Stormwater Management Report

Rosseau Springs

Type of Document:
Issued for Approval

Project Name:
Rosseau Springs Development

Project Number:
NON-21019951-A0

Prepared By:
Calvin Caldwell, P.Eng.

EXP Services Inc.
757 Main Street East
North Bay, ON, P1B 1C2
t: +1.705.474.2720
f: +1.705.474.8515

Date Submitted:
August 3, 2023

Table of Contents

Table of Contents **2**
1. Introduction **3**
2. Development Location **3**
3. Existing Conditions **4**
4. Proposed Development **4**
5. Stormwater Management Criteria **4**
6. Rainfall Intensity **4**
6.1. Rainfall Intensity to Hyetograph 5
7. OTTHYMO Model **5**
7.1. Design Storms 5
7.2. Discretization 5
7.3. Pre-Development Models Parameters 6
7.4. Post-Development Models Parameters 7
8. Model Results **8**
8.1. Control Point No. 1 Model Result 8
8.2. Control Point No. 2 Model Results 9
8.3. Control Point No. 3 Model Results 9
8.4. Control Point No. 4 Model Results 10
8.5. Control Point No. 5 Model Results 10
9. Quality Control **11**
10. Construction Erosion and Sediment Control **11**
11. Conclusion **12**

Appendix A – Pre-Development Stormwater Management Plan

Appendix B – Post-Development Stormwater Management Plan, Sections and Details

Appendix C – Modeling Data

Appendix D – OTTHYMO Outputs

1. Introduction

EXP Services Inc. (EXP) has been retained to prepare this Stormwater Management Report (SWM Report) for the development of the residential 50 lot Rosseau Springs subdivision.

The following documents have been used in the preparation of this report:

- Engineering & Utility Services Technical Standards & Specifications.
- Township of Seguin Consultation Form.
- Stormwater Management Planning and Design Guidelines (Ontario Ministry of Environment and Climate Change, 2003).
- MTO Drainage Management Manual (Drainage and Hydrology Section Transportation Engineering Branch Quality and Standards Division, 1995-1997).

2. Development Location

Rosseau Springs is located on the southeast side of Highway 632 south of the Community of Rosseau, Ontario. Access to the site is available from the new entrance off Highway 632 or the existing Maplehurst Road intersection.

Figure 1: Proposed Site

3. Existing Conditions

The 118 hectares (291 acres) site is comprised of forest, bedrock outcrops and marsh / wetland areas. The existing topography is characterised by areas of bedrock outcrops with intermittent pockets of thin soils. Surface water generally flows overland or via existing drainage channels to the north to Cameron Bay (Lake Rosseau) via an existing 700mm culvert under Maplehurst Road, south to Sucker Bay (Lake Rosseau) or east to Morgan Bay (Lake Rosseau).

4. Proposed Development

The land uses proposed for the site is a conservation design subdivision development with residential lots. The conservation approach puts the environment, and its natural features first and then allows residential lots to be placed around the respected natural features. The development will be supported by a road network for access.

5. Stormwater Management Criteria

The following criteria were used to develop the stormwater management plan model:

- The pre & post-development condition flow for the 2, 5, 10, 25, 50, 100 storms must not exceed the pre-development condition flows.
- Visual OTTHYMO software was used to calculate the maximum flow for the 2, 5, 10, 25, 50, 100 storms for the pre-development and post-development conditions.

Visual OTTHYMO (Version 5.0) software was used to calculate the peak flow and total runoff volume for the 2, 5, 10, 25, 50, 100-year storms for the pre-development and post-development conditions.

6. Rainfall Intensity

The Rainfall Intensity-Duration-Frequency (IDF) curves for the property (taken from the Ministry of Transportation IDF curve look-up database) were used to calculate the peak flow rates for the pre-development and post-development conditions. The curves approximate the intensity of rain during a design storm. Rainfall coefficients for the 2, 5, 10, 25, 50 and 100-year design storm events are presented in Table 1 below.

Rainfall intensity calculation formula: $I = (A \times t_d)^B$

Where: *I* – Rainfall intensity (mm/h)
A, *B* – IDF Storm Coefficients
t_d – storm duration (min)

Table 1: A, B MTO IDF Coefficients for Property		
Storm Event Return Period	**Coefficient A**	**Coefficient B**
2-year	21.5	-0.669
5-year	28.6	-0.699
10-year	33.3	-0.699
25-year	39.2	-0.699
50-year	43.5	-0.699
100-year	47.9	-0.699

6.1. Rainfall Intensity to Hyetograph

Visual OTTHYMO applies rainstorms to the model through the use of hyetographs. These hyetographs are generated by applying the 24-hour duration rainfall intensity over the 24-hour time period to determine the total rainfall for each design storm. The total rainfall is then distributed over the 24-hour period using the SCS Type II with 15-minute intervals.

7. OTTHYMO Model

The pre-development and post-development conditions were hydrologically modeled using the Visual OTTHYMO computer software. Given a rainfall event, Visual OTTHYMO calculates peak runoff flows and rainwater volumes for a predefined catchment area. This Visual OTTHYMO model makes use of the NASHYD (natural hydrographs) and STANHYD (urban hydrographs) routines for calculating hydrographs for rural or undeveloped areas and urban developed areas. The details on how the model parameters were determined are provided in the sections below.

7.1. Design Storms

The rainfall events are based on the latest MTO Rosseau, Ontario storm data. The following rainfall events have been modeled:

- 2, 5, 10, 25, 50 and 100-year storm events for the 24-Hour SCS Type II Distribution.

7.2. Discretization

The site has been divided into discrete storm catchment areas for the purpose of hydrologic modeling of the pre-development and post-development conditions.

The time to peak, t_p, was estimated by using the Airport Equation or the Bransby-Williams Formula for calculating time to concentration, t_c. The equations are used as follows:

Airport Equation (Used if *C* value is less than 0.4)

$$t_c = \frac{3.26 \times (1.1 - C) \times L^{1/2}}{S_w{}^{1/3}}$$

Where:

- t_c is the time to concentration for the hydrograph (min)
- C is the runoff coefficient
- L is the watershed length (m)
- S_w is the watershed slope (%)

Bransby-Williams Formula (Used if *C* value is greater than 0.4)

$$t_c = \frac{0.057 \times L}{S_w{}^{0.2} \times A^{0.1}}$$

Where:

- t_c is the time to concentration for the hydrograph (min)
- L is the watershed length (m)
- S_w is the watershed slope (%)
- A is the watershed area (ha)

The time to peak required in the Visual OTTHYMO model is estimated as 66% of time of concentration. The time to peak should not be less than the interval time of the hyetograph for the design storm. The catchment timestep (DT) is to be 1/5 of the time to peak (t_p), but not less than 2.0 minutes.

7.3. Pre-Development Models Parameters

Initial Abstraction (IA) and Runoff Curve Number (CN) were used in the pre-development and post-development models. The numbers in Table 2 were taken from the *MTO Drainage Management Manual – Design Charts 1.09*.

Table 2: Initial Abstraction and Runoff Curve Numbers for NASHYD (Natural Hydrographs)

Land Use or Surface	CN	IA [mm]
Wetland	50	10
Lawns / Pasture	65	10
Granular	98	2
Pavement / Roof	98	2
Rockland	70	2
Woodland	55	10

The pre-development conditions were modeled using both natural hydrographs (NASHYD). Table 3 below indicates the parameters for the natural hydrographs (NASHYD).

Table 3: Natural Catchment Areas Land Use Breakdown (Pre-Development)								
Catchment	Wetland / Pond Area [ha]	Granular Area [ha]	Pavement / Roof Area [ha]	Rockland Area [ha]	Woodland Area [ha]	Weighted		
						CN	IA [mm]	RC
C201	0.84	0.05	0.36	7.90	20.63	59.4	7.8	0.31
C202	4.48	0.78	0.00	5.00	11.98	58.9	7.9	0.27
C203	1.12	0.00	0.00	3.70	8.08	58.9	7.7	0.30
C204	2.88	0.00	0.00	4.50	10.74	57.9	8.0	0.28
C205	0.00	0.00	0.00	2.10	5.60	59.1	7.8	0.31

7.4. Post-Development Models Parameters

For the post-development modeling, the site was delineated into catchment areas C1 to C10. Natural hydrographs (NASHYD) were used to calculate the post-development runoff from each catchment based on the catchments post-development characteristics.

Table 4 indicates the parameters for the natural hydrographs (NASHYD).

	Table 4: Natural Catchment Areas (NASHYD) Land Use Breakdown (Post-Development)								
Catchment	Wetland / Pond Area [ha]	Granular Area [ha]	Pavement / Roof Area [ha]	Rockland Area [ha]	Woodland Area [ha]	Lawns Area [ha]	Weighted		
							CN	IA [mm]	RC
C1	0.00	0.21	0.04	0.10	4.15	0.20	58.0	9.4	0.21
C2	0.75	0.08	0.16	0.90	5.27	0.20	58.0	8.8	0.24
C3	0.00	0.10	0.02	0.15	0.24	0.08	68.9	6.3	0.39
C4	0.00	0.18	0.18	0.30	1.05	0.19	66.5	7.2	0.36
C5	0.43	0.57	0.40	3.10	7.80	0.75	62.2	7.5	0.33
C6	0.00	0.12	0.06	0.22	0.60	0.06	66.0	7.0	0.36
C7	4.48	0.46	0.32	5.20	9.97	1.47	59.7	7.8	0.28
C8	0.00	0.00	0.10	2.07	5.42	0.11	59.7	7.7	0.32
C9	1.12	0.21	0.12	3.60	8.10	0.27	59.9	7.7	0.31
C10	2.88	0.64	0.40	4.60	11.20	0.48	60.2	7.8	0.30

The post-development catchment areas are provided in **Appendix B**.

8. Model Results

Five (5) Control Points were used to model post-development stormwater discharged from the site. These Control Points correspond to existing locations that convey stormwater offsite from the site. The following are descriptions of the Control Points identified:

- Control Point 1 - Flows discharging to a 700mm culvert sloped at 3.6% which conveys runoff beneath Maplehurst Road.
- Control Point 2 - Flows discharging to a 1000mm culvert sloped at 2.00% which conveys runoff beneath driveway at Lot 43 to Cameron Bay (Lake Rosseau).
- Control Point 3 - Flows discharging eastward towards Snug Harbour (Lake Rosseau).
- Control Point 4 - Flows discharging eastward towards Morgan Bay (Lake Rosseau).
- Control Point 5 - Flows discharging southward towards Sucker Bay (Lake Rosseau).

Refer to both SWM-1 and SWM-2 for the location of the site discharge locations.

8.1. Control Point No. 1 Model Result

The following chart indicates the model results for Control Point 1 – 700mm culvert located beneath Maplehurst Road adjacent to Lot 43.

Table 5: Model Results – Pre-Development Release Rates Control Point 1								
Storm Peak Event Flow [m^3/s]								
Storm Event	**Catchment Area ID**	**Area [ha]**	**Storm Distribution**					
			2 Year	**5 Year**	**10 Year**	**25 Year**	**50 Year**	**100 Year**
Pre - Development Condition								
24 Hour SCS II	201	30.49	0.34	0.62	0.88	1.20	1.48	1.74
Post-Development Condition (without attenuation)								
24 Hour SCS II	1 - 6	28.98	0.36	0.67	0.94	1.28	1.57	1.84

Table 5 above indicates that post-Development peak flows will have a less than 1% increase in peak flow to the Maplehurst culvert and ultimately to Lake Rosseau. However, the existing 700mm crossing culvert has a maximum capacity of 1.92m^3/s which exceeds the maximum expected flow of 1.84m^3/s during the 100-year storm event.

8.2. Control Point No. 2 Model Results

The following chart indicates the model results for Control Point 2 – 1000mm culvert located beneath driveway at Lot 43.

Table 6: Model Results – Pre-Development Release Rates Control Point 2								
Storm Peak Event Flow [m^3/s]								
Storm Event	**Catchment Area ID**	**Area [ha]**	**Storm Distribution**					
			2 Year	**5 Year**	**10 Year**	**25 Year**	**50 Year**	**100 Year**
Pre - Development Condition								
24 Hour SCS II	201 & 202	52.73	0.60	1.10	1.55	2.12	2.61	3.07
Post-Development Condition (without attenuation)								
24 Hour SCS II	1 - 7	50.27	0.60	1.10	1.54	2.10	2.59	3.04

Table 6 above indicates that post-Development peak flows will be below the allowable peak flows. Therefore, no attenuation of this catchment area is required.

8.3. Control Point No. 3 Model Results

The following chart indicates the model results for Control Point 3 – Snug Harbour.

Table 7: Model Results – Pre-Development Release Rates Control Point 3								
Storm Peak Event Flow [m^3/s]								
Storm Event	**Catchment Area ID**	**Area [ha]**	**Storm Distribution**					
			2 Year	**5 Year**	**10 Year**	**25 Year**	**50 Year**	**100 Year**
Pre - Development Condition								
24 Hour SCS II	205	7.70	0.104	0.191	0.270	0.367	0.453	0.532
Post-Development Condition (without attenuation)								
24 Hour SCS II	8	7.91	0.105	0.192	0.269	0.367	0.452	0.531

Table 7 above indicates that the Post-Development peak flows will be below the allowable peak flows, therefore, no attenuation of this catchment area is required.

8.4. Control Point No. 4 Model Results

The following chart indicates the model results for Control Point 4 – towards Morgan Bay.

Table 8: Model Results – Pre-Development Release Rates Control Point 4								
Storm Peak Event Flow [m^3/s]								
Storm Event	Catchment Area ID	Area [ha]	Storm Distribution					
			2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Pre - Development Condition								
24 Hour SCS II	204	18.12	0.208	0.386	0.545	0.745	0.921	1.085
Post-Development Condition								
24 Hour SCS II	10	20.20	0.205	0.377	0.530	0.721	0.888	1.044

Table 8 indicates that the Post-Development peak flows will be below the allowable peak flows, therefore, no attenuation of this catchment area is required.

8.5. Control Point No. 5 Model Results

The following chart indicates the model results for Control Point 4 – towards Sucker Bay.

Table 9: Model Results – Pre-Development Release Rates Control Point 5								
Storm Peak Event Flow [m^3/s]								
Storm Event	Catchment Area ID	Area [ha]	Storm Distribution					
			2 Year	5 Year	10	25	50	100
Pre - Development Condition								
24 Hour SCS II	203	12.90	0.157	0.287	0.405	0.551	0.680	0.800
Post-Development Condition (without attenuation)								
24 Hour SCS II	9	13.42	0.154	0.282	0.396	0.540	0.665	0.781

Table 9 indicates that the Post-Development peak flows will be below the allowable peak flows, therefore, no attenuation of this catchment area is required.

Rock check dams acting like overflow weirs are provided through the roadside ditch system to promote infiltration and reduce erosion and peak flows. Refer to the engineering drawings for rock check dam locations.

9. Quality Control

We have set out to achieve the Normal Long-Term Protection (70% TSS removal) for this project.

Due to the site being located in a rural location with large, vegetated lots we will be utilizing a Low Impact Development (LID) treatment train approach through vegetated roadside ditches, rock check dams and natural infiltration through wetland areas for this project, it is estimated the site will meet the 70% Total Suspended Solids (TTS) removal criteria.

Runoff from all of the catchment areas will be conveyed for long distances (i.e. more than 500m) passing over rock check dams and are discharged to natural drainage channels located throughout the property.

The vegetation and rock check dams in the ditches slow the runoff to allow sedimentation, filtration through the soil, evapotranspiration, and infiltration into the underlying native soils. Also, approximately 0.97ha of natural wetlands throughout the property provide additional significant quality control for all runoff for the area through natural infiltration and plant uptake.

10. Construction Erosion and Sediment Control

During construction, silt and sediment shall be prevented from entering the existing drainage channels, wetlands and adjacent properties by the use of silt fences along the perimeter of the site. At the construction access points to the site, a mud mat, constructed of crusher run material, will be required to prevent silt from being carried or washed onto adjacent roadways. Straw bale check dams will be placed along nature drainage paths throughout the proposed development. Sediment and Erosion Control measures will be removed once construction is complete, and vegetation has stabilized.

The Contractor shall also develop and implement an erosion and sediment control plan to avoid the introduction of sediment into any waterbody during all phases of the work, undertaking or activity.

- Conduct all in-water works, undertakings or activities in isolation of open or flowing water to reduce the introduction of sediment into the watercourse.
- Use the code of practice for temporary cofferdams and diversion channels.
- Schedule work to avoid wet, windy, and rainy periods (and heed weather advisories) that may result in high flow volumes and/ or increase erosion and sedimentation.
- Monitor the watercourse to observe signs of sedimentation during all phases of the work, undertaking or activity and take corrective action.
- Develop and implement a response plan to avoid a spill of deleterious substances.

To avoid and mitigate the potential for prohibited effects to fish and fish habitat, the following measures listed below should also be implemented:

- Plan in-water works, undertakings and activities to respect timing windows to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed and migrate.
- In-water work is only permitted between July 16 and September 30.

- Capture, relocate and monitor for fish trapped within isolated, enclosed, or dewatered areas.
- Dewater gradually to reduce the potential for stranding fish.
- Screen intake pipes to prevent entrainment or impingement of fish.
- Use the code of practice for water intake screens.
- Limit impacts on riparian vegetation to those approved for the work, undertaking or activity.
- Limit access to banks or areas adjacent to waterbodies.
- Construct access points and approaches perpendicular to the watercourse or waterbody.
- Re-vegetate the disturbed area with native species suitable for the site.
- Restore stream geomorphology (i.e., restore the bed and banks, gradient and contour of the waterbody) to its initial state.

It is also the Contractors *Duty to Notify* DFO if they have caused, or are about to cause, the death of fish by means other than fishing and/or the harmful alteration, disruption, or destruction of fish habitat. Such notifications should be directed to FisheriesProtection@dfo-mpo.gc.ca or 1-855-852-8320.

11. Conclusion

This stormwater management report provides a strategy for meeting stormwater quantity control objectives for run-off from the subject site, as well as outlining the required quality control measures.

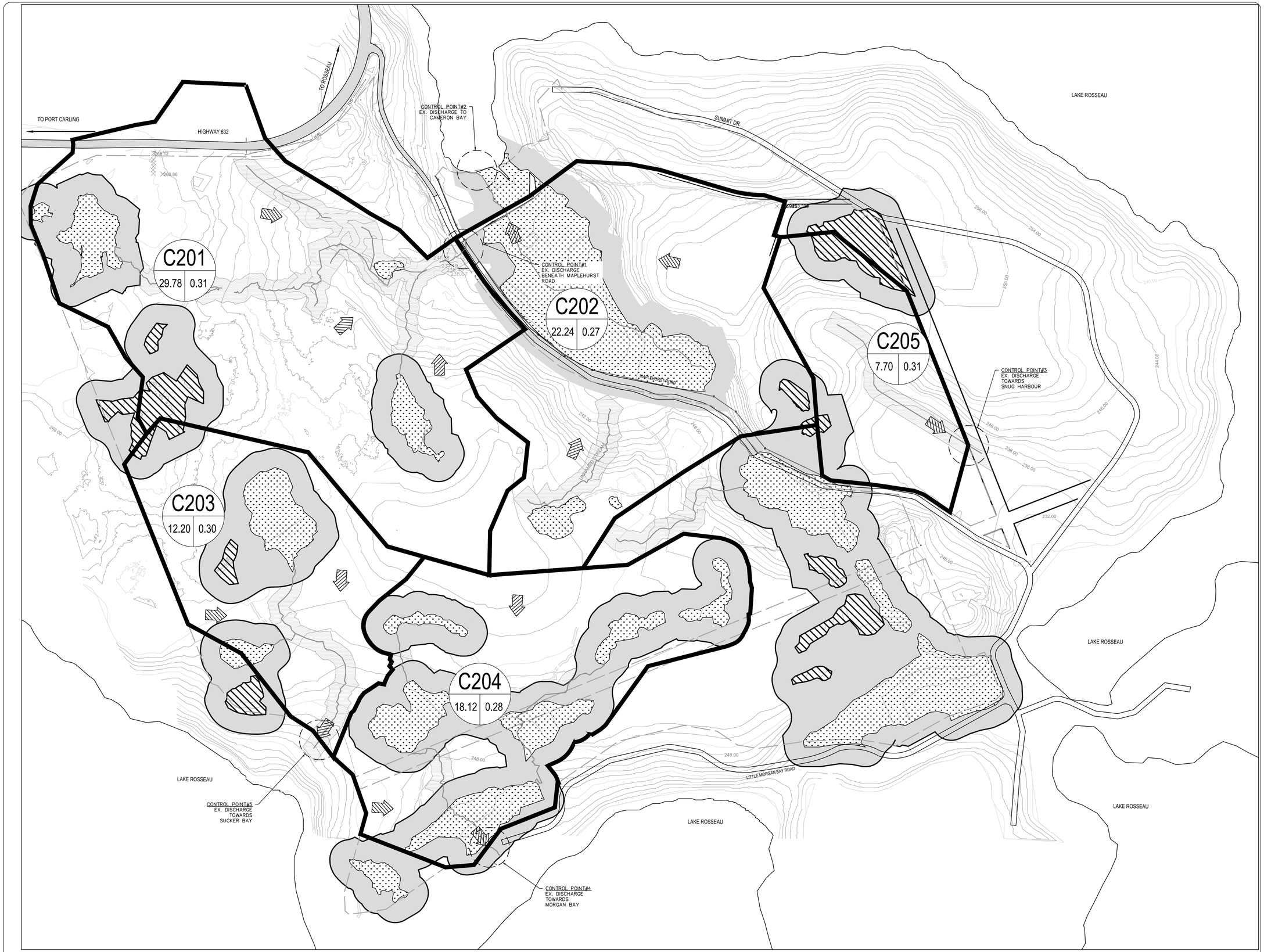
EXP SERVICES INC.

Prepared by:
Calvin Caldwell, P.Eng.
Manager

Reviewed by:
Les Ranta, P.Eng.
Civil Engineer

APPENDIX A

PRE-DEVELOPMENT STORMWATER MANAGEMENT PLAN



EXP Services Inc.
Infrastructure Services - North Bay
757 Main St. East
North Bay, Ontario, Canada
P1B 1C2
Ph. 705 474 2720
Fax 705 474 8515

www.exp.com

• BUILDINGS • EARTH & ENVIRONMENT • ENERGY •
• INDUSTRIAL • INFRASTRUCTURE • SUSTAINABILITY •

GENERAL NOTES:
1. ALL DIMENSIONS ARE IN METERS (m) UNLESS NOTED OTHERWISE.
2. CONTRACTOR TO VERIFY LOCATION AND SIZE OF ALL ABOVE AND BELOW GROUND UTILITIES AND SERVICES PRIOR TO CONSTRUCTION. UTILITIES SHOWN ON THESE DRAWINGS ARE APPROXIMATE ONLY. CONTRACTOR TO INFORM ENGINEER OF ANY DISCREPANCY.

No.	Revision	By:	Date
2	ISSUED FOR FINAL REPORT	BM	AUG. 2, 2023
1	ISSUED FOR REVIEW	CLC	APRIL 4, 2023

Professional Seal

LICENSED PROFESSIONAL ENGINEER
L. J. RANTA
Aug. 3, 2023
PROVINCE OF ONTARIO

Drawn By:	CLC	Scale:	1:2500 (ARCH D)
Checked By:	CLC	Date:	AUGUST 02, 2023
Approved By:	CLC	Date:	AUGUST 02, 2023

Date Printed: February 24, 2023

File Name: Base 9951 Storm Catchment Areas AUGUST 02, 2023

Project Title

ROSSEAU SPRINGS SUBDIVISION

ROSSEAU, ONTARIO

Dwg. Title

PRE-DEVELOPMENT STORMWATER MANAGEMENT PLAN

Project No. NON-21019951

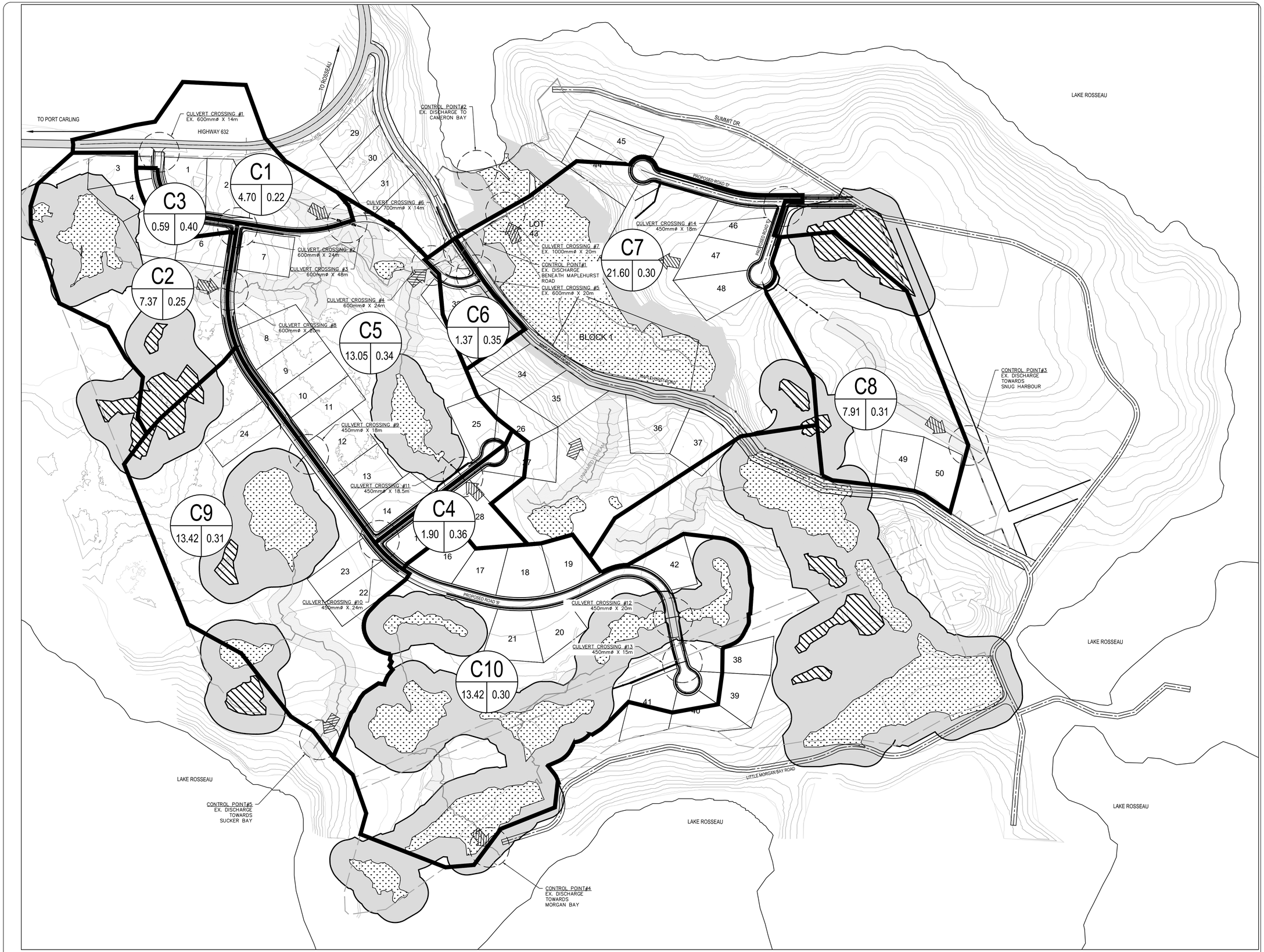
Dwg. No. SWM-1

Rev. No. 2

E:\NTB\NON-21019951-A\60 Execution\65 Drawings

APPENDIX B

POST-DEVELOPMENT STORMWATER MANAGEMENT PLAN



EXP Services Inc.
Infrastructure Services - North Bay
757 Main St. East
North Bay, Ontario, Canada
P1B 1C2
Ph. 705 474 2720
Fax 705 474 8515

www.exp.com

• BUILDINGS • EARTH & ENVIRONMENT • ENERGY •
• INDUSTRIAL • INFRASTRUCTURE • SUSTAINABILITY •

GENERAL NOTES:
1. ALL DIMENSIONS ARE IN METERS (m) UNLESS NOTED OTHERWISE.
2. CONTRACTOR TO VERIFY LOCATION AND SIZE OF ALL ABOVE AND BELOW GROUND UTILITIES AND SERVICES PRIOR TO CONSTRUCTION. UTILITIES SHOWN ON THESE DRAWINGS ARE APPROXIMATE ONLY. CONTRACTOR TO INFORM ENGINEER OF ANY DISCREPANCY.

No.	Revision	By:	Date
2	ISSUED FOR FINAL REPORT	BM	AUG. 2, 2023
1	ISSUED FOR REVIEW	CLC	APRIL 4, 2023

Professional Seal

LICENSED PROFESSIONAL ENGINEER
L. J. RANTA
Aug. 3, 2023
PROVINCE OF ONTARIO

Drawn By:	CLC	Scale:	1:2500 (ARCH D)
Checked By:	CLC	Date:	AUGUST 02, 2023
Approved By:	CLC	Date:	AUGUST 02, 2023

Date Printed: February 24, 2023

File Name: Base 9951 Storm Catchment Areas AUGUST 02, 2023

Project Title

ROSSEAU SPRINGS SUBDIVISION

ROSSEAU, ONTARIO

Dwg. Title

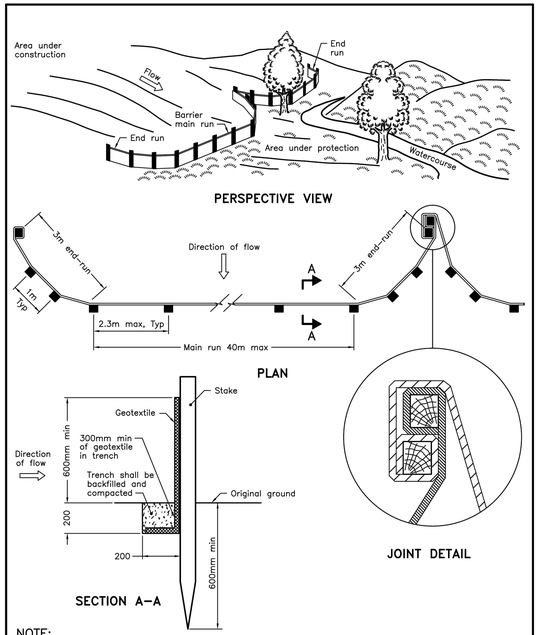
POST-DEVELOPMENT STORMWATER MANAGEMENT PLAN

Project No. NON-21019951

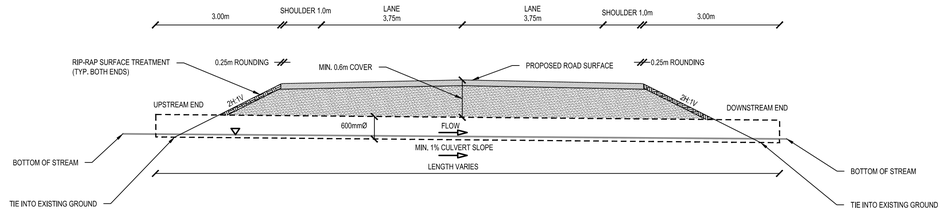
Dwg. No. SWM-2

Rev. No. 2

E:\NTB\NON-21019951-A\60 Execution\65 Drawings

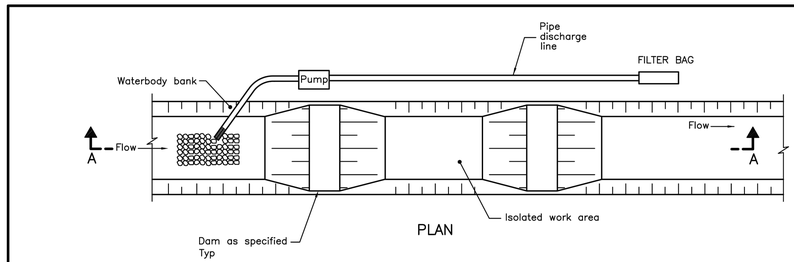


ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2021	Rev	3
LIGHT–DUTY SILT FENCE BARRIER			
	OPSD 219.110		



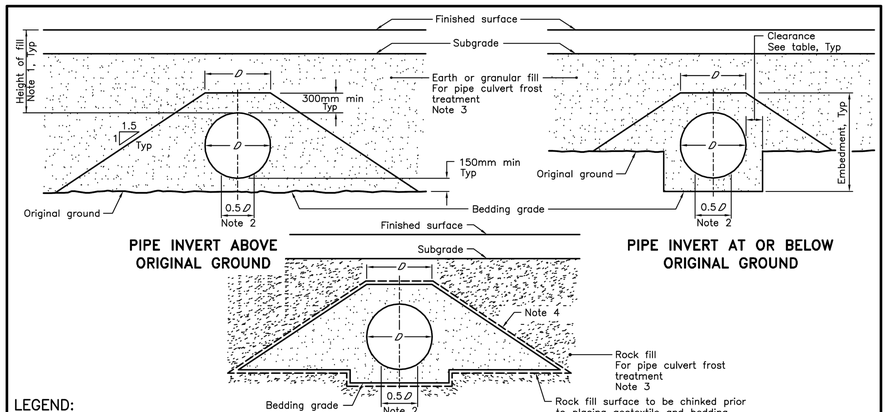
3 SWM-3 CULVERT PROFILE (TYP.)

SCALE : N.T.S.



NOTE:
A Schematic only.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2021	Rev	1
TEMPORARY FLOW PASSAGE SYSTEM PUMPING AND PIPING			
	OPSD 221.020		



LEGEND:
Ø – Inside diameter

NOTES:
1 Height of fill is measured from the finished surface to top of pipe.
2 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
3 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
4 Embedment material shall be wrapped in non–woven geotextile when specified.

CLEARANCE TABLE	
Pipe Inside Diameter mm	Clearance mm
900 or less	300
Over 900	500

A Granular material placed in the haunch area shall be compacted prior to placing and compacting the remainder of the embedment material.
B All dimensions are in metres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev	3
FLEXIBLE PIPE EMBEDMENT IN EMBANKMENT ORIGINAL GROUND: EARTH OR ROCK			
	OPSD 802.014		

EXP Services Inc.
Infrastructure Services - North Bay
757 Main St. East
North Bay, Ontario, Canada
P1B 1C2
Ph. 705 474 2720
Fax 705 474 5515
www.exp.com

• BUILDINGS • EARTH & ENVIRONMENT • ENERGY •
• INDUSTRIAL • INFRASTRUCTURE • SUSTAINABILITY •

GENERAL NOTES:
1. ALL DIMENSIONS ARE IN METERS (m) UNLESS NOTED OTHERWISE.
2. CONTRACTOR TO VERIFY LOCATION AND SIZE OF ALL ABOVE AND BELOW GROUND UTILITIES AND SERVICES PRIOR TO CONSTRUCTION. UTILITIES SHOWN ON THESE DRAWINGS ARE APPROXIMATE ONLY. CONTRACTOR TO INFORM ENGINEER OF ANY DISCREPANCY.

LEGEND

- EX. ASPHALT ROADWAY
- WETLAND
- ROCK BARREN
- 30m BUFFER AREA
- 15m STREAM SETBACK
- STREAM
- EX. TRAIL
- SITE PROPERTY LINE
- LOT PROPERTY LINE
- PROPOSED ROADWAY CENTRELINE
- PROPOSED EDGE OF ROADWAY
- PROPOSED STORM DITCH
- PROPOSED ROAD ALLOWANCE
- TEST PIT LOCATION
- 225.52 / ×225.67 — PROPOSED ELEVATION / EXISTING ELEVATION
- DOR — DEPTH OF REFUSAL
- DAYLIGHT TO EXISTING GROUND SURFACE
- STM — STM — PROPOSED STORM CULVERT
- PROPOSED GRANULAR B TYPE II SUBBASE
- PROPOSED GRANULAR 'A' BASE
- PROPOSED ROCK SHATTER

No.	Revision	By:	Date
2	ISSUED FOR FINAL REPORT	BM	AUG. 2, 2023
1	ISSUED FOR REVIEW	CLC	APRIL 4, 2023

Professional Seal: LICENSED PROFESSIONAL ENGINEER — L. J. RANTA — Aug. 3, 2023 — PROVINCE OF ONTARIO

Drawn By:	CLC	Scale:	1:250 (ANSI D)
Checked By:	CLC	Date:	AUGUST 02, 2023
Approved By:	CLC	Date:	AUGUST 02, 2023

Date Printed: February 24, 2023

File Name: Base 9951 Storm Catchment Areas AUGUST 02, 2023

Project Title

ROSSEAU SPRINGS SUBDIVISION

ROSSEAU, ONTARIO

Dwg. Title

SECTIONS AND DETAILS

Project No. NON-21019951

Dwg. No. SWM-3

Rev. No. 2

E:\NTB\NON-21019951-A\060 Execution\65 Drawings

APPENDIX C

MODELING DATA

Active coordinate

45° 14' 45" N, 79° 39' 45" W (45.245833,-79.662500)

Retrieved: Fri, 24 Mar 2023 17:27:16 GMT

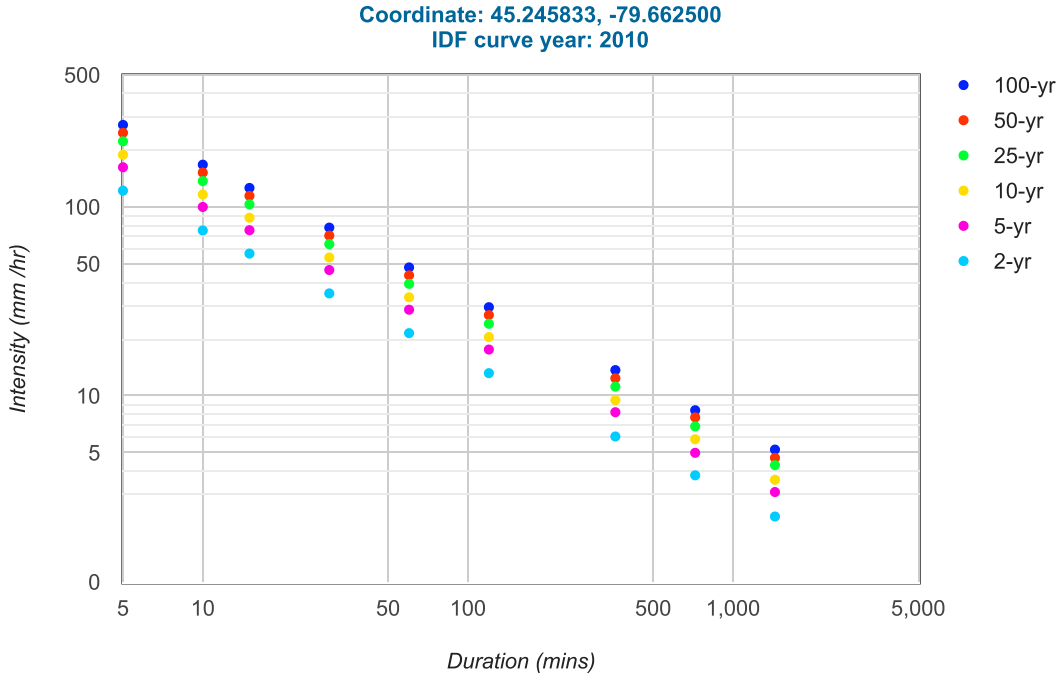
Location summary

These are the locations in the selection.

IDF Curve: 45° 14' 45" N, 79° 39' 45" W (45.245833,-79.662500)

Results

An IDF curve was found.



Coefficient summary

IDF Curve: 45° 14' 45" N, 79° 39' 45" W (45.245833,-79.662500)

Retrieved: Fri, 24 Mar 2023 17:27:16 GMT

Data year: 2010
IDF curve year: 2010

Return period	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
A	21.5	28.6	33.3	39.2	43.5	47.9
B	-0.699	-0.699	-0.699	-0.699	-0.699	-0.699

Statistics

Rainfall intensity (mm hr^{-1})

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	122.1	75.2	56.7	34.9	21.5	13.2	6.1	3.8	2.3
5-yr	162.4	100.1	75.4	46.4	28.6	17.6	8.2	5.0	3.1
10-yr	189.1	116.5	87.8	54.1	33.3	20.5	9.5	5.9	3.6
25-yr	222.7	137.2	103.3	63.6	39.2	24.1	11.2	6.9	4.3
50-yr	247.1	152.2	114.6	70.6	43.5	26.8	12.4	7.7	4.7
100-yr	272.1	167.6	126.2	77.8	47.9	29.5	13.7	8.4	5.2

Rainfall depth (mm)

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	10.2	12.5	14.2	17.5	21.5	26.5	36.9	45.4	56.0
5-yr	13.5	16.7	18.8	23.2	28.6	35.2	49.0	60.4	74.4
10-yr	15.8	19.4	21.9	27.0	33.3	41.0	57.1	70.4	86.7
25-yr	18.6	22.9	25.8	31.8	39.2	48.3	67.2	82.8	102.0
50-yr	20.6	25.4	28.7	35.3	43.5	53.6	74.6	91.9	113.2
100-yr	22.7	27.9	31.6	38.9	47.9	59.0	82.1	101.2	124.7

Terms of Use

APPENDIX D

OTTHYMO OUTPUTS

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


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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Civica Infrastructure
Copyright 2007 - 2013 Civica Infrastructure
All rights reserved.


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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\caldwellc\AppData\Local\Civica\VH5\7454d970-b6c3-4fed-b50a-2bf2b820f422\508
441a9-2dd4-49c8-a13b-533855bf9013\sc
  Summary filename:
C:\Users\caldwellc\AppData\Local\Civica\VH5\7454d970-b6c3-4fed-b50a-2bf2b820f422\508
441a9-2dd4-49c8-a13b-533855bf9013\sc


DATE: 03/31/2023                           TIME: 03:13:23

USER:


COMMENTS: _____________________________________________________________


  ****************************
  ** SIMULATION NUMBER:   0 **
  ****************************

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

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

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


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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Civica Infrastructure
Copyright 2007 - 2013 Civica Infrastructure
All rights reserved.


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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\caldwellc\AppData\Local\Civica\VH5\7454d970-b6c3-4fed-b50a-2bf2b820f422\e20
2eb57-3a80-4f30-998c-4a5afc253b59\sc
  Summary filename:
C:\Users\caldwellc\AppData\Local\Civica\VH5\7454d970-b6c3-4fed-b50a-2bf2b820f422\e20
2eb57-3a80-4f30-998c-4a5afc253b59\sc


DATE: 03/31/2023                           TIME: 03:13:24

USER:


COMMENTS: _____________________________________________________________


  ****************************
  ** SIMULATION NUMBER:   0 **
  ****************************

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

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

```
    [ Ptot= 70.80 mm ]
    fname :
C:\Users\caldwellc\AppData\Local\Temp\2661bc1b-32ea-49d9-9c0d-5be42d68cb50\1e9fed80-
c696-4976-9d90-a
    remark: created from IDF Group New IDFGroup on 2023-03-16

*
 ** CALIB NASHYD         0203  1  2.0   12.90    0.40  6.53  16.57 0.23   0.000
    [CN=58.9         ]
    [ N = 3.0:Tp 0.36]
*
 ** CALIB NASHYD         0204  1  2.0   18.12    0.55  6.53  15.94 0.23   0.000
    [CN=57.9         ]
    [ N = 3.0:Tp 0.36]
*
 ** CALIB NASHYD         0201  1  2.0   29.78    0.88  6.57  16.77 0.24   0.000
    [CN=59.4         ]
    [ N = 3.0:Tp 0.40]
*
    PIPE   [ 2:  0201]   0002  1  2.0   29.78    0.88  6.60  16.77  n/a   0.000
*
 ** CALIB NASHYD         0202  1  2.0   22.24    0.66  6.57  16.48 0.23   0.000
    [CN=58.9         ]
    [ N = 3.0:Tp 0.39]
*
    ADD [  0002+  0202]  0008  3  2.0   52.02    1.53  6.57  16.65  n/a   0.000
*
    PIPE   [ 2:  0008]   0006  1  2.0   52.02    1.53  6.60  16.65  n/a   0.000
*
 ** CALIB NASHYD         0205  1  2.0    7.70    0.27  6.47  16.62 0.23   0.000
    [CN=59.1         ]
    [ N = 3.0:Tp 0.31]
*
 FINISH

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

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


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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Civica Infrastructure
Copyright 2007 - 2013 Civica Infrastructure
All rights reserved.


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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\caldwellc\AppData\Local\Civica\VH5\7454d970-b6c3-4fed-b50a-2bf2b820f422\db4
34bab-d527-41f8-8a9c-e3dbb732b6f9\sc
  Summary filename:
C:\Users\caldwellc\AppData\Local\Civica\VH5\7454d970-b6c3-4fed-b50a-2bf2b820f422\db4
34bab-d527-41f8-8a9c-e3dbb732b6f9\sc


DATE: 03/31/2023                           TIME: 03:13:24

USER:


COMMENTS: _____________________________________________________________


  ****************************
  ** SIMULATION NUMBER:   0 **
  ****************************

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

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

```
    [ Ptot= 82.80 mm ]
    fname :
C:\Users\caldwellc\AppData\Local\Temp\2661bc1b-32ea-49d9-9c0d-5be42d68cb50\1e4a82ec-
3271-4d5e-b305-9
    remark: created from IDF Group New IDFGroup on 2023-03-16

*
 ** CALIB NASHYD         0203  1  2.0   12.90    0.55  6.53  22.35 0.27   0.000
    [CN=58.9         ]
    [ N = 3.0:Tp 0.36]
*
 ** CALIB NASHYD         0204  1  2.0   18.12    0.74  6.53  21.56 0.26   0.000
    [CN=57.9         ]
    [ N = 3.0:Tp 0.36]
*
 ** CALIB NASHYD         0201  1  2.0   29.78    1.20  6.57  22.63 0.27   0.000
    [CN=59.4         ]
    [ N = 3.0:Tp 0.40]
*
    PIPE   [ 2:  0201]   0002  1  2.0   29.78    1.19  6.60  22.63  n/a   0.000
*
 ** CALIB NASHYD         0202  1  2.0   22.24    0.89  6.57  22.25 0.27   0.000
    [CN=58.9         ]
    [ N = 3.0:Tp 0.39]
*
    ADD [  0002+  0202]  0008  3  2.0   52.02    2.09  6.57  22.46  n/a   0.000
*
    PIPE   [ 2:  0008]   0006  1  2.0   52.02    2.08  6.60  22.46  n/a   0.000
*
 ** CALIB NASHYD         0205  1  2.0    7.70    0.37  6.47  22.43 0.27   0.000
    [CN=59.1         ]
    [ N = 3.0:Tp 0.31]
*
```

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


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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Civica Infrastructure
Copyright 2007 - 2013 Civica Infrastructure
All rights reserved.


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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\caldwellc\AppData\Local\Civica\VH5\7454d970-b6c3-4fed-b50a-2bf2b820f422\06a
72c08-8b79-4391-be07-5d027960fa97\sc
  Summary filename:
C:\Users\caldwellc\AppData\Local\Civica\VH5\7454d970-b6c3-4fed-b50a-2bf2b820f422\06a
72c08-8b79-4391-be07-5d027960fa97\sc


DATE: 03/31/2023                          TIME: 03:13:23

USER:


COMMENTS: _____________________________________________________________


  ****************************
  ** SIMULATION NUMBER:   0 **
  ****************************

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

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

```
    [ Ptot= 92.40 mm ]
    fname :
C:\Users\caldwellc\AppData\Local\Temp\2661bc1b-32ea-49d9-9c0d-5be42d68cb50\502bd314-
1b9f-4beb-aee5-6
    remark: created from IDF Group New IDFGroup on 2023-03-16

*
 ** CALIB NASHYD         0203  1  2.0   12.90    0.68  6.50  27.39 0.30   0.000
    [CN=58.9         ]
    [ N = 3.0:Tp 0.36]
*
 ** CALIB NASHYD         0204  1  2.0   18.12    0.92  6.50  26.47 0.29   0.000
    [CN=57.9         ]
    [ N = 3.0:Tp 0.36]
*
 ** CALIB NASHYD         0201  1  2.0   29.78    1.48  6.57  27.72 0.30   0.000
    [CN=59.4         ]
    [ N = 3.0:Tp 0.40]
*
    PIPE   [ 2:  0201]   0002  1  2.0   29.78    1.47  6.60  27.72  n/a   0.000
*
 ** CALIB NASHYD         0202  1  2.0   22.24    1.10  6.57  27.28 0.30   0.000
    [CN=58.9         ]
    [ N = 3.0:Tp 0.39]
*
    ADD [  0002+  0202]  0008  3  2.0   52.02    2.57  6.57  27.53  n/a   0.000
*
    PIPE   [ 2:  0008]   0006  1  2.0   52.02    2.57  6.60  27.53  n/a   0.000
*
 ** CALIB NASHYD         0205  1  2.0    7.70    0.45  6.47  27.49 0.30   0.000
    [CN=59.1         ]
    [ N = 3.0:Tp 0.31]
*
```

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


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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Civica Infrastructure
Copyright 2007 - 2013 Civica Infrastructure
All rights reserved.


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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\caldwellc\AppData\Local\Civica\VH5\7454d970-b6c3-4fed-b50a-2bf2b820f422\b26
51e9b-a270-4cab-bd10-9dc7926b3868\sc
  Summary filename:
C:\Users\caldwellc\AppData\Local\Civica\VH5\7454d970-b6c3-4fed-b50a-2bf2b820f422\b26
51e9b-a270-4cab-bd10-9dc7926b3868\sc


DATE: 03/31/2023                          TIME: 03:13:23

USER:


COMMENTS: _____________________________________________________________


  ****************************
  ** SIMULATION NUMBER:   0 **
  ****************************

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

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

```
    [ Ptot=100.80 mm ]
    fname :
C:\Users\caldwellc\AppData\Local\Temp\2661bc1b-32ea-49d9-9c0d-5be42d68cb50\35cb9924-
3f80-4362-a457-6
    remark: created from IDF Group New IDFGroup on 2023-03-16

*
 ** CALIB NASHYD         0203  1  2.0   12.90    0.80  6.50  32.06 0.32   0.000
    [CN=58.9         ]
    [ N = 3.0:Tp 0.36]
*
 ** CALIB NASHYD         0204  1  2.0   18.12    1.08  6.50  31.03 0.31   0.000
    [CN=57.9         ]
    [ N = 3.0:Tp 0.36]
*
 ** CALIB NASHYD         0201  1  2.0   29.78    1.74  6.57  32.44 0.32   0.000
    [CN=59.4         ]
    [ N = 3.0:Tp 0.40]
*
    PIPE   [ 2:  0201]   0002  1  2.0   29.78    1.73  6.60  32.44  n/a   0.000
*
 ** CALIB NASHYD         0202  1  2.0   22.24    1.30  6.53  31.95 0.32   0.000
    [CN=58.9         ]
    [ N = 3.0:Tp 0.39]
*
    ADD [  0002+  0202]  0008  3  2.0   52.02    3.03  6.57  32.23  n/a   0.000
*
    PIPE   [ 2:  0008]   0006  1  2.0   52.02    3.02  6.60  32.23  n/a   0.000
*
 ** CALIB NASHYD         0205  1  2.0    7.70    0.53  6.47  32.18 0.32   0.000
    [CN=59.1         ]
    [ N = 3.0:Tp 0.31]
*
```

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


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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Civica Infrastructure
Copyright 2007 - 2013 Civica Infrastructure
All rights reserved.


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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\caldwellc\AppData\Local\Civica\VH5\7454d970-b6c3-4fed-b50a-2bf2b820f422\b24
428a8-2fc5-4727-b2ee-6a2e825a853d\sc
  Summary filename:
C:\Users\caldwellc\AppData\Local\Civica\VH5\7454d970-b6c3-4fed-b50a-2bf2b820f422\b24
428a8-2fc5-4727-b2ee-6a2e825a853d\sc


DATE: 03/31/2023                           TIME: 03:23:36

USER:


COMMENTS: _____________________________________________________________


  ****************************
  ** SIMULATION NUMBER:   0 **
  ****************************

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

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

```
    [ Ptot= 60.00 mm ]
    fname :
C:\Users\caldwellc\AppData\Local\Temp\69ac6efe-95aa-406f-90a0-27cee1a290da\a6e69119-
fa45-444b-83b1-1
    remark: created from IDF Group New IDFGroup on 2023-03-16

*
 ** CALIB NASHYD         0003  1  2.0    0.59    0.03  6.37  17.13 0.29   0.000
    [CN=68.9         ]
    [ N = 3.0:Tp 0.21]
*
    PIPE   [ 2:  0003]   0101  1  2.0    0.59    0.03  6.40  17.13  n/a   0.000
*
 ** CALIB NASHYD         0001  1  2.0    4.70    0.09  6.57  10.92 0.18   0.000
    [CN=58.0         ]
    [ N = 3.0:Tp 0.39]
*
    ADD [  0001+  0101]  0023  3  2.0    5.29    0.11  6.50  11.61  n/a   0.000
*
    PIPE   [ 2:  0023]   0100  1  2.0    5.29    0.11  6.57  11.61  n/a   0.000
*
 ** CALIB NASHYD         0002  1  2.0    7.37    0.13  6.63  11.15 0.19   0.000
    [CN=58.0         ]
    [ N = 3.0:Tp 0.44]
*
    PIPE   [ 2:  0002]   0102  1  2.0    7.37    0.13  6.63  11.15  n/a   0.000
*
 ** CALIB NASHYD         0005  1  2.0   50.00    1.31  6.50  13.32 0.22   0.000
    [CN=62.2         ]
    [ N = 3.0:Tp 0.34]
*
 ** CALIB NASHYD         0004  1  2.0    1.90    0.06  6.50  15.42 0.26   0.000
    [CN=66.5         ]
    [ N = 3.0:Tp 0.33]
*
    PIPE   [ 2:  0004]   0103  1  2.0    1.90    0.06  6.53  15.42  n/a   0.000
*
    ADD [  0103+  0005]  0013  3  2.0   51.90    1.37  6.50  13.40  n/a   0.000
*
    ADD [  0100+  0102]  0012  3  2.0   12.66    0.24  6.60  11.34  n/a   0.000
*
    ADD [  0012+  0013]  0012  1  2.0   64.56    1.60  6.50  13.00  n/a   0.000
*
    PIPE   [ 2:  0012]   0099  1  2.0   64.56    1.60  6.53  13.00  n/a   0.000
*
 ** CALIB NASHYD         0006  1  2.0    1.06    0.04  6.37  15.28 0.25   0.000
    [CN=66.0         ]
    [ N = 3.0:Tp 0.21]
*
    ADD [  0006+  0099]  0015  3  2.0   65.62    1.63  6.53  13.03  n/a   0.000
```

```
*
    PIPE   [ 2:  0015]   0016  1  2.0   65.62    1.63  6.57  13.03  n/a   0.000
*
 ** CALIB NASHYD         0007  1  2.0   21.60    0.43  6.60  12.18 0.20   0.000
    [CN=59.7         ]
    [ N = 3.0:Tp 0.43]
*
    ADD [  0016+  0007]  0019  3  2.0   87.22    2.06  6.57  12.82  n/a   0.000
*
    PIPE   [ 2:  0019]   0018  1  2.0   87.22    2.05  6.60  12.82  n/a   0.000
*
 ** CALIB NASHYD         0008  1  2.0    7.70    0.19  6.47  12.22 0.20   0.000
    [CN=59.7         ]
    [ N = 3.0:Tp 0.32]
*
 ** CALIB NASHYD         0009  1  2.0   13.42    0.28  6.60  12.30 0.21   0.000
    [CN=59.9         ]
    [ N = 3.0:Tp 0.41]
*
 ** CALIB NASHYD         0010  1  2.0   20.20    0.38  6.70  12.38 0.21   0.000
    [CN=60.2         ]
    [ N = 3.0:Tp 0.49]
*
```

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


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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Civica Infrastructure
Copyright 2007 - 2013 Civica Infrastructure
All rights reserved.


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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\caldwellc\AppData\Local\Civica\VH5\7454d970-b6c3-4fed-b50a-2bf2b820f422\1b8
17fab-6565-45c9-9865-8ea394061f75\sc
  Summary filename:
C:\Users\caldwellc\AppData\Local\Civica\VH5\7454d970-b6c3-4fed-b50a-2bf2b820f422\1b8
17fab-6565-45c9-9865-8ea394061f75\sc


DATE: 03/31/2023                           TIME: 03:23:36

USER:


COMMENTS: _____________________________________________________________


  ****************************
  ** SIMULATION NUMBER:   0 **
  ****************************

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

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

```
    [ Ptot= 45.60 mm ]
    fname :
C:\Users\caldwellc\AppData\Local\Temp\69ac6efe-95aa-406f-90a0-27cee1a290da\ba47c0c9-
4f0e-4766-88eb-7
    remark: created from IDF Group New IDFGroup on 2023-03-16

*
 ** CALIB NASHYD         0003  1  2.0    0.59    0.02  6.37  10.03 0.22   0.000
    [CN=68.9         ]
    [ N = 3.0:Tp 0.21]
*
    PIPE   [ 2:  0003]   0101  1  2.0    0.59    0.01  6.43  10.03  n/a   0.000
*
 ** CALIB NASHYD         0001  1  2.0    4.70    0.05  6.60   5.95 0.13   0.000
    [CN=58.0         ]
    [ N = 3.0:Tp 0.39]
*
    ADD [  0001+  0101]  0023  3  2.0    5.29    0.06  6.53   6.41  n/a   0.000
*
    PIPE   [ 2:  0023]   0100  1  2.0    5.29    0.06  6.57   6.41  n/a   0.000
*
 ** CALIB NASHYD         0002  1  2.0    7.37    0.07  6.67   6.14 0.13   0.000
    [CN=58.0         ]
    [ N = 3.0:Tp 0.44]
*
    PIPE   [ 2:  0002]   0102  1  2.0    7.37    0.07  6.67   6.14  n/a   0.000
*
 ** CALIB NASHYD         0005  1  2.0   50.00    0.72  6.50   7.54 0.17   0.000
    [CN=62.2         ]
    [ N = 3.0:Tp 0.34]
*
 ** CALIB NASHYD         0004  1  2.0    1.90    0.03  6.50   8.86 0.19   0.000
    [CN=66.5         ]
    [ N = 3.0:Tp 0.33]
*
    PIPE   [ 2:  0004]   0103  1  2.0    1.90    0.03  6.57   8.86  n/a   0.000
*
    ADD [  0103+  0005]  0013  3  2.0   51.90    0.75  6.50   7.59  n/a   0.000
*
    ADD [  0100+  0102]  0012  3  2.0   12.66    0.13  6.63   6.25  n/a   0.000
*
    ADD [  0012+  0013]  0012  1  2.0   64.56    0.88  6.53   7.33  n/a   0.000
*
    PIPE   [ 2:  0012]   0099  1  2.0   64.56    0.87  6.57   7.33  n/a   0.000
*
 ** CALIB NASHYD         0006  1  2.0    1.06    0.03  6.37   8.79 0.19   0.000
    [CN=66.0         ]
    [ N = 3.0:Tp 0.21]
*
    ADD [  0006+  0099]  0015  3  2.0   65.62    0.89  6.53   7.35  n/a   0.000
```

```
*
    PIPE   [ 2:  0015]   0016  1  2.0   65.62    0.89  6.57   7.35  n/a   0.000
*
 ** CALIB NASHYD         0007  1  2.0   21.60    0.24  6.63   6.83 0.15   0.000
    [CN=59.7         ]
    [ N = 3.0:Tp 0.43]
*
    ADD [  0016+  0007]  0019  3  2.0   87.22    1.12  6.57   7.22  n/a   0.000
*
    PIPE   [ 2:  0019]   0018  1  2.0   87.22    1.12  6.60   7.22  n/a   0.000
*
 ** CALIB NASHYD         0008  1  2.0    7.70    0.10  6.50   6.86 0.15   0.000
    [CN=59.7         ]
    [ N = 3.0:Tp 0.32]
*
 ** CALIB NASHYD         0009  1  2.0   13.42    0.15  6.60   6.91 0.15   0.000
    [CN=59.9         ]
    [ N = 3.0:Tp 0.41]
*
 ** CALIB NASHYD         0010  1  2.0   20.20    0.21  6.73   6.95 0.15   0.000
    [CN=60.2         ]
    [ N = 3.0:Tp 0.49]
*
```

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


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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Civica Infrastructure
Copyright 2007 - 2013 Civica Infrastructure
All rights reserved.


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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\caldwellc\AppData\Local\Civica\VH5\7454d970-b6c3-4fed-b50a-2bf2b820f422\69a
18049-53dd-47d9-9e70-6a461461c561\sc
  Summary filename:
C:\Users\caldwellc\AppData\Local\Civica\VH5\7454d970-b6c3-4fed-b50a-2bf2b820f422\69a
18049-53dd-47d9-9e70-6a461461c561\sc


DATE: 03/31/2023                           TIME: 03:23:38

USER:


COMMENTS: _____________________________________________________________


  ****************************
  ** SIMULATION NUMBER:   0 **
  ****************************

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

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

```
    [ Ptot= 70.80 mm ]
    fname :
C:\Users\caldwellc\AppData\Local\Temp\69ac6efe-95aa-406f-90a0-27cee1a290da\1e9fed80-
c696-4976-9d90-a
    remark: created from IDF Group New IDFGroup on 2023-03-16

*
 ** CALIB NASHYD         0003  1  2.0    0.59    0.04  6.37  23.22 0.33   0.000
    [CN=68.9         ]
    [ N = 3.0:Tp 0.21]
*
    PIPE   [ 2:  0003]   0101  1  2.0    0.59    0.04  6.40  23.22  n/a   0.000
*
 ** CALIB NASHYD         0001  1  2.0    4.70    0.13  6.57  15.37 0.22   0.000
    [CN=58.0         ]
    [ N = 3.0:Tp 0.39]
*
    ADD [  0001+  0101]  0023  3  2.0    5.29    0.16  6.50  16.24  n/a   0.000
*
    PIPE   [ 2:  0023]   0100  1  2.0    5.29    0.16  6.53  16.24  n/a   0.000
*
 ** CALIB NASHYD         0002  1  2.0    7.37    0.19  6.63  15.63 0.22   0.000
    [CN=58.0         ]
    [ N = 3.0:Tp 0.44]
*
    PIPE   [ 2:  0002]   0102  1  2.0    7.37    0.19  6.63  15.63  n/a   0.000
*
 ** CALIB NASHYD         0005  1  2.0   50.00    1.83  6.50  18.41 0.26   0.000
    [CN=62.2         ]
    [ N = 3.0:Tp 0.34]
*
 ** CALIB NASHYD         0004  1  2.0    1.90    0.08  6.47  21.12 0.30   0.000
    [CN=66.5         ]
    [ N = 3.0:Tp 0.33]
*
    PIPE   [ 2:  0004]   0103  1  2.0    1.90    0.08  6.53  21.11  n/a   0.000
*
    ADD [  0103+  0005]  0013  3  2.0   51.90    1.91  6.50  18.51  n/a   0.000
*
    ADD [  0100+  0102]  0012  3  2.0   12.66    0.34  6.60  15.89  n/a   0.000
*
    ADD [  0012+  0013]  0012  1  2.0   64.56    2.24  6.50  17.99  n/a   0.000
*
    PIPE   [ 2:  0012]   0099  1  2.0   64.56    2.24  6.53  17.99  n/a   0.000
*
 *  CALIB NASHYD         0006  1  2.0    1.06    0.06  6.37  20.91 0.30   0.000
    [CN=66.0         ]
    [ N = 3.0:Tp 0.21]
*
    ADD [  0006+  0099]  0015  3  2.0   65.62    2.28  6.53  18.04  n/a   0.000
```

```
*
    PIPE   [ 2:  0015]   0016  1  2.0   65.62    2.28  6.57  18.04  n/a   0.000
*
 *  CALIB NASHYD         0007  1  2.0   21.60    0.61  6.60  16.93 0.24   0.000
    [CN=59.7         ]
    [ N = 3.0:Tp 0.43]
*
    ADD [  0016+  0007]  0019  3  2.0   87.22    2.88  6.57  17.77  n/a   0.000
*
    PIPE   [ 2:  0019]   0018  1  2.0   87.22    2.87  6.60  17.77  n/a   0.000
*
 *  CALIB NASHYD         0008  1  2.0    7.70    0.27  6.47  16.97 0.24   0.000
    [CN=59.7         ]
    [ N = 3.0:Tp 0.32]
*
 *  CALIB NASHYD         0009  1  2.0   13.42    0.40  6.57  17.08 0.24   0.000
    [CN=59.9         ]
    [ N = 3.0:Tp 0.41]
*
 *  CALIB NASHYD         0010  1  2.0   20.20    0.53  6.70  17.19 0.24   0.000
    [CN=60.2         ]
    [ N = 3.0:Tp 0.49]
*
```

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


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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Civica Infrastructure
Copyright 2007 - 2013 Civica Infrastructure
All rights reserved.


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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\caldwellc\AppData\Local\Civica\VH5\7454d970-b6c3-4fed-b50a-2bf2b820f422\1b3
3d6f7-d80e-4d17-8d8e-eb6bc91e3e4c\sc
  Summary filename:
C:\Users\caldwellc\AppData\Local\Civica\VH5\7454d970-b6c3-4fed-b50a-2bf2b820f422\1b3
3d6f7-d80e-4d17-8d8e-eb6bc91e3e4c\sc


DATE: 03/31/2023                           TIME: 03:23:37

USER:


COMMENTS: _____________________________________________________________


  ****************************
  ** SIMULATION NUMBER:   0 **
  ****************************

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

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

```
    [ Ptot= 82.80 mm ]
    fname :
C:\Users\caldwellc\AppData\Local\Temp\69ac6efe-95aa-406f-90a0-27cee1a290da\1e4a82ec-
3271-4d5e-b305-9
    remark: created from IDF Group New IDFGroup on 2023-03-16

*
 ** CALIB NASHYD         0003  1  2.0    0.59    0.05  6.37  30.61 0.37   0.000
    [CN=68.9         ]
    [ N = 3.0:Tp 0.21]
*
    PIPE   [ 2:  0003]   0101  1  2.0    0.59    0.05  6.40  30.61  n/a   0.000
*
 ** CALIB NASHYD         0001  1  2.0    4.70    0.18  6.57  20.94 0.25   0.000
    [CN=58.0         ]
    [ N = 3.0:Tp 0.39]
*
    ADD [  0001+  0101]  0023  3  2.0    5.29    0.22  6.50  22.02  n/a   0.000
*
    PIPE   [ 2:  0023]   0100  1  2.0    5.29    0.22  6.53  22.02  n/a   0.000
*
 ** CALIB NASHYD         0002  1  2.0    7.37    0.26  6.63  21.23 0.26   0.000
    [CN=58.0         ]
    [ N = 3.0:Tp 0.44]
*
    PIPE   [ 2:  0002]   0102  1  2.0    7.37    0.26  6.63  21.23  n/a   0.000
*
 ** CALIB NASHYD         0005  1  2.0   50.00    2.48  6.50  24.69 0.30   0.000
    [CN=62.2         ]
    [ N = 3.0:Tp 0.34]
*
 ** CALIB NASHYD         0004  1  2.0    1.90    0.11  6.47  28.08 0.34   0.000
    [CN=66.5         ]
    [ N = 3.0:Tp 0.33]
*
    PIPE   [ 2:  0004]   0103  1  2.0    1.90    0.11  6.53  28.07  n/a   0.000
*
    ADD [  0103+  0005]  0013  3  2.0   51.90    2.59  6.50  24.81  n/a   0.000
*
    ADD [  0100+  0102]  0012  3  2.0   12.66    0.47  6.57  21.56  n/a   0.000
*
    ADD [  0012+  0013]  0012  1  2.0   64.56    3.05  6.50  24.17  n/a   0.000
*
    PIPE   [ 2:  0012]   0099  1  2.0   64.56    3.04  6.53  24.17  n/a   0.000
*
 *  CALIB NASHYD         0006  1  2.0    1.06    0.08  6.37  27.80 0.34   0.000
    [CN=66.0         ]
    [ N = 3.0:Tp 0.21]
*
    ADD [  0006+  0099]  0015  3  2.0   65.62    3.10  6.53  24.23  n/a   0.000
```

```
*
    PIPE   [ 2:  0015]   0016  1  2.0   65.62    3.09  6.53  24.23  n/a   0.000
*
 *  CALIB NASHYD         0007  1  2.0   21.60    0.83  6.60  22.82 0.28   0.000
    [CN=59.7         ]
    [ N = 3.0:Tp 0.43]
*
    ADD [  0016+  0007]  0019  3  2.0   87.22    3.92  6.57  23.88  n/a   0.000
*
    PIPE   [ 2:  0019]   0018  1  2.0   87.22    3.90  6.60  23.88  n/a   0.000
*
 *  CALIB NASHYD         0008  1  2.0    7.70    0.37  6.47  22.87 0.28   0.000
    [CN=59.7         ]
    [ N = 3.0:Tp 0.32]
*
 *  CALIB NASHYD         0009  1  2.0   13.42    0.54  6.57  23.01 0.28   0.000
    [CN=59.9         ]
    [ N = 3.0:Tp 0.41]
*
 *  CALIB NASHYD         0010  1  2.0   20.20    0.72  6.67  23.16 0.28   0.000
    [CN=60.2         ]
    [ N = 3.0:Tp 0.49]
*
```

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


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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Civica Infrastructure
Copyright 2007 - 2013 Civica Infrastructure
All rights reserved.


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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\caldwellc\AppData\Local\Civica\VH5\7454d970-b6c3-4fed-b50a-2bf2b820f422\1f7
bb42d-ee54-4e9a-a9e8-c5c9f72f5160\sc
  Summary filename:
C:\Users\caldwellc\AppData\Local\Civica\VH5\7454d970-b6c3-4fed-b50a-2bf2b820f422\1f7
bb42d-ee54-4e9a-a9e8-c5c9f72f5160\sc


DATE: 03/31/2023                           TIME: 03:23:38

USER:


COMMENTS: _____________________________________________________________


  ****************************
  ** SIMULATION NUMBER:   0 **
  ****************************

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

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

```
    [ Ptot= 92.40 mm ]
    fname :
C:\Users\caldwellc\AppData\Local\Temp\69ac6efe-95aa-406f-90a0-27cee1a290da\502bd314-
1b9f-4beb-aee5-6
    remark: created from IDF Group New IDFGroup on 2023-03-16

*
 ** CALIB NASHYD         0003  1  2.0    0.59    0.06  6.37  36.93 0.40   0.000
    [CN=68.9         ]
    [ N = 3.0:Tp 0.21]
*
    PIPE   [ 2:  0003]   0101  1  2.0    0.59    0.06  6.40  36.92  n/a   0.000
*
 ** CALIB NASHYD         0001  1  2.0    4.70    0.22  6.57  25.81 0.28   0.000
    [CN=58.0         ]
    [ N = 3.0:Tp 0.39]
*
    ADD [  0001+  0101]  0023  3  2.0    5.29    0.27  6.50  27.05  n/a   0.000
*
    PIPE   [ 2:  0023]   0100  1  2.0    5.29    0.27  6.53  27.05  n/a   0.000
*
 ** CALIB NASHYD         0002  1  2.0    7.37    0.32  6.60  26.12 0.28   0.000
    [CN=58.0         ]
    [ N = 3.0:Tp 0.44]
*
    PIPE   [ 2:  0002]   0102  1  2.0    7.37    0.32  6.63  26.12  n/a   0.000
*
 ** CALIB NASHYD         0005  1  2.0   50.00    3.04  6.50  30.13 0.33   0.000
    [CN=62.2         ]
    [ N = 3.0:Tp 0.34]
*
 ** CALIB NASHYD         0004  1  2.0    1.90    0.13  6.47  34.05 0.37   0.000
    [CN=66.5         ]
    [ N = 3.0:Tp 0.33]
*
    PIPE   [ 2:  0004]   0103  1  2.0    1.90    0.13  6.53  34.05  n/a   0.000
*
    ADD [  0103+  0005]  0013  3  2.0   51.90    3.17  6.50  30.27  n/a   0.000
*
    ADD [  0100+  0102]  0012  3  2.0   12.66    0.59  6.57  26.51  n/a   0.000
*
    ADD [  0012+  0013]  0012  1  2.0   64.56    3.75  6.50  29.53  n/a   0.000
*
    PIPE   [ 2:  0012]   0099  1  2.0   64.56    3.74  6.53  29.53  n/a   0.000
*
 *  CALIB NASHYD         0006  1  2.0    1.06    0.10  6.37  33.72 0.36   0.000
    [CN=66.0         ]
    [ N = 3.0:Tp 0.21]
*
    ADD [  0006+  0099]  0015  3  2.0   65.62    3.81  6.53  29.60  n/a   0.000
```

```
*
    PIPE   [ 2:  0015]   0016  1  2.0   65.62    3.80  6.53  29.60  n/a   0.000
*
 *  CALIB NASHYD         0007  1  2.0   21.60    1.03  6.60  27.95 0.30   0.000
    [CN=59.7         ]
    [ N = 3.0:Tp 0.43]
*
    ADD [  0016+  0007]  0019  3  2.0   87.22    4.81  6.57  29.19  n/a   0.000
*
    PIPE   [ 2:  0019]   0018  1  2.0   87.22    4.80  6.57  29.19  n/a   0.000
*
 *  CALIB NASHYD         0008  1  2.0    7.70    0.45  6.47  28.01 0.30   0.000
    [CN=59.7         ]
    [ N = 3.0:Tp 0.32]
*
 *  CALIB NASHYD         0009  1  2.0   13.42    0.66  6.57  28.16 0.30   0.000
    [CN=59.9         ]
    [ N = 3.0:Tp 0.41]
*
 *  CALIB NASHYD         0010  1  2.0   20.20    0.89  6.67  28.34 0.31   0.000
    [CN=60.2         ]
    [ N = 3.0:Tp 0.49]
*
```

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


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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Civica Infrastructure
Copyright 2007 - 2013 Civica Infrastructure
All rights reserved.


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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\voin.dat

  Output  filename:
C:\Users\caldwellc\AppData\Local\Civica\VH5\7454d970-b6c3-4fed-b50a-2bf2b820f422\c47
76b47-9cae-4d40-8ca0-e9e756350840\sc
  Summary filename:
C:\Users\caldwellc\AppData\Local\Civica\VH5\7454d970-b6c3-4fed-b50a-2bf2b820f422\c47
76b47-9cae-4d40-8ca0-e9e756350840\sc


DATE: 03/31/2023                           TIME: 03:23:38

USER:


COMMENTS: _____________________________________________________________


  ****************************
  ** SIMULATION NUMBER:   0 **
  ****************************

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

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

```
    [ Ptot=100.80 mm ]
    fname :
C:\Users\caldwellc\AppData\Local\Temp\69ac6efe-95aa-406f-90a0-27cee1a290da\35cb9924-
3f80-4362-a457-6
    remark: created from IDF Group New IDFGroup on 2023-03-16

*
 ** CALIB NASHYD         0003  1  2.0    0.59    0.07  6.37  42.70 0.42   0.000
    [CN=68.9         ]
    [ N = 3.0:Tp 0.21]
*
    PIPE   [ 2:  0003]   0101  1  2.0    0.59    0.07  6.40  42.69  n/a   0.000
*
 ** CALIB NASHYD         0001  1  2.0    4.70    0.26  6.57  30.34 0.30   0.000
    [CN=58.0         ]
    [ N = 3.0:Tp 0.39]
*
    ADD [  0001+  0101]  0023  3  2.0    5.29    0.32  6.50  31.72  n/a   0.000
*
    PIPE   [ 2:  0023]   0100  1  2.0    5.29    0.32  6.53  31.72  n/a   0.000
*
 ** CALIB NASHYD         0002  1  2.0    7.37    0.38  6.60  30.67 0.30   0.000
    [CN=58.0         ]
    [ N = 3.0:Tp 0.44]
*
    PIPE   [ 2:  0002]   0102  1  2.0    7.37    0.38  6.60  30.67  n/a   0.000
*
 ** CALIB NASHYD         0005  1  2.0   50.00    3.56  6.50  35.15 0.35   0.000
    [CN=62.2         ]
    [ N = 3.0:Tp 0.34]
*
 ** CALIB NASHYD         0004  1  2.0    1.90    0.16  6.47  39.54 0.39   0.000
    [CN=66.5         ]
    [ N = 3.0:Tp 0.33]
*
    PIPE   [ 2:  0004]   0103  1  2.0    1.90    0.15  6.53  39.54  n/a   0.000
*
    ADD [  0103+  0005]  0013  3  2.0   51.90    3.72  6.50  35.31  n/a   0.000
*
    ADD [  0100+  0102]  0012  3  2.0   12.66    0.69  6.57  31.11  n/a   0.000
*
    ADD [  0012+  0013]  0012  1  2.0   64.56    4.39  6.50  34.49  n/a   0.000
*
    PIPE   [ 2:  0012]   0099  1  2.0   64.56    4.38  6.53  34.49  n/a   0.000
*
 *  CALIB NASHYD         0006  1  2.0    1.06    0.12  6.37  39.16 0.39   0.000
    [CN=66.0         ]
    [ N = 3.0:Tp 0.21]
*
    ADD [  0006+  0099]  0015  3  2.0   65.62    4.47  6.50  34.56  n/a   0.000
```

```
*
    PIPE   [ 2:  0015]   0016  1  2.0   65.62    4.46  6.53  34.56  n/a   0.000
*
 *  CALIB NASHYD         0007  1  2.0   21.60    1.21  6.60  32.70 0.32   0.000
    [CN=59.7         ]
    [ N = 3.0:Tp 0.43]
*
    ADD [  0016+  0007]  0019  3  2.0   87.22    5.65  6.53  34.10  n/a   0.000
*
    PIPE   [ 2:  0019]   0018  1  2.0   87.22    5.64  6.57  34.10  n/a   0.000
*
 ** CALIB NASHYD         0008  1  2.0    7.70    0.53  6.47  32.76 0.33   0.000
    [CN=59.7         ]
    [ N = 3.0:Tp 0.32]
*
 ** CALIB NASHYD         0009  1  2.0   13.42    0.78  6.57  32.94 0.33   0.000
    [CN=59.9         ]
    [ N = 3.0:Tp 0.41]
*
 ** CALIB NASHYD         0010  1  2.0   20.20    1.04  6.67  33.15 0.33   0.000
    [CN=60.2         ]
    [ N = 3.0:Tp 0.49]
*
 FINISH

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

```
    [ Ptot= 60.00 mm ]
    fname :
C:\Users\caldwellc\AppData\Local\Temp\2661bc1b-32ea-49d9-9c0d-5be42d68cb50\a6e69119-
fa45-444b-83b1-1
    remark: created from IDF Group New IDFGroup on 2023-03-16

*
 ** CALIB NASHYD         0203  1  2.0   12.90    0.29  6.53  11.92 0.20   0.000
    [CN=58.9         ]
    [ N = 3.0:Tp 0.36]
*
 ** CALIB NASHYD         0204  1  2.0   18.12    0.39  6.53  11.42 0.19   0.000
    [CN=57.9         ]
    [ N = 3.0:Tp 0.36]
*
 ** CALIB NASHYD         0201  1  2.0   29.78    0.62  6.57  12.07 0.20   0.000
    [CN=59.4         ]
    [ N = 3.0:Tp 0.40]
*
    PIPE   [ 2:  0201]   0002  1  2.0   29.78    0.62  6.60  12.07  n/a   0.000
*
 ** CALIB NASHYD         0202  1  2.0   22.24    0.46  6.57  11.84 0.20   0.000
    [CN=58.9         ]
    [ N = 3.0:Tp 0.39]
*
    ADD [  0002+  0202]  0008  3  2.0   52.02    1.09  6.60  11.97  n/a   0.000
*
    PIPE   [ 2:  0008]   0006  1  2.0   52.02    1.08  6.60  11.97  n/a   0.000
*
 ** CALIB NASHYD         0205  1  2.0    7.70    0.19  6.47  11.95 0.20   0.000
    [CN=59.1         ]
    [ N = 3.0:Tp 0.31]
*
```