34	77.49	0	03:28	0.34
HWL-146	OUTFALL	0.11	0.19	78.81	0	03:10	0.19
HWL-200	OUTFALL	0.02	0.54	77.83	0	01:11	0.54
HWL-300	OUTFALL	0.04	0.54	77.50	0	01:13	0.53
P2-T3	OUTFALL	0.01	0.15	77.10	0	03:28	0.15
Pond-Escape	OUTFALL	0.00	0.00	81.50	0	00:00	0.00
100	STORAGE	0.79	1.65	80.88	0	03:16	1.65
100C	STORAGE	0.50	1.36	80.88	0	03:16	1.36
101	STORAGE	0.76	1.62	80.88	0	03:16	1.62
102	STORAGE	0.35	1.17	80.89	0	03:20	1.16
103	STORAGE	0.29	1.16	80.99	0	02:25	1.07
104	STORAGE	0.59	1.46	80.89	0	03:13	1.45
105	STORAGE	0.55	1.42	80.89	0	03:13	1.41
106	STORAGE	0.50	1.37	80.89	0	02:28	1.36
107	STORAGE	0.44	1.30	80.89	0	03:22	1.30
108	STORAGE	0.01	0.63	83.54	0	01:11	0.54
109	STORAGE	0.01	0.79	84.59	0	01:10	0.75
110	STORAGE	0.01	0.22	85.55	0	01:11	0.21
111	STORAGE	0.31	1.15	80.94	0	01:10	1.11
112	STORAGE	0.29	1.19	81.02	0	01:11	1.15
113	STORAGE	0.16	0.99	81.11	0	01:10	0.93
114	STORAGE	0.09	1.11	81.48	0	01:11	1.08
115	STORAGE	0.02	0.99	81.79	0	01:10	0.96
116	STORAGE	0.01	0.50	82.48	0	01:10	0.49
117	STORAGE	0.01	0.90	83.42	0	01:10	0.89
147	STORAGE	0.16	0.27	79.20	0	03:10	0.27
148	STORAGE	0.14	0.22	79.29	0	03:12	0.22
149	STORAGE	0.14	0.24	79.64	0	03:18	0.24
150	STORAGE	0.14	0.23	79.73	0	03:17	0.23
201	STORAGE	0.03	0.63	78.02	0	01:10	0.63
201A	STORAGE	0.03	0.63	78.17	0	01:10	0.63

201B	STORAGE	0.02	0.33	78.44	0 01:03	0.33
202	STORAGE	0.02	0.46	79.77	0 01:10	0.46
203	STORAGE	0.01	0.38	80.84	0 01:10	0.38
301	STORAGE	0.04	0.58	77.57	0 01:12	0.58
302	STORAGE	0.05	0.69	77.93	0 01:12	0.68
303X	STORAGE	0.04	0.59	78.19	0 01:11	0.58
304	STORAGE	0.04	0.57	79.54	0 01:11	0.55
305	STORAGE	0.04	0.56	80.07	0 01:10	0.56
306	STORAGE	0.02	1.71	81.90	0 01:16	1.71
307	STORAGE	0.04	5.06	86.48	0 01:07	5.06
308	STORAGE	0.03	0.46	80.62	0 03:15	0.46
C103B-S	STORAGE	0.03	1.51	82.66	0 01:14	1.51
C114B-S	STORAGE	0.03	1.46	82.46	0 01:14	1.46
C115B-S	STORAGE	0.03	1.46	82.86	0 01:14	1.46
C201AA-S	STORAGE	0.06	1.37	80.07	0 01:23	1.37
C201AB-S	STORAGE	0.06	1.40	80.10	0 01:23	1.40
C201BA-S	STORAGE	0.06	1.35	80.75	0 01:23	1.35
C201BB-S	STORAGE	0.06	1.37	80.77	0 01:23	1.37
C201BC-S	STORAGE	0.06	1.59	80.99	0 01:23	1.59
C202B-S	STORAGE	0.05	1.42	80.82	0 01:23	1.42
C202C-S	STORAGE	0.05	1.44	80.84	0 01:23	1.44
C203B-S	STORAGE	0.06	1.75	83.00	0 01:24	1.75
C203C-S	STORAGE	0.06	1.58	82.28	0 01:23	1.58
EXT1-S	STORAGE	1.06	2.49	81.49	0 03:14	2.49
L103C-S	STORAGE	0.15	1.76	81.96	0 01:32	1.76
L110A-S	STORAGE	0.04	1.46	88.21	0 01:22	1.46
L116A-S	STORAGE	0.05	1.43	83.43	0 01:31	1.43
POND_2	STORAGE	0.52	1.38	80.88	0 03:16	1.38

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
300a	JUNCTION	690.37	690.37	0 03:10	8.96	8.96	0.037
CUL-1	JUNCTION	0.00	984.43	0 03:20	0	13.5	0.000
CUL-2	JUNCTION	0.00	984.38	0 03:20	0	13.5	-0.004
T3-A	JUNCTION	605.81	994.20	0 03:10	4.44	13.4	-0.023
T3-B	JUNCTION	69.14	984.55	0 03:18	0.0747	13.5	0.001
T3-C	JUNCTION	45.90	996.48	0 03:20	0.221	13.7	-0.039
T3-D	JUNCTION	36.93	996.74	0 03:22	0.0304	13.7	0.041
T3-E	JUNCTION	15.83	996.40	0 03:24	0.013	13.7	0.030
T3-F	JUNCTION	0.00	996.03	0 03:27	0	13.7	-0.003
HWL-146	OUTFALL	0.00	74.60	0 03:10	0	11.5	0.000
HWL-200	OUTFALL	0.00	1004.67	0 01:11	0	4.96	0.000

HWL-300	OUTFALL	0.00	909.67	0	01:13	0	9.18	0.000	
P2-T3	OUTFALL	0.00	995.99	0	03:28	0	13.7	0.000	
Pond-Escape	OUTFALL	0.00	0.00	0	00:00	0	0	0.000	ltr
100	STORAGE	0.00	3961.60	0	01:12	0	10	-0.014	
100C	STORAGE	0.00	1358.50	0	01:17	0	5.07	-0.092	
101	STORAGE	0.00	3958.26	0	01:13	0	9.4	-0.046	
102	STORAGE	0.00	866.89	0	01:08	0	3.39	0.083	
103	STORAGE	175.88	831.88	0	01:10	0.215	3.94	-1.391	
104	STORAGE	0.00	2787.02	0	01:11	0	6.03	-0.003	
105	STORAGE	0.00	2798.79	0	01:11	0	6.03	0.023	
106	STORAGE	0.00	2795.43	0	01:11	0	6.02	-0.159	
107	STORAGE	170.30	2802.58	0	01:11	0.208	6.01	-0.213	
108	STORAGE	0.00	432.37	0	01:09	0	0.961	0.226	
109	STORAGE	349.09	450.50	0	01:10	0.435	0.963	0.287	
110	STORAGE	0.00	103.00	0	01:02	0	0.529	0.002	
111	STORAGE	0.00	2259.27	0	01:11	0	4.85	0.069	
112	STORAGE	213.94	2274.56	0	01:11	0.231	4.84	-0.190	
113	STORAGE	175.75	2055.59	0	01:10	0.215	4.62	0.314	
114	STORAGE	358.81	1927.88	0	01:10	0.448	4.38	-0.293	
115	STORAGE	756.04	1412.91	0	01:10	1.59	3.22	0.307	
116	STORAGE	0.00	478.10	0	01:10	0	0.935	0.006	
117	STORAGE	417.92	417.92	0	01:10	0.536	0.536	0.201	
147	STORAGE	39.96	74.63	0	03:10	0.0489	11.5	0.020	
148	STORAGE	0.00	66.21	0	03:18	0	10.1	-0.000	
149	STORAGE	0.00	66.21	0	03:17	0	10.1	0.020	
150	STORAGE	0.00	66.21	0	03:16	0	10.1	0.004	
201	STORAGE	0.00	1004.74	0	01:10	0	4.96	-0.040	
201A	STORAGE	0.00	1004.58	0	01:10	0	4.96	0.066	
201B	STORAGE	0.00	175.80	0	01:02	0	1.18	-0.002	
202	STORAGE	145.86	764.16	0	01:10	0.18	3.28	-0.045	
203	STORAGE	157.25	504.45	0	01:10	0.194	2.36	0.054	
301	STORAGE	0.00	909.53	0	01:13	0	9.18	0.000	
302	STORAGE	0.00	909.99	0	01:12	0	9.18	-0.002	
303X	STORAGE	0.00	909.69	0	01:11	0	9.18	-0.000	
304	STORAGE	0.00	912.59	0	01:10	0	9.18	-0.000	
305	STORAGE	0.00	913.34	0	01:10	0	9.18	0.010	
306	STORAGE	0.00	845.25	0	01:07	0	1.87	-0.010	
307	STORAGE	1507.23	1507.23	0	01:10	2.08	2.08	0.476	
308	STORAGE	578.63	578.63	0	03:15	7.3	7.3	-0.025	
C103B-S	STORAGE	737.22	737.22	0	01:10	0.993	0.993	-0.461	
C114B-S	STORAGE	554.79	554.79	0	01:10	0.707	0.707	-0.242	
C115B-S	STORAGE	532.15	532.15	0	01:10	0.678	0.678	-1.237	
C201AA-S	STORAGE	153.52	153.52	0	01:10	0.213	0.213	0.074	
C201AB-S	STORAGE	206.66	206.66	0	01:10	0.286	0.286	0.062	
C201BA-S	STORAGE	112.19	112.19	0	01:10	0.155	0.155	0.056	
C201BB-S	STORAGE	153.52	153.52	0	01:10	0.213	0.213	-0.161	
C201BC-S	STORAGE	634.05	634.05	0	01:10	0.808	0.808	0.035	
C202B-S	STORAGE	277.40	277.40	0	01:10	0.354	0.354	0.065	
C202C-S	STORAGE	305.70	305.70	0	01:10	0.39	0.39	0.069	
C203B-S	STORAGE	963.45	963.45	0	01:10	1.37	1.37	-1.175	
C203C-S	STORAGE	611.40	611.40	0	01:10	0.779	0.779	0.052	

EXT1-S	STORAGE	1035.62	1035.62	0	01:10	1.4	1.4	-0.651
L103C-S	STORAGE	1094.43	1094.43	0	01:10	2.15	2.78	2.100
L110A-S	STORAGE	408.94	408.94	0	01:10	0.529	0.529	0.025
L116A-S	STORAGE	280.62	280.62	0	01:10	0.4	0.4	0.059
POND_2	STORAGE	877.47	4826.83	0	01:09	0.968	11	0.024

****
Node Surcharge Summary
****

No nodes were surcharged.

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate LPS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
307	0.15	687.32	0 01:10	0.198	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
100	0.001	33	0	0	0.002	69	0 03:16	3972.88
100C	0.001	24	0	0	0.002	64	0 03:16	1359.51
101	0.001	27	0	0	0.002	58	0 03:16	3961.60
102	0.000	15	0	0	0.001	50	0 03:20	1082.78
103	0.000	15	0	0	0.001	60	0 02:25	866.89
104	0.001	23	0	0	0.002	57	0 03:13	2902.92
105	0.001	18	0	0	0.002	47	0 03:13	2787.02
106	0.001	13	0	0	0.002	37	0 02:28	2798.79
107	0.000	10	0	0	0.001	30	0 03:22	2795.43
108	0.000	0	0	0	0.001	19	0 01:11	399.71
109	0.000	0	0	0	0.001	17	0 01:10	432.37
110	0.000	0	0	0	0.000	6	0 01:11	105.05
111	0.000	7	0	0	0.001	27	0 01:10	2267.40
112	0.000	7	0	0	0.001	28	0 01:11	2259.27

113	0.000	4	0	0	0.001	24	0	01:10	2074.99
114	0.000	2	0	0	0.001	26	0	01:11	1894.54
115	0.000	1	0	0	0.001	24	0	01:10	1383.81
116	0.000	0	0	0	0.001	16	0	01:10	469.33
117	0.000	0	0	0	0.001	35	0	01:10	411.10
147	0.000	10	0	0	0.000	17	0	03:10	74.60
148	0.000	5	0	0	0.000	8	0	03:12	66.21
149	0.000	9	0	0	0.000	15	0	03:18	66.21
150	0.000	10	0	0	0.000	16	0	03:17	66.21
201	0.000	1	0	0	0.001	31	0	01:10	1004.67
201A	0.000	1	0	0	0.001	22	0	01:10	1004.74
201B	0.000	1	0	0	0.000	14	0	01:03	175.92
202	0.000	0	0	0	0.001	13	0	01:10	760.48
203	0.000	0	0	0	0.000	8	0	01:10	503.57
301	0.000	2	0	0	0.001	21	0	01:12	909.67
302	0.000	2	0	0	0.001	23	0	01:12	909.53
303X	0.000	1	0	0	0.001	19	0	01:11	909.99
304	0.000	1	0	0	0.001	12	0	01:11	909.69
305	0.000	1	0	0	0.001	11	0	01:10	912.59
306	0.000	0	0	0	0.002	34	0	01:16	815.82
307	0.000	1	0	0	0.006	100	0	01:07	845.25
308	0.000	1	0	0	0.001	9	0	03:15	578.62
C103B-S	0.002	0	0	0	0.243	17	0	01:14	292.00
C114B-S	0.002	0	0	0	0.186	13	0	01:14	199.00
C115B-S	0.002	0	0	0	0.185	13	0	01:14	191.00
C201AA-S	0.002	0	0	0	0.087	6	0	01:23	29.10
C201AB-S	0.003	0	0	0	0.117	8	0	01:23	39.20
C201BA-S	0.001	0	0	0	0.064	4	0	01:23	21.30
C201BB-S	0.002	0	0	0	0.087	6	0	01:23	29.10
C201BC-S	0.007	0	0	0	0.326	23	0	01:23	125.40
C202B-S	0.003	0	0	0	0.143	10	0	01:23	54.90
C202C-S	0.003	0	0	0	0.158	11	0	01:23	60.50
C203B-S	0.010	1	0	0	0.504	35	0	01:24	226.20
C203C-S	0.006	0	0	0	0.314	22	0	01:23	121.00
EXT1-S	0.383	27	0	0	1.319	92	0	03:14	7.80
L103C-S	0.010	1	0	0	0.516	36	0	01:32	364.00
L110A-S	0.003	0	0	0	0.183	13	0	01:22	103.00
L116A-S	0.003	0	0	0	0.151	11	0	01:31	67.00
POND_2	3.099	21	0	0	9.115	60	0	03:16	138.85

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
HWL-146	99.63	34.92	74.60	11.543

HWL-200	11.16	272.14	1004.67	4.959
HWL-300	18.39	240.10	909.67	9.180
P2-T3	66.59	86.98	995.99	13.733
Pond-Escape	0.00	0.00	0.00	0.000
System	39.15	634.14	1958.62	39.415

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
100-100C	CONDUIT	1358.50	0 01:17	1.84	0.55	0.88
100C-pond	CONDUIT	1359.51	0 01:17	2.38	0.61	0.92
100-pond	CONDUIT	3017.85	0 01:09	4.22	0.34	0.96
101-100	CONDUIT	3961.60	0 01:12	3.26	1.66	1.00
102-101	CONDUIT	1082.78	0 01:09	2.09	1.40	1.00
103-102	CONDUIT	866.89	0 01:08	1.57	0.97	1.00
104-101	CONDUIT	2902.92	0 01:13	2.67	1.77	1.00
105-104	CONDUIT	2787.02	0 01:11	2.42	1.51	1.00
106-105	CONDUIT	2798.79	0 01:11	2.21	1.62	1.00
107-106	CONDUIT	2795.43	0 01:11	2.09	1.78	0.98
108-107	CONDUIT	399.71	0 01:08	2.75	1.07	0.96
109-108	CONDUIT	432.37	0 01:09	2.73	1.16	1.00
110-109	CONDUIT	105.05	0 01:12	2.02	0.83	0.86
111-107	CONDUIT	2267.40	0 01:11	2.07	1.38	0.94
112-111	CONDUIT	2259.27	0 01:11	2.02	1.57	0.97
113-112	CONDUIT	2074.99	0 01:11	1.73	1.26	0.99
114-113	CONDUIT	1894.54	0 01:10	1.89	1.25	0.87
115-114	CONDUIT	1383.81	0 01:10	1.67	1.13	0.93
116-115	CONDUIT	469.33	0 01:10	2.30	1.09	0.91
117-116	CONDUIT	411.10	0 01:10	2.61	1.44	0.98
147-146	CONDUIT	74.60	0 03:10	0.92	0.59	0.51
148-147	CONDUIT	66.21	0 03:19	0.88	0.51	0.48
149-148	CONDUIT	66.21	0 03:18	0.83	0.52	0.50
150-149	CONDUIT	66.21	0 03:17	0.87	0.54	0.48
201-200	CONDUIT	1004.67	0 01:11	1.84	0.66	0.49
201A-201	CONDUIT	1004.74	0 01:10	1.78	0.65	0.50
201B-201A	CONDUIT	175.92	0 01:04	1.13	0.41	0.39
202-201A	CONDUIT	760.48	0 01:10	2.71	0.69	0.61
203-202	CONDUIT	503.57	0 01:10	2.46	0.60	0.56
301-300	CONDUIT	909.67	0 01:13	1.94	0.87	0.53
302-301	CONDUIT	909.53	0 01:13	1.73	0.86	0.58
303X-302	CONDUIT	909.99	0 01:12	2.25	0.89	0.71
304-303X	CONDUIT	909.69	0 01:11	2.55	0.92	0.75
305-304	CONDUIT	912.59	0 01:10	2.56	0.91	0.75

306-305	CONDUIT	815.82	0	01:16	3.77	1.89	1.00
307-306	CONDUIT	845.25	0	01:07	3.90	2.02	1.00
308-305	CONDUIT	578.62	0	03:15	2.47	0.94	0.77
CUL1-2	CONDUIT	984.38	0	03:20	1.64	0.10	0.28
T3-0	CONDUIT	685.69	0	03:16	0.52	0.01	0.12
T3-1	CONDUIT	984.53	0	03:18	0.60	0.03	0.14
T3-2	CONDUIT	984.43	0	03:20	0.33	0.03	0.23
T3-3	CONDUIT	984.35	0	03:21	0.41	0.04	0.20
T3-4	CONDUIT	996.74	0	03:22	0.45	0.04	0.18
T3-5	CONDUIT	996.40	0	03:24	0.36	0.04	0.22
T3-6	CONDUIT	996.03	0	03:27	0.48	0.04	0.17
T3-7	CONDUIT	995.99	0	03:28	0.70	0.03	0.12
Pond-OR	ORIFICE	66.21	0	03:16			1.00
OVERFLOW	WEIR	0.00	0	00:00			0.00
C103B-IC	DUMMY	292.00	0	01:01			
C114B-IC	DUMMY	199.00	0	01:02			
C115B-IC	DUMMY	191.00	0	01:01			
C201AA-IC	DUMMY	29.10	0	01:02			
C201AB-IC	DUMMY	39.20	0	01:02			
C201BA-IC	DUMMY	21.30	0	01:02			
C201BB-IC	DUMMY	29.10	0	01:02			
C201BC-IC	DUMMY	125.40	0	01:01			
C202B-IC	DUMMY	54.90	0	01:02			
C202C-IC	DUMMY	60.50	0	01:02			
C203B-IC	DUMMY	226.20	0	01:00			
C203C-IC	DUMMY	121.00	0	01:01			
EXT1-IC	DUMMY	7.80	0	00:25			
L103C-IC	DUMMY	364.00	0	01:02			
L110A-IC	DUMMY	103.00	0	01:02			
L116A-IC	DUMMY	67.00	0	01:03			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
		---------- Fraction of Time in Flow Class ----------								
100-100C	1.00	0.01	0.12	0.00	0.87	0.00	0.00	0.01	0.00	0.00
100C-pond	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.00	0.00	0.00
100-pond	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.00	0.00	0.00
101-100	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
102-101	1.00	0.02	0.01	0.00	0.61	0.00	0.00	0.36	0.03	0.00
103-102	1.00	0.00	0.36	0.00	0.64	0.00	0.00	0.00	0.48	0.00
104-101	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
105-104	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
106-105	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
107-106	1.00	0.00	0.18	0.00	0.81	0.00	0.00	0.00	0.20	0.00

108-107	1.00	0.00	0.01	0.00	0.18	0.01	0.00	0.80	0.19	0.00
109-108	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
110-109	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
111-107	1.00	0.01	0.03	0.00	0.57	0.00	0.00	0.40	0.04	0.00
112-111	1.00	0.00	0.33	0.00	0.66	0.00	0.00	0.00	0.46	0.00
113-112	1.00	0.57	0.03	0.00	0.38	0.00	0.00	0.02	0.03	0.00
114-113	1.00	0.00	0.05	0.00	0.95	0.00	0.00	0.00	0.13	0.00
115-114	1.00	0.00	0.00	0.00	0.19	0.00	0.00	0.80	0.14	0.00
116-115	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
117-116	1.00	0.00	0.00	0.00	0.00	0.02	0.00	0.98	0.01	0.00
147-146	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
148-147	1.00	0.00	0.00	0.00	0.54	0.00	0.00	0.46	0.01	0.00
149-148	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.01	0.00	0.00
150-149	1.00	0.00	0.00	0.00	0.60	0.00	0.00	0.40	0.00	0.00
201-200	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
201A-201	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.00	0.00
201B-201A	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
202-201A	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
203-202	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
301-300	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.00	0.00	0.00
302-301	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
303X-302	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
304-303X	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
305-304	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
306-305	1.00	0.00	0.00	0.00	0.05	0.00	0.00	0.94	0.04	0.00
307-306	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
308-305	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.98	0.01	0.00
CUL1-2	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00	1.00
T3-0	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.00	0.99	0.00
T3-1	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.98	0.00
T3-2	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.86	0.00
T3-3	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.99	0.00
T3-4	1.00	0.00	0.00	0.00	0.09	0.00	0.00	0.90	0.00	0.00
T3-5	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.98	0.00
T3-6	1.00	0.01	0.00	0.00	0.05	0.00	0.00	0.94	0.00	0.00
T3-7	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
100-pond	0.01	0.01	7.15	0.01	0.01
101-100	5.94	5.94	7.15	0.23	0.01
102-101	5.55	5.55	5.94	0.13	0.01
103-102	0.58	0.58	5.53	0.01	0.01

104-101	5.13	5.13	5.94	0.25	0.01
105-104	3.46	3.46	5.13	0.20	0.01
106-105	1.14	1.14	3.46	0.23	0.01
107-106	0.01	0.01	0.01	0.30	0.01
108-107	0.01	0.09	0.01	0.15	0.01
109-108	0.06	0.11	0.07	0.13	0.05
110-109	0.01	0.01	0.11	0.01	0.01
111-107	0.01	0.01	0.01	0.17	0.01
112-111	0.01	0.01	0.01	0.24	0.01
113-112	0.01	0.02	0.01	0.14	0.01
114-113	0.01	0.01	0.01	0.15	0.01
115-114	0.01	0.01	0.01	0.09	0.01
116-115	0.01	0.01	0.01	0.08	0.01
117-116	0.01	0.13	0.01	0.15	0.01
306-305	0.30	0.43	0.30	0.48	0.30
307-306	0.42	0.46	0.42	0.47	0.42

```
Analysis begun on:  Tue Jan 23 08:18:35 2024
Analysis ended on:  Tue Jan 23 08:18:38 2024
Total elapsed time: 00:00:03
```

Design Storm: 25 mm 4-Hour Chicago

```
ALTERNATIVE RUNOFF METHOD (ARM) - PCSWMM VERSION 7.5.3406
---------------------------------------------------------

This is a new version of ARM - your feedback and suggestions are solicited.
Create a ticket, post on the PCSWMM feature request forum, or email us directly!

Simulation start time:                06/01/2023 00:00:00
Simulation end time:                  06/05/2023 00:00:00
Runoff wet weather time steps:        300 seconds
Report time steps:                    300 seconds
Number of data points:                1153


******************************
Unit Hydrographs Runoff Method
******************************
```

Subcatchment	Runoff Method	Raingage	Area (ha)	Time of Concentration (min)	Time to Peak (min)	Time after Peak (min)	Peak UH Flow ($m^3/s/mm$)	UH Depth (mm)
303	Nash IUH	Chicago_25mm4hr	55.03	117.31	58.66	661.34	0.05752	0.999
311	Nash IUH	Chicago_25mm4hr	0.55	11	5.5	54.5	0.00613	0.933

F115D	Nash IUH	Chicago_25mm4hr	2.51	17.34	11.56	73.44	0.0196	0.998
F308B	Nash IUH	Chicago_25mm4hr	22.98	148.66	99.11	575.89	0.02092	1
EXT-2	Nash IUH	Chicago_25mm4hr	1.05	63.31	31.65	243.35	0.00203	0.996
312	Nash IUH	Chicago_25mm4hr	1.95	50.3	25.15	219.85	0.00475	0.996
301	Nash IUH	Chicago_25mm4hr	86.43	111.04	55.52	659.48	0.09545	0.999
302	Nash IUH	Chicago_25mm4hr	80.69	161.19	80.6	914.4	0.06139	1

****
ARM Runoff Summary
****

Subcatchment	Total Precip (mm)	Total Losses (mm)	Total Runoff (mm)	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff (fraction)
303	25.028	24.986	0.042	0.023	2.096	0.002
311	25.028	24.946	0.077	0	0.055	0.003
F115D	25.028	21.419	3.601	0.09	24.288	0.144
F308B	25.028	22.666	2.362	0.543	39.134	0.094
EXT-2	25.028	24.577	0.45	0.005	0.489	0.018
312	25.028	24.911	0.117	0.002	0.257	0.005
301	25.028	25.029	0	0	0	0
302	25.028	25.029	0	0	0	0

WARNING ARM01: Computed UH depth for ARM subcatchment 311 is not unity. Consider reducing wet weather time step.

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.015)

WARNING 03: negative offset ignored for Link 100-pond

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units .... LPS
Process Models:
  Rainfall/Runoff .... YES
  RDII .... NO
  Snowmelt .... NO

```
    Groundwater ............ NO
    Flow Routing ........... YES
    Ponding Allowed ........ NO
    Water Quality .......... NO
  Infiltration Method ...... HORTON
  Flow Routing Method ...... DYNWAVE
  Surcharge Method ......... EXTRAN
  Starting Date ............ 06/01/2023 00:00:00
  Ending Date .............. 06/05/2023 00:00:00
  Antecedent Dry Days ...... 0.0
  Report Time Step ......... 00:05:00
  Wet Time Step ............ 00:05:00
  Dry Time Step ............ 00:05:00
  Routing Time Step ........ 5.00 sec
  Variable Time Step ....... YES
  Maximum Trials ........... 8
  Number of Threads ........ 4
  Head Tolerance ........... 0.001500 m


  **************************        Volume         Depth
  Runoff Quantity Continuity     hectare-m            mm
  **************************     ---------       -------
  Total Precipitation ......         0.746        25.029
  Evaporation Loss .........         0.000         0.000
  Infiltration Loss ........         0.360        12.071
  Surface Runoff ...........         0.363        12.195
  Final Storage ............         0.025         0.845
  Continuity Error (%) .....        -0.327


  **************************        Volume        Volume
  Flow Routing Continuity        hectare-m      10^6 ltr
  **************************     ---------     ---------
  Dry Weather Inflow .......         0.000         0.000
  Wet Weather Inflow .......         0.363         3.633
  Groundwater Inflow .......         0.000         0.000
  RDII Inflow ..............         0.000         0.000
  External Inflow ..........         0.066         0.664
  External Outflow .........         0.418         4.182
  Flooding Loss ............         0.000         0.000
  Evaporation Loss .........         0.000         0.000
  Exfiltration Loss ........         0.000         0.000
  Initial Stored Volume ....         0.001         0.009
  Final Stored Volume ......         0.012         0.124
  Continuity Error (%) .....         0.001


  ***************************
  Time-Step Critical Elements
  ***************************
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None


*********************************
Highest Flow Instability Indexes
*********************************
Link EXT1-IC (5)


*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     1.28 sec
Average Time Step           :     4.99 sec
Maximum Time Step           :     5.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.00
Percent Not Converging      :     0.01
Time Step Frequencies       :
    5.000 -  3.155 sec      :    99.81 %
    3.155 -  1.991 sec      :     0.19 %
    1.991 -  1.256 sec      :     0.00 %
    1.256 -  0.792 sec      :     0.00 %
    0.792 -  0.500 sec      :     0.00 %


***************************
Subcatchment Runoff Summary
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Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
C103A	25.03	0.00	0.00	9.01	15.05	0.00	15.05	0.05	31.26	0.601
C103B	25.03	0.00	0.00	3.50	20.30	0.00	20.30	0.26	170.67	0.811
C107A	25.03	0.00	0.00	9.01	15.05	0.00	15.05	0.05	30.25	0.601
C109A	25.03	0.00	0.00	9.01	15.09	0.00	15.09	0.10	63.53	0.603
C113A	25.03	0.00	0.00	9.01	15.06	0.00	15.06	0.05	31.26	0.602
C114A	25.03	0.00	0.00	9.01	15.09	0.00	15.09	0.10	65.54	0.603
C114B	25.03	0.00	0.00	7.26	16.75	0.00	16.75	0.16	109.62	0.669
C115A	25.03	0.00	0.00	9.01	15.07	0.00	15.07	0.09	63.53	0.602
C115B	25.03	0.00	0.00	7.26	16.75	0.00	16.75	0.16	105.14	0.669
C117A	25.03	0.00	0.00	9.01	15.11	0.00	15.11	0.03	23.19	0.604
C117B	25.03	0.00	0.00	9.01	15.12	0.00	15.12	0.08	55.42	0.604
C147A	25.03	0.00	0.00	9.01	15.05	0.00	15.05	0.01	7.06	0.601
C201AA	25.03	0.00	0.00	1.75	21.96	0.00	21.96	0.06	38.08	0.878
C201AB	25.03	0.00	0.00	1.75	21.96	0.00	21.96	0.08	51.26	0.878
C201BA	25.03	0.00	0.00	1.75	21.94	0.00	21.94	0.04	27.84	0.877
C201BB	25.03	0.00	0.00	1.75	21.94	0.00	21.94	0.06	38.09	0.877

C201BC	25.03	0.00	0.00	7.26	16.75	0.00	16.75	0.19	125.28	0.669
C202B	25.03	0.00	0.00	7.26	16.75	0.00	16.75	0.08	54.81	0.669
C202C	25.03	0.00	0.00	7.26	16.75	0.00	16.75	0.09	60.40	0.669
C203B	25.03	0.00	0.00	9.01	15.14	0.00	15.14	0.31	199.64	0.605
C203C	25.03	0.00	0.00	7.26	16.75	0.00	16.75	0.18	120.80	0.669
EXT-1	25.03	0.00	0.00	3.50	20.30	0.00	20.30	0.36	239.75	0.811
EXT-3	25.03	0.00	0.00	16.99	15.13	7.39	7.39	0.07	63.02	0.295
F112A	25.03	0.00	0.00	24.55	6.82	0.05	0.05	0.00	0.47	0.002
F307A	25.03	0.00	0.00	18.77	5.89	0.00	5.89	0.25	165.44	0.235
F308A	25.03	0.00	0.00	25.03	0.00	0.00	0.00	0.00	0.00	0.000
L103C	25.03	0.00	0.00	17.77	6.86	0.00	6.86	0.29	193.37	0.274
L110A	25.03	0.00	0.00	9.01	15.12	0.00	15.12	0.12	77.57	0.604
L115C	25.03	0.00	0.00	24.56	6.82	0.04	0.04	0.00	0.49	0.002
L116A	25.03	0.00	0.00	17.77	6.84	0.00	6.84	0.05	35.64	0.273
L202A	25.03	0.00	0.00	9.01	15.07	0.00	15.07	0.04	26.22	0.602
L203A	25.03	0.00	0.00	9.01	15.07	0.00	15.07	0.04	28.24	0.602
POND	25.03	0.00	0.00	14.27	10.10	0.00	10.10	0.16	108.40	0.404
UNC-2	25.03	0.00	0.00	19.65	5.05	0.00	5.05	0.01	5.08	0.202
UNC-3	25.03	0.00	0.00	3.50	20.21	0.00	20.21	0.03	18.97	0.808
UNC-4	25.03	0.00	0.00	25.03	0.00	0.00	0.00	0.00	0.00	0.000
UNC-5	25.03	0.00	0.00	25.03	0.00	0.00	0.00	0.00	0.00	0.000
UNC-6	25.03	0.00	0.00	25.03	0.00	0.00	0.00	0.00	0.00	0.000

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Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days	Time of Max Occurrence hr:min	Reported Max Depth Meters
300a	JUNCTION	0.00	0.00	95.35	0	00:00	0.00
CUL-1	JUNCTION	0.00	0.04	81.72	0	02:14	0.04
CUL-2	JUNCTION	0.00	0.04	81.07	0	02:09	0.04
T3-A	JUNCTION	0.00	0.02	85.02	0	02:00	0.02
T3-B	JUNCTION	0.00	0.02	82.18	0	02:11	0.02
T3-C	JUNCTION	0.00	0.04	80.55	0	03:11	0.04
T3-D	JUNCTION	0.00	0.03	79.03	0	03:02	0.03
T3-E	JUNCTION	0.00	0.03	78.16	0	04:19	0.03
T3-F	JUNCTION	0.00	0.02	77.17	0	04:20	0.02
HWL-146	OUTFALL	0.04	0.12	78.74	0	04:10	0.12
HWL-200	OUTFALL	0.01	0.46	77.75	0	01:31	0.46
HWL-300	OUTFALL	0.01	0.22	77.18	0	01:33	0.21
P2-T3	OUTFALL	0.00	0.01	76.96	0	04:20	0.01
Pond-Escape	OUTFALL	0.00	0.00	81.50	0	00:00	0.00
100	STORAGE	0.35	0.58	79.81	0	01:31	0.57
100C	STORAGE	0.06	0.28	79.80	0	04:14	0.28
101	STORAGE	0.32	0.61	79.87	0	01:30	0.60
102	STORAGE	0.01	0.38	80.10	0	01:30	0.38

103	STORAGE	0.01	0.46	80.29	0	01:30	0.46
104	STORAGE	0.15	0.49	79.92	0	01:31	0.49
105	STORAGE	0.11	0.52	79.99	0	01:31	0.51
106	STORAGE	0.06	0.54	80.06	0	01:31	0.54
107	STORAGE	0.03	0.55	80.14	0	01:30	0.55
108	STORAGE	0.00	0.19	83.10	0	01:30	0.19
109	STORAGE	0.00	0.19	83.99	0	01:30	0.19
110	STORAGE	0.00	0.17	85.50	0	01:30	0.17
111	STORAGE	0.01	0.42	80.21	0	01:30	0.42
112	STORAGE	0.01	0.45	80.28	0	01:30	0.45
113	STORAGE	0.01	0.36	80.48	0	01:30	0.36
114	STORAGE	0.01	0.46	80.83	0	01:30	0.46
115	STORAGE	0.01	0.35	81.15	0	01:30	0.35
116	STORAGE	0.00	0.18	82.16	0	01:30	0.18
117	STORAGE	0.00	0.16	82.68	0	01:30	0.16
147	STORAGE	0.06	0.17	79.10	0	04:10	0.17
148	STORAGE	0.05	0.13	79.20	0	04:17	0.13
149	STORAGE	0.05	0.14	79.54	0	04:17	0.14
150	STORAGE	0.05	0.14	79.64	0	04:15	0.14
201	STORAGE	0.01	0.53	77.92	0	01:31	0.53
201A	STORAGE	0.01	0.53	78.07	0	01:30	0.53
201B	STORAGE	0.00	0.33	78.44	0	01:28	0.33
202	STORAGE	0.00	0.35	79.66	0	01:30	0.35
203	STORAGE	0.00	0.30	80.76	0	01:30	0.30
301	STORAGE	0.01	0.25	77.24	0	01:32	0.24
302	STORAGE	0.01	0.28	77.52	0	01:32	0.27
303X	STORAGE	0.01	0.22	77.82	0	01:31	0.22
304	STORAGE	0.01	0.21	79.18	0	01:31	0.21
305	STORAGE	0.01	0.21	79.72	0	01:30	0.21
306	STORAGE	0.00	0.23	80.42	0	01:30	0.23
307	STORAGE	0.00	0.23	81.65	0	01:30	0.23
308	STORAGE	0.01	0.10	80.26	0	04:00	0.10
C103B-S	STORAGE	0.00	0.76	81.91	0	01:30	0.76
C114B-S	STORAGE	0.00	0.72	81.72	0	01:30	0.72
C115B-S	STORAGE	0.00	0.72	82.12	0	01:30	0.72
C201AA-S	STORAGE	0.01	1.30	80.00	0	01:31	1.30
C201AB-S	STORAGE	0.01	1.30	80.00	0	01:31	1.30
C201BA-S	STORAGE	0.01	1.30	80.70	0	01:31	1.30
C201BB-S	STORAGE	0.01	1.30	80.70	0	01:31	1.30
C201BC-S	STORAGE	0.01	1.29	80.69	0	01:30	1.29
C202B-S	STORAGE	0.01	1.29	80.69	0	01:30	1.29
C202C-S	STORAGE	0.01	1.29	80.69	0	01:30	1.29
C203B-S	STORAGE	0.01	1.14	82.39	0	01:30	1.14
C203C-S	STORAGE	0.01	1.29	81.99	0	01:30	1.29
EXT1-S	STORAGE	0.20	1.54	80.54	0	03:19	1.54
L103C-S	STORAGE	0.00	0.69	80.89	0	01:30	0.69
L110A-S	STORAGE	0.01	0.98	87.73	0	01:30	0.98
L116A-S	STORAGE	0.00	0.69	82.69	0	01:30	0.69
POND_2	STORAGE	0.08	0.30	79.80	0	04:15	0.30

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent	
300a	JUNCTION	0.00	0.00	0 00:00	0	0	0.000	ltr
CUL-1	JUNCTION	0.00	13.02	0 02:11	0	0.133	0.006	
CUL-2	JUNCTION	0.00	12.95	0 02:14	0	0.133	-0.019	
T3-A	JUNCTION	68.99	68.99	0 01:35	0.126	0.126	0.140	
T3-B	JUNCTION	5.08	13.34	0 02:07	0.00758	0.133	-0.005	
T3-C	JUNCTION	0.26	14.47	0 02:21	0.00228	0.136	0.221	
T3-D	JUNCTION	0.00	7.70	0 03:11	0	0.135	-0.009	
T3-E	JUNCTION	0.00	9.42	0 03:26	0	0.135	0.271	
T3-F	JUNCTION	0.00	6.20	0 04:19	0	0.135	-0.012	
HWL-146	OUTFALL	0.00	32.55	0 04:10	0	2.1	0.000	
HWL-200	OUTFALL	0.00	726.28	0 01:31	0	1.16	0.000	
HWL-300	OUTFALL	0.00	162.20	0 01:33	0	0.79	0.000	
P2-T3	OUTFALL	0.00	6.20	0 04:20	0	0.135	0.000	
Pond-Escape	OUTFALL	0.00	0.00	0 00:00	0	0	0.000	ltr
100	STORAGE	0.00	1054.13	0 01:31	0	1.68	0.073	
100C	STORAGE	0.00	178.19	0 01:31	0	0.447	-0.189	
101	STORAGE	0.00	1052.65	0 01:31	0	1.68	-0.058	
102	STORAGE	0.00	393.54	0 01:30	0	0.6	0.132	
103	STORAGE	31.26	395.05	0 01:30	0.0466	0.599	-0.095	
104	STORAGE	0.00	667.07	0 01:31	0	1.08	0.042	
105	STORAGE	0.00	664.14	0 01:31	0	1.08	0.061	
106	STORAGE	0.00	663.13	0 01:31	0	1.08	-0.037	
107	STORAGE	30.25	662.66	0 01:30	0.0451	1.08	0.145	
108	STORAGE	0.00	140.50	0 01:30	0	0.211	-0.006	
109	STORAGE	63.53	140.66	0 01:30	0.095	0.211	-0.003	
110	STORAGE	0.00	77.44	0 01:30	0	0.116	0.002	
111	STORAGE	0.00	496.22	0 01:31	0	0.822	-0.089	
112	STORAGE	0.47	495.97	0 01:30	0.00023	0.822	-0.001	
113	STORAGE	31.26	496.67	0 01:30	0.0467	0.823	0.072	
114	STORAGE	65.54	466.87	0 01:30	0.0981	0.774	-0.198	
115	STORAGE	74.67	293.58	0 01:30	0.186	0.514	0.369	
116	STORAGE	0.00	114.06	0 01:30	0	0.171	-0.002	
117	STORAGE	78.60	78.60	0 01:30	0.118	0.118	-0.008	
147	STORAGE	7.06	32.56	0 04:10	0.0105	2.1	0.049	
148	STORAGE	0.00	24.62	0 04:18	0	1.73	-0.015	
149	STORAGE	0.00	24.62	0 04:16	0	1.73	0.088	
150	STORAGE	0.00	24.62	0 04:15	0	1.73	0.006	
201	STORAGE	0.00	726.72	0 01:30	0	1.16	-0.122	
201A	STORAGE	0.00	726.61	0 01:30	0	1.16	0.167	
201B	STORAGE	0.00	174.83	0 01:30	0	0.287	-0.012	
202	STORAGE	26.22	485.29	0 01:30	0.0392	0.741	-0.007	

203	STORAGE	28.24	347.46	0	01:30	0.0422	0.529	-0.002
301	STORAGE	0.00	162.11	0	01:32	0	0.79	-0.001
302	STORAGE	0.00	164.78	0	01:31	0	0.79	-0.011
303X	STORAGE	0.00	164.76	0	01:31	0	0.79	-0.001
304	STORAGE	0.00	165.33	0	01:30	0	0.79	-0.005
305	STORAGE	0.00	165.37	0	01:30	0	0.79	-0.003
306	STORAGE	0.00	165.34	0	01:30	0	0.247	-0.003
307	STORAGE	165.44	165.44	0	01:30	0.247	0.247	-0.012
308	STORAGE	39.13	39.13	0	04:00	0.543	0.543	0.000
C103B-S	STORAGE	170.67	170.67	0	01:30	0.256	0.256	-0.008
C114B-S	STORAGE	109.62	109.62	0	01:30	0.164	0.164	-0.008
C115B-S	STORAGE	105.14	105.14	0	01:30	0.157	0.157	-0.008
C201AA-S	STORAGE	38.08	38.08	0	01:30	0.0571	0.0571	-1.041
C201AB-S	STORAGE	51.26	51.26	0	01:30	0.0768	0.0768	0.040
C201BA-S	STORAGE	27.84	27.84	0	01:30	0.0417	0.0417	-0.003
C201BB-S	STORAGE	38.09	38.09	0	01:30	0.057	0.057	-1.187
C201BC-S	STORAGE	125.28	125.28	0	01:30	0.188	0.188	-0.002
C202B-S	STORAGE	54.81	54.81	0	01:30	0.082	0.082	0.000
C202C-S	STORAGE	60.40	60.40	0	01:30	0.0904	0.0904	0.000
C203B-S	STORAGE	199.64	199.64	0	01:30	0.306	0.306	-0.006
C203C-S	STORAGE	120.80	120.80	0	01:30	0.181	0.181	-0.001
EXT1-S	STORAGE	239.75	239.75	0	01:30	0.359	0.359	-0.163
L103C-S	STORAGE	193.38	193.38	0	01:30	0.297	0.297	-0.008
L110A-S	STORAGE	77.57	77.57	0	01:30	0.116	0.116	-0.006
L116A-S	STORAGE	35.64	35.64	0	01:30	0.0533	0.0533	-0.006
POND_2	STORAGE	108.40	1189.58	0	01:31	0.162	1.84	0.031

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Node Surcharge Summary
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No nodes were surcharged.

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Node Flooding Summary
****

No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS

100	0.000	15	0	0	0.001	24	0	01:31	1056.02
100C	0.000	3	0	0	0.000	13	0	04:14	219.62
101	0.000	12	0	0	0.001	22	0	01:30	1054.13
102	0.000	0	0	0	0.000	16	0	01:30	392.65
103	0.000	0	0	0	0.001	24	0	01:30	393.54
104	0.000	6	0	0	0.001	19	0	01:31	673.23
105	0.000	4	0	0	0.001	17	0	01:31	667.07
106	0.000	2	0	0	0.001	15	0	01:31	664.14
107	0.000	1	0	0	0.001	13	0	01:30	663.13
108	0.000	0	0	0	0.000	6	0	01:30	140.11
109	0.000	0	0	0	0.000	4	0	01:30	140.50
110	0.000	0	0	0	0.000	5	0	01:30	77.23
111	0.000	0	0	0	0.000	10	0	01:30	497.43
112	0.000	0	0	0	0.001	10	0	01:30	496.22
113	0.000	0	0	0	0.000	9	0	01:30	495.89
114	0.000	0	0	0	0.001	11	0	01:30	466.07
115	0.000	0	0	0	0.000	8	0	01:30	292.04
116	0.000	0	0	0	0.000	6	0	01:30	113.91
117	0.000	0	0	0	0.000	6	0	01:30	78.45
147	0.000	4	0	0	0.000	11	0	04:10	32.55
148	0.000	2	0	0	0.000	5	0	04:17	24.62
149	0.000	3	0	0	0.000	9	0	04:17	24.62
150	0.000	4	0	0	0.000	10	0	04:15	24.62
201	0.000	0	0	0	0.001	26	0	01:31	726.28
201A	0.000	0	0	0	0.001	18	0	01:30	726.72
201B	0.000	0	0	0	0.000	14	0	01:28	174.82
202	0.000	0	0	0	0.000	10	0	01:30	483.75
203	0.000	0	0	0	0.000	7	0	01:30	345.54
301	0.000	0	0	0	0.000	9	0	01:32	162.20
302	0.000	0	0	0	0.000	10	0	01:32	162.11
303X	0.000	0	0	0	0.000	7	0	01:31	164.78
304	0.000	0	0	0	0.000	4	0	01:31	164.76
305	0.000	0	0	0	0.000	4	0	01:30	165.33
306	0.000	0	0	0	0.000	4	0	01:30	165.32
307	0.000	0	0	0	0.000	5	0	01:30	165.34
308	0.000	0	0	0	0.000	2	0	04:00	39.13
C103B-S	0.000	0	0	0	0.001	0	0	01:30	170.61
C114B-S	0.000	0	0	0	0.001	0	0	01:30	109.58
C115B-S	0.000	0	0	0	0.001	0	0	01:30	105.11
C201AA-S	0.000	0	0	0	0.005	0	0	01:31	29.06
C201AB-S	0.000	0	0	0	0.006	0	0	01:31	39.17
C201BA-S	0.000	0	0	0	0.004	0	0	01:31	21.24
C201BB-S	0.000	0	0	0	0.005	0	0	01:31	29.07
C201BC-S	0.000	0	0	0	0.001	0	0	01:30	124.53
C202B-S	0.000	0	0	0	0.001	0	0	01:30	54.50
C202C-S	0.000	0	0	0	0.001	0	0	01:30	60.06
C203B-S	0.000	0	0	0	0.001	0	0	01:30	199.18
C203C-S	0.000	0	0	0	0.001	0	0	01:30	120.15
EXT1-S	0.021	1	0	0	0.271	19	0	03:19	7.80
L103C-S	0.000	0	0	0	0.001	0	0	01:30	193.18
L110A-S	0.000	0	0	0	0.001	0	0	01:30	77.44

L116A-S	0.000	0	0	0	0.001	0	0	01:30	35.62
POND_2	0.398	3	0	0	1.529	10	0	04:15	24.62

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
HWL-146	99.03	6.14	32.55	2.095
HWL-200	7.90	53.78	726.28	1.161
HWL-300	13.92	17.62	162.20	0.790
P2-T3	46.74	0.82	6.20	0.135
Pond-Escape	0.00	0.00	0.00	0.000
System	33.52	78.36	897.14	4.182

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
100-100C	CONDUIT	178.19	0	01:31	1.10	0.07	0.16
100C-pond	CONDUIT	219.62	0	01:31	2.09	0.10	0.19
100-pond	CONDUIT	878.73	0	01:31	2.90	0.10	0.29
101-100	CONDUIT	1054.13	0	01:31	1.63	0.44	0.39
102-101	CONDUIT	392.65	0	01:30	1.49	0.51	0.34
103-102	CONDUIT	393.54	0	01:30	1.22	0.44	0.40
104-101	CONDUIT	673.23	0	01:32	1.58	0.41	0.35
105-104	CONDUIT	667.07	0	01:31	1.40	0.36	0.37
106-105	CONDUIT	664.14	0	01:31	1.27	0.39	0.39
107-106	CONDUIT	663.13	0	01:31	1.27	0.42	0.39
108-107	CONDUIT	140.11	0	01:30	2.17	0.38	0.43
109-108	CONDUIT	140.50	0	01:30	2.18	0.38	0.43
110-109	CONDUIT	77.23	0	01:30	1.87	0.61	0.57
111-107	CONDUIT	497.43	0	01:31	1.49	0.30	0.34
112-111	CONDUIT	496.22	0	01:31	1.34	0.35	0.36
113-112	CONDUIT	495.89	0	01:30	1.41	0.30	0.35
114-113	CONDUIT	466.07	0	01:30	1.38	0.31	0.34
115-114	CONDUIT	292.04	0	01:30	1.27	0.24	0.31
116-115	CONDUIT	113.91	0	01:30	1.68	0.26	0.35
117-116	CONDUIT	78.45	0	01:30	1.53	0.27	0.36

147-146	CONDUIT	32.55	0	04:10	0.73	0.26	0.32
148-147	CONDUIT	24.62	0	04:18	0.71	0.19	0.27
149-148	CONDUIT	24.62	0	04:18	0.64	0.19	0.29
150-149	CONDUIT	24.62	0	04:16	0.70	0.20	0.27
201-200	CONDUIT	726.28	0	01:31	1.66	0.47	0.41
201A-201	CONDUIT	726.72	0	01:30	1.63	0.47	0.42
201B-201A	CONDUIT	174.82	0	01:28	1.12	0.41	0.38
202-201A	CONDUIT	483.75	0	01:30	2.43	0.44	0.46
203-202	CONDUIT	345.54	0	01:30	2.24	0.41	0.45
301-300	CONDUIT	162.20	0	01:33	1.13	0.16	0.22
302-301	CONDUIT	162.11	0	01:32	1.02	0.15	0.24
303X-302	CONDUIT	164.78	0	01:31	1.40	0.16	0.27
304-303X	CONDUIT	164.76	0	01:31	1.66	0.17	0.28
305-304	CONDUIT	165.33	0	01:30	1.67	0.17	0.28
306-305	CONDUIT	165.32	0	01:30	1.86	0.38	0.43
307-306	CONDUIT	165.34	0	01:30	1.82	0.40	0.44
308-305	CONDUIT	39.13	0	04:00	1.22	0.06	0.17
CUL1-2	CONDUIT	12.95	0	02:14	0.32	0.00	0.02
T3-0	CONDUIT	0.00	0	00:00	0.00	0.00	0.01
T3-1	CONDUIT	12.92	0	02:07	0.12	0.00	0.01
T3-2	CONDUIT	13.02	0	02:11	0.09	0.00	0.01
T3-3	CONDUIT	14.37	0	02:20	0.10	0.00	0.01
T3-4	CONDUIT	7.70	0	03:11	0.07	0.00	0.01
T3-5	CONDUIT	9.42	0	03:26	0.08	0.00	0.01
T3-6	CONDUIT	6.20	0	04:19	0.07	0.00	0.01
T3-7	CONDUIT	6.20	0	04:20	0.09	0.00	0.01
Pond-OR	ORIFICE	24.62	0	04:15			1.00
OVERFLOW	WEIR	0.00	0	00:00			0.00
C103B-IC	DUMMY	170.61	0	01:30			
C114B-IC	DUMMY	109.58	0	01:30			
C115B-IC	DUMMY	105.11	0	01:30			
C201AA-IC	DUMMY	29.06	0	01:31			
C201AB-IC	DUMMY	39.17	0	01:31			
C201BA-IC	DUMMY	21.24	0	01:31			
C201BB-IC	DUMMY	29.07	0	01:31			
C201BC-IC	DUMMY	124.53	0	01:30			
C202B-IC	DUMMY	54.50	0	01:30			
C202C-IC	DUMMY	60.06	0	01:30			
C203B-IC	DUMMY	199.18	0	01:30			
C203C-IC	DUMMY	120.15	0	01:30			
EXT1-IC	DUMMY	7.80	0	01:10			
L103C-IC	DUMMY	193.18	0	01:30			
L110A-IC	DUMMY	77.44	0	01:30			
L116A-IC	DUMMY	35.62	0	01:30			

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Flow Classification Summary
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Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
		---------- Fraction of Time in Flow Class ----------								
100-100C	1.00	0.51	0.13	0.00	0.36	0.00	0.00	0.00	0.00	0.00
100C-pond	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
100-pond	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.00	0.00	0.00
101-100	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
102-101	1.00	0.01	0.00	0.00	0.09	0.00	0.00	0.91	0.01	0.00
103-102	1.00	0.01	0.56	0.00	0.43	0.00	0.00	0.00	0.97	0.00
104-101	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
105-104	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
106-105	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.01	0.00
107-106	1.00	0.00	0.16	0.00	0.33	0.00	0.00	0.51	0.21	0.00
108-107	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
109-108	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
110-109	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
111-107	1.00	0.00	0.00	0.00	0.05	0.00	0.00	0.95	0.04	0.00
112-111	1.00	0.00	0.50	0.00	0.50	0.00	0.00	0.00	0.92	0.00
113-112	1.00	0.77	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00
114-113	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.03	0.00
115-114	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
116-115	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
117-116	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
147-146	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
148-147	1.00	0.01	0.00	0.00	0.10	0.00	0.00	0.89	0.00	0.00
149-148	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.01	0.00	0.00
150-149	1.00	0.01	0.00	0.00	0.07	0.00	0.00	0.92	0.00	0.00
201-200	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
201A-201	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
201B-201A	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
202-201A	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
203-202	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
301-300	1.00	0.01	0.00	0.00	0.98	0.01	0.00	0.00	0.00	0.00
302-301	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
303X-302	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
304-303X	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
305-304	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
306-305	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
307-306	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
308-305	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
CUL1-2	1.00	0.01	0.00	0.00	0.99	0.01	0.00	0.00	0.00	0.99
T3-0	1.00	0.01	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T3-1	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.99	0.00
T3-2	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.61	0.00
T3-3	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.97	0.00
T3-4	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
T3-5	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.96	0.00
T3-6	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
T3-7	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.00	0.00

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*************************
Conduit Surcharge Summary
*************************

No conduits were surcharged.


Analysis begun on:  Tue Jan 23 08:26:59 2024
Analysis ended on:  Tue Jan 23 08:27:01 2024
Total elapsed time: 00:00:02
```

Project:	**Kanata North - Brigil**
Project Number:	**160401347**
Project Location:	**City of Ottawa**
Designer:	**RB**
Date:	**January 2024**
Revision:	

PCSWMM Hydrograph Data - 2-Year, 24-Hour SCS Design Storm

Total Outlfow on Tributary 3

Max Value and Time
170.5 **6/1/2023 13:00**

IDs:	HWL-146	HWL-200	P2-T3	**SUM**
Date/Time	Total inflow	Total inflow	Total inflow	**Total inflow**
M/d/yyyy	L/s	L/s	L/s	**L/s**
6/1/2023 11:30	7.2	18.1	0.0	25.3
6/1/2023 11:35	7.3	18.3	0.0	25.6
6/1/2023 11:40	7.4	18.3	0.0	25.8
6/1/2023 11:45	7.5	18.4	0.0	25.9
6/1/2023 11:50	7.6	18.4	0.0	26.0
6/1/2023 11:55	7.7	18.4	0.0	26.2
6/1/2023 12:00	7.9	18.4	0.0	26.3
6/1/2023 12:05	10.4	40.8	0.0	51.1
6/1/2023 12:10	11.4	119.4	0.0	130.8
6/1/2023 12:15	11.6	139.5	0.0	151.1
6/1/2023 12:20	12.0	144.1	0.0	156.1
6/1/2023 12:25	12.8	145.5	0.0	158.3
6/1/2023 12:30	14.1	145.9	0.0	160.0
6/1/2023 12:35	15.6	146.1	0.0	161.7
6/1/2023 12:40	17.1	146.1	0.0	163.3
6/1/2023 12:45	18.6	146.2	0.0	164.8
6/1/2023 12:50	20.2	146.2	0.0	166.4
6/1/2023 12:55	21.9	146.2	0.0	168.1
6/1/2023 13:00	24.3	146.2	0.0	170.5
6/1/2023 13:05	25.1	112.9	0.0	138.0
6/1/2023 13:10	25.6	60.6	0.0	86.2
6/1/2023 13:15	26.2	45.9	0.0	72.1
6/1/2023 13:20	26.6	40.8	0.0	67.4
6/1/2023 13:25	26.9	38.9	0.0	65.8
6/1/2023 13:30	27.1	38.1	0.0	65.2
6/1/2023 13:35	27.3	37.7	0.0	65.0
6/1/2023 13:40	27.4	37.5	0.0	64.9
6/1/2023 13:45	27.6	37.4	0.0	65.0
6/1/2023 13:50	27.8	37.4	0.0	65.1
6/1/2023 13:55	27.9	37.3	0.0	65.3
6/1/2023 14:00	28.1	37.3	0.0	65.4
6/1/2023 14:05	28.2	34.1	0.0	62.3

Project: Kanata North - Brigil
Project Number: 160401347
Project Location: City of Ottawa
Designer: RB
Date: January 2024
Revision:

PCSWMM Hydrograph Data - 2-Year, 24-Hour SCS Design Storm

Total Outlfow on Tributary 3

Max Value and Time
318.5 **6/1/2023 13:00**

IDs:	HWL-146	HWL-200	P2-T3	**SUM**
Date/Time	Total inflow	Total inflow	Total inflow	**Total inflow**
M/d/yyyy	L/s	L/s	L/s	**L/s**
6/1/2023 11:30	14.3	35.1	0.0	49.4
6/1/2023 11:35	14.5	35.3	0.0	49.8
6/1/2023 11:40	14.8	35.3	0.0	50.2
6/1/2023 11:45	15.1	35.3	0.0	50.5
6/1/2023 11:50	15.4	35.4	0.0	50.8
6/1/2023 11:55	15.7	35.4	0.0	51.1
6/1/2023 12:00	16.0	35.4	0.0	51.4
6/1/2023 12:05	17.7	105.1	0.0	122.8
6/1/2023 12:10	19.0	254.0	0.0	272.9
6/1/2023 12:15	20.2	275.3	0.0	295.5
6/1/2023 12:20	22.8	279.3	0.0	302.1
6/1/2023 12:25	26.4	280.3	0.0	306.7
6/1/2023 12:30	28.6	280.5	0.0	309.1
6/1/2023 12:35	30.4	280.5	0.0	311.0
6/1/2023 12:40	32.1	280.6	0.0	312.7
6/1/2023 12:45	33.7	280.6	0.0	314.3
6/1/2023 12:50	35.2	280.6	0.0	315.7
6/1/2023 12:55	36.6	280.6	0.0	317.2
6/1/2023 13:00	38.0	280.6	0.0	318.5
6/1/2023 13:05	38.0	197.0	0.0	235.1
6/1/2023 13:10	38.5	99.2	0.0	137.7
6/1/2023 13:15	39.1	79.7	0.0	118.8
6/1/2023 13:20	39.5	74.4	0.1	114.0
6/1/2023 13:25	39.8	72.6	0.2	112.6
6/1/2023 13:30	40.1	72.0	0.6	112.6
6/1/2023 13:35	40.3	71.7	1.3	113.2
6/1/2023 13:40	40.5	71.5	2.5	114.6
6/1/2023 13:45	40.8	71.5	4.3	116.6
6/1/2023 13:50	41.0	71.5	6.8	119.2
6/1/2023 13:55	41.2	71.4	9.7	122.4
6/1/2023 14:00	41.4	71.4	12.8	125.7
6/1/2023 14:05	41.4	62.5	15.7	119.6

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Project: **Kanata North - Brigil**
Project Number: **160401347**
Project Location: **City of Ottawa**
Designer: **RB**
Date: **January 2024**
Revision:

PCSWMM Hydrograph Data - 5-Year, 24-Hour SCS Design Storm

Total Outlfow on Tributary 3

Max Value and Time
456.6 **6/1/2023 13:00**

IDs:	HWL-146	HWL-200	P2-T3	**SUM**
Date/Time	Total inflow	Total inflow	Total inflow	**Total inflow**
M/d/yyyy	L/s	L/s	L/s	**L/s**
6/1/2023 11:30	18.1	45.8	0.0	64.0
6/1/2023 11:35	18.6	45.9	0.0	64.5
6/1/2023 11:40	19.0	46.0	0.0	65.0
6/1/2023 11:45	19.4	46.0	0.0	65.5
6/1/2023 11:50	19.9	46.0	0.0	65.9
6/1/2023 11:55	20.3	46.0	0.0	66.3
6/1/2023 12:00	20.7	46.0	0.0	66.8
6/1/2023 12:05	23.0	152.7	0.0	175.7
6/1/2023 12:10	25.2	338.7	0.0	364.0
6/1/2023 12:15	27.5	360.3	0.0	387.8
6/1/2023 12:20	29.8	363.9	0.0	393.7
6/1/2023 12:25	32.1	364.6	0.0	396.7
6/1/2023 12:30	34.2	364.8	0.0	399.0
6/1/2023 12:35	36.2	364.8	0.0	401.0
6/1/2023 12:40	38.1	365.5	0.0	403.7
6/1/2023 12:45	40.4	373.4	0.0	413.9
6/1/2023 12:50	42.4	387.7	0.1	430.2
6/1/2023 12:55	44.2	400.8	0.1	445.1
6/1/2023 13:00	45.9	410.5	0.2	456.6
6/1/2023 13:05	45.3	277.0	0.5	322.8
6/1/2023 13:10	45.5	134.3	1.0	180.8
6/1/2023 13:15	46.2	105.8	2.0	153.9
6/1/2023 13:20	46.6	97.4	4.0	147.9
6/1/2023 13:25	47.0	94.6	7.4	149.0
6/1/2023 13:30	47.3	93.4	12.8	153.4
6/1/2023 13:35	47.6	93.1	19.7	160.4
6/1/2023 13:40	47.8	93.0	27.8	168.6
6/1/2023 13:45	48.1	92.9	35.2	176.1
6/1/2023 13:50	48.3	92.9	41.6	182.8
6/1/2023 13:55	48.5	92.9	47.5	189.0
6/1/2023 14:00	48.8	92.9	53.2	194.9
6/1/2023 14:05	48.7	79.3	58.8	186.8

Project: **Kanata North - Brigil**
Project Number: **160401347**
Project Location: **City of Ottawa**
Designer: **RB**
Date: **January 2024**
Revision:

PCSWMM Hydrograph Data - 100-Year, 24-Hour SCS Design Storm

Total Outlfow on Tributary 3

Max Value and Time
1025.9 **6/1/2023 15:00**

IDs:	HWL-146	HWL-200	P2-T3	**SUM**
Date/Time	Total inflow	Total inflow	Total inflow	**Total inflow**
M/d/yyyy	L/s	L/s	L/s	**L/s**
6/1/2023 13:30	65.9	166.2	245.2	477.3
6/1/2023 13:35	66.3	162.5	309.0	537.9
6/1/2023 13:40	66.7	160.2	375.3	602.2
6/1/2023 13:45	67.0	158.7	440.3	666.0
6/1/2023 13:50	67.3	157.6	499.0	723.9
6/1/2023 13:55	67.7	156.7	573.5	797.9
6/1/2023 14:00	68.0	156.0	638.7	862.6
6/1/2023 14:05	67.7	126.1	687.9	881.6
6/1/2023 14:10	67.7	83.0	730.2	880.9
6/1/2023 14:15	67.9	72.4	766.9	907.1
6/1/2023 14:20	68.0	69.4	797.8	935.1
6/1/2023 14:25	68.1	68.3	823.3	959.7
6/1/2023 14:30	68.2	67.9	843.7	979.8
6/1/2023 14:35	68.3	67.8	859.7	995.7
6/1/2023 14:40	68.3	67.7	871.9	1007.9
6/1/2023 14:45	68.4	67.6	880.6	1016.7
6/1/2023 14:50	68.5	67.6	886.2	1022.4
6/1/2023 14:55	68.6	67.6	889.1	1025.3
6/1/2023 15:00	68.6	67.6	889.7	1025.9
6/1/2023 15:05	68.6	62.3	888.0	1018.9
6/1/2023 15:10	68.6	51.4	884.5	1004.4
6/1/2023 15:15	68.6	47.4	879.2	995.2
6/1/2023 15:20	68.7	46.0	872.4	987.1
6/1/2023 15:25	68.7	45.5	864.4	978.6
6/1/2023 15:30	68.7	45.3	855.3	969.3
6/1/2023 15:35	68.7	45.2	845.3	959.2
6/1/2023 15:40	68.8	45.1	834.4	948.3
6/1/2023 15:45	68.8	45.1	822.8	936.7
6/1/2023 15:50	68.8	45.1	810.6	924.5
6/1/2023 15:55	68.9	45.1	797.9	911.8
6/1/2023 16:00	68.9	45.1	784.8	898.8
6/1/2023 16:05	68.9	44.0	771.4	884.3

Stantec

Project: **Kanata North - Brigil**
Project Number: **160401347**
Project Location: **City of Ottawa**
Designer: **RB**
Date: **January 2024**
Revision:

PCSWMM Hydrograph Data - 100-Year, 3-Hour ChicagoDesign Storm

Total Outlfow on Tributary 3

Max Value and Time
992.0 **6/1/2023 1:10**

IDs:	HWL-146	HWL-200	P2-T3	**SUM**
Date/Time	Total inflow	Total inflow	Total inflow	**Total inflow**
M/d/yyyy	L/s	L/s	L/s	**L/s**
6/1/2023 0:05	0.0	0.0	0.0	0.0
6/1/2023 0:10	0.0	0.0	0.0	0.0
6/1/2023 0:15	0.0	0.0	0.0	0.0
6/1/2023 0:20	0.0	0.0	0.0	0.0
6/1/2023 0:25	0.0	0.0	0.0	0.1
6/1/2023 0:30	4.0	4.4	0.0	8.3
6/1/2023 0:35	8.2	77.4	0.0	85.6
6/1/2023 0:40	9.0	123.6	0.0	132.5
6/1/2023 0:45	9.4	163.6	0.0	173.1
6/1/2023 0:50	9.8	209.1	0.0	218.8
6/1/2023 0:55	11.6	381.1	0.0	392.7
6/1/2023 1:00	13.4	542.8	0.0	556.3
6/1/2023 1:05	32.5	863.3	0.0	895.8
6/1/2023 1:10	51.7	940.0	0.3	992.0
6/1/2023 1:15	50.1	840.9	2.0	893.0
6/1/2023 1:20	54.4	782.6	3.9	840.9
6/1/2023 1:25	55.7	756.1	6.5	818.3
6/1/2023 1:30	57.7	742.0	11.5	811.3
6/1/2023 1:35	59.5	733.1	22.8	815.4
6/1/2023 1:40	61.1	728.1	44.1	833.3
6/1/2023 1:45	62.0	723.8	74.6	860.5
6/1/2023 1:50	63.0	721.4	107.5	891.9
6/1/2023 1:55	63.8	719.0	134.0	916.8
6/1/2023 2:00	64.5	717.6	155.6	937.7
6/1/2023 2:05	64.9	716.3	175.7	956.9
6/1/2023 2:10	65.3	525.3	196.4	786.9
6/1/2023 2:15	65.5	224.5	219.2	509.2
6/1/2023 2:20	65.8	209.0	245.0	519.8
6/1/2023 2:25	65.9	117.3	274.4	457.6
6/1/2023 2:30	66.1	100.0	307.1	473.3
6/1/2023 2:35	66.2	94.6	342.1	502.9
6/1/2023 2:40	66.4	88.8	377.6	532.8

E.5 Storm Sewer Design Sheet

Stantec

BRIGIL - KANATA NORTH	
DATE:	2024-01-12
REVISION:	3
DESIGNED BY:	WAJ
CHECKED BY:	RB

STORM SEWER DESIGN SHEET (City of Ottawa)

FILE NUMBER: 160401347

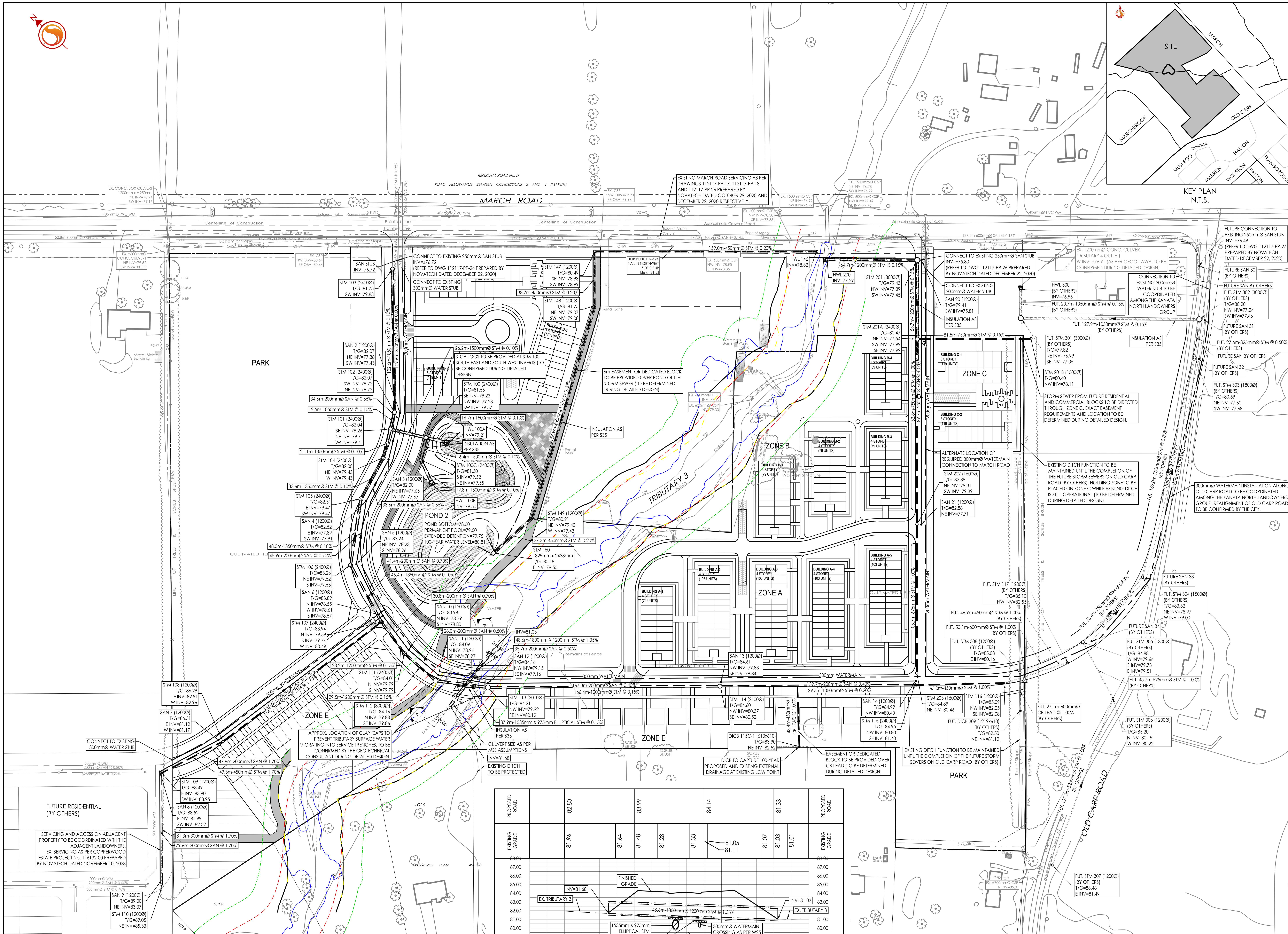
DESIGN PARAMETERS

$I = a / (t+b)^c$ (As per City of Ottawa Guidelines, 2012)

	1:2 yr	1:5 yr	1:10 yr	1:100 yr			
a =	732.951	998.071	1174.184	1735.688	MANNING'S n =	0.013	
b =	6.199	6.053	6.014	6.014	MINIMUM COVER:	2.00	m
c =	0.810	0.814	0.816	0.820	TIME OF ENTRY	10	min

BEDDING CLASS = B

LOCATION			DRAINAGE AREA																									PIPE SELECTION											
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA (2-YEAR) (ha)	AREA (5-YEAR) (ha)	AREA (10-YEAR) (ha)	AREA (100-YEAR) (ha)	AREA (ROOF) (ha)	C (2-YEAR) (-)	C (5-YEAR) (-)	C (10-YEAR) (-)	C (100-YEAR) (-)	A x C (2-YEAR) (ha)	ACCUM AxC (2YR) (ha)	A x C (5-YEAR) (ha)	ACCUM. AxC (5YR) (ha)	A x C (10-YEAR) (ha)	ACCUM. AxC (10YR) (ha)	A x C (100-YEAR) (ha)	ACCUM. AxC (100YR) (ha)	T of C (min)	I_{2-YEAR} (mm/h)	I_{5-YEAR} (mm/h)	$I_{10-YEAR}$ (mm/h)	$I_{100-YEAR}$ (mm/h)	$Q_{CONTROL}$ (L/s)	ACCUM. $Q_{CONTROL}$ (L/s)	Q_{ACT} (CIA/360) (L/s)	LENGTH (m)	PIPE WIDTH OR DIAMETER (mm)	PIPE HEIGHT (mm)	PIPE SHAPE (-)	MATERIAL (-)	CLASS (-)	SLOPE %	Q_{CAP} (FULL) (L/s)	% FULL (-)	VEL. (FULL) (m/s)	VEL. (ACT) (m/s)	TIME OF FLOW (min)
Bypass Inlet	100	100C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	1619.6	1619.6	1619.6	16.4	1500	1500	CIRCULAR	CONCRETE	-	0.10	2332.1	**69.45%**	1.28	1.21	0.23
	100C	100B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.23	75.95	103.01	120.75	176.51	0.0	1619.6	1619.6	19.8	1500	1500	CIRCULAR	CONCRETE	-	0.10	2332.1	**69.45%**	1.28	1.21	0.27
																				10.50									1500	1500									
C103A, L103C, C103B	103	102	4.26	1.57	0.00	0.00	0.00	0.40	0.77	0.00	0.00	1.702	1.702	1.209	1.209	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	713.0	102.6	1050	1050	CIRCULAR	CONCRETE	-	0.10	900.9	**79.14%**	1.01	0.99	1.73
	102	101	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	1.702	0.000	1.209	0.000	0.000	0.000	0.000	11.73	70.74	95.86	112.32	164.14	0.0	0.0	656.3	12.5	1050	1050	CIRCULAR	CONCRETE	-	0.10	900.7	**72.86%**	1.01	0.96	0.22
																				11.95																			
C117B, C117A (Future storm sewer - by others)	117	116	0.00	0.78	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.000	0.000	0.509	0.509	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	147.2	46.9	450	450	CIRCULAR	CONCRETE	-	1.00	297.4	**49.48%**	1.81	1.55	0.51
L116A	116	115	0.78	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.311	0.311	0.000	0.509	0.000	0.000	0.000	0.000	10.51	74.92	101.60	119.09	174.07	0.0	0.0	208.2	65.0	450	450	CIRCULAR	CONCRETE	-	1.00	297.4	**70.01%**	1.81	1.72	0.63
C115A, F115C, C115B, F115D	115	114	0.00	1.57	0.00	0.59	0.00	0.00	0.68	0.00	0.40	0.000	0.311	1.068	1.577	0.000	0.000	0.235	0.235	11.14	72.70	98.56	115.50	168.81	159.0	159.0	763.5	139.5	1050	1050	CIRCULAR	CONCRETE	-	0.20	1274.0	**59.93%**	1.43	1.28	1.81
C114A, C114B	114	113	0.00	1.62	0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.000	0.311	1.104	2.681	0.000	0.000	0.000	0.235	12.95	67.08	90.84	106.42	155.47	0.0	159.0	994.7	166.4	1200	1200	CIRCULAR	CONCRETE	-	0.15	1575.3	**63.15%**	1.35	1.24	2.25
C113A	113	112	0.00	0.31	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.000	0.311	0.199	2.880	0.000	0.000	0.000	0.235	15.19	61.32	82.94	97.13	141.84	0.0	159.0	968.0	37.9	1535	975	ELLIPTICAL	CONCRETE	-	0.15	1548.9	**62.50%**	1.32	1.21	0.52
F112A	112	111	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.00	0.40	0.000	0.311	0.000	2.880	0.000	0.000	0.185	0.419	15.71	60.13	81.32	95.22	139.03	0.0	159.0	1023.4	29.5	1200	1200	CIRCULAR	CONCRETE	-	0.15	1575.2	**64.97%**	1.35	1.24	0.39
	111	107	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.311	0.000	2.880	0.000	0.000	0.000	0.419	16.11	59.27	80.14	93.83	136.99	0.0	159.0	1010.9	28.2	1200	1200	CIRCULAR	CONCRETE	-	0.15	1575.3	**64.17%**	1.35	1.24	0.38
																				16.49																			
L110A	110	109	0.77	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.498	0.498	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	106.3	81.3	300	300	CIRCULAR	PVC	-	1.70	125.4	**84.78%**	1.78	1.78	0.76
C109A	109	108	0.00	0.63	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.000	0.498	0.408	0.408	0.000	0.000	0.000	0.000	10.76	74.01	100.35	117.61	171.90	0.0	0.0	216.1	49.3	450	450	CIRCULAR	CONCRETE	-	1.70	387.8	**55.71%**	2.36	2.09	0.39
	108	107	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.498	0.000	0.408	0.000	0.000	0.000	0.000	11.15	72.65	98.48	115.41	168.67	0.0	0.0	212.1	142.2	450	450	CIRCULAR	CONCRETE	-	1.70	387.8	**54.68%**	2.36	2.08	1.14
																				12.29																			
C107A	107	106	0.00	0.30	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.000	0.809	0.196	3.484	0.000	0.000	0.000	0.419	16.49	58.47	79.05	92.55	135.11	0.0	159.0	1212.8	46.4	1350	1350	CIRCULAR	CONCRETE	-	0.10	1760.8	**68.88%**	1.19	1.12	0.69
	106	105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.809	0.000	3.484	0.000	0.000	0.000	0.419	17.17	57.07	77.13	90.30	131.81	0.0	159.0	1187.3	48.0	1350	1350	CIRCULAR	CONCRETE	-	0.10	1760.8	**67.43%**	1.19	1.12	0.72
	105	104	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.809	0.000	3.484	0.000	0.000	0.000	0.419	17.89	55.69	75.25	88.08	128.56	0.0	159.0	1162.1	33.6	1350	1350	CIRCULAR	CONCRETE	-	0.10	1760.8	**66.00%**	1.19	1.11	0.51
	104	101	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.809	0.000	3.484	0.000	0.000	0.000	0.419	18.40	54.76	73.98	86.59	126.37	0.0	159.0	1145.2	21.1	1350	1350	CIRCULAR	CONCRETE	-	0.10	1760.7	**65.04%**	1.19	1.10	0.32
																				18.72																			
	101	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	2.511	0.000	4.693	0.000	0.000	0.000	0.419	18.72	54.19	73.20	85.68	125.03	0.0	159.0	1636.8	26.2	1500	1500	CIRCULAR	CONCRETE	-	0.10	2331.9	**70.19%**	1.28	1.21	0.36
	100	100A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	2.511	0.000	4.693	0.000	0.000	0.000	0.419	19.08	53.56	72.34	84.67	123.56	0.0	159.0	1619.6	16.7	1500	1500	CIRCULAR	CONCRETE	-	0.10	2332.4	**69.44%**	1.28	1.21	0.23
																				19.31									1500	1500									
C203C, L203A, C203B	203	202	0.28	3.09	0.00	0.00	0.00	0.65	0.67	0.00	0.00	0.179	0.179	2.065	2.065	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	635.8	106.7	675	675	CIRCULAR	CONCRETE	-	1.00	876.9	**72.50%**	2.37	2.27	0.78
L202A, C202B, C202C	202	201A	0.26	1.03	0.00	0.00	0.00	0.65	0.70	0.00	0.00	0.171	0.350	0.719	2.784	0.000	0.000	0.000	0.000	10.78	73.92	100.22	117.47	171.69	0.0	0.0	846.8	132.8	750	750	CIRCULAR	CONCRETE	-	1.00	1161.4	**72.91%**	2.55	2.43	0.91
																				11.69																			
C201BB, C201BC, C201BA	201B	201A	0.00	1.57	0.00	0.00	0.00	0.00	0.74	0.00	0.00	0.000	0.000	1.163	1.163	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	336.6	81.5	750	750	CIRCULAR	CONCRETE	-	0.15	449.8	**74.83%**	0.99	0.95	1.42
																				11.42																			
C201AA, C201AB	201A	201	0.00	0.62	0.00	0.00	0.00	0.00	0.85	0.00	0.00	0.000	0.350	0.523	4.470	0.000	0.000	0.000	0.000	11.69	70.86	96.02	112.52	164.43	0.0	0.0	1261.2	56.7	1200	1200	CIRCULAR	CONCRETE	-	0.15	1575.3	**80.06%**	1.35	1.33	0.71
	201	200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.350	0.000	4.470	0.000	0.000	0.000	0.000	12.40	68.66	93.00	108.96	159.21	0.0	0.0	1221.5	64.7	1200	1200	CIRCULAR	CONCRETE	-	0.15	1575.3	**77.54%**	1.35	1.31	0.82
																				13.22									1200	1200									
F308A, F308B (Future storm sewer - by others)	308	305	0.00	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.20	0.000	0.000	0.000	0.000	0.000	0.000	0.037	0.037	10.00	76.81	104.19	122.14	178.56	507.0	507.0	525.6	50.1	600	600	CIRCULAR	CONCRETE	-	1.00	640.6	**82.05%**	2.19	2.17	0.38
																				10.38																			
F307A (Future storm sewer - by others)	307	306	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	387.0	387.0	387.0	127.3	525	525	CIRCULAR	CONCRETE	-	1.00	448.7	**86.26%**	2.01	2.02	1.05
(Future storm sewer - by others)	306	305	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.05	73.00	98.96	115.98	169.50	0.0	387.0	387.0	45.7	525	525	CIRCULAR	CONCRETE	-	1.00	448.7	**86.26%**	2.01	2.02	0.38
																				11.43																			
	305	304	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.037	11.43	71.73	97.22	113.93	166.49	0.0	894.0	911.3	63.4	750	750	CIRCULAR	CONCRETE	-	0.80	1038.8	**87.73%**	2.28	2.30	0.46
	304	303	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.037	11.88	70.25	95.19	111.54	162.99	0.0	894.0	911.0	162.0	750	750	CIRCULAR	CONCRETE	-	0.80	1038.8	**87.70%**	2.28	2.30	1.17
(Future storm sewers - by others)	303	302	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.037	13.06	66.77	90.41	105.92	154.73	0.0	894.0	910.1	27.6	825	825	CIRCULAR	CONCRETE	-	0.50	1058.9	**85.95%**	1.92	1.93	0.24
	302	301	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.037	13.29	66.11	89.50	104.85	153.16	0.0	894.0	910.0	127.9	1050	1050	CIRCULAR	CONCRETE	-	0.15	1103.3	**82.47%**	1.23	1.23	1.73
	301	300	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.037	15.03	61.70	83.46	97.74	142.73	0.0	894.0	908.9	20.7	1050	1050	CIRCULAR	CONCRETE	-	0.15	1103.3	**82.37%**	1.23	1.23	0.28
																				15.31									1200	1200									
SWM Pond Outlet Pipe (Sized for maximum allowable release rate)	150	149	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	83.0	83.0	83.0	37.3	450	450	CIRCULAR	CONCRETE	-	0.20	133.0	**62.40%**	0.81	0.74	0.84
	149	148	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.84	73.73	99.96	117.16	171.24	0.0	83.0	83.0	158.9	450	450	CIRCULAR	CONCRETE	-	0.20	133.0	**62.40%**	0.81	0.74	3.57
	148	147	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.41	63.20	85.52	100.16	146.28	0.0	83.0	83.0	38.7	450	450	CIRCULAR	CONCRETE	-	0.20	133.0	**62.40%**	0.81	0.74	0.87
C147A	147	146	0.00	0.07	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.000	0.000	0.043	0.043	0.000	0.000	0.000	0.000	15.28	61.12	82.67	96.81	141.36	0.0	83.0	92.8	159.0	450	450	CIRCULAR	CONCRETE	-	0.20	133.0	**69.75%**	0.81	0.76	3.47
																				18.75									450	450									



SEWER CROSSING TABLE								
CROSSING	STM INV	STM OBV	SAN INV	SAN OBV	CULVERT INV	CULVERT OBV	CB LEAD INV	CB LEAD OBV
1	79.59 (79.43)	80.94 (81.10)	78.67	78.87				
2	79.90 (79.76)	80.88 (81.02)	79.09	79.29	81.42 (81.22)	82.62 (82.82)		
3	82.19 (82.11)	82.64 (82.72)					80.89 (80.79)	81.49 (81.59)
4	77.99 (77.88)	78.74 (78.85)	76.38	76.63				

* BRACKETS DENOTE ADJUSTED VALUE WITH CONCRETE PIPE THICKNESS

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Legend

- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- FUTURE WATERMAIN
- FUTURE SANITARY SEWER
- FUTURE STORM SEWER
- MVCA 100 YEAR FLOODPLAIN PROVIDED BY MVCA FEBRUARY 2019
- MVCA MEANDER BELT PROVIDED BY MVCA FEBRUARY 2019
- MVCA REGULATION LIMIT PROVIDED BY MVCA FEBRUARY 2019
- 40m CORRIDOR AS PER HABITAT COMPENSATION BY MATRIX SOLUTIONS. INC. PROVIDED SEPTEMBER 29, 2023.

Notes

		By	Appd.	YY.MM.DD
3	REVISED DRAFT PLAN	WAJ	KJK	24.01.12
2	REVISED CONCEPTS	WAJ	KJK	23.01.16
1	ISSUED FOR DRAFT PLAN APPROVAL	WAJ	AMP	20.08.18

Revision

File Name: 160401347-DB.dwg	WAJ	AMP	WAJ	20.06.11
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

LICENSED PROFESSIONAL ENGINEER
R. J. B. BRANDRICK
100570025
January 24 2024
PROVINCE OF ONTARIO

Client/Project

3223701 CANADA INC.

BRIGIL - KANATA NORTH

OTTAWA, ON

Title

CONCEPTUAL
OVERALL SITE SERVICING PLAN

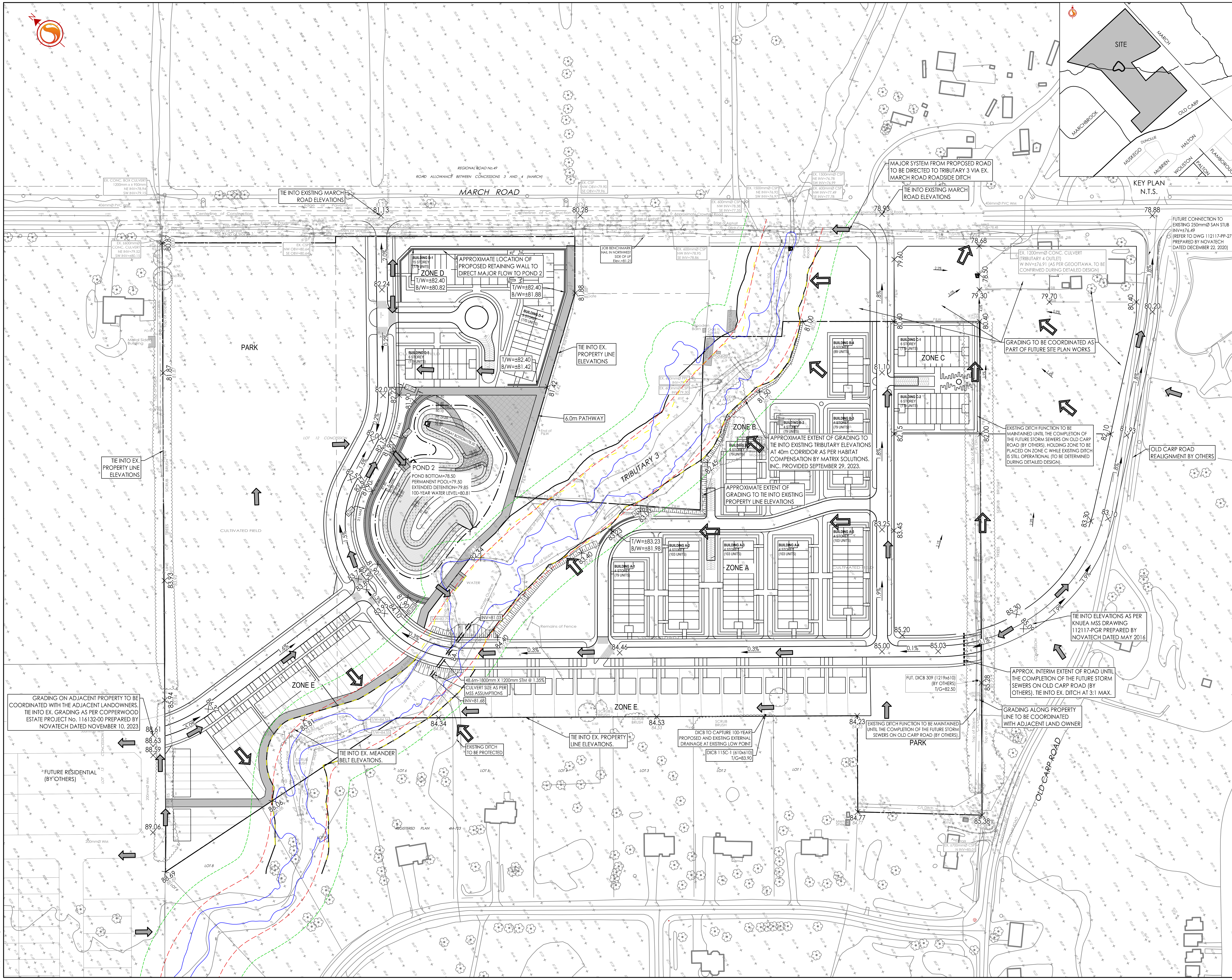
Project No. 160401347

Scale 1:1250 (0, 12.5, 37.5, 62.5m)

Drawing No. OSSP-1

Sheet 1 of 7

Revision 3



KEY PLAN
N.T.S.

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99.99	ORIGINAL GROUND ELEVATION
80.38	PROPOSED ELEVATION
81.00 / 80.25	PROPOSED LOT CORNER ELEVATION / EXISTING ELEVATION AT LOT CORNER
0.6%	FLOW DIRECTION AND GRADE
	MAJOR SYSTEM FLOW DIRECTION
	EMERGENCY OVERLAND FLOW DIRECTION
	MVCA 100 YEAR FLOODPLAIN PROVIDED BY MVCA FEBRUARY 2019
	MVCA MEANDER BELT PROVIDED BY MVCA FEBRUARY 2019
	MVCA REGULATION LIMIT PROVIDED BY MVCA FEBRUARY 2019
	40m CORRIDOR AS PER HABITAT COMPENSATION BY MATRIX SOLUTIONS. INC. PROVIDED SEPTEMBER 29, 2023.

Notes

1. PRPOSED ROADWAY ELEVATIONS AND SLOPES SHOW GENERAL DRAINAGE PATTERN AND HYDRAULIC SLOPE CONDITION ONLY. FINAL GRADING TO BE COMPLETED WITH THE DETAILED DESIGN.
2. GRADING FOR FUTURE LANDS BY OTHERS AS PER MSS PRELIMINARY GRADING PLAN 112117-PGR PREPARED BY NOVATECH DATED MAY 20, 2016.

		By	Appd.	YY.MM.DD
3	REVISED DRAFT PLAN	WAJ	KJK	24.01.12
2	REVISED CONCEPTS	WAJ	KJK	23.01.16
1	ISSUED FOR DRAFT PLAN APPROVAL	WAJ	AMP	20.08.18

Revision

File Name: 160401347-FB.dwg	Dwn.	Chkd.	Dsgn.	YY.MM.DD
	WAJ	AMP	WAJ	20.06.11

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LICENSED PROFESSIONAL ENGINEER
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January 24 2024
PROVINCE OF ONTARIO

Client/Project
3223701 CANADA INC.

BRIGIL - KANATA NORTH

OTTAWA, ON

Title
CONCEPTUAL OVERALL GRADING PLAN

Project No. 160401347
Scale 1:1250 (0, 12.5, 37.5, 62.5m)

Drawing No. OGP-1
Sheet 2 of 7
Revision 3

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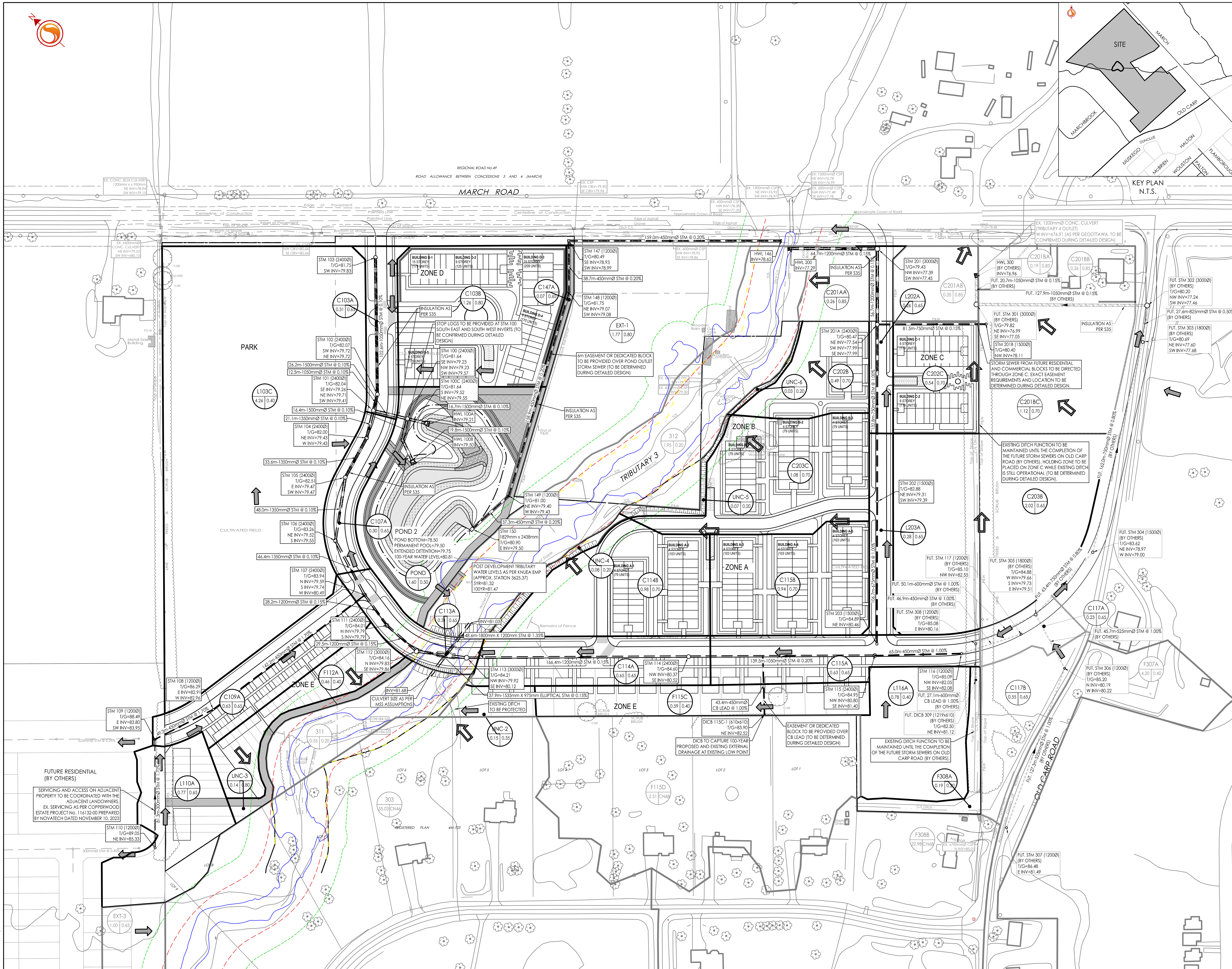
ORIGINAL SHEET - ARCH D



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Legend

- 1-1 — AREA ID
- 1.13 | 0.60 — RUNOFF COEFFICIENT; STORM DRAINAGE AREA ha.
- STORM DRAINAGE BOUNDARY
- FUTURE STORM DRAINAGE BOUNDARY
- EXISTING STORM DRAINAGE BOUNDARY
- PROPOSED STORM SEWER
- FUTURE STORM SEWER
- MAJOR SYSTEM FLOW DIRECTION
- EMERGENCY OVERLAND FLOW DIRECTION
- MVCA 100 YEAR FLOODPLAIN PROVIDED BY MVCA FEBRUARY 2019
- MVCA MEANDER BELT PROVIDED BY MVCA FEBRUARY 2019
- MVCA REGULATION LIMIT PROVIDED BY MVCA FEBRUARY 2019
- 40m CORRIDOR AS PER HABITAT COMPENSATION BY MATRIX SOLUTIONS. INC. PROVIDED SEPTEMBER 29, 2023.

Notes

		By	Appd.	YY.MM.DD
3	REVISED DRAFT PLAN	WAJ	KJK	24.01.12
2	REVISED CONCEPTS	WAJ	KJK	23.01.16
1	ISSUED FOR DRAFT PLAN APPROVAL	WAJ	AMP	20.08.18

Revision

File Name: 160401347-SD.dwg	WAJ	AMP	WAJ	20.06.11
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

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LICENSED PROFESSIONAL ENGINEER
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January 24 2024
PROVINCE OF ONTARIO

Client/Project

3223701 CANADA INC.

BRIGIL - KANATA NORTH

OTTAWA, ON

Title

CONCEPTUAL
OVERALL STORM DRAINAGE PLAN

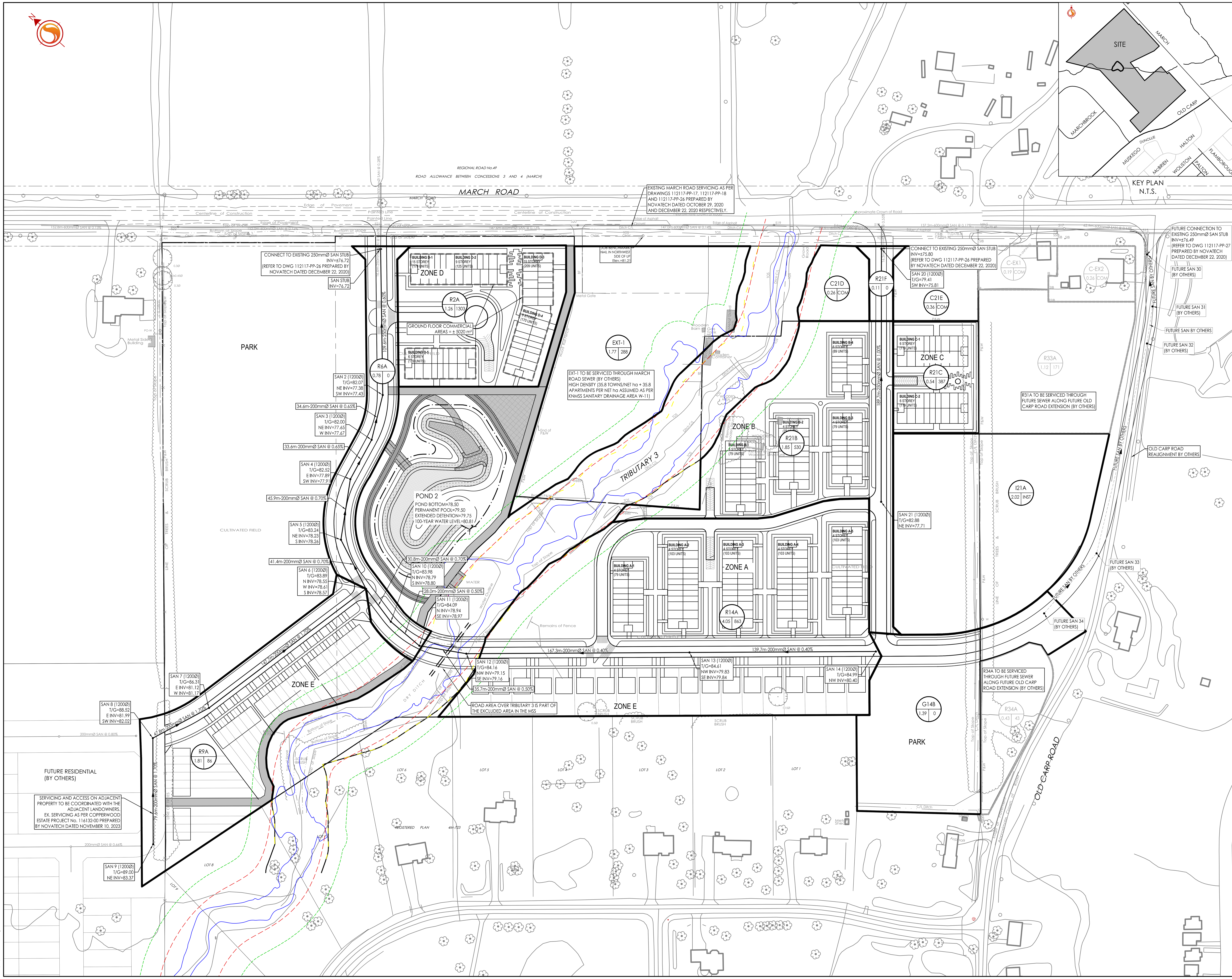
Project No. 160401347

Scale 1:1250 (0, 12.5, 37.5, 62.5m)

Drawing No. OSD-1

Sheet 3 of 7

Revision 3



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2024/01/08 12:30 PM By: Johnson, Warren

ORIGINAL SHEET - ARCH D

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Legend

SA24A / 0.38 / 34
- SANITARY DRAINAGE AREA ID#
- POPULATION
- SANITARY DRAINAGE AREA ha.
- SANITARY DRAINAGE AREA
- PROPOSED SANITARY SEWER
- FUTURE SANITARY DRAINAGE AREA
- FUTURE SANITARY SEWER
- MVCA 100 YEAR FLOODPLAIN PROVIDED BY MVCA FEBRUARY 2019
- MVCA MEANDER BELT PROVIDED BY MVCA FEBRUARY 2019
- MVCA REGULATION LIMIT PROVIDED BY MVCA FEBRUARY 2019
- 40m CORRIDOR AS PER HABITAT COMPENSATION BY MATRIX SOLUTIONS. INC. PROVIDED SEPTEMBER 29, 2023.

Notes

		By	Appd.	YY.MM.DD
3	REVISED DRAFT PLAN	WAJ	KJK	24.01.12
2	REVISED CONCEPTS	WAJ	KJK	23.01.16
1	ISSUED FOR DRAFT PLAN APPROVAL	WAJ	AMP	20.08.18

Revision

File Name: 160401347-SA.dwg	Dwn.	Chkd.	Dsgn.	YY.MM.DD
	WAJ	AMP	WAJ	20.06.11

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LICENSED PROFESSIONAL ENGINEER
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January 24 2024
PROVINCE OF ONTARIO

Client/Project

3223701 CANADA INC.

BRIGIL - KANATA NORTH

OTTAWA, ON

Title

CONCEPTUAL OVERALL SANITARY DRAINAGE PLAN OPTION 1

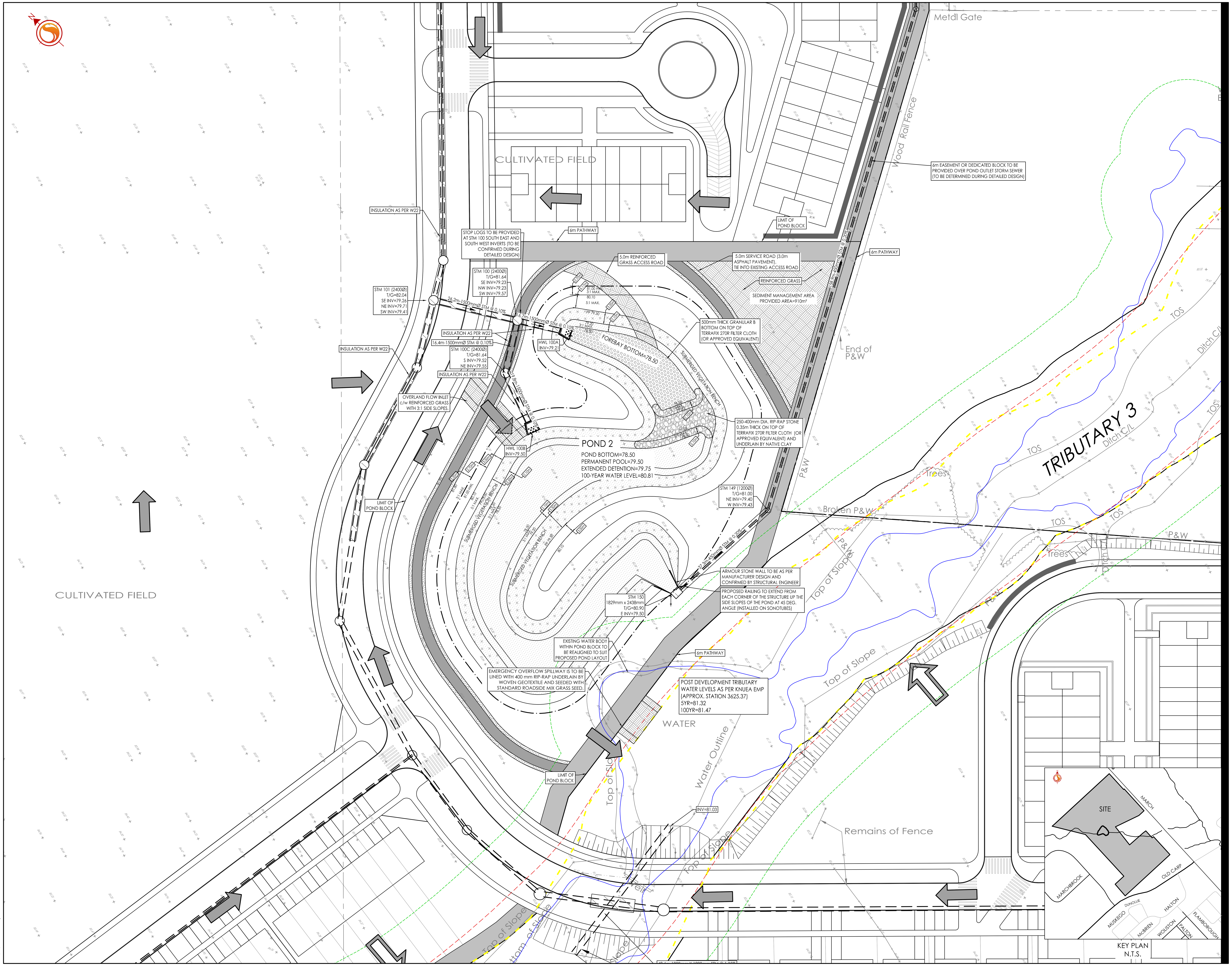
Project No. 160401347

Scale 1:1250 (0 12.5 37.5 62.5m)

Drawing No. OSA-1

Sheet 2 of 7

Revision 3



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Legend

- PROPOSED STORM SEWER
- PROPOSED STORM MANHOLE
- PROPOSED BOX MANHOLE
- PROPOSED HEADWALL
- PROPOSED 5.0m SERVICE ROAD (3.0m ASPHALT PAVEMENT)
- PROPOSED REINFORCED GRASS
- PERMANENT POOL AREA
- APPROXIMATE LOCATION OF RIP-RAP
- 500mm THICK GRANULAR B
- OVERLAND FLOW DIRECTION
- EMERGENCY OVERLAND FLOW DIRECTION
- PROPOSED INSULATION AS PER OPSD 1109.030
- 100 YR WATER LEVEL AS NOTED
- MVCA 100 YEAR FLOODPLAIN PROVIDED BY MVCA FEBRUARY 2019
- MVCA MEANDER BELT PROVIDED BY MVCA FEBRUARY 2019
- MVCA REGULATION LIMIT PROVIDED BY MVCA FEBRUARY 2019
- 40m CORRIDOR AS PER HABITAT COMPENSATION BY MATRIX SOLUTIONS, INC. PROVIDED SEPTEMBER 29, 2023.

Notes

3	REVISED DRAFT PLAN	WAJ	KJK	24.01.12
2	REVISED CONCEPTS	WAJ	KJK	23.01.16
1	ISSUED FOR DRAFT PLAN APPROVAL	WAJ	AMP	20.08.18
Revision		By	Appd.	YY.MM.DD

File Name: 160401347-POND.dwg	WAJ	AMP	WAJ	20.06.11
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

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January 24 2024
PROVINCE OF ONTARIO

Client/Project

3223701 CANADA INC.

BRIGIL - KANATA NORTH

OTTAWA, ON

Title

CONCEPTUAL POND
SERVICING AND GRADING PLAN

Project No.	Scale	
160401347	1:500 (0 5 15 25m)	
Drawing No.	Sheet	Revision
POND-1	5 of 7	3

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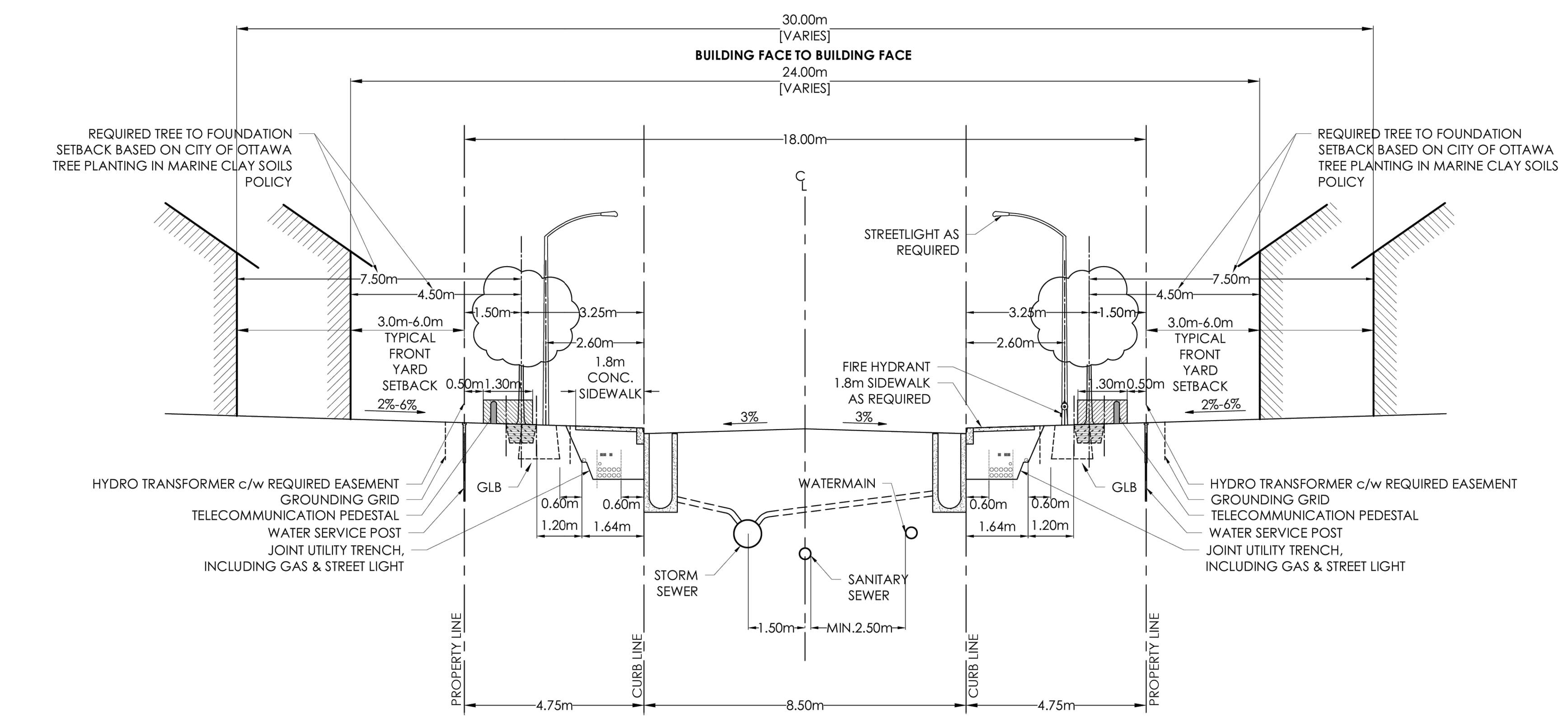
ORIGINAL SHEET - ARCH D

1. STANDARD CROSS-SECTIONS TO BE READ IN CONJUNCTION WITH THE GENERAL STANDARD CROSS-SECTION NOTES AND OTHER APPLICABLE CITY AND UTILITY PLANS AND DETAILS.
2. 18M RIGHT-OF-WAY NOT TO BE USED ON STREETS WITH BUS SERVICE.
3. CONCRETE CURBS TO BE CONSTRUCTED AS PER CITY OF OTTAWA STANDARD DETAILS.
4. TYPICAL FRONT YARD SETBACK IS TO BE CLEAR AND UNENCUMBERED OF ANY SUBSURFACE BUILDING ENCROACHMENTS.
5. FIRE HYDRANTS TO BE LOCATED ON THE WATERMAIN SIDE OF THE STREET.
6. CATCH BASINS TO BE PER CITY OF OTTAWA DETAIL S2.
7. GAS MAIN SHALL HAVE A MINIMUM OF 0.6M CLEARANCE FROM STRUCTURES E.G. CATCH BASINS AND HYDRANTS) AND 1.2 M FROM TREE ROOT BALL.
8. STREETLIGHTS CAN BE LOCATED ON EITHER SIDE OF THE RIGHT-OF-WAY.
9. JOINT-USE UTILITY TRENCH (JUT) UNDER SIDEWALK AS PER DETAIL UDS0049. HELD BY HYDRO OTTAWA.
10. GRADE LEVEL BOX (GLB) AS DRAWN SHOWS GLB3660. EXACT LOCATION TO BE CONFIRMED.
11. THIS CROSS-SECTION CANNOT BE USED WHERE A CONCRETE ENCASED HYDROELECTRIC DUCT OR ANOTHER SEPARATE UTILITY DUCT IS REQUIRED.
12. TREE CLEARANCES TO HYDRO OTTAWA PLANT SHALL FOLLOW GCS0038.
13. CLEARANCES SHOWN ARE MINIMUMS.

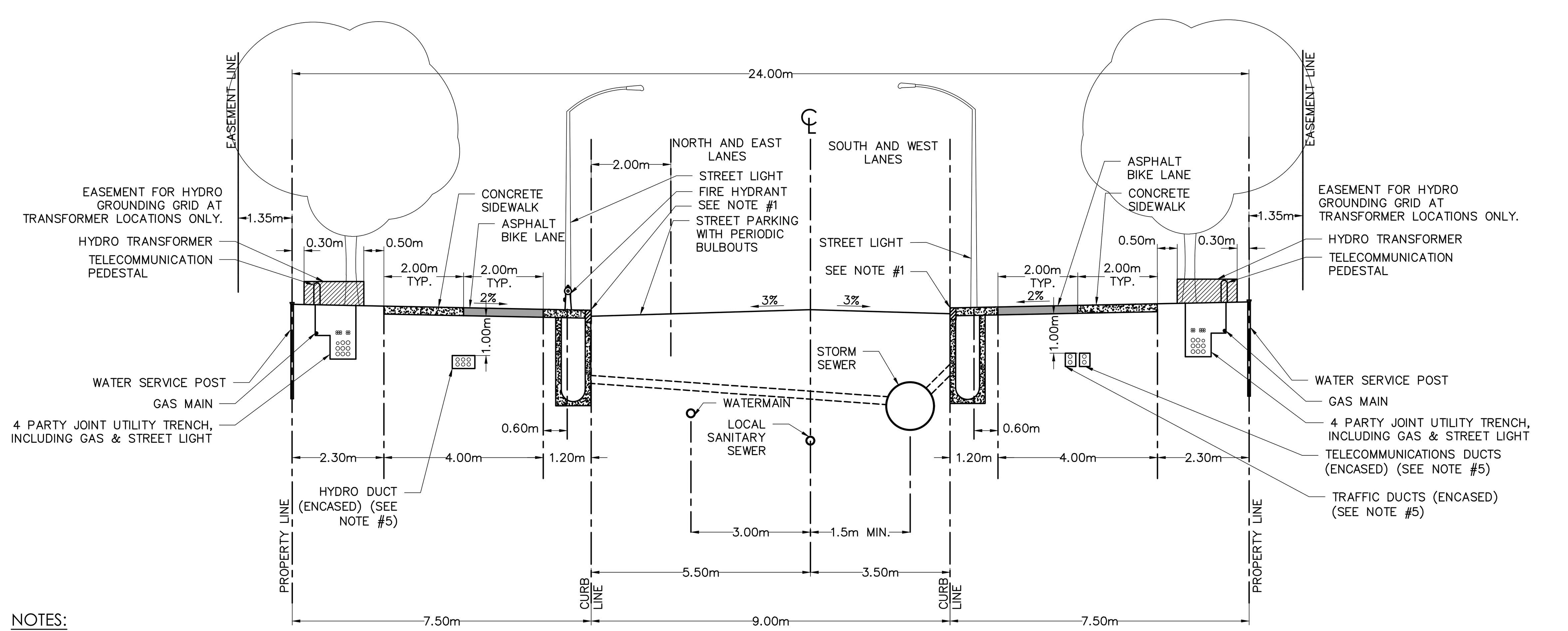


Ottawa

18.0m ROW CROSS SECTION

REV.DATE: AUG. 2022

DWG. No. ROW-18.0



NOTES:

1. REFERENCE STANDARD NOTES ROAD ALLOWANCE (DGN:ROW-NOTES).
2. AT CATCH BASIN AND HYDRANT LOCATIONS THE GAS MAIN SHALL HAVE A MINIMUM 0.6m CLEARANCE FROM STRUCTURES.
3. ALL PEDESTALS TO BE INSTALLED IN LINE WITH HYDRO TRANSFORMERS OR ON SIDE OF TRENCH AWAY FROM ROAD.
4. REQUIREMENT FOR PROTECTIVE BOLLARDS AT TRANSFORMERS SHALL BE DETERMINED BY HYDRO ON A CASE BY CASE BASIS.
5. HYDRO DUCTS & COMMUNICATION DUCTS (ENCASED) TYPICALLY REQUIRED ON ONE SIDE OF R.O.W. ONLY. PROVIDE 1.0m COVER ON ALL CONCRETE ENCASED DUCTS.
6. CONCRETE CURBS MAY BE BARRIER TYPE OR MOUNTABLE TYPE, CATCH BASIN TYPE WILL SUIT CURB DESIGN. SEE SEWER DESIGN GUIDELINES FOR CATCHBASIN PREFERENCE.

MODIFIED 24.0m RIGHT OF WAY

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Legend

Notes

		By	Appd.	YY.MM.DD
3	REVISED DRAFT PLAN	WAJ	KJK	24.01.12
2	REVISED CONCEPTS	WAJ	KJK	23.01.16
1	ISSUED FOR DRAFT PLAN APPROVAL	WAJ	AMP	20.08.18

Revision

File Name: 160401347-DS.dwg	WAJ	AMP	WAJ	20.06.11
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

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LICENSED PROFESSIONAL ENGINEER
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100570025
January 24 2024
PROVINCE OF ONTARIO

Client/Project

3223701 CANADA INC.

BRIGIL - KANATA NORTH

OTTAWA, ON

Title

CONCEPTUAL
DETAIL SHEET

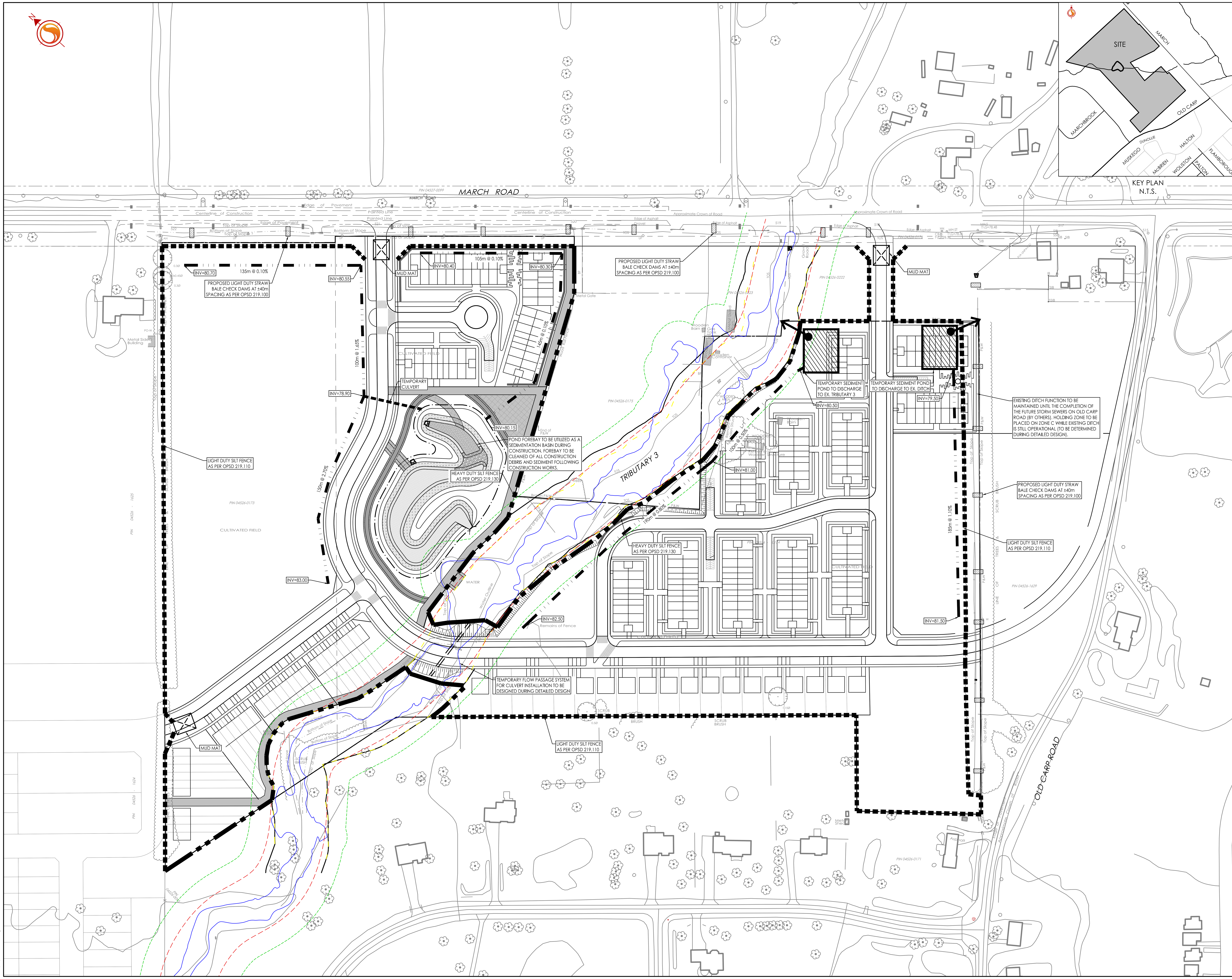
Project No. 160401347

Scale 1:1000 0 10 30 50m

Drawing No. DS-1

Sheet 6 of 7

Revision 3



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Legend

- PROPOSED LIGHT DUTY SILT FENCE BOUNDARY AS PER OPSD 219.110
- PROPOSED HEAVY DUTY SILT FENCE BOUNDARY AS PER OPSD 219.130
- PROPOSED STRAW BALE LOCATION AS PER OPSD 219.100
- PROPOSED TEMPORARY FLAT BOTTOM DIVERSION DITCH
- PROPOSED MUD MAT LOCATION
- MVCA 100 YEAR FLOODPLAIN PROVIDED BY MVCA FEBRUARY 2019
- MVCA MEANDER BELT PROVIDED BY MVCA FEBRUARY 2019
- MVCA REGULATION LIMIT PROVIDED BY MVCA FEBRUARY 2019
- 40m CORRIDOR AS PER HABITAT COMPENSATION BY MATRIX SOLUTIONS. INC. PROVIDED SEPTEMBER 29, 2023.

Best Management Practices

CONTRACTOR TO PROVIDE EROSION AND SEDIMENT CONTROLS (BEST MANAGEMENT PRACTICES) DURING CONSTRUCTION OF THIS PROJECT.

EROSION MUST BE MINIMIZED AND SEDIMENTS MUST BE REMOVED FROM CONSTRUCTION SITE RUN-OFF IN ORDER TO PROTECT DOWNSTREAM AREAS. DURING ALL CONSTRUCTION, EROSION AND SEDIMENTATION SHOULD BE CONTROLLED BY THE FOLLOWING TECHNIQUES:

1. LIMIT THE EXTENT OF EXPOSED SOILS AT ANY GIVEN TIME.
2. REVEGETATE EXPOSED AREAS AND SLOPES AS SOON AS POSSIBLE.
3. MINIMIZE AREA TO BE CLEARED AND GRUBBED.
4. PROTECT EXPOSED SLOPES WITH PLASTIC OR SYNTHETIC MULCHES.
5. INSTALL FILTER CLOTH BETWEEN FRAME AND COVER ON ALL PROPOSED CATCH BASINS AND CATCH BASIN MANHOLES AND ON ALL EXISTING CATCH BASINS THAT WILL RECEIVE RUN-OFF FROM THE SITE.
6. A SILT FENCE SHALL BE INSTALLED AROUND THE PERIMETER OF ALL AND ANY STOCKPILES OF MATERIAL TO BE USED OR REMOVED FROM SITE. (LOCATION TO BE DETERMINED)
7. A VISUAL INSPECTION SHALL BE DONE DAILY ON SEDIMENT CONTROL MEASURES AND CLEANED OF ANY ACCUMULATED SILT AS REQUIRED. THE DEPOSITS WILL BE DISPOSED OFF SITE AS PER THE REQUIREMENTS OF THE CONTRACT.
8. SEDIMENT CONTROL BARRIERS MAY ONLY BE REMOVED TEMPORARILY WITH APPROVAL OF CONTRACT ADMINISTRATOR TO ACCOMMODATE CONSTRUCTION OPERATIONS. ALL AFFECTED BARRIERS MUST BE REINSTATED AT NIGHT WHEN CONSTRUCTION IS COMPLETED. NO REMOVAL WILL OCCUR IF THERE IS A SIGNIFICANT RAINFALL EVENT ANTICIPATED (>10mm) UNLESS A NEW DEVICE HAS BEEN INSTALLED TO PROTECT THE EXISTING STORM AND SANITARY SEWER SYSTEMS.
9. NO REFUELING OR CLEANING OF EQUIPMENT IS PERMITTED NEAR ANY EXISTING WATERWAY.
10. CONTRACTOR SHALL REMOVE SEDIMENT CONTROL MEASURES WHEN, IN THE OPINION OF THE CONTRACT ADMINISTRATOR, THE MEASURE(S) IS NO LONGER REQUIRED. NO CONTROL MEASURES SHALL BE PERMANENTLEY REMOVED WITHOUT PRIOR WRITTEN AUTHORIZATION FROM THE CONTRACT ADMINISTRATOR.
11. THE CONTRACTOR SHALL PERIODICALLY, OR WHEN REQUESTED BY THE CONTRACT ADMINISTRATOR, CLEAN OUT ACCUMULATED SEDIMENTS AS REQUIRED.
12. THE CONTRACTOR SHALL IMMEDIATELY REPORT TO THE ENGINEER ANY ACCIDENTAL DISCHARGES OF SEDIMENT MATERIAL INTO THE WATERCOURSE. APPROPRIATE RESPONSE MEASURES, INCLUDING ANY REPAIRS TO EXISTING CONTROL MEASURES OR THE IMPLEMENTATION OF ADDITIONAL CONTROL MEASURES, SHALL BE CARRIED OUT BY THE CONTRACTOR WITHOUT DELAY.
13. CONTRACTOR SHALL INSTALL MUD MATS AT ALL ENTRANCES TO THE SITE.
14. CONTRACTOR IS RESPONSIBLE TO KEEP THE ROADS FREE AND CLEAN FROM MUD AND DEBRIS.

	Revision	By	Appd.	YY.MM.DD
3	REVISED DRAFT PLAN	WAJ	KJK	24.01.12
2	REVISED CONCEPTS	WAJ	KJK	23.01.16
1	ISSUED FOR DRAFT PLAN APPROVAL	WAJ	AMP	20.08.18

File Name: 160401347-EC.dwg	Dwn.	Chkd.	Dsgn.	YY.MM.DD
	WAJ	AMP	WAJ	20.06.11

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LICENSED PROFESSIONAL ENGINEER
R. J. B. BRANDRICK
100570025
January 24 2024
PROVINCE OF ONTARIO

Client/Project

3223701 CANADA INC.

BRIGIL - KANATA NORTH

OTTAWA, ON

Title

CONCEPTUAL
OVERALL EROSION CONTROL PLAN

Project No. 160401347

Scale 1:1250

Drawing No. EC-1

Sheet 7 of 7

Revision 3

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2024/01/08 12:36 PM By: Johnson, Warren

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