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39 Years

Block 1 Development

240-270 Lamarche Avenue & 3484 Innes Road

Servicing and Stormwater Management Report

Prepared for: Lépine Corporation

Engineering excellence. Planning progress. Liveable landscapes.

SERVICING AND STORMWATER MANAGEMENT REPORT

BLOCK 1 DEVELOPMENT
240-270 LAMARCHE AVENUE & 3484 INNES ROAD
CITY OF OTTAWA

Prepared by:

NOVATECH
Suite 200, 240 Michael Cowpland Drive
Kanata, Ontario
K2M 1P6

Prepared: December 22, 2021

Novatech File: 121214
Ref No. R-2021-194

NOVATECH
Engineers, Planners & Landscape Architects

December 22, 2021

City of Ottawa
Planning and Growth Management Department
110 Laurier Avenue West, 4th Floor
Ottawa, Ontario
K1P 1J1

Attention: **Michael Boughton RPP/MCIP**

Dear Mr. Boughton:

Reference: **Block 1, 240-270 Lamarche Avenue & 3484 Innes Road, City of Ottawa**
Servicing and Stormwater Management Report
Our File No.: 121214

Please find enclosed the 'Servicing and Stormwater Management Report' for the above noted project. This report is being submitted in support of Site Plan Control Application for the proposed development.

Should you have any questions or require additional information, please contact the undersigned.

Yours truly,

NOVATECH

Cara Ruddle, P.Eng.
Senior Project Manager | Land Development Engineering

cc: Pascale Lépine

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1.0 INTRODUCTION

Novatech has been retained by Lépine Corporation to prepare a Servicing and Stormwater Management Report for the proposed residential development located at 240-270 Lamarche Avenue & 3784 Innes Road within the City of Ottawa. The proposed site is denoted as Block 1 on the plan of subdivision 4M-1629 and is part of a larger development which includes the construction of a proposed public right-of-way. The proposed roadway will be named Croissant Francoise and the detailed design of the proposed roadway will be detailed within a separate report. The purpose of this report is to support the site plan application for the subject development on Block 1. **Figure 1** Key Plan shows the site location. A copy of the legal plan is included for reference.

2.0 EXISTING CONDITIONS

The total Block 1 site area is approximately 1.8 hectares. The property was previously part of the Innes Road Golfland Driving range and is currently vacant. The site is bound by the future Croissant Francoise to the north, Lamarche Avenue to the east, residential buildings to the south, and residential buildings fronting Page Road to the west. The site is generally flat and slopes towards the southwest corner of the site. Due to the recent construction of Lamarche Avenue the current site grades are +/- 1.0m below the new roadway. **Figure 2** shows the existing site conditions.

The subject site was denoted as block 150 within the Orleans Village Development. The subdivision was designed by David Schaeffer Engineering Ltd. (DSEL) and design information is provided in the following reports:

- 'Design Brief for Cavian (Orleans Village) Limited, 3490 Innes Road' prepared By DSEL dated November 2018 – Ver 3 (Reference as DSEL Report).
- 'Assessment of Adequacy of Public Services for Lepine Corporation, 3490 Innes Road' Prepared by DSEL dated May 2019 – Rev 1 (Referenced as DSEL Assessment)

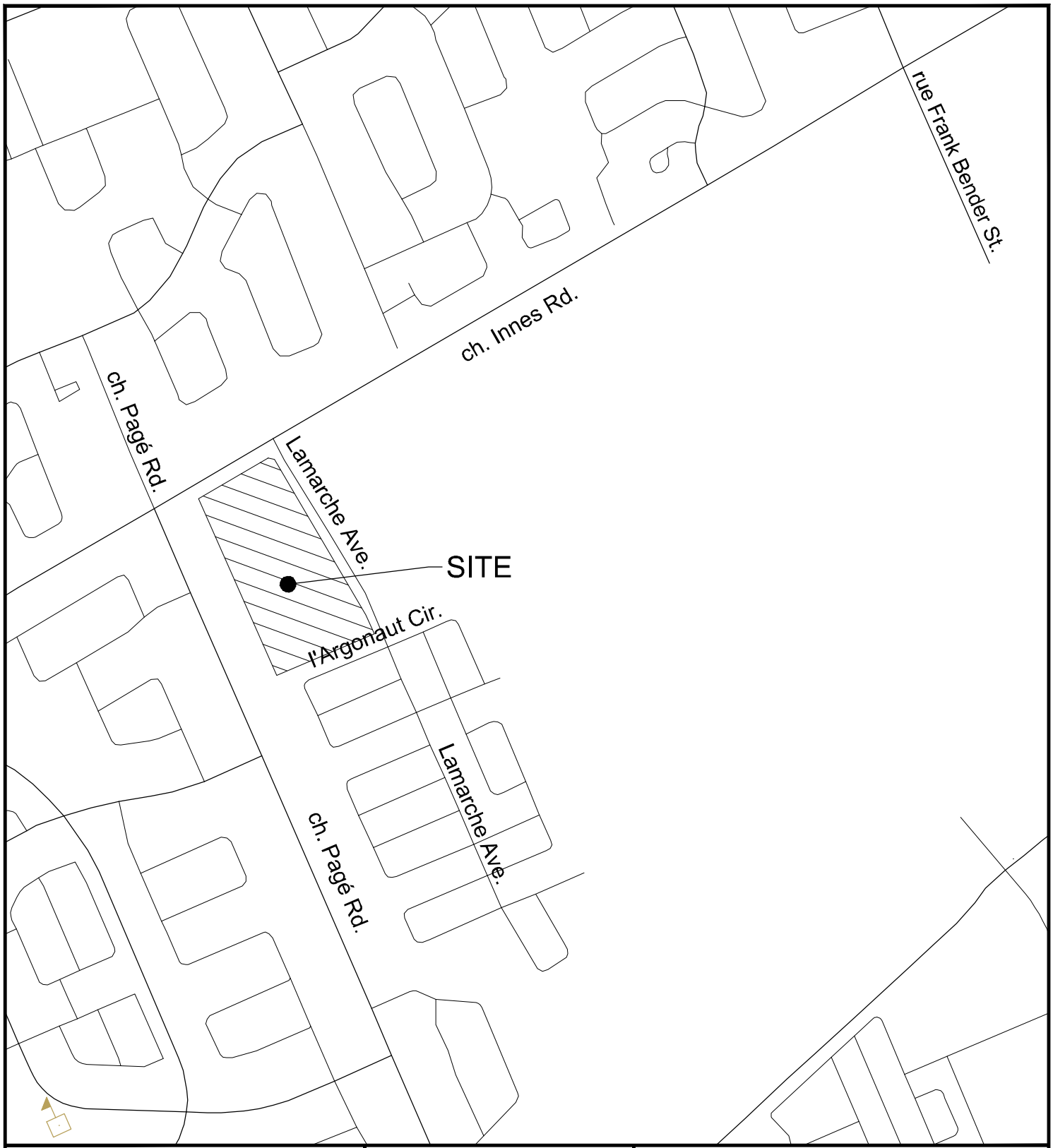
3.0 PROPOSED DEVELOPMENT

The proposed development Block 1 will include +/- 1.6 ha of residential area, and +/- 0.2ha of parkland. It is proposed to develop the residential site with three (3) apartment buildings connected by an underground parking structure. Pavilion A will be six (6) storeys in height with a footprint of 2022m^2 and 105 units. Pavilion B will be seven (7) storeys in height with a footprint of 1966m^2 and 81 units. Pavilion C will be seven (7) storeys in height with a footprint of 1851m^2 and 97 residential units and 252m^2 of commercial space. **Figure 3** shows the proposed development.

Access to the site will be provided from two (2) entrances from the future Croissant Francoise which connects to the existing Lamarche Avenue. It should be noted that this report should be read in conjunction with the following engineering drawings:
General Plan of Services (dwg 121214-GPB1)
Grading Plan (dwg 121214-GRB1)
Erosion and Sediment Control Plan (dwg 121214-ESCB1)
Notes and Details Plan (dwg 121214-NDB1)

4.0 SITE CONSTRAINTS

A geotechnical investigation was completed by Paterson Group Inc. and a report prepared entitled 'Geotechnical Investigation, Proposed Multi-Storey Residential Buildings' dated May 21, 2019. The report included the following recommendations:



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240-270 LAMARCHE AVENUE & 3484 INNES ROAD
CITY OF OTTAWA

KEYPLAN

SCALE		
N.T.S.		
DATE	JOB	FIGURE
SEPT 2021	121214	1

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SHT8X11.DWG - 216mmx279mm

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240-270 LAMARCHE AVENNUE & 3484 INNES ROAD
CITY OF OTTAWA

EXISTING CONDITIONS PLAN

SCALE 1 : 1250 (0 10 20 30 40 50)
DATE DEC 2021
JOB 121214
FIGURE 2

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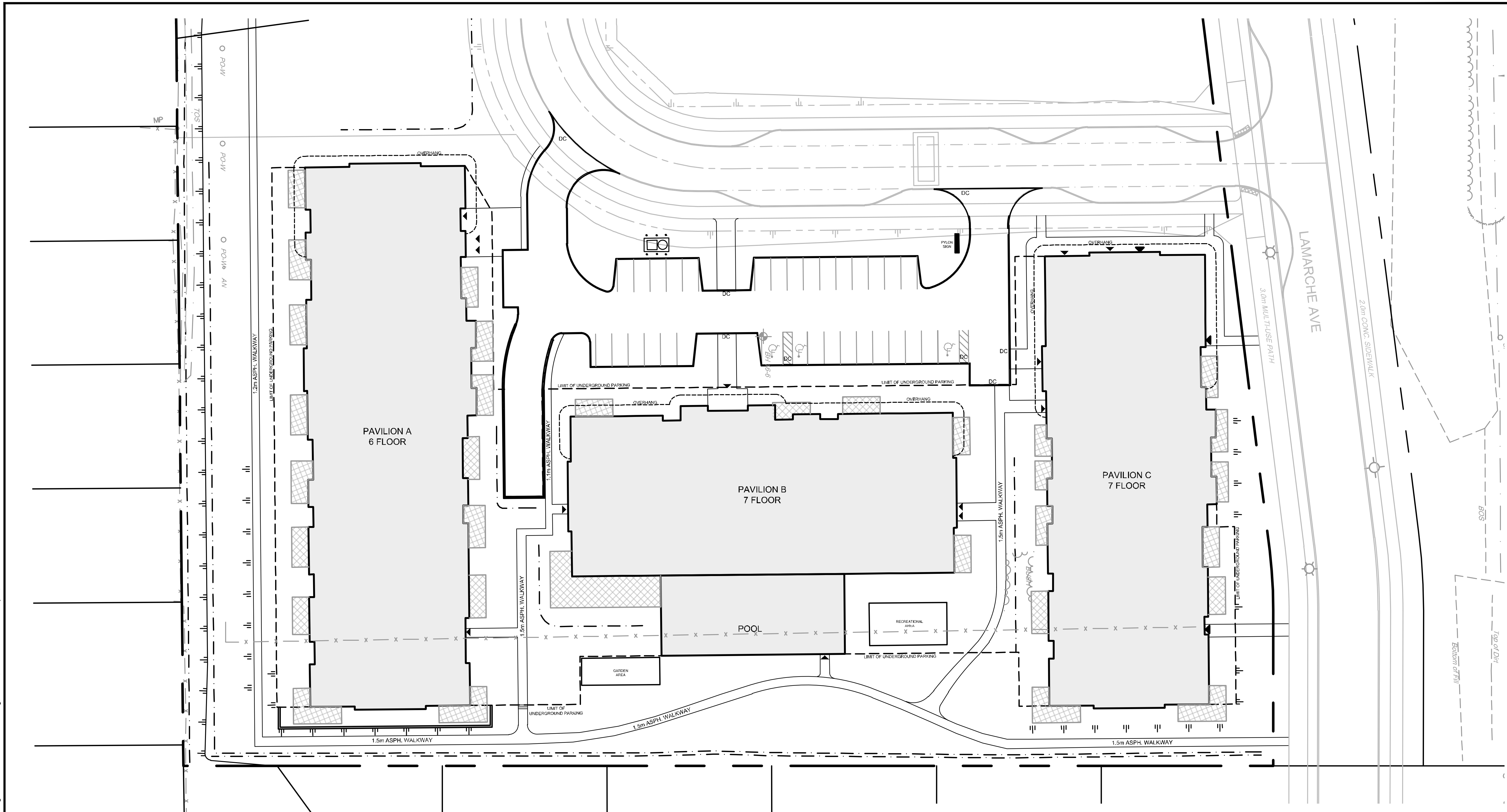

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PROPOSED SITE PLAN -BLOCK 1

SCALE	DATE	JOB	FIGURE
1 : 600	DEC 2021	121214	3

M:\2021\121214\CAD\Design\-Zone 1\Figures\Report Figures\121214-Z1-PRSP.dwg, PRSP, Dec 21, 2021 - 3:26pm, dmaratha

- If buildings are founded directly over a clay deposit, a permissible grade raise restriction will be required. A preliminary permissible grade raise restriction of 2 m is recommended for the south portion of the site.
- It should be noted that bedrock was encountered between 5.6 to 7 m below existing grade within the subject property.
- To reduce long-term lowering of the groundwater level at this site clay seals should be provided along the sewer trenches.
- During construction, groundwater volumes pumped could be between 50,000 to 400,000 L/day and it would be required to register on the Environmental Activity and Sector Registry (EASR). However, the project is expected to be phased, so each building constructed one at a time. As the phasing of the underground foundation works is planned in stages the groundwater volumes to be pumped are expected to be maintained under the 50,000L/day threshold.

5.0 WATER SERVICING

The subject property is within the City of Ottawa 2E pressure zone. There is an existing 300mm diameter watermain within the Lamarche Avenue right-of-way that was installed as part of the Orleans Village Development. The proposed Croissant Francoise public right-of-way includes a 200mm watermain which will connect to the existing Lamarche Avenue watermain in two (2) locations creating a looped system for redundancy purposes. Hydrants are also proposed on Croissant Francoise to provide fire protection for the developments. During the construction of Lamarche Avenue a 150mm diameter watermain stub was installed near the south-east property line to provide a potential future service connection for the development lands.

The proposed development will be serviced by two (2) 150mm diameter watermains that will connect to the proposed 200mm diameter watermain in Croissant Francoise. As per the City of Ottawa Technical Bulletin ISDTB-2014-02, the water services will be separated by an isolation valve in the right-of-way as the average day domestic demands are greater than 50 cubic meters of water per day. The proposed buildings are to be sprinklered and equipped with a Siamese connection located near the front entrance of each building and are to be within 45m of a fire hydrant. Refer to the General Plan of Services drawing (121214-GPB1) for servicing details.

Water demand calculations have been calculated using criteria from Section 4 of the City of Ottawa Water Distribution Guidelines and the Ontario Building Code. The required fire demand was calculated using the Fire Underwriters Survey (FUS) Guidelines. The water demand and fire flow calculations are provided in **Appendix A** for reference. A summary of the water demand and fire flows are provided in **Table 5.1**.

Table 5.1: Domestic Water Demand Summary

Building	Population	Commercial Area (m^2)	Ave. Daily Demand (L/s)	Max. Daily Demand (L/s)	Peak Hour Demand (L/s)	Fire Flow (L/s)
Pavilion A	159	N/A	0.59	1.47	3.22	117
Pavilion B	141	N/A	0.46	1.14	2.51	100
Pavilion C	164	252	0.55	1.36	2.45	100
Park Land	32		0.01	0.02	0.04	
Total Domestic Demands	**496**	**252**	**1.60**	**3.99**	**8.23**	

The DSEL Report provided domestic demand and fire flow allocations for the proposed development lands. In the Orleans Village development, Block 150 was assumed to be a residential development with an equivalent population of 1044 people. The allotted domestic demands and fireflows for the development area (Block 150) are summarized in **Table 5.2**.

Table 5.2 Allowable Block 150 Water Demand (DSEL Report)

Area	Ave. Daily Demand (L/s)	Max. Daily Demand (L/s)	Peak Hour Demand (L/s)	Fire Flow (L/s)
Block 150	3.38	8.44	18.57	217

Therefore, based on the information in the preceding tables the proposed development water demands are less than the demands allotted from DSEL Report. Therefore, it can be concluded that the existing watermain system can provide adequate flow and pressures for the fire flows and domestic demands. Refer to **Appendix A** for DSEL Report excerpts, proposed domestic water demand and fire flow calculations.

6.0 SANITARY SERVICING

There is an existing 250mm diameter sanitary sewer within Lamarche Avenue which was constructed as part of the Orleans Village Development. An existing 200mm diameter sanitary stub is provided from the Lamarche Avenue sanitary sewer and is located near the south-east property line. The future Croissant Francoise public right-of-way will include a 250mm diameter sanitary sewer which will connect to the existing Lamarche Avenue sanitary sewer system.

Pavilion A and B of the proposed development will be serviced with a 200mm private sewer with a connection to the proposed sanitary sewer in the Croissant Francoise. Pavilion C will be serviced directly to the existing sanitary sewer in Lamarche Avenue by the existing 200mm stub in the south east property corner. The proposed park will be serviced by a 200mm service with a connection to the proposed sewer in Croissant Francoise. Refer to the General Plan of Services drawing (121214-GPB1) for servicing details.

Sanitary flows for the proposed development were calculated using criteria from Section 4 of the City of Ottawa Sewer Design Guidelines and the Ontario Building Code as follows:

- Residential Average Flow = 280 L/capita/day
- 1 Bed apartment = 1.4 Person/unit
- 2 Bed apartment = 2.1 Person/unit
- 3 Bed apartment = 3.1 Person/unit
- Single unit = 3.4 Person/unit
- Commercial flow = 75 L/9.3m^3/day
- Parkland = 1 unit/ hectare
- Residential Peaking Factor = Harmon Equation (max peaking factor = 4.0)
- Commercial Peaking Factor = 1.0
- Peak Extraneous Flows (Infiltration) = 0.33L/s/ha

The peak sanitary flow including infiltration for the Block 1 development was calculated to be 6.26 L/s with 4.18 L/s for Pavilion A and B, 2.02 L/s for Pavilion C, and 0.06L/s for the proposed parkland. Detailed sanitary flow calculations are provided in **Appendix B** for reference.

As noted previously, the Orleans Village Development detailed design was completed by DSEL. The Subdivision design assumed that block 150 was a residential development with an equivalent population 1044 people. The design flows were calculated using the following design criteria:

- Average Daily Flow = 280 L/capita/day
- Residential Peaking Factor = Harmon Equation (max peaking factor = 4.0)
- Commercial/ Institutional Peaking Factor = 1.0
- Peak Extraneous Flows (Infiltration) = 0.33L/s/ha

Based on the above criteria a theoretical peak flow of 11.56 L/s that was allotted for Block 150 is greater than the proposed theoretical peak flow of 6.26 L/s. Therefore, it is anticipated that the downstream sanitary sewer infrastructure has capacity to service the proposed Block 1 development and there is additional flow capacity for future developments. Refer to Excerpts **Appendix B** for DSEL Report excerpts, sanitary drainage area plans and design sheets.

7.0 STORM SERVICING

There is an existing 850mm and 1350mm diameter storm sewer fronting the development in Lamarche Avenue. Connected to this sewer is a 750mm diameter storm sewer and catchbasin manhole that was constructed on the Block 1 site which will be used service a portion of the development. As part of the subdivision application, it is proposed to construct Croissant Francoise which will have municipal storm sewers ranging in size from 450mm to 750mm in diameter. The proposed municipal storm sewer system will provide storm servicing for the current and future developments fronting onto Croissant Francoise.

It is proposed to service the Block 1 development by a private storm sewer system with sewers ranging in size from 250mm to 600mm in diameter. It is proposed to service the site with connections to the proposed 750mm diameter storm sewer in Croissant Francoise and the existing 750mm diameter storm sewer on site. Refer to the General Plan of Services (121214-GPB1) for more details.

The proposed storm sewers have been sized to convey the uncontrolled 5-year storm event using the Rational Method. The design criteria used in sizing the storm sewers are summarized below in **Table 7.1**.

Table 7.1: Storm Sewer Design Parameters

Parameter	Design Criteria
Local Roads	2 Year Return Period
Storm Sewer Design	Rational Method
IDF Rainfall Data	Ottawa Sewer Design Guidelines
Initial Time of Concentration (Tc)	10 min
Minimum Velocity	0.8 m/s
Maximum Velocity	3.0 m/s
Minimum Diameter	250 mm

Refer to **Appendix C** for detailed storm drainage area plans and storm sewer design sheets.

8.0 STORM DRAINAGE AND STORMWATER MANAGEMENT

The stormwater management strategy for the site is based on the established criteria from the DSEL Assessment of Adequacy of Public Services.

8.1 Existing Off-Site Storm Infrastructure – Orleans Village Development

The storm infrastructure servicing the Orleans Village development includes a stormwater management facility and storm sewers with sizes ranging from 300mm to 1800mm in diameter. The Orleans Village Development storm sewer system was designed to receive drainage from the proposed development. As previously indicated the overall Lepine development area was identified as Blocks 149 and 150 on the registered plan of subdivision. The downstream SWM Facility was designed to provide stormwater quality and quantity control for the overall Orleans Village development area prior to discharging to Mud Creek. The facility was sized to accommodate all future developments within the tributary drainage area, including the subject development lands.

8.2 Stormwater Management Criteria

8.2.1 Stormwater Quality Control

The existing SWM Facility is currently sized to provide a normal level of stormwater quality control. In the future it is proposed to upgrade the SWM facility to provide and enhanced level of stormwater quality control for 80% long-term removal of total suspended solids (TSS).

As previously indicated the Block 1 development was identified as Block 150 in the Orleans Village Development and was estimated to be 79% impervious. The proposed Block 1 development has an overall imperviousness of 74% and will therefore have no negative effects on the downstream stormwater infrastructure (sewers and pond).

8.2.2 Stormwater Quantity Control – Allowable Release Rate

The DSEL Adequacy of Public Services Report provides stormwater allowable release rates for Blocks 149, Block 150 and the external drainage areas for the residential properties fronting onto Innes Road. The allowable release rates per block are provided in **Table 8.1.**

Table 8.1 Allowable Release Rates Per Block (DSEL Report)

Block	Area (ha)	Allowable Release Rate (L/s)
Block 149	2.86	501
Block 150	2.17	406
External Area	0.11	*9.4
Total	**5.14**	**916.4**

**Note: Calculated using rational method for a 2-year storm event.*

The overall Lepine development will be required to control the release rate of stormwater from the site to 916.4 L/s . Each area in the overall Lepine development has been allocated a portion

of this total release rate. The allocated release rates are summarized below in **Table 8.2** and were calculated based on the following criteria:

- No 2-year surface ponding in the right-of-way.
- No stormwater management controls in the park blocks.
- Each development Block was allocated a portion of the remaining release rate based on its area percentage of the total Block development lands.

Table 8.2 Allowable Release Rates Per Block (Novatech Serviceability Report)

Development Area	Area (ha)	Area %	Allowable Release Rate (L/s)
ROW	0.611	N/A	147.0
Park	0.503	N/A	108.5
Sub Total	**1.114**		**255.5**
Block 1	1.535	38.2%	252.4
Block 2	0.922	22.9%	151.6
Block 3	1.563	38.9%	257.0
Sub Total	**4.020**		**660.9**
Total	**5.134**		**916.4**

Based on the information provided in **Table 8.2** the Block 1 development will be allocated 252.4 L/s to the Lamarche Avenue sewer and ultimately the downstream SWM facility. Refer to **Appendix D** for report excerpts from the DSEL Report and detailed calculations on the allowable release rate allocation.

8.3 Stormwater Management Modeling

The performance of the proposed stormwater management system was evaluated using a dual-drainage model created in PCSWMM. The PCSWMM model simulates the storage and routing of flows through the proposed storm drainage network. The results of the analysis were used to:

- Calculate the storm sewer hydraulic grade line and ponding elevations for the 2year, 5-year, and 100-year storm events.
- Determine the allowable release rates from each drainage area and size the required inlet control devices (ICD's).
- Calculate the modelled runoff from the controlled portions and uncontrolled portions of the site under post-development conditions.

The design storms used in the hydrologic analysis model include the 6-hour Chicago distribution and the 12-hour and 24-hour SCS Type II distribution for the 2-year, 5-year and 100-years storm events. IDF data was taken from the *City of Ottawa Sewer Design Guidelines* (OSDG) (October 2012). The 6-hour Chicago storm distribution was found to generate the highest peak flows and the model results from this distribution are documented in the following tables. The model schematic, system parameters and output files are provided in **Appendix D**.

8.3.1 Model Results

The following sections outline the stormwater management strategy for each area of the proposed Block 1 development, and provides post-development peak flow results from the uncontrolled and controlled flow areas. The site has been divided into the following drainage areas:

Area D-01 – D-05 : Uncontrolled Direct Runoff

Runoff from these drainage areas will sheet drain from the site uncontrolled directly to the Lamarche Avenue right-of-way (D-01), the Croissant Francoise right-of-way (D-02, D-03) and to the adjacent Park Block (D-04, D-05).

Table 8.3 summarizes the post-development direct runoff flows for the 2, 5 and 100-year event from these sub-catchment areas.

Table 8.3: Direct Runoff Flow Summary

Area ID	2-Year Flows (L/s)	5-Year Flows (L/s)	100-Year Flows (L/s)	100-Year +20% Flows (L/s)
D-01	8.7	14.6	28.7	35.1
D-02	2.6	3.6	6.3	7.6
D-03	1.7	2.6	4.8	5.8
D-04	2.6	5.1	10.8	13.3
D-05	0.5	1.1	2.3	2.8
Total	**16.1**	**27.0**	**52.9**	**64.6**

Area A-01 (a-b) : Controlled Flows to Croissant Francoise

The parking lot area fronting the development will outlet to the 750mm diameter storm sewer system in Croissant Francoise. The post-development flow from this sub-catchment area will be attenuated using an inlet control device (ICD) installed in the outlet pipe of CBMH 101. Stormwater runoff from this sub-catchment area will be temporarily stored underground within the storm sewer system and on the paved parking lot area prior to being discharged into the Croissant Francoise storm sewer system.

Table 8.4A summarizes the post-development design flow from this sub-catchment area as well as the ICD specifications, the anticipated ponding elevations, storage volumes required and storage volume provided for the 2-year, 5-year and the 100-year design events.

Table 8.4A: Area A-01 Design Flow and ICD Table

Design Event	Sub-Catchment Area A-01 (CBMH101 T/G=88.70)				
	ICD Type	Design Flow (L/s)	Ponding Elevation (m)	Storage Vol. Required (m^3)	Max Storage Provided (m^3)
2-Year	97mm Plate	28.7 L/s	87.73 m	7.0 m^3	43.1 m^3
5-Year		34.6 L/s	88.72 m	9.4 m^3	
100-Year		35.8 L/s	88.95 m	41.2 m^3	

Area B-01, B-02 : Controlled Building Flows to Lamarche Avenue

The building roofs and surface area above the underground parking structure will outlet to the existing 1350mm diameter storm sewer in Lamarche Avenue via the private sewer system on site. The post-development flow from these sub-catchment areas will be attenuated using ICD's installed on the outlet pipes from the underground storage tanks constructed in the underground parking garage. Stormwater runoff from this sub-catchment area will be temporarily stored underground in storage tanks prior to being discharged into the private sewer system and ultimately the Lamarche Avenue storm sewer.

Table 8.4B summarizes the post-development design flows from these sub-catchment areas as well as the ICD specifications, the anticipated ponding elevations, storage volumes required and storage volume provided for the 2-year, 5-year and the 100-year design events.

Table 8.4b: Area B-01, B-02 Design Flow and ICD Table

	Sub-Catchment Area B-01 (Tank Bottom = 86.00)				
	ICD Type	**Design Flow (L/s)**	**Ponding Elevation (m)**	**Storage Vol. Required (m^3)**	**Max Storage Provided (m^3)**
2-Year	180mm Plate	48.0 L/s	86.58 m	38.3 m^3	133.0 m^3
5-Year		58.8 L/s	86.82 m	54.7 m^3	
100-Year		83.2 L/s	87.55 m	103.1 m^3	
	Sub-Catchment Area B-02 (Tank Bottom = 86.00)				
2-Year	140mm Plate	29.9 L/s	86.59 m	38.9 m^3	133.0 m^3
5-Year		36.1 L/s	86.82 m	54.8 m^3	
100-Year		50.3 L/s	87.53 m	101.7 m^3	

Area C-01 (a-c) : Controlled Rear Yard Flows to Lamarche Avenue

The rear yard drainage for the Block 1 development will be collected and conveyed by a swale and perforated pipe storm sewer system to the existing 1350mm diameter storm sewer in Lamarche Avenue. Post-development flows from this sub-catchment area will be attenuated using an ICD, installed in the outlet pipe of CBMH 206. Stormwater runoff from this sub-catchment area will be temporarily stored underground within the perforated pipe storm sewer system and on the surface in the grassed swale prior to being discharged into the Lamarche Avenue storm sewer system.

Table 8.4C summarizes the post-development design flow from this sub-catchment area as well as the ICD specifications, the anticipated ponding elevations, storage volumes required and storage volume provided for the 2-year, 5-year and the 100-year design events.

Table 8.4C: Area C-01 Design Flow and ICD Table

Design Event	Sub-Catchment Area A-01 (CBMH206 T/G=88.35)				
	ICD Type	Design Flow (L/s)	Ponding Elevation (m)	Storage Vol. Required (m^3)	Max Storage Provided (m^3)
2-Year	100mm Plate	17.6 L/s	87.48 m	9.7 m^3	50.0 m^3
5-Year		20.9 L/s	87.76 m	15.7 m^3	
100-Year		28.5 L/s	88.59 m	48.0 m^3	

Table 8.5 below compares the post-development design flows for 2-year ,5-year and 100-year design events to the target allowable release rates.

Table 8.5 Stormwater Management Post-Development Flow Summary

Drainage Area ID	Drainage Area (ha)	Runoff Coefficient "C"	2-Year Flows (L/s)	5-Year Flows (L/s)	100-Year Flows (L/s)
D-01	0.062	0.48	8.7	14.6	28.7
D-02	0.013	0.70	2.6	3.6	6.3
D-03	0.010	0.58	1.7	2.6	4.8
D-04	0.024	0.25	2.6	5.1	10.8
D-05	0.005	0.25	0.5	1.1	2.3
Direct Runoff Sub Total			**16.1**	**27.0**	**52.9**
A-01	0.252	0.73	28.7	34.6	35.8
B-01	0.415	0.90	48.0	58.8	83.2
B-02	0.342	0.90	29.9	36.1	50.3
C-01	0.413	0.45	17.6	20.9	28.5
Controlled Flows Sub Total			**124.2**	**150.4**	**197.8**
Total Post Development Release Rate			**140.3**	**177.4**	**250.7**
Total Block 1 Allowable Release Rate			**252.4**	**252.4**	**252.4**

As indicated in the **Table 8.5** above, the 2-year, 5-year and 100-year post-development flows will be less than or equal to the target allowable release rate for the site. Refer to **Appendix D** for report excerpts from the DSEL Report, Ration Method calculations, PCSSWMM model schematics and results. Refer to the Grading Plan (121214-GRB1) and the Stormwater Management Plan in **Appendix C** for more details.

8.4 Major Overland Flow Route

A major overland flow route will be provided for storms greater than the 100-year storm event. Stormwater will be directed to the Croissant Francoise and Lamarche Avenue rights-of-way. The major overland system is shown on the Grading Plan (drawing 121214-GRB1).

9.0 EROSION AND SEDIMENT CONTROL

Temporary erosion and sediment control measures will be implemented on-site during construction in accordance with the Best Management Practices for Erosion and Sediment Control. This includes the following temporary measures:

- Filter socks (catchbasin inserts) will be placed in existing and proposed catchbasins and catchbasin manholes, and will remain in place until vegetation has been established and construction is completed;
- Silt fencing will be placed along the surrounding construction limits;
- Mud mats will be installed at the site entrances;
- Strawbale or rock check dams will be installed in swales and ditches;
- The contractor will be required to perform regular street sweeping and cleaning as required, to suppress dust and to provide safe and clean roadways adjacent to the construction site;

Erosion and sediment control measures should be inspected daily and after every rain event to determine maintenance, repair or replacement requirements. Sediments or granulars that enter site sewers shall be removed immediately by the contractor. These measures will be implemented prior to the commencement of construction and maintained in good order until vegetation has been established. Refer to the Erosion and Sediment Control Plan (drawing 121214-ESCZ1) for additional information.

10.0 CONCLUSIONS AND RECOMMENDATIONS

Watermain

The analysis of the existing and proposed watermain network confirms the following:

- The two (2) proposed 150mm dia. watermain services which connect to the proposed 200mm watermain system within Croissant Francoise, and ultimately the existing 300mm dia. watermain in Lamarche Avenue can service the proposed development.
- It is anticipated that there are adequate pressures in the existing watermain infrastructure to meet the required domestic demands for the development.
- It is anticipated that there is adequate flow to service the proposed fire protections system.

Sanitary Servicing

The analysis of the existing and proposed sanitary system confirms the following:

- The (2) proposed sanitary sewer in Croissant Francoise will provide service connections for the parkland and Pavilions A/ B. The existing service stub connection from the Lamarche Avenue sanitary sewer will directly service Pavilion C.
- It is anticipated there is adequate capacity within the existing sanitary infrastructure to service the proposed development based on the information provided in the existing Orleans Village Development design.

Stormwater Management

The following provides a summary of the storm sewer and stormwater management system:

- The proposed storm sewer system is to connect to the proposed 750mm diameter storm sewer in Croissant Francoise and the existing 1350mm diameter storm sewer in Lamarche Avenue.
- Storm sewers (minor system) have been designed to convey the uncontrolled 2-year peak flow using the Rational Method.
- Underground storage is be provided within the storm sewer system and underground storage tanks.

- Inlet control devices and underground storage has been designed to ensure no static ponding is achieved in the 2-year event.
- Storm flows will be attenuated through the implementation of inlet control devices.
- Parking lots have been graded to ensure that static ponding depths do not exceed 0.30m.
- As per existing conditions a major overland flow route is provided to Lamarche Avenue.
- Quality control of stormwater will be provided in the downstream SWM facility.

Erosion and Sediment control

- Erosion and sediment control measures (i.e. filter fabric, catchbasin inserts, silt fences, etc.) will be implemented prior to construction and are to remain in place until vegetation is established.

11.0 CLOSURE

The preceding report is respectfully submitted for review and approval. Please contact the undersigned should you have questions or require additional information.

NOVATECH

Prepared by:	Prepared by:	Reviewed by:
		
Matt Hrehoriak, P.Eng. Project Manager Land Development Engineering	Anthony Mestwarp, P.Eng. Project Engineer Land Development Engineering	Cara Ruddle, P.Eng. Senior Project Manager Land Development Engineering

APPENDIX A
Water Servicing Information

Project No. 121214
Project Name: 240-270 Lamarche Avenue 3484 Innes Road - Zone 1
Project Location: 240-270 Lamarche Avenue 3484 Innes Road - Zone 1

NOVATECH
Engineers, Planners & Landscape Architects

Date: December, 2021

Proposed Development Conditions - ZONE 1

	Pavilion A	Pavilion B	Pavilion C	Park	Totals
1 Bed Apartment	58	42	57		157
2 Bed Apartment	46	39	40		125
3 Bed Apartment	1	0	0		1
Number of units	105	81	97		283
Commercial area (m2)	n/a	n/a	252		252
Area (ha)	n/a	n/a	n/a	0.1724	0
Total Daily Volume (Liters)	50652.0	39396.0	47896.3	639.0	138583.3
Avg Day Demand (L/s)	0.586	0.456	0.554	0.007	1.60
Max Day Demand (L/s)	1.466	1.140	1.362	0.018	3.99
Peak Hour Demand (L/s)	3.224	2.508	2.452	0.041	8.23

Design Parameters

Establishment	Daily Demand Volume		Source
1 Bed Apartment	1.4	Person/unit	City of Ottawa Sewer Design Guidelines
2 Bed Apartment	2.1	Person/unit	
3 Bed Apartment	3.1	Person/unit	
Residential Average Flow	280	L/c/day	
Picnic and Fair Grounds Flush Toilets only	20	L/Person/day Assume 75 Per/acre	
Office:	75	l/9.3m² /day	Daily Demands from OBC Table 8.2.1.3

Residential Peaking Factors City of Ottawa Water Distrubution Guidelines:

Conditions	Peaking Factor		Units
Maximum Day	2.5	x avg day	L/c/day
Peak Hour	2.2	x max day	L/c/day

Commercial Peaking Factors City of Ottawa Water Distribution Guidelines

Conditions	Peaking Factor		Units
Maximum Day	1.5	x avg day	L/c/day
Peak Hour	1.8	x max day	L/c/day

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 121214
240-270 Lamarche Avenue & 3484 Innes
Project Name: Road - Zone 1
Date: 12/20/2021
Input By: Anthony Mestwarp
Reviewed By: Cara Ruddle

Legend: Input by User; No Information or Input Required

Building Description: Pavilion A
Fire Resistive Construction

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Wood frame		1.5	0.6	
		Ordinary construction		1		
		Non-combustible construction		0.8		
		Modified Fire resistive construction (2 hrs)	Yes	0.6		
		Fire resistive construction (> 3 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	2202			
		Number of Floors/Storeys	6			
		Protected Openings (1 hr)	Yes			
		Area of structure considered (m^2)			**3,303**	
	F	**Base fire flow without reductions**				**8,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**			**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**6,800**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**			**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	**-2,720**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	No	-10%		
				Cumulative Total	**-40%**	
5	**Exposure Surcharge (cumulative %)**				**Surcharge**	
	(3)	North Side	> 45.1m		0%	**2,720**
		East Side	10.1 - 20 m		15%	
		South Side	10.1 - 20 m		15%	
		West Side	20.1 - 30 m		10%	
				Cumulative Total	**40%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**7,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	**L/s**	**117**
				or	USGPM	1,849
7	**Storage Volume**	Required Duration of Fire Flow (hours)			Hours	2
		Required Volume of Fire Flow (m^3)			m^3	840

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 121214
Project Name: 240-270 Lamarche Avenue & 3484 Innes Road - Zone 1
Date: 12/20/2021
Input By: Anthony Mestwarp
Reviewed By: Cara Ruddle

Legend: Input by User; No Information or Input Required

Building Description: Pavilion B
Fire Resistive Construction

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Wood frame		1.5	0.6	
		Ordinary construction		1		
		Non-combustible construction		0.8		
		Modified Fire resistive construction (2 hrs)	Yes	0.6		
		Fire resistive construction (> 3 hrs)		0.6		
2	**Floor Area**					
	A	Podium Level Footprint (m^2)	1966			
		Total Floors/Storeys (Podium)	1			
		Tower Footprint (m^2)	1589			
		Total Floors/Storeys (Tower)	6			
		Protected Openings (1 hr)	Yes			
		Area of structure considered (m^2)			**2,761**	
	F	**Base fire flow without reductions**				**7,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**			**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**5,950**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**			**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	**-2,380**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System		-10%		
				Cumulative Total	**-40%**	
5	**Exposure Surcharge (cumulative %)**				**Surcharge**	
	(3)	North Side	> 45.1m		0%	**2,380**
		East Side	10.1 - 20 m		15%	
		South Side	20.1 - 30 m		10%	
		West Side	10.1 - 20 m		15%	
				Cumulative Total	**40%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**6,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**100**
				or	USGPM	1,585
7	**Storage Volume**	Required Duration of Fire Flow (hours)			Hours	2
		Required Volume of Fire Flow (m^3)			m^3	720

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 121214
240-270 Lamarche Avenue & 3484 Innes
Project Name: Road - Zone 1
Date: 12/20/2021
Input By: Anthony Mestwarp
Reviewed By: Cara Ruddle

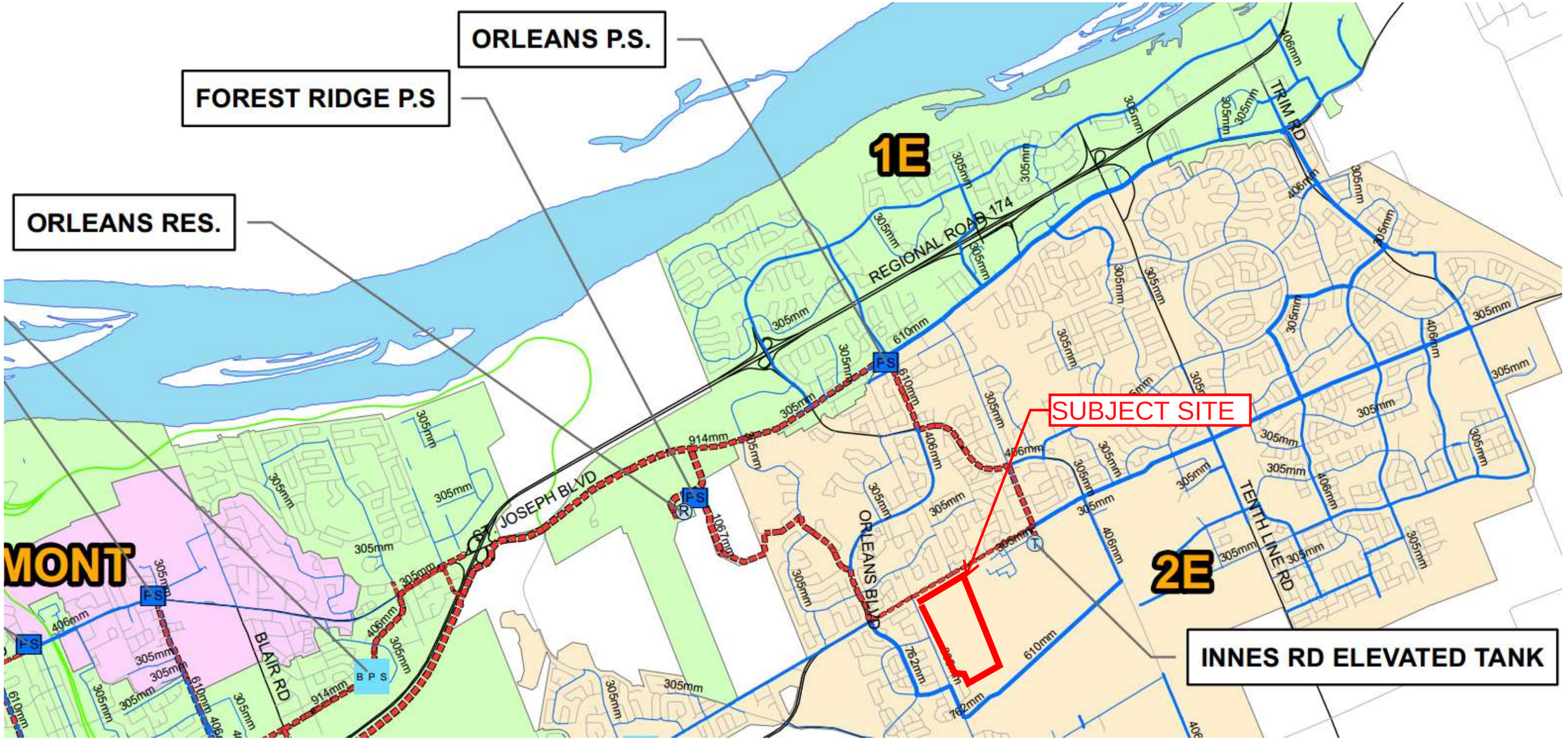
Legend: Input by User; No Information or Input Required

Building Description: Pavilion C
Fire Resistive Construction

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Wood frame		1.5	0.6	
		Ordinary construction		1		
		Non-combustible construction		0.8		
		Modified Fire resistive construction (2 hrs)	Yes	0.6		
		Fire resistive construction (> 3 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	1851			
		Number of Floors/Storeys	7			
		Protected Openings (1 hr)	Yes			
		Area of structure considered (m^2)			**2,777**	
	F	**Base fire flow without reductions**				**7,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**			**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**5,950**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**			**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	**-2,380**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	No	-10%		
				Cumulative Total	**-40%**	
5	**Exposure Surcharge (cumulative %)**				**Surcharge**	
	(3)	North Side	30.1- 45 m		5%	**2,380**
		East Side	30.1- 45 m		5%	
		South Side	10.1 - 20 m		15%	
		West Side	10.1 - 20 m		15%	
				Cumulative Total	**40%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**6,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**100**
				or	USGPM	1,585
7	**Storage Volume**	Required Duration of Fire Flow (hours)			Hours	2
		Required Volume of Fire Flow (m^3)			m^3	720

APPENDIX C

Water Supply Servicing (DSEL, May 2018)


ORLEANS P.S.
FOREST RIDGE P.S
ORLEANS RES.
1E
2E
REGIONAL ROAD 174
TRIM RD
JOSEPH BLVD
BLAIR RD
ORLEANS BLVD
TENTH LINE RD
SUBJECT SITE
INNES RD ELEVATED TANK
MONT
P S
B P S
305mm
406mm
610mm
762mm
914mm

Water Demand
Alternative 1 + 2 - Residential Commercial

Water Demand Design Flows per Unit Count
City of Ottawa - Water Distribution Guidelines, July 2010 (& Bulletin ISTB-2018-02)

Domestic Demand

Type of Housing	Per / Unit	Units	Pop
Single Family	3.4	330	1122
Semi-detached	2.7		0
Townhouse / Back-to-Back	2.7	131	354
Condo/Mixed Use Residential			4671
Apartment			
Bachelor	1.4		0
1 Bedroom	1.4		0
2 Bedroom	2.1		0
3 Bedroom	3.1		0
Average	1.8		0

	Pop	Avg. Daily		Max Day		Peak Hour	
		m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Total Domestic Demand	6147	1721.2	1195.3	4302.9	2988.1	9466.4	6573.9

Institutional / Commercial / Industrial Demand

			Avg. Daily		Max Day		Peak Hour	
Property Type	**Unit Rate**	**Units**	m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Park	9,300.0 L/ha/day	1.43	13.30	9.2	19.9	13.9	35.9	24.9
Commercial Floor Space	28,000.0 L/ha/day	5.40	151.20	105.0	226.8	157.5	408.2	283.5
Residential Commercial Space	28,000.0 L/ha/day	0.00	0.00	0.0	0.0	0.0	0.0	0.0
	Total I/CI Demand		164.5	114.2	246.7	171.4	444.1	308.4
	Total Demand		**1885.7**	**1309.5**	**4549.6**	**3159.5**	**9910.5**	**6882.3**

Page Road
FUS-Fire Flow Demand
Non-Conforming Standard TH

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999

Fire Flow Required

Location Page Road - Non-Conforming TH Blocks

1. Base Requirement

$F = 220C\sqrt{A}$ L/min *Where **F** is the fire flow, **C** is the Type of construction and **A** is the Total floor area*

Type of Construction: Wood Frame

C	1.5		*Type of Construction Coefficient per FUS Part II, Section 1*
A	1184.0	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	11355.1	L/min	
	11000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible	-15%	
Fire Flow	**9350.0**	**L/min**

3. Reduction for Sprinkler Protection

Non-Sprinklered	0%	
Reduction	**0**	**L/min**

4. Increase for Separation Distance

N	10.1m-20m	15%	
S	10.1m-20m	15%	
E	3.1m-10m	20%	
W	3.1m-10m	20%	
	% Increase	**70%**	*value not to exceed 75% per FUS Part II, Section 4*
	Increase	**6545.0**	**L/min**

Total Fire Flow

Fire Flow	15895.0	L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	16000.0	**L/min**	*rounded to the nearest 1,000 L/min*
	266.66667	L/s	

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by Caivan Development Corporation
-Calculations based on Fire Underwriters Survey - Part II

Boundary Conditions at 3490 Innes Rd

Information Provided:

Date provided: Nov 2016

Criteria	Demand (L/s)	
	Phase 1	Phase2
Average Demand (l/min)	438.9	725.6
Maximum Daily Demand (L/min)	1077.3	1641.1
Peak Hourly Demand (L/min)	2358.2	3506.6
Fire Flow Demand (L/s)	167, 216, 266	167, 216, 266

Location:

Results

Phase 1 - Scenario 1

		Boundary Condition (m)		
Demand Scenario	**Demand (l/min)**	**Innes Road**	**Nature Trail**	**Page Road**
Avg Day	438.9	132.7	133.4	N/A
Max Day + Fire Flow (Single/Town conforming to Technical Bulletin ISTB-2014-02)[1]	11077.3	128.2	121.0	N/A
Max Day + Fire Flow (Back-to-Back)	14077.3	127.4	116.2	N/A
Max Day + Fire Flow (Town not conforming to Technical Bulletin ISTB-2014-02[1])	17077.3	126.6	110.4	N/A
Peak Hour	2358.2	128.1	128.0	N/A

Phase 1 - Scenario 2

		Boundary Condition (m)		
Demand Scenario	**Demand (l/min)**	**Innes Road**	**Nature Trail**	**Page Road**
Avg Day	438.9	N/A	133.4	133.4
Max Day + Fire Flow (Single/Town conforming to Technical Bulletin ISTB-2014-02[1])	11077.3	N/A	120.9	127.5
Max Day + Fire Flow (Back-to-Back)	14077.3	N/A	116.2	126.4
Max Day + Fire Flow (Town not conforming to Technical Bulletin ISTB-2014-02[1])	17077.3	N/A	110.4	125.3
Peak Hour	2358.2	N/A	127.9	128.1

Phase 2 - Scenario 1

		Boundary Condition (m)		
Demand Scenario	**Demand (l/min)**	**Innes Road**	**Nature Trail**	**Page Road**
Avg Day	725.6	133.4	134.3	N/A
Max Day + Fire Flow (Single/Town conforming to Technical Bulletin ISTB-2014-02[1])	11641.1	127.9	120.4	N/A
Max Day + Fire Flow (Back-to-Back/Commercial)	14641.1	127.4	115.6	N/A
Max Day + Fire Flow (Town not conforming to Technical Bulletin ISTB-2014-02[1])	17641.1	126.4	109.6	N/A
Peak Hour	3506.6	128.0	127.7	N/A

Phase 2 - Scenario 2

		Boundary Condition (m)		
Demand Scenario	**Demand (l/min)**	**Innes Road**	**Nature Trail**	**Page Road**
Avg Day	725.6	133.5	134.3	134.2
Max Day + Fire Flow (Single/Town conforming to Technical Bulletin ISTB-2014-02[1])	11641.1	127.9	120.8	127.3
Max Day + Fire Flow (Back-to-Back/Commercial)	14641.1	127.5	116.1	126.5
Max Day + Fire Flow (Town not conforming to Technical Bulletin ISTB-2014-02[1])	17641.1	126.5	110.2	125.1
Peak Hour	3506.6	128.0	127.8	128.0

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.

FIGURE 2 - PHASE 1 BOUNDARY CONDITION LOCATIONS

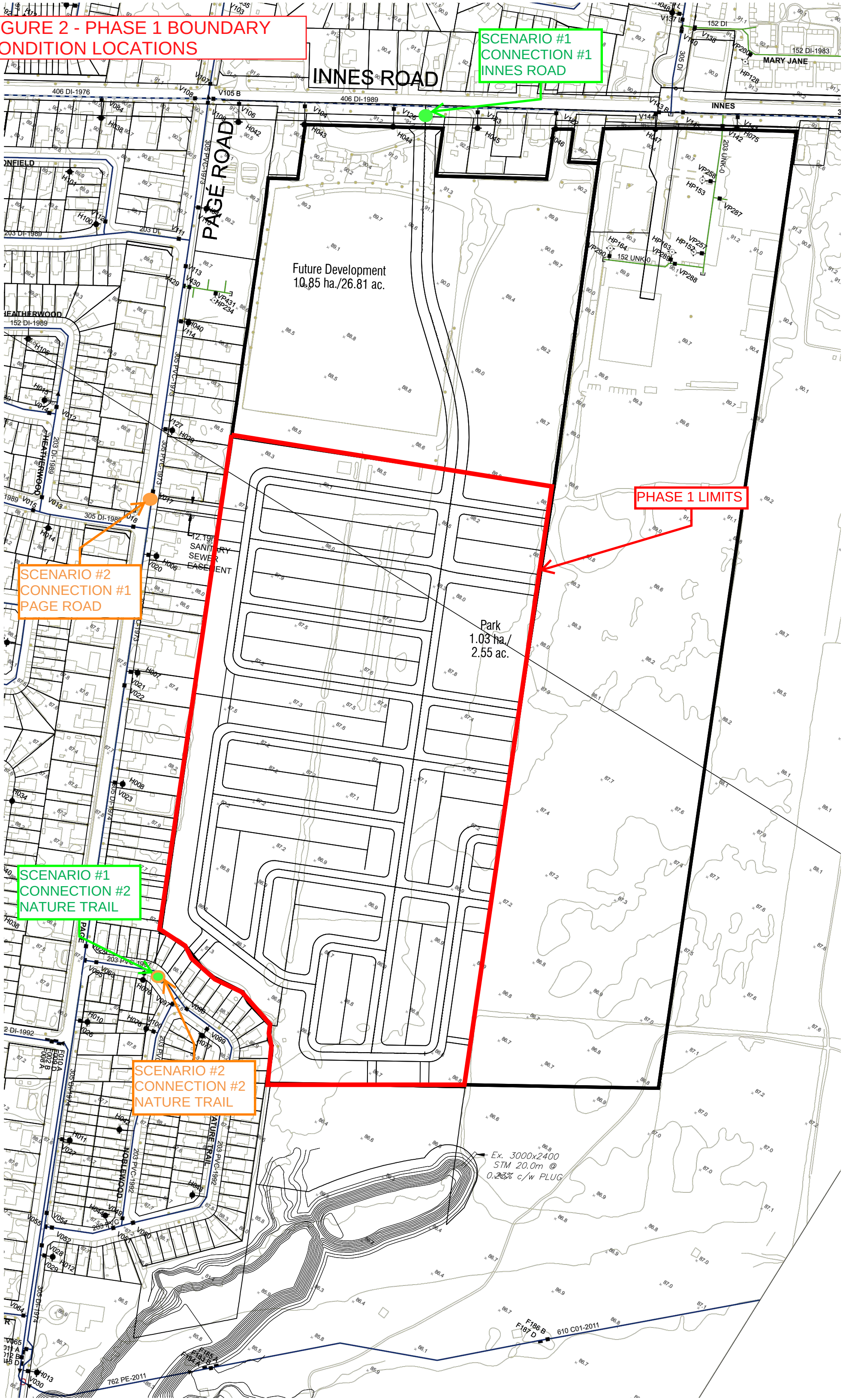
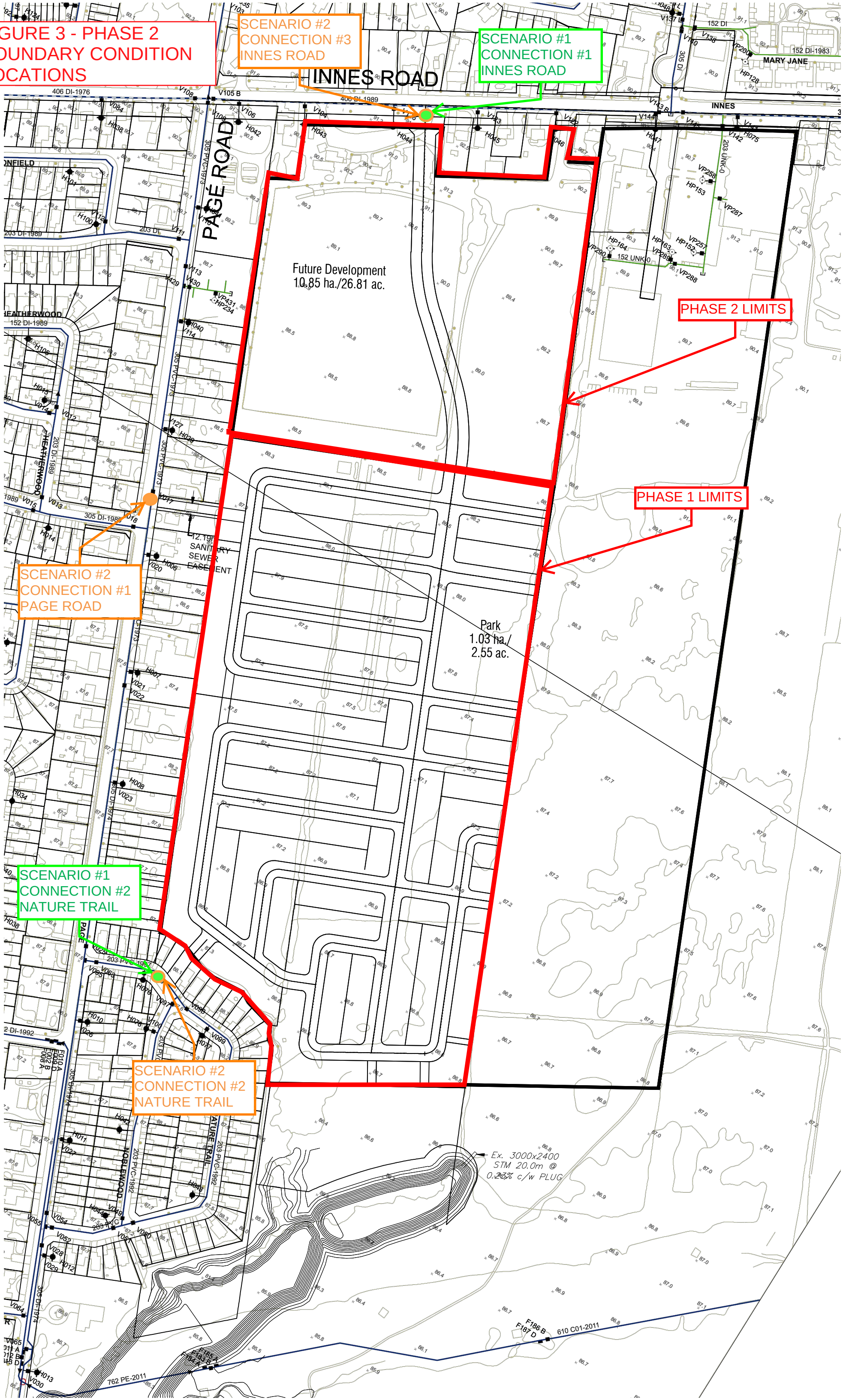


FIGURE 3 - PHASE 2 BOUNDARY CONDITION LOCATIONS



Minor Loss Coefficients

Fitting	Loss Coefficient
Globe valve, fully open	10
Angle Valve, fully open	5
Swing check valve, fully open	2.5
Gate valve, fully open	0.2
Short-radius elbow	0.9
Medium-radius elbow	0.8
Long-radius elbow	0.6
45 degree elbow	0.4
Closed return bend	2.2
Standard tee-flow through run	0.6
Standard tee- flow through branch	1.8
Square entrance	0.5
Exit	1

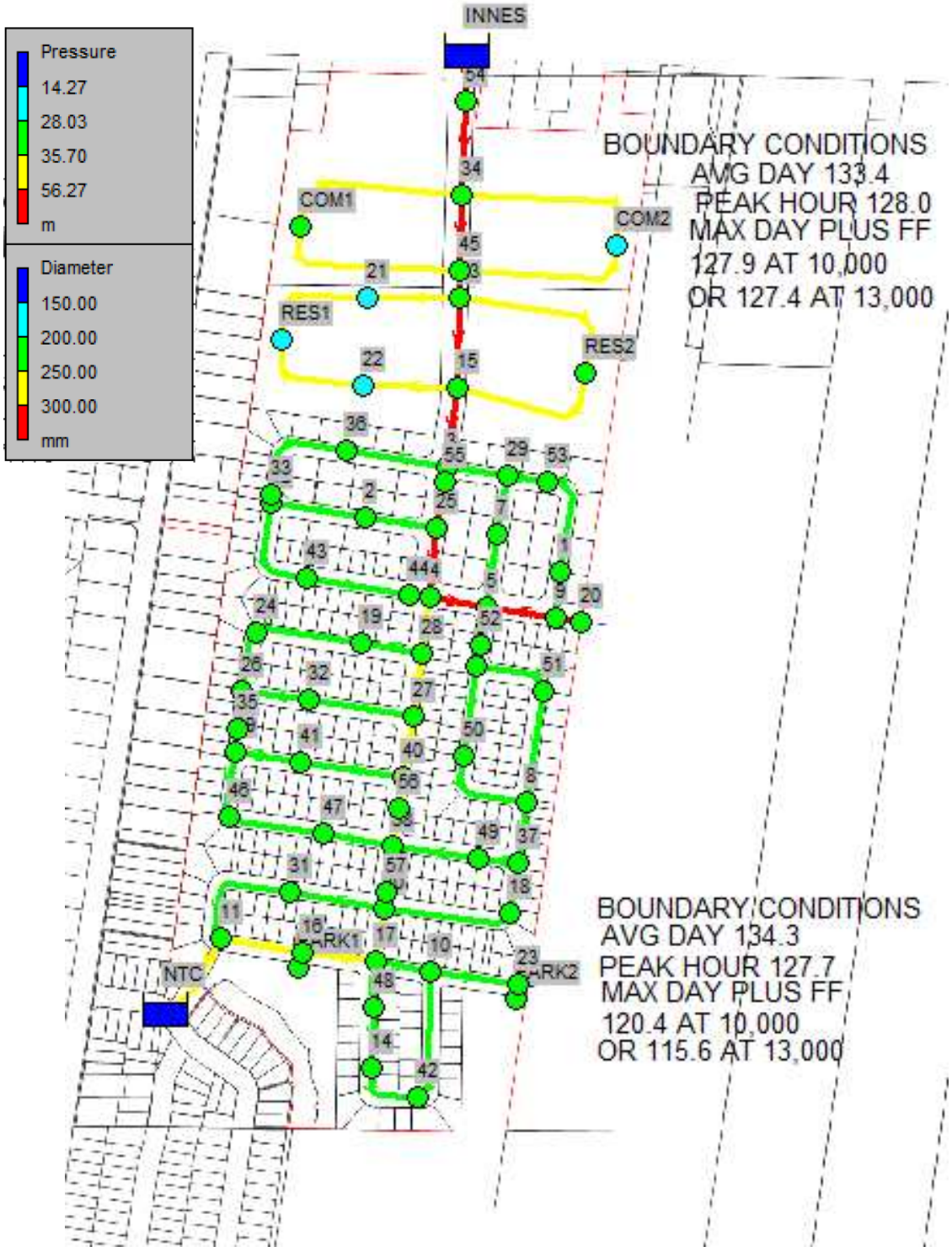
Pipe Diameter vs. "C"

Pipe Diameter (mm)	C-Factor
150	100
200 to 250	110
300 to 600	120
Over 600	130

Node Pressures

Kpa	Pressure (Kpa)	Pressure (mm H_2O)
Max	552	56.3
Rec Max	480	49.0
Rec Min	350	35.7
Min	275	28.1

AVERAGE DAY SCENARIO



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**********************************************************************
*                            E P A N E T                             *
*                     Hydraulic and Water Quality                    *
*                     Analysis for Pipe Networks                     *
*                           Version 2.0                              *
**********************************************************************
```

Input File: 2018-04-05_881_wtr-Alt1ggm.net

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
28	31	30	89.2	200
66	30	17	52.5	250
68	30	18	127.8	200
72	18	37	43.5	200
77	8	37	58.5	200
79	5	9	64.5	300
80	9	20	26.3	300
81	3	29	56.3	200
86	25	4	66.1	300
87	4	5	53.6	300
88	40	27	58.5	250
89	27	28	58.5	250
97	21	RES1	97.1	250
98	RES1	22	96.9	250
99	22	15	83.5	250
100	15	3	73.8	300
101	3	36	95.2	200
102	36	33	111.2	200
103	15	RES2	132.6	250
104	RES2	13	139.8	250
106	12	2	90.5	200
107	33	12	3.2	200
108	4	28	52.6	250
109	2	25	67.4	200
111	12	43	103.3	200
112	43	44	97.6	200
113	44	4	19.2	200
114	34	COM2	173.5	250
115	COM2	45	130.1	250
117	45	COM1	130.1	250
118	COM1	34	173.5	250

119	34	45	86.0	300
1	13	15	90	300
2	45	13	4.1	300
3	13	21	77.9	250
12	1	9	42.5	200
13	29	7	56.9	200

Page 2
Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
14	7	5	68	200
17	11	31	115.3	200
8	17	10	51.3	200
15	10	23	59.8	200
19	42	10	123.7	200
21	14	42	44.7	200
22	16	17	64.9	250
23	16	PARK1	13.3	200
24	16	11	81.7	250
27	11	NTC	115.6	250
29	23	PARK2	13.3	200
5	26	24	57.5	200
10	24	19	99.2	200
16	19	28	56.6	200
18	26	32	62.5	200
25	32	27	97.7	200
26	26	35	38	200
30	35	39	20.5	200
33	39	46	63.6	200
34	46	47	90.2	200
35	47	38	65.4	200
36	39	41	62.5	200
37	41	40	97.5	200
38	17	48	40.9	200
39	48	14	77.4	200
41	38	49	81	200
42	49	37	36.8	200
43	8	50	93.5	200
44	50	6	85	200
45	6	51	73.3	200
46	51	8	105.2	200
47	6	52	20	200
48	52	5	36.2	200
49	29	53	38.7	200

50	53	1	101.9	200
4	INNES	54	41	300
6	54	34	90	300
7	3	55	16.2	300
9	55	25	42.3	300
11	40	56	30.3	250
20	56	38	34.2	250
31	38	57	42.3	250
32	57	30	16.2	250

Page 3
Node Results at 0:00 Hrs:

Node ID	Demand LPM	Head m	Pressure m	Quality hours
3	5.74	133.49	47.44	0.00
4	5.74	133.53	47.73	0.00
5	5.74	133.53	47.51	0.00
6	5.74	133.58	47.64	0.00
10	5.74	133.83	48.53	0.00
12	5.74	133.50	47.38	0.00
PARK2	4.20	133.83	48.31	0.00
17	5.74	133.83	48.37	0.00
18	5.74	133.70	48.33	0.00
20	5.74	133.53	47.49	0.00
23	5.74	133.83	48.31	0.00
2	5.74	133.51	47.66	0.00
25	5.74	133.51	47.61	0.00
26	5.74	133.62	47.74	0.00
27	5.74	133.62	48.09	0.00
28	5.74	133.58	48.01	0.00
30	5.74	133.77	48.44	0.00
31	5.74	133.86	48.26	0.00
13	0.00	133.42	46.40	0.00
15	0.00	133.44	47.34	0.00
RES2	201.64	133.42	46.26	0.00
RES1	202.61	133.42	44.94	0.00
COM1	322.58	133.41	43.81	0.00
COM2	286.61	133.41	43.58	0.00
34	0.00	133.41	44.04	0.00
21	0.00	133.42	45.42	0.00
22	0.00	133.43	45.43	0.00
33	5.74	133.50	47.32	0.00
36	5.74	133.49	47.24	0.00
37	5.74	133.68	48.16	0.00

38	5.74	133.69	47.93	0.00
39	5.74	133.64	47.81	0.00
40	5.74	133.64	48.21	0.00
42	5.74	133.83	48.70	0.00
44	5.74	133.52	47.84	0.00
8	5.74	133.62	48.02	0.00
9	5.74	133.53	47.59	0.00
29	5.74	133.51	47.40	0.00
43	5.74	133.51	47.77	0.00
45	0.00	133.42	46.40	0.00
PARK1	5.00	133.90	48.42	0.00
1	5.74	133.52	47.29	0.00
7	5.74	133.52	47.32	0.00
11	5.74	134.00	48.48	0.00
14	5.74	133.83	48.92	0.00
16	5.74	133.90	48.42	0.00
19	5.74	133.59	47.81	0.00

Node Results at 0:00 Hrs: (continued)

Node ID	Demand LPM	Head m	Pressure m	Quality hours	
24	5.74	133.61	47.86	0.00	
32	5.74	133.62	47.94	0.00	
35	5.74	133.63	47.67	0.00	
41	5.74	133.64	47.96	0.00	
46	5.74	133.65	48.05	0.00	
47	5.74	133.67	48.07	0.00	
48	5.74	133.83	48.57	0.00	
49	5.74	133.68	48.08	0.00	
50	5.74	133.60	47.70	0.00	
51	5.74	133.60	47.82	0.00	
52	5.74	133.56	47.52	0.00	
53	5.74	133.51	47.15	0.00	
54	0.00	133.40	43.52	0.00	
55	5.74	133.49	47.26	0.00	
56	5.74	133.66	48.43	0.00	
57	5.74	133.74	48.28	0.00	
INNES	462.30	133.40	0.00	0.00	Reservoir
NTC	-1771.94	134.30	0.00	0.00	Reservoir

Link Results at 0:00 Hrs:

Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status

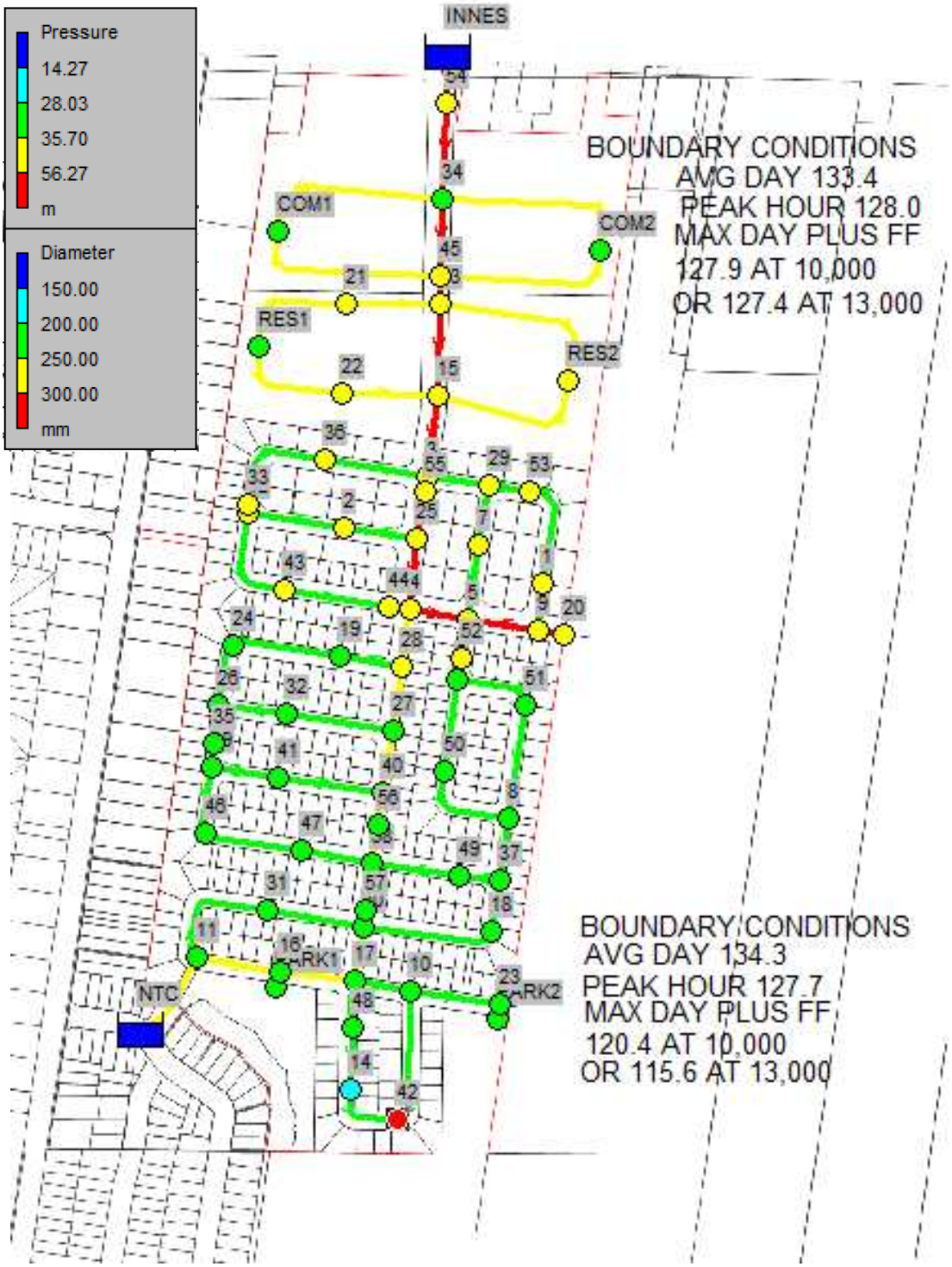
28	645.91	0.34	1.02	Open
66	-1065.17	0.36	1.09	Open
68	427.70	0.23	0.53	Open
72	421.96	0.22	0.57	Open
77	-566.87	0.30	0.94	Open
79	183.95	0.04	0.01	Open
80	5.74	0.00	0.00	Open
81	-363.89	0.19	0.41	Open
86	-981.67	0.23	0.34	Open
87	-134.11	0.03	0.01	Open
88	758.44	0.26	0.50	Open
89	817.23	0.28	0.57	Open
97	-106.78	0.04	0.01	Open
98	-309.39	0.11	0.09	Open
99	-309.39	0.11	0.09	Open
100	-1475.74	0.35	0.64	Open
101	-157.79	0.08	0.08	Open
102	-163.53	0.09	0.08	Open
103	349.33	0.12	0.11	Open
104	147.69	0.05	0.02	Open
106	-4.65	0.00	0.00	Open
107	-169.27	0.09	0.39	Open
108	-1035.14	0.35	1.04	Open

Link Results at 0:00 Hrs: (continued)

Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status
109	-10.39	0.01	0.00	Open
111	-170.36	0.09	0.10	Open
112	-176.10	0.09	0.09	Open
113	-181.84	0.10	0.16	Open
114	29.88	0.01	0.00	Open
115	-256.73	0.09	0.06	Open
117	265.04	0.09	0.07	Open
118	-57.54	0.02	0.00	Open
119	-549.71	0.13	0.10	Open
1	-817.01	0.19	0.21	Open
2	-1071.49	0.25	0.78	Open
3	-106.78	0.04	0.01	Open
12	-172.47	0.09	0.09	Open
13	-208.64	0.11	0.15	Open
14	-214.38	0.11	0.13	Open
17	651.65	0.35	1.21	Open

8	18.60	0.01	0.00	Open
15	9.94	0.01	0.00	Open
19	-2.92	0.00	0.00	Open
21	2.82	0.00	0.00	Open
22	1103.81	0.37	1.19	Open
23	5.00	0.00	0.00	Open
24	-1114.55	0.38	1.17	Open
27	-1771.94	0.60	2.61	Open
29	4.20	0.00	0.00	Open
5	235.14	0.12	0.19	Open
10	229.40	0.12	0.16	Open
16	223.66	0.12	0.17	Open
18	70.26	0.04	0.02	Open
25	64.52	0.03	0.02	Open
26	-311.14	0.17	0.35	Open
30	-316.88	0.17	0.44	Open
33	-245.01	0.13	0.21	Open
34	-250.75	0.13	0.20	Open
35	-256.49	0.14	0.22	Open
36	-77.61	0.04	0.02	Open
37	-83.35	0.04	0.03	Open
38	14.30	0.01	0.00	Open
39	8.56	0.00	0.00	Open
41	156.39	0.08	0.08	Open
42	150.65	0.08	0.09	Open
43	282.96	0.15	0.25	Open
44	277.22	0.15	0.22	Open
45	-272.44	0.14	0.24	Open
46	-278.18	0.15	0.23	Open
47	543.91	0.29	0.87	Open
48	538.17	0.29	0.93	Open

MAX DAY + FIRE FLOW 10,000 L/min @ 42



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**********************************************************************
*                            E P A N E T                             *
*                     Hydraulic and Water Quality                    *
*                     Analysis for Pipe Networks                     *
*                           Version 2.0                              *
**********************************************************************
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Input File: 2018-04-05_881_wtr-Alt1ggm.net

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
28	31	30	89.2	200
66	30	17	52.5	250
68	30	18	127.8	200
72	18	37	43.5	200
77	8	37	58.5	200
79	5	9	64.5	300
80	9	20	26.3	300
81	3	29	56.3	200
86	25	4	66.1	300
87	4	5	53.6	300
88	40	27	58.5	250
89	27	28	58.5	250
97	21	RES1	97.1	250
98	RES1	22	96.9	250
99	22	15	83.5	250
100	15	3	73.8	300
101	3	36	95.2	200
102	36	33	111.2	200
103	15	RES2	132.6	250
104	RES2	13	139.8	250
106	12	2	90.5	200
107	33	12	3.2	200
108	4	28	52.6	250
109	2	25	67.4	200
111	12	43	103.3	200
112	43	44	97.6	200
113	44	4	19.2	200
114	34	COM2	173.5	250
115	COM2	45	130.1	250
117	45	COM1	130.1	250
118	COM1	34	173.5	250

119	34	45	86.0	300
1	13	15	90	300
2	45	13	4.1	300
3	13	21	77.9	250
12	1	9	42.5	200
13	29	7	56.9	200

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
14	7	5	68	200
17	11	31	115.3	200
8	17	10	51.3	200
15	10	23	59.8	200
19	42	10	123.7	200
21	14	42	44.7	200
22	16	17	64.9	250
23	16	PARK1	13.3	200
24	16	11	81.7	250
27	11	NTC	115.6	250
29	23	PARK2	13.3	200
5	26	24	57.5	200
10	24	19	99.2	200
16	19	28	56.6	200
18	26	32	62.5	200
25	32	27	97.7	200
26	26	35	38	200
30	35	39	20.5	200
33	39	46	63.6	200
34	46	47	90.2	200
35	47	38	65.4	200
36	39	41	62.5	200
37	41	40	97.5	200
38	17	48	40.9	200
39	48	14	77.4	200
41	38	49	81	200
42	49	37	36.8	200
43	8	50	93.5	200
44	50	6	85	200
45	6	51	73.3	200
46	51	8	105.2	200
47	6	52	20	200
48	52	5	36.2	200
49	29	53	38.7	200

50	53	1	101.9	200
4	INNES	54	41	300
6	54	34	90	300
7	3	55	16.2	300
9	55	25	42.3	300
11	40	56	30.3	250
20	56	38	34.2	250
31	38	57	42.3	250
32	57	30	16.2	250

Node Results at 0:00 Hrs:

Node ID	Demand LPM	Head m	Pressure m	Quality hours
3	14.35	122.95	36.90	0.00
4	14.35	122.27	36.47	0.00
5	14.35	122.26	36.24	0.00
6	14.35	121.49	35.55	0.00
10	14.35	114.75	29.45	0.00
12	14.35	122.63	36.51	0.00
PARK2	6.40	114.75	29.23	0.00
17	14.35	117.43	31.97	0.00
18	14.35	119.90	34.53	0.00
20	14.35	122.27	36.23	0.00
23	14.35	114.75	29.23	0.00
2	14.35	122.63	36.78	0.00
25	14.35	122.63	36.73	0.00
26	14.35	120.93	35.05	0.00
27	14.35	120.98	35.45	0.00
28	14.35	121.45	35.88	0.00
30	14.35	119.11	33.78	0.00
31	14.35	119.12	33.52	0.00
13	0.00	124.28	37.26	0.00
15	0.00	123.79	37.69	0.00
RES2	504.10	123.94	36.78	0.00
RES1	506.53	123.94	35.46	0.00
COM1	750.85	124.57	34.97	0.00
COM2	667.14	124.58	34.75	0.00
34	0.00	125.05	35.68	0.00
21	0.00	124.12	36.12	0.00
22	0.00	123.86	35.86	0.00
33	14.35	122.65	36.47	0.00
36	14.35	122.81	36.56	0.00
37	14.35	120.20	34.68	0.00

38	14.35	120.08	34.32	0.00
39	14.35	120.63	34.80	0.00
40	14.35	120.59	35.16	0.00
42	10014.35	107.96	22.83	0.00
44	14.35	122.32	36.64	0.00
8	14.35	120.91	35.31	0.00
9	14.35	122.27	36.33	0.00
29	14.35	122.53	36.42	0.00
43	14.35	122.46	36.72	0.00
45	0.00	124.43	37.41	0.00
PARK1	7.50	118.19	32.71	0.00
1	14.35	122.32	36.09	0.00
7	14.35	122.40	36.20	0.00
11	14.35	119.12	33.60	0.00
14	14.35	110.44	25.53	0.00
16	14.35	118.19	32.71	0.00
19	14.35	121.29	35.51	0.00

Node Results at 0:00 Hrs: (continued)

Node ID	Demand LPM	Head m	Pressure m	Quality hours	
24	14.35	121.07	35.32	0.00	
32	14.35	120.95	35.27	0.00	
35	14.35	120.75	34.79	0.00	
41	14.35	120.61	34.93	0.00	
46	14.35	120.46	34.86	0.00	
47	14.35	120.24	34.64	0.00	
48	14.35	114.67	29.41	0.00	
49	14.35	120.16	34.56	0.00	
50	14.35	121.23	35.33	0.00	
51	14.35	121.24	35.46	0.00	
52	14.35	121.74	35.70	0.00	
53	14.35	122.47	36.11	0.00	
54	0.00	126.72	36.84	0.00	
55	14.35	122.85	36.62	0.00	
56	14.35	120.35	35.12	0.00	
57	14.35	119.41	33.95	0.00	
INNES	-9325.16	127.90	0.00	0.00	Reservoir
NTC	-3834.86	120.40	0.00	0.00	Reservoir

Link Results at 0:00 Hrs:

Link ID	Flow LPM	Velocity m/s	Unit Headloss m/km	Status

28	78.98	0.04	0.02	Open
66	6387.17	2.17	32.11	Open
68	-1590.42	0.84	6.13	Open
72	-1604.77	0.85	7.02	Open
77	2218.90	1.18	12.17	Open
79	-689.17	0.16	0.15	Open
80	14.35	0.00	0.00	Open
81	1693.65	0.90	7.38	Open
86	4319.81	1.02	5.49	Open
87	697.45	0.16	0.15	Open
88	-3036.64	1.03	6.58	Open
89	-3377.68	1.15	8.03	Open
97	1532.03	0.52	1.81	Open
98	1025.50	0.35	0.86	Open
99	1025.50	0.35	0.81	Open
100	6896.54	1.63	11.47	Open
101	763.06	0.40	1.46	Open
102	748.71	0.40	1.39	Open
103	-1200.24	0.41	1.13	Open
104	-1704.34	0.58	2.39	Open
106	-62.63	0.03	0.02	Open
107	734.36	0.39	7.09	Open
108	4361.94	1.48	15.61	Open

Link Results at 0:00 Hrs: (continued)

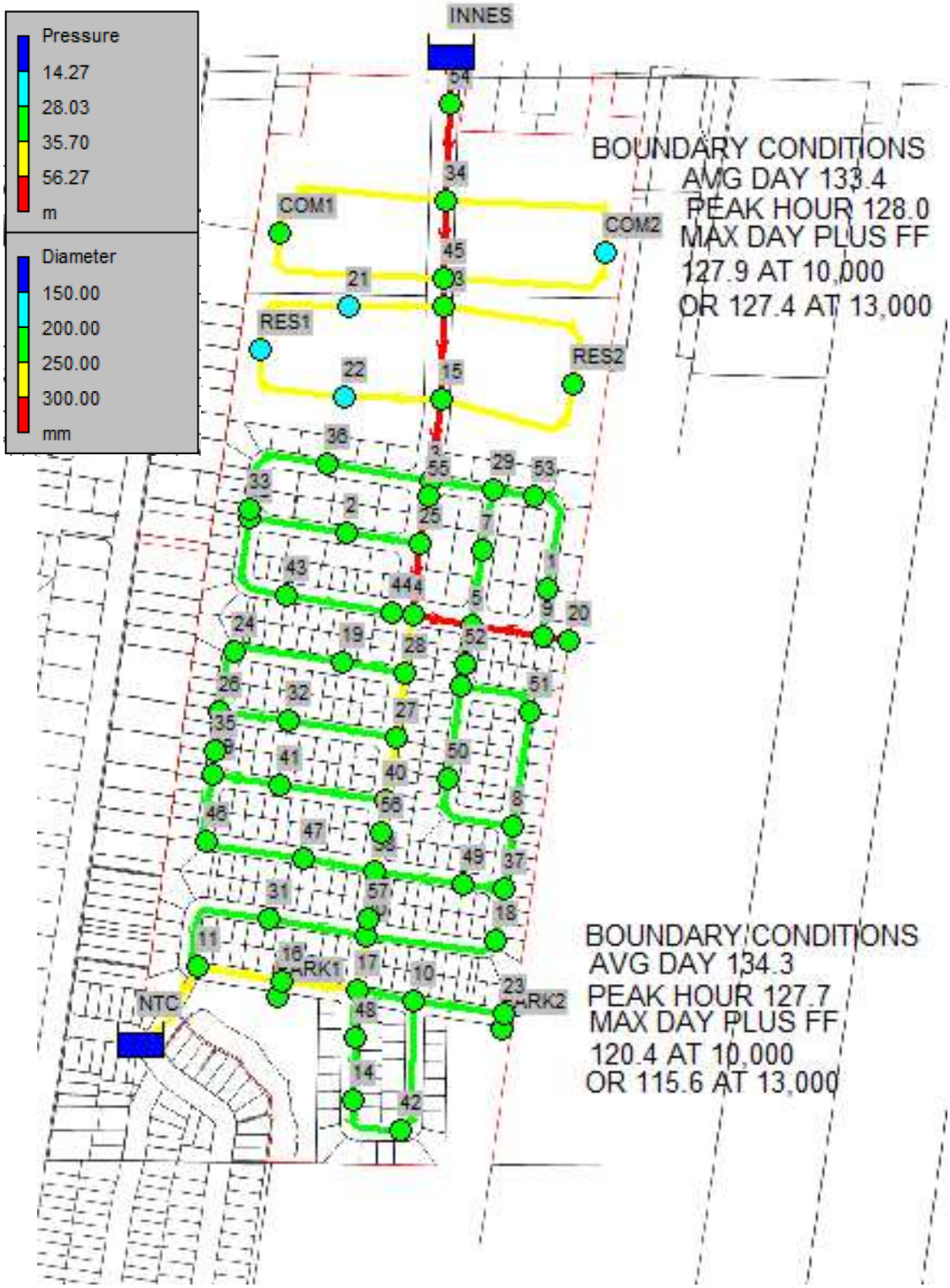
Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status
109	-76.98	0.04	0.02	Open
111	782.63	0.42	1.67	Open
112	768.28	0.41	1.45	Open
113	753.93	0.40	2.37	Open
114	1853.26	0.63	2.72	Open
115	1186.12	0.40	1.11	Open
117	-1128.87	0.38	1.01	Open
118	-1879.72	0.64	2.79	Open
119	5592.18	1.32	7.16	Open
1	4670.80	1.10	5.37	Open
2	7907.17	1.86	38.34	Open
3	1532.03	0.52	2.02	Open
12	717.87	0.38	1.24	Open
13	932.73	0.49	2.40	Open
14	918.38	0.49	1.95	Open
17	93.33	0.05	0.03	Open

8	5155.12	2.73	52.10	Open
15	20.75	0.01	0.00	Open
19	-5120.02	2.72	54.94	Open
21	4894.33	2.60	55.57	Open
22	3705.33	1.26	11.70	Open
23	7.50	0.00	0.00	Open
24	-3727.18	1.27	11.41	Open
27	-3834.86	1.30	11.08	Open
29	6.40	0.00	0.00	Open
5	-941.21	0.50	2.53	Open
10	-955.56	0.51	2.23	Open
16	-969.91	0.51	2.73	Open
18	-312.35	0.17	0.32	Open
25	-326.70	0.17	0.33	Open
26	1239.21	0.66	4.79	Open
30	1224.86	0.65	5.85	Open
33	955.00	0.51	2.67	Open
34	940.65	0.50	2.43	Open
35	926.30	0.49	2.43	Open
36	255.51	0.14	0.22	Open
37	241.16	0.13	0.18	Open
38	4923.03	2.61	67.48	Open
39	4908.68	2.60	54.59	Open
41	-585.43	0.31	0.99	Open
42	-599.78	0.32	1.22	Open
43	-1127.91	0.60	3.36	Open
44	-1142.26	0.61	3.06	Open
45	1119.68	0.59	3.45	Open
46	1105.33	0.59	3.05	Open
47	-2276.29	1.21	12.71	Open
48	-2290.65	1.22	14.35	Open

Link Results at 0:00 Hrs: (continued)

Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status
49	746.57	0.40	1.70	Open
50	732.22	0.39	1.39	Open
4	9325.16	2.20	28.88	Open
6	9325.16	2.20	18.51	Open
7	4425.48	1.04	6.30	Open
9	4411.13	1.04	5.00	Open
11	3263.45	1.11	8.13	Open
20	3249.10	1.10	7.92	Open
31	4746.47	1.61	15.66	Open

MAX DAY + FIRE FLOW 13,000 L/min @ RES1



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**********************************************************************
*                            E P A N E T                             *
*                     Hydraulic and Water Quality                    *
*                     Analysis for Pipe Networks                     *
*                           Version 2.0                              *
**********************************************************************
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Input File: 2018-04-05_881_wtr-Alt1ggm.net

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
28	31	30	89.2	200
66	30	17	52.5	250
68	30	18	127.8	200
72	18	37	43.5	200
77	8	37	58.5	200
79	5	9	64.5	300
80	9	20	26.3	300
81	3	29	56.3	200
86	25	4	66.1	300
87	4	5	53.6	300
88	40	27	58.5	250
89	27	28	58.5	250
97	21	RES1	97.1	250
98	RES1	22	96.9	250
99	22	15	83.5	250
100	15	3	73.8	300
101	3	36	95.2	200
102	36	33	111.2	200
103	15	RES2	132.6	250
104	RES2	13	139.8	250
106	12	2	90.5	200
107	33	12	3.2	200
108	4	28	52.6	250
109	2	25	67.4	200
111	12	43	103.3	200
112	43	44	97.6	200
113	44	4	19.2	200
114	34	COM2	173.5	250
115	COM2	45	130.1	250
117	45	COM1	130.1	250
118	COM1	34	173.5	250

119	34	45	86.0	300
1	13	15	90	300
2	45	13	4.1	300
3	13	21	77.9	250
12	1	9	42.5	200
13	29	7	56.9	200

Page 2
Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
14	7	5	68	200
17	11	31	115.3	200
8	17	10	51.3	200
15	10	23	59.8	200
19	42	10	123.7	200
21	14	42	44.7	200
22	16	17	64.9	250
23	16	PARK1	13.3	200
24	16	11	81.7	250
27	11	NTC	115.6	250
29	23	PARK2	13.3	200
5	26	24	57.5	200
10	24	19	99.2	200
16	19	28	56.6	200
18	26	32	62.5	200
25	32	27	97.7	200
26	26	35	38	200
30	35	39	20.5	200
33	39	46	63.6	200
34	46	47	90.2	200
35	47	38	65.4	200
36	39	41	62.5	200
37	41	40	97.5	200
38	17	48	40.9	200
39	48	14	77.4	200
41	38	49	81	200
42	49	37	36.8	200
43	8	50	93.5	200
44	50	6	85	200
45	6	51	73.3	200
46	51	8	105.2	200
47	6	52	20	200
48	52	5	36.2	200
49	29	53	38.7	200

50	53	1	101.9	200
4	INNES	54	41	300
6	54	34	90	300
7	3	55	16.2	300
9	55	25	42.3	300
11	40	56	30.3	250
20	56	38	34.2	250
31	38	57	42.3	250
32	57	30	16.2	250

Node Results at 0:00 Hrs:

Node ID	Demand LPM	Head m	Pressure m	Quality hours
3	14.35	115.71	29.66	0.00
4	14.35	115.69	29.89	0.00
5	14.35	115.69	29.67	0.00
6	14.35	115.67	29.73	0.00
10	14.35	115.63	30.33	0.00
12	14.35	115.70	29.58	0.00
PARK2	6.40	115.63	30.11	0.00
17	14.35	115.63	30.17	0.00
18	14.35	115.65	30.28	0.00
20	14.35	115.69	29.65	0.00
23	14.35	115.63	30.11	0.00
2	14.35	115.70	29.85	0.00
25	14.35	115.70	29.80	0.00
26	14.35	115.66	29.78	0.00
27	14.35	115.66	30.13	0.00
28	14.35	115.67	30.10	0.00
30	14.35	115.64	30.31	0.00
31	14.35	115.63	30.03	0.00
13	0.00	116.53	29.51	0.00
15	0.00	115.74	29.64	0.00
RES2	504.10	116.01	28.85	0.00
RES1	13506.53	110.96	22.48	0.00
COM1	750.85	117.65	28.05	0.00
COM2	667.14	117.68	27.85	0.00
34	0.00	118.97	29.60	0.00
21	0.00	113.87	25.87	0.00
22	0.00	113.62	25.62	0.00
33	14.35	115.70	29.52	0.00
36	14.35	115.71	29.46	0.00
37	14.35	115.65	30.13	0.00

38	14.35	115.65	29.89	0.00	
39	14.35	115.66	29.83	0.00	
40	14.35	115.66	30.23	0.00	
42	14.35	115.63	30.50	0.00	
44	14.35	115.69	30.01	0.00	
8	14.35	115.66	30.06	0.00	
9	14.35	115.69	29.75	0.00	
29	14.35	115.70	29.59	0.00	
43	14.35	115.70	29.96	0.00	
45	0.00	117.09	30.07	0.00	
PARK1	7.50	115.63	30.15	0.00	
1	14.35	115.69	29.46	0.00	
7	14.35	115.69	29.49	0.00	
11	14.35	115.62	30.10	0.00	
14	14.35	115.63	30.72	0.00	
16	14.35	115.63	30.15	0.00	
19	14.35	115.67	29.89	0.00	

Node Results at 0:00 Hrs: (continued)

Node ID	Demand LPM	Head m	Pressure m	Quality hours	
24	14.35	115.66	29.91	0.00	
32	14.35	115.66	29.98	0.00	
35	14.35	115.66	29.70	0.00	
41	14.35	115.66	29.98	0.00	
46	14.35	115.65	30.05	0.00	
47	14.35	115.65	30.05	0.00	
48	14.35	115.63	30.37	0.00	
49	14.35	115.65	30.05	0.00	
50	14.35	115.67	29.77	0.00	
51	14.35	115.67	29.89	0.00	
52	14.35	115.68	29.64	0.00	
53	14.35	115.70	29.34	0.00	
54	0.00	123.84	33.96	0.00	
55	14.35	115.71	29.48	0.00	
56	14.35	115.65	30.42	0.00	
57	14.35	115.64	30.18	0.00	
INNES	-16568.39	127.40	0.00	0.00	Reservoir
NTC	408.37	115.60	0.00	0.00	Reservoir

Link Results at 0:00 Hrs:

Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status

28	-181.59	0.10	0.10	Open
66	369.83	0.13	0.15	Open
68	-143.27	0.08	0.07	Open
72	-157.62	0.08	0.09	Open
77	242.22	0.13	0.19	Open
79	-61.94	0.01	0.00	Open
80	14.35	0.00	0.00	Open
81	272.62	0.14	0.24	Open
86	648.34	0.15	0.15	Open
87	141.79	0.03	0.01	Open
88	-350.31	0.12	0.12	Open
89	-426.60	0.14	0.17	Open
97	6912.03	2.35	29.97	Open
98	-6594.50	2.24	27.46	Open
99	-6594.50	2.24	25.35	Open
100	1139.77	0.27	0.39	Open
101	132.90	0.07	0.06	Open
102	118.55	0.06	0.05	Open
103	-1654.92	0.56	2.06	Open
104	-2159.02	0.73	3.71	Open
106	-28.51	0.02	0.00	Open
107	104.20	0.06	0.15	Open
108	581.85	0.20	0.35	Open

Link Results at 0:00 Hrs: (continued)

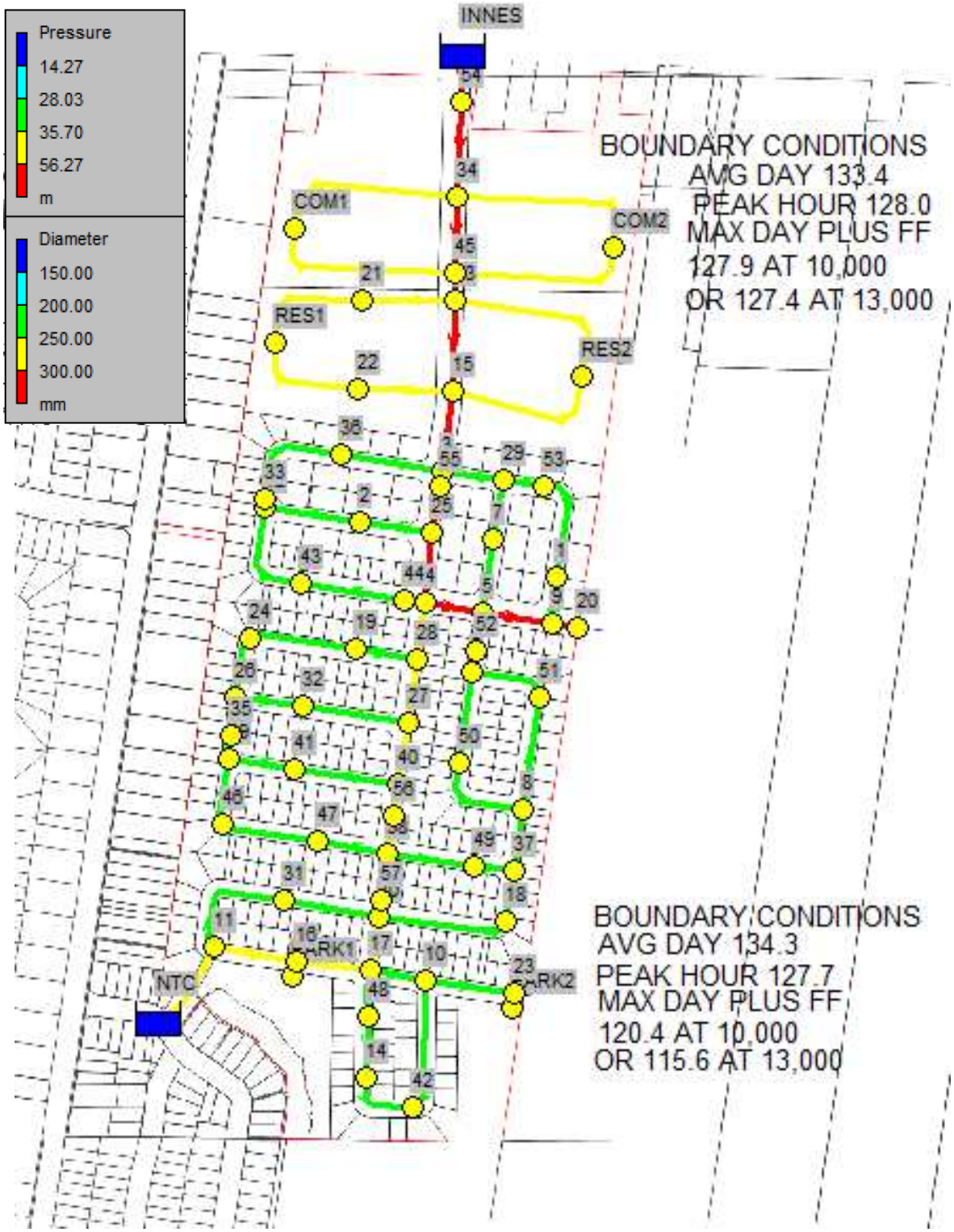
Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status
109	-42.86	0.02	0.01	Open
111	118.36	0.06	0.05	Open
112	104.01	0.06	0.04	Open
113	89.66	0.05	0.04	Open
114	3183.15	1.08	7.47	Open
115	2516.01	0.85	4.48	Open
117	-2462.32	0.84	4.31	Open
118	-3213.17	1.09	7.60	Open
119	10172.07	2.40	21.86	Open
1	6079.35	1.43	8.80	Open
2	15150.40	3.57	136.56	Open
3	6912.03	2.35	34.14	Open
12	90.64	0.05	0.03	Open
13	138.94	0.07	0.07	Open
14	124.59	0.07	0.05	Open
17	-167.24	0.09	0.10	Open

8	43.61	0.02	0.01	Open
15	20.75	0.01	0.00	Open
19	-8.51	0.00	0.00	Open
21	5.84	0.00	0.00	Open
22	-277.33	0.09	0.09	Open
23	7.50	0.00	0.00	Open
24	255.48	0.09	0.07	Open
27	408.37	0.14	0.17	Open
29	6.40	0.00	0.00	Open
5	-112.21	0.06	0.05	Open
10	-126.56	0.07	0.05	Open
16	-140.91	0.07	0.07	Open
18	-47.59	0.03	0.01	Open
25	-61.94	0.03	0.01	Open
26	145.45	0.08	0.08	Open
30	131.10	0.07	0.08	Open
33	105.62	0.06	0.04	Open
34	91.27	0.05	0.03	Open
35	76.92	0.04	0.02	Open
36	11.12	0.01	0.00	Open
37	-3.23	0.00	0.00	Open
38	34.54	0.02	0.01	Open
39	20.19	0.01	0.00	Open
41	-55.90	0.03	0.01	Open
42	-70.25	0.04	0.02	Open
43	-129.16	0.07	0.06	Open
44	-143.51	0.08	0.06	Open
45	141.76	0.08	0.07	Open
46	127.41	0.07	0.05	Open
47	-299.62	0.16	0.28	Open
48	-313.97	0.17	0.34	Open

Link Results at 0:00 Hrs: (continued)

Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status
49	119.34	0.06	0.05	Open
50	104.99	0.06	0.04	Open
4	16568.39	3.91	86.82	Open
6	16568.39	3.91	54.08	Open
7	719.90	0.17	0.20	Open
9	705.55	0.17	0.16	Open
11	332.73	0.11	0.11	Open
20	318.38	0.11	0.10	Open
31	436.85	0.15	0.18	Open

PEAK HOUR SCENARIO



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**********************************************************************
*                            E P A N E T                             *
*                     Hydraulic and Water Quality                    *
*                     Analysis for Pipe Networks                     *
*                           Version 2.0                              *
**********************************************************************

Input File: 2018-04-05_881_wtr-Alt1ggm.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
28	31	30	89.2	200
66	30	17	52.5	250
68	30	18	127.8	200
72	18	37	43.5	200
77	8	37	58.5	200
79	5	9	64.5	300
80	9	20	26.3	300
81	3	29	56.3	200
86	25	4	66.1	300
87	4	5	53.6	300
88	40	27	58.5	250
89	27	28	58.5	250
97	21	RES1	97.1	250
98	RES1	22	96.9	250
99	22	15	83.5	250
100	15	3	73.8	300
101	3	36	95.2	200
102	36	33	111.2	200
103	15	RES2	132.6	250
104	RES2	13	139.8	250
106	12	2	90.5	200
107	33	12	3.2	200
108	4	28	52.6	250
109	2	25	67.4	200
111	12	43	103.3	200
112	43	44	97.6	200
113	44	4	19.2	200
114	34	COM2	173.5	250
115	COM2	45	130.1	250
117	45	COM1	130.1	250
118	COM1	34	173.5	250

119	34	45	86.0	300
1	13	15	90	300
2	45	13	4.1	300
3	13	21	77.9	250
12	1	9	42.5	200
13	29	7	56.9	200

Page 2
Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
14	7	5	68	200
17	11	31	115.3	200
8	17	10	51.3	200
15	10	23	59.8	200
19	42	10	123.7	200
21	14	42	44.7	200
22	16	17	64.9	250
23	16	PARK1	13.3	200
24	16	11	81.7	250
27	11	NTC	115.6	250
29	23	PARK2	13.3	200
5	26	24	57.5	200
10	24	19	99.2	200
16	19	28	56.6	200
18	26	32	62.5	200
25	32	27	97.7	200
26	26	35	38	200
30	35	39	20.5	200
33	39	46	63.6	200
34	46	47	90.2	200
35	47	38	65.4	200
36	39	41	62.5	200
37	41	40	97.5	200
38	17	48	40.9	200
39	48	14	77.4	200
41	38	49	81	200
42	49	37	36.8	200
43	8	50	93.5	200
44	50	6	85	200
45	6	51	73.3	200
46	51	8	105.2	200
47	6	52	20	200
48	52	5	36.2	200
49	29	53	38.7	200

50	53	1	101.9	200
4	INNES	54	41	300
6	54	34	90	300
7	3	55	16.2	300
9	55	25	42.3	300
11	40	56	30.3	250
20	56	38	34.2	250
31	38	57	42.3	250
32	57	30	16.2	250

Node Results at 0:00 Hrs:

Node ID	Demand LPM	Head m	Pressure m	Quality hours
3	31.57	126.95	40.90	0.00
4	31.57	126.96	41.16	0.00
5	31.57	126.96	40.94	0.00
6	31.57	126.97	41.03	0.00
10	31.57	127.15	41.85	0.00
12	31.57	126.95	40.83	0.00
PARK2	11.50	127.15	41.63	0.00
17	31.57	127.15	41.69	0.00
18	31.57	127.05	41.68	0.00
20	31.57	126.95	40.91	0.00
23	31.57	127.15	41.63	0.00
2	31.57	126.95	41.10	0.00
25	31.57	126.95	41.05	0.00
26	31.57	126.99	41.11	0.00
27	31.57	126.99	41.46	0.00
28	31.57	126.97	41.40	0.00
30	31.57	127.10	41.77	0.00
31	31.57	127.20	41.60	0.00
13	0.00	126.96	39.94	0.00
15	0.00	126.95	40.85	0.00
RES2	1109.01	126.92	39.76	0.00
RES1	1114.36	126.90	38.42	0.00
COM1	1618.50	126.94	37.34	0.00
COM2	1438.07	126.96	37.13	0.00
34	0.00	127.13	37.76	0.00
21	0.00	126.93	38.93	0.00
22	0.00	126.93	38.93	0.00
33	31.57	126.95	40.77	0.00
36	31.57	126.95	40.70	0.00
37	31.57	127.03	41.51	0.00

38	31.57	127.03	41.27	0.00
39	31.57	127.00	41.17	0.00
40	31.57	127.00	41.57	0.00
42	31.57	127.15	42.02	0.00
44	31.57	126.95	41.27	0.00
8	31.57	126.99	41.39	0.00
9	31.57	126.95	41.01	0.00
29	31.57	126.95	40.84	0.00
43	31.57	126.95	41.21	0.00
45	0.00	126.97	39.95	0.00
PARK1	13.40	127.24	41.76	0.00
1	31.57	126.95	40.72	0.00
7	31.57	126.95	40.75	0.00
11	31.57	127.35	41.83	0.00
14	31.57	127.15	42.24	0.00
16	31.57	127.24	41.76	0.00
19	31.57	126.98	41.20	0.00

Node Results at 0:00 Hrs: (continued)

Node ID	Demand LPM	Head m	Pressure m	Quality hours	
24	31.57	126.98	41.23	0.00	
32	31.57	126.99	41.31	0.00	
35	31.57	126.99	41.03	0.00	
41	31.57	127.00	41.32	0.00	
46	31.57	127.01	41.41	0.00	
47	31.57	127.02	41.42	0.00	
48	31.57	127.15	41.89	0.00	
49	31.57	127.03	41.43	0.00	
50	31.57	126.98	41.08	0.00	
51	31.57	126.98	41.20	0.00	
52	31.57	126.97	40.93	0.00	
53	31.57	126.95	40.59	0.00	
54	0.00	127.65	37.77	0.00	
55	31.57	126.95	40.72	0.00	
56	31.57	127.02	41.79	0.00	
57	31.57	127.08	41.62	0.00	
INNES	-4959.37	128.00	0.00	0.00	Reservoir
NTC	-1923.97	127.70	0.00	0.00	Reservoir

Link Results at 0:00 Hrs:

Link ID	Flow LPM	Velocity m/s	Unit Headloss m/km	Status

28	651.35	0.35	1.03	Open
66	-963.59	0.33	0.91	Open
68	395.22	0.21	0.46	Open
72	363.65	0.19	0.43	Open
77	-440.38	0.23	0.59	Open
79	165.37	0.04	0.01	Open
80	31.57	0.01	0.00	Open
81	-89.07	0.05	0.03	Open
86	-394.04	0.09	0.06	Open
87	27.53	0.01	0.00	Open
88	560.39	0.19	0.28	Open
89	504.84	0.17	0.23	Open
97	595.50	0.20	0.31	Open
98	-518.86	0.18	0.24	Open
99	-518.86	0.18	0.23	Open
100	-320.57	0.08	0.04	Open
101	5.12	0.00	0.00	Open
102	-26.45	0.01	0.00	Open
103	517.94	0.18	0.24	Open
104	-591.07	0.20	0.33	Open
106	-31.14	0.02	0.00	Open
107	-58.02	0.03	0.05	Open
108	-574.73	0.20	0.34	Open

Page 5
Link Results at 0:00 Hrs: (continued)

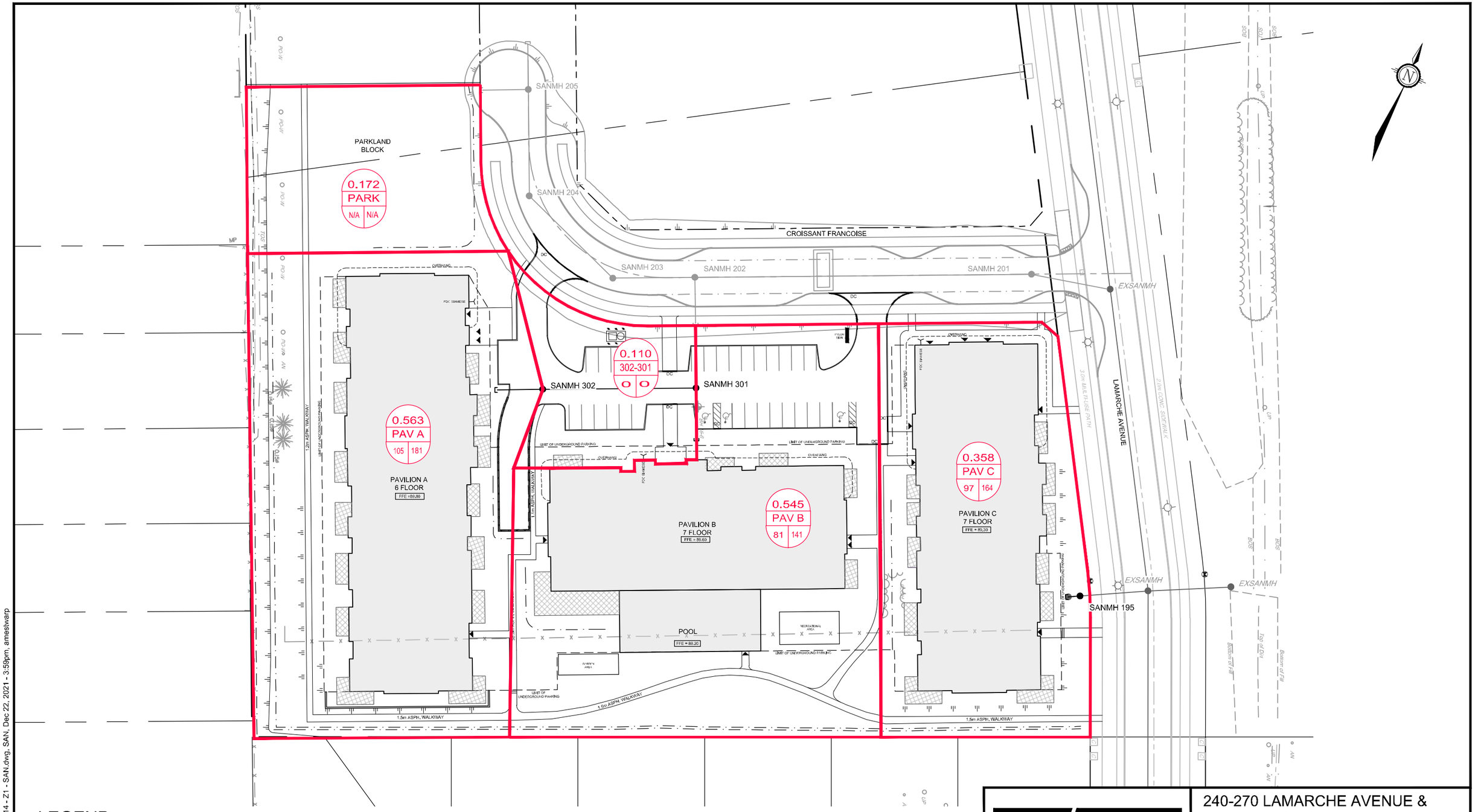
Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status
109	-62.71	0.03	0.02	Open
111	-58.45	0.03	0.01	Open
112	-90.02	0.05	0.03	Open
113	-121.59	0.06	0.07	Open
114	1094.02	0.37	1.02	Open
115	-344.05	0.12	0.11	Open
117	482.97	0.16	0.21	Open
118	-1135.53	0.39	1.09	Open
119	2729.83	0.64	1.88	Open
1	716.23	0.17	0.16	Open
2	1902.80	0.45	2.39	Open
3	595.50	0.20	0.34	Open
12	-102.23	0.05	0.03	Open
13	-81.54	0.04	0.03	Open
14	-113.11	0.06	0.04	Open
17	682.92	0.36	1.32	Open

8	94.15	0.05	0.03	Open
15	43.07	0.02	0.01	Open
19	-19.51	0.01	0.00	Open
21	12.06	0.01	0.00	Open
22	1164.51	0.40	1.32	Open
23	13.40	0.01	0.00	Open
24	-1209.48	0.41	1.37	Open
27	-1923.97	0.65	3.04	Open
29	11.50	0.01	0.00	Open
5	164.60	0.09	0.10	Open
10	133.03	0.07	0.06	Open
16	101.46	0.05	0.04	Open
18	7.59	0.00	0.00	Open
25	-23.98	0.01	0.00	Open
26	-203.76	0.11	0.16	Open
30	-235.33	0.12	0.25	Open
33	-188.47	0.10	0.13	Open
34	-220.04	0.12	0.16	Open
35	-251.61	0.13	0.21	Open
36	-78.42	0.04	0.02	Open
37	-109.99	0.06	0.04	Open
38	75.20	0.04	0.03	Open
39	43.63	0.02	0.01	Open
41	139.87	0.07	0.07	Open
42	108.30	0.06	0.05	Open
43	206.25	0.11	0.14	Open
44	174.68	0.09	0.09	Open
45	-170.99	0.09	0.10	Open
46	-202.56	0.11	0.13	Open
47	314.10	0.17	0.31	Open
48	282.53	0.15	0.28	Open

Page 6
Link Results at 0:00 Hrs: (continued)

Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status
49	-39.09	0.02	0.01	Open
50	-70.66	0.04	0.02	Open
4	4959.37	1.17	8.64	Open
6	4959.37	1.17	5.70	Open
7	-268.19	0.06	0.03	Open
9	-299.76	0.07	0.03	Open
11	-701.96	0.24	0.46	Open
20	-733.53	0.25	0.49	Open
31	-1156.58	0.39	1.12	Open

APPENDIX B
Sanitary Servicing Information



LEGEND

0.495 / ST-208 / 125 / 225	DRAINAGE AREA (ha) DRAINAGE AREA ID NO. OF UNITS / TOTAL POPULATION
	SANITARY DRAINAGE AREA BOUNDARY
	PROPOSED SANITARY SEWER C/W MANHOLE
SAN MH	*EXISTING SANITARY MANHOLE & SEWER*

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

240-270 LAMARCHE AVENUE & 3484 INNES ROAD
CITY OF OTTAWA

SANITARY DRAINAGE AREA PLAN - BLOCK1

SCALE 1 : 750 (0 10 20 30)
DATE DEC 2021
JOB 121214
FIGURE SANB1

M:\2021\121214\CAD\Design\Zone 1\121214 - Z1 - SAN.dwg, SAN, Dec 22, 2021 - 3:59pm, amestwarp

SHT11X17.DWG - 279mmX432mm

SANITARY SEWER DESIGN SHEET

Novatech Project #: 121214
Project Name: 3484 Innes Road Zone 1
Date Prepared: 12/16/2021
Date Revised:
Input By: Anthony Mestwarp
Reviewed By: Cara Ruddle
Drawing Reference: 121214- SANZ1

Legend:
- PROJECT SPECIFIC INFO
- USER DESIGN INPUT
- CUMULATIVE CELL
- CALCULATED DESIGN CELL OUTPUT

NOVATECH
Engineers, Planners & Landscape Architects

LOCATION			DEMAND																	DESIGN CAPACITY							
			RESIDENTIAL FLOW									COMMERCIAL FLOW					EXTRANEOUS FLOW				PROPOSED SEWER PIPE SIZING / DESIGN							
AREA	FROM MH	TO MH	1 Bed Apartment	2 Bed Apartment	3 Bed Apartment	PARK AREA (ha)	POPULATION (in 1000's)	CUMULATIVE POPULATION (in 1000's)	PEAK FACTOR M	AVG POPULATION FLOW (L/s)	PEAKED DESIGN POP FLOW (L/s)	COMMERICAL AREA (m^2)	CUMULATIVE COMMERICAL AREA (m^2)	DESIGN COMMERICAL FLOW (L/s)	COMMERICAL PEAK FACTOR	PEAKED COMMERCIAL FLOW	Total Area (ha.)	Accum. Area (ha.)	DESIGN EXTRAN. FLOW (L/s)	TOTAL DESIGN FLOW (L/s)	PIPE LENGTH (m)	PIPE SIZE (mm) AND MATERIAL	PIPE ID ACTUAL (m)	ROUGH. (n)	DESIGN GRADE (%)	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	Qpeak Design / Qcap
CROISSANT FRANCOISE (SANMH 202)																											
PAV A	PAV A	302	58	46	1		0.181	0.181	3.53	0.59	2.07		0.000	0.00	1.00	0.00	0.56	0.56	0.19	2.26	10.0	200 PVC	0.203	0.013	2.00	48.4	1.49	4.7%
302-301	302	301					0.000	0.181	3.53	0.59	2.07		0.000	0.00	1.00	0.00	0.11	0.67	0.22	2.29	31.9	200 PVC	0.203	0.013	0.50	24.2	0.75	9.5%
PAV B	PAV B	301	42	39	0		0.141	0.141	3.56	0.46	1.62		0.000	0.00	1.00	0.00	0.55	0.55	0.18	1.80	11.0	200 PVC	0.203	0.013	2.00	48.4	1.49	3.7%
	301	STUB					0.000	0.322	3.45	1.04	3.60		0.000	0.00	1.00	0.00	0.55	1.76	0.58	4.18	13.0	200 PVC	0.203	0.013	0.50	24.2	0.75	17.3%
LAMARCHE AVENUE																											
PAV C	PAV C	401	57	40			0.164	0.164	3.54	0.53	1.88	252.000	252.000	0.02	1.00	0.02	0.36	0.36	0.12	2.02	3.1	200 PVC	0.203	0.013	2.00	48.4	1.49	4.2%
CROISSANT FRANCOISE (SANMH 205)																											
PARK	STUB	205				0.172	0.001	0.001	3.78	0.00	0.01		0.000	0.00	1.00	0.00	0.17	0.17	0.06	0.06	10.0	250 PVC	0.254	0.013	1.00	62.0	1.22	0.1%
TOTAL			157	125	1	0.172	0.486	0.486				252.000	252.000				2.12											

Design Parameters:

1. Residential Flows
   - -SINGLE UNIT 3.4 Person/ Unit
   - -1 Bed Apartment 1.4 Person/ Unit
   - -2 Bed Apartment 2.1 Person/ Unit
   - -3 Bed Apartment 3.1 Person/ Unit
2. Commercial Flow
   - -Office 75 L/9.3m^3/day
3. q Avg capita flow 280 L/per/day
4. M = Harmon Formula (maximum of 4.0)
5. K = 0.8
6. Commercial Peak Factor
   - -area > 20% of development 1.5
   - -area < 20% of development 1.0
7. Park flow is considered equivalent to a single unit / ha
   - Park Demand = 1 Single Unit Equivalent / Park ha
8. Extraneous Flows = 0.33 L/sec/ha

CAPACITY EQUATION

Q full= (1/n) A R^(2/3)So^(1/2)

Where : Q full = Capacity (L/s)

n = Manning coefficient of roughness (0.013)
A = Flow area (m^2)
R = Wetter perimenter (m)
So = Pipe Slope/gradient

APPENDIX D

Sanitary Sewer Design Sheet (DSEL, May 2018)

Sanitary Drainage Area Plans (May 2018)

External Sanitary Drainage Plan (DSEL, January 2018)

External Sanitary Drainage Plan (DSEL, January 2018)

EUC MUC CDP Development Statistic Assumptions (DSEL, June 2017)

Comparison of MSU, Servicing Report, and FSR Sanitary Designs (DSEL, August 2017)

SANITARY SEWER CALCULATION SHEET

Manning's n=0.013

LOCATION			RESIDENTIAL AREA AND POPULATION							COMM		INSTIT		PARK		C+I+I	INFILTRATION				PIPE						
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	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)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
Rang de Loury Row - 03																											
	200A	19A	0.42		44	0.42	44	3.66	0.52								0.42	0.42	0.14	0.66	77.50	200	0.90	31.12	0.02	0.99	0.39
To Chemin de Jargeau Road, Pipe 19A - 34A						0.42	44											0.42									
	200A	20A	0.18		17	0.18	17	3.71	0.20								0.18	0.18	0.06	0.26	40.50	200	0.65	26.44	0.01	0.84	0.27
To Cours Crevier Walk, Pipe 20A - 24A						0.18	17											0.18									
Cercle de l'Argonaut Circle - 12																											
	27A	26A	0.08		4	0.08	4	3.76	0.05								0.08	0.08	0.03	0.08	10.00	200	0.65	26.44	0.00	0.84	0.05
			0.05		4	0.13	8										0.05	0.13									
	26A	25A	0.41		44	0.54	52	3.65	0.62								0.41	0.54	0.18	0.80	71.00	200	0.65	26.44	0.03	0.84	0.37
	25A	24A	0.38		38	0.92	90	3.60	1.05								0.38	0.92	0.30	1.35	74.00	200	0.35	19.40	0.07	0.62	0.35
To Avenue de Lamarche Avenue, Pipe 24A - 21A						0.92	90											0.92									
	27A	29A	0.23		17	0.23	17	3.71	0.20								0.23	0.23	0.08	0.28	51.50	200	0.65	26.44	0.01	0.84	0.27
	29A	30A	0.26		14	0.49	31	3.68	0.37								0.26	0.49	0.16	0.53	51.50	200	0.60	25.41	0.02	0.81	0.32
	30A	31A	0.18		11	0.67	42	3.66	0.50								0.18	0.67	0.22	0.72	11.00	200	0.35	19.40	0.04	0.62	0.30
	31A	32A	0.38		34	1.05	76	3.62	0.89								0.38	1.05	0.35	1.24	65.50	200	0.35	19.40	0.06	0.62	0.34
	32A	34A	0.39		34	1.44	110	3.59	1.28								0.39	1.44	0.48	1.76	81.50	200	0.35	19.40	0.09	0.62	0.38
To Avenue de Lamarche Avenue, Pipe 34A - 35A						1.44	110											1.44									
Placette de Darvoy Mews - 13																											
	29A	28A	0.37		38	0.37	38	3.67	0.45								0.37	0.37	0.12	0.57	71.50	200	0.75	28.40	0.02	0.90	0.35
	28A	21A	0.42		44	0.79	82	3.61	0.96								0.42	0.79	0.26	1.22	80.50	200	0.35	19.40	0.06	0.62	0.34
To Avenue de Lamarche Avenue, Pipe 21A - 33A						0.79	82											0.79									
Croissant des Aubrais Crescent - 10																											
	8A	9A	0.55		41	0.55	41	3.67	0.49								0.55	0.55	0.18	0.67	75.00	200	0.65	26.44	0.03	0.84	0.37
	9A	35A	0.30		24	0.85	65	3.63	0.76								0.30	0.85	0.28	1.04	72.50	200	0.35	19.40	0.05	0.62	0.32
To Avenue de Lamarche Avenue, Pipe 35A - 36A						0.85	65											0.85									
	8A	7A	0.13		7	0.13	7	3.74	0.08								0.13	0.13	0.04	0.12	10.00	200	0.65	26.44	0.00	0.84	0.05
	7A	38A	0.23		14	0.36	21	3.70	0.25								0.23	0.36	0.12	0.37	51.50	200	0.35	19.40	0.02	0.62	0.24
To Bois de Cravant Grove, Pipe 38A - 37A						0.36	21											0.36									
	38A	40A	0.25		17	0.25	17	3.71	0.20								0.25	0.25	0.08	0.28	59.00	200	0.65	26.44	0.01	0.84	0.27
	40A	41A	0.22		14	0.47	31	3.68	0.37								0.22	0.47	0.16	0.53	51.50	200	0.35	19.40	0.03	0.62	0.27
	41A	42A	0.14		7	0.61	38	3.67	0.45								0.14	0.61	0.20	0.65	10.00	200	0.35	19.40	0.03	0.62	0.27
	42A	43A	0.40		34	1.01	72	3.62	0.84								0.40	1.01	0.33	1.17	69.00	200	0.35	19.40	0.06	0.62	0.34
	43A	52A	0.36		31	1.37	103	3.59	1.20								0.36	1.37	0.45	1.65	78.00	200	0.35	19.40	0.09	0.62	0.38
To Avenue de Lamarche Avenue, Pipe 52A - 53A						1.37	103											1.37									
Bois de Cravant Grove - 14																											
Contribution From Croissant des Aubrais Crescent, Pipe 7A - 38A						0.36	21										0.36	0.36									
	38A	37A	0.39		34	0.75	55	3.64	0.65								0.39	0.75	0.25	0.90	69.50	200	0.35	19.40	0.05	0.62	0.32
	37A	36A	0.34		28	1.09	83	3.61	0.97								0.34	1.09	0.36	1.33	85.00	200	0.35	19.40	0.07	0.62	0.35
To Avenue de Lamarche Avenue, Pipe 36A - 44A						1.09	83											1.09									

DESIGN PARAMETERS

Park Flow =	9300	L/ha/da	0.10764	l/s/Ha
Average Daily Flow =	280	l/p/day		
Comm/Inst Flow =	28000	L/ha/da	0.5787	l/s/Ha
Industrial Flow =	35000	L/ha/da	0.40509	l/s/Ha
Max Res. Peak Factor =	4.00			
Commercial/Inst./Park Peak Factor =	1.00			
Institutional =	0.32	l/s/Ha		

Industrial Peak Factor = as per MOE Graph

Extraneous Flow =		0.330	L/s/ha	
Minimum Velocity =		0.600	m/s	
Manning's n =	(Conc)	0.013	(Pvc)	0.013
Townhouse coeff=		2.7		
Single house coeff=		3.4		

Designed: P.P

Checked: M.Z

Dwg. Reference: Sanitary Drainage Plan, Dwgs. No.

PROJECT: ORLEANS VILLAGE

LOCATION: City of Ottawa

File Ref: 16-881 Date: 2018-05-10 Sheet No. 1 of 4

881_SAN2.xlsx

SANITARY SEWER CALCULATION SHEET

Ottawa

Manning's n=0.013

LOCATION			RESIDENTIAL AREA AND POPULATION							COMM		INSTIT		PARK		C+I+I	INFILTRATION				PIPE						
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	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)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
Place de Sandillon Place - 11																											
	40A	39A	0.38		34	0.38	34	3.68	0.41								0.38	0.38	0.13	0.54	69.50	200	0.65	26.44	0.02	0.84	0.33
	39A	44A	0.34		28	0.72	62	3.64	0.73								0.34	0.72	0.24	0.97	85.00	200	0.40	20.74	0.05	0.66	0.34
To Avenue de Lamarche Avenue, Pipe 44A - 52A						0.72	62											0.72									
Cours Crevier Walk- 02																											
	18A	17A	0.07		6	0.07	6	3.75	0.07								0.07	0.07	0.02	0.09	10.00	200	0.65	26.44	0.00	0.84	0.05
	17A	16A	0.65		65	0.72	71	3.63	0.84								0.65	0.72	0.24	1.08	111.50	200	0.35	19.40	0.06	0.62	0.34
To Chemin de Jargeau Road, Pipe 16A - 19A						0.72	71											0.72									
	18A	20A	0.19		17	0.19	17	3.71	0.20								0.19	0.19	0.06	0.26	51.50	200	0.80	29.34	0.01	0.93	0.30
Contribution From Rang de Loury Row, Pipe 200A - 20A						0.18	17										0.18	0.37									
	20A	24A	0.20		17	0.57	51	3.65	0.60								0.20	0.57	0.19	0.79	62.50	200	0.45	22.00	0.04	0.70	0.34
To Avenue de Lamarche Avenue, Pipe 24A - 21A						0.57	51											0.57									
Chemin de Jargeau Road - 04																											
	10A	16A	0.12		7	0.12	7	3.74	0.08								0.12	0.12	0.04	0.12	26.50	200	0.65	26.44	0.00	0.84	0.05
Contribution From Cours Crevier Walk, Pipe 17A - 16A						0.72	71										0.72	0.84									
	16A	19A	0.23		14	1.07	92	3.60	1.07								0.23	1.07	0.35	1.42	58.50	200	0.35	19.40	0.07	0.62	0.35
Contribution From Rang de Loury Row, Pipe 200A - 19A						0.42	44										0.42	1.49									
	19A	34A	0.11		1	1.60	137	3.56	1.58								0.11	1.60	0.53	2.11	59.00	200	0.35	19.40	0.11	0.62	0.40
To Avenue de Lamarche Avenue, Pipe 34A - 35A						1.60	137											1.60									
Voie de Lesage Way - 05																											
	190A	15A	0.21		14	0.21	14	3.72	0.17								0.21	0.21	0.07	0.24	42.50	200	0.65	26.44	0.01	0.84	0.27
	15A	14A	0.60		55	0.81	69	3.63	0.81								0.60	0.81	0.27	1.08	106.50	200	0.35	19.40	0.06	0.62	0.34
	14A	13A	0.13		7	0.94	76	3.62	0.89								0.13	0.94	0.31	1.20	11.50	200	0.35	19.40	0.06	0.62	0.34
	13A	45A	0.16		11	1.10	87	3.61	1.02								0.16	1.10	0.36	1.38	49.00	200	0.35	19.40	0.07	0.62	0.35
To Terrase de Vennecy Terrace, Pipe 45A - 47A						1.10	87											1.10									
Terrase de Vennecy Terrace - 06																											
	15A	11A	0.15		11	0.15	11	3.73	0.13								0.15	0.15	0.05	0.18	49.00	200	0.65	26.44	0.01	0.84	0.27
	11A	12A	0.11		7	0.26	18	3.71	0.22								0.11	0.26	0.09	0.31	11.50	200	0.35	19.40	0.02	0.62	0.24
	12A	45A	0.64		55	0.90	73	3.62	0.86								0.64	0.90	0.30	1.16	106.50	200	0.35	19.40	0.06	0.62	0.34
Contribution From Voie de Lesage Way, Pipe 13A - 45A						1.10	87										1.10	2.00									
	45A	47A	0.43		31	2.43	191	3.52	2.18								0.43	2.43	0.80	2.98	111.00	250	0.30	32.57	0.09	0.66	0.41
	47A	48A	0.12		7	2.55	198	3.52	2.26								0.12	2.55	0.84	3.10	10.50	250	0.30	32.57	0.10	0.66	0.42
	48A	53A	0.59		55	3.14	253	3.49	2.86								0.59	3.14	1.04	3.90	108.50	250	0.30	32.57	0.12	0.66	0.44
To Avenue de Lamarche Avenue, Pipe 53A - 55A						3.14	253											3.14									
Ruelle de Carden Lane - 07																											
	46A	52A	0.56		48	0.56	48	3.65	0.57								0.56	0.56	0.18	0.75	105.50	200	0.65	26.44	0.03	0.84	0.37
To Avenue de Lamarche Avenue, Pipe 52A - 53A						0.56	48											0.56									

DESIGN PARAMETERS

Park Flow =	9300	L/ha/da	0.10764	l/s/Ha
Average Daily Flow =	280	l/p/day		
Comm/Inst Flow =	28000	L/ha/da	0.5787	l/s/Ha
Industrial Flow =	35000	L/ha/da	0.40509	l/s/Ha
Max Res. Peak Factor =	4.00			
Commercial/Inst./Park Peak Factor =	1.00			
Institutional =	0.32	l/s/Ha		

Industrial Peak Factor = as per MOE Graph

Extraneous Flow =		0.330	L/s/ha	
Minimum Velocity =		0.600	m/s	
Manning's n =	(Conc)	0.013	(Pvc)	0.013
Townhouse coeff=		2.7		
Single house coeff=		3.4		

Designed: P.P

Checked: M.Z

Dwg. Reference:
Sanitary Drainage Plan, Dwgs. No.

PROJECT: **ORLEANS VILLAGE**

LOCATION: **City of Ottawa**

File Ref: 16-881

Date: 2018-05-10

Sheet No. 2 of 4

881_SAN2.xlsx

SANITARY SEWER CALCULATION SHEET

Ottawa

Manning's n=0.013

LOCATION			RESIDENTIAL AREA AND POPULATION							COMM		INSTIT		PARK		C+I+I	INFILTRATION				PIPE						
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	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)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
Croissant de Mercier Crescent- 09																											
	4A	5A	0.13		7	0.13	7	3.74	0.08								0.13	0.13	0.04	0.12	11.00	200	0.95	31.97	0.00	1.02	0.06
	5A	6A	0.61		48	0.74	55	3.64	0.65								0.61	0.74	0.24	0.89	106.50	200	0.50	23.19	0.04	0.74	0.36
To Cercle du Ponthieu Circle, Pipe 6A - 55A						0.74	55											0.74									
	4A	3A	0.21		11	0.21	11	3.73	0.13								0.21	0.21	0.07	0.20	42.00	200	0.65	26.44	0.01	0.84	0.27
	3A	2A	0.08		4	0.29	15	3.72	0.18								0.08	0.29	0.10	0.28	10.50	200	0.35	19.40	0.01	0.62	0.20
	2A	54A	0.60		51	0.89	66	3.63	0.78								0.60	0.89	0.29	1.07	100.50	200	0.35	19.40	0.06	0.62	0.34
	54A	55A	0.05		4	0.94	70	3.63	0.82								0.05	0.94	0.31	1.13	13.50	200	0.35	19.40	0.06	0.62	0.34
To Cercle du Ponthieu Circle, Pipe 55A - 58A						0.94	70											0.94									
Avenue de Lamarche Avenue - 01																											
			0.60		1	0.60	1			2.54	2.54						3.14	3.14									
			2.54		1222	3.14	1223			2.86	5.40						5.40	8.54									
	22A	230A	2.86		1376	6.00	2599	3.00	25.27		5.40					1.75	2.86	11.40	3.76	30.78	76.50	250	1.20	65.14	0.47	1.33	1.30
	230A	23A	0.15		1	6.15	2600	3.00	25.28		5.40					1.75	0.15	11.55	3.81	30.84	63.50	250	0.85	54.83	0.56	1.12	1.15
			0.13		1	6.28	2601				5.40						0.13	11.68									
			2.16		1039	8.44	3640				5.40						2.16	13.84									
	23A	24A	2.17		1044	10.61	4684	2.82	42.81		5.40					1.75	2.17	16.01	5.28	49.84	59.50	375	0.29	94.42	0.53	0.85	0.86
Contribution From Cours Crevier Walk, Pipe 20A - 24A						0.57	51										0.57	16.58									
Contribution From Cercle de l'Argonaut Circle, Pipe 25A - 24A						0.92	90										0.92	17.50									
	24A	21A	0.23		17	12.33	4842	2.81	44.09		5.40					1.75	0.23	17.73	5.85	51.69	58.50	375	0.30	96.03	0.54	0.87	0.89
Contribution From Placette de Darvoy Mews, Pipe 28A - 21A						0.79	82										0.79	18.52									
	21A	33A	0.19		14	13.31	4938	2.80	44.81		5.40					1.75	0.19	18.71	6.17	52.73	42.50	375	0.20	78.41	0.67	0.71	0.76
	33A	34A	0.03		1	13.34	4939	2.80	44.82		5.40					1.75	0.03	18.74	6.18	52.75	17.00	375	0.42	113.63	0.46	1.03	1.01
Contribution From Chemin de Jargeau Road, Pipe 19A - 34A						1.60	137										1.60	20.34									
Contribution From Cercle de l'Argonaut Circle, Pipe 32A - 34A						1.44	110										1.44	21.78									
	34A	35A	0.29		24	16.67	5210	2.78	46.94		5.40					1.75	0.29	22.07	7.28	55.97	59.00	375	0.20	78.41	0.71	0.71	0.77
Contribution From Croissant des Aubrais Crescent, Pipe 9A - 35A						0.85	65										0.85	22.92									
	35A	36A	0.31		28	17.83	5303	2.78	47.78		5.40					1.75	0.31	23.23	7.67	57.20	58.50	375	0.20	78.41	0.73	0.71	0.77
Contribution From Bois de Cravant Grove, Pipe 37A - 36A						1.09	83										1.09	24.32									
	36A	44A	0.32		28	19.24	5414	2.77	48.60		5.40					1.75	0.32	24.64	8.13	58.48	58.50	375	0.20	78.41	0.75	0.71	0.78
Contribution From Place de Sandillon Place, Pipe 39A - 44A						0.72	62										0.72	25.36									
	44A	52A	0.29		24	20.25	5500	2.77	49.37		5.40					1.75	0.29	25.65	8.46	59.58	58.50	450	0.15	110.42	0.54	0.69	0.70
Contribution From Croissant des Aubrais Crescent, Pipe 43A - 52A						1.37	103										1.37	27.02									
Contribution From Ruelle de Carden Lane, Pipe 46A - 52A						0.56	48										0.56	27.58									
	52A	53A	0.09		1	22.27	5652	2.76	50.55		5.40					1.75	0.09	27.67	9.13	61.43	58.50	450	0.15	110.42	0.56	0.69	0.71
Contribution From Terrase de Vennecy Terrace, Pipe 48A - 53A						3.14	253										3.14	30.81									
Contribution From Cercle du Ponthieu Circle, Pipe 51A - 53A						0.80	69										0.80	31.61									
	53A	55A	0.09		1	26.30	5975	2.74	53.06		5.40					1.75	0.09	31.70	10.46	65.27	61.50	450	0.15	110.42	0.59	0.69	0.72
To Cercle du Ponthieu Circle, Pipe 55A - 58A						26.30	5975				5.40							31.70									

LICENSED PROFESSIONAL ENGINEER
M. ZDRAVEVSKI
100130902
12.05.17
PROVINCE OF ONTARIO

DESIGN PARAMETERS

Park Flow =	9300	L/ha/da	0.10764	l/s/Ha
Average Daily Flow =	280	l/p/day		
Comm/Inst Flow =	28000	L/ha/da	0.5787	l/s/Ha
Industrial Flow =	35000	L/ha/da	0.40509	l/s/Ha
Max Res. Peak Factor =	4.00			
Commercial/Inst./Park Peak Factor =	1.00			
Institutional =	0.32	l/s/Ha		

Industrial Peak Factor = as per MOE Graph

Extraneous Flow =	0.330	L/s/ha		
Minimum Velocity =	0.600	m/s		
Manning's n =	(Conc)	0.013	(Pvc)	0.013
Townhouse coeff=		2.7		
Single house coeff=		3.4		

Designed:	P.P	PROJECT:	ORLEANS VILLAGE
Checked:	M.Z	LOCATION:	City of Ottawa
Dwg. Reference: Sanitary Drainage Plan, Dwgs. No.		File Ref: 16-881	Date: 2018-05-10

Sheet No. 3 of 4

881_SAN2.xlsx

SANITARY SEWER CALCULATION SHEET

Ottawa

Manning's n=0.013

LOCATION			RESIDENTIAL AREA AND POPULATION							COMM		INSTIT		PARK		C+I+I	INFILTRATION				PIPE						
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	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)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
Cercle du Ponthieu Circle - 08																											
	50A	51A	0.25		21	0.25	21	3.70	0.25								0.25	0.25	0.08	0.33	41.50	200	0.70	27.44	0.01	0.87	0.28
	51A	53A	0.55		48	0.80	69	3.63	0.81								0.55	0.80	0.26	1.07	98.50	200	0.55	24.32	0.04	0.77	0.37
To Avenue de Lamarche Avenue, Pipe 53A - 55A						0.80	69											0.80									
	490A	49A	0.14		7	0.14	7	3.74	0.08								0.14	0.14	0.05	0.13	11.00	200	0.65	26.44	0.00	0.84	0.05
	49A	57A	0.24		14	0.38	21	3.70	0.25								0.24	0.38	0.13	0.38	50.50	200	0.35	19.40	0.02	0.62	0.24
	57A	58A	0.09		4	0.47	25	3.69	0.30								0.09	0.47	0.16	0.46	14.00	200	0.35	19.40	0.02	0.62	0.24
To Nature Trail Crescent, Pipe 58A - 59A						0.47	25											0.47									
Rue de Beaugency Street - 08																											
	500A	501A	0.33		24	0.33	24	3.70	0.29					0.65	0.65	0.07	0.98	0.98	0.32	0.68	62.50	200	0.65	26.44	0.03	0.84	0.37
	501A	502A	0.19		14	0.52	38	3.67	0.45						0.65	0.07	0.19	1.17	0.39	0.91	78.50	200	0.35	19.40	0.05	0.62	0.32
	502A	55A				0.52	38	3.67	0.45						0.65	0.07	0.00	1.17	0.39	0.91	2.50	200	1.65	42.13	0.02	1.34	0.52
Cercle du Ponthieu Circle - 08																											
	503A	504A	0.25		17	0.25	17	3.71	0.20								0.25	0.25	0.08	0.28	57.50	200	0.65	26.44	0.01	0.84	0.27
	504A	505A	0.26		17	0.51	34	3.68	0.41					0.77	0.77	0.08	1.03	1.28	0.42	0.91	69.50	200	0.50	23.19	0.04	0.74	0.36
	505A	58A				0.51	34	3.68	0.41						0.77	0.08	0.00	1.28	0.42	0.91	3.00	200	1.00	32.80	0.03	1.04	0.46
To Nature Trail Crescent, Pipe 58A - 59A						0.51	34								0.77			1.28									
	1A	6A	63.57		6462	63.57	6462	2.71	56.75	53.65	53.65			10.45	10.45	18.51	127.67	127.67	42.13	117.39	88.50	675	0.11	278.79	0.42	0.78	0.74
Contribution From Croissant de Mercier Crescent, Pipe 5A - 6A						0.74	55										0.74	128.41									
	6A	55A				64.31	6517	2.71	57.23		53.65				10.45	18.51	0.00	128.41	42.38	118.12	57.00	675	0.11	278.79	0.42	0.78	0.74
Contribution From Avenue de Lamarche Avenue, Pipe 53A - 55A						26.30	5975				5.40						31.70	160.11									
Contribution From Croissant de Mercier Crescent, Pipe 54A - 55A						0.94	70										0.94	161.05									
	55A	58A				92.07	12600	2.48	101.27		59.05				11.10	20.33	0.00	161.05	53.15	174.75	143.00	675	0.11	278.79	0.63	0.78	0.83
To Sanitary Easement, Pipe 58A - 59A						92.07	12600				59.05				11.10			161.05									
Sanitary Easement - 20																											
Contribution From Cercle du Ponthieu Circle, Pipe 505A - 58A						0.51	34								0.77		1.28	1.28		0.00							
Contribution From Cercle du Ponthieu Circle, Pipe 55A - 58A						92.07	12600				59.05				11.10		161.05	162.33		0.00							
Contribution From Cercle du Ponthieu Circle, Pipe 57A - 58A						0.47	25										0.47	162.80									
	58A	59A	0.07		1	93.12	12660	2.48	101.75		59.05				11.87	20.41	0.07	162.87	53.75	175.91	48.00	675	0.11	278.79	0.63	0.78	0.83
			0.01		1	93.13	12661				59.05				11.87		0.01	162.88									
	59A	60A	0.05		1	93.18	12662	2.48	101.76		59.05				11.87	20.41	0.05	162.93	53.77	175.94	33.00	675	0.11	278.79	0.63	0.78	0.83
To Nature Trail Crescent, Pipe 60A - 61A						93.18	12662				59.05				11.87			162.93		0.00							
Nature Trail Crescent - 21																											
Contribution From Sanitary Easement, Pipe 59A - 60A						93.18	12662				59.05				11.87		162.93	162.93		0.00							
			0.06		4	93.24	12666				59.05				11.87		0.06	162.99									
	60A	61A	1.47		82	94.71	12748	2.48	102.46		59.05				11.87	20.41	1.47	164.46	54.27	177.14	11.00	675	0.11	278.79	0.64	0.78	0.83
	61A	62A	0.59		47	95.30	12795	2.48	102.83		59.05				11.87	20.41	0.59	165.05	54.47	177.71	73.50	675	0.11	278.79	0.64	0.78	0.83

LICENSED PROFESSIONAL ENGINEER
M. ZDRAVEVSKI
100130902
16-05-17
PROVINCE OF ONTARIO

DESIGN PARAMETERS

Park Flow =	9300	L/ha/da	0.10764	l/s/Ha
Average Daily Flow =	280	l/p/day		
Comm/Inst Flow =	28000	L/ha/da	0.5787	l/s/Ha
Industrial Flow =	35000	L/ha/da	0.40509	l/s/Ha
Max Res. Peak Factor =	4.00			
Commercial/Inst./Park Peak Factor =	1.00			
Institutional =	0.32	l/s/Ha		

Industrial Peak Factor = as per MOE Graph
Extraneous Flow = 0.330 L/s/ha
Minimum Velocity = 0.600 m/s
Manning's n = (Conc) 0.013 (Pvc) 0.013
Townhouse coeff= 2.7
Single house coeff= 3.4

Designed: P.P
Checked: M.Z
Dwg. Reference: Sanitary Drainage Plan, Dwgs. No.

PROJECT: ORLEANS VILLAGE
LOCATION: City of Ottawa
File Ref: 16-881
Date: 2018-05-10
Sheet No. 4 of 4
881 SAN2.xlsx

KEY PLAN
SCALE 1:10000

LEGEND

SANITARY DRAINAGE BOUNDARY
SANITARY SUB-DRAINAGE BOUNDARY
SANITARY DRAINAGE BOUNDARY (OTHER PHASES)

UPSTREAM MH TO DOWNSTREAM MH → 43A - 44A
AREA IN HECTARES → 0.78
POPULATION → 61

UPSTREAM MH TO DOWNSTREAM MH → 43A-44A
AREA IN OTHER PHASES IN HECTARES → 0.78
POPULATION → 61

EXTERNAL AREA IN HECTARES → A=53.63
EXTERNAL POPULATION → POP=5739
DENSITY (PERSONS/HECTARE) → 107
EXTERNAL LAND USE → RESIDENTIAL

200mmø SAN
MAINTENANCE HOLE → MH202A

CAP

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16–10–116–00. SURVEYS DATED NOVEMBER 30, 2017.

LEGAL INFORMATION

CALCULATED M–PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16–10–116–00 (PHASE 1 & 2) DATED MARCH 08, 2018.

ISSUED FOR MOE APPROVAL 18–05–09

NOT FOR CONSTRUCTION

ELEVATION NOTE ELEVATION = 86.12 m

ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM SITE BENCHMARK NCC CONTROL POINT 001196530229 HAVING A PUBLISHED ELEVATION OF 86.12m

No.	DATE	BY	DESCRIPTION
2.	18–05–09	M.Z.	ISSUED FOR MOE APPROVAL
1.	18–01–24	M.Z.	1st SUBMISSION

CITY OF OTTAWA

PROJECT No. 16–881

LICENSED PROFESSIONAL ENGINEER
M.ZDRAVEVSKI
100130902
18-05-09
PROVINCE OF ONTARIO

SANITARY DRAINAGE PLAN

© DSEL

CAIVAN
(ORLEANS VILLAGE)
LIMITED

ORLEANS VILLAGE

DSEL
david schaeffer engineering ltd

120 Iber Road, Unit 103
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www.DSEL.ca

DRAWN BY: M.Z./J.Y.	CHECKED BY: P.P.	DRAWING NO.	SHEET NO.
DESIGNED BY: P.P.	CHECKED BY: M.Z.		65
SCALE: 1:1000	DATE: JANUARY 2018		

CITY PLAN No. XXXXX

CITY FILE No. D07-16-16-0022

KEY PLAN
SCALE 1:10000

LEGEND

- SANITARY DRAINAGE BOUNDARY
- SANITARY SUB-DRAINAGE BOUNDARY
- SANITARY DRAINAGE BOUNDARY (OTHER PHASES)
- UPSTREAM MH TO DOWNSTREAM MH — 43A - 44A
- AREA IN HECTARES — 0.78
- POPULATION — 61
- UPSTREAM MH TO DOWNSTREAM MH — 43A - 44A
- AREA IN OTHER PHASES IN HECTARES — 0.78
- POPULATION — 61
- EXTERNAL AREA IN HECTARES — A=53.63
- EXTERNAL POPULATION — POP=5739
- DENSITY (PERSONS/HECTARE) — 107
- EXTERNAL LAND USE — RESIDENTIAL
- MAINTENANCE HOLE — 200mmø SAN — MH202A
- CAP

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16-10-116-00. SURVEYS DATED NOVEMBER 30, 2017.

LEGAL INFORMATION

CALCULATED M-PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16-10-116-00 (PHASE 1 & 2) DATED MARCH 08, 2018.

ISSUED FOR MOE APPROVAL 18-05-09

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ELEVATION NOTE

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No.	DATE	BY	DESCRIPTION
2.	18-05-09	M.Z.	ISSUED FOR MOE APPROVAL
1.	18-01-24	M.Z.	1st SUBMISSION

Ottawa CITY OF OTTAWA

PROJECT No. 16-881

LICENSED PROFESSIONAL ENGINEER M.ZDRAVEVSKI 100130902 18-05-09 PROVINCE OF ONTARIO

SANITARY DRAINAGE PLAN

CAIVAN (ORLEANS VILLAGE) LIMITED

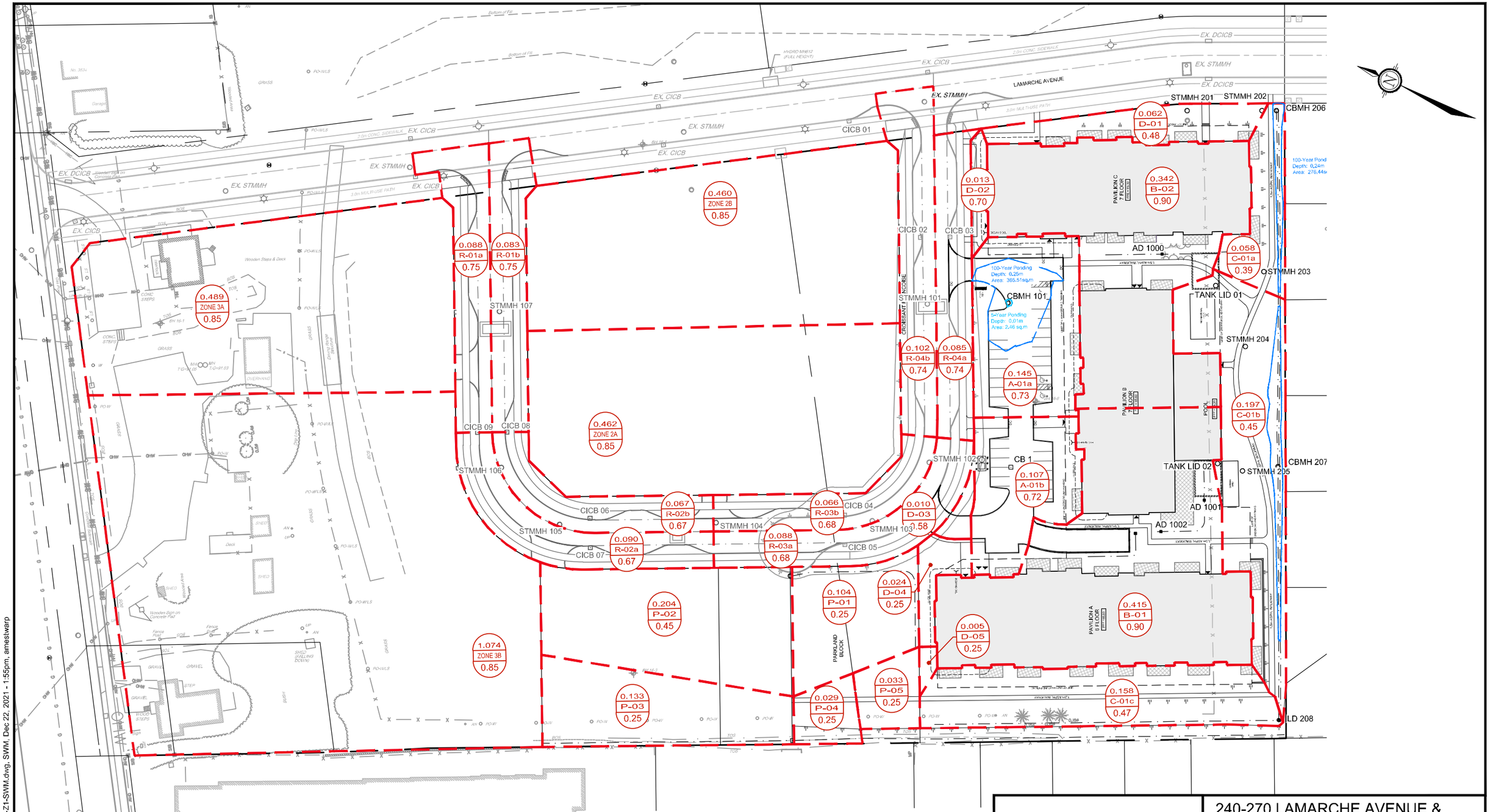
ORLEANS VILLAGE

DSEL david schaeffer engineering ltd
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY: M.Z./J.Y.	CHECKED BY: P.P.	DRAWING NO.	SHEET NO.
DESIGNED BY: P.P.	CHECKED BY: M.Z.		66
SCALE: 1:1000	DATE: JANUARY 2018		

CITY FILE No. D07-16-16-0022 CITY PLAN No. XXXXX

APPENDIX C
Storm Servicing Information



LEGEND

0.495 / ZONE 3A / 0.85 — DRAINAGE AREA (ha), DRAINAGE AREA ID, RUNOFF COEFFICIENT

STORM DRAINAGE AREA BOUNDARY

PROPOSED STORM SEWER C/W MANHOLE

STM MH — *EXISTING STORM MANHOLE & SEWER*

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

240-270 LAMARCHE AVENUE & 3484 INNES ROAD
CITY OF OTTAWA

STORMWATER MANAGEMENT PLAN - BLOCK 1

SCALE 1 : 1000 (0 10 20 30 40)

DATE DEC 2021 | JOB 121214 | FIGURE SWMB1

SHT11X17.DWG - 279mmX432mm

M:\2021\121214\CADD\Design\Zone 1\121214-Z1-SWM.dwg, SWM, Dec 22, 2021 - 1:55pm, arnestwarp

STORM SEWER DESIGN SHEET

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 121214
Project Name: 240-270 Lamarche Avenue & 3484 Innes Road
Date Prepared: 12/21/2021
Date Revised:
Input By: Anthony Mestwarp
Reviewed By:
Drawing Reference: 121214-GPZ1 AND 121214-SWMZ1

Legend:
- PROJECT SPECIFIC INFO
- USER DESIGN INPUT
- CUMILATIVE CELL
- CALCULATED DESIGN CELL OUTPUT
- USER AS-BUILT INPUT

LOCATION			DEMAND												CAPACITY					
			AREA							FLOW					PROPOSED SEWER PIPE SIZING / DESIGN					
From MH	To MH	Area ID	Hardscape	Landscaping	Total Area	Weighted Runoff Coefficient	Indivi 2.78 AR	Accum 2.78 AR	Time of Concentration	Rain Intensity (mm/hr) 2yr	5yr	100yr	Peak Flow	TOTAL UNRESTRICTED PEAK FLOW (QDesign)	PIPE PROPERTIES LENGTH	SIZE / MATERIAL	ID ACTUAL	ROUGHNESS	DESIGN GRADE	CAPACITY	FULL FLOW VELOCITY	TIME OF FLOW	QPEAK DESIGN / QFULL
			0.90	0.20	(ha)				(min.)				(L/s)	(L/s)	(m)	(mm / type)	(m)		(%)	(L/s)	(m/s)	(min.)	(%)
Croissant Francoise (STMMH 101)																							
CBMH 101	STMMH 101	A-01b	0.08	0.03	0.11	0.72	0.21	0.21															
					0.00		0.00	0.00															
					0.00		0.00	0.00															
		A-01a	0.11	0.03	0.14	0.73	0.29	0.51	10.00	76.81			39.05										
					0.00		0.00	0.00	10.00				0.00	**39.0**	22.2	375 PVC	0.381	0.013	0.50	129.3	1.13	0.33	30.2%
					0.00		0.00	0.00	10.00				0.00										
Lamarche Avenue (EXSTMMH)																							
TANK 02	STMMH 205	B-01	0.42		0.42	0.90	1.04	1.04	10.00	76.81			79.75										
					0.00		0.00	0.00	10.00				0.00	**79.7**	4.8	300 PVC	0.3048	0.013	1.00	100.9	1.38	0.06	79.1%
					0.00		0.00	0.00	10.00				0.00										
STMMH 205	STMMH 204				0.00		0.00	1.04	10.00	76.81			79.75										
					0.00		0.00	0.00	10.00				0.00	**79.7**	34.2	450 PVC	0.4572	0.013	0.50	210.3	1.28	0.44	37.9%
					0.00		0.00	0.00	10.00				0.00										
STMMH 204	STMMH203				0.00		0.00	1.04	10.44	75.14			78.02										
					0.00		0.00	0.00	10.44				0.00	**78.0**	21.2	450 PVC	0.4572	0.013	0.50	210.3	1.28	0.28	37.1%
					0.00		0.00	0.00	10.44				0.00										
TANK 01	STMMH 203	B-02	0.34		0.34	0.90	0.85	0.85	10.00	76.81			65.34										
					0.00		0.00	0.00	10.00				0.00	**65.3**	11.3	300 PVC	0.3048	0.013	1.00	100.9	1.38	0.14	64.8%
					0.00		0.00	0.00	10.00				0.00										
STMMH203	STMMH 202	B-02			0.00		0.00	1.89	10.72	74.14			140.06										
					0.00		0.00	0.00	10.72				0.00	**140.1**	44.2	450 PVC	0.4572	0.013	0.50	210.3	1.28	0.58	66.6%
					0.00		0.00	0.00	10.72				0.00										
CBMH 207	CBMH 206	C-01c	0.06	0.10	0.16	0.47	0.21																
					0.00		0.00																
					0.00		0.00																
		C-01b	0.07	0.12	0.20	0.45	0.25	0.45	10.00	76.81			34.66										
					0.00		0.00	0.00	10.00				0.00	**34.7**	97.8	375 PVC	0.381	0.013	0.50	129.3	1.13	1.44	26.8%
					0.00		0.00	0.00	10.00				0.00										
CBMH 206	STMMH 202	C-01a	0.02	0.04	0.06	0.39	0.06	0.51	11.44	71.70			36.86										
					0.00		0.00	0.00	11.44				0.00	**36.9**	4.0	375 PVC	0.381	0.013	0.50	129.3	1.13	0.06	28.5%
					0.00		0.00	0.00	11.44				0.00										
STMMH 202	STMMH 201				0.00		0.00	2.40	11.50	71.50			171.83										
					0.00		0.00	0.00	11.50				0.00	**171.8**	44.2	525 CONC	0.5334	0.013	0.50	317.2	1.42	0.52	54.2%
					0.00		0.00	0.00	11.50				0.00										

DEMAND EQUATION
Q = 2.78 AIR

Where : **Q = Peak flow in litres per second (L/s)**
A = Area in hectares (ha)
R = Weighted runoff coefficient (increased by 25% for 100-year)
I = Rainfall intensity in millimeters per hour (mm/hr)
Rainfall Intensity (I) is based on City of Ottawa IDF data presented in the City of Ottawa Sewer Design Guidelines (Oct. 2012)

CAPACITY EQUATION
Q full= (1/n) A R^(2/3)So^(1/2)

Where : **Q full = Capacity (L/s)**
n = Manning coefficient of roughness (0.013)
A = Flow area (m^2)
R = Wetter perimenter (m)
So = Pipe Slope/gradient

APPENDIX D
Stormwater Management Calculations

External Drainage Area Flows

TABLE 1: Allowable Runoff Coefficient "C" - External

Area	"C"
Total	0.40
0.110	

TABLE 1F: Allowable Flows - External

Outlet Options	Area (ha)	"C"	Tc (min)	$Q_{2\ Year}$ (L/s)
	0.110	0.40	10	**9.4**

Time of Concentration	T_C=	10	min
Intensity (2 Year Event)	I_2=	76.81	mm/hr
Intensity (5 Year Event)	I_5=	104.19	mm/hr
Intensity (100 Year Event)	I_{100}=	178.56	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014) $^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$

Equations:
Flow Equation
Q = 2.78 x C x I x A
Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

TABLE 2A: Allowable release rate from DSEL Report

Area ID	Area (ha)	Allowable Flow	
Block 149	2.86	501	(From Assessment of Adequacy of Public Services By DSEI - May 2019)
Block 150	2.17	406	(From Assessment of Adequacy of Public Services By DSEI - May 2020)
External	0.11	9.4	(Calculated)
Total	**5.140**	**916.4**	**L/s**

TABLE 2B: Calculated Allowable Release Rate Per Block

Zone	Area (ha)	% Area	Release Rate (L/s)	Comments
ROW	0.611	N/A	147.0	* ROW release rate based on 2-yr storage requirement
Park	0.503	N/A	108.5	* Park release rate uncontrolled flows
Sub Total	**1.114**		**255.5**	
Block 1	1.535	38.2%	252.4	* Release Rate allocated by % area for remaining flow
Block 2	0.922	22.9%	151.6	
Block 3	1.563	38.9%	257.0	
Sub Total	4.020		660.90	
Total	**5.134**		**916.4**	

Table 3: Post-Development Stormwater Mangement Summary

Area ID	Area (ha)	1:5 Year Weighted Cw	Oulet Location	Orifice	2 Year Storm Event			5 Year Storm Event			100 Year Storm Event				100 Year + 20% Storm Event		
					Release (L/s)	Head (m)	Req'd Vol (cu.m)	Release (L/s)	Head (m)	Req'd Vol (cu.m)	Release (L/s)	Head	Req'd Vol (cu.m)	Max. Vol. Provided (cu.m.)	Release (L/s)	Head (m)	Req'd Vol (cu.m)
D-01	0.062	0.48	Lamarche Ave	N/A	8.7	N/A	N/A	14.6	N/A	N/A	28.7	N/A	N/A	N/A	35.1	N/A	N/A
D-02	0.013	0.70	Francoise Cres	N/A	2.6	N/A	N/A	3.6	N/A	N/A	6.3	N/A	N/A	N/A	7.6	N/A	N/A
D-03	0.010	0.58	Francoise Cres	N/A	1.7	N/A	N/A	2.6	N/A	N/A	4.8	N/A	N/A	N/A	5.8	N/A	N/A
D-04	0.024	0.25	Park	N/A	2.6	N/A	N/A	5.1	N/A	N/A	10.8	N/A	N/A	N/A	13.3	N/A	N/A
D-05	0.005	0.25	Park	N/A	0.5	N/A	N/A	1.1	N/A	N/A	2.3	N/A	N/A	N/A	2.8	N/A	N/A
Sub Total					16.1			27.0			52.9				64.6		
A-01	0.252	0.73	Francoise Cres	97mm Plate	28.6	2.36	3.7	34.6	3.35	9.2	35.8	3.59	41.2	43.1	136.5	3.63	N/A
B-01	0.415	0.90	Lamarche Ave	180mm Plate	48.0	0.58	38.3	58.8	0.82	54.7	83.2	1.55	103.1	133.0	93.3	1.93	128.0
B-02	0.342	0.90	Lamarche Ave	140mm Plate	29.9	0.59	38.9	36.1	0.82	54.8	50.3	1.53	101.7	133.0	56.3	1.90	127.0
C-01	0.413	0.45	Lamarche Ave	100mm Plate	17.6	0.74	9.7	20.9	1.02	15.7	28.5	1.85	48.0	50.0	55.7	1.92	N/A
Sub Total					124.1			150.4			197.8				341.8		
Total					**140.2**			**177.4**			**250.7**				**406.4**		
Allowable					**252.4**			**252.4**			**252.4**				**N/A**		

*Refer to PCSWMM model results for mnore details

Legend

- Junctions
- Outfalls

Storages

- Visible
- CB
- HP
- Manhole
- Tank
- Landscape Drain

Conduits

- Visible
- Major System
- Control
- RearYard Swale
- Orifices

Subcatchments

- Visible
- ROW
- Block
- Park
- Tank Areas
- Direct Runoff
- Controlled Flows

N

50 m

Chicago 6hr 2-Year Storm PCSWM Model Results

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

****
Element Count
****
Number of rain gages 1
Number of subcatchments ... 29
Number of nodes 51
Number of links 61
Number of pollutants 0
Number of land uses 0

****
Raingage Summary
****

Name	Data Source	Data Type	Recording Interval
Raingage1	C6-2	INTENSITY	10 min.

****
Subcatchment Summary
****

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A-01a	0.14	41.43	76.00	2.0000	Raingage1	CBMH101
A-01b	0.11	10.70	74.00	2.0000	Raingage1	CB1
A-04b	0.10	10.20	77.00	1.0000	Raingage1	CB2
B-01	0.41	166.00	100.00	1.5000	Raingage1	TANK1
B-02	0.34	136.80	100.00	1.5000	Raingage1	TANK2
C-01a	0.06	11.37	27.00	0.5000	Raingage1	CBMH206
C-01b	0.20	24.02	36.00	0.5000	Raingage1	CBMH207
C-01c	0.16	15.96	39.00	0.7000	Raingage1	LD208
D-01	0.06	62.00	40.00	2.0000	Raingage1	LamarcheB
D-02	0.01	32.50	71.00	2.0000	Raingage1	R-04a
D-03	0.01	12.50	54.00	1.5000	Raingage1	R-03a
D-04	0.02	48.00	7.00	1.5000	Raingage1	P-01
D-05	0.01	10.00	7.00	1.5000	Raingage1	EXDITCH2
P-01	0.10	29.71	7.00	0.5000	Raingage1	MH400
P-02	0.20	29.14	36.00	0.5000	Raingage1	MH400
P-03	0.13	19.56	7.00	1.5000	Raingage1	CB401
P-04	0.03	15.68	7.00	1.5000	Raingage1	CB401
P-05	0.03	16.50	7.00	1.0000	Raingage1	EXDITCH1
R-01a	0.09	10.23	79.00	1.0000	Raingage1	CB9
R-01b	0.08	10.25	79.00	1.0000	Raingage1	CB8
R-02a	0.09	10.00	67.00	1.0000	Raingage1	CB7
R-02b	0.07	10.00	67.00	1.0000	Raingage1	CB6
R-03a	0.09	10.00	69.00	1.0000	Raingage1	CB5
R-03b	0.07	10.00	69.00	1.0000	Raingage1	CB4
R-04a	0.08	10.12	77.00	1.0000	Raingage1	CB3
ZONE2A	0.46	102.67	93.00	2.0000	Raingage1	ZN2A
ZONE2B	0.46	92.00	93.00	2.0000	Raingage1	ZN2B
ZONE3A	0.49	54.33	93.00	2.0000	Raingage1	ZN3B
ZONE3B	1.07	102.29	93.00	2.0000	Raingage1	ZN3A

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Node Summary
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Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
MH101	JUNCTION	84.87	4.10	0.0	
MH102	JUNCTION	85.17	4.19	0.0	
MH103	JUNCTION	85.31	3.93	0.0	
MH104	JUNCTION	85.55	3.95	0.0	
MH105	JUNCTION	85.84	3.64	0.0	
MH106	JUNCTION	85.98	3.74	0.0	
MH107	JUNCTION	86.75	3.35	0.0	
EXDITCH1	OUTFALL	88.70	0.00	0.0	
EXDITCH2	OUTFALL	88.70	0.00	0.0	
LamarcheA	OUTFALL	88.54	1.00	0.0	
LamarcheAC	OUTFALL	88.78	1.00	0.0	
LamarcheB	OUTFALL	88.40	0.00	0.0	
LamarcheBD	OUTFALL	88.78	1.00	0.0	
LamarcheE	OUTFALL	89.53	1.16	0.0	
MH100	OUTFALL	84.52	0.83	0.0	

XMH13	OUTFALL	0.00	0.00	0.0
XMH15	OUTFALL	0.00	84.55	0.0
1+017a	STORAGE	88.90	1.00	0.0
1+017b	STORAGE	88.90	1.00	0.0
1+104a	STORAGE	89.31	1.00	0.0
1+104b	STORAGE	89.31	1.00	0.0
1+179a	STORAGE	89.48	1.00	0.0
1+179b	STORAGE	89.48	1.00	0.0
1+329	STORAGE	90.50	1.00	0.0
CB1	STORAGE	87.50	2.50	0.0
CB2	STORAGE	87.24	2.50	0.0
CB3	STORAGE	87.24	2.50	0.0
CB4	STORAGE	87.62	2.50	0.0
CB401	STORAGE	86.53	1.87	0.0
CB5	STORAGE	87.62	2.50	0.0
CB6	STORAGE	87.81	2.50	0.0
CB7	STORAGE	87.81	2.50	0.0
CB8	STORAGE	88.23	2.50	0.0
CB9	STORAGE	88.23	2.50	0.0
CBMH101	STORAGE	85.36	4.34	0.0
CBMH206	STORAGE	86.74	2.61	0.0
CBMH207	STORAGE	87.35	2.00	0.0
HPRYS	STORAGE	88.60	1.00	0.0
LD208	STORAGE	87.70	2.00	0.0
MH201	STORAGE	83.91	4.80	0.0
MH202	STORAGE	85.03	3.71	0.0
MH203	STORAGE	85.03	3.91	0.0
MH204	STORAGE	85.46	3.50	0.0
MH205	STORAGE	85.71	3.60	0.0
MH400	STORAGE	86.07	3.13	0.0
TANK1	STORAGE	86.00	3.50	0.0
TANK2	STORAGE	86.00	3.30	0.0
ZN2A	STORAGE	85.90	4.50	0.0
ZN2B	STORAGE	85.37	5.03	0.0
ZN3A	STORAGE	86.35	4.25	0.0
ZN3B	STORAGE	87.10	3.75	0.0

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
1	1+329	CB9	CONDUIT	65.0	1.1847	0.0150
10	1+104b	CB4	CONDUIT	33.6	0.5651	0.0150
101-100	MH101	MH100	CONDUIT	55.5	0.4863	0.0130
102-101	MH102	MH101	CONDUIT	43.6	0.5048	0.0130
103-102	MH103	MH102	CONDUIT	22.4	0.4907	0.0130
104-103	MH104	MH103	CONDUIT	42.9	0.4892	0.0130
105	MH105	MH104	CONDUIT	42.9	0.3495	0.0130
106-105	MH106	MH105	CONDUIT	22.4	0.4913	0.0130
107-106	MH107	MH106	CONDUIT	43.0	1.3969	0.0130
11	1+104a	CB3	CONDUIT	57.2	0.9970	0.0150
1-101	CB1	CBMH101	CONDUIT	45.1	0.9972	0.0130
12	1+104b	CB2	CONDUIT	56.5	1.0097	0.0150
13	1+017a	CB3	CONDUIT	26.0	0.6158	0.0150
14	1+017b	CB2	CONDUIT	25.8	0.6210	0.0150
15	1+017a	LamarcheAC	CONDUIT	9.2	1.3023	0.0150
16	1+017b	LamarcheBD	CONDUIT	12.2	0.9832	0.0150
2	1+329	CB8	CONDUIT	65.0	1.1847	0.0150
202-201	MH202	MH201	CONDUIT	20.5	0.4868	0.0130
203-202	MH203	MH202	CONDUIT	44.2	0.4973	0.0130
204-203	MH204	MH203	CONDUIT	21.2	0.4711	0.0130
205-204	MH205	MH204	CONDUIT	34.2	0.4976	0.0130
207-206	CBMH207	CBMH206	CONDUIT	97.8	0.5010	0.0130
208-207	LD208	CBMH207	CONDUIT	69.7	0.5022	0.0130
3	CB9	CB7	CONDUIT	50.7	0.8291	0.0150
4	CB8	CB6	CONDUIT	37.6	1.1157	0.0150
5	1+179a	CB7	CONDUIT	33.8	0.5034	0.0150
6	1+179b	CB6	CONDUIT	33.8	0.5032	0.0150
7	1+179a	CB5	CONDUIT	36.2	0.9959	0.0150
8	1+179b	CB4	CONDUIT	36.4	0.9900	0.0150
9	1+104a	CB5	CONDUIT	45.8	0.4148	0.0150
C1	ZN3A	CB9	CONDUIT	1.0	1.0001	0.0130
C2	ZN3B	CB9	CONDUIT	1.0	1.0001	0.0150
C3	HPRYS	CBMH206	CONDUIT	51.2	0.4885	0.0130
C4	HPRYS	CBMH207	CONDUIT	47.6	0.5256	0.0130
C5	LD208	CBMH207	CONDUIT	70.2	0.4985	0.0130
C6	CBMH206	LamarcheA	CONDUIT	1.0	6.0108	0.2500
CAP4-104	MH400	MH104	CONDUIT	13.9	1.0072	0.0130
CB3/2	CB3	CB2	CONDUIT	1.0	0.1000	0.0130
CB5/4	CB5	CB4	CONDUIT	1.0	0.1000	0.0150

CB7/6	CB7	CB6	CONDUIT	1.0	0.1000	0.0150
OVF2A	ZN2A	CB4	CONDUIT	1.0	1.0001	0.0150
OVF2B	ZN2B	LamarcheE	CONDUIT	1.0	1.0001	0.0130
OVFA1	CBMH101	CB3	CONDUIT	1.0	0.1000	0.0150
STM-36_(STM)	CB401	MH400	CONDUIT	46.2	0.9740	0.0130
STM-39_(STM)	MH201	XMH15	CONDUIT	11.8	0.3385	0.0130
CAP3b-107	ZN3B	MH107	ORIFICE			
OR1	CB3	MH101	ORIFICE			
OR3	CB2	MH101	ORIFICE			
OR3A	ZN3A	MH106	ORIFICE			
OR4	CB6	MH105	ORIFICE			
OR5	CB7	MH105	ORIFICE			
ORCB4	CB4	MH104	ORIFICE			
ORCB5	CB5	MH104	ORIFICE			
ORCB8	CB8	MH107	ORIFICE			
ORCB9	CB9	MH107	ORIFICE			
ORCBMH206	CBMH206	MH202	ORIFICE			
ORTANK1	TANK1	MH205	ORIFICE			
ORTANK2	TANK2	MH203	ORIFICE			
ORZN2a	ZN2A	MH104	ORIFICE			
ORZN2b	ZN2B	XMH13	ORIFICE			
STM-23_(STM)	CBMH101	MH101	ORIFICE			

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
1	20mROWlaf	1.00	8.41	0.25	10.01	1	24202.43
10	20mROWlaf	1.00	8.41	0.25	10.01	1	16715.41
101-100	CIRCULAR	0.75	0.44	0.19	0.75	1	776.37
102-101	CIRCULAR	0.68	0.36	0.17	0.68	1	597.29
103-102	CIRCULAR	0.68	0.36	0.17	0.68	1	588.87
104-103	CIRCULAR	0.68	0.36	0.17	0.68	1	587.95
105	CIRCULAR	0.60	0.28	0.15	0.60	1	363.00
106-105	CIRCULAR	0.60	0.28	0.15	0.60	1	430.38
107-106	CIRCULAR	0.45	0.16	0.11	0.45	1	336.99
11	20mROWlaf	1.00	8.41	0.25	10.01	1	22202.02
1-101	CIRCULAR	0.38	0.11	0.09	0.38	1	175.09
12	20mROWlaf	1.00	8.41	0.25	10.01	1	22343.95
13	20mROWlaf	1.00	8.41	0.25	10.01	1	17448.82
14	20mROWlaf	1.00	8.41	0.25	10.01	1	17522.14
15	20mROWlaf	1.00	8.41	0.25	10.01	1	25375.60
16	20mROWlaf	1.00	8.41	0.25	10.01	1	22048.01
2	20mROWlaf	1.00	8.41	0.25	10.01	1	24202.43
202-201	CIRCULAR	0.53	0.22	0.13	0.53	1	300.09
203-202	CIRCULAR	0.45	0.16	0.11	0.45	1	201.08
204-203	CIRCULAR	0.45	0.16	0.11	0.45	1	195.71
205-204	CIRCULAR	0.45	0.16	0.11	0.45	1	201.13
207-206	CIRCULAR	0.38	0.11	0.09	0.38	1	124.11
208-207	CIRCULAR	0.30	0.07	0.07	0.30	1	68.53
3	20mROWlaf	1.00	8.41	0.25	10.01	1	20247.11
4	20mROWlaf	1.00	8.41	0.25	10.01	1	23487.33
5	20mROWlaf	1.00	8.41	0.25	10.01	1	15776.25
6	20mROWlaf	1.00	8.41	0.25	10.01	1	15774.15
7	20mROWlaf	1.00	8.41	0.25	10.01	1	22189.98
8	20mROWlaf	1.00	8.41	0.25	10.01	1	22124.89
9	20mROWlaf	1.00	8.41	0.25	10.01	1	14321.75
C1	CIRCULAR	1.00	0.79	0.25	1.00	1	2397.78
C2	RECT_OPEN	1.00	3.00	0.60	3.00	1	14228.79
C3	TRAPEZOIDAL	1.00	3.50	0.51	6.50	1	12057.61
C4	TRAPEZOIDAL	1.00	3.50	0.51	6.50	1	12506.56
C5	TRAPEZOIDAL	1.00	3.50	0.51	6.50	1	12179.66
C6	RECT_OPEN	1.00	3.00	0.60	3.00	1	2093.03
CAP4-104	CIRCULAR	0.30	0.07	0.07	0.30	1	97.06
CB3/2	CIRCULAR	1.00	0.79	0.25	1.00	1	758.23
CB5/4	RECT_OPEN	1.00	1.00	0.33	1.00	1	1013.57
CB7/6	RECT_OPEN	1.00	1.00	0.33	1.00	1	1013.57
OVF2A	RECT_OPEN	1.00	3.00	0.60	3.00	1	14228.79
OVF2B	RECT_OPEN	1.00	3.00	0.60	3.00	1	16417.83
OVFA1	CIRCULAR	1.00	0.79	0.25	1.00	1	657.13
STM-36_(STM)	CIRCULAR	0.30	0.07	0.07	0.30	1	95.44
STM-39_(STM)	CIRCULAR	0.68	0.36	0.17	0.68	1	489.07

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Transect Summary
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Transect 20mROW1af
Area:

0.0008	0.0030	0.0068	0.0121	0.0189
0.0270	0.0354	0.0440	0.0547	0.0677
0.0832	0.1010	0.1212	0.1438	0.1676
0.1913	0.2151	0.2389	0.2626	0.2864
0.3102	0.3339	0.3577	0.3815	0.4052
0.4290	0.4528	0.4766	0.5004	0.5241
0.5479	0.5717	0.5955	0.6193	0.6431
0.6668	0.6906	0.7144	0.7382	0.7620
0.7858	0.8096	0.8334	0.8572	0.8810
0.9048	0.9286	0.9524	0.9762	1.0000

Hrad:

0.0387	0.0774	0.1162	0.1549	0.1936
0.2510	0.3264	0.3981	0.4447	0.4684
0.4771	0.4767	0.4711	0.4627	0.4586
0.4606	0.4665	0.4751	0.4856	0.4976
0.5106	0.5244	0.5389	0.5539	0.5693
0.5851	0.6011	0.6174	0.6339	0.6506
0.6674	0.6844	0.7014	0.7186	0.7358
0.7532	0.7705	0.7880	0.8055	0.8230
0.8406	0.8582	0.8759	0.8935	0.9112
0.9289	0.9467	0.9644	0.9822	1.0000

Width:

0.0635	0.1270	0.1906	0.2541	0.3176
0.3495	0.3496	0.3996	0.4993	0.5991
0.6989	0.7987	0.8984	0.9982	0.9982
0.9983	0.9983	0.9984	0.9984	0.9985
0.9985	0.9986	0.9986	0.9987	0.9987
0.9988	0.9988	0.9989	0.9989	0.9990
0.9990	0.9991	0.9991	0.9992	0.9992
0.9993	0.9993	0.9994	0.9994	0.9995
0.9995	0.9996	0.9996	0.9997	0.9997
0.9998	0.9998	0.9999	0.9999	1.0000

Transect ROW20m
Area:

0.0008	0.0030	0.0068	0.0121	0.0189
0.0270	0.0354	0.0440	0.0547	0.0678
0.0832	0.1011	0.1213	0.1439	0.1676
0.1914	0.2152	0.2389	0.2627	0.2865

0.3103	0.3340	0.3578	0.3816	0.4054
0.4291	0.4529	0.4767	0.5005	0.5243
0.5480	0.5718	0.5956	0.6194	0.6432
0.6670	0.6907	0.7145	0.7383	0.7621
0.7859	0.8097	0.8335	0.8572	0.8810
0.9048	0.9286	0.9524	0.9762	1.0000

Hrad:

0.0387	0.0774	0.1161	0.1548	0.1935
0.2508	0.3262	0.3978	0.4443	0.4680
0.4768	0.4764	0.4708	0.4624	0.4583
0.4603	0.4662	0.4748	0.4854	0.4973
0.5103	0.5242	0.5386	0.5536	0.5690
0.5848	0.6009	0.6172	0.6337	0.6504
0.6672	0.6842	0.7012	0.7184	0.7357
0.7530	0.7704	0.7878	0.8053	0.8229
0.8405	0.8581	0.8758	0.8934	0.9112
0.9289	0.9466	0.9644	0.9822	1.0000

Width:

0.0636	0.1272	0.1908	0.2544	0.3179
0.3498	0.3499	0.3999	0.4998	0.5996
0.6995	0.7993	0.8992	0.9990	0.9990
0.9991	0.9991	0.9991	0.9991	0.9992
0.9992	0.9992	0.9992	0.9993	0.9993
0.9993	0.9994	0.9994	0.9994	0.9994
0.9995	0.9995	0.9995	0.9996	0.9996
0.9996	0.9996	0.9997	0.9997	0.9997
0.9998	0.9998	0.9998	0.9998	0.9999
0.9999	0.9999	0.9999	1.0000	1.0000

****
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 ............ 11/15/2021 00:00:00
Ending Date .............. 11/16/2021 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
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
```

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Initial LID Storage	0.004	0.699
Total Precipitation	0.191	36.858
Evaporation Loss	0.000	0.000
Infiltration Loss	0.039	7.512
Surface Runoff	0.153	29.558
Final Storage	0.004	0.699
Continuity Error (%)	-0.565	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.153	1.535
Groundwater Inflow	0.000	0.000

RDII Inflow	0.000	0.000
External Inflow	0.000	0.003
External Outflow	0.154	1.536
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.005	0.046
Final Stored Volume	0.004	0.044
Continuity Error (%)	0.226	

```
**************************
Time-Step Critical Elements
**************************
None

*******************************
Highest Flow Instability Indexes
*******************************
Link ORZN2b (110)
Link STM-23_(STM) (103)

************************
Routing Time Step Summary
************************
Minimum Time Step           :     1.59 sec
Average Time Step           :     5.00 sec
Maximum Time Step           :     5.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.01
Percent Not Converging      :     0.04
Time Step Frequencies       :
    5.000 -  3.155 sec      :    99.98 %
    3.155 -  1.991 sec      :     0.01 %
    1.991 -  1.256 sec      :     0.01 %
    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
A-01a	36.86	0.00	0.00	7.57	28.15	1.35	29.50	0.04	26.09	0.800
A-01b	36.86	0.00	0.00	8.56	27.46	1.06	28.52	0.03	17.45	0.774
A-04b	36.86	0.00	0.00	7.65	28.57	0.85	29.42	0.03	16.63	0.798
B-01	36.86	0.00	0.00	0.00	37.05	0.00	37.05	0.15	88.49	1.005
B-02	36.86	0.00	0.00	0.00	37.05	0.00	37.05	0.13	72.92	1.005
C-01a	36.86	0.00	0.00	25.17	10.00	1.78	11.78	0.01	3.82	0.320
C-01b	36.86	0.00	0.00	22.36	13.36	1.25	14.61	0.03	16.03	0.396
C-01c	36.86	0.00	0.00	21.29	14.47	1.22	15.69	0.02	13.80	0.426
D-01	36.86	0.00	0.00	18.75	14.75	3.59	18.34	0.01	8.72	0.498
D-02	36.86	0.00	0.00	8.85	26.18	1.96	28.15	0.00	2.57	0.764
D-03	36.86	0.00	0.00	14.26	19.92	2.89	22.81	0.00	1.66	0.619
D-04	36.86	0.00	0.00	28.99	2.58	5.66	8.25	0.00	2.55	0.224
D-05	36.86	0.00	0.00	28.99	2.58	5.66	8.25	0.00	0.53	0.224
P-01	36.86	1.90	0.00	32.71	2.71	3.39	6.10	0.01	2.90	0.157
P-02	36.86	0.00	0.00	22.23	13.36	1.39	14.75	0.03	16.03	0.400
P-03	36.86	0.00	0.00	32.04	2.58	2.29	4.87	0.01	3.43	0.132
P-04	36.86	0.00	0.00	30.27	2.58	4.16	6.75	0.00	1.46	0.183
P-05	36.86	0.00	0.00	30.63	2.58	3.77	6.35	0.00	1.41	0.172
R-01a	36.86	0.00	0.00	6.91	29.32	0.86	30.18	0.03	14.92	0.819
R-01b	36.86	0.00	0.00	6.89	29.32	0.88	30.20	0.03	14.16	0.819
R-02a	36.86	0.00	0.00	11.10	24.87	1.09	25.96	0.02	13.13	0.704
R-02b	36.86	0.00	0.00	10.95	24.87	1.25	26.11	0.02	10.04	0.708
R-03a	36.86	2.59	0.00	10.74	27.39	1.52	28.91	0.03	14.07	0.733
R-03b	36.86	0.00	0.00	10.25	25.61	1.21	26.82	0.02	10.12	0.728
R-04a	36.86	4.30	0.00	8.02	31.88	1.49	33.37	0.03	15.72	0.811
ZONE2A	36.86	0.00	0.00	2.16	34.49	0.46	34.95	0.16	95.51	0.948
ZONE2B	36.86	0.00	0.00	2.17	34.50	0.45	34.95	0.16	94.80	0.948
ZONE3A	36.86	0.00	0.00	2.19	34.51	0.42	34.93	0.17	97.83	0.948
ZONE3B	36.86	0.00	0.00	2.20	34.51	0.40	34.91	0.37	212.09	0.947

****
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
MH101	JUNCTION	0.63	0.80	85.67	0 02:11	0.80
MH102	JUNCTION	0.33	0.58	85.75	0 02:11	0.58
MH103	JUNCTION	0.19	0.53	85.84	0 02:11	0.53

MH104	JUNCTION	0.03	0.47	86.02	0	02:11	0.47
MH105	JUNCTION	0.03	0.39	86.23	0	02:11	0.39
MH106	JUNCTION	0.03	0.39	86.37	0	02:11	0.39
MH107	JUNCTION	0.01	0.17	86.92	0	02:10	0.17
EXDITCH1	OUTFALL	0.00	0.00	88.70	0	00:00	0.00
EXDITCH2	OUTFALL	0.00	0.00	88.70	0	00:00	0.00
LamarcheA	OUTFALL	0.00	0.00	88.54	0	00:00	0.00
LamarcheAC	OUTFALL	0.00	0.00	88.78	0	00:00	0.00
LamarcheB	OUTFALL	0.00	0.00	88.40	0	00:00	0.00
LamarcheBD	OUTFALL	0.00	0.00	88.78	0	00:00	0.00
LamarcheE	OUTFALL	0.00	0.00	89.53	0	00:00	0.00
MH100	OUTFALL	0.98	0.98	85.50	0	00:00	0.98
XMH13	OUTFALL	85.88	85.88	85.88	0	00:00	85.88
XMH15	OUTFALL	85.01	85.01	85.01	0	00:00	85.01
1+017a	STORAGE	0.00	0.00	88.90	0	00:00	0.00
1+017b	STORAGE	0.00	0.00	88.90	0	00:00	0.00
1+104a	STORAGE	0.00	0.00	89.31	0	00:00	0.00
1+104b	STORAGE	0.00	0.00	89.31	0	00:00	0.00
1+179a	STORAGE	0.00	0.00	89.48	0	00:00	0.00
1+179b	STORAGE	0.00	0.00	89.48	0	00:00	0.00
1+329	STORAGE	0.00	0.00	90.50	0	00:00	0.00
CB1	STORAGE	0.01	0.22	87.72	0	02:13	0.22
CB2	STORAGE	0.02	1.11	88.35	0	02:11	1.11
CB3	STORAGE	0.02	1.00	88.24	0	02:11	1.00
CB4	STORAGE	0.01	0.48	88.10	0	02:10	0.47
CB401	STORAGE	0.00	0.05	86.58	0	02:10	0.05
CB5	STORAGE	0.01	0.83	88.45	0	02:10	0.83
CB6	STORAGE	0.01	0.47	88.28	0	02:10	0.46
CB7	STORAGE	0.01	0.74	88.55	0	02:10	0.74
CB8	STORAGE	0.01	0.85	89.08	0	02:10	0.84
CB9	STORAGE	0.02	0.93	89.16	0	02:10	0.92
CBMH101	STORAGE	0.17	2.36	87.72	0	02:12	2.36
CBMH206	STORAGE	0.02	0.74	87.48	0	02:13	0.73
CBMH207	STORAGE	0.01	0.13	87.48	0	02:14	0.13
HPRYS	STORAGE	0.00	0.00	88.60	0	00:00	0.00
LD208	STORAGE	0.01	0.09	87.79	0	02:10	0.09
MH201	STORAGE	1.11	1.11	85.02	0	02:12	1.11
MH202	STORAGE	0.02	0.25	85.28	0	02:15	0.25
MH203	STORAGE	0.32	0.52	85.55	0	02:14	0.52
MH204	STORAGE	0.01	0.16	85.62	0	02:14	0.16
MH205	STORAGE	0.01	0.15	85.86	0	02:13	0.15
MH400	STORAGE	0.01	0.12	86.19	0	02:10	0.12
TANK1	STORAGE	0.02	0.58	86.58	0	02:13	0.58
TANK2	STORAGE	0.03	0.59	86.59	0	02:14	0.59
ZN2A	STORAGE	0.06	3.56	89.46	0	02:12	3.56
ZN2B	STORAGE	0.55	4.09	89.46	0	02:11	4.09
ZN3A	STORAGE	0.06	3.30	89.65	0	02:12	3.30
ZN3B	STORAGE	0.05	2.80	89.90	0	02:11	2.80

****
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	
MH101	JUNCTION	0.00	469.23	0 02:11	0	1.02	-0.038	
MH102	JUNCTION	0.00	411.46	0 02:11	0	0.888	0.006	
MH103	JUNCTION	0.00	412.22	0 02:11	0	0.888	0.037	
MH104	JUNCTION	0.00	412.32	0 02:10	0	0.887	-0.018	
MH105	JUNCTION	0.00	294.78	0 02:11	0	0.637	-0.068	
MH106	JUNCTION	0.00	273.08	0 02:11	0	0.597	0.096	
MH107	JUNCTION	0.00	105.67	0 02:10	0	0.222	0.011	
EXDITCH1	OUTFALL	1.41	1.41	0 02:10	0.00209	0.00209	0.000	
EXDITCH2	OUTFALL	0.53	0.53	0 02:10	0.000412	0.000412	0.000	
LamarcheA	OUTFALL	0.00	0.00	0 00:00	0	0	0.000	ltr
LamarcheAC	OUTFALL	0.00	0.00	0 00:00	0	0	0.000	ltr
LamarcheB	OUTFALL	8.72	8.72	0 02:10	0.0114	0.0114	0.000	
LamarcheBD	OUTFALL	0.00	0.00	0 00:00	0	0	0.000	ltr
LamarcheE	OUTFALL	0.00	0.00	0 00:00	0	0	0.000	ltr
MH100	OUTFALL	0.00	469.33	0 02:12	0	1.02	0.000	
XMH13	OUTFALL	0.00	73.21	0 02:12	0	0.162	0.000	
XMH15	OUTFALL	0.00	95.13	0 02:15	0	0.341	0.000	
1+017a	STORAGE	0.00	0.00	0 00:00	0	1.07e-06	0.000	ltr
1+017b	STORAGE	0.00	0.00	0 00:00	0	1.09e-06	0.000	ltr
1+104a	STORAGE	0.00	0.00	0 00:00	0	0	0.000	ltr
1+104b	STORAGE	0.00	0.00	0 00:00	0	0	0.000	ltr
1+179a	STORAGE	0.00	0.00	0 00:00	0	0	0.000	ltr

1+179b	STORAGE	0.00	0.00	0	00:00	0	0	0.000	ltr
1+329	STORAGE	0.00	0.00	0	00:00	0	0	-0.000	ltr
CB1	STORAGE	17.45	17.45	0	02:10	0.0305	0.0305	0.435	
CB2	STORAGE	16.63	16.63	0	02:10	0.03	0.03	0.001	
CB3	STORAGE	15.72	15.72	0	02:10	0.0284	0.0284	0.001	
CB4	STORAGE	10.12	10.12	0	02:10	0.0176	0.0176	0.001	
CB401	STORAGE	4.89	4.89	0	02:10	0.00843	0.00844	0.105	
CB5	STORAGE	14.07	14.07	0	02:10	0.0254	0.0254	0.001	
CB6	STORAGE	10.04	10.04	0	02:10	0.0175	0.0175	0.002	
CB7	STORAGE	13.13	13.13	0	02:10	0.0234	0.0234	0.001	
CB8	STORAGE	14.16	14.16	0	02:10	0.0251	0.0251	0.001	
CB9	STORAGE	14.92	14.92	0	02:10	0.0266	0.0266	0.001	
CBMH101	STORAGE	26.09	42.38	0	02:09	0.0428	0.0743	0.234	
CBMH206	STORAGE	3.82	32.42	0	02:10	0.00683	0.0602	-0.452	
CBMH207	STORAGE	16.03	29.54	0	02:10	0.0288	0.0536	0.331	
HPRYS	STORAGE	0.00	0.00	0	00:00	0	0	0.000	ltr
LD208	STORAGE	13.80	13.80	0	02:10	0.0248	0.0248	-0.063	
MH201	STORAGE	0.00	95.13	0	02:15	0	0.342	-0.002	
MH202	STORAGE	0.00	95.13	0	02:15	0	0.341	-0.001	
MH203	STORAGE	0.00	77.86	0	02:14	0	0.281	-0.030	
MH204	STORAGE	0.00	47.99	0	02:14	0	0.154	0.052	
MH205	STORAGE	0.00	48.00	0	02:13	0	0.154	-0.004	
MH400	STORAGE	19.73	24.35	0	02:10	0.0364	0.0449	-0.019	
TANK1	STORAGE	88.49	88.49	0	02:10	0.154	0.154	0.002	
TANK2	STORAGE	72.92	72.92	0	02:10	0.127	0.127	0.002	
ZN2A	STORAGE	95.51	95.51	0	02:10	0.161	0.161	0.203	
ZN2B	STORAGE	94.80	94.80	0	02:10	0.161	0.162	0.597	
ZN3A	STORAGE	212.09	212.09	0	02:10	0.375	0.375	0.098	
ZN3B	STORAGE	97.83	97.83	0	02:10	0.171	0.171	-0.038	

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters

MH101	JUNCTION	0.19	0.050	3.295

****
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
1+017a	0.000	0	0	0	0.000	0	0 00:00	0.00
1+017b	0.000	0	0	0	0.000	0	0 00:00	0.00
1+104a	0.000	0	0	0	0.000	0	0 00:00	0.00
1+104b	0.000	0	0	0	0.000	0	0 00:00	0.00
1+179a	0.000	0	0	0	0.000	0	0 00:00	0.00
1+179b	0.000	0	0	0	0.000	0	0 00:00	0.00
1+329	0.000	0	0	0	0.000	0	0 00:00	0.00
CB1	0.000	0	0	0	0.000	0	0 02:13	16.80
CB2	0.000	1	0	0	0.001	44	0 02:11	15.12
CB3	0.000	1	0	0	0.001	40	0 02:11	14.29
CB4	0.000	0	0	0	0.000	19	0 02:10	9.65
CB401	0.000	0	0	0	0.000	2	0 02:10	4.75
CB5	0.000	1	0	0	0.001	33	0 02:10	12.97
CB6	0.000	0	0	0	0.000	19	0 02:10	9.58
CB7	0.000	1	0	0	0.001	30	0 02:10	12.25
CB8	0.000	1	0	0	0.001	34	0 02:10	13.12
CB9	0.000	1	0	0	0.001	37	0 02:10	13.75
CBMH101	0.000	1	0	0	0.003	7	0 02:12	28.59
CBMH206	0.000	1	0	0	0.001	28	0 02:13	17.60
CBMH207	0.000	0	0	0	0.000	7	0 02:14	28.76
HPRYS	0.000	0	0	0	0.000	0	0 00:00	0.00
LD208	0.000	0	0	0	0.000	5	0 02:10	13.58

MH201	0.001	23	0	0	0.001	23	0	02:12	95.13
MH202	0.000	1	0	0	0.000	7	0	02:15	95.13
MH203	0.000	8	0	0	0.001	13	0	02:14	77.73
MH204	0.000	0	0	0	0.000	4	0	02:14	48.00
MH205	0.000	0	0	0	0.000	4	0	02:13	47.99
MH400	0.000	0	0	0	0.000	4	0	02:10	23.93
TANK1	0.002	1	0	0	0.038	23	0	02:13	48.00
TANK2	0.002	1	0	0	0.039	23	0	02:14	29.87
ZN2A	0.000	0	0	0	0.007	4	0	02:12	71.91
ZN2B	0.000	0	0	0	0.006	4	0	02:11	73.21
ZN3A	0.000	0	0	0	0.010	3	0	02:12	167.44
ZN3B	0.000	0	0	0	0.004	3	0	02:11	78.83

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
EXDITCH1	6.34	0.35	1.41	0.002
EXDITCH2	2.26	0.19	0.53	0.000
LamarcheA	0.00	0.00	0.00	0.000
LamarcheAC	0.00	0.00	0.00	0.000
LamarcheB	25.21	0.54	8.72	0.011
LamarcheBD	0.00	0.00	0.00	0.000
LamarcheE	0.00	0.00	0.00	0.000
MH100	74.01	16.40	469.33	1.021
XMH13	99.94	1.93	73.21	0.162
XMH15	41.22	9.71	95.13	0.341
System	24.90	29.12	640.65	1.538

****
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
1	CHANNEL	0.00	0 00:00	0.00	0.00	0.00
10	CHANNEL	0.00	0 00:00	0.00	0.00	0.00
101-100	CONDUIT	469.33	0 02:12	1.06	0.60	1.00
102-101	CONDUIT	411.87	0 02:12	1.19	0.69	0.93
103-102	CONDUIT	411.46	0 02:11	1.36	0.70	0.80
104-103	CONDUIT	412.22	0 02:11	1.55	0.70	0.71
105	CONDUIT	294.78	0 02:11	1.59	0.81	0.62
106-105	CONDUIT	273.08	0 02:11	1.48	0.63	0.62
107-106	CONDUIT	105.69	0 02:11	1.66	0.31	0.43
11	CHANNEL	0.00	0 00:00	0.00	0.00	0.00
1-101	CONDUIT	16.80	0 02:09	0.89	0.10	0.80
12	CHANNEL	0.00	0 00:00	0.00	0.00	0.00
13	CHANNEL	0.00	0 00:00	0.00	0.00	0.00
14	CHANNEL	0.00	0 00:00	0.00	0.00	0.00
15	CHANNEL	0.00	0 00:00	0.00	0.00	0.00
16	CHANNEL	0.00	0 00:00	0.00	0.00	0.00
2	CHANNEL	0.00	0 00:00	0.00	0.00	0.00
202-201	CONDUIT	95.13	0 02:15	1.06	0.32	0.43
203-202	CONDUIT	77.73	0 02:15	1.09	0.39	0.46
204-203	CONDUIT	48.00	0 02:14	0.86	0.25	0.38
205-204	CONDUIT	47.99	0 02:14	1.03	0.24	0.34
207-206	CONDUIT	28.76	0 02:10	0.69	0.23	0.68
208-207	CONDUIT	13.58	0 02:10	0.60	0.20	0.36
3	CHANNEL	0.00	0 00:00	0.00	0.00	0.00
4	CHANNEL	0.00	0 00:00	0.00	0.00	0.00
5	CHANNEL	0.00	0 00:00	0.00	0.00	0.00
6	CHANNEL	0.00	0 00:00	0.00	0.00	0.00
7	CHANNEL	0.00	0 00:00	0.00	0.00	0.00
8	CHANNEL	0.00	0 00:00	0.00	0.00	0.00
9	CHANNEL	0.00	0 00:00	0.00	0.00	0.00
C1	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
C2	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
C3	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
C4	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
C5	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
C6	CONDUIT	0.00	0 00:00	0.00	0.00	0.00

CAP4-104	CONDUIT	23.93	0	02:10	1.02	0.25	0.37
CB3/2	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
CB5/4	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
CB7/6	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
OVF2A	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
OVF2B	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
OVFA1	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
STM-36_(STM)	CONDUIT	4.75	0	02:10	0.38	0.05	0.26
STM-39_(STM)	CONDUIT	95.13	0	02:15	0.27	0.19	1.00
CAP3b-107	ORIFICE	78.83	0	02:11			1.00
OR1	ORIFICE	14.29	0	02:11			1.00
OR3	ORIFICE	15.12	0	02:11			1.00
OR3A	ORIFICE	167.44	0	02:12			1.00
OR4	ORIFICE	9.58	0	02:10			1.00
OR5	ORIFICE	12.25	0	02:10			1.00
ORCB4	ORIFICE	9.65	0	02:10			1.00
ORCB5	ORIFICE	12.97	0	02:10			1.00
ORCB8	ORIFICE	13.12	0	02:10			1.00
ORCB9	ORIFICE	13.75	0	02:10			1.00
ORCBMH206	ORIFICE	17.60	0	02:13			1.00
ORTANK1	ORIFICE	48.00	0	02:13			1.00
ORTANK2	ORIFICE	29.87	0	02:14			1.00
ORZN2a	ORIFICE	71.91	0	02:14			1.00
ORZN2b	ORIFICE	73.21	0	02:12			1.00
STM-23_(STM)	ORIFICE	28.59	0	02:12			1.00

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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
1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	1.00	1.00	0.00	0.00	0.00	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	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
103-102	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
104-103	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.01	0.96	0.00
105	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
106-105	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
107-106	1.00	0.00	0.00	0.00	0.00	0.01	0.00	0.99	0.00	0.00
11	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-101	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.01	0.00
12	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
14	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
15	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
16	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202-201	1.00	0.00	0.00	0.00	0.95	0.00	0.00	0.05	0.93	0.00
203-202	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
204-203	1.00	0.00	0.00	0.00	0.05	0.00	0.00	0.95	0.02	0.00
205-204	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
207-206	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.02	0.00
208-207	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.99	0.00
3	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C3	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C6	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CAP4-104	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
CB3/2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CB5/4	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CB7/6	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OVF2A	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OVF2B	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OVFA1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STM-36_(STM)	1.00	0.00	0.00	0.00	0.16	0.08	0.00	0.76	0.14	0.00
STM-39_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00

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Conduit Surcharge Summary
****

Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
101-100	0.19	0.19	24.00	0.01	0.01
102-101	0.01	0.01	0.19	0.01	0.01
1-101	0.01	0.01	0.18	0.01	0.01
207-206	0.01	0.01	0.36	0.01	0.01
STM-39_(STM)	24.00	24.00	24.00	0.01	0.01

Analysis begun on: Wed Dec 22 12:33:42 2021
Analysis ended on: Wed Dec 22 12:33:43 2021
Total elapsed time: 00:00:01

Chicago 6hr 5-Year Storm PCSWM Model Results

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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.015)
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*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 29
Number of nodes ........... 51
Number of links ........... 61
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
----------------------------------------------------------------------
Raingage1            C6-5                        INTENSITY   10 min.


********************
Subcatchment Summary
********************
Name                         Area     Width   %Imperv    %Slope Rain Gage            Outlet
-------------------------------------------------------------------------------------------
A-01a                        0.14     41.43     76.00    2.0000 Raingage1            CBMH101
A-01b                        0.11     10.70     74.00    2.0000 Raingage1            CB1
A-04b                        0.10     10.20     77.00    1.0000 Raingage1            CB2
B-01                         0.41    166.00    100.00    1.5000 Raingage1            TANK1
B-02                         0.34    136.80    100.00    1.5000 Raingage1            TANK2
C-01a                        0.06     11.37     27.00    0.5000 Raingage1            CBMH206
C-01b                        0.20     24.02     36.00    0.5000 Raingage1            CBMH207
C-01c                        0.16     15.96     39.00    0.7000 Raingage1            LD208
D-01                         0.06     62.00     40.00    2.0000 Raingage1            LamarcheB
D-02                         0.01     32.50     71.00    2.0000 Raingage1            R-04a
D-03                         0.01     12.50     54.00    1.5000 Raingage1            R-03a
D-04                         0.02     48.00      7.00    1.5000 Raingage1            P-01
D-05                         0.01     10.00      7.00    1.5000 Raingage1            EXDITCH2
P-01                         0.10     29.71      7.00    0.5000 Raingage1            MH400
P-02                         0.20     29.14     36.00    0.5000 Raingage1            MH400
P-03                         0.13     19.56      7.00    1.5000 Raingage1            CB401
P-04                         0.03     15.68      7.00    1.5000 Raingage1            CB401
P-05                         0.03     16.50      7.00    1.0000 Raingage1            EXDITCH1
R-01a                        0.09     10.23     79.00    1.0000 Raingage1            CB9
R-01b                        0.08     10.25     79.00    1.0000 Raingage1            CB8
R-02a                        0.09     10.00     67.00    1.0000 Raingage1            CB7
R-02b                        0.07     10.00     67.00    1.0000 Raingage1            CB6
R-03a                        0.09     10.00     69.00    1.0000 Raingage1            CB5
R-03b                        0.07     10.00     69.00    1.0000 Raingage1            CB4
R-04a                        0.08     10.12     77.00    1.0000 Raingage1            CB3
ZONE2A                       0.46    102.67     93.00    2.0000 Raingage1            ZN2A
ZONE2B                       0.46     92.00     93.00    2.0000 Raingage1            ZN2B
ZONE3A                       0.49     54.33     93.00    2.0000 Raingage1            ZN3B
ZONE3B                       1.07    102.29     93.00    2.0000 Raingage1            ZN3A


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Node Summary
************
                                    Invert      Max.    Ponded    External
Name                 Type            Elev.     Depth      Area    Inflow
----------------------------------------------------------------------
MH101                JUNCTION        84.87      4.10       0.0
MH102                JUNCTION        85.17      4.19       0.0
MH103                JUNCTION        85.31      3.93       0.0
MH104                JUNCTION        85.55      3.95       0.0
MH105                JUNCTION        85.84      3.64       0.0
MH106                JUNCTION        85.98      3.74       0.0
MH107                JUNCTION        86.75      3.35       0.0
EXDITCH1             OUTFALL         88.70      0.00       0.0
EXDITCH2             OUTFALL         88.70      0.00       0.0
LamarcheA            OUTFALL         88.54      1.00       0.0
LamarcheAC           OUTFALL         88.78      1.00       0.0
LamarcheB            OUTFALL         88.40      0.00       0.0
LamarcheBD           OUTFALL         88.78      1.00       0.0
LamarcheE            OUTFALL         89.53      1.16       0.0
MH100                OUTFALL         84.52      0.83       0.0
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XMH13	OUTFALL	0.00	0.00	0.0
XMH15	OUTFALL	0.00	84.55	0.0
1+017a	STORAGE	88.90	1.00	0.0
1+017b	STORAGE	88.90	1.00	0.0
1+104a	STORAGE	89.31	1.00	0.0
1+104b	STORAGE	89.31	1.00	0.0
1+179a	STORAGE	89.48	1.00	0.0
1+179b	STORAGE	89.48	1.00	0.0
1+329	STORAGE	90.50	1.00	0.0
CB1	STORAGE	87.50	2.50	0.0
CB2	STORAGE	87.24	2.50	0.0
CB3	STORAGE	87.24	2.50	0.0
CB4	STORAGE	87.62	2.50	0.0
CB401	STORAGE	86.53	1.87	0.0
CB5	STORAGE	87.62	2.50	0.0
CB6	STORAGE	87.81	2.50	0.0
CB7	STORAGE	87.81	2.50	0.0
CB8	STORAGE	88.23	2.50	0.0
CB9	STORAGE	88.23	2.50	0.0
CBMH101	STORAGE	85.36	4.34	0.0
CBMH206	STORAGE	86.74	2.61	0.0
CBMH207	STORAGE	87.35	2.00	0.0
HPRYS	STORAGE	88.60	1.00	0.0
LD208	STORAGE	87.70	2.00	0.0
MH201	STORAGE	83.91	4.80	0.0
MH202	STORAGE	85.03	3.71	0.0
MH203	STORAGE	85.03	3.91	0.0
MH204	STORAGE	85.46	3.50	0.0
MH205	STORAGE	85.71	3.60	0.0
MH400	STORAGE	86.07	3.13	0.0
TANK1	STORAGE	86.00	3.50	0.0
TANK2	STORAGE	86.00	3.30	0.0
ZN2A	STORAGE	85.90	4.50	0.0
ZN2B	STORAGE	85.37	5.03	0.0
ZN3A	STORAGE	86.35	4.25	0.0
ZN3B	STORAGE	87.10	3.75	0.0

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
1	1+329	CB9	CONDUIT	65.0	1.1847	0.0150
10	1+104b	CB4	CONDUIT	33.6	0.5651	0.0150
101-100	MH101	MH100	CONDUIT	55.5	0.4863	0.0130
102-101	MH102	MH101	CONDUIT	43.6	0.5048	0.0130
103-102	MH103	MH102	CONDUIT	22.4	0.4907	0.0130
104-103	MH104	MH103	CONDUIT	42.9	0.4892	0.0130
105	MH105	MH104	CONDUIT	42.9	0.3495	0.0130
106-105	MH106	MH105	CONDUIT	22.4	0.4913	0.0130
107-106	MH107	MH106	CONDUIT	43.0	1.3969	0.0130
11	1+104a	CB3	CONDUIT	57.2	0.9970	0.0150
1-101	CB1	CBMH101	CONDUIT	45.1	0.9972	0.0130
12	1+104b	CB2	CONDUIT	56.5	1.0097	0.0150
13	1+017a	CB3	CONDUIT	26.0	0.6158	0.0150
14	1+017b	CB2	CONDUIT	25.8	0.6210	0.0150
15	1+017a	LamarcheAC	CONDUIT	9.2	1.3023	0.0150
16	1+017b	LamarcheBD	CONDUIT	12.2	0.9832	0.0150
2	1+329	CB8	CONDUIT	65.0	1.1847	0.0150
202-201	MH202	MH201	CONDUIT	20.5	0.4868	0.0130
203-202	MH203	MH202	CONDUIT	44.2	0.4973	0.0130
204-203	MH204	MH203	CONDUIT	21.2	0.4711	0.0130
205-204	MH205	MH204	CONDUIT	34.2	0.4976	0.0130
207-206	CBMH207	CBMH206	CONDUIT	97.8	0.5010	0.0130
208-207	LD208	CBMH207	CONDUIT	69.7	0.5022	0.0130
3	CB9	CB7	CONDUIT	50.7	0.8291	0.0150
4	CB8	CB6	CONDUIT	37.6	1.1157	0.0150
5	1+179a	CB7	CONDUIT	33.8	0.5034	0.0150
6	1+179b	CB6	CONDUIT	33.8	0.5032	0.0150
7	1+179a	CB5	CONDUIT	36.2	0.9959	0.0150
8	1+179b	CB4	CONDUIT	36.4	0.9900	0.0150
9	1+104a	CB5	CONDUIT	45.8	0.4148	0.0150
C1	ZN3A	CB9	CONDUIT	1.0	1.0001	0.0130
C2	ZN3B	CB9	CONDUIT	1.0	1.0001	0.0150
C3	HPRYS	CBMH206	CONDUIT	51.2	0.4885	0.0130
C4	HPRYS	CBMH207	CONDUIT	47.6	0.5256	0.0130
C5	LD208	CBMH207	CONDUIT	70.2	0.4985	0.0130
C6	CBMH206	LamarcheA	CONDUIT	1.0	6.0108	0.2500
CAP4-104	MH400	MH104	CONDUIT	13.9	1.0072	0.0130
CB3/2	CB3	CB2	CONDUIT	1.0	0.1000	0.0130
CB5/4	CB5	CB4	CONDUIT	1.0	0.1000	0.0150

CB7/6	CB7	CB6	CONDUIT	1.0	0.1000	0.0150
OVF2A	ZN2A	CB4	CONDUIT	1.0	1.0001	0.0150
OVF2B	ZN2B	LamarcheE	CONDUIT	1.0	1.0001	0.0130
OVFA1	CBMH101	CB3	CONDUIT	1.0	0.1000	0.0150
STM-36_(STM)	CB401	MH400	CONDUIT	46.2	0.9740	0.0130
STM-39_(STM)	MH201	XMH15	CONDUIT	11.8	0.3385	0.0130
CAP3b-107	ZN3B	MH107	ORIFICE			
OR1	CB3	MH101	ORIFICE			
OR3	CB2	MH101	ORIFICE			
OR3A	ZN3A	MH106	ORIFICE			
OR4	CB6	MH105	ORIFICE			
OR5	CB7	MH105	ORIFICE			
ORCB4	CB4	MH104	ORIFICE			
ORCB5	CB5	MH104	ORIFICE			
ORCB8	CB8	MH107	ORIFICE			
ORCB9	CB9	MH107	ORIFICE			
ORCBMH206	CBMH206	MH202	ORIFICE			
ORTANK1	TANK1	MH205	ORIFICE			
ORTANK2	TANK2	MH203	ORIFICE			
ORZN2a	ZN2A	MH104	ORIFICE			
ORZN2b	ZN2B	XMH13	ORIFICE			
STM-23_(STM)	CBMH101	MH101	ORIFICE			

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
1	20mROWlaf	1.00	8.41	0.25	10.01	1	24202.43
10	20mROWlaf	1.00	8.41	0.25	10.01	1	16715.41
101-100	CIRCULAR	0.75	0.44	0.19	0.75	1	776.37
102-101	CIRCULAR	0.68	0.36	0.17	0.68	1	597.29
103-102	CIRCULAR	0.68	0.36	0.17	0.68	1	588.87
104-103	CIRCULAR	0.68	0.36	0.17	0.68	1	587.95
105	CIRCULAR	0.60	0.28	0.15	0.60	1	363.00
106-105	CIRCULAR	0.60	0.28	0.15	0.60	1	430.38
107-106	CIRCULAR	0.45	0.16	0.11	0.45	1	336.99
11	20mROWlaf	1.00	8.41	0.25	10.01	1	22202.02
1-101	CIRCULAR	0.38	0.11	0.09	0.38	1	175.09
12	20mROWlaf	1.00	8.41	0.25	10.01	1	22343.95
13	20mROWlaf	1.00	8.41	0.25	10.01	1	17448.82
14	20mROWlaf	1.00	8.41	0.25	10.01	1	17522.14
15	20mROWlaf	1.00	8.41	0.25	10.01	1	25375.60
16	20mROWlaf	1.00	8.41	0.25	10.01	1	22048.01
2	20mROWlaf	1.00	8.41	0.25	10.01	1	24202.43
202-201	CIRCULAR	0.53	0.22	0.13	0.53	1	300.09
203-202	CIRCULAR	0.45	0.16	0.11	0.45	1	201.08
204-203	CIRCULAR	0.45	0.16	0.11	0.45	1	195.71
205-204	CIRCULAR	0.45	0.16	0.11	0.45	1	201.13
207-206	CIRCULAR	0.38	0.11	0.09	0.38	1	124.11
208-207	CIRCULAR	0.30	0.07	0.07	0.30	1	68.53
3	20mROWlaf	1.00	8.41	0.25	10.01	1	20247.11
4	20mROWlaf	1.00	8.41	0.25	10.01	1	23487.33
5	20mROWlaf	1.00	8.41	0.25	10.01	1	15776.25
6	20mROWlaf	1.00	8.41	0.25	10.01	1	15774.15
7	20mROWlaf	1.00	8.41	0.25	10.01	1	22189.98
8	20mROWlaf	1.00	8.41	0.25	10.01	1	22124.89
9	20mROWlaf	1.00	8.41	0.25	10.01	1	14321.75
C1	CIRCULAR	1.00	0.79	0.25	1.00	1	2397.78
C2	RECT_OPEN	1.00	3.00	0.60	3.00	1	14228.79
C3	TRAPEZOIDAL	1.00	3.50	0.51	6.50	1	12057.61
C4	TRAPEZOIDAL	1.00	3.50	0.51	6.50	1	12506.56
C5	TRAPEZOIDAL	1.00	3.50	0.51	6.50	1	12179.66
C6	RECT_OPEN	1.00	3.00	0.60	3.00	1	2093.03
CAP4-104	CIRCULAR	0.30	0.07	0.07	0.30	1	97.06
CB3/2	CIRCULAR	1.00	0.79	0.25	1.00	1	758.23
CB5/4	RECT_OPEN	1.00	1.00	0.33	1.00	1	1013.57
CB7/6	RECT_OPEN	1.00	1.00	0.33	1.00	1	1013.57
OVF2A	RECT_OPEN	1.00	3.00	0.60	3.00	1	14228.79
OVF2B	RECT_OPEN	1.00	3.00	0.60	3.00	1	16417.83
OVFA1	CIRCULAR	1.00	0.79	0.25	1.00	1	657.13
STM-36_(STM)	CIRCULAR	0.30	0.07	0.07	0.30	1	95.44
STM-39_(STM)	CIRCULAR	0.68	0.36	0.17	0.68	1	489.07

****
Transect Summary
****

Transect 20mROW1af
Area:

0.0008	0.0030	0.0068	0.0121	0.0189
0.0270	0.0354	0.0440	0.0547	0.0677
0.0832	0.1010	0.1212	0.1438	0.1676
0.1913	0.2151	0.2389	0.2626	0.2864
0.3102	0.3339	0.3577	0.3815	0.4052
0.4290	0.4528	0.4766	0.5004	0.5241
0.5479	0.5717	0.5955	0.6193	0.6431
0.6668	0.6906	0.7144	0.7382	0.7620
0.7858	0.8096	0.8334	0.8572	0.8810
0.9048	0.9286	0.9524	0.9762	1.0000

Hrad:

0.0387	0.0774	0.1162	0.1549	0.1936
0.2510	0.3264	0.3981	0.4447	0.4684
0.4771	0.4767	0.4711	0.4627	0.4586
0.4606	0.4665	0.4751	0.4856	0.4976
0.5106	0.5244	0.5389	0.5539	0.5693
0.5851	0.6011	0.6174	0.6339	0.6506
0.6674	0.6844	0.7014	0.7186	0.7358
0.7532	0.7705	0.7880	0.8055	0.8230
0.8406	0.8582	0.8759	0.8935	0.9112
0.9289	0.9467	0.9644	0.9822	1.0000

Width:

0.0635	0.1270	0.1906	0.2541	0.3176
0.3495	0.3496	0.3996	0.4993	0.5991
0.6989	0.7987	0.8984	0.9982	0.9982
0.9983	0.9983	0.9984	0.9984	0.9985
0.9985	0.9986	0.9986	0.9987	0.9987
0.9988	0.9988	0.9989	0.9989	0.9990
0.9990	0.9991	0.9991	0.9992	0.9992
0.9993	0.9993	0.9994	0.9994	0.9995
0.9995	0.9996	0.9996	0.9997	0.9997
0.9998	0.9998	0.9999	0.9999	1.0000

Transect ROW20m
Area:

0.0008	0.0030	0.0068	0.0121	0.0189
0.0270	0.0354	0.0440	0.0547	0.0678
0.0832	0.1011	0.1213	0.1439	0.1676
0.1914	0.2152	0.2389	0.2627	0.2865

0.3103	0.3340	0.3578	0.3816	0.4054
0.4291	0.4529	0.4767	0.5005	0.5243
0.5480	0.5718	0.5956	0.6194	0.6432
0.6670	0.6907	0.7145	0.7383	0.7621
0.7859	0.8097	0.8335	0.8572	0.8810
0.9048	0.9286	0.9524	0.9762	1.0000

Hrad:

0.0387	0.0774	0.1161	0.1548	0.1935
0.2508	0.3262	0.3978	0.4443	0.4680
0.4768	0.4764	0.4708	0.4624	0.4583
0.4603	0.4662	0.4748	0.4854	0.4973
0.5103	0.5242	0.5386	0.5536	0.5690
0.5848	0.6009	0.6172	0.6337	0.6504
0.6672	0.6842	0.7012	0.7184	0.7357
0.7530	0.7704	0.7878	0.8053	0.8229
0.8405	0.8581	0.8758	0.8934	0.9112
0.9289	0.9466	0.9644	0.9822	1.0000

Width:

0.0636	0.1272	0.1908	0.2544	0.3179
0.3498	0.3499	0.3999	0.4998	0.5996
0.6995	0.7993	0.8992	0.9990	0.9990
0.9991	0.9991	0.9991	0.9991	0.9992
0.9992	0.9992	0.9992	0.9993	0.9993
0.9993	0.9994	0.9994	0.9994	0.9994
0.9995	0.9995	0.9995	0.9996	0.9996
0.9996	0.9996	0.9997	0.9997	0.9997
0.9998	0.9998	0.9998	0.9998	0.9999
0.9999	0.9999	0.9999	1.0000	1.0000

****
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 ............ 11/15/2021 00:00:00
Ending Date .............. 11/16/2021 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
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
```

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Initial LID Storage	0.004	0.699
Total Precipitation	0.255	49.037
Evaporation Loss	0.000	0.000
Infiltration Loss	0.046	8.770
Surface Runoff	0.211	40.595
Final Storage	0.004	0.699
Continuity Error (%)	-0.662	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.211	2.107
Groundwater Inflow	0.000	0.000

RDII Inflow	0.000	0.000
External Inflow	0.000	0.003
External Outflow	0.211	2.113
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.005	0.046
Final Stored Volume	0.004	0.044
Continuity Error (%)	-0.082	

```
**************************
Time-Step Critical Elements
**************************
Link 103-102 (1.53%)

*******************************
Highest Flow Instability Indexes
*******************************
Link ORZN2b (109)
Link STM-23_(STM) (103)

************************
Routing Time Step Summary
************************
Minimum Time Step           :     1.69 sec
Average Time Step           :     4.98 sec
Maximum Time Step           :     5.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.01
Percent Not Converging      :     0.06
Time Step Frequencies       :
    5.000 -  3.155 sec      :    99.63 %
    3.155 -  1.991 sec      :     0.20 %
    1.991 -  1.256 sec      :     0.17 %
    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
A-01a	49.04	0.00	0.00	8.67	37.43	3.28	40.71	0.06	38.01	0.830
A-01b	49.04	0.00	0.00	9.84	36.55	2.99	39.53	0.04	25.15	0.806
A-04b	49.04	0.00	0.00	8.82	38.03	2.52	40.54	0.04	23.86	0.827
B-01	49.04	0.00	0.00	0.00	49.27	0.00	49.27	0.20	120.08	1.005
B-02	49.04	0.00	0.00	0.00	49.27	0.00	49.27	0.17	98.96	1.005
C-01a	49.04	0.00	0.00	29.65	13.30	6.24	19.54	0.01	6.08	0.398
C-01b	49.04	0.00	0.00	26.68	17.77	4.76	22.53	0.04	23.80	0.460
C-01c	49.04	0.00	0.00	25.38	19.26	4.59	23.85	0.04	20.36	0.486
D-01	49.04	0.00	0.00	21.49	19.62	8.50	28.13	0.02	14.61	0.574
D-02	49.04	0.00	0.00	10.20	34.83	4.81	39.65	0.01	3.60	0.809
D-03	49.04	0.00	0.00	16.38	26.50	6.74	33.24	0.00	2.57	0.678
D-04	49.04	0.00	0.00	33.24	3.43	13.32	16.76	0.00	5.10	0.342
D-05	49.04	0.00	0.00	33.24	3.43	13.32	16.76	0.00	1.06	0.342
P-01	49.04	3.87	0.00	38.17	3.71	11.17	14.88	0.02	6.68	0.281
P-02	49.04	0.00	0.00	26.36	17.90	5.09	22.99	0.05	[illegible]	[illegible]

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
P-03	49.04	0.00	0.00	37.72	3.43	8.00	11.44	0.02	7.31	0.233
P-04	49.04	0.00	0.00	34.71	3.43	11.26	14.69	0.00	3.49	0.300
P-05	49.04	0.00	0.00	35.23	3.44	10.67	14.10	0.00	3.36	0.288
R-01a	49.04	0.00	0.00	7.94	39.02	2.42	41.44	0.04	21.37	0.845
R-01b	49.04	0.00	0.00	7.92	39.02	2.45	41.47	0.03	20.29	0.846
R-02a	49.04	0.00	0.00	12.87	33.09	3.38	36.48	0.03	18.99	0.744
R-02b	49.04	0.00	0.00	12.63	33.08	3.64	36.73	0.02	14.61	0.749
R-03a	49.04	3.78	0.00	12.32	36.68	4.14	40.81	0.04	20.64	0.773
R-03b	49.04	0.00	0.00	11.80	34.07	3.49	37.56	0.02	14.70	0.766
R-04a	49.04	6.06	0.00	9.13	42.69	3.63	46.32	0.04	23.13	0.841
ZONE2A	49.04	0.00	0.00	2.48	45.88	1.05	46.93	0.22	131.67	0.957
ZONE2B	49.04	0.00	0.00	2.48	45.89	1.04	46.94	0.22	130.89	0.957
ZONE3A	49.04	0.00	0.00	2.51	45.93	0.99	46.92	0.23	136.51	0.957
ZONE3B	49.04	0.00	0.00	2.52	45.93	0.97	46.90	0.50	297.00	0.956

****
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
MH101	JUNCTION	0.63	0.85	85.72	0 02:12	0.85
MH102	JUNCTION	0.34	0.67	85.84	0 02:12	0.67
MH103	JUNCTION	0.20	0.62	85.93	0 02:12	0.62

MH104	JUNCTION	0.04	0.52	86.07	0	02:12	0.52
MH105	JUNCTION	0.03	0.42	86.26	0	02:12	0.42
MH106	JUNCTION	0.03	0.40	86.38	0	02:12	0.40
MH107	JUNCTION	0.01	0.18	86.93	0	02:10	0.18
EXDITCH1	OUTFALL	0.00	0.00	88.70	0	00:00	0.00
EXDITCH2	OUTFALL	0.00	0.00	88.70	0	00:00	0.00
LamarcheA	OUTFALL	0.00	0.00	88.54	0	00:00	0.00
LamarcheAC	OUTFALL	0.00	0.00	88.78	0	00:00	0.00
LamarcheB	OUTFALL	0.00	0.00	88.40	0	00:00	0.00
LamarcheBD	OUTFALL	0.00	0.00	88.78	0	00:00	0.00
LamarcheE	OUTFALL	0.00	0.00	89.53	0	00:00	0.00
MH100	OUTFALL	0.98	0.98	85.50	0	00:00	0.98
XMH13	OUTFALL	85.88	85.88	85.88	0	00:00	85.88
XMH15	OUTFALL	85.01	85.01	85.01	0	00:00	85.01
1+017a	STORAGE	0.00	0.00	88.90	0	00:00	0.00
1+017b	STORAGE	0.00	0.00	88.90	0	00:00	0.00
1+104a	STORAGE	0.00	0.00	89.31	0	00:00	0.00
1+104b	STORAGE	0.00	0.00	89.31	0	00:00	0.00
1+179a	STORAGE	0.00	0.00	89.48	0	00:00	0.00
1+179b	STORAGE	0.00	0.00	89.48	0	00:00	0.00
1+329	STORAGE	0.00	0.00	90.50	0	00:00	0.00
CB1	STORAGE	0.02	1.21	88.71	0	02:13	1.21
CB2	STORAGE	0.03	1.54	88.78	0	02:12	1.54
CB3	STORAGE	0.03	1.53	88.77	0	02:12	1.53
CB4	STORAGE	0.02	0.91	88.53	0	02:10	0.91
CB401	STORAGE	0.00	0.07	86.60	0	02:10	0.07
CB5	STORAGE	0.03	1.51	89.13	0	02:11	1.51
CB6	STORAGE	0.02	0.90	88.71	0	02:10	0.90
CB7	STORAGE	0.02	1.42	89.23	0	02:11	1.42
CB8	STORAGE	0.03	1.50	89.73	0	02:11	1.50
CB9	STORAGE	0.03	1.51	89.74	0	02:11	1.51
CBMH101	STORAGE	0.21	3.35	88.71	0	02:13	3.35
CBMH206	STORAGE	0.05	1.02	87.76	0	02:21	1.02
CBMH207	STORAGE	0.02	0.42	87.77	0	02:21	0.42
HPRYS	STORAGE	0.00	0.00	88.60	0	00:00	0.00
LD208	STORAGE	0.01	0.11	87.81	0	02:10	0.11
MH201	STORAGE	1.11	1.11	85.02	0	02:14	1.11
MH202	STORAGE	0.03	0.29	85.32	0	02:15	0.29
MH203	STORAGE	0.32	0.55	85.58	0	02:15	0.55
MH204	STORAGE	0.02	0.18	85.64	0	02:14	0.18
MH205	STORAGE	0.02	0.17	85.88	0	02:14	0.17
MH400	STORAGE	0.01	0.17	86.24	0	02:10	0.17
TANK1	STORAGE	0.03	0.82	86.82	0	02:13	0.82
TANK2	STORAGE	0.04	0.82	86.82	0	02:14	0.82
ZN2A	STORAGE	0.10	3.63	89.53	0	02:13	3.63
ZN2B	STORAGE	0.59	4.15	89.52	0	02:13	4.15
ZN3A	STORAGE	0.10	3.38	89.73	0	02:13	3.38
ZN3B	STORAGE	0.08	2.87	89.97	0	02:13	2.87

****
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	
MH101	JUNCTION	0.00	523.73	0 02:12	0	1.41	-0.040	
MH102	JUNCTION	0.00	453.75	0 02:12	0	1.23	0.004	
MH103	JUNCTION	0.00	456.08	0 02:11	0	1.23	0.017	
MH104	JUNCTION	0.00	458.12	0 02:10	0	1.22	-0.049	
MH105	JUNCTION	0.00	314.69	0 02:11	0	0.863	-0.082	
MH106	JUNCTION	0.00	284.42	0 02:12	0	0.806	0.091	
MH107	JUNCTION	0.00	115.12	0 02:12	0	0.3	0.106	
EXDITCH1	OUTFALL	3.36	3.36	0 02:10	0.00465	0.00465	0.000	
EXDITCH2	OUTFALL	1.06	1.06	0 02:10	0.000837	0.000837	0.000	
LamarcheA	OUTFALL	0.00	0.00	0 00:00	0	0	0.000	ltr
LamarcheAC	OUTFALL	0.00	0.00	0 00:00	0	0	0.000	ltr
LamarcheB	OUTFALL	14.61	14.61	0 02:10	0.0174	0.0174	0.000	
LamarcheBD	OUTFALL	0.00	0.00	0 00:00	0	0	0.000	ltr
LamarcheE	OUTFALL	0.00	0.00	0 00:00	0	0	0.000	ltr
MH100	OUTFALL	0.00	523.74	0 02:12	0	1.41	0.000	
XMH13	OUTFALL	0.00	73.84	0 02:13	0	0.217	0.000	
XMH15	OUTFALL	0.00	115.28	0 02:15	0	0.466	0.000	
1+017a	STORAGE	0.00	0.00	0 00:00	0	1.07e-06	-0.254	ltr
1+017b	STORAGE	0.00	0.00	0 00:00	0	1.09e-06	-0.326	ltr
1+104a	STORAGE	0.00	0.00	0 00:00	0	0	0.000	ltr
1+104b	STORAGE	0.00	0.00	0 00:00	0	0	0.000	ltr
1+179a	STORAGE	0.00	0.00	0 00:00	0	0	0.000	ltr

1+179b	STORAGE	0.00	0.00	0	00:00	0	0	0.000 ltr
1+329	STORAGE	0.00	0.00	0	00:00	0	0	-0.000 ltr
CB1	STORAGE	25.15	31.08	0	02:06	0.0423	0.0425	0.369
CB2	STORAGE	23.86	23.86	0	02:10	0.0413	0.0413	-0.096
CB3	STORAGE	23.13	23.13	0	02:10	0.0394	0.0394	-0.050
CB4	STORAGE	14.70	14.70	0	02:10	0.0247	0.0247	0.001
CB401	STORAGE	10.80	10.80	0	02:10	0.0195	0.0195	0.075
CB5	STORAGE	20.64	20.64	0	02:10	0.0359	0.0359	-0.088
CB6	STORAGE	14.61	14.63	0	02:10	0.0246	0.0246	0.002
CB7	STORAGE	18.99	19.01	0	02:10	0.0328	0.0328	0.002
CB8	STORAGE	20.29	20.29	0	02:10	0.0344	0.0344	0.019
CB9	STORAGE	21.37	21.37	0	02:10	0.0364	0.0364	0.065
CBMH101	STORAGE	38.01	58.21	0	02:08	0.059	0.102	0.224
CBMH206	STORAGE	6.08	44.87	0	02:08	0.0113	0.0932	-0.281
CBMH207	STORAGE	23.80	43.72	0	02:10	0.0444	0.0821	0.215
HPRYS	STORAGE	0.00	0.00	0	00:00	0	0	0.000 ltr
LD208	STORAGE	20.36	20.36	0	02:10	0.0377	0.0377	-0.086
MH201	STORAGE	0.00	115.28	0	02:15	0	0.467	-0.003
MH202	STORAGE	0.00	115.29	0	02:15	0	0.466	-0.000
MH203	STORAGE	0.00	94.95	0	02:14	0	0.373	-0.023
MH204	STORAGE	0.00	58.83	0	02:14	0	0.204	0.039
MH205	STORAGE	0.00	58.83	0	02:13	0	0.204	-0.004
MH400	STORAGE	31.96	42.25	0	02:10	0.0624	0.0818	0.089
TANK1	STORAGE	120.08	120.08	0	02:10	0.204	0.204	0.003
TANK2	STORAGE	98.96	98.96	0	02:10	0.168	0.168	0.002
ZN2A	STORAGE	131.67	131.67	0	02:10	0.217	0.217	-0.435
ZN2B	STORAGE	130.89	130.89	0	02:10	0.216	0.217	0.413
ZN3A	STORAGE	297.00	297.00	0	02:10	0.503	0.503	-0.673
ZN3B	STORAGE	136.51	136.51	0	02:10	0.229	0.229	0.074

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters

MH101	JUNCTION	0.38	0.092	3.253

****
Node Flooding Summary
****

No nodes were flooded.

****
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
1+017a	0.000	0	0	0	0.000	0	0 00:00	0.00
1+017b	0.000	0	0	0	0.000	0	0 00:00	0.00
1+104a	0.000	0	0	0	0.000	0	0 00:00	0.00
1+104b	0.000	0	0	0	0.000	0	0 00:00	0.00
1+179a	0.000	0	0	0	0.000	0	0 00:00	0.00
1+179b	0.000	0	0	0	0.000	0	0 00:00	0.00
1+329	0.000	0	0	0	0.000	0	0 00:00	0.00
CB1	0.000	0	0	0	0.000	1	0 02:13	21.66
CB2	0.000	1	0	0	0.002	62	0 02:12	17.91
CB3	0.000	1	0	0	0.002	61	0 02:12	17.85
CB4	0.000	1	0	0	0.001	36	0 02:10	13.65
CB401	0.000	0	0	0	0.000	4	0 02:10	10.57
CB5	0.000	1	0	0	0.002	60	0 02:11	17.70
CB6	0.000	1	0	0	0.001	36	0 02:10	13.56
CB7	0.000	1	0	0	0.001	57	0 02:11	17.14
CB8	0.000	1	0	0	0.002	60	0 02:11	17.69
CB9	0.000	1	0	0	0.002	60	0 02:11	17.81
CBMH101	0.000	1	0	0	0.004	11	0 02:13	36.85
CBMH206	0.000	2	0	0	0.001	39	0 02:21	20.89
CBMH207	0.000	1	0	0	0.000	21	0 02:21	39.24
HPRYS	0.000	0	0	0	0.000	0	0 00:00	0.00
LD208	0.000	0	0	0	0.000	6	0 02:10	20.03

MH201	0.001	23	0	0	0.001	23	0	02:14	115.28
MH202	0.000	1	0	0	0.000	8	0	02:15	115.28
MH203	0.000	8	0	0	0.001	14	0	02:15	94.81
MH204	0.000	0	0	0	0.000	5	0	02:14	58.83
MH205	0.000	0	0	0	0.000	5	0	02:14	58.83
MH400	0.000	0	0	0	0.000	5	0	02:10	41.52
TANK1	0.002	1	0	0	0.055	33	0	02:13	58.83
TANK2	0.003	2	0	0	0.055	33	0	02:14	36.14
ZN2A	0.000	0	0	0	0.027	17	0	02:13	72.39
ZN2B	0.000	0	0	0	0.024	16	0	02:13	73.84
ZN3A	0.001	0	0	0	0.055	18	0	02:13	169.35
ZN3B	0.000	0	0	0	0.022	15	0	02:13	79.78

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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
EXDITCH1	8.70	0.71	3.36	0.005
EXDITCH2	3.07	0.37	1.06	0.001
LamarcheA	0.00	0.00	0.00	0.000
LamarcheAC	0.00	0.00	0.00	0.000
LamarcheB	25.51	0.93	14.61	0.017
LamarcheBD	0.00	0.00	0.00	0.000
LamarcheE	0.00	0.00	0.00	0.000
MH100	84.52	21.60	523.74	1.411
XMH13	99.94	2.79	73.84	0.217
XMH15	41.74	13.87	115.28	0.466
System	26.35	40.26	721.38	2.116

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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
1	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
10	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
101-100	CONDUIT	523.74	0	02:12	1.19	0.67	1.00
102-101	CONDUIT	453.58	0	02:12	1.27	0.76	1.00
103-102	CONDUIT	453.75	0	02:12	1.37	0.77	0.94
104-103	CONDUIT	456.08	0	02:11	1.56	0.78	0.82
105	CONDUIT	314.28	0	02:11	1.62	0.87	0.67
106-105	CONDUIT	284.48	0	02:12	1.49	0.66	0.66
107-106	CONDUIT	115.12	0	02:12	1.62	0.34	0.46
11	CHANNEL	0.00	0	00:00	0.00	0.00	0.02
1-101	CONDUIT	21.66	0	02:08	0.90	0.12	1.00
12	CHANNEL	0.00	0	00:00	0.00	0.00	0.02
13	CHANNEL	0.00	0	02:08	0.00	0.00	0.02
14	CHANNEL	0.00	0	02:07	0.00	0.00	0.02
15	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
16	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
2	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
202-201	CONDUIT	115.28	0	02:15	1.10	0.38	0.49
203-202	CONDUIT	94.81	0	02:15	1.15	0.47	0.52
204-203	CONDUIT	58.83	0	02:14	0.88	0.30	0.44
205-204	CONDUIT	58.83	0	02:14	1.09	0.29	0.37
207-206	CONDUIT	39.24	0	02:08	0.66	0.32	1.00
208-207	CONDUIT	20.03	0	02:10	0.66	0.29	0.67
3	CHANNEL	0.11	0	02:11	0.18	0.00	0.01
4	CHANNEL	0.02	0	02:10	0.00	0.00	0.00
5	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
6	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
7	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
8	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
9	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
C1	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C2	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C3	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C4	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C5	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C6	CONDUIT	0.00	0	00:00	0.00	0.00	0.00

CAP4-104	CONDUIT	41.52	0	02:10	1.15	0.43	0.51	
CB3/2	CONDUIT	0.00	0	00:00	0.00	0.00	0.00	
CB5/4	CONDUIT	0.00	0	00:00	0.00	0.00	0.00	
CB7/6	CONDUIT	0.00	0	00:00	0.00	0.00	0.00	
OVF2A	CONDUIT	0.00	0	00:00	0.00	0.00	0.00	
OVF2B	CONDUIT	0.00	0	00:00	0.00	0.00	0.00	
OVFA1	CONDUIT	0.00	0	00:00	0.00	0.00	0.00	
STM-36_(STM)	CONDUIT	10.57	0	02:10	0.47	0.11	0.38	
STM-39_(STM)	CONDUIT	115.28	0	02:15	0.32	0.24	1.00	
CAP3b-107	ORIFICE	79.78	0	02:13			1.00	
OR1	ORIFICE	17.85	0	02:12			1.00	
OR3	ORIFICE	17.91	0	02:12			1.00	
OR3A	ORIFICE	169.35	0	02:13			1.00	
OR4	ORIFICE	13.56	0	02:10			1.00	
OR5	ORIFICE	17.14	0	02:11			1.00	
ORCB4	ORIFICE	13.65	0	02:10			1.00	
ORCB5	ORIFICE	17.70	0	02:11			1.00	
ORCB8	ORIFICE	17.68	0	02:11			1.00	
ORCB9	ORIFICE	17.71	0	02:11			1.00	
ORCBMH206	ORIFICE	20.89	0	02:21			1.00	
ORTANK1	ORIFICE	58.83	0	02:13			1.00	
ORTANK2	ORIFICE	36.14	0	02:14			1.00	
ORZN2a	ORIFICE	72.39	0	02:19			1.00	
ORZN2b	ORIFICE	73.84	0	02:13			1.00	
STM-23_(STM)	ORIFICE	34.57	0	02:13			1.00	

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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
1	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	1.00	1.00	0.00	0.00	0.00	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	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
103-102	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
104-103	1.00	0.00	0.00	0.00	0.98	0.01	0.00	0.01	0.95	0.00
105	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
106-105	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.00	0.00
107-106	1.00	0.00	0.00	0.00	0.00	0.02	0.00	0.98	0.00	0.00
11	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-101	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.00	0.00
12	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.91	0.00
14	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.01	0.00
15	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
16	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202-201	1.00	0.00	0.00	0.00	0.93	0.00	0.00	0.07	0.91	0.00
203-202	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
204-203	1.00	0.00	0.00	0.00	0.07	0.00	0.00	0.93	0.03	0.00
205-204	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
207-206	1.00	0.00	0.00	0.00	0.05	0.00	0.00	0.95	0.02	0.00
208-207	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.99	0.00
3	1.00	0.99	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
4	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C3	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C6	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CAP4-104	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
CB3/2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CB5/4	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CB7/6	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OVF2A	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OVF2B	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OVFA1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STM-36_(STM)	1.00	0.00	0.00	0.00	0.21	0.04	0.00	0.75	0.19	0.00
STM-39_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00

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Conduit Surcharge Summary
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Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
101-100	0.38	0.38	24.00	0.01	0.01
102-101	0.01	0.01	0.38	0.01	0.01
1-101	0.27	0.27	0.40	0.01	0.01
207-206	0.21	0.21	0.81	0.01	0.01
208-207	0.01	0.01	0.34	0.01	0.01
STM-39_(STM)	24.00	24.00	24.00	0.01	0.01

Analysis begun on: Wed Dec 22 12:30:48 2021
Analysis ended on: Wed Dec 22 12:30:50 2021
Total elapsed time: 00:00:02

Chicago 6hr 100-Year Storm PCSWM Model Results

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

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Element Count
****
Number of rain gages 1
Number of subcatchments ... 29
Number of nodes 51
Number of links 61
Number of pollutants 0
Number of land uses 0

****
Raingage Summary
****

Name	Data Source	Data Type	Recording Interval
Raingage1	C6-100	INTENSITY	10 min.

****
Subcatchment Summary
****

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A-01a	0.14	41.43	76.00	2.0000	Raingage1	CBMH101
A-01b	0.11	10.70	74.00	2.0000	Raingage1	CB1
A-04b	0.10	10.20	77.00	1.0000	Raingage1	CB2
B-01	0.41	166.00	100.00	1.5000	Raingage1	TANK1
B-02	0.34	136.80	100.00	1.5000	Raingage1	TANK2
C-01a	0.06	11.37	27.00	0.5000	Raingage1	CBMH206
C-01b	0.20	24.02	36.00	0.5000	Raingage1	CBMH207
C-01c	0.16	15.96	39.00	0.7000	Raingage1	LD208
D-01	0.06	62.00	40.00	2.0000	Raingage1	LamarcheB
D-02	0.01	32.50	71.00	2.0000	Raingage1	R-04a
D-03	0.01	12.50	54.00	1.5000	Raingage1	R-03a
D-04	0.02	48.00	7.00	1.5000	Raingage1	P-01
D-05	0.01	10.00	7.00	1.5000	Raingage1	EXDITCH2
P-01	0.10	29.71	7.00	0.5000	Raingage1	MH400
P-02	0.20	29.14	36.00	0.5000	Raingage1	MH400
P-03	0.13	19.56	7.00	1.5000	Raingage1	CB401
P-04	0.03	15.68	7.00	1.5000	Raingage1	CB401
P-05	0.03	16.50	7.00	1.0000	Raingage1	EXDITCH1
R-01a	0.09	10.23	79.00	1.0000	Raingage1	CB9
R-01b	0.08	10.25	79.00	1.0000	Raingage1	CB8
R-02a	0.09	10.00	67.00	1.0000	Raingage1	CB7
R-02b	0.07	10.00	67.00	1.0000	Raingage1	CB6
R-03a	0.09	10.00	69.00	1.0000	Raingage1	CB5
R-03b	0.07	10.00	69.00	1.0000	Raingage1	CB4
R-04a	0.08	10.12	77.00	1.0000	Raingage1	CB3
ZONE2A	0.46	102.67	93.00	2.0000	Raingage1	ZN2A
ZONE2B	0.46	92.00	93.00	2.0000	Raingage1	ZN2B
ZONE3A	0.49	54.33	93.00	2.0000	Raingage1	ZN3B
ZONE3B	1.07	102.29	93.00	2.0000	Raingage1	ZN3A

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Node Summary
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Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
MH101	JUNCTION	84.87	4.10	0.0	
MH102	JUNCTION	85.17	4.19	0.0	
MH103	JUNCTION	85.31	3.93	0.0	
MH104	JUNCTION	85.55	3.95	0.0	
MH105	JUNCTION	85.84	3.64	0.0	
MH106	JUNCTION	85.98	3.74	0.0	
MH107	JUNCTION	86.75	3.35	0.0	
EXDITCH1	OUTFALL	88.70	0.00	0.0	
EXDITCH2	OUTFALL	88.70	0.00	0.0	
LamarcheA	OUTFALL	88.54	1.00	0.0	
LamarcheAC	OUTFALL	88.78	1.00	0.0	
LamarcheB	OUTFALL	88.40	0.00	0.0	
LamarcheBD	OUTFALL	88.78	1.00	0.0	
LamarcheE	OUTFALL	89.53	1.16	0.0	
MH100	OUTFALL	84.52	0.83	0.0	

XMH13	OUTFALL	0.00	0.00	0.0
XMH15	OUTFALL	0.00	84.55	0.0
1+017a	STORAGE	88.90	1.00	0.0
1+017b	STORAGE	88.90	1.00	0.0
1+104a	STORAGE	89.31	1.00	0.0
1+104b	STORAGE	89.31	1.00	0.0
1+179a	STORAGE	89.48	1.00	0.0
1+179b	STORAGE	89.48	1.00	0.0
1+329	STORAGE	90.50	1.00	0.0
CB1	STORAGE	87.50	2.50	0.0
CB2	STORAGE	87.24	2.50	0.0
CB3	STORAGE	87.24	2.50	0.0
CB4	STORAGE	87.62	2.50	0.0
CB401	STORAGE	86.53	1.87	0.0
CB5	STORAGE	87.62	2.50	0.0
CB6	STORAGE	87.81	2.50	0.0
CB7	STORAGE	87.81	2.50	0.0
CB8	STORAGE	88.23	2.50	0.0
CB9	STORAGE	88.23	2.50	0.0
CBMH101	STORAGE	85.36	4.34	0.0
CBMH206	STORAGE	86.74	2.61	0.0
CBMH207	STORAGE	87.35	2.00	0.0
HPRYS	STORAGE	88.60	1.00	0.0
LD208	STORAGE	87.70	2.00	0.0
MH201	STORAGE	83.91	4.80	0.0
MH202	STORAGE	85.03	3.71	0.0
MH203	STORAGE	85.03	3.91	0.0
MH204	STORAGE	85.46	3.50	0.0
MH205	STORAGE	85.71	3.60	0.0
MH400	STORAGE	86.07	3.13	0.0
TANK1	STORAGE	86.00	3.50	0.0
TANK2	STORAGE	86.00	3.30	0.0
ZN2A	STORAGE	85.90	4.50	0.0
ZN2B	STORAGE	85.37	5.03	0.0
ZN3A	STORAGE	86.35	4.25	0.0
ZN3B	STORAGE	87.10	3.75	0.0

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
1	1+329	CB9	CONDUIT	65.0	1.1847	0.0150
10	1+104b	CB4	CONDUIT	33.6	0.5651	0.0150
101-100	MH101	MH100	CONDUIT	55.5	0.4863	0.0130
102-101	MH102	MH101	CONDUIT	43.6	0.5048	0.0130
103-102	MH103	MH102	CONDUIT	22.4	0.4907	0.0130
104-103	MH104	MH103	CONDUIT	42.9	0.4892	0.0130
105	MH105	MH104	CONDUIT	42.9	0.3495	0.0130
106-105	MH106	MH105	CONDUIT	22.4	0.4913	0.0130
107-106	MH107	MH106	CONDUIT	43.0	1.3969	0.0130
11	1+104a	CB3	CONDUIT	57.2	0.9970	0.0150
1-101	CB1	CBMH101	CONDUIT	45.1	0.9972	0.0130
12	1+104b	CB2	CONDUIT	56.5	1.0097	0.0150
13	1+017a	CB3	CONDUIT	26.0	0.6158	0.0150
14	1+017b	CB2	CONDUIT	25.8	0.6210	0.0150
15	1+017a	LamarcheAC	CONDUIT	9.2	1.3023	0.0150
16	1+017b	LamarcheBD	CONDUIT	12.2	0.9832	0.0150
2	1+329	CB8	CONDUIT	65.0	1.1847	0.0150
202-201	MH202	MH201	CONDUIT	20.5	0.4868	0.0130
203-202	MH203	MH202	CONDUIT	44.2	0.4973	0.0130
204-203	MH204	MH203	CONDUIT	21.2	0.4711	0.0130
205-204	MH205	MH204	CONDUIT	34.2	0.4976	0.0130
207-206	CBMH207	CBMH206	CONDUIT	97.8	0.5010	0.0130
208-207	LD208	CBMH207	CONDUIT	69.7	0.5022	0.0130
3	CB9	CB7	CONDUIT	50.7	0.8291	0.0150
4	CB8	CB6	CONDUIT	37.6	1.1157	0.0150
5	1+179a	CB7	CONDUIT	33.8	0.5034	0.0150
6	1+179b	CB6	CONDUIT	33.8	0.5032	0.0150
7	1+179a	CB5	CONDUIT	36.2	0.9959	0.0150
8	1+179b	CB4	CONDUIT	36.4	0.9900	0.0150
9	1+104a	CB5	CONDUIT	45.8	0.4148	0.0150
C1	ZN3A	CB9	CONDUIT	1.0	1.0001	0.0130
C2	ZN3B	CB9	CONDUIT	1.0	1.0001	0.0150
C3	HPRYS	CBMH206	CONDUIT	51.2	0.4885	0.0130
C4	HPRYS	CBMH207	CONDUIT	47.6	0.5256	0.0130
C5	LD208	CBMH207	CONDUIT	70.2	0.4985	0.0130
C6	CBMH206	LamarcheA	CONDUIT	1.0	6.0108	0.2500
CAP4-104	MH400	MH104	CONDUIT	13.9	1.0072	0.0130
CB3/2	CB3	CB2	CONDUIT	1.0	0.1000	0.0130
CB5/4	CB5	CB4	CONDUIT	1.0	0.1000	0.0150

CB7/6	CB7	CB6	CONDUIT	1.0	0.1000	0.0150
OVF2A	ZN2A	CB4	CONDUIT	1.0	1.0001	0.0150
OVF2B	ZN2B	LamarcheE	CONDUIT	1.0	1.0001	0.0130
OVFA1	CBMH101	CB3	CONDUIT	1.0	0.1000	0.0150
STM-36_(STM)	CB401	MH400	CONDUIT	46.2	0.9740	0.0130
STM-39_(STM)	MH201	XMH15	CONDUIT	11.8	0.3385	0.0130
CAP3b-107	ZN3B	MH107	ORIFICE			
OR1	CB3	MH101	ORIFICE			
OR3	CB2	MH101	ORIFICE			
OR3A	ZN3A	MH106	ORIFICE			
OR4	CB6	MH105	ORIFICE			
OR5	CB7	MH105	ORIFICE			
ORCB4	CB4	MH104	ORIFICE			
ORCB5	CB5	MH104	ORIFICE			
ORCB8	CB8	MH107	ORIFICE			
ORCB9	CB9	MH107	ORIFICE			
ORCBMH206	CBMH206	MH202	ORIFICE			
ORTANK1	TANK1	MH205	ORIFICE			
ORTANK2	TANK2	MH203	ORIFICE			
ORZN2a	ZN2A	MH104	ORIFICE			
ORZN2b	ZN2B	XMH13	ORIFICE			
STM-23_(STM)	CBMH101	MH101	ORIFICE			

****
Cross Section Summary
****

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
1	20mROWlaf	1.00	8.41	0.25	10.01	1	24202.43
10	20mROWlaf	1.00	8.41	0.25	10.01	1	16715.41
101-100	CIRCULAR	0.75	0.44	0.19	0.75	1	776.37
102-101	CIRCULAR	0.68	0.36	0.17	0.68	1	597.29
103-102	CIRCULAR	0.68	0.36	0.17	0.68	1	588.87
104-103	CIRCULAR	0.68	0.36	0.17	0.68	1	587.95
105	CIRCULAR	0.60	0.28	0.15	0.60	1	363.00
106-105	CIRCULAR	0.60	0.28	0.15	0.60	1	430.38
107-106	CIRCULAR	0.45	0.16	0.11	0.45	1	336.99
11	20mROWlaf	1.00	8.41	0.25	10.01	1	22202.02
1-101	CIRCULAR	0.38	0.11	0.09	0.38	1	175.09
12	20mROWlaf	1.00	8.41	0.25	10.01	1	22343.95
13	20mROWlaf	1.00	8.41	0.25	10.01	1	17448.82
14	20mROWlaf	1.00	8.41	0.25	10.01	1	17522.14
15	20mROWlaf	1.00	8.41	0.25	10.01	1	25375.60
16	20mROWlaf	1.00	8.41	0.25	10.01	1	22048.01
2	20mROWlaf	1.00	8.41	0.25	10.01	1	24202.43
202-201	CIRCULAR	0.53	0.22	0.13	0.53	1	300.09
203-202	CIRCULAR	0.45	0.16	0.11	0.45	1	201.08
204-203	CIRCULAR	0.45	0.16	0.11	0.45	1	195.71
205-204	CIRCULAR	0.45	0.16	0.11	0.45	1	201.13
207-206	CIRCULAR	0.38	0.11	0.09	0.38	1	124.11
208-207	CIRCULAR	0.30	0.07	0.07	0.30	1	68.53
3	20mROWlaf	1.00	8.41	0.25	10.01	1	20247.11
4	20mROWlaf	1.00	8.41	0.25	10.01	1	23487.33
5	20mROWlaf	1.00	8.41	0.25	10.01	1	15776.25
6	20mROWlaf	1.00	8.41	0.25	10.01	1	15774.15
7	20mROWlaf	1.00	8.41	0.25	10.01	1	22189.98
8	20mROWlaf	1.00	8.41	0.25	10.01	1	22124.89
9	20mROWlaf	1.00	8.41	0.25	10.01	1	14321.75
C1	CIRCULAR	1.00	0.79	0.25	1.00	1	2397.78
C2	RECT_OPEN	1.00	3.00	0.60	3.00	1	14228.79
C3	TRAPEZOIDAL	1.00	3.50	0.51	6.50	1	12057.61
C4	TRAPEZOIDAL	1.00	3.50	0.51	6.50	1	12506.56
C5	TRAPEZOIDAL	1.00	3.50	0.51	6.50	1	12179.66
C6	RECT_OPEN	1.00	3.00	0.60	3.00	1	2093.03
CAP4-104	CIRCULAR	0.30	0.07	0.07	0.30	1	97.06
CB3/2	CIRCULAR	1.00	0.79	0.25	1.00	1	758.23
CB5/4	RECT_OPEN	1.00	1.00	0.33	1.00	1	1013.57
CB7/6	RECT_OPEN	1.00	1.00	0.33	1.00	1	1013.57
OVF2A	RECT_OPEN	1.00	3.00	0.60	3.00	1	14228.79
OVF2B	RECT_OPEN	1.00	3.00	0.60	3.00	1	16417.83
OVFA1	CIRCULAR	1.00	0.79	0.25	1.00	1	657.13
STM-36_(STM)	CIRCULAR	0.30	0.07	0.07	0.30	1	95.44
STM-39_(STM)	CIRCULAR	0.68	0.36	0.17	0.68	1	489.07

****
Transect Summary
****

Transect 20mROW1af
Area:

0.0008	0.0030	0.0068	0.0121	0.0189
0.0270	0.0354	0.0440	0.0547	0.0677
0.0832	0.1010	0.1212	0.1438	0.1676
0.1913	0.2151	0.2389	0.2626	0.2864
0.3102	0.3339	0.3577	0.3815	0.4052
0.4290	0.4528	0.4766	0.5004	0.5241
0.5479	0.5717	0.5955	0.6193	0.6431
0.6668	0.6906	0.7144	0.7382	0.7620
0.7858	0.8096	0.8334	0.8572	0.8810
0.9048	0.9286	0.9524	0.9762	1.0000

Hrad:

0.0387	0.0774	0.1162	0.1549	0.1936
0.2510	0.3264	0.3981	0.4447	0.4684
0.4771	0.4767	0.4711	0.4627	0.4586
0.4606	0.4665	0.4751	0.4856	0.4976
0.5106	0.5244	0.5389	0.5539	0.5693
0.5851	0.6011	0.6174	0.6339	0.6506
0.6674	0.6844	0.7014	0.7186	0.7358
0.7532	0.7705	0.7880	0.8055	0.8230
0.8406	0.8582	0.8759	0.8935	0.9112
0.9289	0.9467	0.9644	0.9822	1.0000

Width:

0.0635	0.1270	0.1906	0.2541	0.3176
0.3495	0.3496	0.3996	0.4993	0.5991
0.6989	0.7987	0.8984	0.9982	0.9982
0.9983	0.9983	0.9984	0.9984	0.9985
0.9985	0.9986	0.9986	0.9987	0.9987
0.9988	0.9988	0.9989	0.9989	0.9990
0.9990	0.9991	0.9991	0.9992	0.9992
0.9993	0.9993	0.9994	0.9994	0.9995
0.9995	0.9996	0.9996	0.9997	0.9997
0.9998	0.9998	0.9999	0.9999	1.0000

Transect ROW20m
Area:

0.0008	0.0030	0.0068	0.0121	0.0189
0.0270	0.0354	0.0440	0.0547	0.0678
0.0832	0.1011	0.1213	0.1439	0.1676
0.1914	0.2152	0.2389	0.2627	0.2865

0.3103	0.3340	0.3578	0.3816	0.4054
0.4291	0.4529	0.4767	0.5005	0.5243
0.5480	0.5718	0.5956	0.6194	0.6432
0.6670	0.6907	0.7145	0.7383	0.7621
0.7859	0.8097	0.8335	0.8572	0.8810
0.9048	0.9286	0.9524	0.9762	1.0000

Hrad:

0.0387	0.0774	0.1161	0.1548	0.1935
0.2508	0.3262	0.3978	0.4443	0.4680
0.4768	0.4764	0.4708	0.4624	0.4583
0.4603	0.4662	0.4748	0.4854	0.4973
0.5103	0.5242	0.5386	0.5536	0.5690
0.5848	0.6009	0.6172	0.6337	0.6504
0.6672	0.6842	0.7012	0.7184	0.7357
0.7530	0.7704	0.7878	0.8053	0.8229
0.8405	0.8581	0.8758	0.8934	0.9112
0.9289	0.9466	0.9644	0.9822	1.0000

Width:

0.0636	0.1272	0.1908	0.2544	0.3179
0.3498	0.3499	0.3999	0.4998	0.5996
0.6995	0.7993	0.8992	0.9990	0.9990
0.9991	0.9991	0.9991	0.9991	0.9992
0.9992	0.9992	0.9992	0.9993	0.9993
0.9993	0.9994	0.9994	0.9994	0.9994
0.9995	0.9995	0.9995	0.9996	0.9996
0.9996	0.9996	0.9997	0.9997	0.9997
0.9998	0.9998	0.9998	0.9998	0.9999
0.9999	0.9999	0.9999	1.0000	1.0000

****
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 ............ 11/15/2021 00:00:00
Ending Date .............. 11/16/2021 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
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
```

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Initial LID Storage	0.004	0.699
Total Precipitation	0.427	82.323
Evaporation Loss	0.000	0.000
Infiltration Loss	0.058	11.179
Surface Runoff	0.372	71.674
Final Storage	0.004	0.699
Continuity Error (%)	-0.638	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.372	3.715
Groundwater Inflow	0.000	0.000

RDII Inflow	0.000	0.000
External Inflow	0.000	0.003
External Outflow	0.374	3.739
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.005	0.046
Final Stored Volume	0.004	0.044
Continuity Error (%)	-0.495	

```
*************************
Highest Continuity Errors
*************************
Node CB8 (-1.61%)
Node CB7 (1.56%)
Node CB9 (-1.56%)


**************************
Time-Step Critical Elements
**************************
Link CB7/6 (4.39%)
Link 103-102 (1.89%)
Link CB3/2 (1.79%)


********************************
Highest Flow Instability Indexes
********************************
Link ORZN2b (103)
Link STM-23_(STM) (97)


************************
Routing Time Step Summary
************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     4.73 sec
Maximum Time Step           :     5.00 sec
Percent in Steady State     :     0.00
```

```
  Average Iterations per Step :     2.02
  Percent Not Converging      :     0.10
  Time Step Frequencies       :
      5.000 -  3.155 sec      :    93.29 %
      3.155 -  1.991 sec      :     0.70 %
      1.991 -  1.256 sec      :     0.96 %
      1.256 -  0.792 sec      :     4.80 %
      0.792 -  0.500 sec      :     0.25 %
```

****
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
A-01a	82.32	0.00	0.00	11.15	62.76	8.97	71.73	0.10	69.41	0.871
A-01b	82.32	0.00	0.00	12.49	61.33	9.12	70.45	0.08	47.27	0.856
A-04b	82.32	0.00	0.00	11.17	63.86	7.92	71.77	0.07	44.59	0.872
B-01	82.32	0.00	0.00	0.00	82.60	0.00	82.60	0.34	205.83	1.003
B-02	82.32	0.00	0.00	0.00	82.60	0.00	82.60	0.28	169.63	1.003
C-01a	82.32	0.00	0.00	37.61	22.30	22.73	45.03	0.03	13.93	0.547
C-01b	82.32	0.00	0.00	34.08	29.82	18.77	48.59	0.10	49.01	0.590
C-01c	82.32	0.00	0.00	32.39	32.31	17.98	50.30	0.08	41.36	0.611
D-01	82.32	0.00	0.00	27.73	32.94	22.66	55.61	0.03	28.73	0.675
D-02	82.32	0.00	0.00	13.25	58.47	10.97	69.44	0.01	6.30	0.844
D-03	82.32	0.00	0.00	21.18	44.47	17.50	61.98	0.01	4.75	0.753
D-04	82.32	0.00	0.00	42.92	5.76	35.23	40.99	0.01	10.78	0.498
D-05	82.32	0.00	0.00	42.92	5.76	35.23	40.99	0.00	2.25	0.498
P-01	82.32	9.46	0.00	48.04	6.43	37.72	44.15	0.05	22.41	0.481
P-02	82.32	0.00	0.00	33.55	29.80	19.33	49.13	0.10	52.78	0.597
P-03	82.32	0.00	0.00	47.84	5.76	29.05	34.81	0.05	22.88	0.423
P-04	82.32	0.00	0.00	44.17	5.76	33.25	39.02	0.01	9.93	0.474
P-05	82.32	0.00	0.00	44.69	5.76	32.59	38.35	0.01	10.04	0.466
R-01a	82.32	0.00	0.00	10.08	65.51	7.37	72.88	0.06	39.67	0.885
R-01b	82.32	0.00	0.00	10.05	65.50	7.41	72.91	0.06	37.61	0.886
R-02a	82.32	0.00	0.00	16.27	55.55	11.07	66.62	0.06	36.29	0.809
R-02b	82.32	0.00	0.00	15.99	55.51	11.40	66.91	0.04	28.06	0.813
R-03a	82.32	7.04	0.00	15.62	62.05	12.27	74.32	0.07	40.00	0.832
R-03b	82.32	0.00	0.00	14.96	57.17	10.78	67.95	0.04	28.07	0.825
R-04a	82.32	10.62	0.00	11.62	72.00	9.93	81.93	0.07	43.45	0.882
ZONE2A	82.32	0.00	0.00	3.21	76.94	2.67	79.61	0.37	227.76	0.967
ZONE2B	82.32	0.00	0.00	3.22	76.97	2.67	79.64	0.37	226.71	0.967
ZONE3A	82.32	0.00	0.00	3.24	77.10	2.64	79.74	0.39	239.55	0.969
ZONE3B	82.32	0.00	0.00	3.24	77.12	2.63	79.75	0.86	524.06	0.969

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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
MH101	JUNCTION	0.65	0.91	85.78	0	02:12	0.91
MH102	JUNCTION	0.36	0.79	85.96	0	02:12	0.78
MH103	JUNCTION	0.23	0.78	86.09	0	02:12	0.78
MH104	JUNCTION	0.08	0.75	86.30	0	02:12	0.75
MH105	JUNCTION	0.07	0.56	86.40	0	02:12	0.56
MH106	JUNCTION	0.06	0.48	86.46	0	02:13	0.48
MH107	JUNCTION	0.03	0.18	86.93	0	02:13	0.18
EXDITCH1	OUTFALL	0.00	0.00	88.70	0	00:00	0.00
EXDITCH2	OUTFALL	0.00	0.00	88.70	0	00:00	0.00
LamarcheA	OUTFALL	0.00	0.00	88.54	0	00:00	0.00
LamarcheAC	OUTFALL	0.00	0.00	88.78	0	00:00	0.00
LamarcheB	OUTFALL	0.00	0.00	88.40	0	00:00	0.00
LamarcheBD	OUTFALL	0.00	0.00	88.78	0	00:00	0.00
LamarcheE	OUTFALL	0.00	0.00	89.53	0	00:00	0.00
MH100	OUTFALL	0.98	0.98	85.50	0	00:00	0.98
XMH13	OUTFALL	85.88	85.88	85.88	0	00:00	85.88
XMH15	OUTFALL	85.01	85.01	85.01	0	00:00	85.01
1+017a	STORAGE	0.00	0.00	88.90	0	00:00	0.00
1+017b	STORAGE	0.00	0.00	88.90	0	00:00	0.00
1+104a	STORAGE	0.00	0.00	89.31	0	00:00	0.00
1+104b	STORAGE	0.00	0.00	89.31	0	00:00	0.00
1+179a	STORAGE	0.00	0.00	89.48	0	00:00	0.00
1+179b	STORAGE	0.00	0.00	89.48	0	00:00	0.00
1+329	STORAGE	0.00	0.00	90.50	0	00:00	0.00
CB1	STORAGE	0.12	1.46	88.96	0	02:15	1.46
CB2	STORAGE	0.14	1.66	88.90	0	02:17	1.66
CB3	STORAGE	0.14	1.66	88.90	0	02:17	1.66
CB4	STORAGE	0.11	1.59	89.21	0	02:14	1.59
CB401	STORAGE	0.01	0.12	86.65	0	02:10	0.12
CB5	STORAGE	0.13	1.63	89.25	0	02:14	1.63
CB6	STORAGE	0.13	1.66	89.47	0	02:15	1.66
CB7	STORAGE	0.14	1.66	89.47	0	02:15	1.66
CB8	STORAGE	0.10	1.55	89.78	0	02:10	1.55
CB9	STORAGE	0.10	1.55	89.78	0	02:10	1.55
CBMH101	STORAGE	0.45	3.59	88.95	0	02:20	3.59
CBMH206	STORAGE	0.21	1.85	88.59	0	02:34	1.85
CBMH207	STORAGE	0.13	1.26	88.61	0	02:34	1.26
HPRYS	STORAGE	0.00	0.01	88.61	0	02:35	0.01
LD208	STORAGE	0.09	0.92	88.62	0	02:30	0.92
MH201	STORAGE	1.11	1.11	85.02	0	02:15	1.11
MH202	STORAGE	0.05	0.36	85.39	0	02:16	0.36
MH203	STORAGE	0.35	0.62	85.65	0	02:15	0.62
MH204	STORAGE	0.03	0.23	85.69	0	02:15	0.23
MH205	STORAGE	0.03	0.21	85.92	0	02:14	0.21
MH400	STORAGE	0.03	0.51	86.58	0	02:11	0.51
TANK1	STORAGE	0.13	1.55	87.55	0	02:14	1.55
TANK2	STORAGE	0.15	1.53	87.53	0	02:20	1.53
ZN2A	STORAGE	0.36	3.74	89.64	0	02:18	3.74
ZN2B	STORAGE	0.85	4.26	89.63	0	02:15	4.26
ZN3A	STORAGE	0.34	3.50	89.85	0	02:19	3.50
ZN3B	STORAGE	0.28	2.98	90.08	0	02:18	2.98

****
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	
MH101	JUNCTION	0.00	598.87	0	02:12	0	2.49	-0.030	
MH102	JUNCTION	0.00	526.33	0	02:12	0	2.17	0.003	
MH103	JUNCTION	0.00	526.31	0	02:12	0	2.17	-0.010	
MH104	JUNCTION	0.00	526.30	0	02:12	0	2.17	0.003	
MH105	JUNCTION	0.00	329.22	0	02:15	0	1.48	-0.072	
MH106	JUNCTION	0.00	289.45	0	02:14	0	1.36	0.045	
MH107	JUNCTION	0.00	117.12	0	02:13	0	0.499	0.104	
EXDITCH1	OUTFALL	10.04	10.04	0	02:10	0.0126	0.0126	0.000	
EXDITCH2	OUTFALL	2.25	2.25	0	02:10	0.00204	0.00204	0.000	
LamarcheA	OUTFALL	0.00	0.00	0	00:00	0	0	0.000	ltr
LamarcheAC	OUTFALL	0.00	0.00	0	00:00	0	0	0.000	ltr

LamarcheB	OUTFALL	28.73	28.73	0	02:10	0.0344	0.0344	0.000
LamarcheBD	OUTFALL	0.00	0.00	0	00:00	0	0	0.000 ltr
LamarcheE	OUTFALL	0.00	0.00	0	00:00	0	0	0.000 ltr
MH100	OUTFALL	0.00	598.88	0	02:12	0	2.49	0.000
XMH13	OUTFALL	0.00	74.98	0	02:15	0	0.373	0.000
XMH15	OUTFALL	0.00	160.73	0	02:16	0	0.825	0.000
1+017a	STORAGE	0.00	0.00	0	00:00	0	1.07e-06	-1.175 ltr
1+017b	STORAGE	0.00	0.00	0	00:00	0	1.09e-06	-1.274 ltr
1+104a	STORAGE	0.00	0.00	0	00:00	0	0	0.000 ltr
1+104b	STORAGE	0.00	0.00	0	00:00	0	0	0.000 ltr
1+179a	STORAGE	0.00	0.00	0	00:00	0	0	0.000 ltr
1+179b	STORAGE	0.00	0.00	0	00:00	0	0	0.000 ltr
1+329	STORAGE	0.00	0.00	0	00:00	0	0	-0.000 ltr
CB1	STORAGE	47.27	59.05	0	02:04	0.0753	0.076	0.113
CB2	STORAGE	44.59	44.59	0	02:10	0.0731	0.0733	-0.182
CB3	STORAGE	43.45	43.99	0	02:10	0.0695	0.0703	-0.238
CB4	STORAGE	28.07	28.07	0	02:10	0.0446	0.0467	0.018
CB401	STORAGE	32.82	32.82	0	02:10	0.0576	0.0576	0.023
CB5	STORAGE	40.00	40.00	0	02:10	0.0653	0.0653	-0.331
CB6	STORAGE	28.06	51.46	0	02:10	0.0448	0.0562	0.732
CB7	STORAGE	36.29	55.90	0	02:10	0.0599	0.0691	1.590
CB8	STORAGE	37.61	37.61	0	02:10	0.0604	0.0604	-1.582
CB9	STORAGE	39.67	39.67	0	02:10	0.064	0.064	-1.540
CBMH101	STORAGE	69.41	123.02	0	02:06	0.104	0.181	0.077
CBMH206	STORAGE	13.93	61.87	0	02:04	0.0261	0.201	-0.223
CBMH207	STORAGE	49.01	77.50	0	02:06	0.0956	0.175	0.107
HPRYS	STORAGE	0.00	3.41	0	02:27	0	0.00145	0.519
LD208	STORAGE	41.36	41.36	0	02:10	0.0794	0.0794	-0.050
MH201	STORAGE	0.00	160.72	0	02:16	0	0.827	-0.003
MH202	STORAGE	0.00	160.80	0	02:15	0	0.825	-0.043
MH203	STORAGE	0.00	133.21	0	02:15	0	0.624	0.069
MH204	STORAGE	0.00	83.18	0	02:14	0	0.342	0.018
MH205	STORAGE	0.00	83.18	0	02:14	0	0.342	-0.003
MH400	STORAGE	75.20	107.17	0	02:10	0.146	0.204	0.072
TANK1	STORAGE	205.83	205.83	0	02:10	0.342	0.342	0.002
TANK2	STORAGE	169.63	169.63	0	02:10	0.282	0.282	0.003
ZN2A	STORAGE	227.76	227.76	0	02:10	0.367	0.367	-1.408
ZN2B	STORAGE	226.71	226.71	0	02:10	0.366	0.367	-1.377
ZN3A	STORAGE	524.06	524.06	0	02:10	0.855	0.855	-0.905
ZN3B	STORAGE	239.55	239.55	0	02:10	0.389	0.389	-0.182

****
Node Surcharge Summary
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Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
MH101	JUNCTION	0.82	0.159	3.186
MH102	JUNCTION	0.35	0.080	3.405
MH103	JUNCTION	0.29	0.071	3.154
MH104	JUNCTION	0.04	0.007	3.203

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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
1+017a	0.000	0	0	0	0.000	0	0 00:00	0.00
1+017b	0.000	0	0	0	0.000	0	0 00:00	0.00
1+104a	0.000	0	0	0	0.000	0	0 00:00	0.00
1+104b	0.000	0	0	0	0.000	0	0 00:00	0.00
1+179a	0.000	0	0	0	0.000	0	0 00:00	0.00
1+179b	0.000	0	0	0	0.000	0	0 00:00	0.00
1+329	0.000	0	0	0	0.000	0	0 00:00	0.00
CB1	0.000	0	0	0	0.001	1	0 02:15	57.14

CB2	0.000	6	0	0	0.002	66	0	02:17	22.54
CB3	0.000	6	0	0	0.002	66	0	02:17	20.56
CB4	0.000	4	0	0	0.002	64	0	02:14	18.20
CB401	0.000	1	0	0	0.000	6	0	02:10	32.37
CB5	0.000	5	0	0	0.002	65	0	02:14	24.19
CB6	0.000	5	0	0	0.002	67	0	02:15	18.63
CB7	0.000	5	0	0	0.002	67	0	02:15	26.84
CB8	0.000	4	0	0	0.002	62	0	02:10	36.53
CB9	0.000	4	0	0	0.002	62	0	02:10	37.85
CBMH101	0.003	7	0	0	0.036	99	0	02:20	53.24
CBMH206	0.000	8	0	0	0.002	71	0	02:34	28.50
CBMH207	0.000	7	0	0	0.001	63	0	02:34	52.57
HPRYS	0.000	0	0	0	0.000	1	0	02:35	1.82
LD208	0.000	5	0	0	0.001	46	0	02:30	35.10
MH201	0.001	23	0	0	0.001	23	0	02:15	160.73
MH202	0.000	1	0	0	0.000	10	0	02:16	160.72
MH203	0.000	9	0	0	0.001	16	0	02:15	133.18
MH204	0.000	1	0	0	0.000	6	0	02:15	83.14
MH205	0.000	1	0	0	0.000	6	0	02:14	83.18
MH400	0.000	1	0	0	0.001	16	0	02:11	101.94
TANK1	0.008	5	0	0	0.103	62	0	02:14	83.18
TANK2	0.010	6	0	0	0.102	61	0	02:20	50.27
ZN2A	0.007	4	0	0	0.094	61	0	02:18	73.15
ZN2B	0.006	4	0	0	0.091	59	0	02:15	74.98
ZN3A	0.014	5	0	0	0.206	68	0	02:19	172.44
ZN3B	0.006	4	0	0	0.088	59	0	02:18	81.40

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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
EXDITCH1	18.59	2.39	10.04	0.013
EXDITCH2	9.36	0.74	2.25	0.002
LamarcheA	0.00	0.00	0.00	0.000
LamarcheAC	0.00	0.00	0.00	0.000
LamarcheB	29.24	3.40	28.73	0.034
LamarcheBD	0.00	0.00	0.00	0.000
LamarcheE	0.00	0.00	0.00	0.000
MH100	85.68	67.49	598.88	2.495
XMH13	99.94	8.06	74.98	0.373
XMH15	45.11	37.97	160.73	0.825
System	28.79	120.04	855.54	3.742

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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
1	CHANNEL	0.00	0 00:00	0.00	0.00	0.02
10	CHANNEL	0.00	0 00:00	0.00	0.00	0.05
101-100	CONDUIT	598.88	0 02:12	1.36	0.77	1.00
102-101	CONDUIT	526.35	0 02:12	1.47	0.88	1.00
103-102	CONDUIT	526.33	0 02:12	1.47	0.89	1.00
104-103	CONDUIT	526.31	0 02:12	1.59	0.90	1.00
105	CONDUIT	332.21	0 02:15	1.61	0.92	0.97
106-105	CONDUIT	291.96	0 02:15	1.50	0.68	0.84
107-106	CONDUIT	117.12	0 02:13	1.62	0.35	0.55
11	CHANNEL	0.00	0 00:00	0.00	0.00	0.08
1-101	CONDUIT	57.14	0 02:06	0.90	0.33	1.00
12	CHANNEL	0.00	0 00:00	0.00	0.00	0.08
13	CHANNEL	0.00	0 02:04	0.00	0.00	0.08
14	CHANNEL	0.00	0 02:03	0.00	0.00	0.08
15	CHANNEL	0.00	0 00:00	0.00	0.00	0.00
16	CHANNEL	0.00	0 00:00	0.00	0.00	0.00
2	CHANNEL	0.00	0 00:00	0.00	0.00	0.02
202-201	CONDUIT	160.72	0 02:16	1.20	0.54	0.60
203-202	CONDUIT	133.18	0 02:15	1.19	0.66	0.66
204-203	CONDUIT	83.14	0 02:15	0.90	0.42	0.57
205-204	CONDUIT	83.18	0 02:14	1.20	0.41	0.45
207-206	CONDUIT	52.57	0 02:04	0.64	0.42	1.00

208-207	CONDUIT	35.10	0	02:06	0.77	0.51	1.00
3	CHANNEL	19.90	0	02:10	0.42	0.00	0.10
4	CHANNEL	18.59	0	02:10	0.44	0.00	0.10
5	CHANNEL	0.00	0	00:00	0.00	0.00	0.08
6	CHANNEL	0.00	0	00:00	0.00	0.00	0.08
7	CHANNEL	0.00	0	00:00	0.00	0.00	0.06
8	CHANNEL	0.00	0	00:00	0.00	0.00	0.05
9	CHANNEL	0.00	0	00:00	0.00	0.00	0.06
C1	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C2	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C3	CONDUIT	1.82	0	02:35	0.02	0.00	0.13
C4	CONDUIT	3.41	0	02:27	0.03	0.00	0.14
C5	CONDUIT	0.00	0	00:00	0.00	0.00	0.13
C6	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
CAP4-104	CONDUIT	101.94	0	02:10	1.44	1.05	1.00
CB3/2	CONDUIT	4.02	0	02:12	0.50	0.01	0.05
CB5/4	CONDUIT	5.76	0	02:14	0.33	0.01	0.02
CB7/6	CONDUIT	8.36	0	02:11	0.35	0.01	0.06
OVF2A	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
OVF2B	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
OVFA1	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
STM-36_(STM)	CONDUIT	32.37	0	02:10	0.61	0.34	0.70
STM-39_(STM)	CONDUIT	160.73	0	02:16	0.45	0.33	1.00
CAP3b-107	ORIFICE	81.40	0	02:18			1.00
OR1	ORIFICE	18.59	0	02:17			1.00
OR3	ORIFICE	18.59	0	02:17			1.00
OR3A	ORIFICE	172.44	0	02:19			1.00
OR4	ORIFICE	18.63	0	02:15			1.00
OR5	ORIFICE	18.63	0	02:15			1.00
ORCB4	ORIFICE	18.20	0	02:14			1.00
ORCB5	ORIFICE	18.43	0	02:14			1.00
ORCB8	ORIFICE	17.93	0	02:10			1.00
ORCB9	ORIFICE	17.95	0	02:10			1.00
ORCBMH206	ORIFICE	28.50	0	02:34			1.00
ORTANK1	ORIFICE	83.18	0	02:14			1.00
ORTANK2	ORIFICE	50.27	0	02:20			1.00
ORZN2a	ORIFICE	73.15	0	02:41			1.00
ORZN2b	ORIFICE	74.98	0	02:15			1.00
STM-23_(STM)	ORIFICE	35.80	0	02:30			1.00

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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
1	1.00	0.95	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	1.00	0.94	0.06	0.00	0.00	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	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
103-102	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
104-103	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.01	0.92	0.00
105	1.00	0.00	0.00	0.00	0.07	0.00	0.00	0.93	0.00	0.00
106-105	1.00	0.00	0.00	0.00	0.09	0.00	0.00	0.91	0.00	0.00
107-106	1.00	0.00	0.00	0.00	0.02	0.07	0.00	0.91	0.03	0.00
11	1.00	0.92	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-101	1.00	0.00	0.00	0.00	0.09	0.00	0.00	0.91	0.00	0.00
12	1.00	0.92	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	1.00	0.00	0.00	0.00	0.08	0.00	0.00	0.92	0.91	0.00
14	1.00	0.00	0.00	0.00	0.08	0.00	0.00	0.92	0.91	0.00
15	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
16	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
2	1.00	0.96	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202-201	1.00	0.00	0.00	0.00	0.85	0.00	0.00	0.15	0.85	0.00
203-202	1.00	0.00	0.00	0.00	0.08	0.00	0.00	0.92	0.00	0.00
204-203	1.00	0.00	0.00	0.00	0.14	0.00	0.00	0.86	0.04	0.00
205-204	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
207-206	1.00	0.00	0.00	0.00	0.14	0.00	0.00	0.86	0.02	0.00
208-207	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.93	0.00
3	1.00	0.92	0.03	0.00	0.05	0.00	0.00	0.00	0.91	0.00
4	1.00	0.93	0.03	0.00	0.04	0.00	0.00	0.00	0.91	0.00
5	1.00	0.93	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	1.00	0.93	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	1.00	0.93	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	1.00	0.94	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	1.00	0.93	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

C3	1.00	0.88	0.05	0.00	0.04	0.00	0.00	0.03	0.03	0.00
C4	1.00	0.88	0.05	0.00	0.04	0.00	0.00	0.03	0.02	0.00
C5	1.00	0.91	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C6	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CAP4-104	1.00	0.00	0.00	0.00	0.06	0.00	0.00	0.93	0.00	0.00
CB3/2	1.00	0.94	0.00	0.00	0.06	0.01	0.00	0.00	0.00	0.00
CB5/4	1.00	0.95	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00
CB7/6	1.00	0.94	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00
OVF2A	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OVF2B	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OVFA1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STM-36_(STM)	1.00	0.00	0.00	0.00	0.28	0.01	0.00	0.71	0.24	0.00
STM-39_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00

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Conduit Surcharge Summary
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Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
101-100	0.84	0.84	24.00	0.01	0.13
102-101	0.41	0.41	0.82	0.01	0.01
103-102	0.34	0.34	0.35	0.01	0.32
104-103	0.23	0.23	0.29	0.01	0.04
105	0.01	0.01	0.04	0.01	0.01
1-101	0.82	0.82	0.91	0.01	0.01
207-206	1.46	1.46	1.79	0.01	0.01
208-207	1.28	1.28	1.50	0.01	0.01
CAP4-104	0.19	0.22	0.21	0.04	0.17
STM-36_(STM)	0.01	0.01	0.20	0.01	0.01
STM-39_(STM)	24.00	24.00	24.00	0.01	0.01

Analysis begun on: Wed Dec 22 12:28:04 2021
Analysis ended on: Wed Dec 22 12:28:05 2021
Total elapsed time: 00:00:01

Chicago 6hr 100 + 20% Storm PCSWM Model Results

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

****
Element Count
****
Number of rain gages 1
Number of subcatchments ... 29
Number of nodes 51
Number of links 61
Number of pollutants 0
Number of land uses 0

****
Raingage Summary
****

Name	Data Source	Data Type	Recording Interval
Raingage1	C6-100+20%	INTENSITY	10 min.

****
Subcatchment Summary
****

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A-01a	0.14	41.43	76.00	2.0000	Raingage1	CBMH101
A-01b	0.11	10.70	74.00	2.0000	Raingage1	CB1
A-04b	0.10	10.20	77.00	1.0000	Raingage1	CB2
B-01	0.41	166.00	100.00	1.5000	Raingage1	TANK1
B-02	0.34	136.80	100.00	1.5000	Raingage1	TANK2
C-01a	0.06	11.37	27.00	0.5000	Raingage1	CBMH206
C-01b	0.20	24.02	36.00	0.5000	Raingage1	CBMH207
C-01c	0.16	15.96	39.00	0.7000	Raingage1	LD208
D-01	0.06	62.00	40.00	2.0000	Raingage1	LamarcheB
D-02	0.01	32.50	71.00	2.0000	Raingage1	R-04a
D-03	0.01	12.50	54.00	1.5000	Raingage1	R-03a
D-04	0.02	48.00	7.00	1.5000	Raingage1	P-01
D-05	0.01	10.00	7.00	1.5000	Raingage1	EXDITCH2
P-01	0.10	29.71	7.00	0.5000	Raingage1	MH400
P-02	0.20	29.14	36.00	0.5000	Raingage1	MH400
P-03	0.13	19.56	7.00	1.5000	Raingage1	CB401
P-04	0.03	15.68	7.00	1.5000	Raingage1	CB401
P-05	0.03	16.50	7.00	1.0000	Raingage1	EXDITCH1
R-01a	0.09	10.23	79.00	1.0000	Raingage1	CB9
R-01b	0.08	10.25	79.00	1.0000	Raingage1	CB8
R-02a	0.09	10.00	67.00	1.0000	Raingage1	CB7
R-02b	0.07	10.00	67.00	1.0000	Raingage1	CB6
R-03a	0.09	10.00	69.00	1.0000	Raingage1	CB5
R-03b	0.07	10.00	69.00	1.0000	Raingage1	CB4
R-04a	0.08	10.12	77.00	1.0000	Raingage1	CB3
ZONE2A	0.46	102.67	93.00	2.0000	Raingage1	ZN2A
ZONE2B	0.46	92.00	93.00	2.0000	Raingage1	ZN2B
ZONE3A	0.49	54.33	93.00	2.0000	Raingage1	ZN3B
ZONE3B	1.07	102.29	93.00	2.0000	Raingage1	ZN3A

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Node Summary
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Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
MH101	JUNCTION	84.87	4.10	0.0	
MH102	JUNCTION	85.17	4.19	0.0	
MH103	JUNCTION	85.31	3.93	0.0	
MH104	JUNCTION	85.55	3.95	0.0	
MH105	JUNCTION	85.84	3.64	0.0	
MH106	JUNCTION	85.98	3.74	0.0	
MH107	JUNCTION	86.75	3.35	0.0	
EXDITCH1	OUTFALL	88.70	0.00	0.0	
EXDITCH2	OUTFALL	88.70	0.00	0.0	
LamarcheA	OUTFALL	88.54	1.00	0.0	
LamarcheAC	OUTFALL	88.78	1.00	0.0	
LamarcheB	OUTFALL	88.40	0.00	0.0	
LamarcheBD	OUTFALL	88.78	1.00	0.0	
LamarcheE	OUTFALL	89.53	1.16	0.0	
MH100	OUTFALL	84.52	0.83	0.0	

XMH13	OUTFALL	0.00	0.00	0.0
XMH15	OUTFALL	0.00	84.55	0.0
1+017a	STORAGE	88.90	1.00	0.0
1+017b	STORAGE	88.90	1.00	0.0
1+104a	STORAGE	89.31	1.00	0.0
1+104b	STORAGE	89.31	1.00	0.0
1+179a	STORAGE	89.48	1.00	0.0
1+179b	STORAGE	89.48	1.00	0.0
1+329	STORAGE	90.50	1.00	0.0
CB1	STORAGE	87.50	2.50	0.0
CB2	STORAGE	87.24	2.50	0.0
CB3	STORAGE	87.24	2.50	0.0
CB4	STORAGE	87.62	2.50	0.0
CB401	STORAGE	86.53	1.87	0.0
CB5	STORAGE	87.62	2.50	0.0
CB6	STORAGE	87.81	2.50	0.0
CB7	STORAGE	87.81	2.50	0.0
CB8	STORAGE	88.23	2.50	0.0
CB9	STORAGE	88.23	2.50	0.0
CBMH101	STORAGE	85.36	4.34	0.0
CBMH206	STORAGE	86.74	2.61	0.0
CBMH207	STORAGE	87.35	2.00	0.0
HPRYS	STORAGE	88.60	1.00	0.0
LD208	STORAGE	87.70	2.00	0.0
MH201	STORAGE	83.91	4.80	0.0
MH202	STORAGE	85.03	3.71	0.0
MH203	STORAGE	85.03	3.91	0.0
MH204	STORAGE	85.46	3.50	0.0
MH205	STORAGE	85.71	3.60	0.0
MH400	STORAGE	86.07	3.13	0.0
TANK1	STORAGE	86.00	3.50	0.0
TANK2	STORAGE	86.00	3.30	0.0
ZN2A	STORAGE	85.90	4.50	0.0
ZN2B	STORAGE	85.37	5.03	0.0
ZN3A	STORAGE	86.35	4.25	0.0
ZN3B	STORAGE	87.10	3.75	0.0

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
1	1+329	CB9	CONDUIT	65.0	1.1847	0.0150
10	1+104b	CB4	CONDUIT	33.6	0.5651	0.0150
101-100	MH101	MH100	CONDUIT	55.5	0.4863	0.0130
102-101	MH102	MH101	CONDUIT	43.6	0.5048	0.0130
103-102	MH103	MH102	CONDUIT	22.4	0.4907	0.0130
104-103	MH104	MH103	CONDUIT	42.9	0.4892	0.0130
105	MH105	MH104	CONDUIT	42.9	0.3495	0.0130
106-105	MH106	MH105	CONDUIT	22.4	0.4913	0.0130
107-106	MH107	MH106	CONDUIT	43.0	1.3969	0.0130
11	1+104a	CB3	CONDUIT	57.2	0.9970	0.0150
1-101	CB1	CBMH101	CONDUIT	45.1	0.9972	0.0130
12	1+104b	CB2	CONDUIT	56.5	1.0097	0.0150
13	1+017a	CB3	CONDUIT	26.0	0.6158	0.0150
14	1+017b	CB2	CONDUIT	25.8	0.6210	0.0150
15	1+017a	LamarcheAC	CONDUIT	9.2	1.3023	0.0150
16	1+017b	LamarcheBD	CONDUIT	12.2	0.9832	0.0150
2	1+329	CB8	CONDUIT	65.0	1.1847	0.0150
202-201	MH202	MH201	CONDUIT	20.5	0.4868	0.0130
203-202	MH203	MH202	CONDUIT	44.2	0.4973	0.0130
204-203	MH204	MH203	CONDUIT	21.2	0.4711	0.0130
205-204	MH205	MH204	CONDUIT	34.2	0.4976	0.0130
207-206	CBMH207	CBMH206	CONDUIT	97.8	0.5010	0.0130
208-207	LD208	CBMH207	CONDUIT	69.7	0.5022	0.0130
3	CB9	CB7	CONDUIT	50.7	0.8291	0.0150
4	CB8	CB6	CONDUIT	37.6	1.1157	0.0150
5	1+179a	CB7	CONDUIT	33.8	0.5034	0.0150
6	1+179b	CB6	CONDUIT	33.8	0.5032	0.0150
7	1+179a	CB5	CONDUIT	36.2	0.9959	0.0150
8	1+179b	CB4	CONDUIT	36.4	0.9900	0.0150
9	1+104a	CB5	CONDUIT	45.8	0.4148	0.0150
C1	ZN3A	CB9	CONDUIT	1.0	1.0001	0.0130
C2	ZN3B	CB9	CONDUIT	1.0	1.0001	0.0150
C3	HPRYS	CBMH206	CONDUIT	51.2	0.4885	0.0130
C4	HPRYS	CBMH207	CONDUIT	47.6	0.5256	0.0130
C5	LD208	CBMH207	CONDUIT	70.2	0.4985	0.0130
C6	CBMH206	LamarcheA	CONDUIT	1.0	6.0108	0.2500
CAP4-104	MH400	MH104	CONDUIT	13.9	1.0072	0.0130
CB3/2	CB3	CB2	CONDUIT	1.0	0.1000	0.0130
CB5/4	CB5	CB4	CONDUIT	1.0	0.1000	0.0150

CB7/6	CB7	CB6	CONDUIT	1.0	0.1000	0.0150
OVF2A	ZN2A	CB4	CONDUIT	1.0	1.0001	0.0150
OVF2B	ZN2B	LamarcheE	CONDUIT	1.0	1.0001	0.0130
OVFA1	CBMH101	CB3	CONDUIT	1.0	0.1000	0.0150
STM-36_(STM)	CB401	MH400	CONDUIT	46.2	0.9740	0.0130
STM-39_(STM)	MH201	XMH15	CONDUIT	11.8	0.3385	0.0130
CAP3b-107	ZN3B	MH107	ORIFICE			
OR1	CB3	MH101	ORIFICE			
OR3	CB2	MH101	ORIFICE			
OR3A	ZN3A	MH106	ORIFICE			
OR4	CB6	MH105	ORIFICE			
OR5	CB7	MH105	ORIFICE			
ORCB4	CB4	MH104	ORIFICE			
ORCB5	CB5	MH104	ORIFICE			
ORCB8	CB8	MH107	ORIFICE			
ORCB9	CB9	MH107	ORIFICE			
ORCBMH206	CBMH206	MH202	ORIFICE			
ORTANK1	TANK1	MH205	ORIFICE			
ORTANK2	TANK2	MH203	ORIFICE			
ORZN2a	ZN2A	MH104	ORIFICE			
ORZN2b	ZN2B	XMH13	ORIFICE			
STM-23_(STM)	CBMH101	MH101	ORIFICE			

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
1	20mROWlaf	1.00	8.41	0.25	10.01	1	24202.43
10	20mROWlaf	1.00	8.41	0.25	10.01	1	16715.41
101-100	CIRCULAR	0.75	0.44	0.19	0.75	1	776.37
102-101	CIRCULAR	0.68	0.36	0.17	0.68	1	597.29
103-102	CIRCULAR	0.68	0.36	0.17	0.68	1	588.87
104-103	CIRCULAR	0.68	0.36	0.17	0.68	1	587.95
105	CIRCULAR	0.60	0.28	0.15	0.60	1	363.00
106-105	CIRCULAR	0.60	0.28	0.15	0.60	1	430.38
107-106	CIRCULAR	0.45	0.16	0.11	0.45	1	336.99
11	20mROWlaf	1.00	8.41	0.25	10.01	1	22202.02
1-101	CIRCULAR	0.38	0.11	0.09	0.38	1	175.09
12	20mROWlaf	1.00	8.41	0.25	10.01	1	22343.95
13	20mROWlaf	1.00	8.41	0.25	10.01	1	17448.82
14	20mROWlaf	1.00	8.41	0.25	10.01	1	17522.14
15	20mROWlaf	1.00	8.41	0.25	10.01	1	25375.60
16	20mROWlaf	1.00	8.41	0.25	10.01	1	22048.01
2	20mROWlaf	1.00	8.41	0.25	10.01	1	24202.43
202-201	CIRCULAR	0.53	0.22	0.13	0.53	1	300.09
203-202	CIRCULAR	0.45	0.16	0.11	0.45	1	201.08
204-203	CIRCULAR	0.45	0.16	0.11	0.45	1	195.71
205-204	CIRCULAR	0.45	0.16	0.11	0.45	1	201.13
207-206	CIRCULAR	0.38	0.11	0.09	0.38	1	124.11
208-207	CIRCULAR	0.30	0.07	0.07	0.30	1	68.53
3	20mROWlaf	1.00	8.41	0.25	10.01	1	20247.11
4	20mROWlaf	1.00	8.41	0.25	10.01	1	23487.33
5	20mROWlaf	1.00	8.41	0.25	10.01	1	15776.25
6	20mROWlaf	1.00	8.41	0.25	10.01	1	15774.15
7	20mROWlaf	1.00	8.41	0.25	10.01	1	22189.98
8	20mROWlaf	1.00	8.41	0.25	10.01	1	22124.89
9	20mROWlaf	1.00	8.41	0.25	10.01	1	14321.75
C1	CIRCULAR	1.00	0.79	0.25	1.00	1	2397.78
C2	RECT_OPEN	1.00	3.00	0.60	3.00	1	14228.79
C3	TRAPEZOIDAL	1.00	3.50	0.51	6.50	1	12057.61
C4	TRAPEZOIDAL	1.00	3.50	0.51	6.50	1	12506.56
C5	TRAPEZOIDAL	1.00	3.50	0.51	6.50	1	12179.66
C6	RECT_OPEN	1.00	5.00	0.71	5.00	1	3918.36
CAP4-104	CIRCULAR	0.30	0.07	0.07	0.30	1	97.06
CB3/2	CIRCULAR	1.00	0.79	0.25	1.00	1	758.23
CB5/4	RECT_OPEN	1.00	1.00	0.33	1.00	1	1013.57
CB7/6	RECT_OPEN	1.00	1.00	0.33	1.00	1	1013.57
OVF2A	RECT_OPEN	1.00	3.00	0.60	3.00	1	14228.79
OVF2B	RECT_OPEN	1.00	3.00	0.60	3.00	1	16417.83
OVFA1	RECT_OPEN	1.00	5.00	0.71	5.00	1	8423.38
STM-36_(STM)	CIRCULAR	0.30	0.07	0.07	0.30	1	95.44
STM-39_(STM)	CIRCULAR	0.68	0.36	0.17	0.68	1	489.07

****
Transect Summary
****

Transect 20mROW1af
Area:

0.0008	0.0030	0.0068	0.0121	0.0189
0.0270	0.0354	0.0440	0.0547	0.0677
0.0832	0.1010	0.1212	0.1438	0.1676
0.1913	0.2151	0.2389	0.2626	0.2864
0.3102	0.3339	0.3577	0.3815	0.4052
0.4290	0.4528	0.4766	0.5004	0.5241
0.5479	0.5717	0.5955	0.6193	0.6431
0.6668	0.6906	0.7144	0.7382	0.7620
0.7858	0.8096	0.8334	0.8572	0.8810
0.9048	0.9286	0.9524	0.9762	1.0000

Hrad:

0.0387	0.0774	0.1162	0.1549	0.1936
0.2510	0.3264	0.3981	0.4447	0.4684
0.4771	0.4767	0.4711	0.4627	0.4586
0.4606	0.4665	0.4751	0.4856	0.4976
0.5106	0.5244	0.5389	0.5539	0.5693
0.5851	0.6011	0.6174	0.6339	0.6506
0.6674	0.6844	0.7014	0.7186	0.7358
0.7532	0.7705	0.7880	0.8055	0.8230
0.8406	0.8582	0.8759	0.8935	0.9112
0.9289	0.9467	0.9644	0.9822	1.0000

Width:

0.0635	0.1270	0.1906	0.2541	0.3176
0.3495	0.3496	0.3996	0.4993	0.5991
0.6989	0.7987	0.8984	0.9982	0.9982
0.9983	0.9983	0.9984	0.9984	0.9985
0.9985	0.9986	0.9986	0.9987	0.9987
0.9988	0.9988	0.9989	0.9989	0.9990
0.9990	0.9991	0.9991	0.9992	0.9992
0.9993	0.9993	0.9994	0.9994	0.9995
0.9995	0.9996	0.9996	0.9997	0.9997
0.9998	0.9998	0.9999	0.9999	1.0000

Transect ROW20m
Area:

0.0008	0.0030	0.0068	0.0121	0.0189
0.0270	0.0354	0.0440	0.0547	0.0678
0.0832	0.1011	0.1213	0.1439	0.1676
0.1914	0.2152	0.2389	0.2627	0.2865

0.3103	0.3340	0.3578	0.3816	0.4054
0.4291	0.4529	0.4767	0.5005	0.5243
0.5480	0.5718	0.5956	0.6194	0.6432
0.6670	0.6907	0.7145	0.7383	0.7621
0.7859	0.8097	0.8335	0.8572	0.8810
0.9048	0.9286	0.9524	0.9762	1.0000

Hrad:

0.0387	0.0774	0.1161	0.1548	0.1935
0.2508	0.3262	0.3978	0.4443	0.4680
0.4768	0.4764	0.4708	0.4624	0.4583
0.4603	0.4662	0.4748	0.4854	0.4973
0.5103	0.5242	0.5386	0.5536	0.5690
0.5848	0.6009	0.6172	0.6337	0.6504
0.6672	0.6842	0.7012	0.7184	0.7357
0.7530	0.7704	0.7878	0.8053	0.8229
0.8405	0.8581	0.8758	0.8934	0.9112
0.9289	0.9466	0.9644	0.9822	1.0000

Width:

0.0636	0.1272	0.1908	0.2544	0.3179
0.3498	0.3499	0.3999	0.4998	0.5996
0.6995	0.7993	0.8992	0.9990	0.9990
0.9991	0.9991	0.9991	0.9991	0.9992
0.9992	0.9992	0.9992	0.9993	0.9993
0.9993	0.9994	0.9994	0.9994	0.9994
0.9995	0.9995	0.9995	0.9996	0.9996
0.9996	0.9996	0.9997	0.9997	0.9997
0.9998	0.9998	0.9998	0.9998	0.9999
0.9999	0.9999	0.9999	1.0000	1.0000

****
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 ............ 11/15/2021 00:00:00
Ending Date .............. 11/16/2021 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
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
```

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Initial LID Storage	0.004	0.699
Total Precipitation	0.513	98.788
Evaporation Loss	0.000	0.000
Infiltration Loss	0.063	12.159
Surface Runoff	0.453	87.211
Final Storage	0.004	0.699
Continuity Error (%)	-0.584	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.452	4.520
Groundwater Inflow	0.000	0.000

RDII Inflow	0.000	0.000
External Inflow	0.000	0.004
External Outflow	0.453	4.531
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.005	0.046
Final Stored Volume	0.004	0.044
Continuity Error (%)	-0.105	

```
*************************
Highest Continuity Errors
*************************
Node CB9 (-1.81%)
Node CB7 (1.46%)
Node CB8 (-1.45%)

***************************
Time-Step Critical Elements
***************************
Link CB7/6 (6.73%)
Link CB3/2 (3.58%)
Link C6 (3.46%)

*********************************
Highest Flow Instability Indexes
*********************************
Link ORZN2b (95)
Link STM-23_(STM) (91)

************************
Routing Time Step Summary
************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     4.41 sec
Maximum Time Step           :     5.00 sec
Percent in Steady State     :     0.00
```

Average Iterations per Step : 2.01
Percent Not Converging : 0.10
Time Step Frequencies :
5.000 - 3.155 sec : 85.44 %
3.155 - 1.991 sec : 0.84 %
1.991 - 1.256 sec : 2.39 %
1.256 - 0.792 sec : 5.28 %
0.792 - 0.500 sec : 6.05 %

****
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
A-01a	98.79	0.00	0.00	12.23	75.28	11.82	87.10	0.13	84.14	0.882
A-01b	98.79	0.00	0.00	13.63	73.58	12.29	85.87	0.09	58.10	0.869
A-04b	98.79	0.00	0.00	12.17	76.62	10.73	87.35	0.09	54.79	0.884
B-01	98.79	0.00	0.00	0.00	99.08	0.00	99.08	0.41	247.00	1.003
B-02	98.79	0.00	0.00	0.00	99.08	0.00	99.08	0.34	203.55	1.003
C-01a	98.79	0.00	0.00	40.75	26.75	31.67	58.42	0.03	18.30	0.591
C-01b	98.79	0.00	0.00	36.88	35.77	26.55	62.32	0.12	62.70	0.631
C-01c	98.79	0.00	0.00	35.05	38.76	25.41	64.17	0.10	52.68	0.650
D-01	98.79	0.00	0.00	30.45	39.53	29.71	69.24	0.04	35.12	0.701
D-02	98.79	0.00	0.00	14.59	70.17	14.35	84.51	0.01	7.59	0.855
D-03	98.79	0.00	0.00	23.27	53.37	22.82	76.19	0.01	5.76	0.771
D-04	98.79	0.00	0.00	47.15	6.92	46.10	53.01	0.01	13.27	0.537
D-05	98.79	0.00	0.00	47.15	6.92	46.10	53.01	0.00	2.77	0.537
P-01	98.79	12.23	0.00	51.97	7.77	51.78	59.56	0.06	31.79	0.536
P-02	98.79	0.00	0.00	36.32	35.75	27.14	62.89	0.13	67.77	0.637
P-03	98.79	0.00	0.00	51.83	6.92	40.44	47.36	0.06	32.15	0.479
P-04	98.79	0.00	0.00	48.28	6.92	44.55	51.47	0.01	13.13	0.521
P-05	98.79	0.00	0.00	48.76	6.92	43.93	50.85	0.02	13.52	0.515
R-01a	98.79	0.00	0.00	11.00	78.60	9.94	88.53	0.08	48.58	0.896
R-01b	98.79	0.00	0.00	10.97	78.59	9.97	88.56	0.07	46.03	0.896
R-02a	98.79	0.00	0.00	17.70	66.64	15.12	81.76	0.07	45.00	0.828
R-02b	98.79	0.00	0.00	17.43	66.59	15.43	82.02	0.05	34.75	0.830
R-03a	98.79	8.66	0.00	16.97	74.58	16.57	91.15	0.08	49.67	0.848
R-03b	98.79	0.00	0.00	16.32	68.58	14.57	83.14	0.05	34.68	0.842
R-04a	98.79	12.93	0.00	12.66	86.52	13.25	99.77	0.08	53.34	0.893
ZONE2A	98.79	0.00	0.00	3.54	92.28	3.47	95.75	0.44	273.67	0.969
ZONE2B	98.79	0.00	0.00	3.54	92.32	3.47	95.79	0.44	272.44	0.970
ZONE3A	98.79	0.00	0.00	3.56	92.50	3.46	95.96	0.47	288.52	0.971
ZONE3B	98.79	0.00	0.00	3.56	92.53	3.46	95.98	1.03	631.96	0.972

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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
MH101	JUNCTION	0.67	0.95	85.82	0	02:12	0.95
MH102	JUNCTION	0.39	0.84	86.01	0	02:12	0.84
MH103	JUNCTION	0.27	0.85	86.16	0	02:12	0.85
MH104	JUNCTION	0.13	0.85	86.40	0	02:12	0.85
MH105	JUNCTION	0.11	0.68	86.52	0	02:12	0.68
MH106	JUNCTION	0.10	0.61	86.59	0	02:12	0.61
MH107	JUNCTION	0.04	0.18	86.93	0	02:14	0.18
EXDITCH1	OUTFALL	0.00	0.00	88.70	0	00:00	0.00
EXDITCH2	OUTFALL	0.00	0.00	88.70	0	00:00	0.00
LamarcheA	OUTFALL	0.00	0.01	88.55	0	02:24	0.01
LamarcheAC	OUTFALL	0.00	0.05	88.83	0	02:13	0.05
LamarcheB	OUTFALL	0.00	0.00	88.40	0	00:00	0.00
LamarcheBD	OUTFALL	0.00	0.05	88.83	0	02:15	0.05
LamarcheE	OUTFALL	0.00	0.00	89.53	0	00:00	0.00
MH100	OUTFALL	0.98	0.98	85.50	0	00:00	0.98
XMH13	OUTFALL	85.88	85.88	85.88	0	00:00	85.88
XMH15	OUTFALL	85.02	85.01	85.01	0	00:00	85.01
1+017a	STORAGE	0.00	0.05	88.95	0	02:13	0.05
1+017b	STORAGE	0.00	0.05	88.95	0	02:15	0.05
1+104a	STORAGE	0.00	0.00	89.31	0	00:00	0.00
1+104b	STORAGE	0.00	0.00	89.31	0	00:00	0.00
1+179a	STORAGE	0.00	0.03	89.51	0	02:15	0.03
1+179b	STORAGE	0.00	0.03	89.51	0	02:15	0.03
1+329	STORAGE	0.00	0.00	90.50	0	00:00	0.00
CB1	STORAGE	0.22	1.53	89.03	0	02:11	1.53
CB2	STORAGE	0.25	1.71	88.95	0	02:14	1.71
CB3	STORAGE	0.25	1.71	88.95	0	02:13	1.71
CB4	STORAGE	0.22	1.67	89.29	0	02:21	1.67
CB401	STORAGE	0.03	0.43	86.96	0	02:11	0.43
CB5	STORAGE	0.24	1.67	89.29	0	02:20	1.67
CB6	STORAGE	0.24	1.70	89.51	0	02:14	1.70
CB7	STORAGE	0.25	1.70	89.51	0	02:15	1.70
CB8	STORAGE	0.15	1.55	89.78	0	02:10	1.55
CB9	STORAGE	0.16	1.56	89.79	0	02:10	1.56
CBMH101	STORAGE	0.68	3.63	88.99	0	02:10	3.62
CBMH206	STORAGE	0.34	1.92	88.66	0	02:24	1.92
CBMH207	STORAGE	0.22	1.32	88.67	0	02:23	1.32
HPRYS	STORAGE	0.01	0.06	88.66	0	02:24	0.06
LD208	STORAGE	0.17	1.01	88.71	0	02:21	1.01
MH201	STORAGE	1.11	1.11	85.02	0	02:15	1.11
MH202	STORAGE	0.08	0.38	85.41	0	02:16	0.38
MH203	STORAGE	0.37	0.65	85.68	0	02:15	0.65
MH204	STORAGE	0.05	0.25	85.71	0	02:15	0.25
MH205	STORAGE	0.04	0.22	85.93	0	02:14	0.22
MH400	STORAGE	0.07	0.81	86.88	0	02:11	0.80
TANK1	STORAGE	0.24	1.93	87.93	0	02:14	1.93
TANK2	STORAGE	0.28	1.90	87.90	0	02:20	1.90
ZN2A	STORAGE	0.62	3.77	89.67	0	02:21	3.77
ZN2B	STORAGE	1.12	4.30	89.67	0	02:20	4.30
ZN3A	STORAGE	0.59	3.54	89.89	0	02:21	3.54
ZN3B	STORAGE	0.49	3.02	90.12	0	02:21	3.02

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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
MH101	JUNCTION	0.00	633.05	0	02:12	0	3	-0.021
MH102	JUNCTION	0.00	559.88	0	02:12	0	2.63	0.003
MH103	JUNCTION	0.00	559.86	0	02:12	0	2.62	-0.017
MH104	JUNCTION	0.00	559.81	0	02:12	0	2.62	0.008
MH105	JUNCTION	0.00	331.20	0	02:22	0	1.77	-0.048
MH106	JUNCTION	0.00	290.87	0	02:23	0	1.62	0.014
MH107	JUNCTION	0.00	117.71	0	02:14	0	0.592	0.103
EXDITCH1	OUTFALL	13.52	13.52	0	02:10	0.0168	0.0168	0.000
EXDITCH2	OUTFALL	2.77	2.77	0	02:10	0.00264	0.00264	0.000
LamarcheA	OUTFALL	0.00	26.70	0	02:24	0	0.0295	0.000
LamarcheAC	OUTFALL	0.00	24.46	0	02:13	0	0.0129	0.000

LamarcheB	OUTFALL	35.12	35.12	0	02:10	0.0428	0.0428	0.000	
LamarcheBD	OUTFALL	0.00	19.78	0	02:15	0	0.00999	0.000	
LamarcheE	OUTFALL	0.00	0.00	0	00:00	0	0	0.000	ltr
MH100	OUTFALL	0.00	633.05	0	02:12	0	3	0.000	
XMH13	OUTFALL	0.00	75.37	0	02:20	0	0.446	0.000	
XMH15	OUTFALL	0.00	177.59	0	02:16	0	0.977	0.000	
1+017a	STORAGE	0.00	25.70	0	02:13	0	0.0131	0.506	
1+017b	STORAGE	0.00	21.33	0	02:14	0	0.0102	0.461	
1+104a	STORAGE	0.00	0.00	0	00:00	0	0	0.000	ltr
1+104b	STORAGE	0.00	0.00	0	00:00	0	0	0.000	ltr
1+179a	STORAGE	0.00	16.19	0	02:11	0	0.00472	3.465	
1+179b	STORAGE	0.00	16.10	0	02:11	0	0.00467	2.366	
1+329	STORAGE	0.00	0.00	0	00:00	0	0	-0.000	ltr
CB1	STORAGE	58.10	64.27	0	02:03	0.0917	0.0925	0.038	
CB2	STORAGE	54.79	69.55	0	02:12	0.0889	0.0977	-0.012	
CB3	STORAGE	53.34	155.43	0	02:10	0.0846	0.106	-0.180	
CB4	STORAGE	34.68	45.64	0	02:12	0.0545	0.0656	0.024	
CB401	STORAGE	45.28	45.28	0	02:10	0.0778	0.0778	0.012	
CB5	STORAGE	49.67	49.67	0	02:10	0.0801	0.0842	0.019	
CB6	STORAGE	34.75	68.21	0	02:08	0.0548	0.0744	0.824	
CB7	STORAGE	45.00	76.12	0	02:09	0.0735	0.0895	1.485	
CB8	STORAGE	46.03	46.03	0	02:10	0.0734	0.0734	-1.428	
CB9	STORAGE	48.58	48.58	0	02:10	0.0778	0.0778	-1.774	
CBMH101	STORAGE	84.14	140.74	0	02:10	0.126	0.22	0.139	
CBMH206	STORAGE	18.30	61.98	0	02:03	0.0338	0.258	-0.160	
CBMH207	STORAGE	62.70	108.81	0	02:10	0.123	0.224	0.043	
HPRYS	STORAGE	0.00	31.43	0	02:23	0	0.0429	0.047	
LD208	STORAGE	52.68	52.68	0	02:10	0.101	0.101	-0.045	
MH201	STORAGE	0.00	177.59	0	02:16	0	0.978	-0.002	
MH202	STORAGE	0.00	177.64	0	02:16	0	0.977	-0.039	
MH203	STORAGE	0.00	149.03	0	02:15	0	0.749	0.063	
MH204	STORAGE	0.00	93.26	0	02:14	0	0.41	0.012	
MH205	STORAGE	0.00	93.26	0	02:14	0	0.41	-0.001	
MH400	STORAGE	99.57	135.50	0	02:10	0.19	0.268	0.137	
TANK1	STORAGE	247.00	247.00	0	02:10	0.41	0.41	0.000	
TANK2	STORAGE	203.55	203.55	0	02:10	0.338	0.338	0.002	
ZN2A	STORAGE	273.67	273.67	0	02:10	0.441	0.441	0.131	
ZN2B	STORAGE	272.44	272.44	0	02:10	0.44	0.441	-1.005	
ZN3A	STORAGE	631.96	631.96	0	02:10	1.03	1.03	-0.243	
ZN3B	STORAGE	288.52	288.52	0	02:10	0.468	0.468	0.099	

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Node Surcharge Summary
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Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
MH101	JUNCTION	0.94	0.193	3.152
MH102	JUNCTION	0.48	0.136	3.349
MH103	JUNCTION	0.40	0.144	3.081
MH104	JUNCTION	0.24	0.109	3.101
MH105	JUNCTION	0.10	0.050	2.960

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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
1+017a	0.000	0	0	0	0.000	5	0 02:13	24.46
1+017b	0.000	0	0	0	0.000	5	0 02:15	19.78
1+104a	0.000	0	0	0	0.000	0	0 00:00	0.00
1+104b	0.000	0	0	0	0.000	0	0 00:00	0.00
1+179a	0.000	0	0	0	0.000	3	0 02:15	7.17
1+179b	0.000	0	0	0	0.000	3	0 02:15	7.17
1+329	0.000	0	0	0	0.000	0	0 00:00	0.00

CB1	0.000	0	0	0	0.001	1	0	02:11	57.17
CB2	0.000	10	0	0	0.002	68	0	02:14	40.21
CB3	0.000	10	0	0	0.002	68	0	02:13	78.33
CB4	0.000	9	0	0	0.002	67	0	02:21	18.68
CB401	0.000	1	0	0	0.000	23	0	02:11	41.64
CB5	0.000	9	0	0	0.002	67	0	02:20	36.52
CB6	0.000	10	0	0	0.002	68	0	02:14	34.89
CB7	0.000	10	0	0	0.002	68	0	02:15	41.84
CB8	0.000	6	0	0	0.002	62	0	02:10	44.81
CB9	0.000	6	0	0	0.002	62	0	02:10	46.59
CBMH101	0.004	12	0	0	0.036	100	0	02:10	136.42
CBMH206	0.000	13	0	0	0.002	74	0	02:24	55.73
CBMH207	0.000	11	0	0	0.001	66	0	02:23	51.94
HPRYS	0.000	1	0	0	0.000	6	0	02:24	30.96
LD208	0.000	8	0	0	0.001	50	0	02:21	46.65
MH201	0.001	23	0	0	0.001	23	0	02:15	177.59
MH202	0.000	2	0	0	0.000	10	0	02:16	177.59
MH203	0.000	9	0	0	0.001	17	0	02:15	148.98
MH204	0.000	1	0	0	0.000	7	0	02:15	93.19
MH205	0.000	1	0	0	0.000	6	0	02:14	93.26
MH400	0.000	2	0	0	0.001	26	0	02:11	130.95
TANK1	0.016	10	0	0	0.128	77	0	02:14	93.26
TANK2	0.019	11	0	0	0.127	76	0	02:20	56.32
ZN2A	0.015	10	0	0	0.125	80	0	02:21	73.37
ZN2B	0.015	10	0	0	0.124	80	0	02:20	75.37
ZN3A	0.035	11	0	0	0.284	95	0	02:21	173.52
ZN3B	0.015	10	0	0	0.124	82	0	02:21	82.00

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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
EXDITCH1	27.04	3.24	13.52	0.017
EXDITCH2	16.04	0.81	2.77	0.003
LamarcheA	10.43	15.20	26.70	0.030
LamarcheAC	11.76	8.33	24.46	0.013
LamarcheB	34.06	5.23	35.12	0.043
LamarcheBD	11.75	6.12	19.78	0.010
LamarcheE	0.00	0.00	0.00	0.000
MH100	95.46	103.21	633.05	2.998
XMH13	99.94	13.38	75.37	0.446
XMH15	49.00	59.27	177.59	0.977
System	35.55	214.78	943.76	4.535

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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
1	CHANNEL	0.00	0 00:00	0.00	0.00	0.03
10	CHANNEL	0.00	0 00:00	0.00	0.00	0.09
101-100	CONDUIT	633.05	0 02:12	1.43	0.82	1.00
102-101	CONDUIT	559.89	0 02:12	1.56	0.94	1.00
103-102	CONDUIT	559.88	0 02:12	1.56	0.95	1.00
104-103	CONDUIT	559.86	0 02:12	1.59	0.95	1.00
105	CONDUIT	333.75	0 02:22	1.60	0.92	1.00
106-105	CONDUIT	293.63	0 02:22	1.50	0.68	1.00
107-106	CONDUIT	117.71	0 02:14	1.67	0.35	0.69
11	CHANNEL	0.00	0 00:00	0.00	0.00	0.11
1-101	CONDUIT	57.17	0 02:05	0.85	0.33	1.00
12	CHANNEL	0.00	0 00:00	0.00	0.00	0.10
13	CHANNEL	25.70	0 02:13	0.13	0.00	0.13
14	CHANNEL	21.33	0 02:14	0.08	0.00	0.13
15	CHANNEL	24.46	0 02:13	0.62	0.00	0.05
16	CHANNEL	19.78	0 02:15	0.53	0.00	0.05
2	CHANNEL	0.00	0 00:00	0.00	0.00	0.03
202-201	CONDUIT	177.59	0 02:16	1.23	0.59	0.63
203-202	CONDUIT	148.98	0 02:15	1.21	0.74	0.73
204-203	CONDUIT	93.19	0 02:15	0.90	0.48	0.64
205-204	CONDUIT	93.26	0 02:14	1.24	0.46	0.48

207-206	CONDUIT	51.94	0	02:03	0.65	0.42	1.00
208-207	CONDUIT	46.65	0	02:10	0.79	0.68	1.00
3	CHANNEL	28.59	0	02:10	0.48	0.00	0.12
4	CHANNEL	26.83	0	02:10	0.44	0.00	0.12
5	CHANNEL	16.19	0	02:11	0.11	0.00	0.12
6	CHANNEL	16.10	0	02:11	0.11	0.00	0.12
7	CHANNEL	7.17	0	02:15	0.15	0.00	0.10
8	CHANNEL	7.17	0	02:15	0.17	0.00	0.10
9	CHANNEL	0.00	0	00:00	0.00	0.00	0.09
C1	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C2	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C3	CONDUIT	30.96	0	02:24	0.16	0.00	0.19
C4	CONDUIT	31.43	0	02:23	0.15	0.00	0.19
C5	CONDUIT	0.77	0	02:21	0.00	0.00	0.16
C6	CONDUIT	26.70	0	02:24	0.14	0.01	0.04
CAP4-104	CONDUIT	130.95	0	02:10	1.85	1.35	1.00
CB3/2	CONDUIT	33.77	0	02:13	0.82	0.04	0.10
CB5/4	CONDUIT	17.99	0	02:12	0.52	0.02	0.06
CB7/6	CONDUIT	9.14	0	02:08	0.32	0.01	0.09
OVF2A	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
OVF2B	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
OVFA1	CONDUIT	100.80	0	02:10	0.55	0.01	0.04
STM-36_(STM)	CONDUIT	41.64	0	02:12	0.65	0.44	1.00
STM-39_(STM)	CONDUIT	177.59	0	02:16	0.50	0.36	1.00
CAP3b-107	ORIFICE	82.00	0	02:21			1.00
OR1	ORIFICE	18.90	0	02:13			1.00
OR3	ORIFICE	18.88	0	02:14			1.00
OR3A	ORIFICE	173.52	0	02:23			1.00
OR4	ORIFICE	18.85	0	02:14			1.00
OR5	ORIFICE	18.85	0	02:15			1.00
ORCB4	ORIFICE	18.68	0	02:21			1.00
ORCB5	ORIFICE	18.68	0	02:21			1.00
ORCB8	ORIFICE	17.97	0	02:10			1.00
ORCB9	ORIFICE	18.00	0	02:10			1.00
ORCBMH206	ORIFICE	29.03	0	02:24			1.00
ORTANK1	ORIFICE	93.26	0	02:14			1.00
ORTANK2	ORIFICE	56.32	0	02:20			1.00
ORZN2a	ORIFICE	73.37	0	02:50			1.00
ORZN2b	ORIFICE	75.37	0	02:20			1.00
STM-23_(STM)	ORIFICE	35.69	0	02:35			1.00

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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
1	1.00	0.92	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	1.00	0.87	0.13	0.00	0.00	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	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
103-102	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
104-103	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.01	0.91	0.00
105	1.00	0.00	0.00	0.00	0.13	0.00	0.00	0.87	0.00	0.00
106-105	1.00	0.00	0.00	0.00	0.16	0.00	0.00	0.84	0.00	0.00
107-106	1.00	0.00	0.00	0.00	0.07	0.09	0.00	0.84	0.04	0.00
11	1.00	0.86	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-101	1.00	0.00	0.00	0.00	0.16	0.00	0.00	0.84	0.00	0.00
12	1.00	0.86	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	1.00	0.00	0.00	0.00	0.14	0.00	0.00	0.86	0.02	0.00
14	1.00	0.00	0.00	0.00	0.14	0.00	0.00	0.86	0.02	0.00
15	1.00	0.00	0.00	0.00	0.76	0.24	0.00	0.00	0.00	0.00
16	1.00	0.00	0.00	0.00	0.76	0.24	0.00	0.00	0.00	0.00
2	1.00	0.93	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202-201	1.00	0.00	0.00	0.00	0.78	0.00	0.00	0.22	0.82	0.00
203-202	1.00	0.00	0.00	0.00	0.15	0.00	0.00	0.85	0.00	0.00
204-203	1.00	0.00	0.00	0.00	0.21	0.00	0.00	0.79	0.04	0.00
205-204	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
207-206	1.00	0.00	0.00	0.00	0.21	0.00	0.00	0.79	0.02	0.00
208-207	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.92	0.00
3	1.00	0.86	0.06	0.00	0.08	0.00	0.00	0.00	0.91	0.00
4	1.00	0.86	0.06	0.00	0.07	0.00	0.00	0.00	0.91	0.00
5	1.00	0.08	0.01	0.00	0.13	0.00	0.00	0.78	0.02	0.00
6	1.00	0.08	0.01	0.00	0.12	0.00	0.00	0.79	0.01	0.00
7	1.00	0.08	0.01	0.00	0.12	0.00	0.00	0.79	0.02	0.00
8	1.00	0.08	0.01	0.00	0.11	0.00	0.00	0.80	0.02	0.00
9	1.00	0.87	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

C2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C3	1.00	0.80	0.02	0.00	0.14	0.00	0.00	0.03	0.05	0.00
C4	1.00	0.80	0.02	0.00	0.14	0.00	0.00	0.03	0.02	0.00
C5	1.00	0.84	0.13	0.00	0.03	0.00	0.00	0.00	0.90	0.00
C6	1.00	0.90	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00
CAP4-104	1.00	0.00	0.00	0.00	0.12	0.01	0.00	0.87	0.00	0.00
CB3/2	1.00	0.88	0.00	0.00	0.10	0.00	0.01	0.02	0.00	0.00
CB5/4	1.00	0.89	0.00	0.00	0.09	0.00	0.00	0.02	0.00	0.00
CB7/6	1.00	0.88	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00
OVF2A	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OVF2B	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OVFA1	1.00	0.94	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00
STM-36_(STM)	1.00	0.00	0.00	0.00	0.34	0.01	0.00	0.66	0.24	0.00
STM-39_(STM)	1.00	0.00	0.00	0.00	1.00	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	1.00	1.00	24.00	0.01	0.31
102-101	0.58	0.58	0.94	0.01	0.01
103-102	0.46	0.46	0.48	0.01	0.44
104-103	0.35	0.35	0.40	0.01	0.24
105	0.16	0.16	0.24	0.01	0.01
106-105	0.03	0.03	0.10	0.01	0.01
1-101	0.90	0.90	0.99	0.01	0.01
207-206	1.67	1.67	2.01	0.01	0.01
208-207	1.51	1.51	1.72	0.01	0.01
CAP4-104	0.33	0.35	0.34	0.20	0.31
STM-36_(STM)	0.07	0.07	0.35	0.01	0.01
STM-39_(STM)	24.00	24.00	24.00	0.01	0.01

Analysis begun on: Wed Dec 22 13:44:58 2021
Analysis ended on: Wed Dec 22 13:44:59 2021

Total elapsed time: 00:00:01

SCS 12hr 100-Year Storm PCSWM Model Results

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


  *************
  Element Count
  *************
  Number of rain gages ...... 1
  Number of subcatchments ... 29
  Number of nodes ........... 51
  Number of links ........... 61
  Number of pollutants ...... 0
  Number of land uses ....... 0


  ****************
  Raingage Summary
  ****************
                                                      Data       Recording
  Name                 Data Source                    Type       Interval
  ------------------------------------------------------------------------
  Raingage1            S12-100                        INTENSITY   30 min.


  ********************
  Subcatchment Summary
  ********************
  Name                        Area     Width   %Imperv    %Slope Rain Gage
Outlet
  ------------------------------------------------------------------------------------
--------------------------
  A-01a                       0.14     41.43     76.00    2.0000 Raingage1
CBMH101
  A-01b                       0.11     10.70     74.00    2.0000 Raingage1
CB1
  A-04b                       0.10     10.20     77.00    1.0000 Raingage1
CB2
  B-01                        0.41    166.00    100.00    1.5000 Raingage1
TANK1
  B-02                        0.34    136.80    100.00    1.5000 Raingage1
TANK2
  C-01a                       0.06     11.37     27.00    0.5000 Raingage1
CBMH206
  C-01b                       0.20     24.02     36.00    0.5000 Raingage1
CBMH207
  C-01c                       0.16     15.96     39.00    0.7000 Raingage1
LD208
  D-01                        0.06     62.00     40.00    2.0000 Raingage1
LamarcheB
  D-02                        0.01     32.50     71.00    2.0000 Raingage1
R-04a
  D-03                        0.01     12.50     54.00    1.5000 Raingage1
R-03a
  D-04                        0.02     48.00      7.00    1.5000 Raingage1
P-01
  D-05                        0.01     10.00      7.00    1.5000 Raingage1
EXDITCH2
  P-01                        0.10     29.71      7.00    0.5000 Raingage1
```

P-02	0.20	29.14	36.00	0.5000	Raingage1
MH400					
P-03	0.13	19.56	7.00	1.5000	Raingage1
CB401					
P-04	0.03	15.68	7.00	1.5000	Raingage1
CB401					
P-05	0.03	16.50	7.00	1.0000	Raingage1
EXDITCH1					
R-01a	0.09	10.23	79.00	1.0000	Raingage1
CB9					
R-01b	0.08	10.25	79.00	1.0000	Raingage1
CB8					
R-02a	0.09	10.00	67.00	1.0000	Raingage1
CB7					
R-02b	0.07	10.00	67.00	1.0000	Raingage1
CB6					
R-03a	0.09	10.00	69.00	1.0000	Raingage1
CB5					
R-03b	0.07	10.00	69.00	1.0000	Raingage1
CB4					
R-04a	0.08	10.12	77.00	1.0000	Raingage1
CB3					
ZONE2A	0.46	102.67	93.00	2.0000	Raingage1
ZN2A					
ZONE2B	0.46	92.00	93.00	2.0000	Raingage1
ZN2B					
ZONE3A	0.49	54.33	93.00	2.0000	Raingage1
ZN3B					
ZONE3B	1.07	102.29	93.00	2.0000	Raingage1
ZN3A					

****
Node Summary
****

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
MH101	JUNCTION	84.87	4.10	0.0	
MH102	JUNCTION	85.17	4.19	0.0	
MH103	JUNCTION	85.31	3.93	0.0	
MH104	JUNCTION	85.55	3.95	0.0	
MH105	JUNCTION	85.84	3.64	0.0	
MH106	JUNCTION	85.98	3.74	0.0	
MH107	JUNCTION	86.75	3.35	0.0	
EXDITCH1	OUTFALL	88.70	0.00	0.0	
EXDITCH2	OUTFALL	88.70	0.00	0.0	
LamarcheA	OUTFALL	88.54	1.00	0.0	
LamarcheAC	OUTFALL	88.78	1.00	0.0	
LamarcheB	OUTFALL	88.40	0.00	0.0	
LamarcheBD	OUTFALL	88.78	1.00	0.0	
LamarcheE	OUTFALL	89.53	1.16	0.0	
MH100	OUTFALL	84.52	0.83	0.0	
XMH13	OUTFALL	0.00	0.00	0.0	
XMH15	OUTFALL	0.00	84.55	0.0	
1+017a	STORAGE	88.90	1.00	0.0	
1+017b	STORAGE	88.90	1.00	0.0	
1+104a	STORAGE	89.31	1.00	0.0	

1+104b	STORAGE	89.31	1.00	0.0
1+179a	STORAGE	89.48	1.00	0.0
1+179b	STORAGE	89.48	1.00	0.0
1+329	STORAGE	90.50	1.00	0.0
CB1	STORAGE	87.50	2.50	0.0
CB2	STORAGE	87.24	2.50	0.0
CB3	STORAGE	87.24	2.50	0.0
CB4	STORAGE	87.62	2.50	0.0
CB401	STORAGE	86.53	1.87	0.0
CB5	STORAGE	87.62	2.50	0.0
CB6	STORAGE	87.81	2.50	0.0
CB7	STORAGE	87.81	2.50	0.0
CB8	STORAGE	88.23	2.50	0.0
CB9	STORAGE	88.23	2.50	0.0
CBMH101	STORAGE	85.36	4.34	0.0
CBMH206	STORAGE	86.74	2.61	0.0
CBMH207	STORAGE	87.35	2.00	0.0
HPRYS	STORAGE	88.60	1.00	0.0
LD208	STORAGE	87.70	2.00	0.0
MH201	STORAGE	83.91	4.80	0.0
MH202	STORAGE	85.03	3.71	0.0
MH203	STORAGE	85.03	3.91	0.0
MH204	STORAGE	85.46	3.50	0.0
MH205	STORAGE	85.71	3.60	0.0
MH400	STORAGE	86.07	3.13	0.0
TANK1	STORAGE	86.00	3.50	0.0
TANK2	STORAGE	86.00	3.30	0.0
ZN2A	STORAGE	85.90	4.50	0.0
ZN2B	STORAGE	85.37	5.03	0.0
ZN3A	STORAGE	86.35	4.25	0.0
ZN3B	STORAGE	87.10	3.75	0.0

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Link Summary
****

Name	From Node	To Node	Type	Length	% Slope	Roughness
1	1+329	CB9	CONDUIT	65.0	1.1847	0.0150
10	1+104b	CB4	CONDUIT	33.6	0.5651	0.0150
101-100	MH101	MH100	CONDUIT	55.5	0.4863	0.0130
102-101	MH102	MH101	CONDUIT	43.6	0.5048	0.0130
103-102	MH103	MH102	CONDUIT	22.4	0.4907	0.0130
104-103	MH104	MH103	CONDUIT	42.9	0.4892	0.0130
105	MH105	MH104	CONDUIT	42.9	0.3495	0.0130
106-105	MH106	MH105	CONDUIT	22.4	0.4913	0.0130
107-106	MH107	MH106	CONDUIT	43.0	1.3969	0.0130

11	1+104a	CB3	CONDUIT	57.2	
0.9970	0.0150				
1-101	CB1	CBMH101	CONDUIT	45.1	
0.9972	0.0130				
12	1+104b	CB2	CONDUIT	56.5	
1.0097	0.0150				
13	1+017a	CB3	CONDUIT	26.0	
0.6158	0.0150				
14	1+017b	CB2	CONDUIT	25.8	
0.6210	0.0150				
15	1+017a	LamarcheAC	CONDUIT	9.2	
1.3023	0.0150				
16	1+017b	LamarcheBD	CONDUIT	12.2	
0.9832	0.0150				
2	1+329	CB8	CONDUIT	65.0	
1.1847	0.0150				
202-201	MH202	MH201	CONDUIT	20.5	
0.4868	0.0130				
203-202	MH203	MH202	CONDUIT	44.2	
0.4973	0.0130				
204-203	MH204	MH203	CONDUIT	21.2	
0.4711	0.0130				
205-204	MH205	MH204	CONDUIT	34.2	
0.4976	0.0130				
207-206	CBMH207	CBMH206	CONDUIT	97.8	
0.5010	0.0130				
208-207	LD208	CBMH207	CONDUIT	69.7	
0.5022	0.0130				
3	CB9	CB7	CONDUIT	50.7	
0.8291	0.0150				
4	CB8	CB6	CONDUIT	37.6	
1.1157	0.0150				
5	1+179a	CB7	CONDUIT	33.8	
0.5034	0.0150				
6	1+179b	CB6	CONDUIT	33.8	
0.5032	0.0150				
7	1+179a	CB5	CONDUIT	36.2	
0.9959	0.0150				
8	1+179b	CB4	CONDUIT	36.4	
0.9900	0.0150				
9	1+104a	CB5	CONDUIT	45.8	
0.4148	0.0150				
C1	ZN3A	CB9	CONDUIT	1.0	
1.0001	0.0130				
C2	ZN3B	CB9	CONDUIT	1.0	
1.0001	0.0150				
C3	HPRYS	CBMH206	CONDUIT	51.2	
0.4885	0.0130				
C4	HPRYS	CBMH207	CONDUIT	47.6	
0.5256	0.0130				
C5	LD208	CBMH207	CONDUIT	70.2	
0.4985	0.0130				
C6	CBMH206	LamarcheA	CONDUIT	1.0	
6.0108	0.2500				
CAP4-104	MH400	MH104	CONDUIT	13.9	
1.0072	0.0130				
CB3/2	CB3	CB2	CONDUIT	1.0	
0.1000	0.0130				
CB5/4	CB5	CB4	CONDUIT	1.0	
0.1000	0.0150				

```
  CB7/6            CB7              CB6              CONDUIT            1.0
0.1000    0.0150
  OVF2A            ZN2A             CB4              CONDUIT            1.0
1.0001    0.0150
  OVF2B            ZN2B             LamarcheE        CONDUIT            1.0
1.0001    0.0130
  OVFA1            CBMH101          CB3              CONDUIT            1.0
0.1000    0.0150
  STM-36_(STM)     CB401            MH400            CONDUIT           46.2
0.9740    0.0130
  STM-39_(STM)     MH201            XMH15            CONDUIT           11.8
0.3385    0.0130
  CAP3b-107        ZN3B             MH107            ORIFICE
  OR1              CB3              MH101            ORIFICE
  OR3              CB2              MH101            ORIFICE
  OR3A             ZN3A             MH106            ORIFICE
  OR4              CB6              MH105            ORIFICE
  OR5              CB7              MH105            ORIFICE
  ORCB4            CB4              MH104            ORIFICE
  ORCB5            CB5              MH104            ORIFICE
  ORCB8            CB8              MH107            ORIFICE
  ORCB9            CB9              MH107            ORIFICE
  ORCBMH206        CBMH206          MH202            ORIFICE
  ORTANK1          TANK1            MH205            ORIFICE
  ORTANK2          TANK2            MH203            ORIFICE
  ORZN2a           ZN2A             MH104            ORIFICE
  ORZN2b           ZN2B             XMH13            ORIFICE
  STM-23_(STM)     CBMH101          MH101            ORIFICE


  **********
  Cross Section Summary
  **********
                                      Full     Full     Hyd.     Max.   No. of
Full
  Conduit          Shape              Depth     Area     Rad.    Width  Barrels
Flow
  ---------------------------------------------------------------------------
------
  1                20mROWlaf          1.00     8.41     0.25    10.01        1
24202.43
  10               20mROWlaf          1.00     8.41     0.25    10.01        1
16715.41
  101-100          CIRCULAR           0.75     0.44     0.19     0.75        1
776.37
  102-101          CIRCULAR           0.68     0.36     0.17     0.68        1
597.29
  103-102          CIRCULAR           0.68     0.36     0.17     0.68        1
588.87
  104-103          CIRCULAR           0.68     0.36     0.17     0.68        1
587.95
  105              CIRCULAR           0.60     0.28     0.15     0.60        1
363.00
  106-105          CIRCULAR           0.60     0.28     0.15     0.60        1
430.38
  107-106          CIRCULAR           0.45     0.16     0.11     0.45        1
336.99
  11               20mROWlaf          1.00     8.41     0.25    10.01        1
22202.02
```

1-101	CIRCULAR	0.38	0.11	0.09	0.38	1
175.09						
12	20mROWlaf	1.00	8.41	0.25	10.01	1
22343.95						
13	20mROWlaf	1.00	8.41	0.25	10.01	1
17448.82						
14	20mROWlaf	1.00	8.41	0.25	10.01	1
17522.14						
15	20mROWlaf	1.00	8.41	0.25	10.01	1
25375.60						
16	20mROWlaf	1.00	8.41	0.25	10.01	1
22048.01						
2	20mROWlaf	1.00	8.41	0.25	10.01	1
24202.43						
202-201	CIRCULAR	0.53	0.22	0.13	0.53	1
300.09						
203-202	CIRCULAR	0.45	0.16	0.11	0.45	1
201.08						
204-203	CIRCULAR	0.45	0.16	0.11	0.45	1
195.71						
205-204	CIRCULAR	0.45	0.16	0.11	0.45	1
201.13						
207-206	CIRCULAR	0.38	0.11	0.09	0.38	1
124.11						
208-207	CIRCULAR	0.30	0.07	0.07	0.30	1
68.53						
3	20mROWlaf	1.00	8.41	0.25	10.01	1
20247.11						
4	20mROWlaf	1.00	8.41	0.25	10.01	1
23487.33						
5	20mROWlaf	1.00	8.41	0.25	10.01	1
15776.25						
6	20mROWlaf	1.00	8.41	0.25	10.01	1
15774.15						
7	20mROWlaf	1.00	8.41	0.25	10.01	1
22189.98						
8	20mROWlaf	1.00	8.41	0.25	10.01	1
22124.89						
9	20mROWlaf	1.00	8.41	0.25	10.01	1
14321.75						
C1	CIRCULAR	1.00	0.79	0.25	1.00	1
2397.78						
C2	RECT_OPEN	1.00	3.00	0.60	3.00	1
14228.79						
C3	TRAPEZOIDAL	1.00	3.50	0.51	6.50	1
12057.61						
C4	TRAPEZOIDAL	1.00	3.50	0.51	6.50	1
12506.56						
C5	TRAPEZOIDAL	1.00	3.50	0.51	6.50	1
12179.66						
C6	RECT_OPEN	1.00	3.00	0.60	3.00	1
2093.03						
CAP4-104	CIRCULAR	0.30	0.07	0.07	0.30	1
97.06						
CB3/2	CIRCULAR	1.00	0.79	0.25	1.00	1
758.23						
CB5/4	RECT_OPEN	1.00	1.00	0.33	1.00	1
1013.57						
CB7/6	RECT_OPEN	1.00	1.00	0.33	1.00	1
1013.57						

OVF2A	RECT_OPEN	1.00	3.00	0.60	3.00	1
14228.79						
OVF2B	RECT_OPEN	1.00	3.00	0.60	3.00	1
16417.83						
OVFA1	CIRCULAR	1.00	0.79	0.25	1.00	1
657.13						
STM-36_(STM)	CIRCULAR	0.30	0.07	0.07	0.30	1
95.44						
STM-39_(STM)	CIRCULAR	0.68	0.36	0.17	0.68	1
489.07						

****
Transect Summary
****

Transect 20mROWlaf
Area:

0.0008	0.0030	0.0068	0.0121	0.0189
0.0270	0.0354	0.0440	0.0547	0.0677
0.0832	0.1010	0.1212	0.1438	0.1676
0.1913	0.2151	0.2389	0.2626	0.2864
0.3102	0.3339	0.3577	0.3815	0.4052
0.4290	0.4528	0.4766	0.5004	0.5241
0.5479	0.5717	0.5955	0.6193	0.6431
0.6668	0.6906	0.7144	0.7382	0.7620
0.7858	0.8096	0.8334	0.8572	0.8810
0.9048	0.9286	0.9524	0.9762	1.0000

Hrad:

0.0387	0.0774	0.1162	0.1549	0.1936
0.2510	0.3264	0.3981	0.4447	0.4684
0.4771	0.4767	0.4711	0.4627	0.4586
0.4606	0.4665	0.4751	0.4856	0.4976
0.5106	0.5244	0.5389	0.5539	0.5693
0.5851	0.6011	0.6174	0.6339	0.6506
0.6674	0.6844	0.7014	0.7186	0.7358
0.7532	0.7705	0.7880	0.8055	0.8230
0.8406	0.8582	0.8759	0.8935	0.9112
0.9289	0.9467	0.9644	0.9822	1.0000

Width:

0.0635	0.1270	0.1906	0.2541	0.3176
0.3495	0.3496	0.3996	0.4993	0.5991
0.6989	0.7987	0.8984	0.9982	0.9982
0.9983	0.9983	0.9984	0.9984	0.9985
0.9985	0.9986	0.9986	0.9987	0.9987
0.9988	0.9988	0.9989	0.9989	0.9990
0.9990	0.9991	0.9991	0.9992	0.9992
0.9993	0.9993	0.9994	0.9994	0.9995
0.9995	0.9996	0.9996	0.9997	0.9997
0.9998	0.9998	0.9999	0.9999	1.0000

Transect ROW20m
Area:

0.0008	0.0030	0.0068	0.0121	0.0189
0.0270	0.0354	0.0440	0.0547	0.0678
0.0832	0.1011	0.1213	0.1439	0.1676
0.1914	0.2152	0.2389	0.2627	0.2865

```
            0.3103     0.3340     0.3578     0.3816     0.4054
            0.4291     0.4529     0.4767     0.5005     0.5243
            0.5480     0.5718     0.5956     0.6194     0.6432
            0.6670     0.6907     0.7145     0.7383     0.7621
            0.7859     0.8097     0.8335     0.8572     0.8810
            0.9048     0.9286     0.9524     0.9762     1.0000
Hrad:
            0.0387     0.0774     0.1161     0.1548     0.1935
            0.2508     0.3262     0.3978     0.4443     0.4680
            0.4768     0.4764     0.4708     0.4624     0.4583
            0.4603     0.4662     0.4748     0.4854     0.4973
            0.5103     0.5242     0.5386     0.5536     0.5690
            0.5848     0.6009     0.6172     0.6337     0.6504
            0.6672     0.6842     0.7012     0.7184     0.7357
            0.7530     0.7704     0.7878     0.8053     0.8229
            0.8405     0.8581     0.8758     0.8934     0.9112
            0.9289     0.9466     0.9644     0.9822     1.0000
Width:
            0.0636     0.1272     0.1908     0.2544     0.3179
            0.3498     0.3499     0.3999     0.4998     0.5996
            0.6995     0.7993     0.8992     0.9990     0.9990
            0.9991     0.9991     0.9991     0.9991     0.9992
            0.9992     0.9992     0.9992     0.9993     0.9993
            0.9993     0.9994     0.9994     0.9994     0.9994
            0.9995     0.9995     0.9995     0.9996     0.9996
            0.9996     0.9996     0.9997     0.9997     0.9997
            0.9998     0.9998     0.9998     0.9998     0.9999
            0.9999     0.9999     0.9999     1.0000     1.0000


************************************************************
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 ............ 11/15/2021 00:00:00
Ending Date .............. 11/16/2021 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
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
```

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Initial LID Storage	0.004	0.699
Total Precipitation	0.488	93.910
Evaporation Loss	0.000	0.000
Infiltration Loss	0.077	14.825
Surface Runoff	0.412	79.391
Final Storage	0.004	0.700
Continuity Error (%)	-0.324	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.412	4.122
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.001
External Outflow	0.412	4.123
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.005	0.046
Final Stored Volume	0.004	0.044
Continuity Error (%)	0.044	

```
**************************
Time-Step Critical Elements
**************************
Link 103-102 (3.38%)
```

```
******************************
Highest Flow Instability Indexes
******************************
Link ORZN2b (71)
Link STM-23_(STM) (65)
```

```
*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     4.94 sec
Maximum Time Step           :     5.00 sec
Percent in Steady State     :    -0.00
Average Iterations per Step :     2.01
```

```
  Percent Not Converging      :     0.05
  Time Step Frequencies       :
      5.000 -  3.155 sec      :    98.91 %
      3.155 -  1.991 sec      :     0.46 %
      1.991 -  1.256 sec      :     0.31 %
      1.256 -  0.792 sec      :     0.18 %
      0.792 -  0.500 sec      :     0.13 %


  ***************************
  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
  ----------------------------------------------------------------------------------------
-----------------------------------------------
  A-01a                       93.91       0.00       0.00      15.05      71.57
7.60      79.17        0.11    31.07   0.843
  A-01b                       93.91       0.00       0.00      16.72      69.75
7.76      77.51        0.08    22.40   0.825
  A-04b                       93.91       0.00       0.00      14.92      72.56
6.74      79.30        0.08    21.33   0.844
  B-01                        93.91       0.00       0.00       0.00      94.19
0.00      94.19        0.39    92.66   1.003
  B-02                        93.91       0.00       0.00       0.00      94.19
0.00      94.19        0.32    76.36   1.003
  C-01a                       93.91       0.00       0.00      49.44      25.43
19.21      44.64        0.03     8.45   0.475
  C-01b                       93.91       0.00       0.00      44.40      33.93
15.77      49.70        0.10    27.93   0.529
  C-01c                       93.91       0.00       0.00      42.23      36.76
15.12      51.88        0.08    23.16   0.552
  D-01                        93.91       0.00       0.00      37.47      37.57
19.18      56.76        0.04    12.47   0.604
  D-02                        93.91       0.00       0.00      17.91      66.69
9.57      76.26        0.01     2.76   0.812
  D-03                        93.91       0.00       0.00      28.63      50.73
14.83      65.57        0.01     2.06   0.698
  D-04                        93.91       0.00       0.00      58.03       6.57
29.82      36.40        0.01     4.54   0.388
  D-05                        93.91       0.00       0.00      58.03       6.57
29.82      36.40        0.00     0.95   0.388
  P-01                        93.91       8.40       0.00      63.45       7.16
31.85      39.02        0.04    17.19   0.381
  P-02                        93.91       0.00       0.00      43.89      33.93
16.28      50.22        0.10    30.18   0.535
  P-03                        93.91       0.00       0.00      62.90       6.58
24.55      31.13        0.04    16.69   0.332
  P-04                        93.91       0.00       0.00      59.33       6.57
28.28      34.86        0.01     5.23   0.371
  P-05                        93.91       0.00       0.00      59.84       6.57
27.73      34.31        0.01     5.72   0.365
```

```
  R-01a                    93.91       0.00       0.00      13.50      74.46
6.28      80.73        0.07    18.67   0.860
  R-01b                    93.91       0.00       0.00      13.47      74.46
6.30      80.76        0.07    17.64   0.860
  R-02a                    93.91       0.00       0.00      21.64      63.15
9.41      72.56        0.07    17.91   0.773
  R-02b                    93.91       0.00       0.00      21.37      63.16
9.70      72.86        0.05    13.63   0.776
  R-03a                    93.91       7.45       0.00      21.08      70.17
10.41      80.58        0.07    19.79   0.795
  R-03b                    93.91       0.00       0.00      20.01      65.04
9.18      74.22        0.05    13.51   0.790
  R-04a                    93.91      11.66       0.00      15.89      81.55
8.46      90.01        0.08    20.67   0.853
  ZONE2A                   93.91       0.00       0.00       4.35      87.65
2.27      89.92        0.42   101.97   0.957
  ZONE2B                   93.91       0.00       0.00       4.35      87.65
2.27      89.92        0.41   101.53   0.958
  ZONE3A                   93.91       0.00       0.00       4.37      87.66
2.24      89.89        0.44   107.92   0.957
  ZONE3B                   93.91       0.00       0.00       4.38      87.65
2.22      89.87        0.97   237.01   0.957
```

****
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
MH101	JUNCTION	0.64	0.88	85.75	0 06:31	0.88
MH102	JUNCTION	0.34	0.72	85.89	0 06:31	0.72
MH103	JUNCTION	0.21	0.69	86.00	0 06:31	0.69
MH104	JUNCTION	0.07	0.60	86.15	0 06:31	0.60
MH105	JUNCTION	0.06	0.44	86.28	0 06:31	0.44
MH106	JUNCTION	0.06	0.41	86.39	0 06:31	0.41
MH107	JUNCTION	0.03	0.18	86.93	0 06:30	0.18
EXDITCH1	OUTFALL	0.00	0.00	88.70	0 00:00	0.00
EXDITCH2	OUTFALL	0.00	0.00	88.70	0 00:00	0.00
LamarcheA	OUTFALL	0.00	0.00	88.54	0 00:00	0.00
LamarcheAC	OUTFALL	0.00	0.00	88.78	0 00:00	0.00
LamarcheB	OUTFALL	0.00	0.00	88.40	0 00:00	0.00
LamarcheBD	OUTFALL	0.00	0.00	88.78	0 00:00	0.00
LamarcheE	OUTFALL	0.00	0.00	89.53	0 00:00	0.00
MH100	OUTFALL	0.98	0.98	85.50	0 00:00	0.98
XMH13	OUTFALL	85.88	85.88	85.88	0 00:00	85.88
XMH15	OUTFALL	85.01	85.01	85.01	0 00:00	85.01
1+017a	STORAGE	0.00	0.00	88.90	0 00:00	0.00
1+017b	STORAGE	0.00	0.00	88.90	0 00:00	0.00
1+104a	STORAGE	0.00	0.00	89.31	0 00:00	0.00
1+104b	STORAGE	0.00	0.00	89.31	0 00:00	0.00
1+179a	STORAGE	0.00	0.00	89.48	0 00:00	0.00
1+179b	STORAGE	0.00	0.00	89.48	0 00:00	0.00
1+329	STORAGE	0.00	0.00	90.50	0 00:00	0.00
CB1	STORAGE	0.06	1.38	88.88	0 06:31	1.38

CB2	STORAGE	0.07	1.57	88.81	0	06:31	1.57
CB3	STORAGE	0.07	1.56	88.80	0	06:31	1.56
CB4	STORAGE	0.04	0.88	88.50	0	06:30	0.87
CB401	STORAGE	0.01	0.10	86.63	0	06:30	0.10
CB5	STORAGE	0.06	1.53	89.15	0	06:31	1.53
CB6	STORAGE	0.04	0.89	88.70	0	06:30	0.89
CB7	STORAGE	0.05	1.49	89.30	0	06:30	1.48
CB8	STORAGE	0.06	1.47	89.70	0	06:30	1.47
CB9	STORAGE	0.06	1.51	89.74	0	06:30	1.51
CBMH101	STORAGE	0.30	3.52	88.88	0	06:32	3.52
CBMH206	STORAGE	0.13	1.71	88.45	0	06:41	1.71
CBMH207	STORAGE	0.07	1.12	88.47	0	06:41	1.12
HPRYS	STORAGE	0.00	0.00	88.60	0	00:00	0.00
LD208	STORAGE	0.04	0.78	88.48	0	06:41	0.78
MH201	STORAGE	1.11	1.11	85.02	0	06:32	1.11
MH202	STORAGE	0.05	0.33	85.36	0	06:33	0.33
MH203	STORAGE	0.35	0.59	85.62	0	06:32	0.59
MH204	STORAGE	0.03	0.20	85.66	0	06:32	0.20
MH205	STORAGE	0.03	0.19	85.90	0	06:32	0.19
MH400	STORAGE	0.02	0.25	86.32	0	06:30	0.25
TANK1	STORAGE	0.07	1.13	87.13	0	06:31	1.13
TANK2	STORAGE	0.09	1.24	87.24	0	06:32	1.24
ZN2A	STORAGE	0.20	3.67	89.57	0	06:32	3.67
ZN2B	STORAGE	0.68	4.19	89.56	0	06:32	4.19
ZN3A	STORAGE	0.20	3.42	89.77	0	06:32	3.42
ZN3B	STORAGE	0.16	2.90	90.00	0	06:32	2.90

****
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
MH101	JUNCTION	0.00	556.70	0	06:31	0	2.74	-0.017
MH102	JUNCTION	0.00	485.22	0	06:31	0	2.39	0.002
MH103	JUNCTION	0.00	485.23	0	06:30	0	2.39	0.021
MH104	JUNCTION	0.00	486.78	0	06:30	0	2.39	-0.036
MH105	JUNCTION	0.00	316.43	0	06:30	0	1.65	-0.026
MH106	JUNCTION	0.00	285.70	0	06:30	0	1.54	0.033
MH107	JUNCTION	0.00	115.43	0	06:30	0	0.577	0.062

```
  EXDITCH1              OUTFALL       5.72     5.72     0  06:30      0.0113
0.0113       0.000
  EXDITCH2              OUTFALL       0.95     0.95     0  06:30     0.00182
0.00182      0.000
  LamarcheA             OUTFALL       0.00     0.00     0  00:00           0
0       0.000 ltr
  LamarcheAC            OUTFALL       0.00     0.00     0  00:00           0
0       0.000 ltr
  LamarcheB             OUTFALL      12.47    12.47     0  06:30      0.0352
0.0352       0.000
  LamarcheBD            OUTFALL       0.00     0.00     0  00:00           0
0       0.000 ltr
  LamarcheE             OUTFALL       0.00     0.00     0  00:00           0
0       0.000 ltr
  MH100                 OUTFALL       0.00   556.72     0  06:31           0
2.74       0.000
  XMH13                 OUTFALL       0.00    74.22     0  06:32           0
0.415       0.000
  XMH15                 OUTFALL       0.00   142.21     0  06:33           0
0.919       0.000
  1+017a                STORAGE       0.00     0.00     0  00:00           0
1.07e-06      -0.670 ltr
  1+017b                STORAGE       0.00     0.00     0  00:00           0
1.09e-06      -0.803 ltr
  1+104a                STORAGE       0.00     0.00     0  00:00           0
0       0.000 ltr
  1+104b                STORAGE       0.00     0.00     0  00:00           0
0       0.000 ltr
  1+179a                STORAGE       0.00     0.00     0  00:00           0
0       0.000 ltr
  1+179b                STORAGE       0.00     0.00     0  00:00           0
0       0.000 ltr
  1+329                 STORAGE       0.00     0.00     0  00:00           0
0      -0.000 ltr
  CB1                   STORAGE      22.40    22.40     0  06:30      0.0829
0.0829       0.168
  CB2                   STORAGE      21.33    21.33     0  06:30      0.0809
0.0809      -0.011
  CB3                   STORAGE      20.67    20.67     0  06:30      0.0765
0.0765       0.013
  CB4                   STORAGE      13.51    13.51     0  06:30      0.0488
0.0488      -0.000
  CB401                 STORAGE      21.92    21.92     0  06:30      0.0515
0.0515       0.030
  CB5                   STORAGE      19.79    19.79     0  06:30      0.0709
0.0709      -0.025
  CB6                   STORAGE      13.63    13.63     0  06:30      0.0488
0.0488       0.000
  CB7                   STORAGE      17.91    18.02     0  06:30      0.0653
0.0653       0.000
  CB8                   STORAGE      17.64    17.64     0  06:30       0.067
0.067       0.000
  CB9                   STORAGE      18.67    18.67     0  06:30       0.071
0.071      -0.045
  CBMH101               STORAGE      31.07    53.11     0  06:30       0.115
0.198       0.097
  CBMH206               STORAGE       8.45    36.59     0  06:11      0.0259
0.206      -0.174
  CBMH207               STORAGE      27.93    49.22     0  06:29      0.0979
0.18       0.120
```

HPRYS	STORAGE	0.00	0.00	0	00:00	0	
0	0.000 ltr						
LD208	STORAGE	23.16	23.16	0	06:30	0.082	
0.082	-0.062						
MH201	STORAGE	0.00	142.21	0	06:33	0	
0.92	-0.002						
MH202	STORAGE	0.00	142.27	0	06:33	0	
0.919	-0.021						
MH203	STORAGE	0.00	115.14	0	06:32	0	
0.713	0.034						
MH204	STORAGE	0.00	70.07	0	06:32	0	
0.391	0.012						
MH205	STORAGE	0.00	70.07	0	06:31	0	
0.391	-0.002						
MH400	STORAGE	47.37	69.11	0	06:30	0.143	
0.195	0.009						
TANK1	STORAGE	92.66	92.66	0	06:15	0.391	
0.391	0.002						
TANK2	STORAGE	76.36	76.36	0	06:15	0.322	
0.322	0.001						
ZN2A	STORAGE	101.97	101.97	0	06:30	0.415	
0.415	-0.141						
ZN2B	STORAGE	101.53	101.53	0	06:30	0.414	
0.414	-0.074						
ZN3A	STORAGE	237.01	237.01	0	06:30	0.965	
0.965	0.074						
ZN3B	STORAGE	107.92	107.92	0	06:30	0.439	
0.439	0.077						

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
MH101	JUNCTION	0.72	0.121	3.224
MH102	JUNCTION	0.13	0.016	3.469

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

	Average	Avg	Evap	Exfil	Maximum	Max	Time of Max	Maximum

Storage Unit	Volume 1000 m3	Pcnt Full	Pcnt Loss	Pcnt Loss	Volume 1000 m3	Pcnt Full	days	Occurrence hr:min	Outflow LPS
1+017a	0.000	0	0	0	0.000	0	0	00:00	0.00
1+017b	0.000	0	0	0	0.000	0	0	00:00	0.00
1+104a	0.000	0	0	0	0.000	0	0	00:00	0.00
1+104b	0.000	0	0	0	0.000	0	0	00:00	0.00
1+179a	0.000	0	0	0	0.000	0	0	00:00	0.00
1+179b	0.000	0	0	0	0.000	0	0	00:00	0.00
1+329	0.000	0	0	0	0.000	0	0	00:00	0.00
CB1	0.000	0	0	0	0.000	1	0	06:31	22.04
CB2	0.000	3	0	0	0.002	63	0	06:31	18.06
CB3	0.000	3	0	0	0.002	62	0	06:31	18.00
CB4	0.000	1	0	0	0.001	35	0	06:30	13.35
CB401	0.000	0	0	0	0.000	5	0	06:30	21.79
CB5	0.000	3	0	0	0.002	61	0	06:31	17.86
CB6	0.000	1	0	0	0.001	35	0	06:30	13.45
CB7	0.000	2	0	0	0.001	59	0	06:30	17.58
CB8	0.000	2	0	0	0.001	59	0	06:30	17.47
CB9	0.000	2	0	0	0.002	60	0	06:30	17.83
CBMH101	0.001	1	0	0	0.016	45	0	06:32	35.54
CBMH206	0.000	5	0	0	0.002	66	0	06:41	27.37
CBMH207	0.000	4	0	0	0.001	56	0	06:41	32.05
HPRYS	0.000	0	0	0	0.000	0	0	00:00	0.00
LD208	0.000	2	0	0	0.001	39	0	06:41	21.63
MH201	0.001	23	0	0	0.001	23	0	06:32	142.21
MH202	0.000	1	0	0	0.000	9	0	06:33	142.21
MH203	0.000	9	0	0	0.001	15	0	06:32	115.12
MH204	0.000	1	0	0	0.000	6	0	06:32	70.06
MH205	0.000	1	0	0	0.000	5	0	06:32	70.07

MH400		0.000	1	0	0	0.000	8	0
06:30	68.40							
TANK1		0.005	3	0	0	0.075	45	0
06:31	70.07							
TANK2		0.006	4	0	0	0.083	50	0
06:32	45.09							
ZN2A		0.001	1	0	0	0.046	29	0
06:32	72.65							
ZN2B		0.001	1	0	0	0.041	27	0
06:32	74.22							
ZN3A		0.002	1	0	0	0.092	31	0
06:32	170.33							
ZN3B		0.001	1	0	0	0.038	25	0
06:32	80.30							

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
EXDITCH1	17.73	0.99	5.72	0.011
EXDITCH2	5.75	0.49	0.95	0.002
LamarcheA	0.00	0.00	0.00	0.000
LamarcheAC	0.00	0.00	0.00	0.000
LamarcheB	50.84	1.02	12.47	0.035
LamarcheBD	0.00	0.00	0.00	0.000
LamarcheE	0.00	0.00	0.00	0.000
MH100	75.16	49.92	556.72	2.741
XMH13	99.94	5.61	74.22	0.415
XMH15	67.15	17.85	142.21	0.919
System	31.66	75.88	787.53	4.124

****
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
1	CHANNEL	0.00	0 00:00	0.00	0.00	0.00
10	CHANNEL	0.00	0 00:00	0.00	0.00	0.00
101-100	CONDUIT	556.72	0 06:31	1.26	0.72	1.00
102-101	CONDUIT	485.30	0 06:31	1.36	0.81	1.00
103-102	CONDUIT	485.22	0 06:31	1.36	0.82	1.00
104-103	CONDUIT	485.23	0 06:30	1.55	0.83	0.94
105	CONDUIT	315.90	0 06:31	1.61	0.87	0.75
106-105	CONDUIT	285.49	0 06:31	1.49	0.66	0.69
107-106	CONDUIT	115.44	0 06:30	1.63	0.34	0.47
11	CHANNEL	0.00	0 00:00	0.00	0.00	0.03

1-101	CONDUIT	22.04	0	06:30	0.89	0.13	1.00
12	CHANNEL	0.00	0	00:00	0.00	0.00	0.03
13	CHANNEL	0.00	0	06:16	0.00	0.00	0.03
14	CHANNEL	0.00	0	06:14	0.00	0.00	0.03
15	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
16	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
2	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
202-201	CONDUIT	142.21	0	06:33	1.16	0.47	0.55
203-202	CONDUIT	115.12	0	06:33	1.17	0.57	0.59
204-203	CONDUIT	70.06	0	06:32	0.87	0.36	0.51
205-204	CONDUIT	70.07	0	06:32	1.14	0.35	0.41
207-206	CONDUIT	32.05	0	06:11	0.71	0.26	1.00
208-207	CONDUIT	21.63	0	06:29	0.62	0.32	1.00
3	CHANNEL	0.12	0	06:30	0.19	0.00	0.01
4	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
5	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
6	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
7	CHANNEL	0.00	0	00:00	0.00	0.00	0.02
8	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
9	CHANNEL	0.00	0	00:00	0.00	0.00	0.02
C1	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C2	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C3	CONDUIT	0.00	0	00:00	0.00	0.00	0.05
C4	CONDUIT	0.00	0	00:00	0.00	0.00	0.06
C5	CONDUIT	0.00	0	00:00	0.00	0.00	0.06
C6	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
CAP4-104	CONDUIT	68.40	0	06:30	1.20	0.70	0.79
CB3/2	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
CB5/4	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
CB7/6	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
OVF2A	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
OVF2B	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
OVFA1	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
STM-36_(STM)	CONDUIT	21.79	0	06:30	0.54	0.23	0.57
STM-39_(STM)	CONDUIT	142.21	0	06:33	0.40	0.29	1.00
CAP3b-107	ORIFICE	80.30	0	06:32			1.00
OR1	ORIFICE	18.00	0	06:31			1.00
OR3	ORIFICE	18.06	0	06:31			1.00
OR3A	ORIFICE	170.33	0	06:32			1.00
OR4	ORIFICE	13.45	0	06:30			1.00
OR5	ORIFICE	17.58	0	06:30			1.00
ORCB4	ORIFICE	13.35	0	06:30			1.00
ORCB5	ORIFICE	17.86	0	06:31			1.00
ORCB8	ORIFICE	17.47	0	06:30			1.00
ORCB9	ORIFICE	17.71	0	06:30			1.00
ORCBMH206	ORIFICE	27.37	0	06:41			1.00
ORTANK1	ORIFICE	70.07	0	06:31			1.00
ORTANK2	ORIFICE	45.09	0	06:33			1.00
ORZN2a	ORIFICE	72.65	0	06:40			1.00
ORZN2b	ORIFICE	74.22	0	06:32			1.00
STM-23_(STM)	ORIFICE	35.54	0	06:39			1.00

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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 ----------								
1	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	1.00	1.00	0.00	0.00	0.00	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	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
103-102	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
104-103	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.01	0.92	0.00
105	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.00	0.00
106-105	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.00	0.00
107-106	1.00	0.00	0.00	0.00	0.00	0.04	0.00	0.96	0.01	0.00
11	1.00	0.98	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-101	1.00	0.00	0.00	0.00	0.05	0.00	0.00	0.95	0.01	0.00
12	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.74	0.00
14	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.74	0.00
15	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
16	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202-201	1.00	0.00	0.00	0.00	0.89	0.00	0.00	0.11	0.79	0.00
203-202	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.00	0.00
204-203	1.00	0.00	0.00	0.00	0.10	0.00	0.00	0.90	0.03	0.00
205-204	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
207-206	1.00	0.00	0.00	0.00	0.09	0.00	0.00	0.91	0.02	0.00
208-207	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.94	0.00
3	1.00	0.99	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
4	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
6	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
7	1.00	0.98	0.02	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
8	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
9	1.00	0.98	0.02	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C3	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C4	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C5	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C6	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
CAP4-104	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.00
0.00									
CB3/2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
CB5/4	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
CB7/6	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
OVF2A	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
OVF2B	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
OVFA1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
STM-36_(STM)	1.00	0.00	0.00	0.00	0.45	0.06	0.00	0.49	0.43
0.00									
STM-39_(STM)	1.00	0.00	0.00	0.00	1.00	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
101-100	0.73	0.73	24.00	0.01	0.01
102-101	0.26	0.26	0.72	0.01	0.01
103-102	0.11	0.11	0.13	0.01	0.05
1-101	0.65	0.65	0.81	0.01	0.01
207-206	1.21	1.21	1.67	0.01	0.01
208-207	0.95	0.95	1.27	0.01	0.01
STM-39_(STM)	24.00	24.00	24.00	0.01	0.01

```
Analysis begun on:  Wed Dec 22 12:35:26 2021
Analysis ended on:  Wed Dec 22 12:35:28 2021
Total elapsed time: 00:00:02
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SCS 24hr 100-Year Storm PCSWM Model Results

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

****
Element Count
****
Number of rain gages 1
Number of subcatchments ... 29
Number of nodes 51
Number of links 61
Number of pollutants 0
Number of land uses 0

****
Raingage Summary
****

Name	Data Source	Data Type	Recording Interval
Raingage1	S24-100	INTENSITY	60 min.

****
Subcatchment Summary
****

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A-01a	0.14	41.43	76.00	2.0000	Raingage1	CBMH101
A-01b	0.11	10.70	74.00	2.0000	Raingage1	CB1
A-04b	0.10	10.20	77.00	1.0000	Raingage1	CB2
B-01	0.41	166.00	100.00	1.5000	Raingage1	TANK1
B-02	0.34	136.80	100.00	1.5000	Raingage1	TANK2
C-01a	0.06	11.37	27.00	0.5000	Raingage1	CBMH206
C-01b	0.20	24.02	36.00	0.5000	Raingage1	CBMH207
C-01c	0.16	15.96	39.00	0.7000	Raingage1	LD208
D-01	0.06	62.00	40.00	2.0000	Raingage1	LamarcheB
D-02	0.01	32.50	71.00	2.0000	Raingage1	R-04a
D-03	0.01	12.50	54.00	1.5000	Raingage1	R-03a
D-04	0.02	48.00	7.00	1.5000	Raingage1	P-01
D-05	0.01	10.00	7.00	1.5000	Raingage1	EXDITCH2
P-01	0.10	29.71	7.00	0.5000	Raingage1	MH400
P-02	0.20	29.14	36.00	0.5000	Raingage1	MH400
P-03	0.13	19.56	7.00	1.5000	Raingage1	CB401
P-04	0.03	15.68	7.00	1.5000	Raingage1	CB401
P-05	0.03	16.50	7.00	1.0000	Raingage1	EXDITCH1
R-01a	0.09	10.23	79.00	1.0000	Raingage1	CB9
R-01b	0.08	10.25	79.00	1.0000	Raingage1	CB8
R-02a	0.09	10.00	67.00	1.0000	Raingage1	CB7
R-02b	0.07	10.00	67.00	1.0000	Raingage1	CB6
R-03a	0.09	10.00	69.00	1.0000	Raingage1	CB5
R-03b	0.07	10.00	69.00	1.0000	Raingage1	CB4
R-04a	0.08	10.12	77.00	1.0000	Raingage1	CB3
ZONE2A	0.46	102.67	93.00	2.0000	Raingage1	ZN2A
ZONE2B	0.46	92.00	93.00	2.0000	Raingage1	ZN2B
ZONE3A	0.49	54.33	93.00	2.0000	Raingage1	ZN3B
ZONE3B	1.07	102.29	93.00	2.0000	Raingage1	ZN3A

****
Node Summary
****

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
MH101	JUNCTION	84.87	4.10	0.0	
MH102	JUNCTION	85.17	4.19	0.0	
MH103	JUNCTION	85.31	3.93	0.0	
MH104	JUNCTION	85.55	3.95	0.0	
MH105	JUNCTION	85.84	3.64	0.0	
MH106	JUNCTION	85.98	3.74	0.0	
MH107	JUNCTION	86.75	3.35	0.0	
EXDITCH1	OUTFALL	88.70	0.00	0.0	
EXDITCH2	OUTFALL	88.70	0.00	0.0	
LamarcheA	OUTFALL	88.54	1.00	0.0	
LamarcheAC	OUTFALL	88.78	1.00	0.0	
LamarcheB	OUTFALL	88.40	0.00	0.0	
LamarcheBD	OUTFALL	88.78	1.00	0.0	
LamarcheE	OUTFALL	89.53	1.16	0.0	
MH100	OUTFALL	84.52	0.83	0.0	

XMH13	OUTFALL	0.00	0.00	0.0
XMH15	OUTFALL	0.00	84.55	0.0
1+017a	STORAGE	88.90	1.00	0.0
1+017b	STORAGE	88.90	1.00	0.0
1+104a	STORAGE	89.31	1.00	0.0
1+104b	STORAGE	89.31	1.00	0.0
1+179a	STORAGE	89.48	1.00	0.0
1+179b	STORAGE	89.48	1.00	0.0
1+329	STORAGE	90.50	1.00	0.0
CB1	STORAGE	87.50	2.50	0.0
CB2	STORAGE	87.24	2.50	0.0
CB3	STORAGE	87.24	2.50	0.0
CB4	STORAGE	87.62	2.50	0.0
CB401	STORAGE	86.53	1.87	0.0
CB5	STORAGE	87.62	2.50	0.0
CB6	STORAGE	87.81	2.50	0.0
CB7	STORAGE	87.81	2.50	0.0
CB8	STORAGE	88.23	2.50	0.0
CB9	STORAGE	88.23	2.50	0.0
CBMH101	STORAGE	85.36	4.34	0.0
CBMH206	STORAGE	86.74	2.61	0.0
CBMH207	STORAGE	87.35	2.00	0.0
HPRYS	STORAGE	88.60	1.00	0.0
LD208	STORAGE	87.70	2.00	0.0
MH201	STORAGE	83.91	4.80	0.0
MH202	STORAGE	85.03	3.71	0.0
MH203	STORAGE	85.03	3.91	0.0
MH204	STORAGE	85.46	3.50	0.0
MH205	STORAGE	85.71	3.60	0.0
MH400	STORAGE	86.07	3.13	0.0
TANK1	STORAGE	86.00	3.50	0.0
TANK2	STORAGE	86.00	3.30	0.0
ZN2A	STORAGE	85.90	4.50	0.0
ZN2B	STORAGE	85.37	5.03	0.0
ZN3A	STORAGE	86.35	4.25	0.0
ZN3B	STORAGE	87.10	3.75	0.0

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
1	1+329	CB9	CONDUIT	65.0	1.1847	0.0150
10	1+104b	CB4	CONDUIT	33.6	0.5651	0.0150
101-100	MH101	MH100	CONDUIT	55.5	0.4863	0.0130
102-101	MH102	MH101	CONDUIT	43.6	0.5048	0.0130
103-102	MH103	MH102	CONDUIT	22.4	0.4907	0.0130
104-103	MH104	MH103	CONDUIT	42.9	0.4892	0.0130
105	MH105	MH104	CONDUIT	42.9	0.3495	0.0130
106-105	MH106	MH105	CONDUIT	22.4	0.4913	0.0130
107-106	MH107	MH106	CONDUIT	43.0	1.3969	0.0130
11	1+104a	CB3	CONDUIT	57.2	0.9970	0.0150
1-101	CB1	CBMH101	CONDUIT	45.1	0.9972	0.0130
12	1+104b	CB2	CONDUIT	56.5	1.0097	0.0150
13	1+017a	CB3	CONDUIT	26.0	0.6158	0.0150
14	1+017b	CB2	CONDUIT	25.8	0.6210	0.0150
15	1+017a	LamarcheAC	CONDUIT	9.2	1.3023	0.0150
16	1+017b	LamarcheBD	CONDUIT	12.2	0.9832	0.0150
2	1+329	CB8	CONDUIT	65.0	1.1847	0.0150
202-201	MH202	MH201	CONDUIT	20.5	0.4868	0.0130
203-202	MH203	MH202	CONDUIT	44.2	0.4973	0.0130
204-203	MH204	MH203	CONDUIT	21.2	0.4711	0.0130
205-204	MH205	MH204	CONDUIT	34.2	0.4976	0.0130
207-206	CBMH207	CBMH206	CONDUIT	97.8	0.5010	0.0130
208-207	LD208	CBMH207	CONDUIT	69.7	0.5022	0.0130
3	CB9	CB7	CONDUIT	50.7	0.8291	0.0150
4	CB8	CB6	CONDUIT	37.6	1.1157	0.0150
5	1+179a	CB7	CONDUIT	33.8	0.5034	0.0150
6	1+179b	CB6	CONDUIT	33.8	0.5032	0.0150
7	1+179a	CB5	CONDUIT	36.2	0.9959	0.0150
8	1+179b	CB4	CONDUIT	36.4	0.9900	0.0150
9	1+104a	CB5	CONDUIT	45.8	0.4148	0.0150
C1	ZN3A	CB9	CONDUIT	1.0	1.0001	0.0130
C2	ZN3B	CB9	CONDUIT	1.0	1.0001	0.0150
C3	HPRYS	CBMH206	CONDUIT	51.2	0.4885	0.0130
C4	HPRYS	CBMH207	CONDUIT	47.6	0.5256	0.0130
C5	LD208	CBMH207	CONDUIT	70.2	0.4985	0.0130
C6	CBMH206	LamarcheA	CONDUIT	1.0	6.0108	0.2500
CAP4-104	MH400	MH104	CONDUIT	13.9	1.0072	0.0130
CB3/2	CB3	CB2	CONDUIT	1.0	0.1000	0.0130
CB5/4	CB5	CB4	CONDUIT	1.0	0.1000	0.0150

CB7/6	CB7	CB6	CONDUIT	1.0	0.1000	0.0150
OVF2A	ZN2A	CB4	CONDUIT	1.0	1.0001	0.0150
OVF2B	ZN2B	LamarcheE	CONDUIT	1.0	1.0001	0.0130
OVFA1	CBMH101	CB3	CONDUIT	1.0	0.1000	0.0150
STM-36_(STM)	CB401	MH400	CONDUIT	46.2	0.9740	0.0130
STM-39_(STM)	MH201	XMH15	CONDUIT	11.8	0.3385	0.0130
CAP3b-107	ZN3B	MH107	ORIFICE			
OR1	CB3	MH101	ORIFICE			
OR3	CB2	MH101	ORIFICE			
OR3A	ZN3A	MH106	ORIFICE			
OR4	CB6	MH105	ORIFICE			
OR5	CB7	MH105	ORIFICE			
ORCB4	CB4	MH104	ORIFICE			
ORCB5	CB5	MH104	ORIFICE			
ORCB8	CB8	MH107	ORIFICE			
ORCB9	CB9	MH107	ORIFICE			
ORCBMH206	CBMH206	MH202	ORIFICE			
ORTANK1	TANK1	MH205	ORIFICE			
ORTANK2	TANK2	MH203	ORIFICE			
ORZN2a	ZN2A	MH104	ORIFICE			
ORZN2b	ZN2B	XMH13	ORIFICE			
STM-23_(STM)	CBMH101	MH101	ORIFICE			

****
Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
1	20mROWlaf	1.00	8.41	0.25	10.01	1	24202.43
10	20mROWlaf	1.00	8.41	0.25	10.01	1	16715.41
101-100	CIRCULAR	0.75	0.44	0.19	0.75	1	776.37
102-101	CIRCULAR	0.68	0.36	0.17	0.68	1	597.29
103-102	CIRCULAR	0.68	0.36	0.17	0.68	1	588.87
104-103	CIRCULAR	0.68	0.36	0.17	0.68	1	587.95
105	CIRCULAR	0.60	0.28	0.15	0.60	1	363.00
106-105	CIRCULAR	0.60	0.28	0.15	0.60	1	430.38
107-106	CIRCULAR	0.45	0.16	0.11	0.45	1	336.99
11	20mROWlaf	1.00	8.41	0.25	10.01	1	22202.02
1-101	CIRCULAR	0.38	0.11	0.09	0.38	1	175.09
12	20mROWlaf	1.00	8.41	0.25	10.01	1	22343.95
13	20mROWlaf	1.00	8.41	0.25	10.01	1	17448.82
14	20mROWlaf	1.00	8.41	0.25	10.01	1	17522.14
15	20mROWlaf	1.00	8.41	0.25	10.01	1	25375.60
16	20mROWlaf	1.00	8.41	0.25	10.01	1	22048.01
2	20mROWlaf	1.00	8.41	0.25	10.01	1	24202.43
202-201	CIRCULAR	0.53	0.22	0.13	0.53	1	300.09
203-202	CIRCULAR	0.45	0.16	0.11	0.45	1	201.08
204-203	CIRCULAR	0.45	0.16	0.11	0.45	1	195.71
205-204	CIRCULAR	0.45	0.16	0.11	0.45	1	201.13
207-206	CIRCULAR	0.38	0.11	0.09	0.38	1	124.11
208-207	CIRCULAR	0.30	0.07	0.07	0.30	1	68.53
3	20mROWlaf	1.00	8.41	0.25	10.01	1	20247.11
4	20mROWlaf	1.00	8.41	0.25	10.01	1	23487.33
5	20mROWlaf	1.00	8.41	0.25	10.01	1	15776.25
6	20mROWlaf	1.00	8.41	0.25	10.01	1	15774.15
7	20mROWlaf	1.00	8.41	0.25	10.01	1	22189.98
8	20mROWlaf	1.00	8.41	0.25	10.01	1	22124.89
9	20mROWlaf	1.00	8.41	0.25	10.01	1	14321.75
C1	CIRCULAR	1.00	0.79	0.25	1.00	1	2397.78
C2	RECT_OPEN	1.00	3.00	0.60	3.00	1	14228.79
C3	TRAPEZOIDAL	1.00	3.50	0.51	6.50	1	12057.61
C4	TRAPEZOIDAL	1.00	3.50	0.51	6.50	1	12506.56
C5	TRAPEZOIDAL	1.00	3.50	0.51	6.50	1	12179.66
C6	RECT_OPEN	1.00	3.00	0.60	3.00	1	2093.03
CAP4-104	CIRCULAR	0.30	0.07	0.07	0.30	1	97.06
CB3/2	CIRCULAR	1.00	0.79	0.25	1.00	1	758.23
CB5/4	RECT_OPEN	1.00	1.00	0.33	1.00	1	1013.57
CB7/6	RECT_OPEN	1.00	1.00	0.33	1.00	1	1013.57
OVF2A	RECT_OPEN	1.00	3.00	0.60	3.00	1	14228.79
OVF2B	RECT_OPEN	1.00	3.00	0.60	3.00	1	16417.83
OVFA1	CIRCULAR	1.00	0.79	0.25	1.00	1	657.13
STM-36_(STM)	CIRCULAR	0.30	0.07	0.07	0.30	1	95.44
STM-39_(STM)	CIRCULAR	0.68	0.36	0.17	0.68	1	489.07

****
Transect Summary
****

Transect 20mROW1af
Area:

0.0008	0.0030	0.0068	0.0121	0.0189
0.0270	0.0354	0.0440	0.0547	0.0677
0.0832	0.1010	0.1212	0.1438	0.1676
0.1913	0.2151	0.2389	0.2626	0.2864
0.3102	0.3339	0.3577	0.3815	0.4052
0.4290	0.4528	0.4766	0.5004	0.5241
0.5479	0.5717	0.5955	0.6193	0.6431
0.6668	0.6906	0.7144	0.7382	0.7620
0.7858	0.8096	0.8334	0.8572	0.8810
0.9048	0.9286	0.9524	0.9762	1.0000

Hrad:

0.0387	0.0774	0.1162	0.1549	0.1936
0.2510	0.3264	0.3981	0.4447	0.4684
0.4771	0.4767	0.4711	0.4627	0.4586
0.4606	0.4665	0.4751	0.4856	0.4976
0.5106	0.5244	0.5389	0.5539	0.5693
0.5851	0.6011	0.6174	0.6339	0.6506
0.6674	0.6844	0.7014	0.7186	0.7358
0.7532	0.7705	0.7880	0.8055	0.8230
0.8406	0.8582	0.8759	0.8935	0.9112
0.9289	0.9467	0.9644	0.9822	1.0000

Width:

0.0635	0.1270	0.1906	0.2541	0.3176
0.3495	0.3496	0.3996	0.4993	0.5991
0.6989	0.7987	0.8984	0.9982	0.9982
0.9983	0.9983	0.9984	0.9984	0.9985
0.9985	0.9986	0.9986	0.9987	0.9987
0.9988	0.9988	0.9989	0.9989	0.9990
0.9990	0.9991	0.9991	0.9992	0.9992
0.9993	0.9993	0.9994	0.9994	0.9995
0.9995	0.9996	0.9996	0.9997	0.9997
0.9998	0.9998	0.9999	0.9999	1.0000

Transect ROW20m
Area:

0.0008	0.0030	0.0068	0.0121	0.0189
0.0270	0.0354	0.0440	0.0547	0.0678
0.0832	0.1011	0.1213	0.1439	0.1676
0.1914	0.2152	0.2389	0.2627	0.2865

0.3103	0.3340	0.3578	0.3816	0.4054
0.4291	0.4529	0.4767	0.5005	0.5243
0.5480	0.5718	0.5956	0.6194	0.6432
0.6670	0.6907	0.7145	0.7383	0.7621
0.7859	0.8097	0.8335	0.8572	0.8810
0.9048	0.9286	0.9524	0.9762	1.0000

Hrad:

0.0387	0.0774	0.1161	0.1548	0.1935
0.2508	0.3262	0.3978	0.4443	0.4680
0.4768	0.4764	0.4708	0.4624	0.4583
0.4603	0.4662	0.4748	0.4854	0.4973
0.5103	0.5242	0.5386	0.5536	0.5690
0.5848	0.6009	0.6172	0.6337	0.6504
0.6672	0.6842	0.7012	0.7184	0.7357
0.7530	0.7704	0.7878	0.8053	0.8229
0.8405	0.8581	0.8758	0.8934	0.9112
0.9289	0.9466	0.9644	0.9822	1.0000

Width:

0.0636	0.1272	0.1908	0.2544	0.3179
0.3498	0.3499	0.3999	0.4998	0.5996
0.6995	0.7993	0.8992	0.9990	0.9990
0.9991	0.9991	0.9991	0.9991	0.9992
0.9992	0.9992	0.9992	0.9993	0.9993
0.9993	0.9994	0.9994	0.9994	0.9994
0.9995	0.9995	0.9995	0.9996	0.9996
0.9996	0.9996	0.9997	0.9997	0.9997
0.9998	0.9998	0.9998	0.9998	0.9999
0.9999	0.9999	0.9999	1.0000	1.0000

****
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 ............ 11/15/2021 00:00:00
Ending Date .............. 11/16/2021 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
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
```

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Initial LID Storage	0.004	0.699
Total Precipitation	0.549	105.660
Evaporation Loss	0.000	0.000
Infiltration Loss	0.095	18.348
Surface Runoff	0.453	87.248
Final Storage	0.005	0.964
Continuity Error (%)	-0.188	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.453	4.529
Groundwater Inflow	0.000	0.000

RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.452	4.523
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.005	0.046
Final Stored Volume	0.005	0.050
Continuity Error (%)	0.045	

```
**************************
Time-Step Critical Elements
**************************
Link CAP4-104 (1.69%)
Link 101-100 (1.39%)

******************************
Highest Flow Instability Indexes
******************************
Link ORZN2b (7)
Link STM-23_(STM) (7)

************************
Routing Time Step Summary
************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     4.96 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      :    99.16 %
    3.155 -  1.991 sec      :     0.36 %
    1.991 -  1.256 sec      :     0.24 %
    1.256 -  0.792 sec      :     0.14 %
    0.792 -  0.500 sec      :     0.10 %
```

****
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
A-01a	105.66	0.00	0.00	18.97	80.32	6.44	86.75	0.13	17.13	0.821
A-01b	105.66	0.00	0.00	20.87	78.08	6.63	84.71	0.09	12.51	0.802
A-04b	105.66	0.00	0.00	18.56	81.15	5.77	86.92	0.09	12.01	0.823
B-01	105.66	0.00	0.00	0.00	105.67	0.00	105.67	0.44	52.67	1.000
B-02	105.66	0.00	0.00	0.00	105.67	0.00	105.67	0.36	43.41	1.000
C-01a	105.66	0.00	0.00	60.69	28.53	16.49	45.02	0.03	5.15	0.426
C-01b	105.66	0.00	0.00	54.15	38.00	13.51	51.51	0.10	17.30	0.488
C-01c	105.66	0.00	0.00	51.53	41.16	12.95	54.11	0.09	14.24	0.512
D-01	105.66	0.00	0.00	47.29	42.26	16.25	58.51	0.04	6.50	0.554
D-02	105.66	0.00	0.00	22.68	75.00	8.11	83.11	0.01	1.51	0.787
D-03	105.66	0.00	0.00	36.17	57.05	12.56	69.61	0.01	1.10	0.659
D-04	105.66	0.00	0.00	73.25	7.43	25.25	32.68	0.01	2.23	0.309
D-05	105.66	0.00	0.00	73.25	7.43	25.25	32.68	0.00	0.46	0.309
P-01	105.66	7.54	0.00	77.95	7.92	27.39	35.32	0.04	10.56	0.312
P-02	105.66	0.00	0.00	53.69	38.02	13.96	51.98	0.11	18.47	0.492
P-03	105.66	0.00	0.00	77.24	7.40	21.08	28.47	0.04	10.46	0.269
P-04	105.66	0.00	0.00	74.27	7.40	24.12	31.51	0.01	2.67	0.298
P-05	105.66	0.00	0.00	74.66	7.39	23.70	31.10	0.01	3.01	0.294
R-01a	105.66	0.00	0.00	16.85	83.29	5.36	88.65	0.08	10.46	0.839
R-01b	105.66	0.00	0.00	16.83	83.31	5.38	88.69	0.07	9.87	0.839
R-02a	105.66	0.00	0.00	26.82	70.66	8.07	78.74	0.07	10.17	0.745
R-02b	105.66	0.00	0.00	26.60	70.72	8.30	79.02	0.05	7.63	0.748
R-03a	105.66	7.90	0.00	26.17	78.22	9.07	87.28	0.08	11.15	0.769
R-03b	105.66	0.00	0.00	24.94	72.83	7.85	80.68	0.05	7.55	0.764
R-04a	105.66	12.70	0.00	19.82	90.96	7.43	98.39	0.08	11.55	0.831
ZONE2A	105.66	0.00	0.00	5.50	98.24	1.92	100.16	0.46	57.45	0.948
ZONE2B	105.66	0.00	0.00	5.50	98.22	1.92	100.14	0.46	57.20	0.948
ZONE3A	105.66	0.00	0.00	5.52	98.09	1.89	99.98	0.49	60.81	0.946
ZONE3B	105.66	0.00	0.00	5.53	98.05	1.89	99.93	1.07	133.55	0.946

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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
MH101	JUNCTION	0.64	0.76	85.63	0 13:00	0.76

MH102	JUNCTION	0.34	0.50	85.67	0	13:00	0.50
MH103	JUNCTION	0.20	0.45	85.76	0	13:00	0.45
MH104	JUNCTION	0.09	0.41	85.96	0	13:00	0.41
MH105	JUNCTION	0.08	0.34	86.18	0	13:00	0.34
MH106	JUNCTION	0.08	0.33	86.31	0	13:00	0.33
MH107	JUNCTION	0.04	0.15	86.90	0	13:00	0.15
EXDITCH1	OUTFALL	0.00	0.00	88.70	0	00:00	0.00
EXDITCH2	OUTFALL	0.00	0.00	88.70	0	00:00	0.00
LamarcheA	OUTFALL	0.00	0.00	88.54	0	00:00	0.00
LamarcheAC	OUTFALL	0.00	0.00	88.78	0	00:00	0.00
LamarcheB	OUTFALL	0.00	0.00	88.40	0	00:00	0.00
LamarcheBD	OUTFALL	0.00	0.00	88.78	0	00:00	0.00
LamarcheE	OUTFALL	0.00	0.00	89.53	0	00:00	0.00
MH100	OUTFALL	0.98	0.98	85.50	0	00:00	0.98
XMH13	OUTFALL	85.88	85.88	85.88	0	00:00	85.88
XMH15	OUTFALL	85.01	85.01	85.01	0	00:00	85.01
1+017a	STORAGE	0.00	0.00	88.90	0	00:00	0.00
1+017b	STORAGE	0.00	0.00	88.90	0	00:00	0.00
1+104a	STORAGE	0.00	0.00	89.31	0	00:00	0.00
1+104b	STORAGE	0.00	0.00	89.31	0	00:00	0.00
1+179a	STORAGE	0.00	0.00	89.48	0	00:00	0.00
1+179b	STORAGE	0.00	0.00	89.48	0	00:00	0.00
1+329	STORAGE	0.00	0.00	90.50	0	00:00	0.00
CB1	STORAGE	0.02	0.16	87.66	0	13:00	0.16
CB2	STORAGE	0.05	0.71	87.95	0	13:00	0.71
CB3	STORAGE	0.05	0.66	87.90	0	13:00	0.66
CB4	STORAGE	0.03	0.31	87.93	0	13:00	0.31
CB401	STORAGE	0.01	0.08	86.61	0	13:00	0.08
CB5	STORAGE	0.05	0.62	88.24	0	13:00	0.62
CB6	STORAGE	0.03	0.31	88.12	0	13:00	0.31
CB7	STORAGE	0.04	0.52	88.33	0	13:00	0.52
CB8	STORAGE	0.04	0.50	88.73	0	13:00	0.50
CB9	STORAGE	0.05	0.55	88.78	0	13:00	0.55
CBMH101	STORAGE	0.24	2.30	87.66	0	13:00	2.30
CBMH206	STORAGE	0.11	1.45	88.19	0	13:04	1.45
CBMH207	STORAGE	0.05	0.85	88.20	0	13:04	0.85
HPRYS	STORAGE	0.00	0.00	88.60	0	00:00	0.00
LD208	STORAGE	0.03	0.51	88.21	0	13:03	0.51
MH201	STORAGE	1.11	1.11	85.02	0	13:01	1.11
MH202	STORAGE	0.06	0.28	85.31	0	13:02	0.28
MH203	STORAGE	0.36	0.54	85.57	0	13:01	0.54
MH204	STORAGE	0.04	0.16	85.62	0	13:00	0.16
MH205	STORAGE	0.04	0.16	85.87	0	13:00	0.16
MH400	STORAGE	0.02	0.17	86.24	0	13:00	0.17
TANK1	STORAGE	0.07	0.63	86.63	0	13:00	0.63
TANK2	STORAGE	0.09	0.86	86.86	0	13:01	0.86
ZN2A	STORAGE	0.16	2.27	88.17	0	13:00	2.27
ZN2B	STORAGE	0.62	2.69	88.06	0	13:00	2.69
ZN3A	STORAGE	0.17	2.14	88.49	0	13:00	2.14
ZN3B	STORAGE	0.13	1.70	88.80	0	13:00	1.70

****
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	
MH101	JUNCTION	0.00	402.28	0	13:00	0	3.01	-0.001	
MH102	JUNCTION	0.00	350.43	0	13:00	0	2.62	0.001	
MH103	JUNCTION	0.00	350.50	0	13:00	0	2.62	0.022	
MH104	JUNCTION	0.00	350.52	0	13:00	0	2.62	-0.008	
MH105	JUNCTION	0.00	232.44	0	13:00	0	1.84	0.003	
MH106	JUNCTION	0.00	214.68	0	13:00	0	1.71	0.038	
MH107	JUNCTION	0.00	81.13	0	13:00	0	0.64	0.016	
EXDITCH1	OUTFALL	3.01	3.01	0	13:00	0.0103	0.0103	0.000	
EXDITCH2	OUTFALL	0.46	0.46	0	12:55	0.00163	0.00163	0.000	
LamarcheA	OUTFALL	0.00	0.00	0	00:00	0	0	0.000	ltr
LamarcheAC	OUTFALL	0.00	0.00	0	00:00	0	0	0.000	ltr
LamarcheB	OUTFALL	6.50	6.50	0	12:55	0.0363	0.0363	0.000	
LamarcheBD	OUTFALL	0.00	0.00	0	00:00	0	0	0.000	ltr
LamarcheE	OUTFALL	0.00	0.00	0	00:00	0	0	0.000	ltr
MH100	OUTFALL	0.00	402.31	0	13:00	0	3.01	0.000	
XMH13	OUTFALL	0.00	57.20	0	13:00	0	0.461	0.000	
XMH15	OUTFALL	0.00	112.41	0	13:02	0	1.01	0.000	
1+017a	STORAGE	0.00	0.00	0	00:00	0	1.07e-06	0.000	ltr
1+017b	STORAGE	0.00	0.00	0	00:00	0	1.09e-06	0.000	ltr
1+104a	STORAGE	0.00	0.00	0	00:00	0	0	0.000	ltr

1+104b	STORAGE	0.00	0.00	0	00:00	0	0	0.000 ltr
1+179a	STORAGE	0.00	0.00	0	00:00	0	0	0.000 ltr
1+179b	STORAGE	0.00	0.00	0	00:00	0	0	0.000 ltr
1+329	STORAGE	0.00	0.00	0	00:00	0	0	-0.000 ltr
CB1	STORAGE	12.51	12.51	0	13:00	0.0906	0.0906	0.148
CB2	STORAGE	12.01	12.01	0	13:00	0.0886	0.0886	0.003
CB3	STORAGE	11.55	11.55	0	13:00	0.0836	0.0836	0.003
CB4	STORAGE	7.55	7.55	0	13:00	0.053	0.053	0.003
CB401	STORAGE	13.14	13.14	0	13:00	0.047	0.047	0.034
CB5	STORAGE	11.15	11.15	0	13:00	0.0768	0.0768	0.003
CB6	STORAGE	7.63	7.63	0	13:00	0.0529	0.0529	0.003
CB7	STORAGE	10.17	10.17	0	13:00	0.0708	0.0708	0.003
CB8	STORAGE	9.87	9.87	0	13:00	0.0736	0.0736	0.003
CB9	STORAGE	10.46	10.46	0	13:00	0.078	0.078	0.003
CBMH101	STORAGE	17.13	29.44	0	12:43	0.126	0.216	-0.035
CBMH206	STORAGE	5.15	28.41	0	13:00	0.0261	0.213	-0.122
CBMH207	STORAGE	17.30	29.12	0	13:00	0.101	0.187	0.204
HPRYS	STORAGE	0.00	0.00	0	00:00	0	0	0.000 ltr
LD208	STORAGE	14.24	14.24	0	13:00	0.0855	0.0855	-0.002
MH201	STORAGE	0.00	112.41	0	13:02	0	1.01	0.000
MH202	STORAGE	0.00	112.41	0	13:02	0	1.01	0.008
MH203	STORAGE	0.00	87.53	0	13:01	0	0.796	0.015
MH204	STORAGE	0.00	50.66	0	13:00	0	0.436	0.039
MH205	STORAGE	0.00	50.67	0	13:00	0	0.437	0.025
MH400	STORAGE	29.03	42.13	0	13:00	0.143	0.19	0.003
TANK1	STORAGE	52.67	52.67	0	13:00	0.438	0.438	0.000
TANK2	STORAGE	43.41	43.41	0	13:00	0.361	0.361	0.000
ZN2A	STORAGE	57.45	57.45	0	13:00	0.463	0.463	0.008
ZN2B	STORAGE	57.20	57.20	0	13:00	0.46	0.461	0.018
ZN3A	STORAGE	133.55	133.55	0	13:00	1.07	1.07	0.004
ZN3B	STORAGE	60.81	60.81	0	13:00	0.489	0.489	0.008

****
Node Surcharge Summary
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Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours	Max. Height Above Crown	Min. Depth Below Rim
MH101	JUNCTION	0.20	0.003	3.342

****
Node Flooding Summary
****

No nodes were flooded.

****
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
1+017a	0.000	0	0	0	0.000	0	0 00:00	0.00
1+017b	0.000	0	0	0	0.000	0	0 00:00	0.00
1+104a	0.000	0	0	0	0.000	0	0 00:00	0.00
1+104b	0.000	0	0	0	0.000	0	0 00:00	0.00
1+179a	0.000	0	0	0	0.000	0	0 00:00	0.00
1+179b	0.000	0	0	0	0.000	0	0 00:00	0.00
1+329	0.000	0	0	0	0.000	0	0 00:00	0.00
CB1	0.000	0	0	0	0.000	0	0 13:00	13.96
CB2	0.000	2	0	0	0.001	29	0 13:00	12.00
CB3	0.000	2	0	0	0.001	27	0 13:00	11.54
CB4	0.000	1	0	0	0.000	12	0 13:00	7.54
CB401	0.000	1	0	0	0.000	4	0 13:00	13.10
CB5	0.000	2	0	0	0.001	25	0 13:00	11.13
CB6	0.000	1	0	0	0.000	13	0 13:00	7.62
CB7	0.000	2	0	0	0.001	21	0 13:00	10.14
CB8	0.000	2	0	0	0.000	20	0 13:00	9.87
CB9	0.000	2	0	0	0.001	22	0 13:00	10.46
CBMH101	0.000	1	0	0	0.003	7	0 13:00	28.46
CBMH206	0.000	4	0	0	0.002	55	0 13:04	25.08
CBMH207	0.000	3	0	0	0.001	43	0 13:04	23.33

HPRYS	0.000	0	0	0	0.000	0	0	00:00	0.00
LD208	0.000	1	0	0	0.001	25	0	13:03	12.51
MH201	0.001	23	0	0	0.001	23	0	13:01	112.41
MH202	0.000	2	0	0	0.000	8	0	13:02	112.41
MH203	0.000	9	0	0	0.001	14	0	13:01	87.49
MH204	0.000	1	0	0	0.000	5	0	13:00	50.66
MH205	0.000	1	0	0	0.000	4	0	13:00	50.66
MH400	0.000	1	0	0	0.000	5	0	13:00	41.99
TANK1	0.005	3	0	0	0.042	25	0	13:00	50.67
TANK2	0.006	3	0	0	0.057	34	0	13:01	36.87
ZN2A	0.000	0	0	0	0.000	0	0	00:00	57.45
ZN2B	0.000	0	0	0	0.000	0	0	00:00	57.20
ZN3A	0.000	0	0	0	0.000	0	0	00:00	133.55
ZN3B	0.000	0	0	0	0.000	0	0	00:00	60.81

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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
EXDITCH1	17.27	0.73	3.01	0.010
EXDITCH2	5.95	0.33	0.46	0.002
LamarcheA	0.00	0.00	0.00	0.000
LamarcheAC	0.00	0.00	0.00	0.000
LamarcheB	95.75	0.48	6.50	0.036
LamarcheBD	0.00	0.00	0.00	0.000
LamarcheE	0.00	0.00	0.00	0.000
MH100	99.67	37.42	402.31	3.006
XMH13	99.98	5.69	57.20	0.461
XMH15	95.12	12.92	112.41	1.008
System	41.37	57.59	580.88	4.523

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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
1	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
10	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
101-100	CONDUIT	402.31	0	13:00	0.91	0.52	1.00
102-101	CONDUIT	350.49	0	13:00	1.06	0.59	0.87
103-102	CONDUIT	350.43	0	13:00	1.34	0.60	0.68
104-103	CONDUIT	350.50	0	13:00	1.52	0.60	0.62
105	CONDUIT	232.43	0	13:00	1.48	0.64	0.54
106-105	CONDUIT	214.68	0	13:00	1.41	0.50	0.53
107-106	CONDUIT	81.13	0	13:00	1.69	0.24	0.35
11	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
1-101	CONDUIT	13.96	0	13:03	0.85	0.08	0.72
12	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
13	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
14	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
15	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
16	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
2	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
202-201	CONDUIT	112.41	0	13:02	1.10	0.37	0.48
203-202	CONDUIT	87.49	0	13:01	1.13	0.44	0.49
204-203	CONDUIT	50.66	0	13:01	0.83	0.26	0.41
205-204	CONDUIT	50.66	0	13:00	1.04	0.25	0.35
207-206	CONDUIT	23.33	0	13:00	0.66	0.19	1.00
208-207	CONDUIT	12.51	0	12:44	0.54	0.18	1.00
3	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
4	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
5	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
6	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
7	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
8	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
9	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
C1	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C2	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C3	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C4	CONDUIT	0.00	0	00:00	0.00	0.00	0.00

C5	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C6	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
CAP4-104	CONDUIT	41.99	0	13:00	1.15	0.43	0.51
CB3/2	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
CB5/4	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
CB7/6	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
OVF2A	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
OVF2B	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
OVFA1	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
STM-36_(STM)	CONDUIT	13.10	0	13:00	0.51	0.14	0.39
STM-39_(STM)	CONDUIT	112.41	0	13:02	0.31	0.23	1.00
CAP3b-107	ORIFICE	60.81	0	13:00			1.00
OR1	ORIFICE	11.54	0	13:00			1.00
OR3	ORIFICE	12.00	0	13:00			1.00
OR3A	ORIFICE	133.55	0	13:00			1.00
OR4	ORIFICE	7.62	0	13:00			1.00
OR5	ORIFICE	10.14	0	13:00			1.00
ORCB4	ORIFICE	7.54	0	13:00			1.00
ORCB5	ORIFICE	11.13	0	13:00			1.00
ORCB8	ORIFICE	9.87	0	13:00			1.00
ORCB9	ORIFICE	10.46	0	13:00			1.00
ORCBMH206	ORIFICE	25.08	0	13:04			1.00
ORTANK1	ORIFICE	50.67	0	13:00			1.00
ORTANK2	ORIFICE	36.87	0	13:01			1.00
ORZN2a	ORIFICE	57.45	0	13:00			1.00
ORZN2b	ORIFICE	57.20	0	13:00			1.00
STM-23_(STM)	ORIFICE	28.46	0	13:00			1.00

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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
1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	1.00	1.00	0.00	0.00	0.00	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	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
103-102	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
104-103	1.00	0.00	0.00	0.00	0.96	0.02	0.00	0.02	0.91	0.00
105	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
106-105	1.00	0.00	0.00	0.00	0.05	0.00	0.00	0.95	0.00	0.00
107-106	1.00	0.00	0.00	0.00	0.00	0.04	0.00	0.96	0.00	0.00
11	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-101	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.02	0.00
12	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
14	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
15	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
16	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202-201	1.00	0.00	0.00	0.00	0.90	0.00	0.00	0.10	0.83	0.00
203-202	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
204-203	1.00	0.00	0.00	0.00	0.10	0.00	0.00	0.90	0.04	0.00
205-204	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
207-206	1.00	0.00	0.00	0.00	0.10	0.00	0.00	0.90	0.03	0.00
208-207	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.96	0.00
3	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C3	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C6	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CAP4-104	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
CB3/2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CB5/4	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CB7/6	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OVF2A	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OVF2B	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OVFA1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STM-36_(STM)	1.00	0.00	0.00	0.00	0.50	0.41	0.00	0.09	0.49	0.00

STM-39_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00

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Conduit Surcharge Summary
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Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
101-100	0.37	0.37	24.00	0.01	0.01
102-101	0.01	0.01	0.20	0.01	0.01
1-101	0.01	0.01	0.50	0.01	0.01
207-206	0.82	0.82	1.66	0.01	0.01
208-207	0.39	0.39	0.93	0.01	0.01
STM-39_(STM)	24.00	24.00	24.00	0.01	0.01

Analysis begun on: Wed Dec 22 12:38:06 2021
Analysis ended on: Wed Dec 22 12:38:08 2021
Total elapsed time: 00:00:02

5.0 STORMWATER MANAGEMENT

5.1 Existing Stormwater Drainage

The existing site drains via sheet flow from north to south to the existing EUC Pond 1, which outlets to Mud Creek.

The subject site was contemplated in the ***Design Brief*** and construction of a storm sewer varying from 300mm to 1350mm in diameter, fronting the subject site within Avenue de Lamache is underway during the time of publication of this report.

5.2 Post-Development Stormwater Management Targets

Stormwater management for the subject property has been contemplated in the ***Design Brief*** and ***OV SWM Report***. The site is required to provide:

- Quantity controls to attenuate stormwater runoff to capture rates for Blocks 147 to 150 per ***Table 5*** for all storms up to and including the 100-year event;
- Provide an estimated storage volume of ***1780m^3*** (based on preliminary analysis of the ***OV SWM Report***), to be confirmed with detailed analysis and actual percent imperviousness during detailed design;

Table 5
Summary of Stormwater Management Targets

	Area (ha)	Capture Rate* (L/s)	Storage Required (m^3)
Block 147	2.16	405	380
Block 148	2.54	457	470
Block 149	2.86	501	545
Block 150	2.17	406	385
External Area**	0.75	73	0

Capture rates per JFSA **OV SWM Report*
*** 2-Year Capture contemplated in the storm sewer design from the **Design Brief***

- Approximately ***0.64 Ha*** and ***0.11 Ha*** of external residential properties fronting Innes Road was contemplated to drain to Blocks 147 & 148 and Blocks 149 & 150, respectively. The 2-year flow rate from the external areas is proposed to be added to the allowable release rates for Blocks 147,148, 149 and 150 described above.

5.3 Proposed Stormwater Management System

The subject property is anticipated to discharge to the future 825mm storm sewer within Avenue de Lamache. The storm sewers have been sized to convey the 2-year flow from the subject site, refer to ***Appendix D*** for stormwater drainage plans and design sheets extracted from the ***Design Brief***.

The quantity and quality control has been prescribed by the ***Design Brief*** and ***OV SWM Report.*** It is anticipated to use a combination of surface, rooftop and subsurface storage to provide the ***1780m^3*** of preliminary required storage to control the flow to a maximum of ***1842 L/s***.

5.4 Stormwater Servicing Conclusions

Stormwater management for the subject site was contemplated in the ***Design Brief*** and ***OV SWM Report***. Minor system flow is anticipated to be directed to a future 825mm storm sewer within Avenue de Lamache, the subject site was contemplated in the minor system design of the subdivision.

To accommodate the 100-year storm event, it is anticipated to use a combination of surface, rooftop and subsurface storage to provide the ***1780m^3*** of preliminary required on-site storage to control the release rate to a maximum of the 2-year storm event or a total flow of ***1842 L/s*** per the ***OV SWM Report***.

Quality control to be provided by the EUC Pond 1 in accordance with the ***Design Brief.***

The proposed stormwater design conforms to all relevant City Guidelines and Policies.

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Arterial Roads Return Frequency = 10 years

Manning 0.013

	LOCATION		AREA (Ha)														FLOW						SEWER DATA								
			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
			AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	Conc.	2 Year	5 Year	10 Year	100 Year										
Location	From Node	To Node	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	FLOW (min.	Q/Q full
West Boundary STM System																																
					0.00	0.00			0.00	0.00			0.00	0.00	1.74	0.55	2.66	2.66														
					0.00	0.00			0.00	0.00			0.00	0.00	0.02	0.70	0.04	2.70														
					0.00	0.00			0.00	0.00			0.00	0.00	0.14	0.50	0.19	2.89														
					0.00	0.00			0.00	0.00			0.00	0.00	0.05	0.50	0.07	2.96	Tc=340/(2*60)+10min. (For 340.0m and 2.0m/s)					-59	FLOW TO MH C8 TO 5								
	MH C12 (100yr. Intake	HW C13			0.00	0.00			0.00	0.00			0.00	0.00	0.44	0.50	0.61	3.58	12.80	67.50	91.41	0.00	156.46	500	600	600	CONC	0.90	22.0	583	2.06	0.18	0.86
	.																															

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

Designed: P.P./C.M.	PROJECT: **Caivan Communities** **Orleans Village**		
Checked: M.Z.	LOCATION: **City of Ottawa**		
Dwg. Reference:	File Ref:	Date: 30 Oct 2018	Sheet No. SHEET 1 OF 5

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Arterial Roads Return Frequency = 10 years

Manning 0.013

	LOCATION		AREA (Ha)																FLOW						SEWER DATA							
			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
			AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	Conc.	2 Year	5 Year	10 Year	100 Year										
Location	From Node	To Node	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	FLOW (min.	Q/Q full
Block 155 - 2003																																
Contribution From Block 155, Pipe C8 - 5																								59	SUBDRAIN FLOW							
	C8	5			0.00	0.00			0.00	0.00			0.00	0.00	0.06	0.50	0.08	0.08	10.00	76.81	104.19	0.00	178.56	74	300	300	PVC	1.00	26.0	97	1.37	0.32	0.76
To Cercle du Ponthieu Circle, Pipe 5 - 56						0.00				0.00				0.00				0.08	10.32					59									
Rue de Beaugency Street-08																																
	CTRL MH 106	4	0.66	0.40	0.73	0.73			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	56	300	300	CONC	0.50	10.5	68	0.97	0.18	0.82
			0.13	0.50	0.18	0.18			0.00	0.00			0.00	0.00			0.00	0.00														
	4	58	0.25	0.70	0.49	1.40			0.00	0.00			0.00	0.00			0.00	0.00	10.18	76.12	103.25	0.00	176.92	107	375	375	PVC	0.70	81.5	147	1.33	1.02	0.73
			0.14	0.70	0.27	1.01			0.00	0.00			0.00	0.00			0.00	0.00														
	58	57	0.22	0.50	0.31	3.45			0.00	0.00			0.00	0.00			0.00	0.00	11.20	72.47	98.24	0.00	168.26	250	450	450	PVC	1.25	61.5	319	2.00	0.51	0.78
To Avenue de Lamarche Avenue, Pipe 57 - 1TEE						3.45				0.00				0.00				0.00	11.72														
Contribution Block 155, Pipe C8 - 5						0.00				0.00				0.00				0.08	10.32					59									
			0.30	0.50	0.42	0.42			0.00	0.00			0.00	0.00			0.00	0.08														
	5	56	0.63	0.70	1.23	1.64			0.00	0.00			0.00	0.00			0.00	0.08	10.32	75.61	102.55	0.00	175.71	198	675	675	CONC	0.95	138.0	819	2.29	1.00	0.24
To Avenue de Lamarche Avenue, Pipe 56 - 57						1.64				0.00				0.00				0.08	11.32					59									
	5	6			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	0	300	300	PVC	1.00	14.5	97	1.37	0.18	0.00
	6	7			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.18	76.13	103.27	0.00	176.96	0	300	300	PVC	0.65	47.0	78	1.10	0.71	0.00
	7	8			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.89	73.56	99.73	0.00	170.84	0	300	300	PVC	0.55	12.0	72	1.01	0.20	0.00
			0.13	0.50	0.18	0.18			0.00	0.00			0.00	0.00			0.00	0.00														
	8	9	0.27	0.70	0.53	0.71			0.00	0.00			0.00	0.00			0.00	0.00	11.08	72.88	98.80	0.00	169.22	51	300	300	PVC	0.55	68.0	72	1.01	1.12	0.72
	CTRL MH 105	9	0.71	0.40	0.79	0.79			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	61	375	375	PVC	0.40	10.5	111	1.00	0.17	0.55
			0.18	0.50	0.25				0.00	0.00			0.00	0.00			0.00	0.00														
	9	57	0.20	0.70	0.39	2.14			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	164	375	375	CONC	1.30	71.5	200	1.81	0.66	0.82
To Avenue de Lamarche Avenue, Pipe 57 - 1TEE						2.14				0.00				0.00				0.00	10.17														
Voie de Lesage Way - 05																																
	410	42	0.07	0.70	0.14	0.14			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	10	300	300	PVC	0.69	51.0	80	1.14	0.75	0.13
			0.17	0.50	0.24	0.37			0.00	0.00			0.00	0.00			0.00	0.00														
	42	45	0.35	0.70	0.68	1.05			0.00	0.00			0.00	0.00			0.00	0.00	10.75	74.05	100.40	0.00	172.00	78	375	375	PVC	0.35	103.0	104	0.94	1.83	0.75
	45	46			0.00	1.05			0.00	0.00			0.00	0.00			0.00	0.00	12.58	68.15	92.31	0.00	158.00	72	375	375	PVC	0.72	10.5	149	1.35	0.13	0.48
			0.05	0.50	0.07	1.12			0.00	0.00			0.00	0.00			0.00	0.00														
	46	47	0.25	0.70	0.49	1.61			0.00	0.00			0.00	0.00			0.00	0.00	12.71	67.77	91.79	0.00	157.10	109	450	450	CONC	0.47	45.5	195	1.23	0.62	0.56
To Terrase de Vennecy Terrace, Pipe 47 - 54						1.61				0.00				0.00				0.00	13.32														
Terrase de Vennecy Terrace - 06																																
			0.22	0.50	0.31	0.31			0.00	0.00			0.00	0.00			0.00	0.00														
	42	43	0.26	0.70	0.51	0.81			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	62	375	375	PVC	0.66	45.5	142	1.29	0.59	0.44
	43	44			0.00	0.81			0.00	0.00			0.00	0.00			0.00	0.00	10.59	74.62	101.19	0.00	173.36	61	375	375	PVC	1.04	10.5	179	1.62	0.11	0.34
			0.13	0.50	0.18	0.99			0.00	0.00			0.00	0.00			0.00	0.00														
	44	47	0.34	0.70	0.66	1.65			0.00	0.00			0.00	0.00			0.00	0.00	10.70	74.23	100.65	0.00	172.44	123	450	450	CONC	0.38	103.0	176	1.11	1.55	0.70
Contribution From Voie de Lesage Way, Pipe 46 - 47						1.61				0.00				0.00				0.00	13.32														
			0.05	0.50	0.07	3.33			0.00	0.00			0.00	0.00			0.00	0.00														
			0.12	0.50	0.17	3.50			0.00	0.00			0.00	0.00			0.00	0.00														
			0.13	0.50	0.18	3.68			0.00	0.00			0.00	0.00			0.00	0.00														
	47	54	0.33	0.70	0.64	4.32			0.00	0.00			0.00	0.00			0.00	0.00	13.32	66.03	89.40	0.00	152.98	285	600	600	CONC	0.39	111.5	383	1.36	1.37	0.74
	54	55			0.00	4.32			0.00	0.00			0.00	0.00			0.00	0.00	14.69	62.50	84.56	0.00	144.63	270	600	600	CONC	0.35	10.0	363	1.28	0.13	0.74
			0.18	0.50	0.25	4.57			0.00	0.00			0.00	0.00			0.00	0.00														
	55	56	0.31	0.70	0.60	5.18			0.00	0.00			0.00	0.00			0.00	0.00	14.82	62.19	84.13	0.00	143.89	322	675	675	CONC	0.52	110.0	606	1.69	1.08	0.53
To Avenue de Lamarche Avenue, Pipe 56 - 57						5.18				0.00				0.00				0.00	15.91														
Ruelle de Carden Lane - 07																																
			0.28	0.50	0.39	0.39			0.00	0.00			0.00	0.00			0.00	0.00														
	48	52	0.37	0.70	0.72	1.11			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	85	375	375	PVC	1.10	110.0	184	1.66	1.10	0.46
To Avenue de Lamarche Avenue, Pipe 52 - 56						1.11				0.00				0.00				0.00	11.10														

Definitions:
Q = 2.78 AIR, where
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A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

Designed: P.P./C.M.
Checked: M.Z.
Dwg. Reference:

PROJECT: **Caivan Communities**
Orleans Village
LOCATION: **City of Ottawa**
File Ref:
Date: 30 Oct 2018
Sheet No. SHEET 2 OF 5

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Arterial Roads Return Frequency = 10 years

Manning 0.013

	LOCATION		AREA (Ha)																FLOW						SEWER DATA							
			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
			AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	Conc.	2 Year	5 Year	10 Year	100 Year										
Location	From Node	To Node	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	FLOW (min.	Q/Q full
Place de Sandillon Place - 11																																
			0.13	0.50	0.18	0.18			0.00	0.00			0.00	0.00			0.00	0.00														
	36	37	0.26	0.70	0.51	0.69			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	53	300	300	PVC	0.68	59.0	80	1.13	0.87	0.66
			0.17	0.50	0.24	0.92			0.00	0.00			0.00	0.00			0.00	0.00														
	37	38	0.26	0.70	0.51	1.43			0.00	0.00			0.00	0.00			0.00	0.00	10.87	73.61	99.80	0.00	170.96	105	375	375	PVC	0.75	80.5	152	1.37	0.98	0.69
To Avenue de Lamarche Avenue, Pipe 38 - 52						1.43				0.00				0.00				0.00	11.85														
Bois de Cravant Grove - 14																																
Contribution From Croissant des Aubrais Crescent, Pipe 35 - 10						0.00				0.00				0.00				0.00	11.18														
			0.12	0.50	0.17	0.17			0.00	0.00			0.00	0.00			0.00	0.00														
	10	11	0.26	0.70	0.51	0.67			0.00	0.00			0.00	0.00			0.00	0.00	11.18	72.54	98.33	0.00	168.42	49	375	375	PVC	0.38	69.0	108	0.98	1.18	0.45
			0.19	0.50	0.26	0.94			0.00	0.00			0.00	0.00			0.00	0.00														
	11	34	0.29	0.70	0.56	1.50			0.00	0.00			0.00	0.00			0.00	0.00	12.36	68.80	93.19	0.00	159.53	103	375	375	PVC	0.76	80.5	153	1.38	0.97	0.68
To Avenue de Lamarche Avenue, Pipe 34 - 38						1.50				0.00				0.00				0.00	13.33														
Croissant des Aubrais Crescent - 10																																
			0.05	0.50	0.07	0.07			0.00	0.00			0.00	0.00			0.00	0.00														
			0.29	0.50	0.40	0.47			0.00	0.00			0.00	0.00			0.00	0.00														
	31	33	0.68	0.70	1.32	1.80			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	138	450	450	CONC	0.85	143.0	263	1.65	1.44	0.52
To Avenue de Lamarche Avenue, Pipe 33 - 34						1.80				0.00				0.00				0.00	11.44														
	31	35			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	0	300	300	PVC	1.05	9.5	99	1.40	0.11	0.00
	35	10			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.11	76.37	103.60	0.00	177.53	0	300	300	PVC	0.35	52.0	57	0.81	1.07	0.00
To Bois de Cravant Grove, Pipe 10 - 11						0.00				0.00				0.00				0.00	11.18														
	10	49	0.19	0.70	0.37	0.37			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	28	300	300	PVC	0.69	106.5	80	1.14	1.56	0.35
	49	50			0.00	0.37			0.00	0.00			0.00	0.00			0.00	0.00	11.56	71.29	96.61	0.00	165.44	26	300	300	PVC	0.35	9.5	57	0.81	0.20	0.46
			0.13	0.50	0.18	0.55			0.00	0.00			0.00	0.00			0.00	0.00														
			0.17	0.50	0.24	0.79			0.00	0.00			0.00	0.00			0.00	0.00														
	50	52	0.62	0.70	1.21	1.99			0.00	0.00			0.00	0.00			0.00	0.00	11.76	70.66	95.74	0.00	163.94	141	450	450	CONC	0.50	142.5	202	1.27	1.87	0.70
To Avenue de Lamarche Avenue, Pipe 52 - 56						1.99				0.00				0.00				0.00	13.63														
Chemin de Jargeau Road - 04																																
	39	40	0.04	0.54	0.06	0.06			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	5	300	300	PVC	1.60	27.0	122	1.73	0.26	0.04
Contribution From Cours Crevier Walk, Pipe 16 - 40						1.09				0.00				0.00				0.00	11.79														
			0.03	0.54	0.05	1.19			0.00	0.00			0.00	0.00			0.00	0.00														
	40	41	0.24	0.70	0.47	1.66			0.00	0.00			0.00	0.00			0.00	0.00	11.79	70.55	95.60	0.00	163.69	117	525	525	CONC	0.30	54.5	236	1.09	0.83	0.50
Contribution From Rang de Loury Row, Pipe 180 - 41						0.75				0.00				0.00				0.00	10.99														
			0.01	0.70	0.02	2.42			0.00	0.00			0.00	0.00			0.00	0.00														
			0.03	0.54	0.05	2.47			0.00	0.00			0.00	0.00			0.00	0.00														
	41	30	0.13	0.70	0.25	2.72			0.00	0.00			0.00	0.00			0.00	0.00	12.63	68.00	92.10	0.00	157.65	185	525	525	CONC	0.80	64.0	385	1.78	0.60	0.48
To Avenue de Lamarche Avenue, Pipe 30 - 33						2.72				0.00				0.00				0.00	13.23														
Block 158 - 2002																																
															0.06	0.25	0.04	0.04														
															0.95	0.55	1.45	1.49						-29	SUBDRAIN FLOW							
	C100	C4													0.19	0.50	0.26	1.76	10.00	76.81	104.19	0.00	178.56	285	375	375	PVC	3.40	6.0	323	2.93	0.03	0.88
																			10.03														
															0.25	0.55	0.38	0.38														
	C101	C4													0.11	0.50	0.15	0.54	10.00	76.81	104.19	0.00	178.56	67	300	300	PVC	2.00	4.5	137	1.93	0.04	0.49
																			10.04														
	C4	2200															0.00	2.29	10.00	76.81	104.19	0.00	178.56	381	450	450	CONC	2.40	31.0	442	2.78	0.19	0.86
To Cercle de l'Argonaut Circle, Pipe 2200 - 27						0.00				0.00				0.00				2.29	10.19					-29									
Placette de Darvoy Mews - 13																																
	22	24	0.50	0.72	1.00	1.00			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	77	450	450	CONC	0.75	147.5	247	1.55	1.58	0.31
To Avenue de Lamarche Avenue, Pipe 24 - 25						1.00				0.00				0.00				0.00	11.58														
Cercle de l'Argonaut Circle - 12																																
			0.02	0.72	0.04	0.04			0.00	0.00			0.00	0.00			0.00	0.00														
			0.05	0.50	0.07	0.11			0.00	0.00			0.00	0.00			0.00	0.00														
			0.12	0.70	0.23	0.34			0.00	0.00			0.00	0.00			0.00	0.00														
			0.15	0.54	0.23	0.57			0.00	0.00			0.00	0.00			0.00	0.00														
	19	21	0.46	0.72	0.92	1.49			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	114	450	450	CONC	0.75	141.0	247	1.55	1.51	0.46
To Avenue de Lamarche Avenue, Pipe 21 - 24						1.49				0.00				0.00				0.00	11.51														

Definitions:
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A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

Designed: P.P./C.M.
Checked: M.Z.
Dwg. Reference:

PROJECT: **Caivan Communities**
Orleans Village
LOCATION: **City of Ottawa**
File Ref:
Date: 30 Oct 2018
Sheet No. SHEET 3 OF 5

881_STM5_Rev.xlsx

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Arterial Roads Return Frequency = 10 years

Manning 0.013

	LOCATION		AREA (Ha) 2 YEAR				AREA (Ha) 5 YEAR				AREA (Ha) 10 YEAR				AREA (Ha) 100 YEAR				FLOW Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	SEWER DATA DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
			AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	Conc.	2 Year	5 Year	10 Year	100 Year										
Location	From Node	To Node	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	FLOW (min.	Q/Q full
	19	26			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	0	300	300	PVC	0.35	9.5	57	0.81	0.20	0.000
			0.07	0.70	0.14	0.14			0.00	0.00			0.00	0.00			0.00	0.00															
	26	22	0.12	0.54	0.18	0.32			0.00	0.00			0.00	0.00			0.00	0.00	10.20	76.06	103.17	0.00	176.79	24	300	300	PVC	0.40	52.0	61	0.87	1.00	0.393
	22	2200			0.00	0.32			0.00	0.00			0.00	0.00			0.00	0.00	11.20	72.49	98.27	0.00	168.31	23	300	300	PVC	0.41	29.0	62	0.88	0.55	0.370
Contribution From Block 158 Pipe C4 - 2200						0.00				0.00				0.00				2.29	10.19					-29.00									
	2200	27			0.00	0.32			0.00	0.00			0.00	0.00			0.00	2.29	11.75	70.68	95.78	0.00	164.01	399	675	675	CONC	0.50	19.0	594	1.66	0.19	0.670
	27	28			0.00	0.32			0.00	0.00			0.00	0.00			0.00	2.29	11.94	70.08	94.95	0.00	162.58	395	675	675	CONC	1.00	10.5	841	2.35	0.07	0.470
			0.05	0.50	0.07	0.39			0.00	0.00			0.00	0.00			0.00	2.29															
			0.05	0.54	0.08	0.46			0.00	0.00			0.00	0.00			0.00	2.29															
			0.10	0.50	0.14	0.60			0.00	0.00			0.00	0.00			0.00	2.29															
			0.10	0.54	0.15	0.75			0.00	0.00			0.00	0.00			0.00	2.29															
	28	30	0.67	0.70	1.30	2.05			0.00	0.00			0.00	0.00			0.00	2.29	12.01	69.85	94.64	0.00	162.03	515	750	750	CONC	0.50	142.5	787	1.78	1.33	0.654
To Avenue de Lamarche Avenue, Pipe 30 - 33						2.05				0.00				0.00				2.29	13.35					-29									
Rang de Loury Row - 03																																	
	180	18	0.16	0.72	0.32	0.32			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	25	300	300	PVC	1.06	38.0	100	1.41	0.45	0.247
To Cours Crevier Walk, Pipe 18 - 21						0.32				0.00				0.00				0.00	10.45														
			0.19	0.54	0.29	0.29			0.00	0.00			0.00	0.00			0.00	0.00															
	180	41	0.23	0.72	0.46	0.75			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	57	300	300	PVC	0.88	76.0	91	1.28	0.99	0.631
To Chemin de Jargeau Road, Pipe 41 - 30						0.75				0.00				0.00				0.00	10.99														
Cours Crevier Walk - 02																																	
	17	16			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	0	300	300	PVC	2.00	9.5	137	1.93	0.08	0.000
			0.15	0.54	0.23	0.23			0.00	0.00			0.00	0.00			0.00	0.00															
	16	40	0.43	0.72	0.86	1.09			0.00	0.00			0.00	0.00			0.00	0.00	10.08	76.49	103.76	0.00	177.81	83	375	375	PVC	0.44	108.0	116	1.05	1.71	0.714
To Chemin de Jargeau Road, Pipe 40 - 41						1.09				0.00				0.00				0.00	11.79														
	17	18	0.00	0.00	0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	0	300	300	PVC	1.09	48.0	101	1.43	0.56	0.000
Contribution From Rang de Loury Row, Pipe 180 - 18						0.32				0.00				0.00				0.00	10.45														
			0.02	0.72	0.04	0.36			0.00	0.00			0.00	0.00			0.00	0.00															
			0.15	0.54	0.23	0.59			0.00	0.00			0.00	0.00			0.00	0.00															
	18	21	0.21	0.72	0.42	1.01			0.00	0.00			0.00	0.00			0.00	0.00	10.56	74.72	101.32	0.00	173.60	75	375	375	PVC	0.54	67.0	129	1.17	0.96	0.583
To Avenue de Lamarche Avenue, Pipe 21 - 24						1.01				0.00				0.00				0.00	11.52														
Avenue de Lamarche Avenue - 01																																	
			0.05	0.40	0.06	0.06			0.00	0.00			0.00	0.00			0.00	0.00															
	CTRL MH 1200	120	0.52	0.47	0.68	0.74			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	56	300	300	PVC	0.50	16.0	68	0.97	0.28	0.826
			0.04	0.85	0.09	0.83																											
	120	12	0.06	0.85	0.14	0.97			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	75	300	300	PVC	1.51	51.0	119	1.68	0.51	0.628
	12	13	0.35	0.85	0.83	1.80			0.00	0.00			0.00	0.00			0.00	0.00	10.51	74.92	101.60	0.00	174.06	135	375	375	PVC	2.00	76.0	248	2.25	0.56	0.543
			2.86	0.85	6.76				0.00	0.00			0.00	0.00			0.00	0.00															
	CTRL MH 100	13	0.11	0.40	0.12	6.88			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	528	750	750	CONC	0.35	14.5	659	1.49	0.16	0.802
			0.07	0.56	0.11				0.00	0.00			0.00	0.00			0.00	0.00															
	CTRL MH 101	13	2.54	0.85	6.00	6.11			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	469	750	750	CONC	0.30	19.5	610	1.38	0.24	0.770
	13	15	0.18	0.85	0.43	15.22			0.00	0.00			0.00	0.00			0.00	0.00	10.24	75.91	102.97	0.00	176.43	1155	825	825	CONC	1	139	1505	2.82	0.82	0.767
	CTRL MH 103	15	2.17	0.75	4.52	4.52			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	348	675	675	CONC	0.30	15.0	460	1.29	0.19	0.755
	CTRL MH 104	15	2.16	0.75	4.50	4.50			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	346	675	675	CONC	0.30	19.5	460	1.29	0.25	0.751
	15	21	0.30	0.85	0.71	24.95			0.00	0.00			0.00	0.00			0.00	0.00	10.25	75.85	102.88	0.00	176.28	1893	1350	1350	CONC	0.37	59	3247	2.27	0.43	0.583
Contribution From Cours Crevier Walk, Pipe 18 - 21						1.01				0.00				0.00				0.00	11.52														
Contribution From Cercle de l'Argonaut Circle, Pipe 19 - 21						1.49				0.00				0.00				0.00	11.51														
			0.05	0.72	0.10	27.55			0.00	0.00			0.00	0.00			0.00	0.00															
	21	24	0.18	0.54	0.27	27.82			0.00	0.00			0.00	0.00			0.00	0.00	11.52	71.43	96.81	0.00	165.78	1987	1350	1350	CONC	0.43	58.5	3500	2.45	0.40	0.568
Contribution From Placette de Darvoy Mews, Pipe 220 - 24						1.00				0.00				0.00				0.00	11.58														
			0.19	0.54	0.29	29.10			0.00	0.00			0.00	0.00			0.00	0.00															
	24	25	0.26	0.72	0.52	29.62			0.00	0.00			0.00	0.00			0.00	0.00	11.92	70.16	95.06	0.00	162.75	2078	1350	1350	CONC	0.50	41.5	3774	2.64	0.26	0.551
	25	30			0.00	29.62			0.00	0.00			0.00	0.00			0.00	0.00	12.18	69.34	93.94	0.00	160.83	2054	1350	1350	CONC	0.49	14.0	3736	2.61	0.09	0.550

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

Designed: P.P./C.M.
Checked: M.Z.
Dwg. Reference:

PROJECT: **Caivan Communities**
Orleans Village
LOCATION: **City of Ottawa**
File Ref:
Date: 30 Oct 2018
Sheet No. SHEET 4 OF 5

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Arterial Roads Return Frequency = 10 years

Manning 0.013

	LOCATION		AREA (Ha)														FLOW						SEWER DATA								
			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
			AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	Conc.	2 Year	5 Year	10 Year	100 Year										
Location	From Node	To Node	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	FLOW (min.	Q/Q full
Contribution From Cercle de l'Argonaut Circle, Pipe 28 - 30						2.05				0.00				0.00				2.29	13.35					-29									
Contribution From Chemin de Jargeau Road, Pipe 41 - 30						2.72				0.00				0.00				0.00	13.23														
	30	33			0.00	34.40			0.00	0.00			0.00	0.00			0.00	2.29	13.35	65.97	89.31	0.00	152.82	2620	1500	1500	CONC	0.20	63.5	3161	1.79	0.59	0.829
Contribution From Croissant des Aubrais Crescent, Pipe 31 - 33						1.80				0.00				0.00				0.00	11.44														
			0.25	0.50	0.35	36.54			0.00	0.00			0.00	0.00			0.00	2.29															
	33	34	0.31	0.70	0.60	37.15			0.00	0.00			0.00	0.00			0.00	2.29	13.94	64.39	87.15	0.00	149.10	2734	1500	1500	CONC	0.23	58.5	3390	1.92	0.51	0.806
Contribution From Bois de Cravant Grove, Pipe 11 - 34						1.50				0.00				0.00				0.00	13.33														
	34	38			0.00	38.65			0.00	0.00			0.00	0.00			0.00	2.29	14.45	63.10	85.39	0.00	146.05	2774	1500	1500	CONC	0.24	58.5	3463	1.96	0.50	0.801
Contribution From Place de Sandillon Place, Pipe 37 - 38						1.43				0.00				0.00				0.00	11.85														
	38	52	0.28	0.70	0.54	40.62			0.00	0.00			0.00	0.00			0.00	2.29	14.94	61.90	83.74	0.00	143.20	2843	1650	1650	CONC	0.16	54.5	3646	1.71	0.53	0.780
Contribution From Ruelle de Carden Lane, Pipe 48 - 52						1.11				0.00				0.00				0.00	11.10														
Contribution From Croissant des Aubrais Crescent, Pipe 50 - 52						1.99				0.00				0.00				0.00	13.63														
	52	56			0.00	43.72			0.00	0.00			0.00	0.00			0.00	2.29	15.48	60.66	82.05	0.00	140.29	2974	1650	1650	CONC	0.18	58.5	3867	1.81	0.54	0.769
Contribution From Cercle du Ponthieu Circle, Pipe 5 - 56						1.64				0.00				0.00				0.08	11.32					59									
Contribution From Terrase de Vennecy Terrace, Pipe 55 - 56						5.18				0.00				0.00				0.00	15.91														
	56	57	0.11	0.70	0.21	50.76			0.00	0.00			0.00	0.00			0.00	2.38	16.02	59.47	80.41	0.00	137.47	3404	1650	1650	CONC	0.23	60.5	4371	2.04	0.49	0.779
Contribution From Cercle du Ponthieu Circle, Pipe 58 - 57						3.45				0.00				0.00				0.00	11.72														
Contribution From Cercle du Ponthieu Circle, Pipe 9 - 57						2.14				0.00				0.00				0.00	10.17														
	57	1TEE			0.00	56.34			0.00	0.00			0.00	0.00			0.00	2.38	16.51	58.42	78.98	0.00	134.99	3671	1800	1800	CONC	0.15	10.5	4452	1.75	0.10	0.825
To Croissant de Mercier Crescent, Pipe 1TEE - 2TEE						56.34				0.00				0.00				2.38	16.61					30									
Croissant de Mercier Crescent - 09																																	
			0.20	0.50	0.28	0.28			0.00	0.00			0.00	0.00			0.00	0.00															
			0.24	0.50	0.33	0.61			0.00	0.00			0.00	0.00			0.00	0.00															
	590	59	0.39	0.70	0.76	1.37			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	105	375	375	PVC	0.85	102.0	162	1.46	1.16	0.651
	59	63			0.00	1.37			0.00	0.00			0.00	0.00			0.00	0.00	11.16	72.62	98.43	0.00	168.60	100	375	375	PVC	0.45	8.5	118	1.06	0.13	0.846
	63	60			0.00	1.37			0.00	0.00			0.00	0.00			0.00	0.00	11.29	72.17	97.82	0.00	167.53	99	375	375	PVC	0.60	9.0	136	1.23	0.12	0.728
To Unknown Road5, Pipe 60 - 61TEE						1.37				0.00				0.00				0.00	11.42														
Contribution From Avenue de Lamarche Avenue, Pipe 57 - 1TEE						56.34				0.00				0.00				2.38	16.61					30									
			0.19	0.70	0.37	56.71			0.00	0.00			0.00	0.00			0.00	2.38															
	1TEE	2TEE	0.39	0.70	0.76	57.47			0.00	0.00			0.00	0.00			0.00	2.38	16.61	58.21	78.69	0.00	134.50	3695	1800	1800	CONC	0.15	105.0	4452	1.75	1.00	0.830
	2TEE	3TEE	0.25	0.50	0.35	57.81			0.00	0.00			0.00	0.00			0.00	2.38	17.61	56.22	75.97	0.00	129.81	3589	1800	1800	CONC	0.15	13.5	4452	1.75	0.13	0.806
	3TEE	60			0.00	57.81			0.00	0.00			0.00	0.00			0.00	2.38	17.74	55.98	75.64	0.00	129.24	3574	1800	1800	CONC	0.15	41.5	4452	1.75	0.40	0.803
To Block 382, Pipe 60 - 61TEE						57.81				0.00				0.00				2.38	18.13					30									
Block 382 - 51																																	
Contribution From Croissant de Mercier Crescent, Pipe 3TEE - 60						57.81				0.00				0.00				2.38	18.13					30									
Contribution From Croissant de Mercier Crescent, Pipe 63 - 60						1.37				0.00				0.00				0.00	11.42														
	60	61TEE			0.00	59.19			0.00	0.00			0.00	0.00			0.00	2.38	18.13	55.24	74.63	0.00	127.50	3602	1800	1800	CONC	0.15	30.5	4452	1.75	0.29	0.809
	61TEE	62TEE			0.00	59.19			0.00	0.00			0.00	0.00			0.00	2.38	18.42	54.71	73.91	0.00	126.26	3568	1800	1800	CONC	0.15	73.5	4452	1.75	0.70	0.802
	62TEE	600TEE			0.00	59.19			0.00	0.00			0.00	0.00			0.00	2.38	19.12	53.48	72.23	0.00	123.36	3489	1800	1800	CONC	0.15	48.0	4452	1.75	0.46	0.784
	600TEE	64TEE			0.00	59.19			0.00	0.00			0.00	0.00			0.00	2.38	19.58	52.71	71.18	0.00	121.55	3439	1800	1800	CONC	0.15	23.5	4452	1.75	0.22	0.772
	64TEE	65			0.00	59.19			0.00	0.00			0.00	0.00			0.00	2.38	19.81	52.35	70.68	0.00	120.69	3415	1800	1800	CONC	0.15	3.0	4452	1.75	0.03	0.767

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

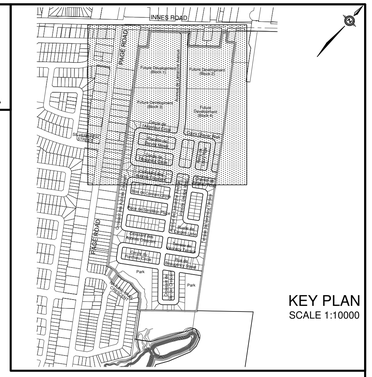
Designed: P.P./C.M.
Checked: M.Z.
Dwg. Reference:

PROJECT: **Caivan Communities**
Orleans Village
LOCATION: **City of Ottawa**
File Ref:
Date: 30 Oct 2018
Sheet No. SHEET 5 OF 5

APPROVED ☐ REFUSED ☐

THIS ____ DAY OF_____, 20____

JOSHUA WHITE, P.ENG
PROJECT MANAGER – EAST BRANCH
PLANNING, INFRASTRUCTURE & ECONOMIC
DEVELOPMENT DEPARTMENT, CITY OF OTTAWA



KEY PLAN
SCALE 1:10000

LEGEND

STORM DRAINAGE BOUNDARY

STORM DRAINAGE BOUNDARY (OTHER PHASES)

UPSTREAM MH TO DOWNSTREAM MH — 43 - 44

AREA IN HECTARES — 0.37

RUNOFF COEFFICIENT — 0.51

EXTERNAL 2.78AC = — 2.78AC=14.40

EXTERNAL TIME OF CONCENTRATION — TC=14.5 MIN

EXTERNAL BLENDED RUNOFF COEFFICIENT — C= 0.70

STREET CATCHBASIN & LEAD
STREET CATCHBASIN WITH CLOSED LID & LEAD MAINTENANCE HOLE — 375 ST MH202

CURB INLET CATCHBASIN & LEAD CATCHBASIN/ MAINTENANCE HOLE — CBMH201

INTERCONNECTED CATCH BASIN & LEADS — 450 E

CAP

OVERLAND FLOW DIRECTION

EXTERNAL OVERLAND FLOW DIRECTION

EMERGENCY OVERLAND FLOW DIRECTION — E

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16-10-116-00. SURVEYS DATED NOVEMBER 30, 2017.

LEGAL INFORMATION

CALCULATED M-PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16-10-116-00 (PHASE 1 & 2) DATED SEPTEMBER 14, 2018.

ELEVATION NOTE

ELEVATION = 86.12 m

ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM SITE BENCHMARK NCC CONTROL POINT 001196530229 HAVING A PUBLISHED ELEVATION OF 86.12m

EAST URBAN COMMUNITY
MIXED USE CENTRE
REFER TO
DAVID SCHAEFFER ENGINEERING LIMITED
PROJECT No. 14-733

REFER TO DWG No. 68

No.	DATE	BY	DESCRIPTION
6.	18-10-30	M.Z.	REVISED M-PLAN
5.	18-07-27	M.Z.	REVISED WEST BOUNDARY STORM SYSTEM
4.	18-07-10	M.Z.	MYLARS FOR PHASE 1 COMMENCE WORK
3.	18-06-28	M.Z.	REVISED AS PER CITY AND UTILITY COMMENTS
2.	18-05-09	M.Z.	ISSUED FOR MOE APPROVAL
1.	18-01-24	M.Z.	1st SUBMISSION

Ottawa CITY OF OTTAWA

PROJECT No. 16-881

LICENSED PROFESSIONAL ENGINEER M. M.ZDRAVEVSKI 100130902 PROVINCE OF ONTARIO

STORM DRAINAGE PLAN

CAIVAN (ORLEANS VILLAGE) LIMITED

ORLEANS VILLAGE

DSEL david schaeffer engineering ltd
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

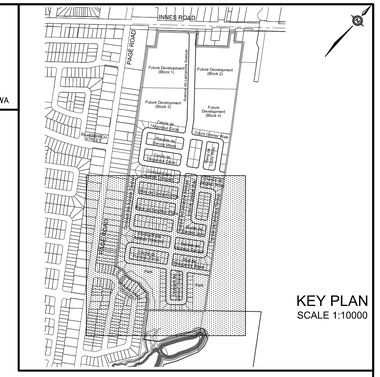
DRAWN BY: M.Z.	CHECKED BY: P.P.	DRAWING NO.	SHEET NO.
DESIGNED BY: P.P.	CHECKED BY: M.Z.		67
SCALE: 1:1000	DATE: JANUARY 2018		

CITY FILE No. D07-16-16-0022 CITY PLAN No. 17675

APPROVED ☐ REFUSED ☐

THIS ____ DAY OF________, 20____

JOSHUA WHITE, P.ENG
PROJECT MANAGER – EAST BRANCH
PLANNING, INFRASTRUCTURE & ECONOMIC
DEVELOPMENT DEPARTMENT, CITY OF OTTAWA



KEY PLAN
SCALE 1:10000

LEGEND

STORM DRAINAGE BOUNDARY
STORM DRAINAGE BOUNDARY (OTHER PHASES)
UPSTREAM MH TO DOWNSTREAM MH → 43 - 44
AREA IN HECTARES → 0.37
RUNOFF COEFFICIENT → 0.51
EXTERNAL 2.78AC = → **2.78AC=14.40**
EXTERNAL TIME OF CONCENTRATION → TC=14.5 MIN
EXTERNAL BLENDED RUNOFF COEFFICIENT → C= 0.70
STREET CATCHBASIN & LEAD
STREET CATCHBASIN WITH CLOSED LID & LEAD
MAINTENANCE HOLE → MH202
CURB INLET CATCHBASIN & LEAD
CATCHBASIN/ MAINTENANCE HOLE → CBMH201
INTERCONNECTED CATCH BASIN & LEADS
CAP
OVERLAND FLOW DIRECTION
EXTERNAL OVERLAND FLOW DIRECTION
EMERGENCY OVERLAND FLOW DIRECTION → E

375mmø ST

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16–10–116–00. SURVEYS DATED NOVEMBER 30, 2017.

LEGAL INFORMATION

CALCULATED M–PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16–10–116–00 (PHASE 1 & 2) DATED SEPTEMBER 14, 2018.

ELEVATION NOTE

ELEVATION = 86.12 m

ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM SITE BENCHMARK NCC CONTROL POINT 001196530229 HAVING A PUBLISHED ELEVATION OF 86.12m

No.	DATE	BY	DESCRIPTION
6.	18–10–30	M.Z.	REVISED M–PLAN
5.	18–07–27	M.Z.	REVISED WEST BOUNDARY STORM SYSTEM
4.	18–07–10	M.Z.	MYLARS FOR PHASE 1 COMMENCE WORK
3.	18–06–28	M.Z.	REVISED AS PER CITY AND UTILITY COMMENTS
2.	18–05–09	M.Z.	ISSUED FOR MOE APPROVAL
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Ottawa CITY OF OTTAWA

PROJECT No. 16–881

M.ZDRAVEVSKI
100130902
18-10-30

STORM DRAINAGE PLAN

© DSEL

CAIVAN
(ORLEANS VILLAGE)
LIMITED

ORLEANS VILLAGE

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DRAWN BY:	M.Z.	CHECKED BY:	P.P.	DRAWING NO.	SHEET NO.
DESIGNED BY:	P.P.	CHECKED BY:	M.Z.		68
SCALE:	1:1000	DATE:	JANUARY 2018		

CITY FILE No. D07-16-16-0022 CITY PLAN No. 17675

APPENDIX E
Drawings

GENERAL NOTES:

1. DIMENSIONS AND LAYOUT INFORMATION SHALL BE CONFIRMED PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. THE ORIGINAL TOPOGRAPHY AND GROUND ELEVATIONS, SERVICING AND SURVEY INFORMATION SHOWN ARE SUPPLIED FOR INFORMATION PURPOSES ONLY. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE ACCURACY OF ALL INFORMATION OBTAINED FROM THIS PLAN.
3. CO-ORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
4. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THESE DRAWINGS.
5. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
6. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
7. CONNECT TO EXISTING SYSTEMS AS DETAILED, INCLUDING ALL RESTORATION WORK NECESSARY TO REINSTATE SURFACES TO EXISTING CONDITIONS OR BETTER.
8. RESTORE ALL TRENCHES AND SURFACE FEATURES TO EXISTING CONDITIONS OR BETTER AND TO THE SATISFACTION OF MUNICIPAL AUTHORITIES.
9. ASPHALT RESTORATION SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA DETAIL R-10. THICKNESS OF GRANULAR MATERIAL AND ASPHALT LAYERS TO MATCH EXISTING. BOULEVARDS SHALL BE REINSTATED WITH 100mm OF TOPSOIL, SEED AND MULCH.
10. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
11. ALL ELEVATIONS ARE GEODETIC AND UTILIZE METRIC UNITS.
12. ALL FENCING TO BE LOCATED 0.15m INSIDE PROPERTY LINE. REFER TO LANDSCAPING PLAN FOR DETAILS.
13. PERFORATED PIPE SUB-DRAINS TO BE PROVIDED AT SUBGRADE LEVEL EXTENDING FROM THE ROADSIDE CATCHBASIN FOR A DISTANCE OF 3.0m, PARALLEL TO THE CURB IN TWO DIRECTIONS.
14. REFER TO GEOTECHNICAL REPORT (No. PG4488-1, DATED MAY 21, 2019), PREPARED BY PATERSON GROUP) FOR SUBSURFACE SOIL AND GROUNDWATER CONDITIONS, CONSTRUCTION RECOMMENDATIONS, AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
15. REFER TO THE STORMWATER MANAGEMENT REPORT No. R-2021-194, DATED DECEMBER 22, 2021 PREPARED BY NOVATECH.
16. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
17. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN, AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/G ELEVATIONS, STRUCTURE LOCATIONS, VALVE AND HYDRANT LOCATIONS, T/WM ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC.

SEWER NOTES:

1. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
SANITARY/STORM/CATCHBASIN MANHOLE (1200Ø)	701.010	OPSD
CATCHBASIN (600x600)	705.010	OPSD
CATCHBASIN FRAME AND COVER	400.020	OPSD
STORM/SANITARY MH FRAME	S25	CITY OF OTTAWA
SANITARY COVER	S24	CITY OF OTTAWA
STORM COVER (CLOSED)	S24.1	CITY OF OTTAWA
STORM COVER (OPEN)	S28.1	CITY OF OTTAWA
SEWER TRENCH	S6 &S7	CITY OF OTTAWA
CLAY SEAL	S8	CITY OF OTTAWA
STORM SEWER < 450mmØ	PVC DR 35(UNLESS SPECIFIED OTHERWISE)	
STORM SEWER >= 450mmØ	CONC 65D (UNLESS SPECIFIED OTHERWISE)	
SANITARY SEWER	PVC DR 35	CITY OF OTTAWA

2. INSULATE ALL PIPES (SAN/STM) THAT HAVE LESS THAN 2.0m COVER WITH 50mmX1200mm HI-40 INSULATION. PROVIDE 150mm CLEARANCE BETWEEN PIPE AND INSULATION.
3. SERVICES ARE TO BE CONSTRUCTED TO PROPERTY LINE AT MINIMUM SLOPE OF 1.0% (2.0% IS PREFERRED).
4. PIPE BEDDING, COVER AND BACKFILL ARE TO BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. THE USE OF CLEAR CRUSHED STONE AS A BEDDING LAYER SHALL NOT BE PERMITTED.
5. SEWER SERVICE CONNECTIONS PER CITY OF OTTAWA DETAILS S11 AND S11.1.
6. FLEXIBLE CONNECTIONS ARE REQUIRED FOR CONNECTING PIPES TO MANHOLES (FOR EXAMPLE KOR-N-SEAL, PSX: POSITIVE SEAL AND DURASEAL). THE CONCRETE CRADLE FOR THE PIPE CAN BE ELIMINATED.
7. THE OWNER SHALL REQUIRE THAT THE SERVICING CONTRACTOR PERFORM FIELD TESTS FOR QUALITY CONTROL OF ALL SANITARY SEWERS. LEAKAGE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH OPSS 410.07.16 AND 407.07.24. DYE TESTING IS TO BE COMPLETED ON ALL SANITARY SERVICES TO CONFIRM PROPER CONNECTION TO THE SANITARY SEWER MAIN. THE FIELD TESTS SHALL BE PERFORMED IN THE PRESENCE OF A CERTIFIED PROFESSIONAL ENGINEER WHO SHALL SUBMIT A CERTIFIED COPY OF TEST RESULTS.
8. STORM MANHOLES AND CBMHS SHALL HAVE 300mm SUMPS UNLESS OTHERWISE INDICATED.
9. CONTRACTOR TO TELEVISE (CCTV) ALL PROPOSED SEWERS, 200mmØ OR GREATER PRIOR TO BASE COURSE ASPHALT, UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH AND CLEAN ALL SEWERS & APPURTENANCES.

WATERMAIN NOTES:

1. GENERAL:

ITEM	DETAIL No.	REFERENCE
WATERMAIN TRENCHING	W17	CITY OF OTTAWA
THERMAL INSULATION IN SHALLOW TRENCHES	W22	CITY OF OTTAWA
WATERMAIN CROSSING BELOW SEWER / OVER SEWER	W25 / W25.2	CITY OF OTTAWA
WATERMAIN	PVC DR18	CITY OF OTTAWA
VALVE CHAMBER	W11	CITY OF OTTAWA
VALVE BOX	W24	CITY OF OTTAWA

2. THE WATERMAIN SHALL BE PVC DR 18 IN ACCORDANCE WITH MATERIAL SPECIFICATION MW-18.1, UNLESS OTHERWISE INDICATED.
3. SUPPLY AND CONSTRUCT ALL WATERMAINS AND APPURTENANCES IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARDS AND SPECIFICATIONS. EXCAVATION, INSTALLATION, BACKFILL AND RESTORATION OF ALL WATERMAINS BY THE CONTRACTOR. CONNECTIONS AND SHUT-OFFS AT THE MAIN AND CHLORINATION OF THE WATER SYSTEM SHALL BE PERFORMED BY CITY OFFICIALS.
4. WATERMAIN SHALL BE MINIMUM 2.4m DEPTH BELOW GRADE UNLESS OTHERWISE INDICATED.
5. PROVIDE MINIMUM 0.25m CLEARANCE BETWEEN OUTSIDE OF PIPES AT ALL CROSSINGS.
6. WATER SERVICE SHALL BE CONSTRUCTED TO WITHIN 1.0mOF FOUNDATION WALL AND CAPPED, UNLESS OTHERWISE INDICATED.

EROSION AND SEDIMENT CONTROL NOTES :

1. ALL EROSION AND SEDIMENT CONTROLS SHALL BE INSTALLED TO THE SATISFACTION OF THE ENGINEER, CITY OF OTTAWA AND THE CONSERVATION AUTHORITY. THEY SHALL BE APPROPRIATE TO THE SITE CONDITIONS, PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.) AND DURING ALL PHASES OF SITE PREPARATION AND CONSTRUCTION. THESE PRACTICES SHALL BE IMPLEMENTED IN ACCORDANCE WITH THE CURRENT BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL AND SHOULD INCLUDE AS A MINIMUM THOSE MEASURES INDICATED ON THE PLAN.
2. TO PREVENT SURFACE EROSION FROM ENTERING THE DITCH OR STORM SYSTEM DURING CONSTRUCTION, FILTER SOCKS WILL BE PLACED UNDER GRATES OF ALL PROPOSED AND EXISTING CATCHBASINS AND STRUCTURES. A LIGHT DUTY SILT FENCE BARRIER WILL ALSO BE INSTALLED IN SELECTED LOCATIONS, AND STRAW BALE BARRIERS WILL BE INSTALLED WITHIN THE OUTLET DITCHES. THESE CONTROL MEASURES WILL REMAIN IN PLACE UNTIL VEGETATION HAS BEEN ESTABLISHED AND CONSTRUCTION COMPLETE.
3. THE SEDIMENT CONTROL MEASURES SHALL ONLY BE REMOVED WHEN, IN THE OPINION OF THE ENGINEER, THE MEASURES ARE NO LONGER REQUIRED. NO CONTROL MEASURES MAY BE PERMANENTLY REMOVED WITHOUT PRIOR AUTHORIZATION FROM THE ENGINEER.
4. THE CONTRACTOR SHALL IMMEDIATELY REPORT TO THE ENGINEER ANY ACCIDENTAL DISCHARGES OF SEDIMENT MATERIAL INTO ANY DITCH OR STORM SEWER SYSTEM. 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.
5. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
6. THE CONTRACTOR SHALL PROVIDE DUST CONTROL WITH THE APPLICATION OF WATER AND/OR CALCIUM CHLORIDE AS REQUIRED.

GRADING NOTES:

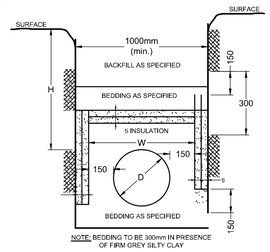
1. ALL TOPSOIL, ORGANIC OR DELETERIOUS MATERIAL MUST BE ENTIRELY REMOVED FROM BENEATH THE PROPOSED PAVED AREAS AS DIRECTED BY THE SITE ENGINEER OR GEOTECHNICAL ENGINEER.
2. EXPOSED SUBGRADES IN PROPOSED PAVED AREAS SHOULD BE PROOF ROLLED WITH A LARGE STEEL DRUM ROLLER AND INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF GRANULARS.
3. ANY SOFT AREAS EVIDENT FROM THE PROOF ROLLING SHOULD BE SUB-EXCAVATED AND REPLACED WITH SUITABLE MATERIAL THAT IS FROST COMPATIBLE WITH THE EXISTING SOILS AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
4. THE GRANULAR BASE SHOULD BE COMPACTED TO AT LEAST 100% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE IN 300mm THICK LIFTS. ANY ADDITIONAL GRANULAR FILL USED BELOW THE PROPOSED PAVEMENT SHOULD BE COMPACTED TO AT LEAST 100% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE.
5. MINIMUM OF 2% GRADE FOR ALL GRASS AREAS UNLESS OTHERWISE NOTED.
6. MAXIMUM TERRACING GRADE TO BE 3:1 UNLESS OTHERWISE NOTED.
7. ALL GRADES BY CURBS ARE EDGE OF PAVEMENT GRADES UNLESS OTHERWISE INDICATED.
8. ALL CURBS SHALL BE BARRIER CURB (150mm) UNLESS OTHERWISE NOTED AND CONSTRUCTED AS PER CITY OF OTTAWA STANDARDS (SC1.1).
9. REFER TO LANDSCAPE PLAN FOR PLANTING AND OTHER LANDSCAPE FEATURE DETAILS.
10. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GRADING PLAN INDICATING AS-BUILT ELEVATIONS OF ALL DESIGN GRADES SHOWN ON THIS PLAN.

SEWER & WATERMAIN INSULATION NOTES:

1. INSULATE ALL SEWER PIPES THAT HAVE LESS THAN 2.0m COVER AND ALL WATERMAIN WITH LESS THAN 2.4m OF COVER WITH EXPANDED POLYSTYRENE INSULATION AS PER OPSD 1109.030.
2. THE THICKNESS OF INSULATION SHALL BE THE EQUIVALENT OF 25mm FOR EVERY 300mm REDUCTION IN THE REQUIRED DEPTH OF COVER WITH 50mm MINIMUM (SEE TABLE)

COVER SEWER / WATER (mm)	INSULATION THICKNESS (mm)
2000-1700 / 2400-2100	50
1700-1400 / 2100-1800	75
1400-1100 / 1800-1500	100

T = THICKNESS OF INSULATION (mm)
W = WIDTH OF INSULATION (mm)
W = D + 300 (1000 min.)
D = O.D OF PIPE (mm)



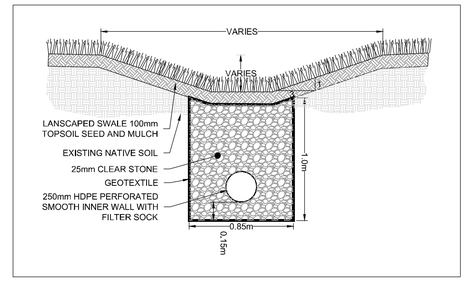
NOTE: BEDDING TO BE 300mm IN PRESENCE OF FIRM GREY SILTY CLAY

INSULATION DETAIL FOR SHALLOW SEWERS & WATERMAIN
N.T.S

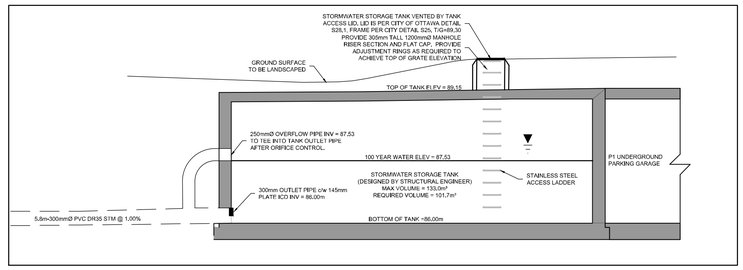
150mmØ WATERMAIN TABLE			
STATION	ELEVATION	TOP OF WATERMAIN	DESCRIPTION
1+000.0	89.43	87.00	REMOVE EX CAP AND CONNECT TO EXISTING WATERMAIN
1+001.9	89.50	87.10	150 X 150mm TEE
1+003.4	89.57	87.17	45° HORIZONTAL BEND
1+009.0	89.69	87.30	CAP AT 1.0m FROM FOUNDATION WALL

150mmØ WATERMAIN TABLE			
STATION	ELEVATION	TOP OF WATERMAIN	DESCRIPTION
2+000.0	89.38	86.98	REMOVE EX. CAP AND CONNECT TO EXISTING WATERMAIN, 45° HORIZONTAL BEND
2+002.8	89.41	87.01	45° HORIZONTAL BEND
2+007.2	89.50	87.10	150 X 150mm TEE

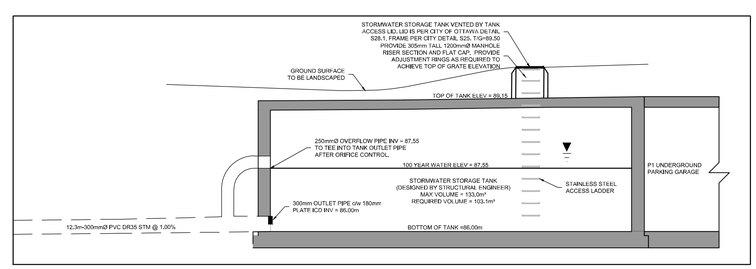
PIPE CROSSING TABLE			
CROSSING	LOWER PIPE	HIGHER PIPE	CLEARANCE
1	200mmØ SAN OBV = 86.38	375mmØ STM INV = 87.32	±0.94m



TYPICAL SWALE CROSS-SECTION DETAIL
N.T.S



STORMWATER TANK 01
N.T.S



STORMWATER TANK 02
N.T.S

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
1.	ISSUED FOR SITE PLAN APPLICATION	DEC 22/21	MJH

SCALE: AS SHOWN

DESIGN: MJH/ARM
CHECKED: CJR
DRAWN: MJH/ARM
CHECKED: CJR
APPROVED: JLS

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER A. R. WESTWARP 100201994 DEC 22/21 PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER M. J. RACHORIAK 100211356 DEC 22/21 PROVINCE OF ONTARIO

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Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
240-270 LAMARCHE AVENUE & 3484 INNES ROAD

DRAWING NAME
NOTES AND DETAILS - BLOCK 1

PROJECT No. 121214
REV REV # 1
DRAWING No. 121214 - NDB1

M:\2021\121214\CAD\Design\Zone 1\121214 - Z1 - ND.dwg, ND, Dec 22, 2021 - 4:25pm, amestwarp

PLAN41.DWG - 841mmx594mm


LEGEND
PROPERTY LINE
PROPOSED CURB
PROPOSED DEPRESSED CURB
PROPOSED STORM MANHOLE
PROPOSED CATCHBASIN MANHOLE
PROPOSED CATCHBASIN
PROPOSED LANDSCAPE DRAIN
PROPOSED AREA DRAIN
PROPOSED BUILDING ENTRANCE
PROPOSED TRANSFORMER
PROPOSED SWALE
TERRACING 3:1 SLOPE MAX (UNLESS OTHERWISE INDICATED)
PROPOSED FILTER BAGS AT CATCHBASINS, AND CATCHBASIN MANHOLES
PROPOSED MUD MAT
LIGHT DUTY SILT FENCE (OPSD 219.110)
STRAW BALE BARRIER AS PER OPSD 219.180
EXISTING STORM MANHOLE
EXISTING CATCHBASIN
EXISTING CATCHBASIN MANHOLE
WIDTH VARIES WIDTH OF ENTRANCE
200mm MINIMUM
50mmØ TO 100mmØ CRUSHED STONE
6.5m MINIMUM
MUD MAT DETAIL
NOT TO SCALE
NORTH
KEY PLAN
N.T.S.
SITE
PARKLAND BLOCK
CROISSANT FRANCOISE
LAMARCHE AVENUE
PAVILION A
6 FLOOR
FFE =89.80
PAVILION B
7 FLOOR
FFE = 89.60
PAVILION C
7 FLOOR
FFE = 89.30
POOL
FFE = 89.20
RECREATIONAL AREA
GARDEN AREA
STRAW BALE BARRIER AS PER OPSD 219.180
LIGHT DUTY ESC SILT FENCE PER OPSD 219.110
LIMIT OF UNDERGROUND PARKING
1.5m ASPH. WALKWAY
1.2m ASPH. WALKWAY
1.1m ASPH. WALKWAY
3.0m MULTI-USE PATH
2.0m CONC. SIDEWALK
CB 401
CBMH 400
CICB 05
CICB 04
STMMH 103
STMMH 102
STMMH 101
CICB 02
CICB 03
CICB 01
STMMH 100
CB 1
CBMH 101
AD 1003
AD 1002
AD 1001
AD 1000
STMMH 02
STMMH 01
STMMH 205
STMMH 204
STMMH 203
STMMH 202
STMMH 201
LD 208
CBMH 207
CBMH 206
REFER TO 121214 - NDZ1 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.

NOT FOR CONSTRUCTION

No.	REVISION	DATE	BY
1.	ISSUED FOR SITE PLAN APPLICATION	DEC 22/21	MJH

SCALE 1:300

DESIGN MJH/ARM · CHECKED CJR · DRAWN MJH/ARM · CHECKED CJR · APPROVED JLS

FOR REVIEW ONLY

A. R. MESTWARP 100201804 DEC 22/21 — LICENSED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

M. J. HAPHORIAK 100217255 DEC 22/21 — LICENSED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

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Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
240-270 LAMARCHE AVENUE & 3484 INNES ROAD

DRAWING NAME
EROSION AND SEDIMENT CONTROL PLAN - BLOCK 1

PROJECT No. 121214
REV # 1
DRAWING No. 121214-ESCB1

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.

NOT FOR CONSTRUCTION

No.	REVISION	DATE	BY
1.	ISSUED FOR SITE PLAN APPLICATION	DEC22/21	MJH

SCALE 1:300

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

FOR REVIEW ONLY

A. R. MESTWARP 100201694 DEC 22/21 — LICENSED PROFESSIONAL ENGINEER PROVINCE OF ONTARIO

M. J. HABORIAK 100211256 DEC 22/21 — LICENSED PROFESSIONAL ENGINEER PROVINCE OF ONTARIO

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LOCATION
CITY OF OTTAWA
240-270 LAMARCHE AVENUE & 3484 INNES ROAD

DRAWING NAME
GENERAL PLAN OF SERVICING - BLOCK 1

PROJECT No. 121214
REV # 1
DRAWING No. 121214-GPB1

LEGEND

- PROPERTY LINE
- PROPOSED BARRIER CURB
- DC — PROPOSED DEPRESSED CURB
- 98.40 — PROPOSED ELEVATION
- x 98.40 — EXISTING ELEVATION
- x 97.79(S) — PROPOSED SWALE ELEVATION
- x 97.79TW — PROPOSED TOP OF WALL ELEVATION
- x 97.79BW — PROPOSED BOTTOM OF WALL ELEVATION
- x 97.88TC — PROPOSED TOP OF CURB ELEVATION
- V&VB — PROPOSED VALVE AND VALVE BOX
- FDSC — FIRE DEPARTMENT SIAMESE CONNECTION
- PROPOSED BUILDING ENTRANCE
- H.P. — PROPOSED HIGH POINT
- SWALE C/W SUBDRAIN AND DIRECTION OF FLOW
- TERRACING 3:1 SLOPE MAX (UNLESS OTHERWISE INDICATED)
- PROPOSED RETAINING WALL
- 2.0% — SLOPE AND DIRECTION
- DIRECTION OF MAJOR OVERLAND FLOW
- PROPOSED LANDSCAPE DRAIN
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED CATCHBASIN
- SAN MH — PROPOSED SANITARY MANHOLE
- STM MH — PROPOSED STORM MANHOLE
- PROPOSED HYDRANT & VALVE
- PROPOSED VALVE AND VALVE BOX
- 100 YEAR SURFACE PONDING EXTENTS
- PROPOSED TRANSFORMER
- EXISTING VALVE & VALVE BOX
- EXISTING VALVE & LEAD
- SAN MH — EXISTING SANITARY MANHOLE
- STM MH — EXISTING STORM MANHOLE
- CB 1 — EXISTING CATCHBASIN
- EXISTING DITCH CENTERLINE
- UP — EXISTING UTILITY POLE
- AN — EXISTING UTILITY POLE ANCHORS
- EXISTING STREETLIGHT

PAVEMENT STRUCTURE:

LIGHT DUTY PAVEMENT
50mm HL3 OR SP 12.5
150mm GRANULAR "A" CRUSHED STONE
300mm OPSS GRANULAR "B" TYPE II

HEAVY DUTY PAVEMENT
40mm HL3 OR SP 12.5
50mm HL8 OR SP 19.0
150mm OPSS GRANULAR "A" CRUSHED STONE
400mm OPSS GRANULAR "B" TYPE II

NORTH

KEY PLAN
N.T.S.

SITE

PARKLAND BLOCK

CROISSANT FRANCOISE

LAMARCHE AVENUE

PAVILION A
6 FLOOR
FFE =89.80

PAVILION B
7 FLOOR
FFE = 89.60

PAVILION C
7 FLOOR
FFE = 89.30

POOL
FFE = 89.20

MATCH INTO EXISTING SIDEWALK GRADES

MATCH INTO EXISTING ASPHALT GRADES. CURB RETURN ENTRANCE PER CITY OF OTTAWA STANDARD SC7.1

MATCH INTO EXISTING GRADES AT PROPERTY LINE

3 STEPS AT 0.18m

3 STEPS AT 0.15m

1.5m ASPH. WALKWAY

1.1m ASPH. WALKWAY

1.2m ASPH. WALKWAY

3.0m MULTI USE PATH

2.0m CONC. SIDEWALK

0.5m FLAT BOTTOM SWALE (REFER TO 121214-NDZ1 FOR DETAILS)

LIMIT OF UNDERGROUND PARKING

OVERHANG

FDC SIAMESE

REFER TO 121214 - NDZ1 FOR ADDITIONAL NOTES

NOTE:
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NOT FOR CONSTRUCTION

No.	REVISION	DATE	BY
1.	ISSUED FOR SITE PLAN APPLICATION	DEC 22/21	MJH

SCALE
1:300
1:300
0 3 6 9 12

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

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER A.R. WESTWARP 100201994 DEC 22/21 PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER M.J. HAGHORIAK 100211255 DEC 22/21 PROVINCE OF ONTARIO

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Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
240-270 LAMARCHE AVENUE & 3484 INNES ROAD

DRAWING NAME
GRADING PLAN - BLOCK 1

PROJECT No. 121214
REV REV # 1
DRAWING No. 121214-GRB1

M:\2021\121214\CAD\Design\Zone 1\121214 - Z1 - GR.dwg, GR, Dec 22, 2021 - 2:04pm, amstwarp

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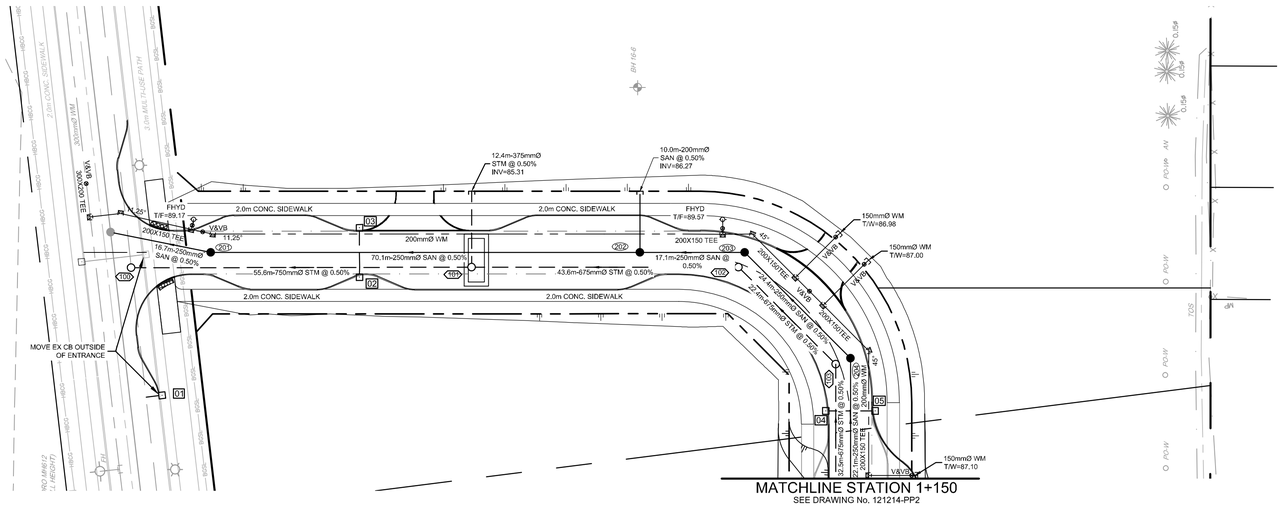
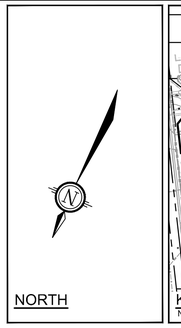
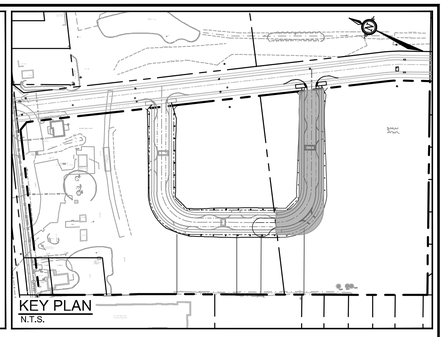
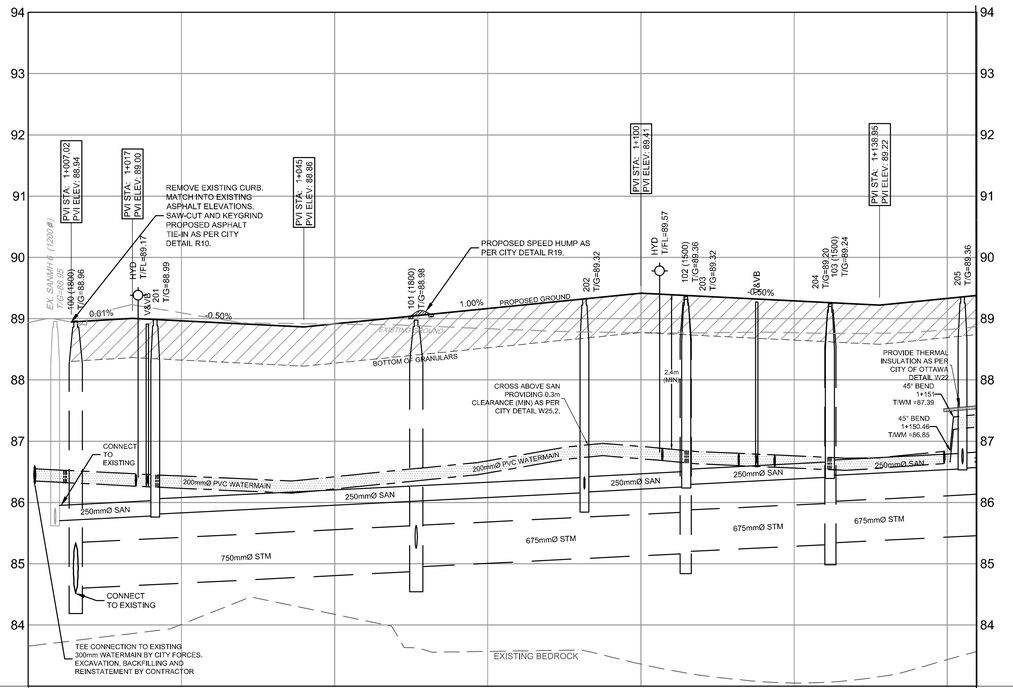






LEGEND

- PROPERTY LINE
- PROPOSED BARRIER CURB
- [PROPOSED CAP
- (101) PROPOSED SANITARY SEWER AND MANHOLE
- ⟨100⟩ PROPOSED STORM SEWER AND MANHOLE
- 99 PROPOSED CATCHBASIN & LEAD
- PROPOSED WATER MAIN
- PROPOSED HYDRANT C/W LEAD & VALVE
- T/F=98.45 PROPOSED TOP OF BOTTOM FLANGE
- V&VB ⊗ PROPOSED VALVE AND VALVE BOX
- BEND PROPOSED BEND AND THRUSTBLOCK 11.25°, 22.5°, 45° or TEE (REFER TO PLAN AND PROFILES)
- V&VB *EXISTING WATERMAIN C/W VALVE & VALVE BOX*
- *EXISTING HYDRANT C/W VALVE & LEAD*
- SAN MH *EXISTING SANITARY MANHOLE & SEWER*
- STM MH *EXISTING STORM MANHOLE & SEWER*
- CB 1 *EXISTING CATCHBASIN*
- *EXISTING SWALE CENTERLINE*
- UP *EXISTING UTILITY POLE*
- AN *EXISTING UTILITY POLE ANCHORS*
- *EXISTING STREETLIGHT*
- *EXISTING TRANSFORMER*



PROPOSED ELEVATION	88.94 89.00 88.96 88.86 88.91 89.16 89.41 89.29 89.22 89.33
TOP OF WM ELEVATION	86.53 86.44 86.46 86.45 86.43 86.35 86.42 86.65 86.68 86.90 86.92 86.85 86.79 86.76 86.74 86.73 86.73 86.84
STORM SEWER INVERTS	NW=84.52 SE=84.52 SW=84.60 55.57m - 750mmØ CONC 65D STM @ 0.50% SW=84.95 NE=84.87 SE=85.25 43.55m - 675mmØ CONC 65D STM @ 0.50% W=85.20 NE=85.17 22.41m - 675mmØ CONC 65D STM @ 0.50% NW=85.34 E=85.31 32.5m - 675mmØ STM @ 0.50%
SANITARY SEWER INVERTS	W=85.70 NW=85.66 SE=85.64 16.7m - 250mmØ SAN @ 0.50% SW=85.81 E=85.78 SW=86.17 NE=86.16 SE=86.22 17.1m - 250mmØ SAN @ 0.50% W=86.29 NE=86.26 24.40m - 250mmØ PVC DR 35 SAN @ 0.50% NW=86.44 E=86.41 22.1m - 250mmØ SAN @ 0.50% NW=86.56 SE=86.55 SW=86.63
EXISTING ELEVATION	*89.09* *88.91* *88.84* *88.77* *88.77* *88.82*
CHAINAGE	1+000 1+004.4 1+006.03 11.25° H.BEND 1+007.8 1+017.94 HYD 1+019.4 V&VB 1+021.06 11.25° H.BEND 1+025 1+050 1+063.3 1+075 1+090.8 1+100 1+103.04 HYD 1+107.3 1+107.45 45° H.BEND ??? V&VB 1+125 1+130.77 45° H.BEND 1+130.9 1+149.49 200X150 TEE 1+152.5

REFER TO 121214 - ND FOR ADDITIONAL NOTES

NOTE:
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No.	REVISION	DATE	BY
1.	BLOCK 1 SERVICING	DEC 22/21	ARM

SCALE
1:500
1:500
0 5 10 15 20

DESIGN	MJH/ARM
CHECKED	CJR
DRAWN	MJH/ARM
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
CITY OF OTTAWA
240-270 LAMARCHE AVENUE & 3484 INNES ROAD

DRAWING NAME
PLAN AND PROFILE
CROISSANT FRANCOISE
1+000.00 - 1+150.00

PROJECT No.
121214
REV
REV # 1
DRAWING No.
121214 - PP1

PLANA1.DWG - 841mmx594mm

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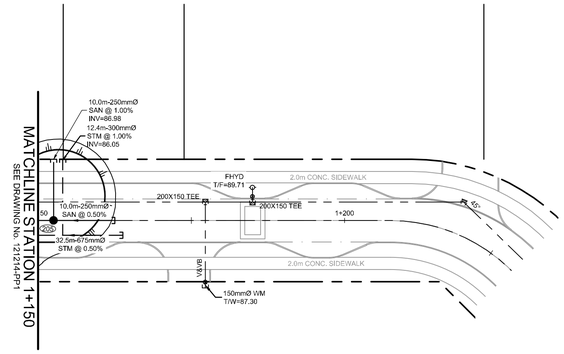

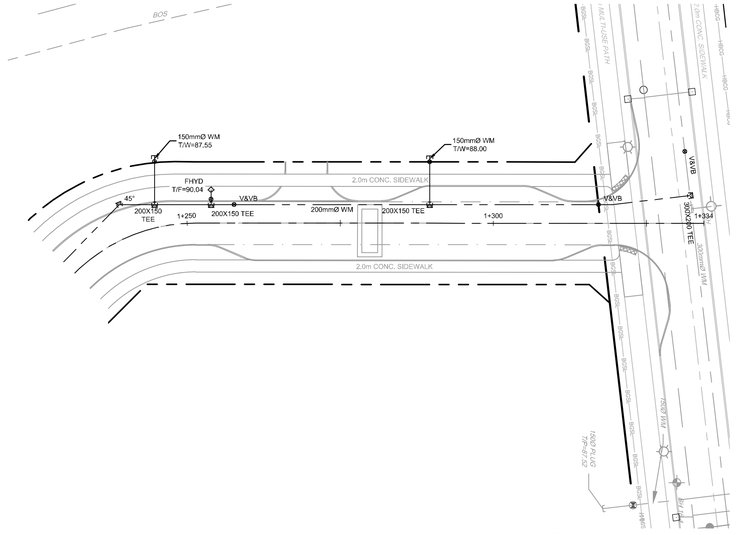

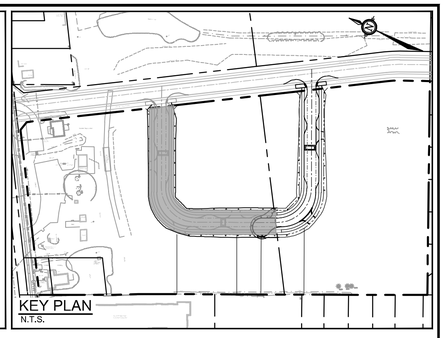

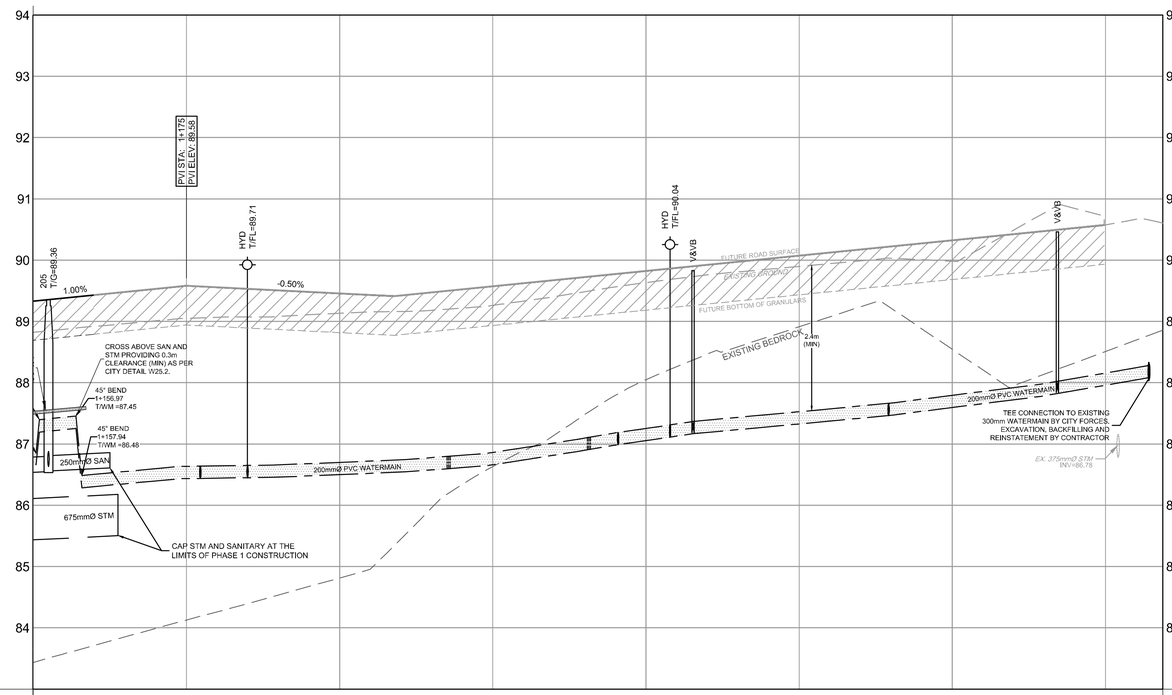

LEGEND

▬	PROPERTY LINE
═	PROPOSED BARRIER CURB
[	PROPOSED CAP
(101) ●	PROPOSED SANITARY SEWER AND MANHOLE
⟨100⟩ ○	PROPOSED STORM SEWER AND MANHOLE
99 ⊞	PROPOSED CATCHBASIN & LEAD
—	PROPOSED WATER MAIN
⊕⊗	PROPOSED HYDRANT C/W LEAD & VALVE
T/F=98.45	PROPOSED TOP OF BOTTOM FLANGE
V&VB ⊗	PROPOSED VALVE AND VALVE BOX
BEND	PROPOSED BEND AND THRUSTBLOCK 11.25°, 22.5°, 45° or TEE (REFER TO PLAN AND PROFILES)
V&VB ⊗	*EXISTING WATERMAIN C/W VALVE & VALVE BOX*
⊕⊗	*EXISTING HYDRANT C/W VALVE & LEAD*
SAN MH ●	*EXISTING SANITARY MANHOLE & SEWER*
STM MH ○	*EXISTING STORM MANHOLE & SEWER*
CB 1 ⊡	*EXISTING CATCHBASIN*
►	*EXISTING SWALE CENTERLINE*
○ UP	*EXISTING UTILITY POLE*
AN ○	*EXISTING UTILITY POLE ANCHORS*
✲	*EXISTING STREETLIGHT*
▶	*EXISTING TRANSFORMER*

PROPOSED ELEVATION	89.58
TOP OF WM ELEVATION	87.45 86.63 86.63 86.64 86.65 86.62 86.70 86.74 86.80 86.85 86.86 87.07 87.11 87.19 87.19 87.25 87.28 87.37 87.53 87.60 87.66 87.67 87.79 87.98 88.02 88.16 88.28
STORM SEWER INVERTS	32.5m - 675mmØ STM @ 0.50% 85.50
SANITARY SEWER INVERTS	NW=86.56 SE=86.55 SW=86.63 10.0m - 250mmØ SAN @ 0.50% 86.61
EXISTING ELEVATION	*89.05* *89.13* *89.26* *89.63* *89.90* *89.98*
CHAINAGE	1+152.5 1+175 1+177.27 200x150 TEE 1+184.97 HYD 1+200 1+217.78 45° H.BEND 1+225 1+240.70 45° H.BEND 1+245.44 200x150 TEE 1+250 1+253.93 HYD 1+257.7 V&VB 1+275 1+289.60 200x150 TEE 1+300 1+317.1 V&VB 1+325 1+334.35

REFER TO 121214 - ND FOR ADDITIONAL NOTES

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No.	REVISION	DATE	BY
1.	BLOCK 1 SERVICING	DEC 22/21	ARM

SCALE
1:500
1:500
0 5 10 15 20

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

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LOCATION
CITY OF OTTAWA
240-270 LAMARCHE AVENUE & 3484 INNES ROAD

DRAWING NAME
PLAN AND PROFILE
CROISSANT FRANCOISE
1+150.00 - 1+350.00 (PHASE 1)

PROJECT No. 121214
REV REV # 1
DRAWING No. 121214 - PP2