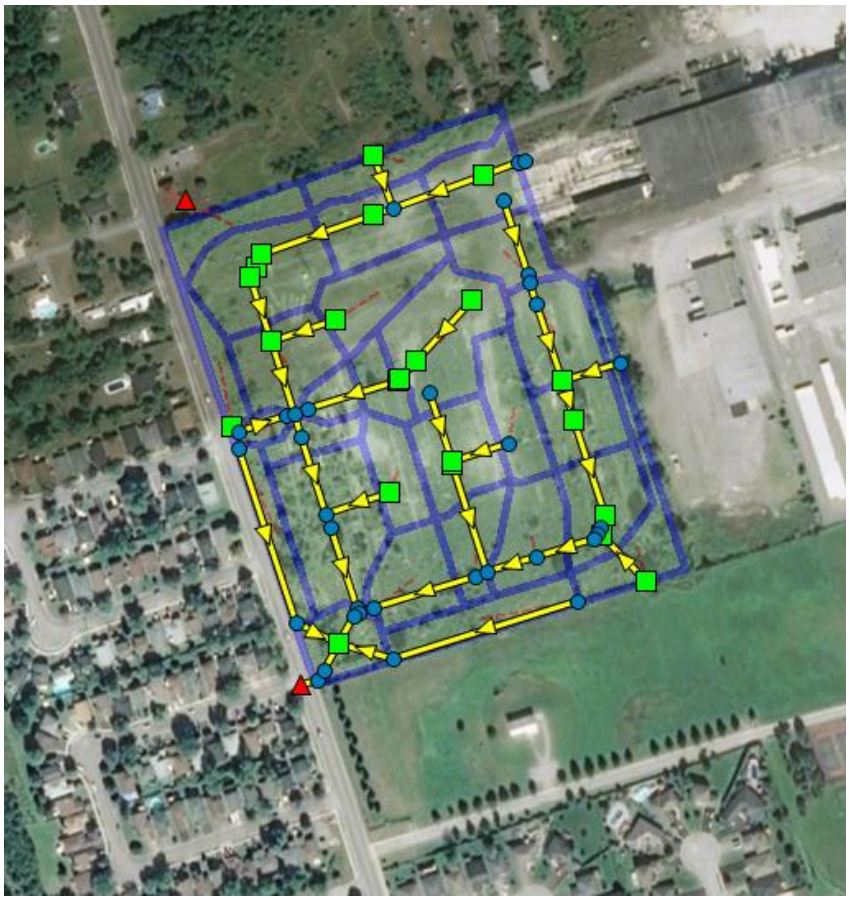
ROMSPEN & RIC (MIDLAND LAND) INC.

WILSON AVENUE SUBDIVISION
STORMWATER MANAGEMENT REPORT

AUGUST 04, 2022



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ROMSPEN
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STORMWATER MANAGEMENT REPORT
COPY

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APPENDICES

1 INTRODUCTION

WSP Canada Inc. (WSP) was retained by Romspen and RIC (Midland Land) Inc. to complete a Stormwater Management (SWM) Report for the storm sewer system and stormwater management facilities proposed for the Wilson Avenue Subdivision (Subdivision) located on Wilson Avenue in Belleville, Ontario.

This report provides the methodology and assumptions used for the modeling analysis and presents the results and findings from the analysis.

1.1 STUDY AREA

The proposed subdivision is located in Belleville Ontario, south of Moira Street West, west of Sidney Street, north of Bridge Street West and east of Palmer Road. Figure 1-1 shows the project location and the general model sketch.

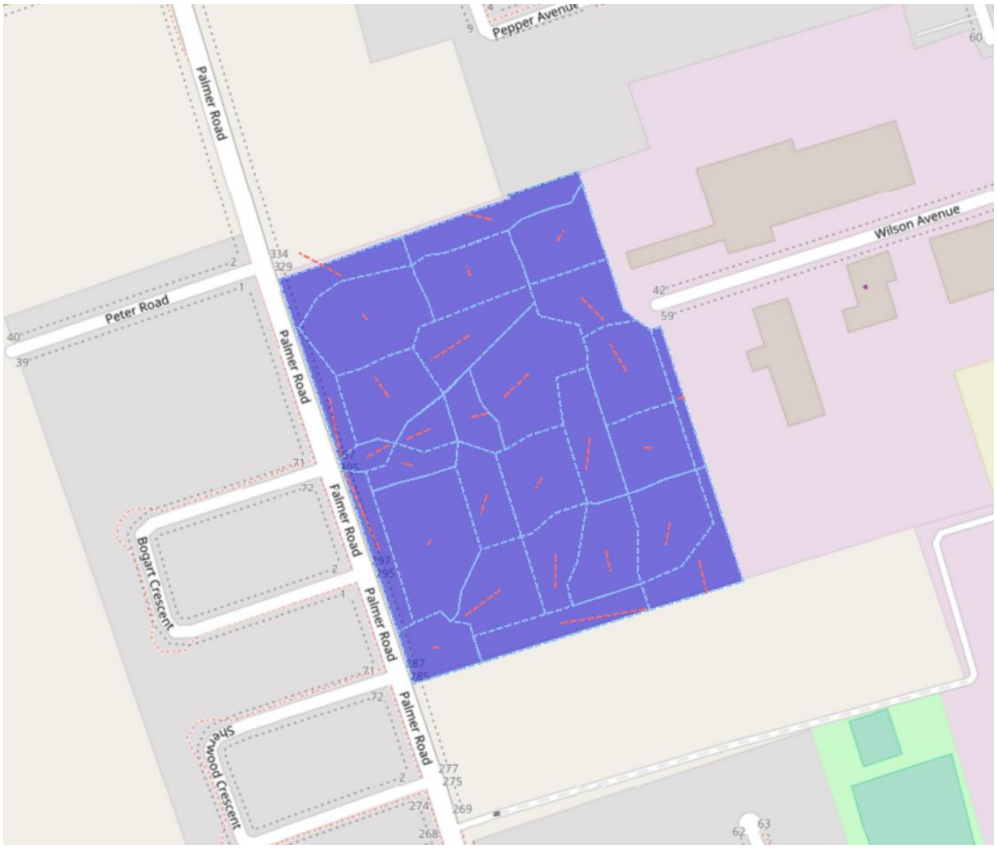


Figure 1-1: Project Location and General Modeling Sketch

1.2 BACKGROUND INFORMATION

This development is a proposed residential subdivision with a mix of single detached and townhome units. The current site does not include any existing servicing infrastructure. The subdivision development is to be serviced by overland flow paths, the proposed storm sewer system and SWM facilities. All stormwater will flow into the SWM facility which will retain the flow within the subject site. Only the subject site serviced by the proposed drainage system is included in this study.

The proposed development is located in Belleville Ontario meaning the stormwater management and controls for the site are governed by the Quinte Conservation Authority (QCA). The QCA provides guidelines on quality control, post development flow rates and stormwater submission requirements.

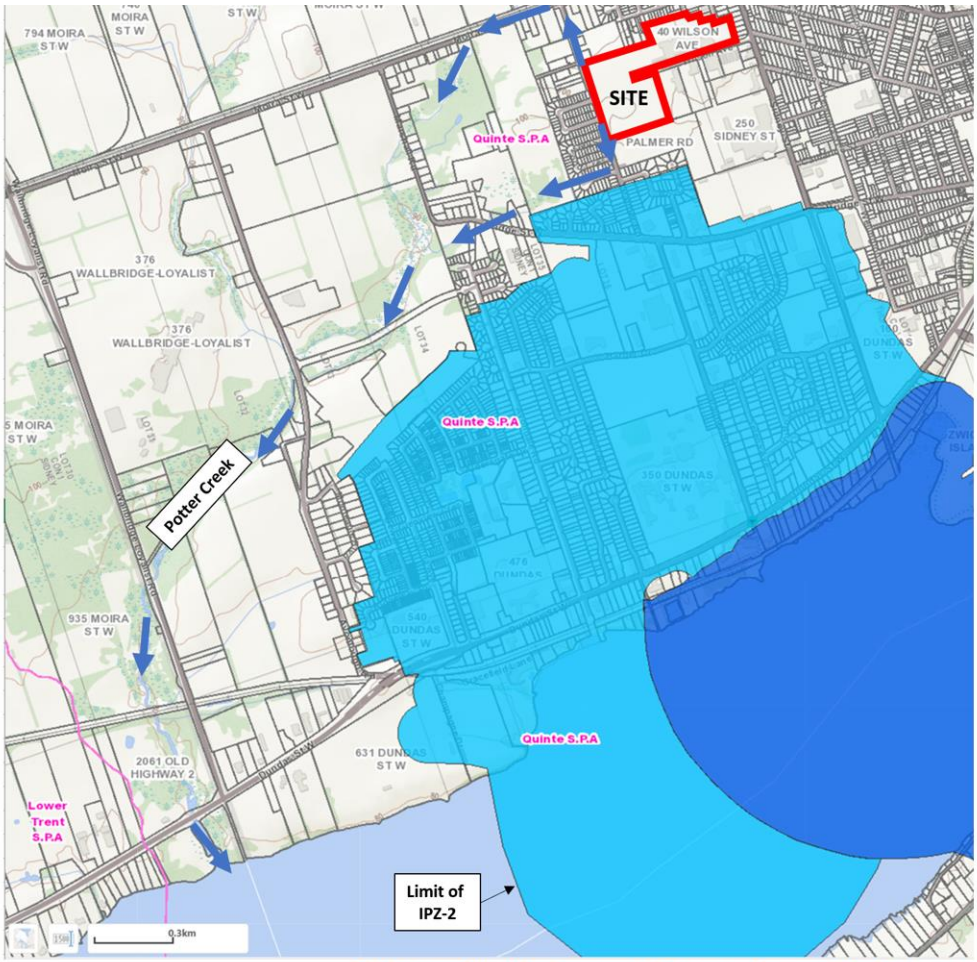
1.3 INTAKE PROTECTION ZONE

In communications on June 28, 2022, the QCA requested confirmation whether the Site was located within the Intake Protection Zone 2 (IPZ-2) for the City of Belleville water intake in the Bay of Quinte. This regulatory zone was established for the protection of the City of Belleville municipal water intake and is based on surface water time; sites from which surface runoff can reach the intake within 2 hours are considered to be within the IPZ-2 and are required to provide additional surface water protection means. The limits of the IPZ-2 are therefore established by estimating travel time along drainage flow paths.

In the case of the proposed development, there are two surface drainage flow paths for surface runoff leaving the Site:

- A sub-catchment on northwest corner of the Site flows to the existing 450mm storm sewer on Palmer Road, which drains north to Moira Street West, then west along Moira Street West, before ultimately discharging to Potter Creek.
- The majority of the Site drains via the proposed stormwater pond to the existing 675 mm diameter storm sewer on Palmer Road, which in turn discharges to the existing west-flowing ditch north of Benson Court, and ultimately to Potter Creek.

Flow paths are shown in Figure 1-2, along with the existing mapped IPZ-2. In both cases, runoff ultimately discharges via Potter Creek to the Bay of Quinte 150m west of Wallbridge-Loyalist Road. Since the Potter Creek discharge location is over 1 km outside of the established mapped IPZ-2 (meaning flow from Potter Creek would take longer than 2 hours to each the intake), runoff from the Site (which contributes to Potter Creek) would likewise take longer than 2 hours to reach the intake and is therefore outside of the IPZ-2.



GIS Background: Ministry of the Environment, Conservation and Parks (gov.on.ca)

Figure 1-2: Intake Protection Zone

1.4 OBJECTIVES

The objectives of the stormwater management plan are as follows:

- **Quantity Control** – the proposed development will increase the imperviousness of the site. The post-development flow will need to be restricted to pre-development flow for 2-year, 5-year and 100-year design storm events.
- **Quality Control** – the proposed development is required to meet the MECP's Enhanced Level (80% TSS Removal). This will be addressed with an oil/grit separator using a Stormceptor or approved equivalent and other stormwater BMPs as discussion in Section 3.
- **Erosion Control** – appropriate erosion and sediment controls will be implemented during the construction phase.

2 DESIGN CRITERIA

2.1 RAINFALL DATA

Rainfall Intensity-Duration-Frequency (IDF) curves were derived from the Ontario Ministry of Transportation (MTO) IDF Curve Lookup website. The retrieved IDF curves are shown in Figure 2-1.

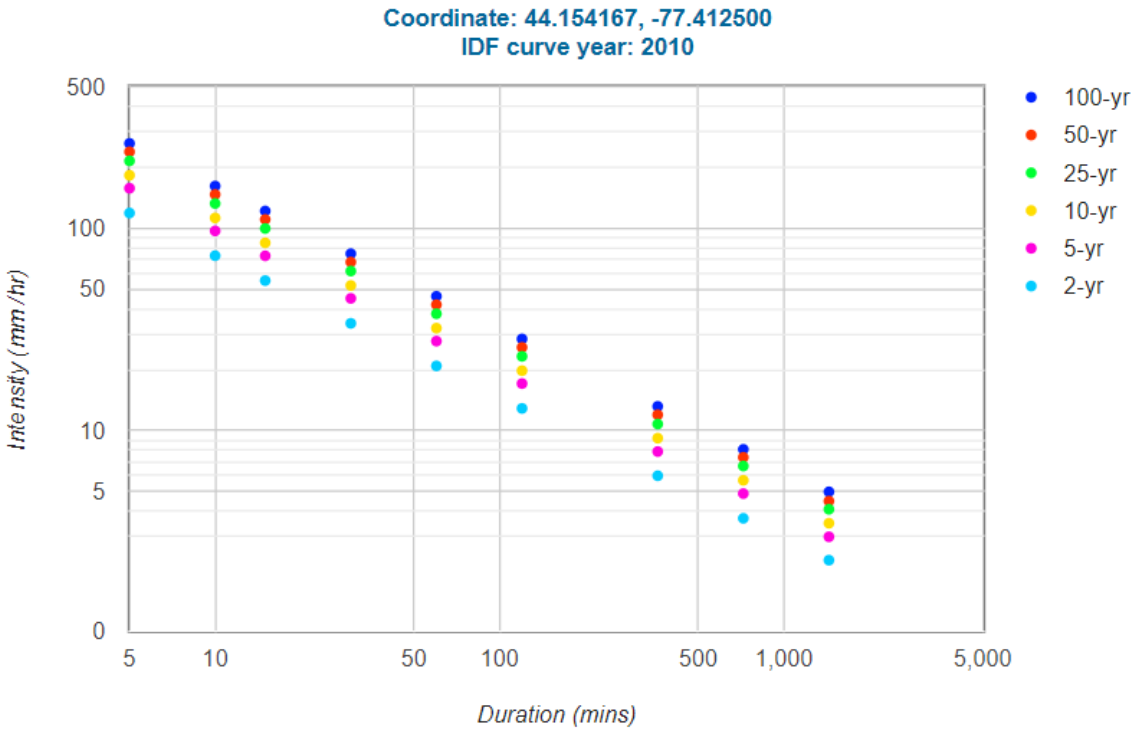


Figure 2-1: IDF Curves from MTO Website

The IDF parameters that were used in the PCSWMM models are detailed in Table 2-1 and Table 2-2.

Table 2-1: Study IDF Parameters (Rainfall Intensity / mm/hr)

DURATION	5 MIN	10 MIN	15 MIN	30 MIN	1 HR	2 HR	6 HR	12HR	24 HR
2-Year	118.7	73.1	55.1	33.9	20.9	12.9	6.0	3.7	2.3
5-Year	157.3	96.9	73	45	27.7	17.1	7.9	4.9	3.0
100-Year	261.8	161.3	121.5	74.8	46.1	28.4	13.2	8.1	5.0

Table 2-2: Study IDF Parameters (Rainfall Depth / mm)

DURATION	5 MIN	10 MIN	15 MIN	30 MIN	1 HR	2 HR	6 HR	12HR	24 HR
2-Year	9.9	12.2	13.8	17	20.9	25.7	35.8	44.2	54.4
5-Year	13.1	16.2	18.2	22.5	27.7	34.1	47.5	58.5	72.1
100-Year	21.8	26.9	30.4	37.4	46.1	56.8	79.1	97.4	120.0

The standard IDF curves were converted into the 10-minute timestep Chicago distribution design storms and applied for the modeling analysis. An R value of 0.33 was used for the Chicago distribution design storm analysis.

The rainfall intensity hyetograph (10 minute timestep) for 2-year, 5-year and 100-year design storms used in the analysis are presented in Figure 2-2.

Similarly, the total rainfall depth for 3 hr duration 2-year design storm, 3 hr duration 5-year design storm and 6 hr duration 100-year design storm used in the analysis are presented in Figure 2-3.

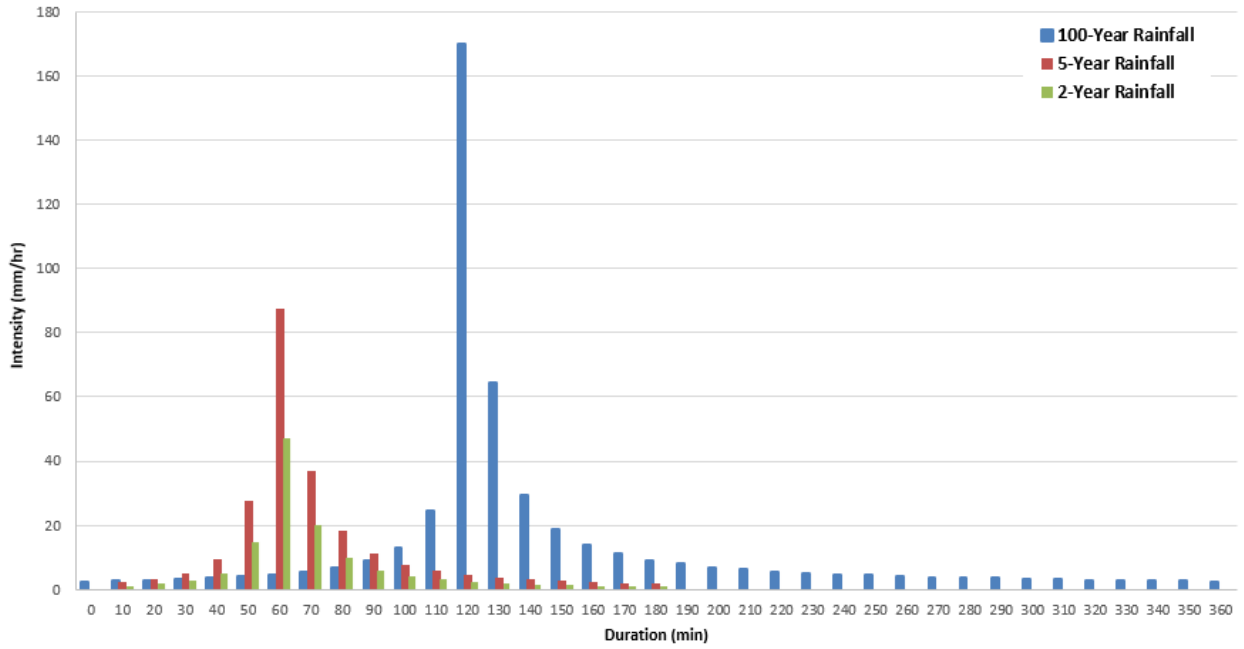


Figure 2-2: 2-Year, 5-Year & 100-Year Chicago Design Rainfall Intensity

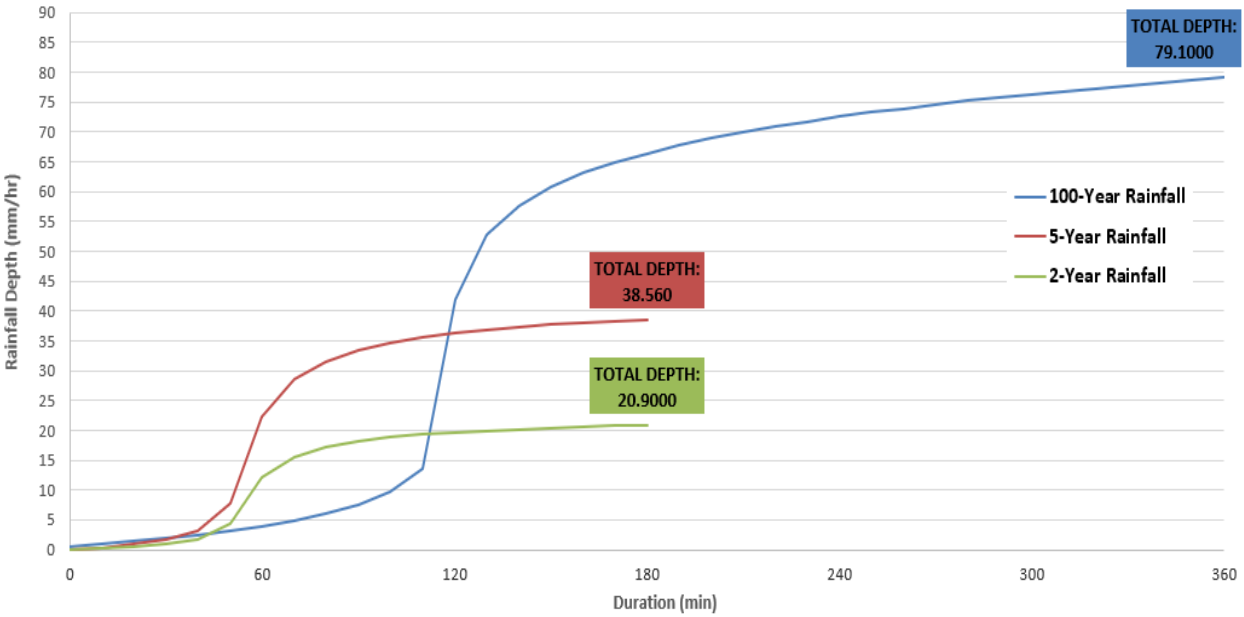


Figure 2-3: 2-Year, 5-Year & 100-Year Chicago Design Rainfall Depth

2.2 STORM SEWER DESIGN PARAMETERS

The storm sewer designs for the development are based on the following parameters:

- Pipe sizes were determined based on the 5-year design storm, with full pipe capacity and no surcharging permitted.
- Manning's "n" value:
  - 0.013 for the storm sewer pipes
  - 0.25 for corrugated metal pipe culverts
- Minimum storm sewer pipe size is 375 mm, and minimum catch basin lead size is 250 mm.
- Pipe diameter and slope are based on providing a minimum full flow velocity of 0.9 m/sec.
- Inlets on streets spaced to provide the following level of service under a 5-year design storm:
  - Prevent curb overtopping
  - Flow spread not to exceed at least one (1) lane free of water
- Maximum allowable flow depth permitted within the right of way is 300 mm.
- Inlet performance on continuous grade analysis in accordance with Federal Highway Administration HEC-22 methods.

2.3 STORMWATER DETENTION POND DESIGN PARAMETERS

The design criteria for the proposed stormwater management dry pond follows the standards of the MOE Stormwater Management Planning and Design Manual.

- Minimum active storage detention time: 24 hrs
  - Minimum detention time is 12 hrs for a drainage area < 8 ha
- Maximum depth: 3 m
- Minimum length-to-width ratio: 3:1
- Maximum side slope: 4:1
- Minimum inlet size: 450 mm
- Minimum outlet size: 450 mm
- Minimum orifice size: 75 mm
- Minimum buffer zone: 3 m above maximum water level

2.4 RUNOFF COEFFICENTS AND IMPERVIOUSNESS

Surface runoff coefficients (C-Value) for various land uses are as follow per the City of Kinston Engineering Design Specification Manual:

- Paved areas and roof: 0.95
- Gravel road: 0.70
- Grassland: 0.25

- Single Family Residential: 0.5
- Townhouse Residential: 0.6
- For 100-year design storms, add 25% to C values

The following equation was used to determine a blended runoff coefficient when a land consists of a mixture of impervious and pervious areas:

$$imp = \frac{\text{impervious area}}{\text{total area}}$$

$$C = imp \times C_{impervious} + (1 - imp) \times C_{pervious}$$

3 PRE-DEVELOPMENT DRAINAGE CONDITIONS

3.1 EXISTING CONDITIONS

Per Google Earth imagery and topographic surveys, the existing land cover of the Wilson Avenue Subdivision development is grassland with of gravel cover throughout. The existing topography of the site shows that the majority of the site, approximately 6.62 ha, generally flows from north to south with some localized low and high points throughout the site. Approximately 1.17 ha of the north portion of the site drains to the northeast and northwest corners of the subject site. Three (3) drainage sub-catchments were identified based on the topographic survey data and the estimated coefficients for each sub-catchment are listed in Table 3-1.

Table 3-1: Pre-Development Area and Runoff Coefficients

SUB_CATCHMENT	TOTAL AREA (m^2)	IMPERVIOUS AREA (m^2)	IMPERVIOUS %	C-VALUE
SC_1 (A1, A2)	11,699	3,412	29.2%	0.38
SC_2 (A3,A4,A5,A6,A8)	60,969	16,187	26.6%	0.37
SC_3 (A7)	5,181	233	4.5%	0.27
TOTAL	77,850	19,832	25.5%	0.36

Figure 3-1 illustrates the boundaries of the sub-catchments under pre-development conditions.

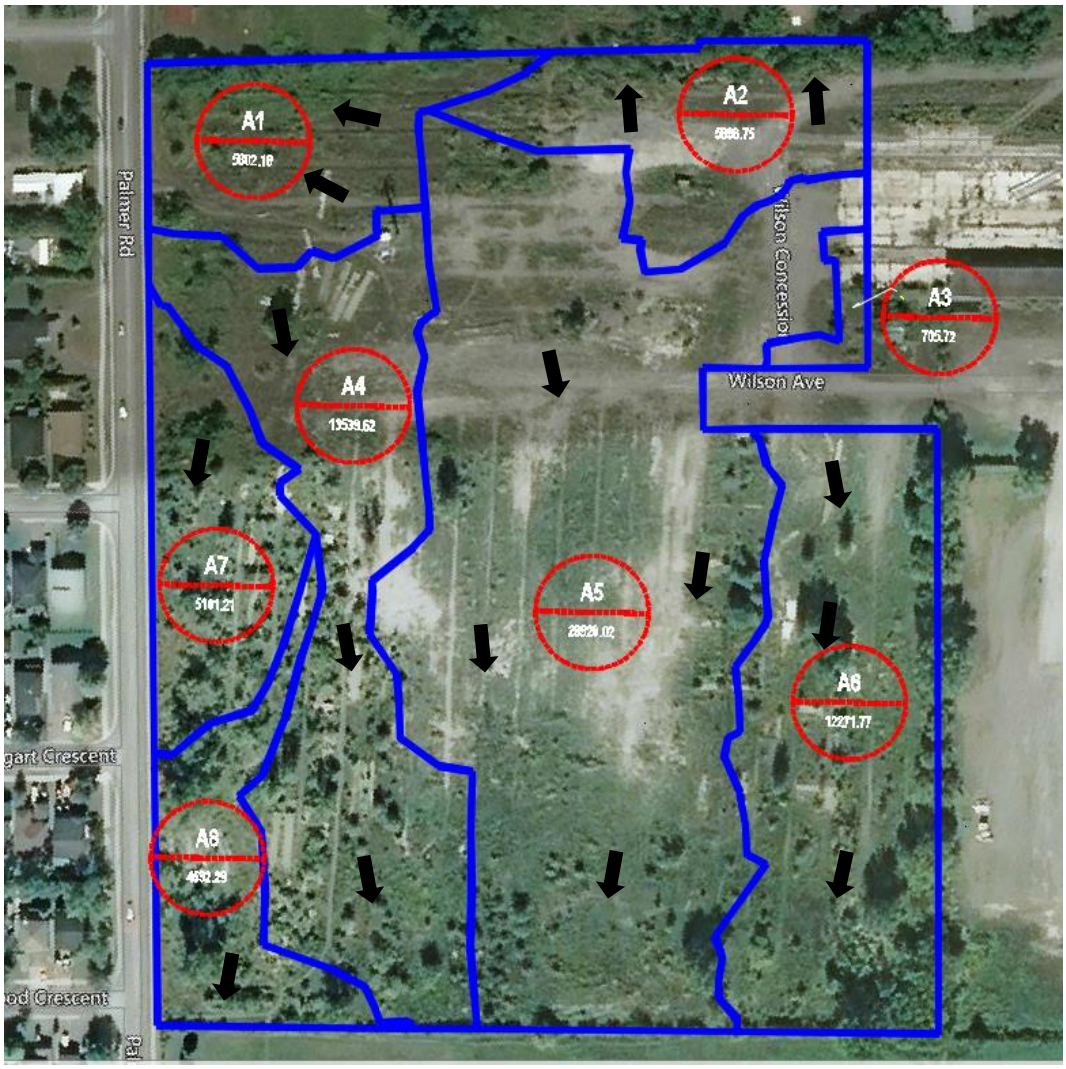


Figure 3-1: Pre-development Sub-catchment Boundary

The Rational Method was used to calculate the peak runoff from the study area under the pre-development condition. The Time of Concentration (T_c) was estimated by using the Airport Method, as shown below.

$$t_c = \frac{3.26 * (1.1 - C) * L^{0.5}}{S_w^{0.33}}$$

where:
t_c = time of concentration (min)
C= runoff coefficient
L = catchment length, (m)
S_w = catchment slope (%)

Table 3-2 summarizes the estimated T_c for each sub-catchment under pre-development conditions.

Table 3-2: Pre-Development Sub-catchment Time of Concentration

SUB_CATCHMENT	C-VALUE	CATCHMENT LENGTH (m)	CATCHMENT SLOPE	T_C (min)
SC_1	0.38	235	1.5%	31.4
SC_2	0.37	324	1.0%	42.9
SC_3	0.27	146	1.5%	28.6

The calculated 2-year, 5-year and 100-year peak runoff flows from the subject site under the pre-development condition are 220.3 L/s, 291.6 L/s and 606.4 L/s, respectively. Details are summarized in Table 3-3, Table 3-4 and Table 3-5.

Table 3-3: Pre-Development 2-Year Rainfall Intensity and Peak Runoff

SUB_CATCHMENT	T_C (min)	INTENSITY (mm/hr)	TOTAL AREA (m^2)	C-VALUE	PEAK RUNOFF (L/s)
SC_1	31.4	32.9	11,699	0.38	40.8
SC_2	42.9	26.5	60,969	0.37	165.9
SC_3	28.6	35.1	5,181	0.27	13.7
SUM-PRODUCT			77,850		**220.3**

Table 3-4: Pre-Development 5-Year Rainfall Intensity and Peak Runoff

SUB_CATCHMENT	T_C (min)	INTENSITY (mm/hr)	TOTAL AREA (m^2)	C-VALUE	PEAK RUNOFF (L/s)
SC_1	31.4	43.6	11,699	0.38	54.0
SC_2	42.9	35.1	60,969	0.37	219.5
SC_3	28.6	46.5	5,181	0.27	18.1
SUM-PRODUCT			77,850		**291.6**

Table 3-5: Pre-Development 100-Year Rainfall Intensity and Peak Runoff

SUB_CATCHMENT	T_C (min)	INTENSITY (mm/hr)	TOTAL AREA (m^2)	C-VALUE	PEAK RUNOFF (L/s)
SC_1	31.4	72.5	11,699	0.47*	112.3
SC_2	42.9	58.3	60,969	0.46*	456.4
SC_3	28.6	77.3	5,181	0.34*	37.6
SUM-PRODUCT		47.5	77,850		**606.4**

* C-values are increased by 25% for the 100-year design storm

4 POST-DEVELOPMENT DRAINAGE CONDITIONS

4.1 PROPOSED CONDITIONS

Storm sewer systems are proposed to convey runoff from the Wilson Avenue Subdivision development, discharge into the proposed dry pond in Block 96, and eventually release to the Municipal stormwater system. Per the design criteria, storm sewer pipes were sized for the 5-year design storm, with full pipe capacity and no surcharging permitted. A total of 1,462 m of storm sewers are included, and pipe size diameters range from 375 mm to 750 mm. Proposed storm sewers and manholes, and the dry pond are shown in Drawing C1.2 in Appendix E. A storm sewer calculation sheet is included in Appendix B.

Based on the preliminary lot grading design, 23 drainage sub-catchments were identified, including 15 frontage sub-catchments, seven (7) rear yard sub-catchments, and one (1) pond. The estimated runoff coefficients for each sub-catchment are listed in Table 4-1.

Table 4-1: Post-development Runoff Coefficients

SUB_CATCHMENT	TOTAL AREA (m^2)	LAND TYPE	IMPERVIOUS %	C-VALUE
SC_1	2,984	Frontage	57.1%	0.65
SC_2	2,807	Rear yard	0.0%	0.25
SC_3	3,330	Frontage	57.1%	0.65
SC_4	5,143	Frontage	57.1%	0.65
SC_5	2,092	Rear yard	0.0%	0.25
SC_6	6,493	Frontage	57.1%	0.65
SC_7	1,341	Rear yard	0.0%	0.25
SC_8	3,122	Rear yard	0.0%	0.25
SC_9	4,455	Frontage	57.1%	0.65
SC_10	1,807	Rear yard	0.0%	0.25
SC_11	2,272	Rear yard	0.0%	0.25
SC_12	4,565	Frontage	57.1%	0.65
SC_13	5,988	Frontage	57.1%	0.65
SC_14	6,784	Frontage	57.1%	0.65
SC_15	3,344	Frontage	57.1%	0.65
SC_16	2,832	Rear yard	0.0%	0.25
SC_17	2,818	Frontage	57.1%	0.65
SC_18	833	Rear yard	0.0%	0.25
SC_19	5,443	Frontage	57.1%	0.65
SC_20	3,393	Frontage	57.1%	0.65
SC_21	2,553	Rear yard	0.0%	0.25
SC_22	2,639	Rear yard	0.0%	0.25
POND	2,103	POND	0.0%	0.25
SUB-TOTAL (Frontage)	54,740		57.1%	0.65
SUB-TOTAL (Rear yard & Pond)	24,400		0.0%	0.25
TOTAL	79,140*		43.0%	0.53

*Total drainage area includes portion of Wilson Ave Extension roadway design area.

The overall C value for the development site is 0.53, which was calculated based on the typical C values for the single family residential development and the multi-family residential development as stated in Section 2.4.

Figure 4-1 illustrates the boundaries of 23 sub-catchments under the post-development conditions.

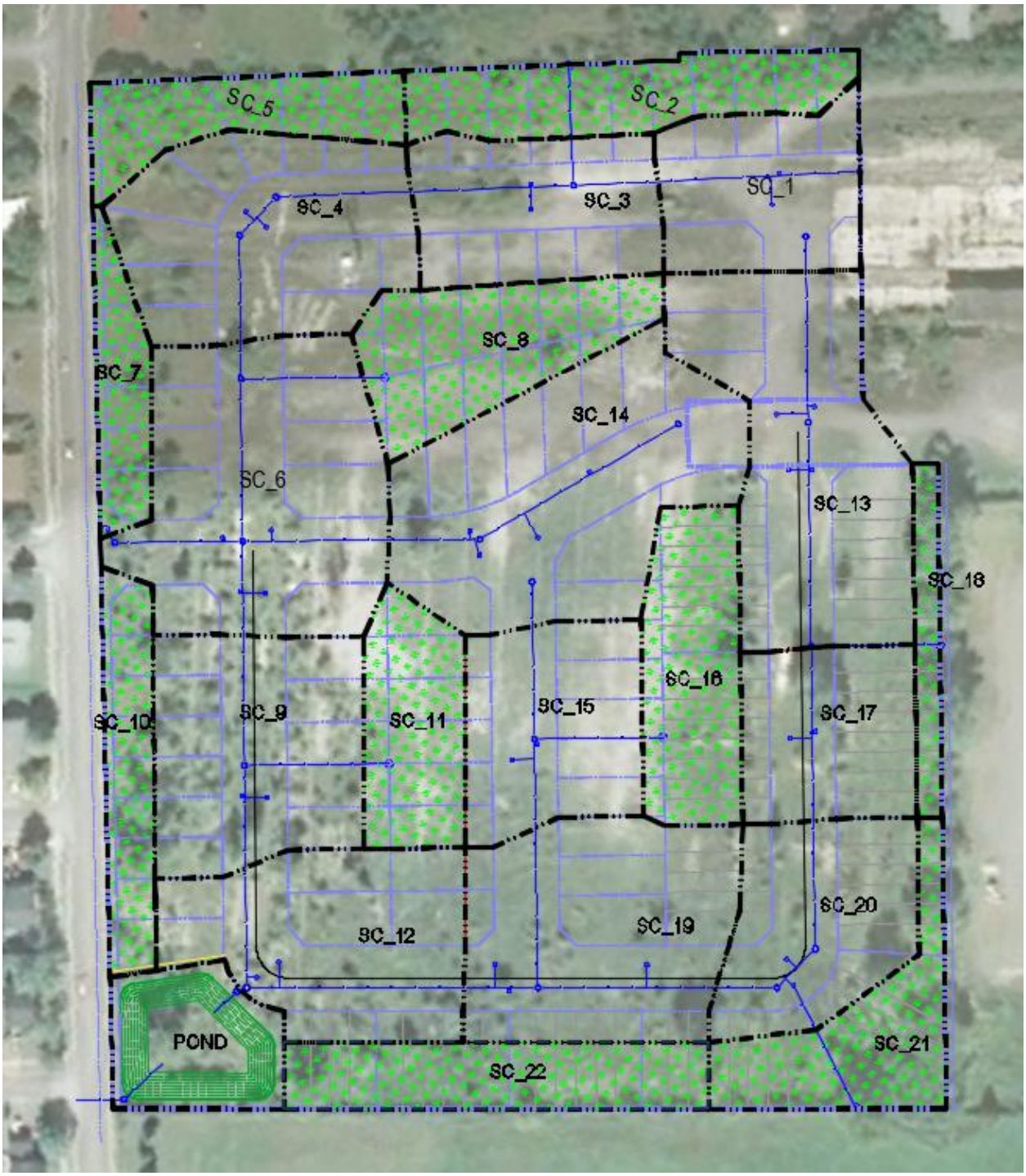


Figure 4-1: Post-Development Sub-Catchment Boundary

The runoff generated in sub-catchment SC_5 overland flow (unrestrictedly) to the existing watercourses outside of the subject site and drain to the existing 450 mm storm sewer on Palmer Rd.

Runoff generated in sub-catchments SC_2, SC_7, SC_8, SC_11, SC_16, SC_18, and SC_21 are rear yard grassed areas that are collected by catch basins which discharge into the proposed storm sewer systems and drain to the proposed dry pond.

Runoff generated in sub-catchments SC_10 and SC_22 is collected by swales which discharge directly into the proposed dry pond.

All remaining areas drain towards the roadways where the stormwater is collected by catch basins located within the ROW. The runoff is discharged into the proposed storm sewer systems and drains to the proposed dry pond. The discharge from the dry pond is controlled by an orifice which discharge the water into the existing 675 mm diameter storm sewer at Sherwood Crescent (north leg).

Estimated post-development peak runoff from the unrestricted sub-catchment under the 2-year, 5-year and the 100-year design storms are summarized in Table 4-2.

Table 4-2: Post-development Rainfall Intensity and Unrestricted Peak Runoffs for Sub-catchment SC_6

SUB_CATCHMENT	T_C (min)	INTENSITY (mm/hr)	TOTAL AREA (m^2)	C-VALUE	PEAK RUNOFF (L/s)
2-Year Storm	15	55.1	2,092	0.25	8.0
5-Year Storm	15	73.0	2,092	0.25	10.6
100-Year Storm	15	121.5	2,092	0.31*	22.1

* C-values are increased by 25% for the 100-year design storm

A dry stormwater management pond is proposed to retain runoff from the storm sewer system and release to the Municipal storm system at a restricted rate. Overall peak discharges from the study area, including both restricted sub-catchments and unrestricted sub-catchments, are limited to pre-development conditions under the 2-year, 5-year and the 100-year design storms.

Table 4-3: Peak Flow Rates and Required Storage

DESIGN STORMS	2-YEAR STORM	5-YEAR STORM	100-YEAR STORM
Pre-development Peak Discharge Flow (L/s)*	220.3	291.6	606.4
Post-development Peak Unrestricted Flow (L/s)	8.0	10.6	22.1
Post-development Peak Restricted Flow (L/s)	**212.3**	**281.0**	**584.3**
Required Onsite Storage (m^3)	431.3	536.3	910.3

To restrict the post-development flow to pre-development flow rates, the required onsite storages which were calculated to measure 431.3 m^3, 536.3 m^3 and 910.3 m^3 for the 2-year, 5-year and the 100-year design storms, respectively using the Rational method. The required on-site storages will be verified in the PCSWMM modeling analysis.

Figure 4-2, Figure 4-3 and Figure 4-1 detail the hydrographs of estimated post-development runoff, discharges, and required onsite storage under the 5-year and the 100-year design storms, respectively.

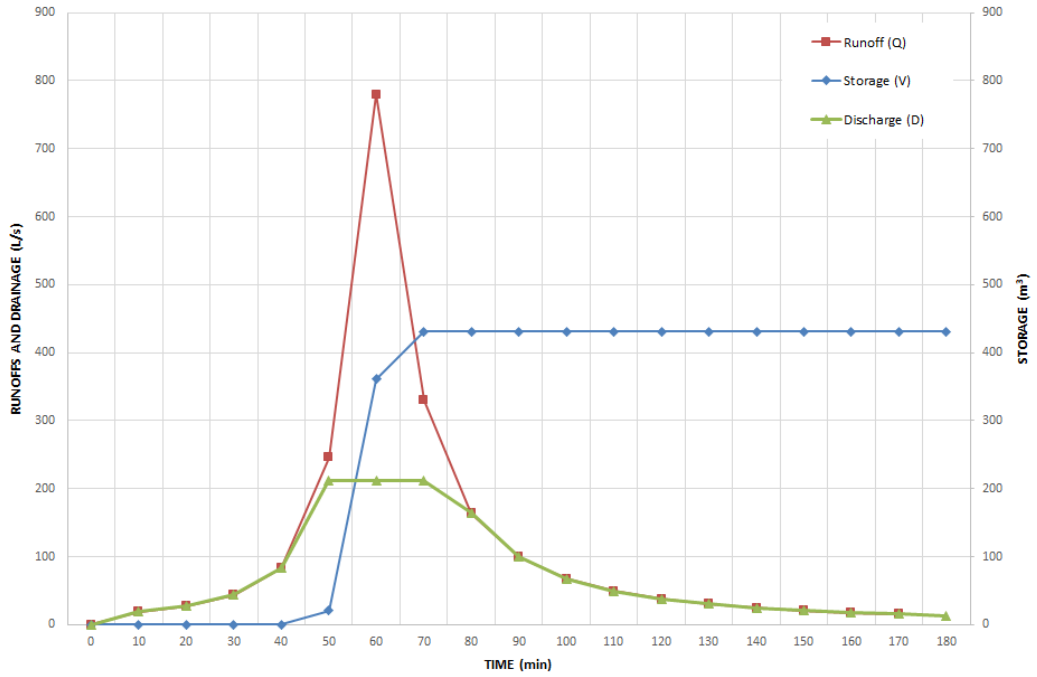


Figure 4-2: Rational Method Calculated Onsite Storage (2-Year Storm)

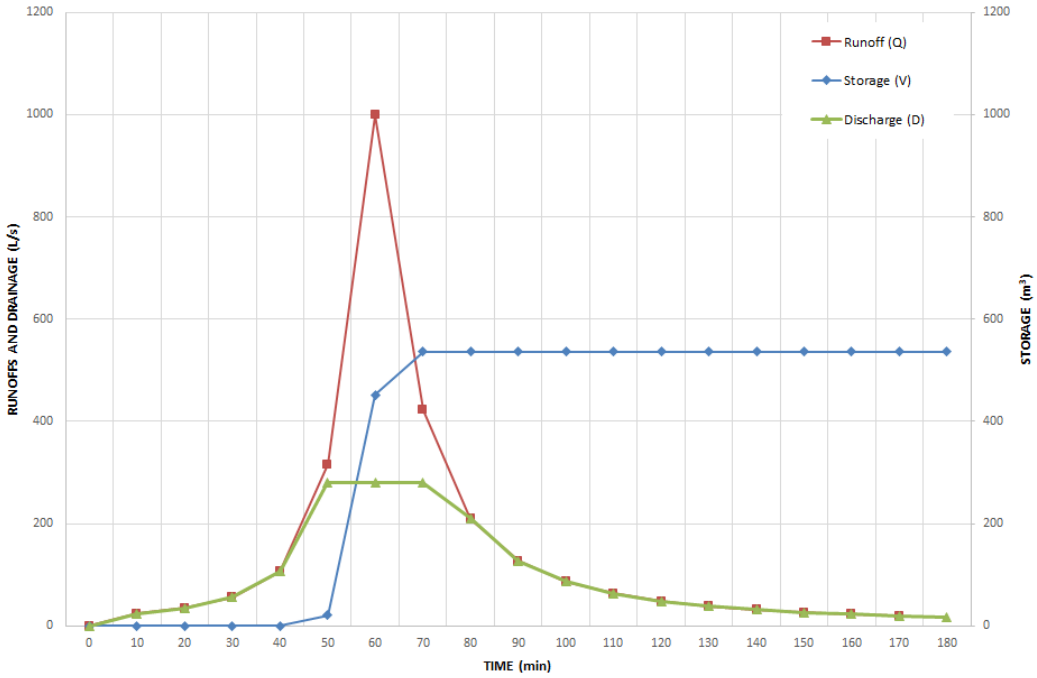


Figure 4-3: Rational Method Calculated Onsite Storage (5-Year Storm)

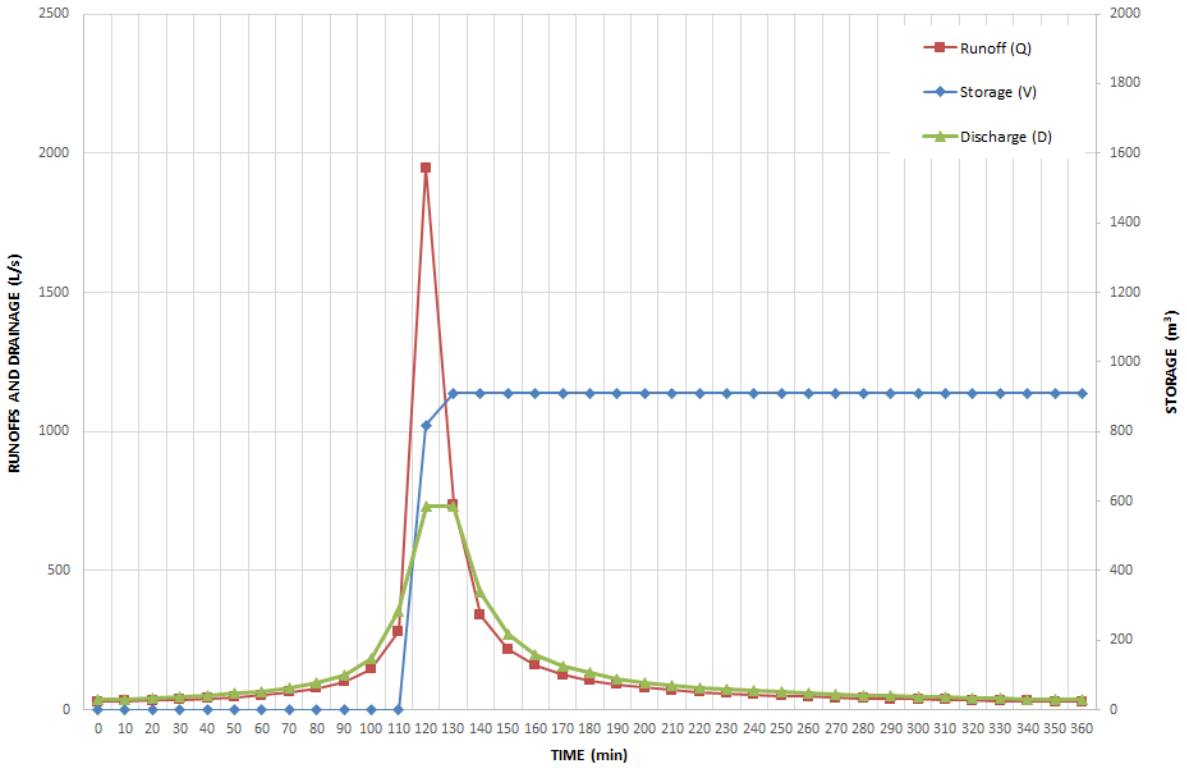


Figure 4-1: Rational Method Calculated Onsite Storage (100-Year Storm)

5 HYDRAULIC MODEL ANALYSIS

Hydraulic analyses were completed by using PCSWMM 2021 modeling software to review the hydraulic grade line (HGL) conditions within the proposed storm sewer system and verify the required storages and the peak discharges from the proposed dry stormwater management pond under the 2-year, 5-year and the 100-year design storms.

5.1 SUB-CATCHMENT AREAS

The total modeled drainage area measures 7.785 hectares and includes 23 drainage sub-catchments. The estimated overall impervious percentage is approximately 43.0%. The impervious area was converted from the estimated runoff coefficient C-value of 0.65 as discussed in Section 4. The pervious area was calculated by measuring the rear yard areas and all areas were assumed to be grassland.

The PCSWMM model was set to make use of basic SWMM runoff surfaces for converting a rainfall hyetograph into an inflow hydrograph.

The Horton Method was used for calculating infiltration rates. These surface and infiltration parameters are listed in Table 5-1.

Table 5-1: Surface and Infiltration Parameters Used in PCSWMM Models

SURFACE / INFILTRATION PARAMETERS	MODELED VALUES
Impervious depression storage (mm)*	1.6
Pervious depression storage (mm)*	4.7
Average catchment slope (%)	1-2
Initial infiltration rate (mm/hr)*	76.2
Final infiltration rate (mm/hr)*	13.2
Decay coefficient (hr^{-1})*	4.14
Percentage of impervious area with no depression storage (%)	25
Manning "n" for impervious area	0.014
Manning "n" for pervious area	0.45

*City of Ottawa Sewer Design Guidelines (October 2012).

SWMM software accounts for retention storage (i.e. initial loss due to depressions in pavement). Typically, it is assumed that only 25% of the impervious area contains no retention storage. The remainder of impervious area assumes an initial abstraction of 1.6 mm. Therefore, PCSWM assumes an area that is 40% impervious will have 10% of the total catchment area impervious with zero retention storage, 30% is impervious with 1.6 mm of retention storage (10%+30%=40% total impervious), and the remaining 60% of the catchment area is pervious, with typical Horton infiltration parameters reducing the catchment runoff.

5.2 CONVEYANCE SYSTEM (HYDRAULIC)

The gravity storm sewers were assigned a typical Manning's roughness coefficient of 0.013 for all smooth walled sewers. Entrance and exit losses were only assigned to major pipes along the open channel sections of the model. Open channels were assigned a Manning's roughness of 0.035 which represents a clean channel free of debris and heavy vegetation per MTO Drainage Management Manual, Design Chart 2.01.

Figure 5-2 shows the modeled conveyance system including conduits and junctions.

Two (2) types of inlet hydraulics and surface storages were used for junctions in the PCSWMM models. For catch basins or inlets proposed in the rear yard, parking lots, and vegetated swales, modeled storage curves were determined based on the proposed grading plan. For catch basins in the road right-of-way (ROW), a maximum of 300 mm ponding depth was assigned to junctions. The ponding area at 300 mm depth was assumed to be 10% of the drainage sub-catchment areas which are directing runoff to the junctions.

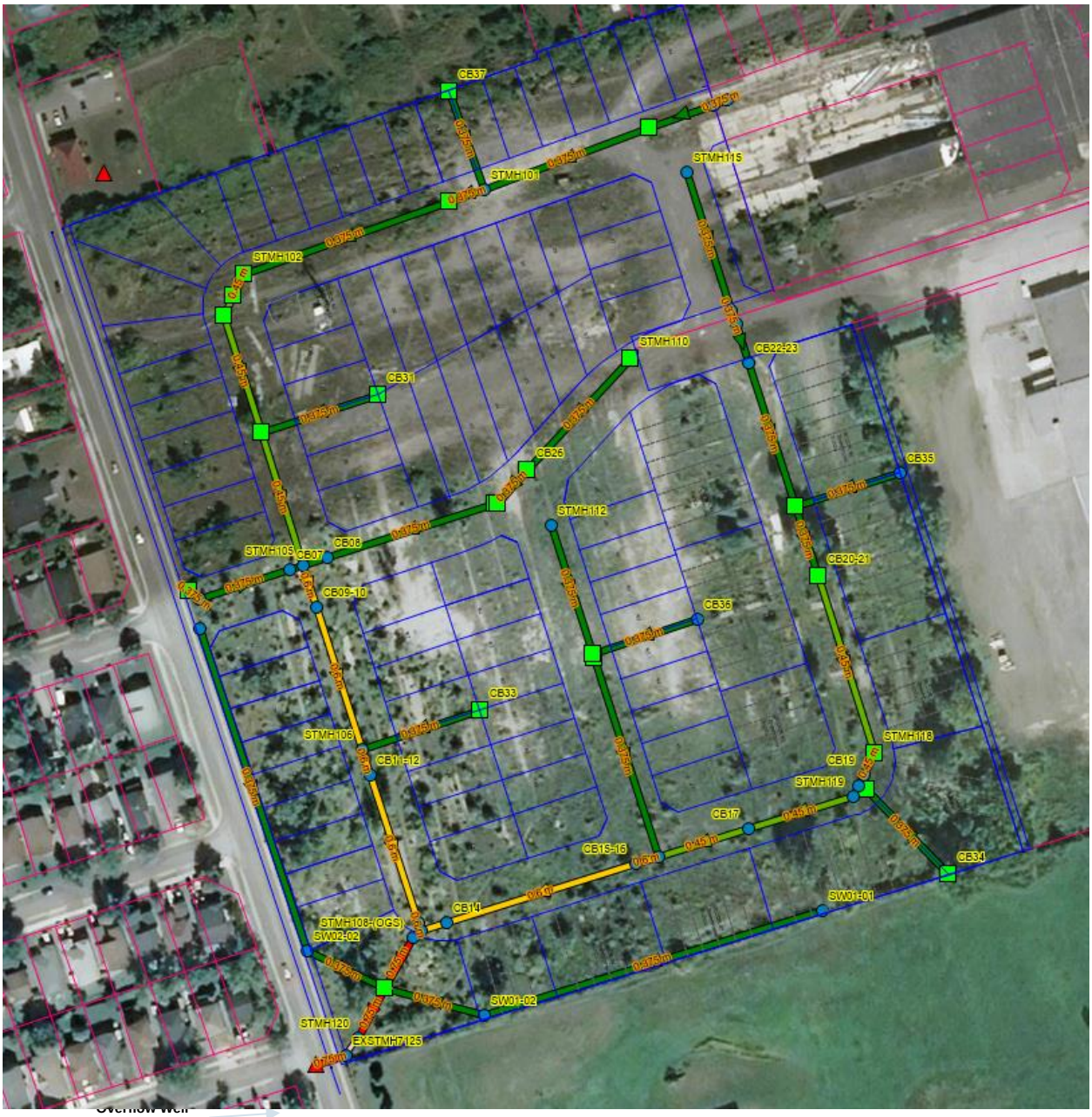


Figure 5-2: Modeled Junctions and Conduits

5.3 DRY STORMWATER MANAGEMENT POND

A dry stormwater management pond is proposed in Block 96 to provide stormwater management quantity control to the Wilson Avenue development. The open area of the proposed dry pond measures approximately 1,524 m^2 with an overall available storage of 2048.9 m^3. The pond storage curve is shown in Appendix D. The other design parameters are as follows:

- Bottom pond elevation: 97.35 m
- Bottom trench slope: 1.0%

- Side slope: 4:1
- Depth of pond: 2.15 m
- Top of berm elevation: 99.35 m
- Freeboard: 0.4 m

5.4 OUTLET STRUCTURE

The discharge rates from the proposed dry stormwater pond will be restricted by two (2) orifices in a maintenance hole with a weir structure. Size and invert of the orifice was determined through the hydraulic modeling analysis. An overflow weir is proposed at the 100-year high water level as shown in Figure 5-3.

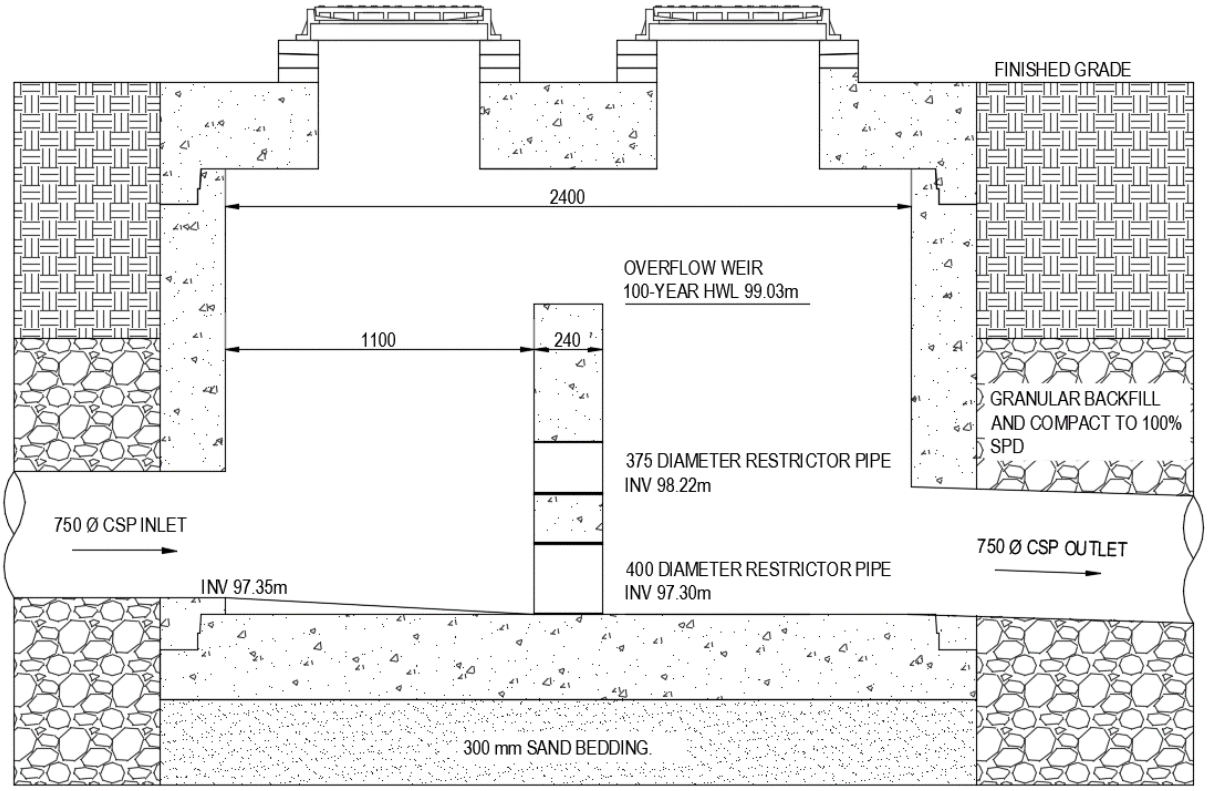


Figure 5-3: Outlet Control Structure with Orifices and Weir

5.5 MODELING RESULTS

5.5.1 2-YEAR DESIGN STORM

The modeled peak discharge under the 2-year design storm measures approximately 207.6 L/s. The maximum storage that was used during the 2-year design storm event in the proposed dry pond was 415.1 m^3, and the maximum depth measured 0.61 m. Figure 5-4 shows the flow hydrographs at the outfall structure of the proposed dry pond. Figure 5-5 shows the modeled dry pond storage and water depth under the 2-year design storm.

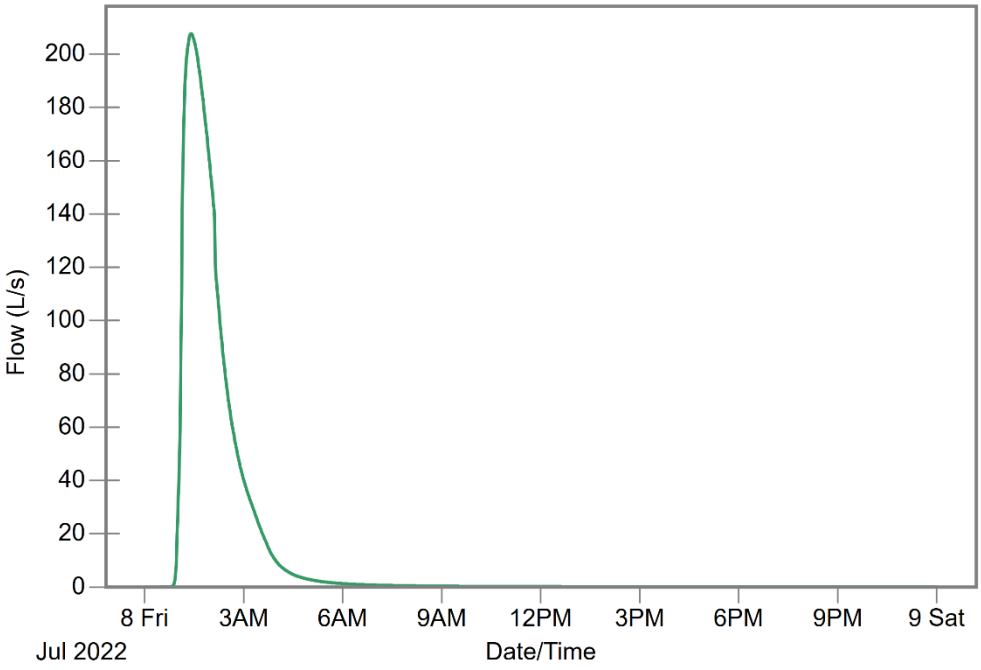


Figure 5-4: Dry Pond Outfall Discharge Hydrograph (2-year Storm)

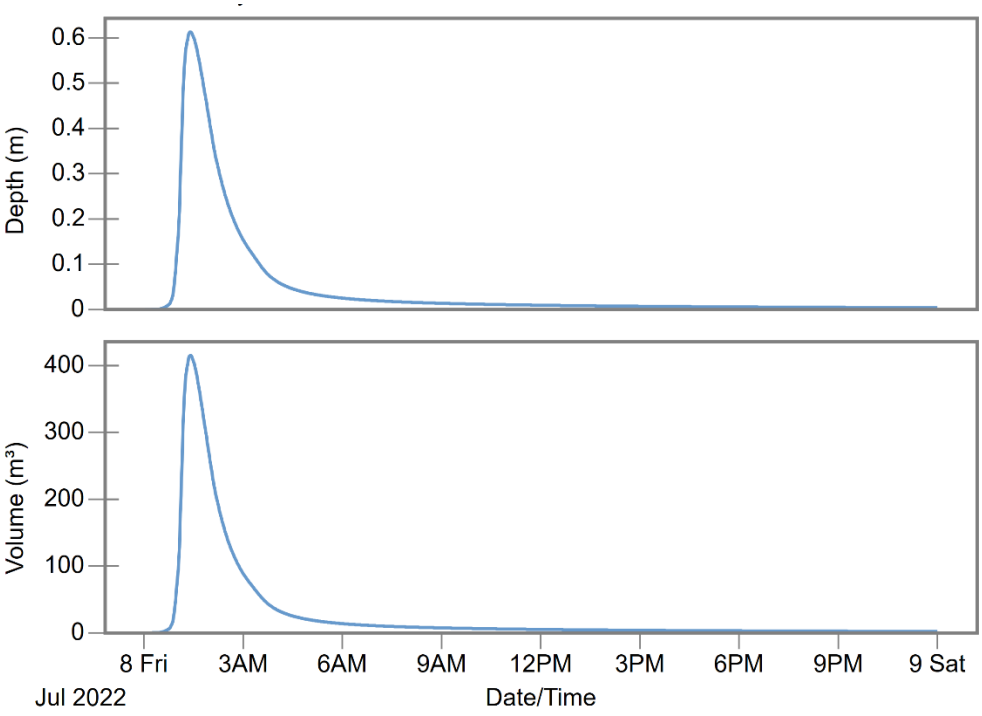


Figure 5-5: Modeled Dry Pond Depth and Storage (2-year Storm)

Figure 5-6 and Figure 5-7 illustrate the HGL profiles within the proposed storm sewer systems. A summary statistic report for the 2-year design storm scenario is included in Appendix C.

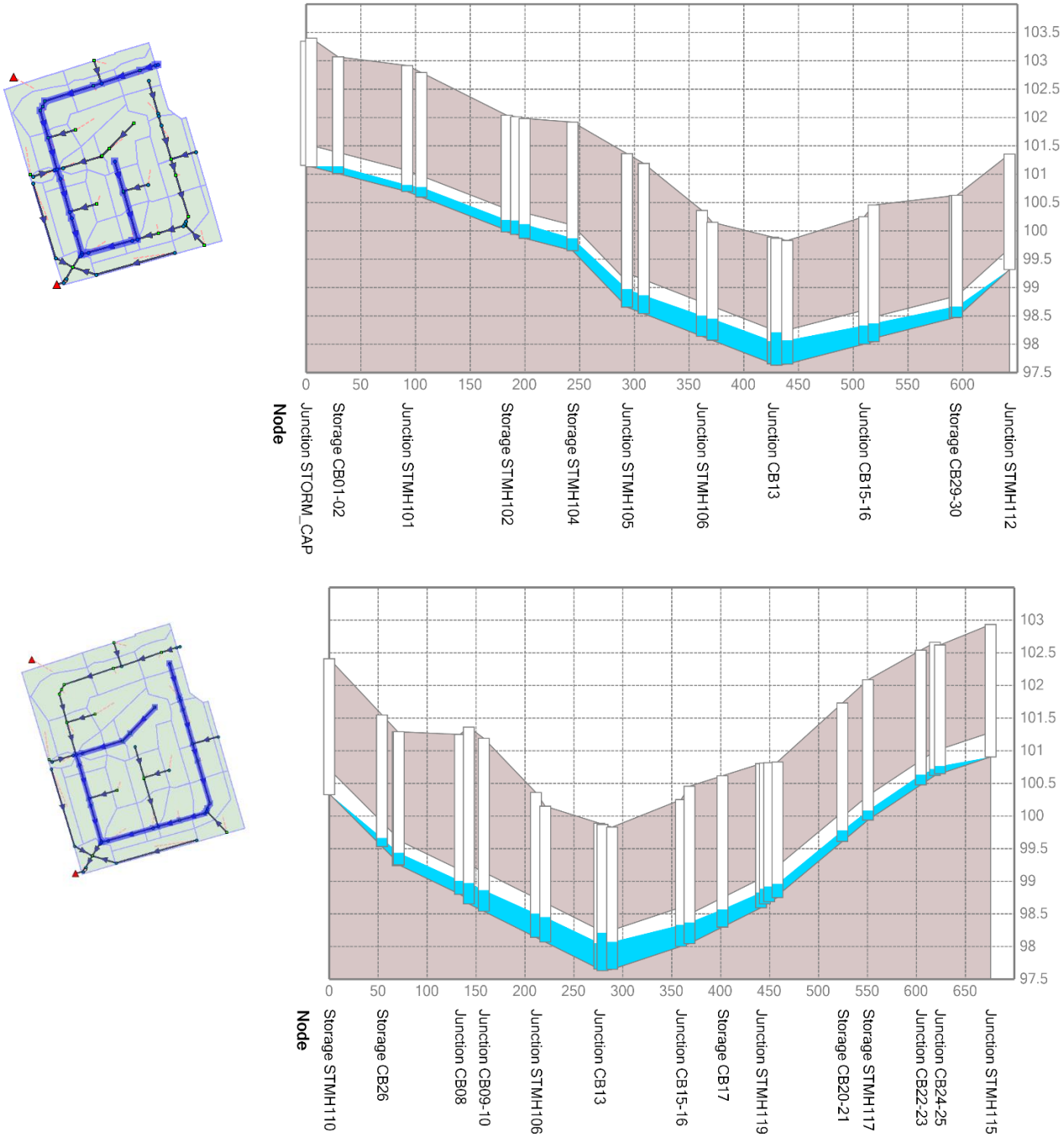


Figure 5-7: 2-year Storm System Peak HGL - 2

5.5.2 5-YEAR DESIGN STORM

The modeled peak discharge under the 5-year design storm measures approximately 250.1 L/s. The maximum storage that was used during the 5-year design storm event in the proposed dry pond was 587.2 m^3, and the maximum depth measured 0.815 m. Figure 5-8 shows the flow hydrographs at the outfall

structure of the proposed dry pond. Figure 5-9 shows the modeled dry pond storage and water depth under the 5-year design storm.

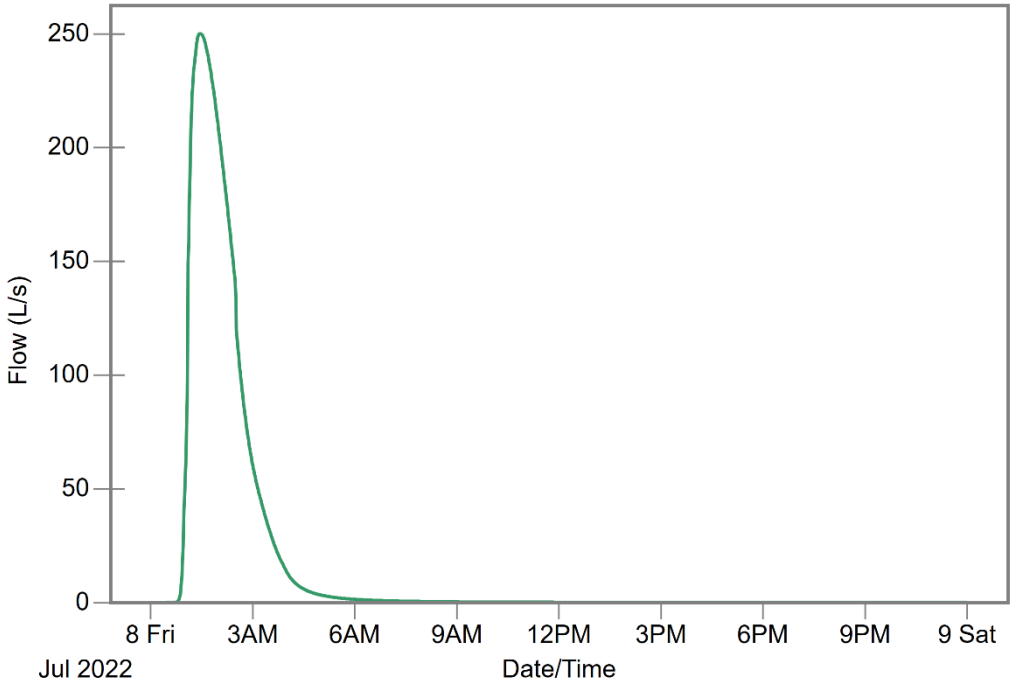


Figure 5-9: Dry Pond Outfall Discharge Hydrograph (5-year Storm)

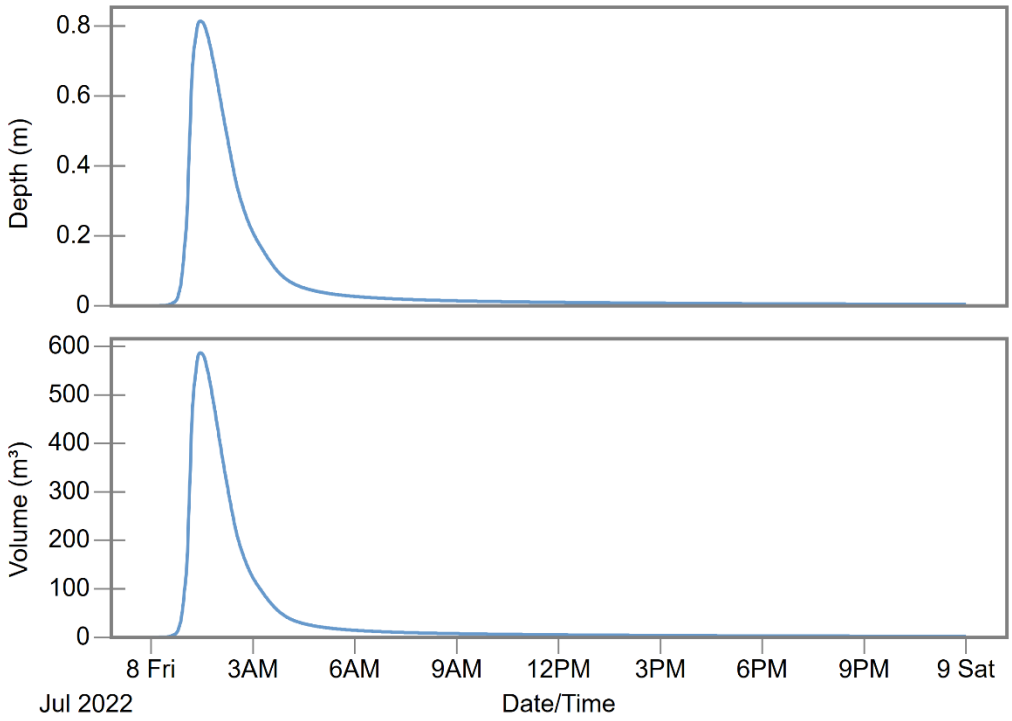


Figure 5-8: Modeled Dry Pond Depth and Storage (5-year Storm)

Figure 5-10 and Figure 5-11 illustrate the HGL profiles within the proposed storm sewer systems. A summary statistic report for the 5-year design storm scenario is included in Appendix C.

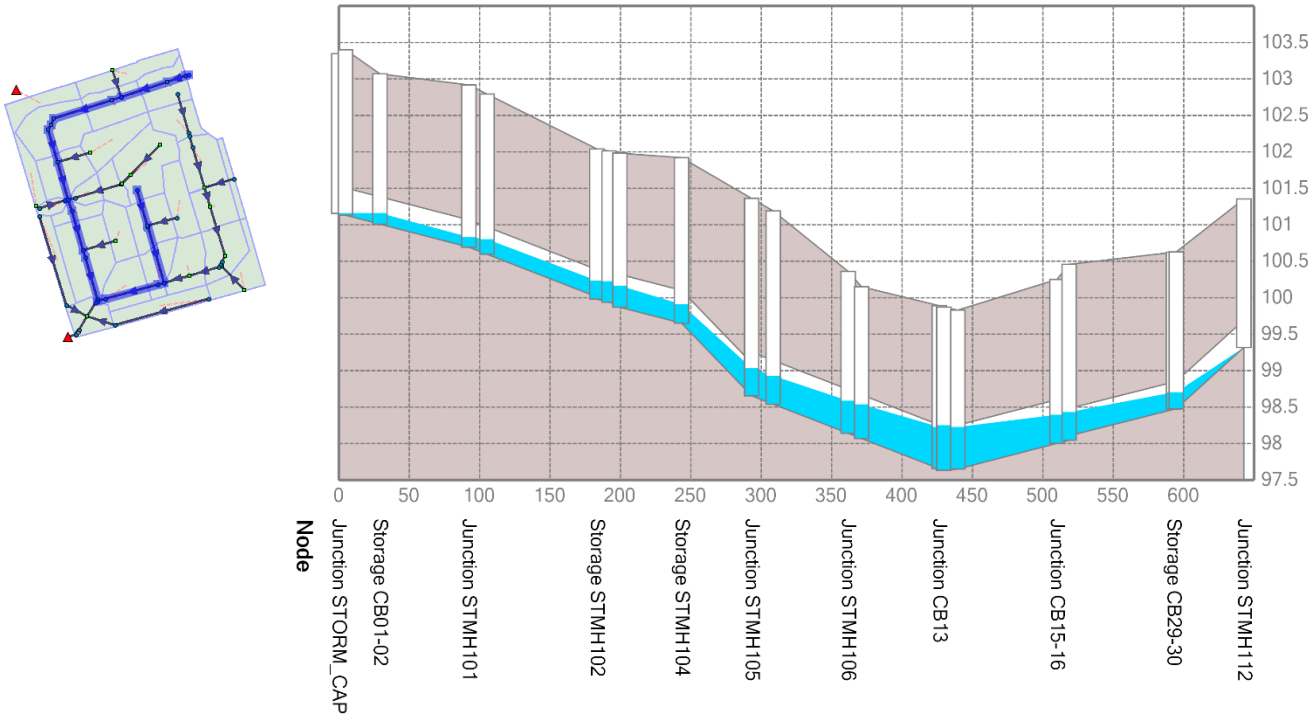


Figure 5-10: 5-year Storm System Peak HGL - 1

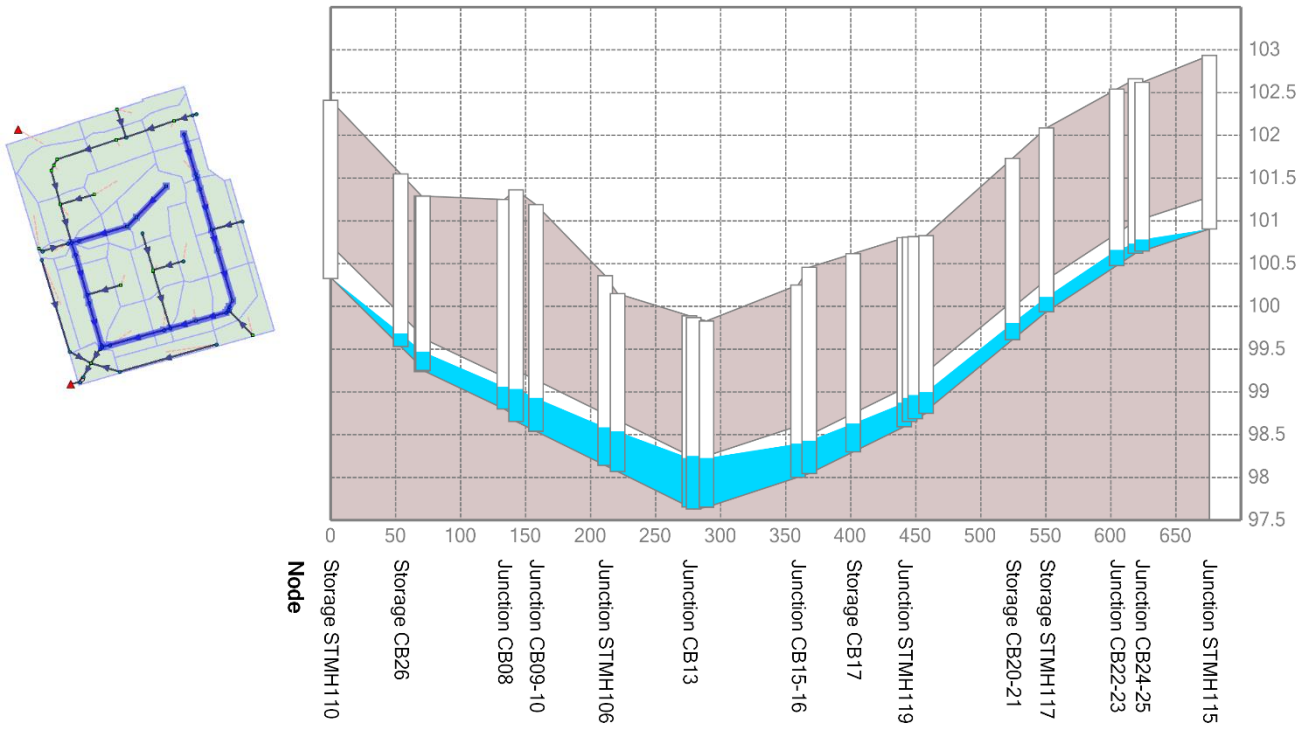


Figure 5-11: 5-year Storm System Peak HGL - 2

5.5.3 100-YEAR DESIGN STORM

The modeled peak discharge under the 100-year design storm measures approximately 583.9 L/s. The maximum storage that was used during the 100-year design storm event in the proposed dry pond was 1,477 m^3, and the maximum depth measured 1.623 m. Figure 5-12 shows the flow hydrographs at the outfall structure of the proposed dry pond. Figure 5-13 shows the modeled dry pond storage and water depth under the 100-year design storm.

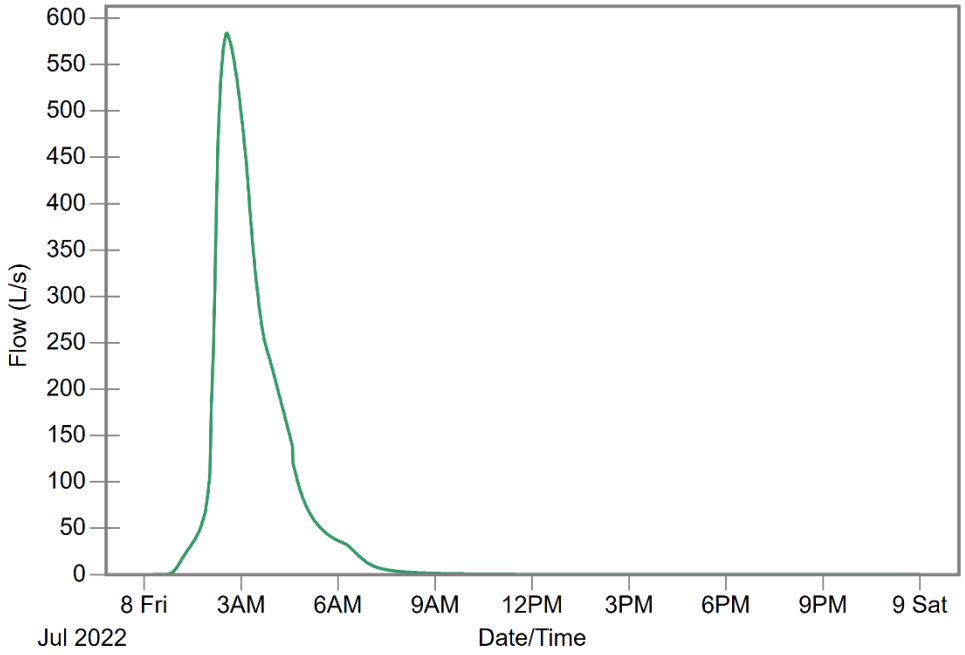


Figure 5-12: Dry Pond Outfall Discharge Hydrograph (100-year Storm)

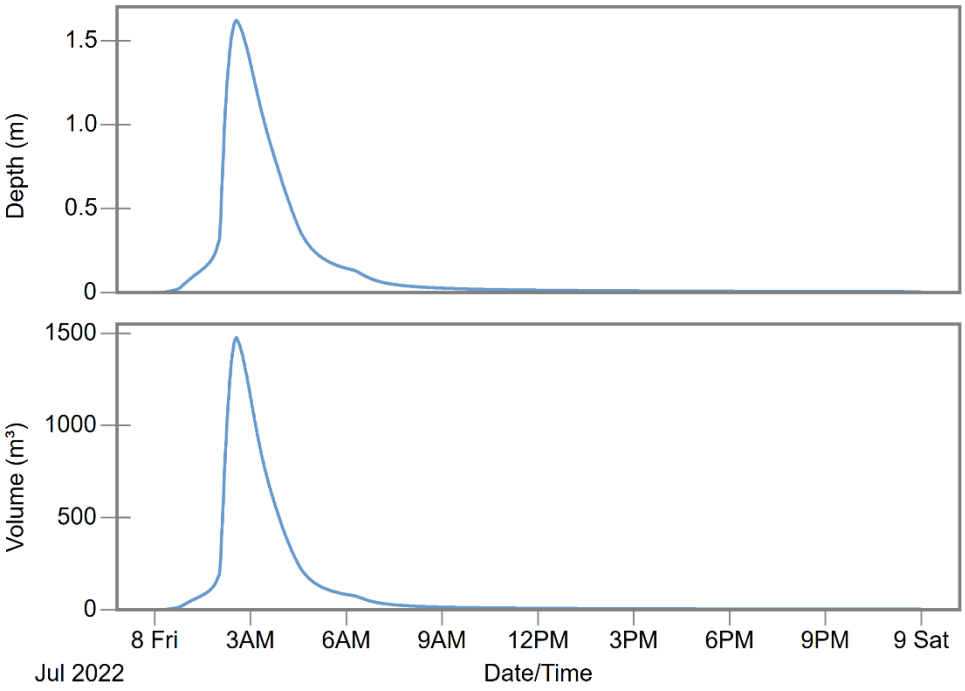


Figure 5-13: Modeled Dry Pond Depth and Storage (100-year Storm)

Figure 5-14 and Figure 5-15 illustrate the HGL profiles within the proposed storm sewer systems. A summary statistic report for the 100-year design storm scenario is included in Appendix C.

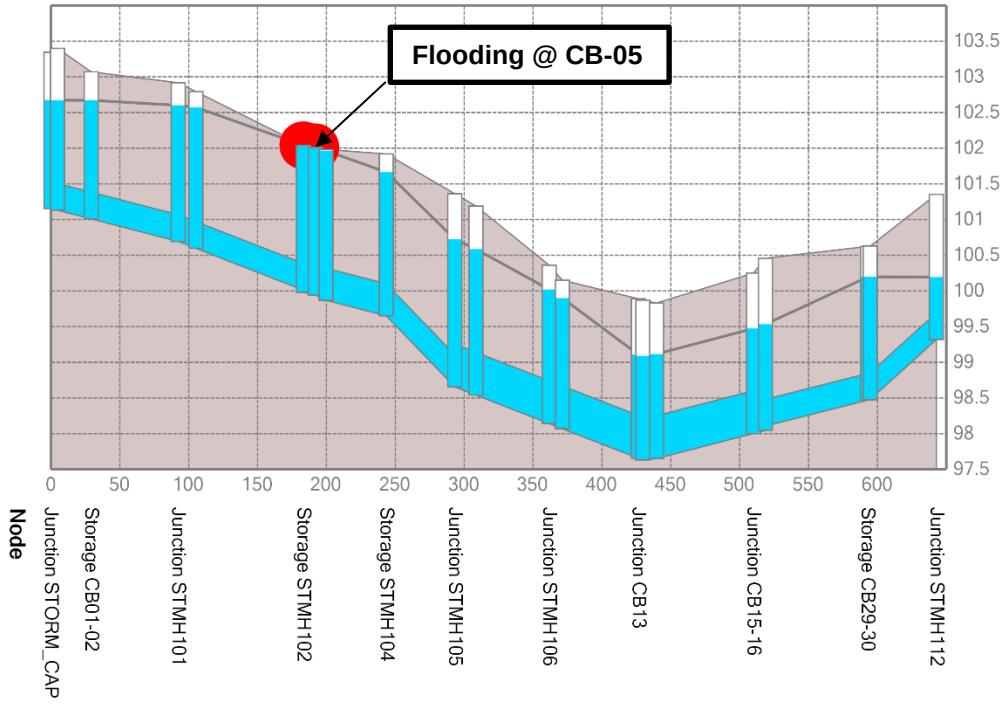


Figure 5-14: 100-year Storm System Peak HGL - 1

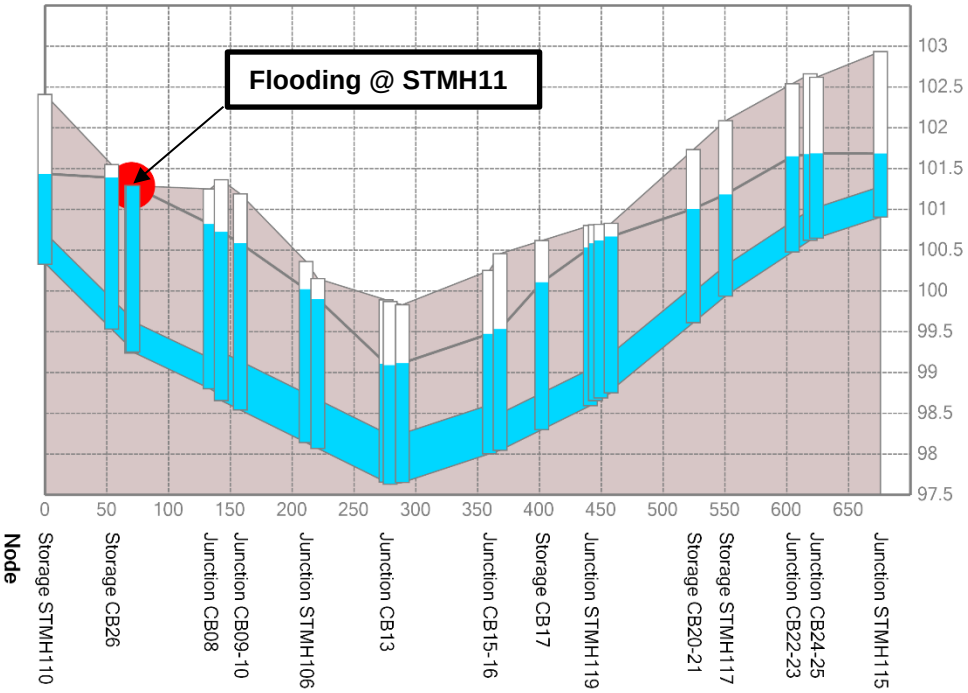


Figure 5-15: 100-year Storm System Peak HGL - 2

The 100-year design storm modeling results showed that the proposed storm sewer system would experience flooding in two locations. One of them is at CB-05 and the other is at STMH11. The maximum flooding flow at CB-05 is 18.3 L/s, and the maximum flooding flow at STMH11 is 21.1 L/s. Both flooding occurred at the modeling time of 2:10, and lasted about two (2) minutes.

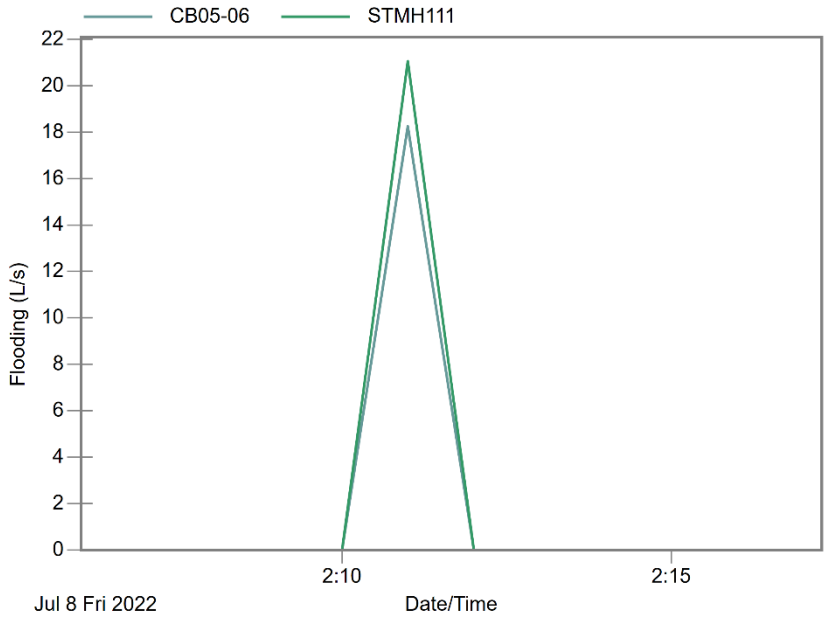


Figure 5-16: Flooding Flows at CB05 & STMH11 under 100-year Storm

The storm sewer system is designed to accommodate the peak runoff under the 5-year design storm. During the 100-year design storm events which will exceed the capacity of the storm sewer system, and

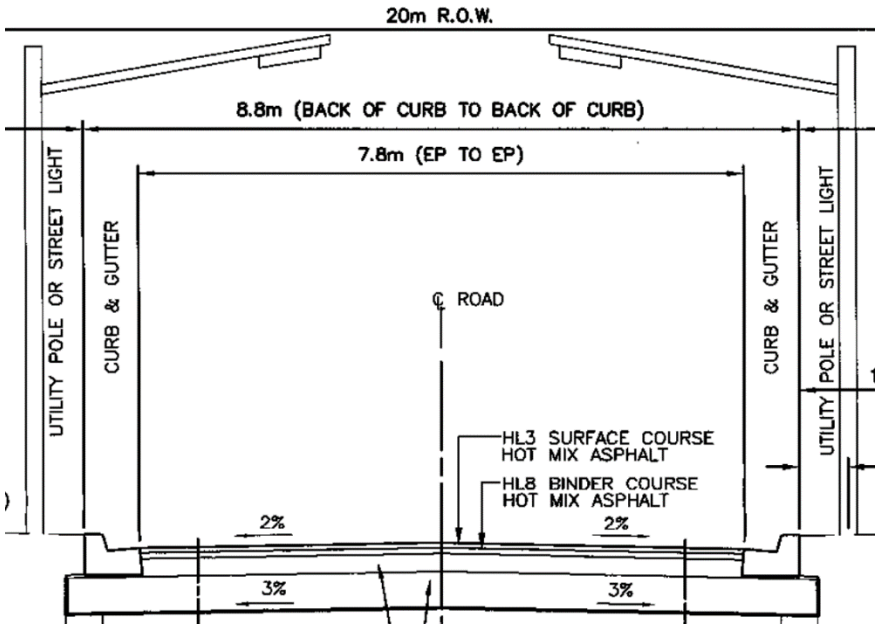


Figure 5-17: Typical Roadway Section (City of Belleville)

excess runoff is conveyed overland and eventual discharge into the dry pond. Figure 5-17 shows the typical roadway section from the City of Belleville Engineering and Development Services Department.

The maximum depth from the invert of the gutter to the center line of road is 0.078 m based on a 2.0% cross slope. The Manning equation is used to calculate the roadway channel capacity to convey the excess runoff overland.

$$Q = VA = \left(\frac{1.00}{n}\right) AR^{\frac{2}{3}}\sqrt{S}$$

Where: Q = Flow Rate (m^3/s)

A = Flow Area (m^2)

n = Manning's Roughness Coefficient (**0.013** for pavement)

R = Hydraulic Radius (m)

S = Channel Slope (Average **1.5%**)

The calculated roadway channel capacity is 179.3 L/s with an average channel slope of 1.5%. The proposed roadway has sufficient capacity to convey the excess runoff under the 100-year design storm without overtop of the curb.

5.6 QUALITY CONTROL

The quality control for drainage areas within the Wilson Avenue Subdivision development shall be an enhanced level with a long-term removal rate of at least 80% total suspended sediments (TSS) per the QCA requirements. Following Best Management Practices (BMP), roof downstream disconnects, rear yard infiltration swales, and an oil/grit separator are proposed.

5.6.1 INFILTRATION SWALES

Infiltration swales are proposed within the rear yards of sub-catchment areas SC_2, SC_5, SC_7, SC_10, SC_18, SC_21 and SC_22, as shown in Figure 4-1. Overall, approximately 1.41 ha or 18.1% of the study area will be serviced by rear yard infiltration swales to enhance the stormwater quality control. The infiltration swales are implemented at the ground surface to intercept overland flows. Details and dimensions of the proposed infiltration swale is shown in Figure 5-17. The location of the proposed infiltration trench is shown on Drawing C1.1 in Appendix E.

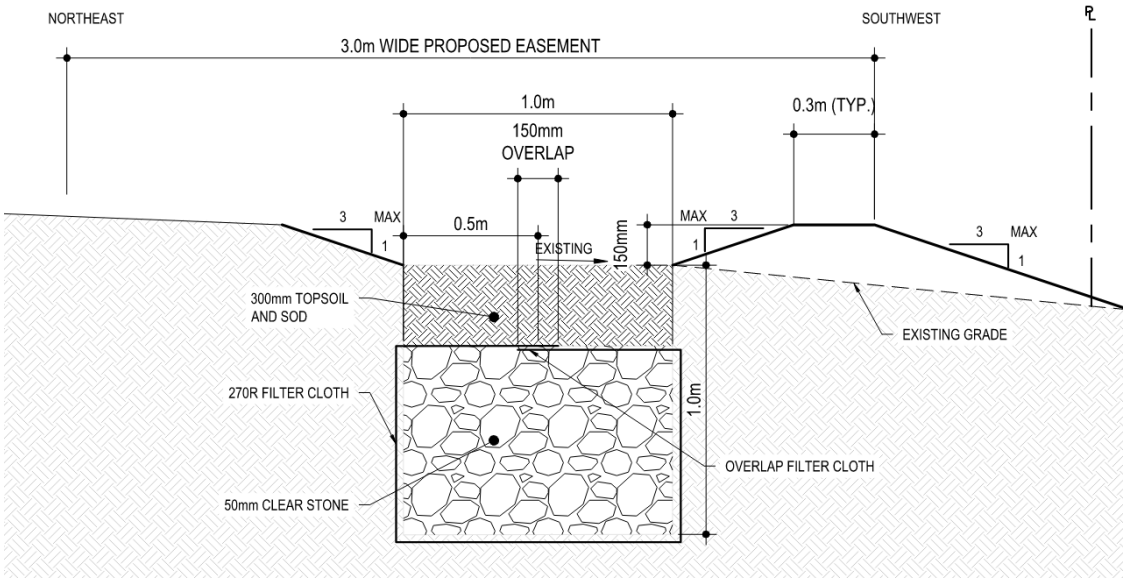


Figure 5-18: Typical Infiltration Swale Detail

As outlined in Table 3.2 of The MOE Stormwater Management Planning and Design Manual, the required storage volume of the infiltration trench for an impervious level equal to or less than 35% is 25 m^3 per hectare. Therefore, the required infiltration storage for the rear yard sub-catchments is 35.3 m^3.

Equation 4.3 from The MOE Stormwater Management Planning and Design Manual was used to determine the minimum required bottom area of the infiltration trench as follows:

$$A = \frac{1{,}000\,V}{P\,n\,\triangle t}$$

Where A = bottom area of the infiltration trench (m^2)

V = runoff volume to be infiltration (m^3)

P = soil percolation rate of surrounding native soil (mm/hr)

n = porosity of the storage media

$\triangle t$ = retention time

As indicated in the Hydrogeological Investigation Report (GEI, May 2022), the infiltration rate for the proposed rear yard infiltration trench area (BH6, BHMW7, BH9, BH10, BHMW12, & BHMW13) range from 30 to 75 mm/hr. The minimum required bottom area of the infiltration trench is 123 m^2. The

proposed infiltration trench area is 867 m^2 (867 m long x 1 m wide) and is estimated to be sufficient to infiltrate runoff from the rear yards of 32 lots.

5.6.2 GRASSED SWALES

Grassed swales with a combination of 150 mm diameter standard perforated pipe and a filter sock are proposed along the rear yard property line in sub-catchment areas SC_8, SC_11 and SC_16 to collect runoff, as shown in Figure 5-19. The total area serviced by the grassed swales is approximately 0.82 ha or 10.6% of the study area. Grassed swales are effective SWMPs for stormwater quality control when the swales are designed to maintain flows equal to or smaller than 0.15 m^3/s and velocities equal to or smaller than 0.5 m/s under a 4-hour 25 mm Chicago storm.

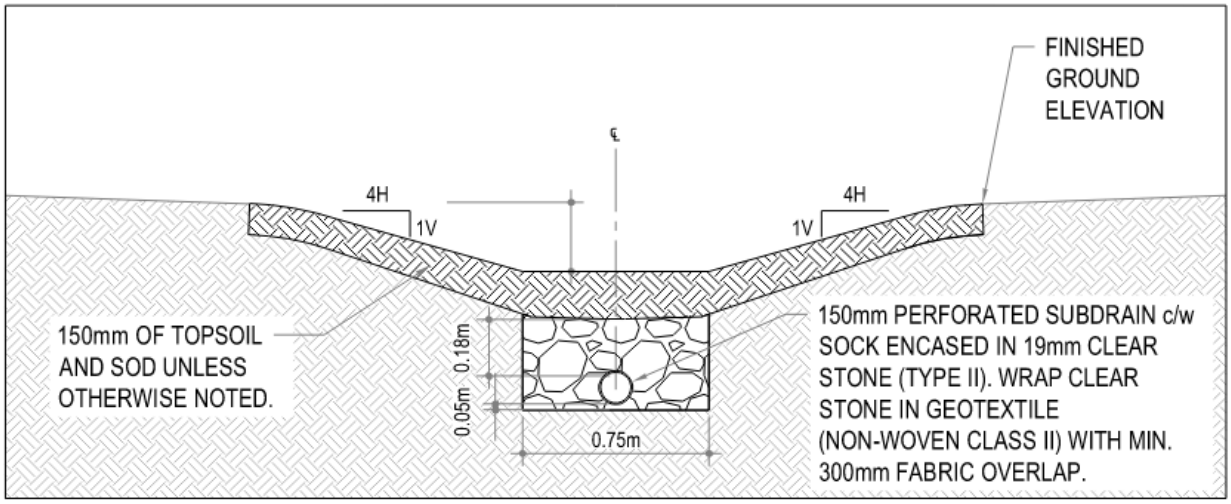


Figure 5-19: Typical Swale and Subdrain Details

The hydraulic modeling analysis indicated that the peak runoff generated from three sub-catchments range from 18.1L/s to 24.8 L/s under 25 mm, 4-hour Chicago storm. The design slope of the rear yard swale is 1.0%. The maximum flow velocity in the proposed grassed swales is 0.39 m/s.

5.6.3 OIL/GRIT SEPARATOR

All runoff collected by the proposed storm sewer system and outlet through a proposed dry pond within Block 96 to the existing the Municipal storm system. Total drainage area of these sub-catchments is 5.6 ha or 71.3% of the study area. The estimated imperviousness is 57.1%.

A Stormceptor EFO10 oil/grit separator located upstream of the dry pond is proposed to provide stormwater quality control to removal 80% of the long-term average total suspended solids from runoff collected by the storm sewer system. The design capacity of Stormceptor EFO10 is outlined below.

- Maximum Treatment Flow Rate: 65.0 L/s
- Maintenance Sediment Volume: 3,560 L
- Maximum Sediment Capacity: 17,790 L
- Maximum Hydrocarbon Storage Capacity: 1,670 L
- Total Storage Volume: 23,700 L

Stormceptor design details are included in Appendix 0.

5.7 SUMMARY

The hydraulic modeling analysis was completed to review the system HGL conditions as well as the required storage and water levels in the proposed dry pond under, the 2-year, the 5-year, and the 100-year design storms. The modeling results are summarized in Table 5-2.

Table 5-2: Summary of Modeling Results

STORM EVENT	MAX ALLOWABLE DISCHARGE (L/s)	MODELED PEAK DISCHARGE @ DRY POND OUTLET (L/s)	ESTIMATED REQUIRED STORAGE (m^3)	MODELED WATER DEPTH @ DRY POND (m)	MODELED PEAK STORAGE @ DRY POND (m^3)
2-Year	212.3	207.6	431.3	0.610	415.1
5-Year	281.0	250.1	536.3	0.815	587.2
100-Year	584.3	583.9	901.3	1.623	1,477.0

- The peak discharge rate at the dry pond outlet under the 2-year design storm measures 207.6 L/s.
- The modeled storage under the 2-year design storm is 431.3 m^3 at a water depth of 0.61 m.
- The peak discharge rate at the dry pond outlet under the 5-year design storm measures 250.1 L/s.
- The modeled storage under the 5-year design storm is 536.3 m^3 at a water depth of 0.815 m.
- The peak discharge rate at the dry pond outlet under the 100-year design storm measures 583.9 L/s.
- The modeled storage under the 100-year design storm is 1,477 m^3 at a water depth of 1.623 m.

Through the implementation of the Stormwater Plan presented, there will be no increase in peak stormwater flow rates conveyed off-site during minor and major storm events. Additionally, through these measures, the quality of runoff from the proposed development will be enhanced to 80% TSS removal.

Three stormwater quality control BMP have been proposed for this project, which include infiltration swales, grassed swales, and an oil/grit separator. The design criteria and effectiveness are detailed in Table 5-3.

Table 5-3: Summary of Stormwater Quality Control BMP

STORMWATER MANAGEMENT BMP	CATCHMENTS AREA (ha)	MECP DESIGN CRITERIA	EFFECTIVENESS
Infiltration Trench	1.41	Minimum required trench bottom area: 123 m^2 as per Equation 4.3.	Design trench bottom area: 867 m^2
Grassed Swale	0.82	Flow velocity < 0.5 m/s; Flow rate < 0.15 m^3/s (25mm 4hr Chicago Storm)	Max design swale velocity: 0.39 m/s Peak runoff: 24.8 L/s
Stormceptor EFO10		Target TSS removal: 80%	Provided TSS removal: 81%

6 EROSION AND SEDIMENT CONTROL

Regular monitoring and inspection of the silt mitigation measures and/or devices are critical during site construction until all vegetation is established, and construction activity is complete. This inspection will ensure that any breach of the silt mitigation measures is immediately identified and able to be reinstated and/or remedied in a timely fashion. During the spring freshet and during major storm events, the inspections may have to be more frequent.

A contingency plan should also be in place to ensure the response to any problems can be immediate. This plan shall include:

1. Generic plans for constructing temporary berms, check dams, and new sedimentation control ponds if any emergency measures are required;
2. The necessary equipment (excavator, loader, pumps and hoses) and supplies (silt fencing, clear stone, straw bales and dry sand stock piles) on hand during construction, and check for operational efficiency of the installations daily;
3. A list of contact names and telephone numbers of equipment operators and laborers who can be called upon to make emergency repairs; and
4. A list of emergency contact names and telephone numbers.

If repairs are required for any component of the silt mitigation installations, the work must be performed in a timely manner. The on-site inspector will have the authority to ensure the required works are performed immediately, and to issue a “Stop Work Order” if necessary.

In the event of a spill, or failure of the water quality control measures, the MECP spill reporting procedures shall be used to report any unexpected discharge of silt, sediment, and/or other deleterious substance. The MECP 24-hour spill line is 1-800-268-6060.

7 CLOSING

We trust that this Draft Stormwater Management Report is suitable to support the draft plan approval and bylaw amendment for the proposed Wilson Avenue Subdivision development. If you require any additional information, or have any comments or concerns, please do not hesitate to contact our office.

APPENDIX

A CORRESPONDENCE

Delpellaro, Jared

From: Christine Phillibert <CPhillibert@quinteconservation.ca>
Sent: June 28, 2022 1:47 PM
To: Delpellaro, Jared
Cc: Davidson, Steve; Pan, Zhidong; Paul McCoy; Dave Eastcott; Amy Dickens
Subject: Wilson Avenue Subdivision Submission Requirements

Hello Jared,

Quinte Conservation will be looking for the following:

- Quality control to level 1/enhanced protection would be required for this site. Quinte Conservation does not support the use of OGS units for standalone quality control when drainage areas exceed 2ha in size.
- Mapping and quantification of pre-development and post-development drainage areas, discharge points, and flows. Quantity control matching post-development runoff to pre-development rates for the 2-year, 5-year and 100-year storm events) for each discharge location/direction.
- An overland flow route should be maintained for major flows.
- Infiltration should not be used if there are known or suspected contamination issues on the property.
- Quinte Conservation's stormwater submission guidelines are available on our website https://www.quinteconservation.ca/en/watershed-management/stormwater-management.aspx
- The property in question is adjacent to the intake protection zone 2 for source water protection of the Belleville Municipal Drinking Water System. If the stormwater from the property contributes to the intake protection zone 2 and/or could reach the municipal intake within 2 hours, the intake protection zone would require an expansion update to include the new development, therefore the determination of the stormwater time of travel will be required. Staff are available to consult, should you wish on determining whether this development will expand the intake protection zone 2.

Potential downstream capacity issues should be confirmed with the municipality.

Feel free to contact Quinte Conservation staff if you have any questions.

Regards,

Christine (McClure) Phillibert, P.Eng. (She/Her)
Water Resources Manager
Quinte Conservation
cphillibert@quinteconservation.ca

Working, living, and learning on the traditional territories of the Anishnabek, Huron-Wendat, and Haudenosaunee (Iroquois) peoples.

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1947 - 2022

IMPORTANT COVID-19 NOTICE: In light of health concerns related to the Covid-19 virus, the QC office will be closed to the public until further notice. Events and meetings will be postponed until further notice. Residents can reach the office by calling 613-968-3434 or by emailing info@quinteconservation.ca. Documents can be dropped off via the mail slot at the main office or by mail at 2061 Old Hwy 2. Belleville ON, K8N 4Z2.

Click here to sign up for one of Quinte Conservation's e-newsletters!

www.QuinteConservation.ca
www.QuinteSourceWater.ca

RR#2, 2061 Old Hwy #2, Belleville, ON K8N 4Z2
Phone: (613) 968-3434 or (613) 354-3312 ext. 130

APPENDIX

B STORM SEWER DESIGN SHEET

Storm Sewer Design -Rational Method

Consultant: WSP Canada Inc
Project No: 221-05962-00
Project: Wilson Avenue Subdivision

Storm Sewer Design Criteria

Rainfall Intensity (pre-determined storm equation)

Q=C x A m^2 x I mm/hr/(3600x1000) (m^3/s)
I= (27.71*25.4)/t^0.699 mm/hr
MNANNING "n" = **0.013**

Sheet 1 of 1
File Name: LDS Rational Method
Completed by: Jared Delpellaro, EIT
Checked by: Zhidong Pan, P.Eng.
Date: 2022/07/19

Manhole		Area (m^2)		Runoff Coefficient		CxA	Total C x A	U/S Time of Concentration	Total Time	Intensity	Runoff Flow	Pipe Selection								Inc. Travel Time To Downstream Manhole	Ratio	Header	Pipe Invert Ele.		Pipe Crown Ele.		Ground Ele.		Cover	
										I	Q	Min. Pipe Slope	Pipe Dia.	Pipe A	Hydraulic radius (full flow)	Manning's "n"	Full Q Cap.	Velocity V	Length		Q/Q Cap.	Manning's "S"	U/S Invert	D/S Invert	U/S Crown	D/S Crown	U/S Ground	D/S Ground	U/S Cover	D/S Cover
From	To	Frontage	Rear yard	Frontage	Rear yard	(m^2)	(m^2)	(min)	(min)	(mm/hr)	(m^3/s)	%	(mm)	m^2	R		(m^3/s)	(m/s)	(m)	(min)	%	m/m	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
STMH100	STMH101	2,984	-	0.65	0.25	1,950	1,950	0.00	15.00	106.02	0.057	0.50%	375	0.110	0.094	0.013	0.124	0.520	88	2.82	46.48%	0.11%	101.130	100.693	101.505	101.068	103.200	102.920	1.695	1.852
CB37	STMH101	-	2,807	0.65	0.25	702	702	0.00	15.00	106.02	0.021	0.50%	375	0.110	0.094	0.013	0.124	0.187	37	3.30	16.67%	0.01%	100.878	100.693	101.253	101.068	102.600	102.920	1.347	1.852
STMH101	STMH102	3,330	-	0.65	0.25	2,176	4,828	15.00	18.30	92.28	0.124	2.10%	375	0.110	0.094	0.013	0.254	1.120	33	0.48	48.72%	0.50%	100.693	100.011	101.068	100.386	102.920	102.040	1.852	1.654
STMH102	STMH103	5,143	-	0.65	0.25	3,361	8,188	18.30	18.78	90.61	0.206	0.51%	450	0.159	0.113	0.013	0.203	1.296	16	0.21	101.60%	0.52%	99.980	99.899	100.430	100.349	102.040	101.980	1.610	1.631
STMH103	STMH104	-	-	0.65	0.25	-	8,188	18.78	18.98	89.93	0.205	0.51%	450	0.159	0.113	0.013	0.203	1.286	43	0.56	100.75%	0.51%	99.869	99.651	100.319	100.101	101.980	101.920	1.661	1.819
CB31	STMH104	-	3,122	0.65	0.25	781	781	0.00	15.00	106.02	0.023	0.50%	375	0.110	0.094	0.013	0.124	0.208	44	3.52	18.54%	0.02%	99.871	99.651	100.246	100.026	102.150	101.920	1.904	1.894
STMH104	STMH105	-		0.65	0.25	-	8,969	18.98	19.54	88.12	0.220	1.99%	450	0.159	0.113	0.013	0.402	1.380	50	0.60	54.56%	0.59%	99.651	98.655	100.101	99.105	101.920	101.360	1.819	2.255
STMH109	STMH105	-	1,341	0.65	0.25	335	335	0.00	15.00	106.02	0.010	1.50%	375	0.110	0.094	0.013	0.215	0.089	39	7.27	4.60%	0.00%	99.300	98.715	99.675	99.090	101.340	101.360	1.665	2.270
STMH110	STMH111	-	-	0.65	0.25	-	-	0.00	15.00	106.02	0.000	1.50%	375	0.110	0.094	0.013	0.215	0.000	70	0.00	0.00%	0.00%	100.340	99.289	100.715	99.664	102.410	101.290	1.695	1.626
STMH111	STMH105	6,784	-	0.65	0.25	4,433	4,433	0.00	15.00	106.02	0.131	0.60%	375	0.110	0.094	0.013	0.136	1.182	73	1.03	96.02%	0.55%	99.289	98.850	99.664	99.225	101.290	101.360	1.626	2.135
STMH105	STMH106	6,493	-	0.65	0.25	4,243	17,980	19.54	20.92	84.02	0.420	0.76%	525	0.216	0.131	0.013	0.374	1.938	68	0.58	112.23%	0.95%	98.655	98.141	99.180	98.666	101.360	100.440	2.180	1.774
CB33	STMH106	-	2,272	0.65	0.25	568	568	15.00	15.00	106.02	0.017	1.00%	375	0.110	0.094	0.013	0.175	0.151	38	4.18	9.54%	0.01%	98.521	98.141	98.896	98.516	101.300	100.400	2.404	1.884
STMH106	STMH107	4,455	-	0.65	0.25	2,911	21,459	20.92	21.51	82.42	0.491	0.75%	600	0.283	0.150	0.013	0.532	1.737	68	0.65	92.30%	0.64%	98.141	97.630	98.741	98.230	100.400	99.850	1.659	1.620
STMH115	STMH116	-	-	0.65	0.25	-	-	0.00	15.00	106.02	0.000	0.50%	375	0.110	0.094	0.013	0.124	0.000	57	0.00	0.00%	0.00%	100.905	100.621	101.280	100.996	103.360	102.660	2.080	1.664
STMH116	STMH117	5,988	-	0.65	0.25	3,913	3,913	15.00	15.00	106.02	0.115	0.99%	375	0.110	0.094	0.013	0.175	1.043	69	1.10	66.01%	0.43%	100.621	99.937	100.996	100.312	102.660	102.090	1.664	1.778
CB35	STMH117	-	833	0.65	0.25	208	208	0.00	15.00	106.02	0.006	1.00%	375	0.110	0.094	0.013	0.175	0.056	39	11.71	3.50%	0.00%	100.327	99.937	100.702	100.312	102.200	102.090	1.498	1.778
STMH117	STMH118	2,818	-	0.65	0.25	1,841	5,962	15.00	16.10	100.90	0.167	1.24%	375	0.110	0.094	0.013	0.196	1.513	93	1.02	85.45%	0.91%	99.937	98.780	100.312	99.155	102.090	100.830	1.778	1.675
STMH118	STMH119	3,393	-	0.65	0.25	2,217	8,180	16.10	17.13	96.64	0.220	0.74%	450	0.159	0.113	0.013	0.244	1.381	17	0.21	89.81%	0.59%	98.750	98.625	99.200	99.075	100.830	100.800	1.630	1.725
CB34	STMH119	-	2,553	0.65	0.25	638	638	0.00	15.00	106.02	0.019	1.00%	375	0.110	0.094	0.013	0.175	0.170	45	4.41	10.72%	0.01%	99.044	98.594	99.419	98.969	101.000	100.800	1.581	1.831
STMH119	STMH114	-	-	0.65	0.25	-	8,818	17.13	17.33	95.84	0.235	0.54%	450	0.159	0.113	0.013	0.209	1.476	73	0.82	112.07%	0.68%	98.594	98.200	99.044	98.650	100.800	100.460	1.756	1.810
STMH112	STMH113	-	-	0.65	0.25	-	-	0.00	15.00	106.02	0.000	1.71%	375	0.110	0.094	0.013	0.230	0.000	49	0.00	0.00%	0.00%	99.318	98.478	99.693	98.853	101.350	100.630	1.657	1.777
CB36	STMH113	-	2,832	0.65	0.25	708	708	0.00	15.00	106.02	0.021	0.50%	375	0.110	0.094	0.013	0.124	0.189	40	3.53	16.82%	0.01%	98.678	98.478	99.053	98.853	100.500	100.630	1.447	1.777
STMH113	STMH114	3,344	-	0.65	0.25	2,185	2,893	15.00	15.82	102.13	0.082	0.49%	375	0.110	0.094	0.013	0.123	0.743	76	1.70	66.91%	0.22%	98.478	98.106	98.853	98.481	100.630	100.460	1.777	1.979
STMH114	STMH107	5,443	-	0.65	0.25	3,557	15,268	17.33	18.16	92.77	0.393	0.50%	600	0.283	0.150	0.013	0.434	1.392	89	1.07	90.62%	0.41%	98.046	97.601	98.646	98.201	100.460	99.850	1.814	1.649
STMH107	POND	4,565	-	0.65	0.25	2,983	39,709	21.51	22.16	80.71	0.890	1.00%	750	0.442	0.188	0.013	1.113	2.015	10	0.08	79.97%	0.64%	97.450	97.350	98.200	98.100	99.850	99.750	1.650	1.650

APPENDIX

C

MODELING SCENARIOS SUMMARY REPORTS

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

  WARNING 03: negative offset ignored for Link C2
  WARNING 03: negative offset ignored for Link C4
  WARNING 03: negative offset ignored for Link Pipe_-_(117)_(STORM_SEWER)
  WARNING 03: negative offset ignored for Link Pipe_-_(27)_(STORM_SEWER)
  WARNING 03: negative offset ignored for Link Pipe_-_(30)_(2)_(1)_(STORM_SEWER)
_2
  WARNING 03: negative offset ignored for Link Pipe_-_(30)_(2)_(1)_(STORM_SEWER)
_4
  WARNING 03: negative offset ignored for Link Pipe_-_(37)_(2)_(STORM_SEWER)_2
  WARNING 03: negative offset ignored for Link Pipe_-_(95)_(STORM_SEWER)
  WARNING 02: maximum depth increased for Node SW01-01
  WARNING 02: maximum depth increased for Node SW01-02
  WARNING 02: maximum depth increased for Node SW02-01
  WARNING 02: maximum depth increased for Node SW02-02

  *************
  Element Count
  *************
  Number of rain gages ...... 4
  Number of subcatchments ... 29
  Number of nodes ........... 57
  Number of links ........... 56
  Number of pollutants ...... 0
  Number of land uses ....... 0


  ****************
  Raingage Summary
  ****************
                                                    Data       Recording
  Name                 Data Source                  Type       Interval
  ----------------------------------------------------------------------
  100Yr-Storm          6hr-ChicagoStorm             INTENSITY   10 min.
  25mm-4hr-Chicago     25mm-4hr-Chicago             INTENSITY   10 min.
  2Yr-Storm            3hr-ChicagoStorm-2yr         INTENSITY   10 min.
  5Yr-Storm            3hr-ChicagoStorm             INTENSITY   10 min.


  ********************
  Subcatchment Summary
  ********************
  Name                        Area     Width   %Imperv    %Slope Rain Gage
Outlet
  ----------------------------------------------------------------------------
----------------------------
  Post_SC_1                   0.28     88.55      0.00    1.5000 2Yr-Storm
CB37
  Post_SC_10                  0.51     79.09     57.10    1.5000 2Yr-Storm
CB05-06
  Post_SC_11                  0.28     53.24     57.10    1.5000 2Yr-Storm
CB20-21
  Post_SC_12                  0.34     93.31     57.10    1.5000 2Yr-Storm
CB19
  Post_SC_13                  0.26     89.23      0.00    1.5000 2Yr-Storm
CB34
  Post_SC_14                  0.30     91.53     57.10    1.5000 2Yr-Storm
CB17
  Post_SC_15                  0.13     99.00      0.00    1.5000 2Yr-Storm
CB32
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Post_SC_16	0.28	99.52	57.10	1.5000	2Yr-Storm CB36
Post_SC_17	0.33	87.74	57.10	1.5000	2Yr-Storm CB29-30
Post_SC_18	0.59	97.29	57.10	1.5000	2Yr-Storm CB11-12
Post_SC_19	0.23	81.42	57.10	1.5000	2Yr-Storm CB33
Post_SC_2	0.30	84.01	57.10	1.5000	2Yr-Storm CB01-02
Post_SC_20	0.13	68.05	57.10	1.5000	2Yr-Storm CB09-10
Post_SC_21	0.07	43.41	57.10	1.5000	2Yr-Storm CB07
Post_SC_22	0.34	61.39	57.10	1.5000	2Yr-Storm STMH104
Post_SC_23	0.18	121.24	0.00	1.5000	2Yr-Storm SW02-01
Post_SC_24	0.21	52.61	0.00	1.5000	2Yr-Storm DryPond
Post_SC_25	0.26	129.90	0.00	1.5000	2Yr-Storm SW01-01
Post_SC_26	0.15	61.89	57.10	1.5000	2Yr-Storm CB27-28
Post_SC_27	0.11	50.45	57.10	1.5000	2Yr-Storm CB08
Post_SC_28	0.23	88.73	57.10	1.5000	2Yr-Storm CB15-16
Post_SC_29	0.33	74.75	57.10	1.5000	2Yr-Storm CB03-04
Post_SC_3	0.31	81.21	57.10	1.5000	2Yr-Storm CB14
Post_SC_4	0.25	52.33	57.10	1.5000	2Yr-Storm CB24-25
Post_SC_5	0.31	95.82	57.10	1.5000	2Yr-Storm CB31
Post_SC_6	0.21	95.72	0.00	1.5000	2Yr-Storm OF1
Post_SC_7	0.53	109.85	57.10	1.5000	2Yr-Storm CB26
Post_SC_8	0.35	68.83	57.10	1.5000	2Yr-Storm CB22-23
Post_SC_9	0.08	108.12	0.00	1.5000	2Yr-Storm CB35

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Node Summary
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Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
CB07	JUNCTION	98.79	2.57	0.0	
CB08	JUNCTION	98.80	2.45	0.0	
CB09-10	JUNCTION	98.54	2.65	0.0	
CB11-12	JUNCTION	98.07	2.08	0.0	
CB13	JUNCTION	97.66	2.23	0.0	
CB14	JUNCTION	97.65	2.18	0.0	
CB15-16	JUNCTION	98.00	2.25	0.0	
CB19	JUNCTION	98.69	2.13	0.0	
CB22-23	JUNCTION	100.48	2.06	0.0	
CB24-25	JUNCTION	100.65	1.97	0.0	

CB35	JUNCTION	100.79	1.75	0.0
CB36	JUNCTION	99.33	1.87	0.0
EXSTMH7125	JUNCTION	97.36	1.45	0.0
J1	JUNCTION	98.65	2.15	0.0
STMH100	JUNCTION	101.13	2.27	0.0
STMH101	JUNCTION	100.69	2.22	0.0
STMH105	JUNCTION	98.65	2.71	0.0
STMH106	JUNCTION	98.14	2.22	0.0
STMH107	JUNCTION	97.63	2.24	0.0
STMH108-(OGS)	JUNCTION	97.48	2.22	0.0
STMH109	JUNCTION	99.30	2.04	0.0
STMH112	JUNCTION	99.32	2.04	0.0
STMH114	JUNCTION	98.05	2.41	0.0
STMH115	JUNCTION	100.91	2.03	0.0
STMH116	JUNCTION	100.62	2.04	0.0
STMH119	JUNCTION	98.59	2.21	0.0
STMH120	JUNCTION	97.36	1.94	0.0
STORM_CAP	JUNCTION	101.16	2.19	0.0
SW01-01	JUNCTION	100.79	0.38	0.0
SW01-02	JUNCTION	99.53	0.38	0.0
SW02-01	JUNCTION	101.40	0.38	0.0
SW02-02	JUNCTION	100.19	0.38	0.0
OF1	OUTFALL	0.00	0.00	0.0
Outfall	OUTFALL	97.32	0.75	0.0
CB01-02	STORAGE	101.01	2.06	0.0
CB03-04	STORAGE	100.60	2.20	0.0
CB05-06	STORAGE	99.94	2.07	0.0
CB17	STORAGE	98.30	2.32	0.0
CB18	STORAGE	99.56	1.20	0.0
CB20-21	STORAGE	99.61	2.12	0.0
CB26	STORAGE	99.53	2.02	0.0
CB27-28	STORAGE	99.25	2.04	0.0
CB29-30	STORAGE	98.47	2.15	0.0
CB31	STORAGE	100.59	1.86	0.0
CB32	STORAGE	99.43	1.95	0.0
CB33	STORAGE	99.09	1.54	0.0
CB34	STORAGE	99.65	1.25	0.0
CB37	STORAGE	101.43	1.32	0.0
DryPond	STORAGE	97.41	2.00	0.0
STMH102	STORAGE	99.98	2.06	0.0
STMH103	STORAGE	99.87	2.11	0.0
STMH104	STORAGE	99.65	2.27	0.0
STMH110	STORAGE	100.33	2.08	0.0
STMH111	STORAGE	99.24	2.05	0.0
STMH113	STORAGE	98.48	2.15	0.0
STMH117	STORAGE	99.94	2.15	0.0
STMH118	STORAGE	98.75	2.08	0.0

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Link Summary
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Name	From Node	To Node	Type	Length	% Slope	Roughness
C1	CB37	STMH101	CONDUIT	37.0	2.0000	0.0130
C2	STMH108-(OGS)	DryPond	CONDUIT	15.0	0.5133	0.0130
C3	DryPond	STMH120	CONDUIT	15.0	0.3133	0.0130

```
  C4                EXSTMH7125       Outfall           CONDUIT           11.3
0.3200    0.0130
  Pipe_-_(112)_(STORM_SEWER) CB35             STMH117          CONDUIT
39.5    2.0014    0.0130
  Pipe_-_(114)_(STORM_SEWER) CB31             STMH104          CONDUIT
44.0    2.0004    0.0130
  Pipe_-_(115)_(STORM_SEWER) CB33             STMH106          CONDUIT
44.2    2.0005    0.0130
  Pipe_-_(116)_(STORM_SEWER) CB36             STMH113          CONDUIT
39.5    2.0005    0.0130
  Pipe_-_(117)_(STORM_SEWER) CB34             CB18             CONDUIT
42.0    0.1978    0.0130
  Pipe_-_(20)_(STORM_SEWER) STORM_CAP        STMH100          CONDUIT
4.7    0.5089    0.0130
  Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_1 STMH100          CB01-02          CONDUIT
24.5    0.4983    0.0130
  Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_2 CB01-02          STMH101          CONDUIT
63.2    0.5004    0.0130
  Pipe_-_(22)_(1)_(STORM_SEWER)_1 STMH101          CB03-04          CONDUIT
12.9    0.7523    0.0130
  Pipe_-_(22)_(1)_(STORM_SEWER)_2 CB03-04          STMH102          CONDUIT
78.0    0.7500    0.0130
  Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_1 STMH102          CB05-06          CONDUIT
8.7    0.4964    0.0130
  Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_2 CB05-06          STMH103          CONDUIT
7.7    0.5058    0.0130
  Pipe_-_(24)_(STORM_SEWER) STMH103          STMH104          CONDUIT
43.8    0.4978    0.0130
  Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_1 STMH105          CB09-10          CONDUIT
15.3    0.7505    0.0130
  Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_2 CB09-10          STMH106          CONDUIT
53.2    0.7496    0.0130
  Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_1 STMH106          CB11-12          CONDUIT
9.5    0.7550    0.0130
  Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_3 CB11-12          CB13             CONDUIT
55.2    0.7501    0.0130
  Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_4 CB13             STMH107          CONDUIT
3.3    0.7378    0.0130
  Pipe_-_(27)_(STORM_SEWER) STMH107          STMH108-(OGS)    CONDUIT
3.5    4.2083    0.0130
  Pipe_-_(29)_(STORM_SEWER)_1 STMH110          CB26             CONDUIT
53.9    1.5006    0.0130
  Pipe_-_(29)_(STORM_SEWER)_2 CB26             STMH111          CONDUIT
16.1    1.5000    0.0130
  Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_2 CB08             STMH105          CONDUIT
9.0    0.9442    0.0130
  Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_3 STMH111          CB27-28          CONDUIT
1.0    0.7828    0.0130
  Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_4 CB27-28          CB08             CONDUIT
62.5    0.7213    0.0130
  Pipe_-_(31)_(STORM_SEWER) STMH112          STMH113          CONDUIT
48.0    1.7489    0.0130
  Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_1 STMH113          CB29-30          CONDUIT
1.9    0.4767    0.0130
  Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_2 CB29-30          STMH114          CONDUIT
74.2    0.4894    0.0130
  Pipe_-_(34)_(STORM_SEWER)_1 STMH117          CB20-21          CONDUIT
26.1    1.2508    0.0130
  Pipe_-_(34)_(STORM_SEWER)_2 CB20-21          STMH118          CONDUIT
66.5    1.2502    0.0130
  Pipe_-_(35)_(1)_(STORM_SEWER)_1 STMH118          CB19             CONDUIT
8.4    0.7517    0.0130
  Pipe_-_(35)_(1)_(STORM_SEWER)_3 CB19             J1               CONDUIT
4.3    0.7459    0.0130
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  Pipe_-_(35)_(1)_(STORM_SEWER)_4 J1               STMH119          CONDUIT
4.1    0.7613    0.0130
  Pipe_-_(36)_(1)_(STORM_SEWER)_1 STMH119          CB17             CONDUIT
39.3    0.7506    0.0130
  Pipe_-_(36)_(1)_(STORM_SEWER)_2 CB17             STMH114          CONDUIT
33.8    0.7490    0.0130
  Pipe_-_(37)_(2)_(STORM_SEWER)_2 CB14             STMH107          CONDUIT
9.9    0.2017    0.0130
  Pipe_-_(37)_(2)_(STORM_SEWER)_3 STMH114          CB15-16          CONDUIT
8.6    0.4981    0.0130
  Pipe_-_(37)_(2)_(STORM_SEWER)_4 CB15-16          CB14             CONDUIT
70.4    0.5000    0.0130
  Pipe_-_(64)_(STORM_SEWER)_1 STMH109          CB07             CONDUIT
33.8    1.5018    0.0130
  Pipe_-_(64)_(STORM_SEWER)_2 CB07             STMH105          CONDUIT
5.2    1.4933    0.0130
  Pipe_-_(65)_(STORM_SEWER) CB32             STMH109          CONDUIT
4.9    2.0061    0.0130
  Pipe_-_(66)_(3)_(STORM_SEWER)_1 STMH115          CB24-25          CONDUIT
51.7    0.4988    0.0130
  Pipe_-_(66)_(3)_(STORM_SEWER)_2 CB24-25          STMH116          CONDUIT
5.1    0.5062    0.0130
  Pipe_-_(67)_(STORM_SEWER)_1 STMH116          CB22-23          CONDUIT
14.4    1.0017    0.0130
  Pipe_-_(67)_(STORM_SEWER)_2 CB22-23          STMH117          CONDUIT
54.1    0.9988    0.0130
  Pipe_-_(71)_(STORM_SEWER) STMH104          STMH105          CONDUIT
49.8    2.0021    0.0130
  Pipe_-_(95)_(STORM_SEWER) CB18             J1               CONDUIT
3.2   27.8521    0.0130
  SW01             SW01-01          SW01-02          CONDUIT          126.0
0.9998    0.0350
  SW01.1           SW01-02          DryPond          CONDUIT           37.0
5.7494    0.0350
  SW02             SW02-01          SW02-02          CONDUIT          120.6
1.0004    0.0350
  SW02.1           SW02-02          DryPond          CONDUIT           30.8
9.1024    0.0350
  C5               STMH120          EXSTMH7125       ORIFICE
  OR1              STMH120          EXSTMH7125       ORIFICE


  **********************
  Cross Section Summary
  **********************
                                       Full     Full     Hyd.     Max.   No. of
Full
  Conduit          Shape               Depth     Area     Rad.    Width  Barrels
Flow
  ---------------------------------------------------------------------------
---------
  C1               CIRCULAR             0.38     0.11     0.09     0.38        1
247.97
  C2               CIRCULAR             0.75     0.44     0.19     0.75        1
797.69
  C3               CIRCULAR             0.75     0.44     0.19     0.75        1
623.21
  C4               CIRCULAR             0.75     0.44     0.19     0.75        1
629.78
  Pipe_-_(112)_(STORM_SEWER) CIRCULAR             0.38     0.11     0.09
0.38        1   248.05
  Pipe_-_(114)_(STORM_SEWER) CIRCULAR             0.38     0.11     0.09
0.38        1   247.99
  Pipe_-_(115)_(STORM_SEWER) CIRCULAR             0.38     0.11     0.09
0.38        1   248.00
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Pipe_-_(116)_(STORM_SEWER) CIRCULAR 0.38 0.11 0.09
0.38 1 248.00
Pipe_-_(117)_(STORM_SEWER) CIRCULAR 0.38 0.11 0.09
0.38 1 77.98
Pipe_-_(20)_(STORM_SEWER) CIRCULAR 0.38 0.11 0.09 0.38
1 125.08
Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_1 CIRCULAR 0.38 0.11
0.09 0.38 1 123.78
Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_2 CIRCULAR 0.38 0.11
0.09 0.38 1 124.03
Pipe_-_(22)_(1)_(STORM_SEWER)_1 CIRCULAR 0.38 0.11 0.09
0.38 1 152.08
Pipe_-_(22)_(1)_(STORM_SEWER)_2 CIRCULAR 0.38 0.11 0.09
0.38 1 151.85
Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_1 CIRCULAR 0.45 0.16
0.11 0.45 1 200.88
Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_2 CIRCULAR 0.45 0.16
0.11 0.45 1 202.77
Pipe_-_(24)_(STORM_SEWER) CIRCULAR 0.45 0.16 0.11 0.45
1 201.17
Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_1 CIRCULAR 0.60 0.28
0.15 0.60 1 531.95
Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_2 CIRCULAR 0.60 0.28
0.15 0.60 1 531.63
Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_1 CIRCULAR 0.60 0.28
0.15 0.60 1 533.54
Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_3 CIRCULAR 0.60 0.28
0.15 0.60 1 531.82
Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_4 CIRCULAR 0.60 0.28
0.15 0.60 1 527.44
Pipe_-_(27)_(STORM_SEWER) CIRCULAR 0.75 0.44 0.19 0.75
1 2283.92
Pipe_-_(29)_(STORM_SEWER)_1 CIRCULAR 0.38 0.11 0.09
0.38 1 214.79
Pipe_-_(29)_(STORM_SEWER)_2 CIRCULAR 0.38 0.11 0.09
0.38 1 214.75
Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_2 CIRCULAR 0.38 0.11
0.09 0.38 1 170.38
Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_3 CIRCULAR 0.38 0.11
0.09 0.38 1 155.13
Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_4 CIRCULAR 0.38 0.11
0.09 0.38 1 148.91
Pipe_-_(31)_(STORM_SEWER) CIRCULAR 0.38 0.11 0.09 0.38
1 231.88
Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_1 CIRCULAR 0.38 0.11
0.09 0.38 1 121.06
Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_2 CIRCULAR 0.38 0.11
0.09 0.38 1 122.66
Pipe_-_(34)_(STORM_SEWER)_1 CIRCULAR 0.38 0.11 0.09
0.38 1 196.10
Pipe_-_(34)_(STORM_SEWER)_2 CIRCULAR 0.45 0.16 0.11
0.45 1 318.80
Pipe_-_(35)_(1)_(STORM_SEWER)_1 CIRCULAR 0.45 0.16 0.11
0.45 1 247.21
Pipe_-_(35)_(1)_(STORM_SEWER)_3 CIRCULAR 0.45 0.16 0.11
0.45 1 246.26
Pipe_-_(35)_(1)_(STORM_SEWER)_4 CIRCULAR 0.45 0.16 0.11
0.45 1 248.78
Pipe_-_(36)_(1)_(STORM_SEWER)_1 CIRCULAR 0.45 0.16 0.11
0.45 1 247.02
Pipe_-_(36)_(1)_(STORM_SEWER)_2 CIRCULAR 0.45 0.16 0.11
0.45 1 246.75
Pipe_-_(37)_(2)_(STORM_SEWER)_2 CIRCULAR 0.60 0.28 0.15
0.60 1 275.74

```
  Pipe_-_(37)_(2)_(STORM_SEWER)_3 CIRCULAR            0.60     0.28     0.15
0.60        1   433.37
  Pipe_-_(37)_(2)_(STORM_SEWER)_4 CIRCULAR            0.60     0.28     0.15
0.60        1   434.20
  Pipe_-_(64)_(STORM_SEWER)_1 CIRCULAR            0.38     0.11     0.09
0.38        1   214.88
  Pipe_-_(64)_(STORM_SEWER)_2 CIRCULAR            0.38     0.11     0.09
0.38        1   214.27
  Pipe_-_(65)_(STORM_SEWER) CIRCULAR            0.38     0.11     0.09     0.38
1   248.35
  Pipe_-_(66)_(3)_(STORM_SEWER)_1 CIRCULAR            0.38     0.11     0.09
0.38        1   123.83
  Pipe_-_(66)_(3)_(STORM_SEWER)_2 CIRCULAR            0.38     0.11     0.09
0.38        1   124.76
  Pipe_-_(67)_(STORM_SEWER)_1 CIRCULAR            0.38     0.11     0.09
0.38        1   175.49
  Pipe_-_(67)_(STORM_SEWER)_2 CIRCULAR            0.38     0.11     0.09
0.38        1   175.23
  Pipe_-_(71)_(STORM_SEWER) CIRCULAR            0.45     0.16     0.11     0.45
1   403.44
  Pipe_-_(95)_(STORM_SEWER) CIRCULAR            0.38     0.11     0.09     0.38
1   925.36
  SW01            TRAPEZOIDAL          0.38     0.84     0.22     3.75        1
877.44
  SW01.1          TRAPEZOIDAL          0.38     0.84     0.22     3.75        1
2104.08
  SW02            TRAPEZOIDAL          0.38     0.84     0.22     3.75        1
877.69
  SW02.1          TRAPEZOIDAL          0.38     0.84     0.22     3.75        1
2647.46



  ***********************************************************
  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 ........ YES
    Water Quality .......... NO
  Infiltration Method ...... HORTON
  Flow Routing Method ...... DYNWAVE
  Surcharge Method ......... EXTRAN
  Starting Date ............ 07/08/2022 00:00:00
  Ending Date .............. 07/09/2022 00:00:00
  Antecedent Dry Days ...... 0.0
  Report Time Step ......... 00:01:00
  Wet Time Step ............ 00:01:00
  Dry Time Step ............ 00:05:00
  Routing Time Step ........ 5.00 sec
  Variable Time Step ....... YES
  Maximum Trials ........... 8
```

Number of Threads 6
Head Tolerance ..... 0.001500 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	0.238	30.100
Evaporation Loss	0.000	0.000
Infiltration Loss	0.130	16.431
Surface Runoff	0.104	13.133
Final Storage	0.004	0.545
Continuity Error (%)	-0.030	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.104	1.038
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.104	1.038
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.002
Continuity Error (%)	-0.200	

****
Highest Continuity Errors
****
Node STMH100 (6.28%)

****
Time-Step Critical Elements
****
Link Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_3 (59.38%)

****
Highest Flow Instability Indexes
****
Link Pipe_-_(66)_(3)_(STORM_SEWER)_2 (12)
Link C2 (4)
Link Pipe_-_(27)_(STORM_SEWER) (3)
Link Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_4 (2)
Link Pipe_-_(37)_(2)_(STORM_SEWER)_2 (2)

****
Routing Time Step Summary
****
Minimum Time Step : 0.50 sec
Average Time Step : 2.72 sec
Maximum Time Step : 5.00 sec
Percent in Steady State : 0.00

```
  Average Iterations per Step :     2.02
  Percent Not Converging      :     0.00
  Time Step Frequencies       :
      5.000 -  3.155 sec      :    43.24 %
      3.155 -  1.991 sec      :     8.15 %
      1.991 -  1.256 sec      :     4.81 %
      1.256 -  0.792 sec      :    16.04 %
      0.792 -  0.500 sec      :    27.77 %


  ***************************
  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
  ------------------------------------------------------------------------------
------------------------------------------------
  Post_SC_1                30.10       0.00       0.00      30.10       0.00
0.00       0.00        0.00     0.00   0.000
  Post_SC_10               30.10       0.00       0.00      12.91      16.51
0.00      16.51        0.08    55.20   0.549
  Post_SC_11               30.10       0.00       0.00      12.91      16.51
0.00      16.51        0.05    30.32   0.549
  Post_SC_12               30.10       0.00       0.00      12.91      16.51
0.00      16.51        0.06    36.56   0.549
  Post_SC_13               30.10       0.00       0.00      30.10       0.00
0.00       0.00        0.00     0.00   0.000
  Post_SC_14               30.10       0.00       0.00      12.91      16.51
0.00      16.51        0.05    32.70   0.549
  Post_SC_15               30.10       0.00       0.00      30.10       0.00
0.00       0.00        0.00     0.00   0.000
  Post_SC_16               30.10       0.00       0.00      12.91      16.52
0.00      16.52        0.05    30.53   0.549
  Post_SC_17               30.10       0.00       0.00      12.91      16.51
0.00      16.51        0.06    36.04   0.549
  Post_SC_18               30.10       0.00       0.00      12.91      16.51
0.00      16.51        0.10    63.80   0.549
  Post_SC_19               30.10       0.00       0.00      12.91      16.52
0.00      16.52        0.04    24.50   0.549
  Post_SC_2                30.10       0.00       0.00      12.91      16.51
0.00      16.51        0.05    32.16   0.549
  Post_SC_20               30.10       0.00       0.00      12.91      16.52
0.00      16.52        0.02    13.80   0.549
  Post_SC_21               30.10       0.00       0.00      12.91      16.52
0.00      16.52        0.01     7.11   0.549
  Post_SC_22               30.10       0.00       0.00      12.91      16.51
0.00      16.51        0.06    37.09   0.549
  Post_SC_23               30.10       0.00       0.00      30.10       0.00
0.00       0.00        0.00     0.00   0.000
  Post_SC_24               30.10       0.00       0.00      30.10       0.00
0.00       0.00        0.00     0.00   0.000
  Post_SC_25               30.10       0.00       0.00      30.10       0.00
0.00       0.00        0.00     0.00   0.000
  Post_SC_26               30.10       0.00       0.00      12.91      16.52
0.00      16.52        0.02    15.74   0.549
  Post_SC_27               30.10       0.00       0.00      12.91      16.52
0.00      16.52        0.02    11.73   0.549
```

Post_SC_28	30.10	0.00	0.00	12.91	16.52	0.00
16.52	0.04	24.53	0.549			
Post_SC_29	30.10	0.00	0.00	12.91	16.51	0.00
16.51	0.05	35.83	0.549			
Post_SC_3	30.10	0.00	0.00	12.91	16.51	0.00
16.51	0.05	33.39	0.549			
Post_SC_4	30.10	0.00	0.00	12.91	16.51	0.00
16.51	0.04	26.92	0.549			
Post_SC_5	30.10	0.00	0.00	12.91	16.51	0.00
16.51	0.05	33.65	0.549			
Post_SC_6	30.10	0.00	0.00	30.10	0.00	0.00
0.00	0.00	0.00	0.000			
Post_SC_7	30.10	0.00	0.00	12.91	16.51	0.00
16.51	0.09	57.49	0.549			
Post_SC_8	30.10	0.00	0.00	12.91	16.51	0.00
16.51	0.06	37.52	0.549			
Post_SC_9	30.10	0.00	0.00	30.10	0.00	0.00
0.00	0.00	0.00	0.000			

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
CB07	JUNCTION	0.01	0.18	98.97	0 01:09	0.18
CB08	JUNCTION	0.03	0.21	99.01	0 01:10	0.21
CB09-10	JUNCTION	0.05	0.33	98.87	0 01:10	0.33
CB11-12	JUNCTION	0.06	0.38	98.45	0 01:10	0.38
CB13	JUNCTION	0.08	0.40	98.06	0 01:10	0.40
CB14	JUNCTION	0.08	0.42	98.07	0 01:10	0.42
CB15-16	JUNCTION	0.05	0.33	98.33	0 01:10	0.33
CB19	JUNCTION	0.04	0.23	98.92	0 01:10	0.23
CB22-23	JUNCTION	0.03	0.16	100.64	0 01:10	0.16
CB24-25	JUNCTION	0.02	0.12	100.76	0 01:10	0.12
CB35	JUNCTION	0.00	0.00	100.79	0 00:00	0.00
CB36	JUNCTION	0.02	0.09	99.42	0 01:10	0.09
EXSTMH7125	JUNCTION	0.09	0.28	97.64	0 01:24	0.28
J1	JUNCTION	0.04	0.23	98.89	0 01:10	0.23
STMH100	JUNCTION	0.00	0.01	101.14	0 01:08	0.01

STMH101	JUNCTION	0.02	0.12	100.81	0	01:10	0.12
STMH105	JUNCTION	0.05	0.32	98.97	0	01:10	0.32
STMH106	JUNCTION	0.06	0.36	98.51	0	01:10	0.36
STMH107	JUNCTION	0.08	0.59	98.22	0	01:24	0.58
STMH108-(OGS)	JUNCTION	0.13	0.66	98.15	0	01:26	0.64
STMH109	JUNCTION	0.00	0.00	99.30	0	00:00	0.00
STMH112	JUNCTION	0.00	0.00	99.32	0	00:00	0.00
STMH114	JUNCTION	0.05	0.32	98.37	0	01:10	0.32
STMH115	JUNCTION	0.00	0.00	100.91	0	00:00	0.00
STMH116	JUNCTION	0.02	0.10	100.72	0	01:10	0.10
STMH119	JUNCTION	0.04	0.24	98.83	0	01:10	0.24
STMH120	JUNCTION	0.17	0.66	98.02	0	01:24	0.66
STORM_CAP	JUNCTION	0.00	0.00	101.16	0	00:00	0.00
SW01-01	JUNCTION	0.00	0.00	100.79	0	00:00	0.00
SW01-02	JUNCTION	0.00	0.00	99.53	0	00:00	0.00
SW02-01	JUNCTION	0.00	0.00	101.40	0	00:00	0.00
SW02-02	JUNCTION	0.00	0.00	100.19	0	00:00	0.00
OF1	OUTFALL	0.00	0.00	0.00	0	00:00	0.00
Outfall	OUTFALL	0.08	0.28	97.60	0	01:24	0.28
CB01-02	STORAGE	0.02	0.13	101.14	0	01:09	0.13
CB03-04	STORAGE	0.03	0.18	100.77	0	01:10	0.18
CB05-06	STORAGE	0.04	0.25	100.19	0	01:10	0.25
CB17	STORAGE	0.04	0.27	98.57	0	01:10	0.27
CB18	STORAGE	0.00	0.00	99.56	0	00:00	0.00
CB20-21	STORAGE	0.03	0.17	99.78	0	01:10	0.17
CB26	STORAGE	0.02	0.13	99.66	0	01:10	0.13
CB27-28	STORAGE	0.03	0.19	99.44	0	01:10	0.19
CB29-30	STORAGE	0.03	0.20	98.67	0	01:10	0.20
CB31	STORAGE	0.02	0.09	100.68	0	01:10	0.09
CB32	STORAGE	0.00	0.00	99.43	0	00:00	0.00
CB33	STORAGE	0.01	0.08	99.17	0	01:10	0.08
CB34	STORAGE	0.00	0.00	99.65	0	00:00	0.00

CB37	STORAGE	0.00	0.00	101.43	0	00:00
0.00						
DryPond	STORAGE	0.15	0.61	98.02	0	01:23
0.61						
STMH102	STORAGE	0.03	0.21	100.19	0	01:10
0.21						
STMH103	STORAGE	0.04	0.25	100.12	0	01:10
0.25						
STMH104	STORAGE	0.04	0.22	99.87	0	01:10
0.22						
STMH110	STORAGE	0.00	0.00	100.33	0	00:00
0.00						
STMH111	STORAGE	0.05	0.20	99.44	0	01:10
0.20						
STMH113	STORAGE	0.03	0.19	98.67	0	01:10
0.19						
STMH117	STORAGE	0.03	0.15	100.08	0	01:10
0.15						
STMH118	STORAGE	0.03	0.21	98.96	0	01:10
0.21						

****
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
CB07	JUNCTION	7.11	7.58	0	01:02	0.0109	0.0109	0.012
CB08	JUNCTION	11.73	84.90	0	01:10	0.018	0.13	0.012
CB09-10	JUNCTION	13.80	299.14	0	01:10	0.0211	0.46	0.001
CB11-12	JUNCTION	63.80	386.88	0	01:10	0.0981	0.596	-0.017
CB13	JUNCTION	0.00	386.68	0	01:10	0	0.619	-0.213
CB14	JUNCTION	33.39	287.51	0	01:10	0.0512	0.442	-0.183
CB15-16	JUNCTION	24.53	254.37	0	01:10	0.0376	0.391	-0.035
CB19	JUNCTION	36.56	131.07	0	01:10	0.056	0.201	0.003
CB22-23	JUNCTION	37.52	64.43	0	01:10	0.0576	0.0989	-0.011
CB24-25	JUNCTION	26.92	26.92	0	01:10	0.0413	0.0413	0.001
CB35	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
CB36	JUNCTION	30.53	30.53	0	01:10	0.0468	0.0468	0.196
EXSTMH7125	JUNCTION	0.00	207.65	0	01:24	0	1.04	0.001

```
  J1                    JUNCTION       0.00   131.05      0  01:10            0
0.201       -0.004
  STMH100               JUNCTION       0.00     0.31      0  01:03            0
2.97e-05        1.868 ltr
  STMH101               JUNCTION       0.00    32.18      0  01:09            0
0.0493        0.037
  STMH105               JUNCTION       0.00   285.87      0  01:09            0
0.439       -0.006
  STMH106               JUNCTION       0.00   323.36      0  01:10            0
0.497       -0.014
  STMH107               JUNCTION       0.00   675.33      0  01:10            0
1.15        0.206
  STMH108-(OGS)         JUNCTION       0.00   676.58      0  01:10            0
1.12       -0.150
  STMH109               JUNCTION       0.00     0.00      0  00:00            0
0        0.000 ltr
  STMH112               JUNCTION       0.00     0.00      0  00:00            0
0        0.000 ltr
  STMH114               JUNCTION       0.00   230.07      0  01:10            0
0.353       -0.041
  STMH115               JUNCTION       0.00     0.00      0  00:00            0
0        0.000 ltr
  STMH116               JUNCTION       0.00    27.12      0  01:10            0
0.0413        0.001
  STMH119               JUNCTION       0.00   131.04      0  01:10            0
0.201        0.005
  STMH120               JUNCTION       0.00   207.72      0  01:24            0
1.04        0.004
  STORM_CAP             JUNCTION       0.00     0.00      0  00:00            0
0        0.000 ltr
  SW01-01               JUNCTION       0.00     0.00      0  00:00            0
0        0.000 ltr
  SW01-02               JUNCTION       0.00     0.00      0  00:00            0
0        0.000 ltr
  SW02-01               JUNCTION       0.00     0.00      0  00:00            0
0        0.000 ltr
  SW02-02               JUNCTION       0.00     0.00      0  00:00            0
0        0.000 ltr
  OF1                   OUTFALL        0.00     0.00      0  00:00            0
0        0.000 ltr
  Outfall               OUTFALL        0.00   207.65      0  01:24            0
1.04        0.000
  CB01-02               STORAGE       32.16    32.22      0  01:09       0.0493
0.0493       -0.043
  CB03-04               STORAGE       35.83    67.97      0  01:10       0.0549
0.104        0.053
  CB05-06               STORAGE       55.20   123.05      0  01:10       0.0849
0.189       -0.003
  CB17                  STORAGE       32.70   163.69      0  01:10       0.0501
0.252       -0.002
  CB18                  STORAGE        0.00     0.00      0  00:00            0
0        0.000 ltr
  CB20-21               STORAGE       30.32    94.66      0  01:10       0.0465
0.145        0.047
  CB26                  STORAGE       57.49    57.49      0  01:10       0.0882
0.0882        0.026
  CB27-28               STORAGE       15.74    73.20      0  01:10       0.0241
0.112       -0.003
  CB29-30               STORAGE       36.04    66.53      0  01:10       0.0552
0.102        0.134
  CB31                  STORAGE       33.65    33.65      0  01:10       0.0516
0.0516        0.072
  CB32                  STORAGE        0.00     0.00      0  00:00            0
0        0.000 ltr
```

```
  CB33                  STORAGE      24.50    24.50     0  01:10      0.0375
0.0375       0.079
  CB34                  STORAGE       0.00     0.00     0  00:00           0
0       0.000 ltr
  CB37                  STORAGE       0.00     0.00     0  00:00           0
0       0.000 ltr
  DryPond               STORAGE       0.00   692.02     0  01:10           0
1.04      -0.017
  STMH102               STORAGE       0.00    67.91     0  01:10           0
0.104      -0.080
  STMH103               STORAGE       0.00   123.02     0  01:10           0
0.189       0.008
  STMH104               STORAGE      37.09   193.67     0  01:10       0.057
0.298      -0.028
  STMH110               STORAGE       0.00     0.00     0  00:00           0
0       0.000 ltr
  STMH111               STORAGE       0.00    57.47     0  01:10           0
0.0882      -0.001
  STMH113               STORAGE       0.00    30.52     0  01:10           0
0.0467      -0.281
  STMH117               STORAGE       0.00    64.40     0  01:10           0
0.0989       0.011
  STMH118               STORAGE       0.00    94.58     0  01:10           0
0.145      -0.054


  **********************
  Node Surcharge Summary
  **********************

  No nodes were surcharged.


  **********************
  Node Flooding Summary
  **********************

  No nodes were flooded.


  **********************
  Storage Volume Summary
  **********************

  ------------------------------------------------------------------------------
--------------------
                          Average     Avg  Evap Exfil       Maximum     Max
Time of Max    Maximum
                           Volume    Pcnt  Pcnt  Pcnt        Volume    Pcnt
Occurrence    Outflow
  Storage Unit            1000 m3    Full  Loss  Loss       1000 m3    Full
days hr:min        LPS
  ------------------------------------------------------------------------------
--------------------
  CB01-02                   0.000       1     0     0         0.000       6
0  01:09      32.23
  CB03-04                   0.000       1     0     0         0.000       8
0  01:10      67.91
  CB05-06                   0.000       2     0     0         0.000      12
0  01:10     123.02
  CB17                      0.000       2     0     0         0.000      12
0  01:10     163.58
  CB18                      0.000       0     0     0         0.000       0
0  00:00       0.00
```

CB20-21		0.000	1	0	0	0.000	8
0	01:10	94.58					
CB26		0.000	1	0	0	0.000	7
0	01:10	57.47					
CB27-28		0.000	2	0	0	0.000	9
0	01:10	73.17					
CB29-30		0.000	2	0	0	0.000	9
0	01:10	66.50					
CB31		0.000	1	0	0	0.000	5
0	01:10	33.65					
CB32		0.000	0	0	0	0.000	0
0	00:00	0.00					
CB33		0.000	1	0	0	0.000	5
0	01:10	24.50					
CB34		0.000	0	0	0	0.000	0
0	00:00	0.00					
CB37		0.000	0	0	0	0.000	0
0	00:00	0.00					
DryPond		0.097	5	0	0	0.415	21
0	01:23	207.72					
STMH102		0.000	2	0	0	0.000	10
0	01:10	68.58					
STMH103		0.000	2	0	0	0.000	12
0	01:10	122.98					
STMH104		0.000	2	0	0	0.000	10
0	01:10	193.52					
STMH110		0.000	0	0	0	0.000	0
0	00:00	0.00					
STMH111		0.000	2	0	0	0.000	10
0	01:10	57.47					
STMH113		0.000	1	0	0	0.000	9
0	01:10	31.32					
STMH117		0.000	1	0	0	0.000	7
0	01:10	64.35					
STMH118		0.000	2	0	0	0.000	10
0	01:10	94.89					

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
OF1	0.00	0.00	0.00	0.000
Outfall	95.86	50.49	207.65	1.038
System	47.93	50.49	207.65	1.038

****
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
C1	CONDUIT	0.00	0 00:00	0.00	0.00	0.16

```
  C2                    CONDUIT    692.02     0  01:10      2.71    0.87    0.85
  C3                    CONDUIT    207.72     0  01:24      0.66    0.33    0.85
  C4                    CONDUIT    207.65     0  01:24      1.39    0.33    0.37
  Pipe_-_(112)_(STORM_SEWER) CONDUIT      0.00     0  00:00      0.00    0.00
0.12
  Pipe_-_(114)_(STORM_SEWER) CONDUIT     33.65     0  01:10      1.35    0.14
0.34
  Pipe_-_(115)_(STORM_SEWER) CONDUIT     24.50     0  01:10      0.85    0.10
0.51
  Pipe_-_(116)_(STORM_SEWER) CONDUIT     30.52     0  01:10      1.39    0.12
0.29
  Pipe_-_(117)_(STORM_SEWER) CONDUIT      0.00     0  00:00      0.00    0.00
0.00
  Pipe_-_(20)_(STORM_SEWER) CONDUIT      0.00     0  00:00      0.00    0.00
0.01
  Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_1 CONDUIT      0.31     0  01:03      0.02
0.00    0.19
  Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_2 CONDUIT     32.18     0  01:09      1.01
0.26    0.33
  Pipe_-_(22)_(1)_(STORM_SEWER)_1 CONDUIT     32.15     0  01:10      0.81
0.21    0.39
  Pipe_-_(22)_(1)_(STORM_SEWER)_2 CONDUIT     67.91     0  01:10      1.30
0.45    0.48
  Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_1 CONDUIT     68.58     0  01:10      0.87
0.34    0.51
  Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_2 CONDUIT    123.02     0  01:10      1.38
0.61    0.55
  Pipe_-_(24)_(STORM_SEWER) CONDUIT    122.98     0  01:10      1.47    0.61
0.52
  Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_1 CONDUIT    285.66     0  01:10      1.85
0.54    0.54
  Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_2 CONDUIT    298.93     0  01:10      1.79
0.56    0.57
  Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_1 CONDUIT    324.62     0  01:10      1.78
0.61    0.62
  Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_3 CONDUIT    386.68     0  01:10      1.98
0.73    0.65
  Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_4 CONDUIT    389.12     0  01:10      1.96
0.74    0.77
  Pipe_-_(27)_(STORM_SEWER) CONDUIT    676.58     0  01:10      2.40    0.30
0.68
  Pipe_-_(29)_(STORM_SEWER)_1 CONDUIT      0.00     0  00:00      0.00    0.00
0.18
  Pipe_-_(29)_(STORM_SEWER)_2 CONDUIT     57.47     0  01:10      1.50    0.27
0.38
  Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_2 CONDUIT     84.85     0  01:09      1.22
0.50    0.62
  Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_3 CONDUIT     57.47     0  01:10      1.07
0.37    0.49
  Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_4 CONDUIT     73.17     0  01:10      1.24
0.49    0.53
  Pipe_-_(31)_(STORM_SEWER) CONDUIT      0.00     0  00:00      0.00    0.00
0.25
  Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_1 CONDUIT     31.32     0  01:10      0.56
0.26    0.51
  Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_2 CONDUIT     66.50     0  01:10      0.99
0.54    0.61
  Pipe_-_(34)_(STORM_SEWER)_1 CONDUIT     64.35     0  01:10      1.46    0.33
0.42
  Pipe_-_(34)_(STORM_SEWER)_2 CONDUIT     94.58     0  01:10      1.66    0.30
0.39
  Pipe_-_(35)_(1)_(STORM_SEWER)_1 CONDUIT     94.89     0  01:10      1.25
0.38    0.49
  Pipe_-_(35)_(1)_(STORM_SEWER)_3 CONDUIT    131.05     0  01:10      1.58
0.53    0.52
```

```
  Pipe_-_(35)_(1)_(STORM_SEWER)_4 CONDUIT    131.04     0  01:10      1.58
0.53    0.52
  Pipe_-_(36)_(1)_(STORM_SEWER)_1 CONDUIT    131.02     0  01:10      1.42
0.53    0.56
  Pipe_-_(36)_(1)_(STORM_SEWER)_2 CONDUIT    163.58     0  01:10      1.46
0.66    0.66
  Pipe_-_(37)_(2)_(STORM_SEWER)_2 CONDUIT    287.41     0  01:09      1.39
1.04    0.78
  Pipe_-_(37)_(2)_(STORM_SEWER)_3 CONDUIT    230.13     0  01:10      1.47
0.53    0.54
  Pipe_-_(37)_(2)_(STORM_SEWER)_4 CONDUIT    254.14     0  01:10      1.37
0.59    0.63
  Pipe_-_(64)_(STORM_SEWER)_1 CONDUIT      0.00     0  00:00      0.00    0.00
0.24
  Pipe_-_(64)_(STORM_SEWER)_2 CONDUIT      8.12     0  01:11      0.45    0.04
0.58
  Pipe_-_(65)_(STORM_SEWER) CONDUIT      0.00     0  00:00      0.00    0.00
0.00
  Pipe_-_(66)_(3)_(STORM_SEWER)_1 CONDUIT      0.00     0  00:00      0.00
0.00    0.16
  Pipe_-_(66)_(3)_(STORM_SEWER)_2 CONDUIT     27.12     0  01:10      1.02
0.22    0.29
  Pipe_-_(67)_(STORM_SEWER)_1 CONDUIT     26.90     0  01:10      0.80    0.15
0.34
  Pipe_-_(67)_(STORM_SEWER)_2 CONDUIT     64.40     0  01:10      1.52    0.37
0.41
  Pipe_-_(71)_(STORM_SEWER) CONDUIT    193.52     0  01:10      1.95    0.48
0.60
  Pipe_-_(95)_(STORM_SEWER) CONDUIT      0.00     0  00:00      0.00    0.00
0.23
  SW01                  CONDUIT      0.00     0  00:00      0.00    0.00    0.00
  SW01.1                CONDUIT      0.00     0  00:00      0.00    0.00    0.50
  SW02                  CONDUIT      0.00     0  00:00      0.00    0.00    0.00
  SW02.1                CONDUIT      0.00     0  00:00      0.00    0.00    0.50
  C5                    ORIFICE      0.00     0  00:00                      0.00
  OR1                   ORIFICE    207.65     0  01:24                      1.00


  ***************************
  Flow Classification Summary
  ***************************

  -------------------------------------------------------------------------------
-------
                      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
  -------------------------------------------------------------------------------
-------
  C1                      1.00   0.21  0.79  0.00  0.00  0.00  0.00  0.00  0.00
0.00
  C2                      1.00   0.01  0.03  0.00  0.84  0.13  0.00  0.00  0.89
0.00
  C3                      1.00   0.01  0.00  0.00  0.99  0.00  0.00  0.00  0.85
0.00
  C4                      1.00   0.02  0.00  0.00  0.80  0.19  0.00  0.00  0.00
0.00
  Pipe_-_(112)_(STORM_SEWER)    1.00   0.85  0.15  0.00  0.00  0.00  0.00  0.00
0.00  0.00
  Pipe_-_(114)_(STORM_SEWER)    1.00   0.00  0.00  0.00  0.01  0.10  0.00  0.89
0.02  0.00
```

Pipe_-_(115)_(STORM_SEWER) 1.00 0.00 0.00 0.00 0.19 0.05 0.00 0.75 0.05 0.00
Pipe_-_(116)_(STORM_SEWER) 1.00 0.00 0.00 0.00 0.00 0.05 0.00 0.94 0.01 0.00
Pipe_-_(117)_(STORM_SEWER) 1.00 1.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
Pipe_-_(20)_(STORM_SEWER) 1.00 0.82 0.18 0.00 0.00 0.00 0.00 0.00 0.00 0.00
Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_1 1.00 0.00 0.82 0.00 0.18 0.00 0.00 0.00 0.95 0.00
Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.83 0.17 0.00 0.00 0.03 0.00
Pipe_-_(22)_(1)_(STORM_SEWER)_1 1.00 0.00 0.21 0.00 0.79 0.00 0.00 0.00 0.99 0.00
Pipe_-_(22)_(1)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.00 0.03 0.00 0.96 0.00 0.00
Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_1 1.00 0.00 0.05 0.00 0.94 0.00 0.00 0.00 0.96 0.00
Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00
Pipe_-_(24)_(STORM_SEWER) 1.00 0.00 0.00 0.00 0.64 0.35 0.00 0.00 0.48 0.00
Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_1 1.00 0.00 0.00 0.00 0.53 0.46 0.00 0.00 0.76 0.00
Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.53 0.46 0.00 0.00 0.87 0.00
Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_1 1.00 0.00 0.00 0.00 0.58 0.42 0.00 0.00 0.76 0.00
Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_3 1.00 0.00 0.00 0.00 0.67 0.32 0.00 0.00 0.93 0.00
Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_4 1.00 0.00 0.00 0.00 0.63 0.36 0.00 0.00 0.24 0.00
Pipe_-_(27)_(STORM_SEWER) 1.00 0.00 0.00 0.00 0.68 0.32 0.00 0.00 0.88 0.00
Pipe_-_(29)_(STORM_SEWER)_1 1.00 0.00 1.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
Pipe_-_(29)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.00 0.05 0.00 0.94 0.01 0.00
Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.04 0.07 0.00 0.88 0.00 0.00
Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_3 1.00 0.00 0.00 0.00 0.99 0.00 0.00 0.00 0.33 0.00
Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_4 1.00 0.00 0.00 0.00 0.59 0.41 0.00 0.00 0.96 0.00
Pipe_-_(31)_(STORM_SEWER) 1.00 0.16 0.84 0.00 0.00 0.00 0.00 0.00 0.00 0.00
Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_1 1.00 0.00 0.16 0.00 0.84 0.00 0.00 0.00 0.88 0.00
Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.12 0.00 0.00 0.88 0.02 0.00
Pipe_-_(34)_(STORM_SEWER)_1 1.00 0.00 0.00 0.00 0.54 0.46 0.00 0.00 0.99 0.00
Pipe_-_(34)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.00 0.04 0.00 0.96 0.01 0.00
Pipe_-_(35)_(1)_(STORM_SEWER)_1 1.00 0.00 0.00 0.00 0.88 0.11 0.00 0.00 0.43 0.00
Pipe_-_(35)_(1)_(STORM_SEWER)_3 1.00 0.00 0.00 0.00 0.54 0.45 0.00 0.00 0.96 0.00
Pipe_-_(35)_(1)_(STORM_SEWER)_4 1.00 0.00 0.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00
Pipe_-_(36)_(1)_(STORM_SEWER)_1 1.00 0.00 0.00 0.00 0.68 0.31 0.00 0.00 0.91 0.00
Pipe_-_(36)_(1)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.91 0.08 0.00 0.00 0.74 0.00

Pipe_-_(37)_(2)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.90 0.10 0.00 0.00 0.08 0.00
Pipe_-_(37)_(2)_(STORM_SEWER)_3 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.54 0.00
Pipe_-_(37)_(2)_(STORM_SEWER)_4 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.98 0.00
Pipe_-_(64)_(STORM_SEWER)_1 1.00 0.00 1.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
Pipe_-_(64)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.24 0.01 0.00 0.74 0.04 0.00
Pipe_-_(65)_(STORM_SEWER) 1.00 1.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
Pipe_-_(66)_(3)_(STORM_SEWER)_1 1.00 0.00 1.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
Pipe_-_(66)_(3)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.69 0.31 0.00 0.00 0.03 0.00
Pipe_-_(67)_(STORM_SEWER)_1 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.99 0.00
Pipe_-_(67)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.51 0.49 0.00 0.00 0.12 0.00
Pipe_-_(71)_(STORM_SEWER) 1.00 0.00 0.00 0.00 0.48 0.52 0.00 0.00 0.79 0.00
Pipe_-_(95)_(STORM_SEWER) 1.00 0.77 0.23 0.00 0.00 0.00 0.00 0.00 0.00 0.00
SW01 1.00 1.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
SW01.1 1.00 0.01 0.99 0.00 0.00 0.00 0.00 0.00 0.00 0.00
SW02 1.00 1.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
SW02.1 1.00 0.01 0.99 0.00 0.00 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
Pipe_-_(37)_(2)_(STORM_SEWER)_2	0.01	0.01	0.01	0.07	0.01

Analysis begun on: Mon Jul 25 16:04:21 2022
Analysis ended on: Mon Jul 25 16:04:25 2022
Total elapsed time: 00:00:04

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

  WARNING 03: negative offset ignored for Link C2
  WARNING 03: negative offset ignored for Link C4
  WARNING 03: negative offset ignored for Link Pipe_-_(117)_(STORM_SEWER)
  WARNING 03: negative offset ignored for Link Pipe_-_(27)_(STORM_SEWER)
  WARNING 03: negative offset ignored for Link Pipe_-_(30)_(2)_(1)_(STORM_SEWER)
_2
  WARNING 03: negative offset ignored for Link Pipe_-_(30)_(2)_(1)_(STORM_SEWER)
_4
  WARNING 03: negative offset ignored for Link Pipe_-_(37)_(2)_(STORM_SEWER)_2
  WARNING 03: negative offset ignored for Link Pipe_-_(95)_(STORM_SEWER)
  WARNING 02: maximum depth increased for Node SW01-01
  WARNING 02: maximum depth increased for Node SW01-02
  WARNING 02: maximum depth increased for Node SW02-01
  WARNING 02: maximum depth increased for Node SW02-02

  *************
  Element Count
  *************
  Number of rain gages ...... 4
  Number of subcatchments ... 29
  Number of nodes ........... 57
  Number of links ........... 56
  Number of pollutants ...... 0
  Number of land uses ....... 0


  ****************
  Raingage Summary
  ****************
                                                    Data       Recording
  Name                 Data Source                  Type       Interval
  ----------------------------------------------------------------------
  100Yr-Storm          6hr-ChicagoStorm             INTENSITY   10 min.
  25mm-4hr-Chicago     25mm-4hr-Chicago             INTENSITY   10 min.
  2Yr-Storm            3hr-ChicagoStorm-2yr         INTENSITY   10 min.
  5Yr-Storm            3hr-ChicagoStorm             INTENSITY   10 min.


  ********************
  Subcatchment Summary
  ********************
  Name                        Area     Width   %Imperv    %Slope Rain Gage
Outlet
  ----------------------------------------------------------------------------
----------------------------
  Post_SC_1                   0.28     88.55      0.00    1.5000 5Yr-Storm
CB37
  Post_SC_10                  0.51     79.09     57.10    1.5000 5Yr-Storm
CB05-06
  Post_SC_11                  0.28     53.24     57.10    1.5000 5Yr-Storm
CB20-21
  Post_SC_12                  0.34     93.31     57.10    1.5000 5Yr-Storm
CB19
  Post_SC_13                  0.26     89.23      0.00    1.5000 5Yr-Storm
CB34
  Post_SC_14                  0.30     91.53     57.10    1.5000 5Yr-Storm
CB17
  Post_SC_15                  0.13     99.00      0.00    1.5000 5Yr-Storm
CB32
```

Post_SC_16	0.28	99.52	57.10	1.5000	5Yr-Storm CB36
Post_SC_17	0.33	87.74	57.10	1.5000	5Yr-Storm CB29-30
Post_SC_18	0.59	97.29	57.10	1.5000	5Yr-Storm CB11-12
Post_SC_19	0.23	81.42	57.10	1.5000	5Yr-Storm CB33
Post_SC_2	0.30	84.01	57.10	1.5000	5Yr-Storm CB01-02
Post_SC_20	0.13	68.05	57.10	1.5000	5Yr-Storm CB09-10
Post_SC_21	0.07	43.41	57.10	1.5000	5Yr-Storm CB07
Post_SC_22	0.34	61.39	57.10	1.5000	5Yr-Storm STMH104
Post_SC_23	0.18	121.24	0.00	1.5000	5Yr-Storm SW02-01
Post_SC_24	0.21	52.61	0.00	1.5000	5Yr-Storm DryPond
Post_SC_25	0.26	129.90	0.00	1.5000	5Yr-Storm SW01-01
Post_SC_26	0.15	61.89	57.10	1.5000	5Yr-Storm CB27-28
Post_SC_27	0.11	50.45	57.10	1.5000	5Yr-Storm CB08
Post_SC_28	0.23	88.73	57.10	1.5000	5Yr-Storm CB15-16
Post_SC_29	0.33	74.75	57.10	1.5000	5Yr-Storm CB03-04
Post_SC_3	0.31	81.21	57.10	1.5000	5Yr-Storm CB14
Post_SC_4	0.25	52.33	57.10	1.5000	5Yr-Storm CB24-25
Post_SC_5	0.31	95.82	57.10	1.5000	5Yr-Storm CB31
Post_SC_6	0.21	95.72	0.00	1.5000	5Yr-Storm OF1
Post_SC_7	0.53	109.85	57.10	1.5000	5Yr-Storm CB26
Post_SC_8	0.35	68.83	57.10	1.5000	5Yr-Storm CB22-23
Post_SC_9	0.08	108.12	0.00	1.5000	5Yr-Storm CB35

****
Node Summary
****

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
CB07	JUNCTION	98.79	2.57	0.0	
CB08	JUNCTION	98.80	2.45	0.0	
CB09-10	JUNCTION	98.54	2.65	0.0	
CB11-12	JUNCTION	98.07	2.08	0.0	
CB13	JUNCTION	97.66	2.23	0.0	
CB14	JUNCTION	97.65	2.18	0.0	
CB15-16	JUNCTION	98.00	2.25	0.0	
CB19	JUNCTION	98.69	2.13	0.0	
CB22-23	JUNCTION	100.48	2.06	0.0	
CB24-25	JUNCTION	100.65	1.97	0.0	

CB35	JUNCTION	100.79	1.75	0.0
CB36	JUNCTION	99.33	1.87	0.0
EXSTMH7125	JUNCTION	97.36	1.45	0.0
J1	JUNCTION	98.65	2.15	0.0
STMH100	JUNCTION	101.13	2.27	0.0
STMH101	JUNCTION	100.69	2.22	0.0
STMH105	JUNCTION	98.65	2.71	0.0
STMH106	JUNCTION	98.14	2.22	0.0
STMH107	JUNCTION	97.63	2.24	0.0
STMH108-(OGS)	JUNCTION	97.48	2.22	0.0
STMH109	JUNCTION	99.30	2.04	0.0
STMH112	JUNCTION	99.32	2.04	0.0
STMH114	JUNCTION	98.05	2.41	0.0
STMH115	JUNCTION	100.91	2.03	0.0
STMH116	JUNCTION	100.62	2.04	0.0
STMH119	JUNCTION	98.59	2.21	0.0
STMH120	JUNCTION	97.36	1.94	0.0
STORM_CAP	JUNCTION	101.16	2.19	0.0
SW01-01	JUNCTION	100.79	0.38	0.0
SW01-02	JUNCTION	99.53	0.38	0.0
SW02-01	JUNCTION	101.40	0.38	0.0
SW02-02	JUNCTION	100.19	0.38	0.0
OF1	OUTFALL	0.00	0.00	0.0
Outfall	OUTFALL	97.32	0.75	0.0
CB01-02	STORAGE	101.01	2.06	0.0
CB03-04	STORAGE	100.60	2.20	0.0
CB05-06	STORAGE	99.94	2.07	0.0
CB17	STORAGE	98.30	2.32	0.0
CB18	STORAGE	99.56	1.20	0.0
CB20-21	STORAGE	99.61	2.12	0.0
CB26	STORAGE	99.53	2.02	0.0
CB27-28	STORAGE	99.25	2.04	0.0
CB29-30	STORAGE	98.47	2.15	0.0
CB31	STORAGE	100.59	1.86	0.0
CB32	STORAGE	99.43	1.95	0.0
CB33	STORAGE	99.09	1.54	0.0
CB34	STORAGE	99.65	1.25	0.0
CB37	STORAGE	101.43	1.32	0.0
DryPond	STORAGE	97.41	2.00	0.0
STMH102	STORAGE	99.98	2.06	0.0
STMH103	STORAGE	99.87	2.11	0.0
STMH104	STORAGE	99.65	2.27	0.0
STMH110	STORAGE	100.33	2.08	0.0
STMH111	STORAGE	99.24	2.05	0.0
STMH113	STORAGE	98.48	2.15	0.0
STMH117	STORAGE	99.94	2.15	0.0
STMH118	STORAGE	98.75	2.08	0.0

****
Link Summary
****

Name	From Node	To Node	Type	Length	% Slope	Roughness
C1	CB37	STMH101	CONDUIT	37.0	2.0000	0.0130
C2	STMH108-(OGS)	DryPond	CONDUIT	15.0	0.5133	0.0130
C3	DryPond	STMH120	CONDUIT	15.0	0.3133	0.0130

```
  C4                EXSTMH7125       Outfall           CONDUIT           11.3
0.3200    0.0130
  Pipe_-_(112)_(STORM_SEWER) CB35             STMH117          CONDUIT
39.5    2.0014    0.0130
  Pipe_-_(114)_(STORM_SEWER) CB31             STMH104          CONDUIT
44.0    2.0004    0.0130
  Pipe_-_(115)_(STORM_SEWER) CB33             STMH106          CONDUIT
44.2    2.0005    0.0130
  Pipe_-_(116)_(STORM_SEWER) CB36             STMH113          CONDUIT
39.5    2.0005    0.0130
  Pipe_-_(117)_(STORM_SEWER) CB34             CB18             CONDUIT
42.0    0.1978    0.0130
  Pipe_-_(20)_(STORM_SEWER) STORM_CAP        STMH100          CONDUIT
4.7    0.5089    0.0130
  Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_1 STMH100          CB01-02          CONDUIT
24.5    0.4983    0.0130
  Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_2 CB01-02          STMH101          CONDUIT
63.2    0.5004    0.0130
  Pipe_-_(22)_(1)_(STORM_SEWER)_1 STMH101          CB03-04          CONDUIT
12.9    0.7523    0.0130
  Pipe_-_(22)_(1)_(STORM_SEWER)_2 CB03-04          STMH102          CONDUIT
78.0    0.7500    0.0130
  Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_1 STMH102          CB05-06          CONDUIT
8.7    0.4964    0.0130
  Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_2 CB05-06          STMH103          CONDUIT
7.7    0.5058    0.0130
  Pipe_-_(24)_(STORM_SEWER) STMH103          STMH104          CONDUIT
43.8    0.4978    0.0130
  Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_1 STMH105          CB09-10          CONDUIT
15.3    0.7505    0.0130
  Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_2 CB09-10          STMH106          CONDUIT
53.2    0.7496    0.0130
  Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_1 STMH106          CB11-12          CONDUIT
9.5    0.7550    0.0130
  Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_3 CB11-12          CB13             CONDUIT
55.2    0.7501    0.0130
  Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_4 CB13             STMH107          CONDUIT
3.3    0.7378    0.0130
  Pipe_-_(27)_(STORM_SEWER) STMH107          STMH108-(OGS)    CONDUIT
3.5    4.2083    0.0130
  Pipe_-_(29)_(STORM_SEWER)_1 STMH110          CB26             CONDUIT
53.9    1.5006    0.0130
  Pipe_-_(29)_(STORM_SEWER)_2 CB26             STMH111          CONDUIT
16.1    1.5000    0.0130
  Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_2 CB08             STMH105          CONDUIT
9.0    0.9442    0.0130
  Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_3 STMH111          CB27-28          CONDUIT
1.0    0.7828    0.0130
  Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_4 CB27-28          CB08             CONDUIT
62.5    0.7213    0.0130
  Pipe_-_(31)_(STORM_SEWER) STMH112          STMH113          CONDUIT
48.0    1.7489    0.0130
  Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_1 STMH113          CB29-30          CONDUIT
1.9    0.4767    0.0130
  Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_2 CB29-30          STMH114          CONDUIT
74.2    0.4894    0.0130
  Pipe_-_(34)_(STORM_SEWER)_1 STMH117          CB20-21          CONDUIT
26.1    1.2508    0.0130
  Pipe_-_(34)_(STORM_SEWER)_2 CB20-21          STMH118          CONDUIT
66.5    1.2502    0.0130
  Pipe_-_(35)_(1)_(STORM_SEWER)_1 STMH118          CB19             CONDUIT
8.4    0.7517    0.0130
  Pipe_-_(35)_(1)_(STORM_SEWER)_3 CB19             J1               CONDUIT
4.3    0.7459    0.0130
```

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  Pipe_-_(35)_(1)_(STORM_SEWER)_4 J1               STMH119          CONDUIT
4.1    0.7613    0.0130
  Pipe_-_(36)_(1)_(STORM_SEWER)_1 STMH119          CB17             CONDUIT
39.3    0.7506    0.0130
  Pipe_-_(36)_(1)_(STORM_SEWER)_2 CB17             STMH114          CONDUIT
33.8    0.7490    0.0130
  Pipe_-_(37)_(2)_(STORM_SEWER)_2 CB14             STMH107          CONDUIT
9.9    0.2017    0.0130
  Pipe_-_(37)_(2)_(STORM_SEWER)_3 STMH114          CB15-16          CONDUIT
8.6    0.4981    0.0130
  Pipe_-_(37)_(2)_(STORM_SEWER)_4 CB15-16          CB14             CONDUIT
70.4    0.5000    0.0130
  Pipe_-_(64)_(STORM_SEWER)_1 STMH109          CB07             CONDUIT
33.8    1.5018    0.0130
  Pipe_-_(64)_(STORM_SEWER)_2 CB07             STMH105          CONDUIT
5.2    1.4933    0.0130
  Pipe_-_(65)_(STORM_SEWER) CB32             STMH109          CONDUIT
4.9    2.0061    0.0130
  Pipe_-_(66)_(3)_(STORM_SEWER)_1 STMH115          CB24-25          CONDUIT
51.7    0.4988    0.0130
  Pipe_-_(66)_(3)_(STORM_SEWER)_2 CB24-25          STMH116          CONDUIT
5.1    0.5062    0.0130
  Pipe_-_(67)_(STORM_SEWER)_1 STMH116          CB22-23          CONDUIT
14.4    1.0017    0.0130
  Pipe_-_(67)_(STORM_SEWER)_2 CB22-23          STMH117          CONDUIT
54.1    0.9988    0.0130
  Pipe_-_(71)_(STORM_SEWER) STMH104          STMH105          CONDUIT
49.8    2.0021    0.0130
  Pipe_-_(95)_(STORM_SEWER) CB18             J1               CONDUIT
3.2   27.8521    0.0130
  SW01             SW01-01          SW01-02          CONDUIT          126.0
0.9998    0.0350
  SW01.1           SW01-02          DryPond          CONDUIT           37.0
5.7494    0.0350
  SW02             SW02-01          SW02-02          CONDUIT          120.6
1.0004    0.0350
  SW02.1           SW02-02          DryPond          CONDUIT           30.8
9.1024    0.0350
  C5               STMH120          EXSTMH7125       ORIFICE
  OR1              STMH120          EXSTMH7125       ORIFICE


  **********************
  Cross Section Summary
  **********************
                                       Full     Full     Hyd.     Max.   No. of
Full
  Conduit          Shape               Depth     Area     Rad.    Width  Barrels
Flow
  ---------------------------------------------------------------------------
---------
  C1               CIRCULAR             0.38     0.11     0.09     0.38        1
247.97
  C2               CIRCULAR             0.75     0.44     0.19     0.75        1
797.69
  C3               CIRCULAR             0.75     0.44     0.19     0.75        1
623.21
  C4               CIRCULAR             0.75     0.44     0.19     0.75        1
629.78
  Pipe_-_(112)_(STORM_SEWER) CIRCULAR             0.38     0.11     0.09
0.38        1   248.05
  Pipe_-_(114)_(STORM_SEWER) CIRCULAR             0.38     0.11     0.09
0.38        1   247.99
  Pipe_-_(115)_(STORM_SEWER) CIRCULAR             0.38     0.11     0.09
0.38        1   248.00
```

Pipe_-_(116)_(STORM_SEWER) CIRCULAR 0.38 0.11 0.09
0.38 1 248.00
Pipe_-_(117)_(STORM_SEWER) CIRCULAR 0.38 0.11 0.09
0.38 1 77.98
Pipe_-_(20)_(STORM_SEWER) CIRCULAR 0.38 0.11 0.09 0.38
1 125.08
Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_1 CIRCULAR 0.38 0.11
0.09 0.38 1 123.78
Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_2 CIRCULAR 0.38 0.11
0.09 0.38 1 124.03
Pipe_-_(22)_(1)_(STORM_SEWER)_1 CIRCULAR 0.38 0.11 0.09
0.38 1 152.08
Pipe_-_(22)_(1)_(STORM_SEWER)_2 CIRCULAR 0.38 0.11 0.09
0.38 1 151.85
Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_1 CIRCULAR 0.45 0.16
0.11 0.45 1 200.88
Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_2 CIRCULAR 0.45 0.16
0.11 0.45 1 202.77
Pipe_-_(24)_(STORM_SEWER) CIRCULAR 0.45 0.16 0.11 0.45
1 201.17
Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_1 CIRCULAR 0.60 0.28
0.15 0.60 1 531.95
Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_2 CIRCULAR 0.60 0.28
0.15 0.60 1 531.63
Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_1 CIRCULAR 0.60 0.28
0.15 0.60 1 533.54
Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_3 CIRCULAR 0.60 0.28
0.15 0.60 1 531.82
Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_4 CIRCULAR 0.60 0.28
0.15 0.60 1 527.44
Pipe_-_(27)_(STORM_SEWER) CIRCULAR 0.75 0.44 0.19 0.75
1 2283.92
Pipe_-_(29)_(STORM_SEWER)_1 CIRCULAR 0.38 0.11 0.09
0.38 1 214.79
Pipe_-_(29)_(STORM_SEWER)_2 CIRCULAR 0.38 0.11 0.09
0.38 1 214.75
Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_2 CIRCULAR 0.38 0.11
0.09 0.38 1 170.38
Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_3 CIRCULAR 0.38 0.11
0.09 0.38 1 155.13
Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_4 CIRCULAR 0.38 0.11
0.09 0.38 1 148.91
Pipe_-_(31)_(STORM_SEWER) CIRCULAR 0.38 0.11 0.09 0.38
1 231.88
Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_1 CIRCULAR 0.38 0.11
0.09 0.38 1 121.06
Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_2 CIRCULAR 0.38 0.11
0.09 0.38 1 122.66
Pipe_-_(34)_(STORM_SEWER)_1 CIRCULAR 0.38 0.11 0.09
0.38 1 196.10
Pipe_-_(34)_(STORM_SEWER)_2 CIRCULAR 0.45 0.16 0.11
0.45 1 318.80
Pipe_-_(35)_(1)_(STORM_SEWER)_1 CIRCULAR 0.45 0.16 0.11
0.45 1 247.21
Pipe_-_(35)_(1)_(STORM_SEWER)_3 CIRCULAR 0.45 0.16 0.11
0.45 1 246.26
Pipe_-_(35)_(1)_(STORM_SEWER)_4 CIRCULAR 0.45 0.16 0.11
0.45 1 248.78
Pipe_-_(36)_(1)_(STORM_SEWER)_1 CIRCULAR 0.45 0.16 0.11
0.45 1 247.02
Pipe_-_(36)_(1)_(STORM_SEWER)_2 CIRCULAR 0.45 0.16 0.11
0.45 1 246.75
Pipe_-_(37)_(2)_(STORM_SEWER)_2 CIRCULAR 0.60 0.28 0.15
0.60 1 275.74

```
  Pipe_-_(37)_(2)_(STORM_SEWER)_3 CIRCULAR            0.60     0.28     0.15
0.60        1   433.37
  Pipe_-_(37)_(2)_(STORM_SEWER)_4 CIRCULAR            0.60     0.28     0.15
0.60        1   434.20
  Pipe_-_(64)_(STORM_SEWER)_1 CIRCULAR            0.38     0.11     0.09
0.38        1   214.88
  Pipe_-_(64)_(STORM_SEWER)_2 CIRCULAR            0.38     0.11     0.09
0.38        1   214.27
  Pipe_-_(65)_(STORM_SEWER) CIRCULAR            0.38     0.11     0.09     0.38
1   248.35
  Pipe_-_(66)_(3)_(STORM_SEWER)_1 CIRCULAR            0.38     0.11     0.09
0.38        1   123.83
  Pipe_-_(66)_(3)_(STORM_SEWER)_2 CIRCULAR            0.38     0.11     0.09
0.38        1   124.76
  Pipe_-_(67)_(STORM_SEWER)_1 CIRCULAR            0.38     0.11     0.09
0.38        1   175.49
  Pipe_-_(67)_(STORM_SEWER)_2 CIRCULAR            0.38     0.11     0.09
0.38        1   175.23
  Pipe_-_(71)_(STORM_SEWER) CIRCULAR            0.45     0.16     0.11     0.45
1   403.44
  Pipe_-_(95)_(STORM_SEWER) CIRCULAR            0.38     0.11     0.09     0.38
1   925.36
  SW01            TRAPEZOIDAL          0.38     0.84     0.22     3.75        1
877.44
  SW01.1          TRAPEZOIDAL          0.38     0.84     0.22     3.75        1
2104.08
  SW02            TRAPEZOIDAL          0.38     0.84     0.22     3.75        1
877.69
  SW02.1          TRAPEZOIDAL          0.38     0.84     0.22     3.75        1
2647.46



  ***********************************************************
  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 ........ YES
    Water Quality .......... NO
  Infiltration Method ...... HORTON
  Flow Routing Method ...... DYNWAVE
  Surcharge Method ......... EXTRAN
  Starting Date ............ 07/08/2022 00:00:00
  Ending Date .............. 07/09/2022 00:00:00
  Antecedent Dry Days ...... 0.0
  Report Time Step ......... 00:01:00
  Wet Time Step ............ 00:01:00
  Dry Time Step ............ 00:05:00
  Routing Time Step ........ 5.00 sec
  Variable Time Step ....... YES
  Maximum Trials ........... 8
```

Number of Threads 6
Head Tolerance ..... 0.001500 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	0.305	38.560
Evaporation Loss	0.000	0.000
Infiltration Loss	0.158	20.015
Surface Runoff	0.142	18.013
Final Storage	0.004	0.545
Continuity Error (%)	-0.035	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.142	1.423
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.143	1.425
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.002
Continuity Error (%)	-0.276	

****
Highest Continuity Errors
****
Node STMH100 (2.43%)
Node STMH109 (1.36%)

****
Time-Step Critical Elements
****
Link Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_3 (60.31%)

****
Highest Flow Instability Indexes
****
Link Pipe_-_(66)_(3)_(STORM_SEWER)_2 (16)
Link Pipe_-_(27)_(STORM_SEWER) (5)
Link C2 (4)
Link Pipe_-_(37)_(2)_(STORM_SEWER)_2 (3)
Link Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_4 (3)

****
Routing Time Step Summary
****
Minimum Time Step : 0.50 sec
Average Time Step : 2.64 sec
Maximum Time Step : 5.00 sec

```
  Percent in Steady State     :    -0.00
  Average Iterations per Step :     2.07
  Percent Not Converging      :     0.46
  Time Step Frequencies       :
      5.000 -  3.155 sec      :    41.86 %
      3.155 -  1.991 sec      :     7.89 %
      1.991 -  1.256 sec      :     4.19 %
      1.256 -  0.792 sec      :    14.24 %
      0.792 -  0.500 sec      :    31.82 %


  **************************
  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
  ------------------------------------------------------------------------------
-------------------------------------------------
  Post_SC_1                38.56       0.00       0.00      37.16       0.00
1.40       1.40        0.00     2.75   0.036
  Post_SC_10               38.56       0.00       0.00      15.89      21.34
0.65      21.99        0.11    72.24   0.570
  Post_SC_11               38.56       0.00       0.00      15.81      21.35
0.74      22.08        0.06    39.81   0.573
  Post_SC_12               38.56       0.00       0.00      15.64      21.35
0.91      22.26        0.08    48.46   0.577
  Post_SC_13               38.56       0.00       0.00      37.07       0.00
1.49       1.49        0.00     2.72   0.039
  Post_SC_14               38.56       0.00       0.00      15.59      21.35
0.95      22.30        0.07    43.47   0.578
  Post_SC_15               38.56       0.00       0.00      36.30       0.00
2.27       2.27        0.00     2.49   0.059
  Post_SC_16               38.56       0.00       0.00      15.52      21.35
1.02      22.37        0.06    40.80   0.580
  Post_SC_17               38.56       0.00       0.00      15.66      21.35
0.89      22.23        0.07    47.70   0.577
  Post_SC_18               38.56       0.00       0.00      15.87      21.34
0.68      22.02        0.13    83.57   0.571
  Post_SC_19               38.56       0.00       0.00      15.51      21.35
1.03      22.38        0.05    32.77   0.580
  Post_SC_2                38.56       0.00       0.00      15.63      21.35
0.92      22.27        0.07    42.65   0.577
  Post_SC_20               38.56       0.00       0.00      15.34      21.35
1.21      22.56        0.03    18.80   0.585
  Post_SC_21               38.56       0.00       0.00      15.24      21.36
1.30      22.66        0.01     9.81   0.588
  Post_SC_22               38.56       0.00       0.00      15.83      21.35
0.71      22.06        0.08    48.64   0.572
  Post_SC_23               38.56       0.00       0.00      36.40       0.00
2.16       2.16        0.00     3.15   0.056
  Post_SC_24               38.56       0.00       0.00      37.37       0.00
1.19       1.19        0.00     1.69   0.031
  Post_SC_25               38.56       0.00       0.00      36.73       0.00
1.83       1.83        0.00     3.68   0.048
  Post_SC_26               38.56       0.00       0.00      15.44      21.35
1.11      22.46        0.03    21.20   0.582
  Post_SC_27               38.56       0.00       0.00      15.40      21.35
```

Post_SC_28		38.56	0.00	0.00	15.48	21.35	1.07	22.42	0.05	32.92	0.581
Post_SC_29		38.56	0.00	0.00	15.73	21.35	0.82	22.16	0.07	47.22	0.575
Post_SC_3		38.56	0.00	0.00	15.66	21.35	0.88	22.23	0.07	44.19	0.577
Post_SC_4		38.56	0.00	0.00	15.76	21.35	0.78	22.13	0.06	35.42	0.574
Post_SC_5		38.56	0.00	0.00	15.59	21.35	0.96	22.31	0.07	44.75	0.578
Post_SC_6		38.56	0.00	0.00	36.80	0.00	1.76	1.76	0.00	2.76	0.046
Post_SC_7		38.56	0.00	0.00	15.77	21.35	0.78	22.12	0.12	75.62	0.574
Post_SC_8		38.56	0.00	0.00	15.79	21.35	0.76	22.10	0.08	49.31	0.573
Post_SC_9		38.56	0.00	0.00	35.70	0.00	2.86	2.86	0.00	2.13	0.074

****
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
CB07	JUNCTION	0.02	0.24	99.04	0 01:10	0.24
CB08	JUNCTION	0.04	0.26	99.06	0 01:10	0.26
CB09-10	JUNCTION	0.06	0.39	98.93	0 01:10	0.39
CB11-12	JUNCTION	0.07	0.47	98.54	0 01:10	0.47
CB13	JUNCTION	0.13	0.57	98.23	0 01:26	0.57
CB14	JUNCTION	0.14	0.58	98.23	0 01:26	0.58
CB15-16	JUNCTION	0.07	0.39	98.40	0 01:10	0.39
CB19	JUNCTION	0.05	0.28	98.96	0 01:10	0.28
CB22-23	JUNCTION	0.03	0.18	100.66	0 01:10	0.18
CB24-25	JUNCTION	0.02	0.14	100.78	0 01:10	0.14
CB35	JUNCTION	0.00	0.02	100.81	0 01:20	0.02
CB36	JUNCTION	0.02	0.10	99.43	0 01:10	0.10
EXSTMH7125	JUNCTION	0.11	0.31	97.67	0 01:27	0.31
J1	JUNCTION	0.05	0.28	98.93	0 01:10	0.28
STMH100	JUNCTION	0.00	0.03	101.16	0 01:10	0.03

STMH101	JUNCTION	0.02	0.14	100.83	0	01:10	0.14
STMH105	JUNCTION	0.06	0.38	99.04	0	01:10	0.38
STMH106	JUNCTION	0.07	0.45	98.59	0	01:10	0.45
STMH107	JUNCTION	0.13	0.67	98.30	0	01:17	0.62
STMH108-(OGS)	JUNCTION	0.19	0.99	98.47	0	01:18	0.77
STMH109	JUNCTION	0.00	0.03	99.33	0	01:20	0.03
STMH112	JUNCTION	0.00	0.00	99.32	0	00:00	0.00
STMH114	JUNCTION	0.06	0.39	98.43	0	01:10	0.39
STMH115	JUNCTION	0.00	0.00	100.91	0	00:00	0.00
STMH116	JUNCTION	0.02	0.11	100.74	0	01:10	0.11
STMH119	JUNCTION	0.05	0.28	98.87	0	01:10	0.28
STMH120	JUNCTION	0.23	0.85	98.21	0	01:27	0.85
STORM_CAP	JUNCTION	0.00	0.01	101.16	0	01:10	0.01
SW01-01	JUNCTION	0.00	0.03	100.82	0	01:24	0.03
SW01-02	JUNCTION	0.00	0.01	99.54	0	01:31	0.01
SW02-01	JUNCTION	0.00	0.03	101.43	0	01:23	0.03
SW02-02	JUNCTION	0.00	0.01	100.20	0	01:29	0.01
OF1	OUTFALL	0.00	0.00	0.00	0	00:00	0.00
Outfall	OUTFALL	0.10	0.30	97.63	0	01:27	0.30
CB01-02	STORAGE	0.03	0.15	101.16	0	01:10	0.15
CB03-04	STORAGE	0.04	0.21	100.80	0	01:10	0.21
CB05-06	STORAGE	0.05	0.29	100.23	0	01:10	0.29
CB17	STORAGE	0.05	0.33	98.63	0	01:10	0.33
CB18	STORAGE	0.00	0.01	99.58	0	01:21	0.01
CB20-21	STORAGE	0.03	0.19	99.81	0	01:10	0.19
CB26	STORAGE	0.03	0.15	99.68	0	01:10	0.15
CB27-28	STORAGE	0.04	0.22	99.47	0	01:10	0.22
CB29-30	STORAGE	0.04	0.23	98.70	0	01:10	0.23
CB31	STORAGE	0.02	0.11	100.70	0	01:10	0.11
CB32	STORAGE	0.00	0.03	99.46	0	01:20	0.03
CB33	STORAGE	0.02	0.09	99.18	0	01:10	0.09
CB34	STORAGE	0.01	0.05	99.70	0	01:20	0.05

CB37	STORAGE	0.00	0.03	101.46	0	01:20	0.03
DryPond	STORAGE	0.21	0.81	98.22	0	01:27	0.81
STMH102	STORAGE	0.04	0.25	100.24	0	01:10	0.25
STMH103	STORAGE	0.05	0.30	100.16	0	01:10	0.29
STMH104	STORAGE	0.04	0.26	99.91	0	01:10	0.26
STMH110	STORAGE	0.00	0.00	100.33	0	00:00	0.00
STMH111	STORAGE	0.06	0.24	99.47	0	01:10	0.24
STMH113	STORAGE	0.03	0.23	98.70	0	01:10	0.23
STMH117	STORAGE	0.03	0.17	100.11	0	01:10	0.17
STMH118	STORAGE	0.04	0.25	99.00	0	01:10	0.25

****
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
CB07	JUNCTION	9.81	11.29	0	01:01	0.0149	0.0181	-0.204
CB08	JUNCTION	15.87	111.96	0	01:10	0.0245	0.175	0.017
CB09-10	JUNCTION	18.80	391.56	0	01:10	0.0289	0.625	0.002
CB11-12	JUNCTION	83.57	504.37	0	01:10	0.131	0.807	-0.005
CB13	JUNCTION	0.00	504.14	0	01:10	0	0.852	-0.117
CB14	JUNCTION	44.19	375.67	0	01:10	0.0689	0.603	-0.065
CB15-16	JUNCTION	32.92	332.79	0	01:10	0.051	0.533	-0.025
CB19	JUNCTION	48.46	172.04	0	01:10	0.0755	0.273	0.001
CB22-23	JUNCTION	49.31	84.56	0	01:10	0.0771	0.132	-0.010
CB24-25	JUNCTION	35.42	35.42	0	01:10	0.0553	0.0553	0.002
CB35	JUNCTION	2.13	2.13	0	01:20	0.00239	0.00239	0.528
CB36	JUNCTION	40.80	40.80	0	01:10	0.0633	0.0633	0.211
EXSTMH7125	JUNCTION	0.00	250.06	0	01:27	0	1.42	0.000

J1	JUNCTION	0.00	172.19	0	01:10	0	0.276	-0.003
STMH100	JUNCTION	0.00	1.09	0	01:02	0	0.000112	2.486
STMH101	JUNCTION	0.00	43.33	0	01:10	0	0.0704	0.005
STMH105	JUNCTION	0.00	374.32	0	01:10	0	0.597	-0.007
STMH106	JUNCTION	0.00	423.20	0	01:10	0	0.676	-0.006
STMH107	JUNCTION	0.00	910.11	0	01:09	0	1.51	0.004
STMH108-(OGS)	JUNCTION	0.00	896.14	0	01:09	0	1.47	-0.113
STMH109	JUNCTION	0.00	2.48	0	01:20	0	0.00304	1.384
STMH112	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
STMH114	JUNCTION	0.00	301.29	0	01:10	0	0.481	-0.078
STMH115	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
STMH116	JUNCTION	0.00	35.60	0	01:10	0	0.0553	-0.000
STMH119	JUNCTION	0.00	172.15	0	01:10	0	0.276	0.004
STMH120	JUNCTION	0.00	250.08	0	01:26	0	1.42	0.003
STORM_CAP	JUNCTION	0.00	0.08	0	01:05	0	8.83e-06	0.093 ltr
SW01-01	JUNCTION	3.68	3.68	0	01:20	0.00484	0.00484	-0.389
SW01-02	JUNCTION	0.00	3.02	0	01:26	0	0.00486	0.611
SW02-01	JUNCTION	3.15	3.15	0	01:20	0.00391	0.00391	-0.289
SW02-02	JUNCTION	0.00	2.47	0	01:25	0	0.00392	0.487
OF1	OUTFALL	2.76	2.76	0	01:20	0.00368	0.00368	0.000
Outfall	OUTFALL	0.00	250.06	0	01:27	0	1.42	0.000
CB01-02	STORAGE	42.65	42.65	0	01:10	0.0664	0.0665	-0.043
CB03-04	STORAGE	47.22	89.58	0	01:10	0.0737	0.144	-0.115
CB05-06	STORAGE	72.24	160.54	0	01:10	0.113	0.257	-0.002
CB17	STORAGE	43.47	214.93	0	01:10	0.0677	0.344	-0.002
CB18	STORAGE	0.00	2.63	0	01:20	0	0.00381	0.130
CB20-21	STORAGE	39.81	124.70	0	01:10	0.0622	0.197	0.000
CB26	STORAGE	75.62	75.62	0	01:10	0.118	0.118	0.042
CB27-28	STORAGE	21.20	96.51	0	01:10	0.0328	0.151	-0.001
CB29-30	STORAGE	47.70	87.74	0	01:10	0.0744	0.138	0.264
CB31	STORAGE	44.75	44.75	0	01:10	0.0696	0.0696	0.094
CB32	STORAGE	2.49	2.49	0	01:20	0.00304	0.00304	-0.001

```
  CB33                 STORAGE      32.77    32.77     0  01:10      0.0509
0.0509       0.027
  CB34                 STORAGE       2.72     2.72     0  01:20     0.00381
0.00381      -0.076
  CB37                 STORAGE       2.75     2.75     0  01:20     0.00392
0.00392       0.561
  DryPond              STORAGE       1.69   908.81     0  01:08      0.0025
1.42      -0.026
  STMH102              STORAGE       0.00    89.00     0  01:10           0
0.144       0.030
  STMH103              STORAGE       0.00   160.39     0  01:10           0
0.257       0.006
  STMH104              STORAGE      48.64   253.17     0  01:10      0.0761
0.403      -0.067
  STMH110              STORAGE       0.00     0.00     0  00:00           0
0       0.000 ltr
  STMH111              STORAGE       0.00    75.41     0  01:10           0
0.118      -0.006
  STMH113              STORAGE       0.00    40.70     0  01:10           0
0.0632      -0.270
  STMH117              STORAGE       0.00    85.78     0  01:10           0
0.135       0.007
  STMH118              STORAGE       0.00   124.15     0  01:10           0
0.197      -0.003


  **********************
  Node Surcharge Summary
  **********************

  Surcharging occurs when water rises above the top of the highest conduit.
  -------------------------------------------------------------------------
                                          Max. Height   Min. Depth
                                Hours     Above Crown    Below Rim
  Node                 Type   Surcharged      Meters       Meters
  -------------------------------------------------------------------------
  STMH108-(OGS)        JUNCTION      0.11        0.242        1.228


  **********************
  Node Flooding Summary
  **********************

  No nodes were flooded.


  **********************
  Storage Volume Summary
  **********************

  ------------------------------------------------------------------------------
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                          Average     Avg  Evap Exfil       Maximum     Max
Time of Max    Maximum
                           Volume    Pcnt  Pcnt  Pcnt        Volume    Pcnt
Occurrence    Outflow
  Storage Unit           1000 m3    Full  Loss  Loss       1000 m3    Full
days hr:min        LPS
  ------------------------------------------------------------------------------
--------------------
  CB01-02                  0.000       1     0     0         0.000       7
0  01:10      42.36
  CB03-04                  0.000       2     0     0         0.000       9
0  01:10      89.00
```

CB05-06		0.000	2	0	0	0.000	14
0	01:10	160.39					
CB17		0.000	2	0	0	0.000	14
0	01:10	214.16					
CB18		0.000	0	0	0	0.000	1
0	01:21	2.63					
CB20-21		0.000	2	0	0	0.000	9
0	01:10	124.15					
CB26		0.000	1	0	0	0.000	8
0	01:10	75.41					
CB27-28		0.000	2	0	0	0.000	11
0	01:10	96.14					
CB29-30		0.000	2	0	0	0.000	11
0	01:10	87.24					
CB31		0.000	1	0	0	0.000	6
0	01:10	44.63					
CB32		0.000	0	0	0	0.000	1
0	01:20	2.48					
CB33		0.000	1	0	0	0.000	6
0	01:10	32.65					
CB34		0.000	1	0	0	0.000	4
0	01:20	2.63					
CB37		0.000	0	0	0	0.000	2
0	01:20	2.70					
DryPond		0.143	7	0	0	0.587	29
0	01:27	250.08					
STMH102		0.000	2	0	0	0.000	12
0	01:10	91.08					
STMH103		0.000	2	0	0	0.000	14
0	01:10	160.26					
STMH104		0.000	2	0	0	0.000	11
0	01:10	252.36					
STMH110		0.000	0	0	0	0.000	0
0	00:00	0.00					
STMH111		0.000	3	0	0	0.000	12
0	01:10	75.45					
STMH113		0.000	2	0	0	0.000	10
0	01:10	41.56					
STMH117		0.000	1	0	0	0.000	8
0	01:10	85.26					
STMH118		0.000	2	0	0	0.000	12
0	01:10	124.75					

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
OF1	15.92	1.39	2.76	0.004
Outfall	96.15	68.92	250.06	1.422
System	56.03	70.31	252.09	1.425

****
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
C1	CONDUIT	2.70	0 01:20	0.25	0.01	0.21
C2	CONDUIT	908.52	0 01:08	2.91	1.14	1.00
C3	CONDUIT	250.08	0 01:26	0.66	0.40	1.00
C4	CONDUIT	250.06	0 01:27	1.47	0.40	0.41
Pipe_-_(112)_(STORM_SEWER)	CONDUIT	2.11	0 01:20	0.47	0.01	0.18
Pipe_-_(114)_(STORM_SEWER)	CONDUIT	44.63	0 01:10	1.34	0.18	0.41
Pipe_-_(115)_(STORM_SEWER)	CONDUIT	32.65	0 01:10	0.75	0.13	0.62
Pipe_-_(116)_(STORM_SEWER)	CONDUIT	40.70	0 01:10	1.46	0.16	0.36
Pipe_-_(117)_(STORM_SEWER)	CONDUIT	2.63	0 01:20	0.56	0.03	0.09
Pipe_-_(20)_(STORM_SEWER)	CONDUIT	0.08	0 01:05	0.06	0.00	0.05
Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_1	CONDUIT	1.15	0 01:10	0.07	0.01	0.24
Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_2	CONDUIT	42.27	0 01:10	1.08	0.34	0.39
Pipe_-_(22)_(1)_(STORM_SEWER)_1	CONDUIT	42.70	0 01:10	0.88	0.28	0.46
Pipe_-_(22)_(1)_(STORM_SEWER)_2	CONDUIT	89.00	0 01:10	1.36	0.59	0.57
Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_1	CONDUIT	91.08	0 01:10	0.95	0.45	0.60
Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_2	CONDUIT	160.39	0 01:10	1.52	0.79	0.63
Pipe_-_(24)_(STORM_SEWER)	CONDUIT	160.26	0 01:10	1.58	0.80	0.61
Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_1	CONDUIT	374.14	0 01:10	1.95	0.70	0.64
Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_2	CONDUIT	391.49	0 01:10	1.87	0.74	0.70
Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_1	CONDUIT	425.52	0 01:10	1.86	0.80	0.76
Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_3	CONDUIT	504.14	0 01:10	2.10	0.95	0.80
Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_4	CONDUIT	531.42	0 01:09	2.22	1.01	0.97
Pipe_-_(27)_(STORM_SEWER)	CONDUIT	896.14	0 01:09	2.67	0.39	0.94
Pipe_-_(29)_(STORM_SEWER)_1	CONDUIT	0.00	0 00:00	0.00	0.00	0.21
Pipe_-_(29)_(STORM_SEWER)_2	CONDUIT	75.41	0 01:10	1.56	0.35	0.45
Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_2	CONDUIT	111.33	0 01:10	1.26	0.65	0.78
Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_3	CONDUIT	75.45	0 01:10	1.14	0.49	0.58
Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_4	CONDUIT	96.14	0 01:10	1.30	0.65	0.64
Pipe_-_(31)_(STORM_SEWER)	CONDUIT	0.00	0 00:00	0.00	0.00	0.30
Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_1	CONDUIT	41.56	0 01:10	0.59	0.34	0.61
Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_2	CONDUIT	87.24	0 01:10	1.03	0.71	0.75
Pipe_-_(34)_(STORM_SEWER)_1	CONDUIT	85.26	0 01:10	1.59	0.43	0.49

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  Pipe_-_(34)_(STORM_SEWER)_2 CONDUIT    124.15     0  01:10      1.73    0.39
0.46
  Pipe_-_(35)_(1)_(STORM_SEWER)_1 CONDUIT    124.75     0  01:10      1.33
0.50    0.59
  Pipe_-_(35)_(1)_(STORM_SEWER)_3 CONDUIT    171.93     0  01:10      1.68
0.70    0.61
  Pipe_-_(35)_(1)_(STORM_SEWER)_4 CONDUIT    172.15     0  01:10      1.69
0.69    0.61
  Pipe_-_(36)_(1)_(STORM_SEWER)_1 CONDUIT    171.95     0  01:10      1.50
0.70    0.68
  Pipe_-_(36)_(1)_(STORM_SEWER)_2 CONDUIT    214.16     0  01:10      1.58
0.87    0.80
  Pipe_-_(37)_(2)_(STORM_SEWER)_2 CONDUIT    386.38     0  01:07      1.56
1.40    0.98
  Pipe_-_(37)_(2)_(STORM_SEWER)_3 CONDUIT    301.45     0  01:10      1.56
0.70    0.65
  Pipe_-_(37)_(2)_(STORM_SEWER)_4 CONDUIT    331.82     0  01:10      1.46
0.76    0.75
  Pipe_-_(64)_(STORM_SEWER)_1 CONDUIT      2.45     0  01:20      0.41    0.01
0.35
  Pipe_-_(64)_(STORM_SEWER)_2 CONDUIT     16.30     0  01:22      0.59    0.08
0.75
  Pipe_-_(65)_(STORM_SEWER) CONDUIT      2.48     0  01:20      0.72    0.01
0.07
  Pipe_-_(66)_(3)_(STORM_SEWER)_1 CONDUIT      0.00     0  00:00      0.00
0.00    0.18
  Pipe_-_(66)_(3)_(STORM_SEWER)_2 CONDUIT     35.60     0  01:10      1.11
0.29    0.33
  Pipe_-_(67)_(STORM_SEWER)_1 CONDUIT     35.27     0  01:10      0.86    0.20
0.40
  Pipe_-_(67)_(STORM_SEWER)_2 CONDUIT     84.37     0  01:10      1.63    0.48
0.48
  Pipe_-_(71)_(STORM_SEWER) CONDUIT    252.36     0  01:10      2.09    0.63
0.71
  Pipe_-_(95)_(STORM_SEWER) CONDUIT      2.63     0  01:21      0.38    0.00
0.29
  SW01                  CONDUIT      3.02     0  01:26      0.19    0.00    0.05
  SW01.1                CONDUIT      2.81     0  01:31      0.01    0.00    0.51
  SW02                  CONDUIT      2.47     0  01:25      0.18    0.00    0.04
  SW02.1                CONDUIT      2.33     0  01:29      0.01    0.00    0.51
  C5                    ORIFICE      0.00     0  00:00                      0.00
  OR1                   ORIFICE    250.06     0  01:27                      1.00


  **************************
  Flow Classification Summary
  **************************

  -------------------------------------------------------------------------------
-------
                       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
  -------------------------------------------------------------------------------
-------
  C1                       1.00   0.20  0.53  0.00  0.27  0.00  0.00  0.00  0.95
0.00
  C2                       1.00   0.00  0.02  0.00  0.84  0.13  0.00  0.00  0.86
0.00
  C3                       1.00   0.01  0.00  0.00  0.99  0.00  0.00  0.00  0.84
0.00
```

```
  C4                      1.00   0.01  0.00  0.00  0.81  0.18  0.00  0.00  0.00
0.00
  Pipe_-_(112)_(STORM_SEWER)    1.00   0.07  0.05  0.00  0.07  0.03  0.00  0.78
0.02  0.00
  Pipe_-_(114)_(STORM_SEWER)    1.00   0.00  0.00  0.00  0.02  0.13  0.00  0.85
0.03  0.00
  Pipe_-_(115)_(STORM_SEWER)    1.00   0.00  0.00  0.00  0.22  0.06  0.00  0.71
0.06  0.00
  Pipe_-_(116)_(STORM_SEWER)    1.00   0.00  0.00  0.00  0.00  0.08  0.00  0.92
0.01  0.00
  Pipe_-_(117)_(STORM_SEWER)    1.00   0.12  0.00  0.00  0.74  0.13  0.00  0.00
0.87  0.00
  Pipe_-_(20)_(STORM_SEWER)    1.00   0.11  0.01  0.00  0.89  0.00  0.00  0.00
0.95  0.00
  Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_1    1.00   0.00  0.79  0.00  0.20  0.00
0.00  0.00  0.95  0.00
  Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_2    1.00   0.00  0.00  0.00  0.86  0.13
0.00  0.00  0.04  0.00
  Pipe_-_(22)_(1)_(STORM_SEWER)_1    1.00   0.00  0.19  0.00  0.80  0.00  0.00
0.00  0.99  0.00
  Pipe_-_(22)_(1)_(STORM_SEWER)_2    1.00   0.00  0.00  0.00  0.00  0.04  0.00
0.95  0.01  0.00
  Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_1    1.00   0.00  0.05  0.00  0.95  0.00
0.00  0.00  0.95  0.00
  Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_2    1.00   0.00  0.00  0.00  0.00  0.00
0.00  1.00  0.00  0.00
  Pipe_-_(24)_(STORM_SEWER)    1.00   0.00  0.00  0.00  0.59  0.40  0.00  0.00
0.47  0.00
  Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_1    1.00   0.00  0.00  0.00  0.51  0.48
0.00  0.00  0.75  0.00
  Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_2    1.00   0.00  0.00  0.00  0.54  0.46
0.00  0.00  0.86  0.00
  Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_1    1.00   0.00  0.00  0.00  0.58  0.42
0.00  0.00  0.72  0.00
  Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_3    1.00   0.00  0.00  0.00  0.77  0.23
0.00  0.00  0.93  0.00
  Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_4    1.00   0.00  0.00  0.00  0.72  0.28
0.00  0.00  0.20  0.00
  Pipe_-_(27)_(STORM_SEWER)    1.00   0.00  0.00  0.00  0.74  0.26  0.00  0.00
0.83  0.00
  Pipe_-_(29)_(STORM_SEWER)_1    1.00   0.00  1.00  0.00  0.00  0.00  0.00  0.00
0.00  0.00
  Pipe_-_(29)_(STORM_SEWER)_2    1.00   0.00  0.00  0.00  0.00  0.08  0.00  0.92
0.01  0.00
  Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_2    1.00   0.00  0.00  0.00  0.08  0.07
0.00  0.84  0.00  0.00
  Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_3    1.00   0.00  0.00  0.00  0.99  0.00
0.00  0.00  0.32  0.00
  Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_4    1.00   0.00  0.00  0.00  0.59  0.40
0.00  0.00  0.96  0.00
  Pipe_-_(31)_(STORM_SEWER)    1.00   0.16  0.84  0.00  0.00  0.00  0.00  0.00
0.00  0.00
  Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_1    1.00   0.00  0.15  0.00  0.84  0.00
0.00  0.00  0.88  0.00
  Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_2    1.00   0.00  0.00  0.00  0.17  0.00
0.00  0.82  0.03  0.00
  Pipe_-_(34)_(STORM_SEWER)_1    1.00   0.00  0.00  0.00  0.52  0.48  0.00  0.00
0.99  0.00
  Pipe_-_(34)_(STORM_SEWER)_2    1.00   0.00  0.00  0.00  0.00  0.05  0.00  0.94
0.01  0.00
  Pipe_-_(35)_(1)_(STORM_SEWER)_1    1.00   0.00  0.00  0.00  0.89  0.11  0.00
0.00  0.42  0.00
  Pipe_-_(35)_(1)_(STORM_SEWER)_3    1.00   0.00  0.00  0.00  0.52  0.47  0.00
0.00  0.94  0.00
```

Pipe_-_(35)_(1)_(STORM_SEWER)_4 1.00 0.00 0.00 0.00 0.00 0.00 0.00
1.00 0.00 0.00
Pipe_-_(36)_(1)_(STORM_SEWER)_1 1.00 0.00 0.00 0.00 0.65 0.34 0.00
0.00 0.92 0.00
Pipe_-_(36)_(1)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.96 0.04 0.00
0.00 0.72 0.00
Pipe_-_(37)_(2)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.93 0.07 0.00
0.00 0.09 0.00
Pipe_-_(37)_(2)_(STORM_SEWER)_3 1.00 0.00 0.00 0.00 1.00 0.00 0.00
0.00 0.49 0.00
Pipe_-_(37)_(2)_(STORM_SEWER)_4 1.00 0.00 0.00 0.00 1.00 0.00 0.00
0.00 0.96 0.00
Pipe_-_(64)_(STORM_SEWER)_1 1.00 0.00 0.78 0.00 0.22 0.00 0.00 0.00
0.95 0.00
Pipe_-_(64)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.28 0.01 0.00 0.70
0.04 0.00
Pipe_-_(65)_(STORM_SEWER) 1.00 0.12 0.00 0.00 0.00 0.00 0.00 0.88
0.00 0.00
Pipe_-_(66)_(3)_(STORM_SEWER)_1 1.00 0.00 1.00 0.00 0.00 0.00 0.00
0.00 0.00 0.00
Pipe_-_(66)_(3)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.65 0.35 0.00
0.00 0.03 0.00
Pipe_-_(67)_(STORM_SEWER)_1 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00
0.99 0.00
Pipe_-_(67)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.49 0.50 0.00 0.00
0.13 0.00
Pipe_-_(71)_(STORM_SEWER) 1.00 0.00 0.00 0.00 0.46 0.53 0.00 0.00
0.78 0.00
Pipe_-_(95)_(STORM_SEWER) 1.00 0.05 0.07 0.00 0.13 0.06 0.00 0.68
0.04 0.00
SW01 1.00 0.40 0.00 0.00 0.60 0.00 0.00 0.00 0.06
0.00
SW01.1 1.00 0.01 0.41 0.00 0.58 0.00 0.00 0.00 0.95
0.00
SW02 1.00 0.33 0.00 0.00 0.67 0.00 0.00 0.00 0.00
0.00
SW02.1 1.00 0.01 0.38 0.00 0.62 0.00 0.00 0.00 0.95
0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C2	0.10	0.10	0.44	0.10	0.01
C3	0.44	0.44	0.58	0.01	0.01
Pipe_-_(115)_(STORM_SEWER)	0.01	0.01	0.06	0.01	0.01
Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_4	0.01	0.01	0.08	0.01	0.01
Pipe_-_(27)_(STORM_SEWER)	0.01	0.01	0.10	0.01	0.01
Pipe_-_(37)_(2)_(STORM_SEWER)_2	0.01	0.01	0.08	0.15	0.01
SW01.1	0.01	0.01	1.29	0.01	0.01
SW02.1	0.01	0.01	1.29	0.01	0.01

Analysis begun on: Mon Jul 25 16:07:40 2022

Analysis ended on: Mon Jul 25 16:07:45 2022
Total elapsed time: 00:00:05

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

  WARNING 03: negative offset ignored for Link C2
  WARNING 03: negative offset ignored for Link C4
  WARNING 03: negative offset ignored for Link Pipe_-_(117)_(STORM_SEWER)
  WARNING 03: negative offset ignored for Link Pipe_-_(27)_(STORM_SEWER)
  WARNING 03: negative offset ignored for Link Pipe_-_(30)_(2)_(1)_(STORM_SEWER)
_2
  WARNING 03: negative offset ignored for Link Pipe_-_(30)_(2)_(1)_(STORM_SEWER)
_4
  WARNING 03: negative offset ignored for Link Pipe_-_(37)_(2)_(STORM_SEWER)_2
  WARNING 03: negative offset ignored for Link Pipe_-_(95)_(STORM_SEWER)
  WARNING 02: maximum depth increased for Node SW01-01
  WARNING 02: maximum depth increased for Node SW01-02
  WARNING 02: maximum depth increased for Node SW02-01
  WARNING 02: maximum depth increased for Node SW02-02

  *************
  Element Count
  *************
  Number of rain gages ...... 4
  Number of subcatchments ... 29
  Number of nodes ........... 57
  Number of links ........... 56
  Number of pollutants ...... 0
  Number of land uses ....... 0


  ****************
  Raingage Summary
  ****************
                                                    Data       Recording
  Name                 Data Source                  Type       Interval
  ----------------------------------------------------------------------
  100Yr-Storm          6hr-ChicagoStorm             INTENSITY   10 min.
  25mm-4hr-Chicago     25mm-4hr-Chicago             INTENSITY   10 min.
  2Yr-Storm            3hr-ChicagoStorm-2yr         INTENSITY   10 min.
  5Yr-Storm            3hr-ChicagoStorm             INTENSITY   10 min.


  ********************
  Subcatchment Summary
  ********************
  Name                        Area     Width   %Imperv    %Slope Rain Gage
Outlet
  ------------------------------------------------------------------------------
------------------------------
  Post_SC_1                   0.28     88.55      0.00    1.5000 100Yr-Storm
CB37
  Post_SC_10                  0.51     79.09     57.10    1.5000 100Yr-Storm
CB05-06
  Post_SC_11                  0.28     53.24     57.10    1.5000 100Yr-Storm
CB20-21
  Post_SC_12                  0.34     93.31     57.10    1.5000 100Yr-Storm
CB19
  Post_SC_13                  0.26     89.23      0.00    1.5000 100Yr-Storm
CB34
  Post_SC_14                  0.30     91.53     57.10    1.5000 100Yr-Storm
CB17
  Post_SC_15                  0.13     99.00      0.00    1.5000 100Yr-Storm
CB32
```

Post_SC_16	0.28	99.52	57.10	1.5000	100Yr-Storm CB36
Post_SC_17	0.33	87.74	57.10	1.5000	100Yr-Storm CB29-30
Post_SC_18	0.59	97.29	57.10	1.5000	100Yr-Storm CB11-12
Post_SC_19	0.23	81.42	57.10	1.5000	100Yr-Storm CB33
Post_SC_2	0.30	84.01	57.10	1.5000	100Yr-Storm CB01-02
Post_SC_20	0.13	68.05	57.10	1.5000	100Yr-Storm CB09-10
Post_SC_21	0.07	43.41	57.10	1.5000	100Yr-Storm CB07
Post_SC_22	0.34	61.39	57.10	1.5000	100Yr-Storm STMH104
Post_SC_23	0.18	121.24	0.00	1.5000	100Yr-Storm SW02-01
Post_SC_24	0.21	52.61	0.00	1.5000	100Yr-Storm DryPond
Post_SC_25	0.26	129.90	0.00	1.5000	100Yr-Storm SW01-01
Post_SC_26	0.15	61.89	57.10	1.5000	100Yr-Storm CB27-28
Post_SC_27	0.11	50.45	57.10	1.5000	100Yr-Storm CB08
Post_SC_28	0.23	88.73	57.10	1.5000	100Yr-Storm CB15-16
Post_SC_29	0.33	74.75	57.10	1.5000	100Yr-Storm CB03-04
Post_SC_3	0.31	81.21	57.10	1.5000	100Yr-Storm CB14
Post_SC_4	0.25	52.33	57.10	1.5000	100Yr-Storm CB24-25
Post_SC_5	0.31	95.82	57.10	1.5000	100Yr-Storm CB31
Post_SC_6	0.21	95.72	0.00	1.5000	100Yr-Storm OF1
Post_SC_7	0.53	109.85	57.10	1.5000	100Yr-Storm CB26
Post_SC_8	0.35	68.83	57.10	1.5000	100Yr-Storm CB22-23
Post_SC_9	0.08	108.12	0.00	1.5000	100Yr-Storm CB35

****
Node Summary
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Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
CB07	JUNCTION	98.79	2.57	0.0	
CB08	JUNCTION	98.80	2.45	0.0	
CB09-10	JUNCTION	98.54	2.65	0.0	
CB11-12	JUNCTION	98.07	2.08	0.0	
CB13	JUNCTION	97.66	2.23	0.0	
CB14	JUNCTION	97.65	2.18	0.0	
CB15-16	JUNCTION	98.00	2.25	0.0	
CB19	JUNCTION	98.69	2.13	0.0	
CB22-23	JUNCTION	100.48	2.06	0.0	
CB24-25	JUNCTION	100.65	1.97	0.0	

CB35	JUNCTION	100.79	1.75	0.0
CB36	JUNCTION	99.33	1.87	0.0
EXSTMH7125	JUNCTION	97.36	1.45	0.0
J1	JUNCTION	98.65	2.15	0.0
STMH100	JUNCTION	101.13	2.27	0.0
STMH101	JUNCTION	100.69	2.22	0.0
STMH105	JUNCTION	98.65	2.71	0.0
STMH106	JUNCTION	98.14	2.22	0.0
STMH107	JUNCTION	97.63	2.24	0.0
STMH108-(OGS)	JUNCTION	97.48	2.22	0.0
STMH109	JUNCTION	99.30	2.04	0.0
STMH112	JUNCTION	99.32	2.04	0.0
STMH114	JUNCTION	98.05	2.41	0.0
STMH115	JUNCTION	100.91	2.03	0.0
STMH116	JUNCTION	100.62	2.04	0.0
STMH119	JUNCTION	98.59	2.21	0.0
STMH120	JUNCTION	97.36	1.94	0.0
STORM_CAP	JUNCTION	101.16	2.19	0.0
SW01-01	JUNCTION	100.79	0.38	0.0
SW01-02	JUNCTION	99.53	0.38	0.0
SW02-01	JUNCTION	101.40	0.38	0.0
SW02-02	JUNCTION	100.19	0.38	0.0
OF1	OUTFALL	0.00	0.00	0.0
Outfall	OUTFALL	97.32	0.75	0.0
CB01-02	STORAGE	101.01	2.06	0.0
CB03-04	STORAGE	100.60	2.20	0.0
CB05-06	STORAGE	99.94	2.07	0.0
CB17	STORAGE	98.30	2.32	0.0
CB18	STORAGE	99.56	1.20	0.0
CB20-21	STORAGE	99.61	2.12	0.0
CB26	STORAGE	99.53	2.02	0.0
CB27-28	STORAGE	99.25	2.04	0.0
CB29-30	STORAGE	98.47	2.15	0.0
CB31	STORAGE	100.59	1.86	0.0
CB32	STORAGE	99.43	1.95	0.0
CB33	STORAGE	99.09	1.54	0.0
CB34	STORAGE	99.65	1.25	0.0
CB37	STORAGE	101.43	1.32	0.0
DryPond	STORAGE	97.41	2.00	0.0
STMH102	STORAGE	99.98	2.06	0.0
STMH103	STORAGE	99.87	2.11	0.0
STMH104	STORAGE	99.65	2.27	0.0
STMH110	STORAGE	100.33	2.08	0.0
STMH111	STORAGE	99.24	2.05	0.0
STMH113	STORAGE	98.48	2.15	0.0
STMH117	STORAGE	99.94	2.15	0.0
STMH118	STORAGE	98.75	2.08	0.0

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Link Summary
****

Name	From Node	To Node	Type	Length	% Slope	Roughness
C1	CB37	STMH101	CONDUIT	37.0	2.0000	0.0130
C2	STMH108-(OGS)	DryPond	CONDUIT	15.0	0.5133	0.0130
C3	DryPond	STMH120	CONDUIT	15.0	0.3133	0.0130

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  C4                EXSTMH7125       Outfall           CONDUIT           11.3
0.3200    0.0130
  Pipe_-_(112)_(STORM_SEWER) CB35             STMH117          CONDUIT
39.5    2.0014    0.0130
  Pipe_-_(114)_(STORM_SEWER) CB31             STMH104          CONDUIT
44.0    2.0004    0.0130
  Pipe_-_(115)_(STORM_SEWER) CB33             STMH106          CONDUIT
44.2    2.0005    0.0130
  Pipe_-_(116)_(STORM_SEWER) CB36             STMH113          CONDUIT
39.5    2.0005    0.0130
  Pipe_-_(117)_(STORM_SEWER) CB34             CB18             CONDUIT
42.0    0.1978    0.0130
  Pipe_-_(20)_(STORM_SEWER) STORM_CAP        STMH100          CONDUIT
4.7    0.5089    0.0130
  Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_1 STMH100          CB01-02          CONDUIT
24.5    0.4983    0.0130
  Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_2 CB01-02          STMH101          CONDUIT
63.2    0.5004    0.0130
  Pipe_-_(22)_(1)_(STORM_SEWER)_1 STMH101          CB03-04          CONDUIT
12.9    0.7523    0.0130
  Pipe_-_(22)_(1)_(STORM_SEWER)_2 CB03-04          STMH102          CONDUIT
78.0    0.7500    0.0130
  Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_1 STMH102          CB05-06          CONDUIT
8.7    0.4964    0.0130
  Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_2 CB05-06          STMH103          CONDUIT
7.7    0.5058    0.0130
  Pipe_-_(24)_(STORM_SEWER) STMH103          STMH104          CONDUIT
43.8    0.4978    0.0130
  Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_1 STMH105          CB09-10          CONDUIT
15.3    0.7505    0.0130
  Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_2 CB09-10          STMH106          CONDUIT
53.2    0.7496    0.0130
  Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_1 STMH106          CB11-12          CONDUIT
9.5    0.7550    0.0130
  Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_3 CB11-12          CB13             CONDUIT
55.2    0.7501    0.0130
  Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_4 CB13             STMH107          CONDUIT
3.3    0.7378    0.0130
  Pipe_-_(27)_(STORM_SEWER) STMH107          STMH108-(OGS)    CONDUIT
3.5    4.2083    0.0130
  Pipe_-_(29)_(STORM_SEWER)_1 STMH110          CB26             CONDUIT
53.9    1.5006    0.0130
  Pipe_-_(29)_(STORM_SEWER)_2 CB26             STMH111          CONDUIT
16.1    1.5000    0.0130
  Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_2 CB08             STMH105          CONDUIT
9.0    0.9442    0.0130
  Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_3 STMH111          CB27-28          CONDUIT
1.0    0.7828    0.0130
  Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_4 CB27-28          CB08             CONDUIT
62.5    0.7213    0.0130
  Pipe_-_(31)_(STORM_SEWER) STMH112          STMH113          CONDUIT
48.0    1.7489    0.0130
  Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_1 STMH113          CB29-30          CONDUIT
1.9    0.4767    0.0130
  Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_2 CB29-30          STMH114          CONDUIT
74.2    0.4894    0.0130
  Pipe_-_(34)_(STORM_SEWER)_1 STMH117          CB20-21          CONDUIT
26.1    1.2508    0.0130
  Pipe_-_(34)_(STORM_SEWER)_2 CB20-21          STMH118          CONDUIT
66.5    1.2502    0.0130
  Pipe_-_(35)_(1)_(STORM_SEWER)_1 STMH118          CB19             CONDUIT
8.4    0.7517    0.0130
  Pipe_-_(35)_(1)_(STORM_SEWER)_3 CB19             J1               CONDUIT
4.3    0.7459    0.0130
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  Pipe_-_(35)_(1)_(STORM_SEWER)_4 J1               STMH119          CONDUIT
4.1    0.7613    0.0130
  Pipe_-_(36)_(1)_(STORM_SEWER)_1 STMH119          CB17             CONDUIT
39.3    0.7506    0.0130
  Pipe_-_(36)_(1)_(STORM_SEWER)_2 CB17             STMH114          CONDUIT
33.8    0.7490    0.0130
  Pipe_-_(37)_(2)_(STORM_SEWER)_2 CB14             STMH107          CONDUIT
9.9    0.2017    0.0130
  Pipe_-_(37)_(2)_(STORM_SEWER)_3 STMH114          CB15-16          CONDUIT
8.6    0.4981    0.0130
  Pipe_-_(37)_(2)_(STORM_SEWER)_4 CB15-16          CB14             CONDUIT
70.4    0.5000    0.0130
  Pipe_-_(64)_(STORM_SEWER)_1 STMH109          CB07             CONDUIT
33.8    1.5018    0.0130
  Pipe_-_(64)_(STORM_SEWER)_2 CB07             STMH105          CONDUIT
5.2    1.4933    0.0130
  Pipe_-_(65)_(STORM_SEWER) CB32             STMH109          CONDUIT
4.9    2.0061    0.0130
  Pipe_-_(66)_(3)_(STORM_SEWER)_1 STMH115          CB24-25          CONDUIT
51.7    0.4988    0.0130
  Pipe_-_(66)_(3)_(STORM_SEWER)_2 CB24-25          STMH116          CONDUIT
5.1    0.5062    0.0130
  Pipe_-_(67)_(STORM_SEWER)_1 STMH116          CB22-23          CONDUIT
14.4    1.0017    0.0130
  Pipe_-_(67)_(STORM_SEWER)_2 CB22-23          STMH117          CONDUIT
54.1    0.9988    0.0130
  Pipe_-_(71)_(STORM_SEWER) STMH104          STMH105          CONDUIT
49.8    2.0021    0.0130
  Pipe_-_(95)_(STORM_SEWER) CB18             J1               CONDUIT
3.2   27.8521    0.0130
  SW01             SW01-01          SW01-02          CONDUIT          126.0
0.9998    0.0350
  SW01.1           SW01-02          DryPond          CONDUIT           37.0
5.7494    0.0350
  SW02             SW02-01          SW02-02          CONDUIT          120.6
1.0004    0.0350
  SW02.1           SW02-02          DryPond          CONDUIT           30.8
9.1024    0.0350
  C5               STMH120          EXSTMH7125       ORIFICE
  OR1              STMH120          EXSTMH7125       ORIFICE


  **********************
  Cross Section Summary
  **********************
                                       Full     Full     Hyd.     Max.   No. of
Full
  Conduit          Shape               Depth     Area     Rad.    Width  Barrels
Flow
  ---------------------------------------------------------------------------
---------
  C1               CIRCULAR             0.38     0.11     0.09     0.38        1
247.97
  C2               CIRCULAR             0.75     0.44     0.19     0.75        1
797.69
  C3               CIRCULAR             0.75     0.44     0.19     0.75        1
623.21
  C4               CIRCULAR             0.75     0.44     0.19     0.75        1
629.78
  Pipe_-_(112)_(STORM_SEWER) CIRCULAR             0.38     0.11     0.09
0.38        1   248.05
  Pipe_-_(114)_(STORM_SEWER) CIRCULAR             0.38     0.11     0.09
0.38        1   247.99
  Pipe_-_(115)_(STORM_SEWER) CIRCULAR             0.38     0.11     0.09
0.38        1   248.00
```

Pipe_-_(116)_(STORM_SEWER) CIRCULAR 0.38 0.11 0.09
0.38 1 248.00
Pipe_-_(117)_(STORM_SEWER) CIRCULAR 0.38 0.11 0.09
0.38 1 77.98
Pipe_-_(20)_(STORM_SEWER) CIRCULAR 0.38 0.11 0.09 0.38
1 125.08
Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_1 CIRCULAR 0.38 0.11
0.09 0.38 1 123.78
Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_2 CIRCULAR 0.38 0.11
0.09 0.38 1 124.03
Pipe_-_(22)_(1)_(STORM_SEWER)_1 CIRCULAR 0.38 0.11 0.09
0.38 1 152.08
Pipe_-_(22)_(1)_(STORM_SEWER)_2 CIRCULAR 0.38 0.11 0.09
0.38 1 151.85
Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_1 CIRCULAR 0.45 0.16
0.11 0.45 1 200.88
Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_2 CIRCULAR 0.45 0.16
0.11 0.45 1 202.77
Pipe_-_(24)_(STORM_SEWER) CIRCULAR 0.45 0.16 0.11 0.45
1 201.17
Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_1 CIRCULAR 0.60 0.28
0.15 0.60 1 531.95
Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_2 CIRCULAR 0.60 0.28
0.15 0.60 1 531.63
Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_1 CIRCULAR 0.60 0.28
0.15 0.60 1 533.54
Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_3 CIRCULAR 0.60 0.28
0.15 0.60 1 531.82
Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_4 CIRCULAR 0.60 0.28
0.15 0.60 1 527.44
Pipe_-_(27)_(STORM_SEWER) CIRCULAR 0.75 0.44 0.19 0.75
1 2283.92
Pipe_-_(29)_(STORM_SEWER)_1 CIRCULAR 0.38 0.11 0.09
0.38 1 214.79
Pipe_-_(29)_(STORM_SEWER)_2 CIRCULAR 0.38 0.11 0.09
0.38 1 214.75
Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_2 CIRCULAR 0.38 0.11
0.09 0.38 1 170.38
Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_3 CIRCULAR 0.38 0.11
0.09 0.38 1 155.13
Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_4 CIRCULAR 0.38 0.11
0.09 0.38 1 148.91
Pipe_-_(31)_(STORM_SEWER) CIRCULAR 0.38 0.11 0.09 0.38
1 231.88
Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_1 CIRCULAR 0.38 0.11
0.09 0.38 1 121.06
Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_2 CIRCULAR 0.38 0.11
0.09 0.38 1 122.66
Pipe_-_(34)_(STORM_SEWER)_1 CIRCULAR 0.38 0.11 0.09
0.38 1 196.10
Pipe_-_(34)_(STORM_SEWER)_2 CIRCULAR 0.45 0.16 0.11
0.45 1 318.80
Pipe_-_(35)_(1)_(STORM_SEWER)_1 CIRCULAR 0.45 0.16 0.11
0.45 1 247.21
Pipe_-_(35)_(1)_(STORM_SEWER)_3 CIRCULAR 0.45 0.16 0.11
0.45 1 246.26
Pipe_-_(35)_(1)_(STORM_SEWER)_4 CIRCULAR 0.45 0.16 0.11
0.45 1 248.78
Pipe_-_(36)_(1)_(STORM_SEWER)_1 CIRCULAR 0.45 0.16 0.11
0.45 1 247.02
Pipe_-_(36)_(1)_(STORM_SEWER)_2 CIRCULAR 0.45 0.16 0.11
0.45 1 246.75
Pipe_-_(37)_(2)_(STORM_SEWER)_2 CIRCULAR 0.60 0.28 0.15
0.60 1 275.74

```
  Pipe_-_(37)_(2)_(STORM_SEWER)_3 CIRCULAR            0.60     0.28     0.15
0.60        1   433.37
  Pipe_-_(37)_(2)_(STORM_SEWER)_4 CIRCULAR            0.60     0.28     0.15
0.60        1   434.20
  Pipe_-_(64)_(STORM_SEWER)_1 CIRCULAR            0.38     0.11     0.09
0.38        1   214.88
  Pipe_-_(64)_(STORM_SEWER)_2 CIRCULAR            0.38     0.11     0.09
0.38        1   214.27
  Pipe_-_(65)_(STORM_SEWER) CIRCULAR            0.38     0.11     0.09     0.38
1   248.35
  Pipe_-_(66)_(3)_(STORM_SEWER)_1 CIRCULAR            0.38     0.11     0.09
0.38        1   123.83
  Pipe_-_(66)_(3)_(STORM_SEWER)_2 CIRCULAR            0.38     0.11     0.09
0.38        1   124.76
  Pipe_-_(67)_(STORM_SEWER)_1 CIRCULAR            0.38     0.11     0.09
0.38        1   175.49
  Pipe_-_(67)_(STORM_SEWER)_2 CIRCULAR            0.38     0.11     0.09
0.38        1   175.23
  Pipe_-_(71)_(STORM_SEWER) CIRCULAR            0.45     0.16     0.11     0.45
1   403.44
  Pipe_-_(95)_(STORM_SEWER) CIRCULAR            0.38     0.11     0.09     0.38
1   925.36
  SW01            TRAPEZOIDAL          0.38     0.84     0.22     3.75        1
877.44
  SW01.1          TRAPEZOIDAL          0.38     0.84     0.22     3.75        1
2104.08
  SW02            TRAPEZOIDAL          0.38     0.84     0.22     3.75        1
877.69
  SW02.1          TRAPEZOIDAL          0.38     0.84     0.22     3.75        1
2647.46



  ***********************************************************
  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 ........ YES
    Water Quality .......... NO
  Infiltration Method ...... HORTON
  Flow Routing Method ...... DYNWAVE
  Surcharge Method ......... EXTRAN
  Starting Date ............ 07/08/2022 00:00:00
  Ending Date .............. 07/09/2022 00:00:00
  Antecedent Dry Days ...... 0.0
  Report Time Step ......... 00:01:00
  Wet Time Step ............ 00:01:00
  Dry Time Step ............ 00:05:00
  Routing Time Step ........ 5.00 sec
  Variable Time Step ....... YES
  Maximum Trials ........... 8
```

Number of Threads 6
Head Tolerance ..... 0.001500 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	0.625	79.100
Evaporation Loss	0.000	0.000
Infiltration Loss	0.233	29.483
Surface Runoff	0.388	49.121
Final Storage	0.004	0.545
Continuity Error (%)	-0.062	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.388	3.884
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.388	3.885
Flooding Loss	0.000	0.003
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.003
Continuity Error (%)	-0.144	

****
Highest Continuity Errors
****
Node STMH100 (-4.53%)

****
Time-Step Critical Elements
****
Link Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_3 (71.28%)
Link Pipe_-_(27)_(STORM_SEWER) (1.86%)
Link Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_4 (1.02%)

****
Highest Flow Instability Indexes
****
Link Pipe_-_(66)_(3)_(STORM_SEWER)_2 (8)
Link Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_4 (2)
Link Pipe_-_(27)_(STORM_SEWER) (2)
Link Pipe_-_(65)_(STORM_SEWER) (2)
Link C2 (1)

****
Routing Time Step Summary
****
Minimum Time Step : 0.50 sec
Average Time Step : 1.89 sec

```
  Maximum Time Step           :     5.00 sec
  Percent in Steady State     :     0.00
  Average Iterations per Step :     2.07
  Percent Not Converging      :     0.56
  Time Step Frequencies       :
      5.000 -  3.155 sec      :    24.86 %
      3.155 -  1.991 sec      :     6.30 %
      1.991 -  1.256 sec      :     3.84 %
      1.256 -  0.792 sec      :    15.59 %
      0.792 -  0.500 sec      :    49.40 %


  **************************
  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
  ------------------------------------------------------------------------------
----------------------------------------------
  Post_SC_1                79.10       0.00       0.00      55.58       0.00
23.53      23.53        0.07    30.31   0.298
  Post_SC_10               79.10       0.00       0.00      23.63      44.52
10.31      54.83        0.28   162.33   0.693
  Post_SC_11               79.10       0.00       0.00      23.32      44.52
10.62      55.14        0.16    91.32   0.697
  Post_SC_12               79.10       0.00       0.00      22.85      44.53
11.09      55.62        0.19   115.97   0.703
  Post_SC_13               79.10       0.00       0.00      55.18       0.00
23.93      23.93        0.06    28.94   0.303
  Post_SC_14               79.10       0.00       0.00      22.76      44.53
11.19      55.72        0.17   105.17   0.704
  Post_SC_15               79.10       0.00       0.00      52.93       0.00
26.19      26.19        0.04    24.96   0.331
  Post_SC_16               79.10       0.00       0.00      22.61      44.54
11.34      55.88        0.16   100.48   0.706
  Post_SC_17               79.10       0.00       0.00      22.91      44.53
11.04      55.57        0.19   113.53   0.702
  Post_SC_18               79.10       0.00       0.00      23.53      44.52
10.41      54.93        0.33   188.95   0.694
  Post_SC_19               79.10       0.00       0.00      22.59      44.54
11.36      55.89        0.13    80.88   0.707
  Post_SC_2                79.10       0.00       0.00      22.83      44.53
11.11      55.65        0.17   102.35   0.704
  Post_SC_20               79.10       0.00       0.00      22.28      44.55
11.66      56.21        0.07    48.42   0.711
  Post_SC_21               79.10       0.00       0.00      22.16      44.55
11.80      56.35        0.04    25.73   0.712
  Post_SC_22               79.10       0.00       0.00      23.41      44.52
10.53      55.05        0.19   110.90   0.696
  Post_SC_23               79.10       0.00       0.00      53.16       0.00
25.96      25.96        0.05    31.50   0.328
  Post_SC_24               79.10       0.00       0.00      56.57       0.00
22.54      22.54        0.05    20.11   0.285
  Post_SC_25               79.10       0.00       0.00      54.02       0.00
25.10      25.10        0.07    36.70   0.317
  Post_SC_26               79.10       0.00       0.00      22.45      44.54
11.50      56.04        0.08    53.34   0.708
```

Post_SC_27	79.10	0.00	0.00	22.38	44.54	11.57
56.11	0.06	40.30	0.709			
Post_SC_28	79.10	0.00	0.00	22.52	44.54	11.43
55.97	0.13	82.05	0.708			
Post_SC_29	79.10	0.00	0.00	23.09	44.53	10.85
55.38	0.18	110.41	0.700			
Post_SC_3	79.10	0.00	0.00	22.91	44.53	11.03
55.57	0.17	105.17	0.702			
Post_SC_4	79.10	0.00	0.00	23.18	44.53	10.76
55.28	0.14	82.17	0.699			
Post_SC_5	79.10	0.00	0.00	22.74	44.54	11.21
55.74	0.17	108.50	0.705			
Post_SC_6	79.10	0.00	0.00	54.24	0.00	24.87
24.87	0.05	27.50	0.314			
Post_SC_7	79.10	0.00	0.00	23.21	44.53	10.73
55.26	0.30	175.08	0.699			
Post_SC_8	79.10	0.00	0.00	23.26	44.52	10.68
55.20	0.19	113.67	0.698			
Post_SC_9	79.10	0.00	0.00	51.87	0.00	27.26
27.26	0.02	21.64	0.345			

****
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
CB07	JUNCTION	0.06	1.97	100.77	0 02:10	1.94
CB08	JUNCTION	0.09	2.06	100.86	0 02:10	2.02
CB09-10	JUNCTION	0.13	2.43	100.97	0 02:03	2.05
CB11-12	JUNCTION	0.20	1.84	99.91	0 02:10	1.83
CB13	JUNCTION	0.28	1.45	99.11	0 02:29	1.45
CB14	JUNCTION	0.28	1.46	99.12	0 02:28	1.46
CB15-16	JUNCTION	0.20	1.49	99.49	0 02:10	1.47
CB19	JUNCTION	0.10	1.94	100.63	0 02:11	1.93
CB22-23	JUNCTION	0.04	1.21	101.69	0 02:09	1.17
CB24-25	JUNCTION	0.03	1.11	101.76	0 02:09	1.04
CB35	JUNCTION	0.00	0.90	101.68	0 02:10	0.40
CB36	JUNCTION	0.03	0.96	100.28	0 02:08	0.91
EXSTMH7125	JUNCTION	0.16	0.49	97.85	0 02:32	0.49
J1	JUNCTION	0.10	1.94	100.59	0 02:11	1.93

STMH100	JUNCTION	0.02	1.55	102.68	0	02:12	1.54
STMH101	JUNCTION	0.05	1.92	102.61	0	02:12	1.91
STMH105	JUNCTION	0.12	2.11	100.77	0	02:10	2.07
STMH106	JUNCTION	0.18	1.90	100.04	0	02:10	1.88
STMH107	JUNCTION	0.28	1.46	99.09	0	02:29	1.46
STMH108-(OGS)	JUNCTION	0.34	1.59	99.08	0	02:30	1.59
STMH109	JUNCTION	0.02	1.48	100.78	0	02:10	1.43
STMH112	JUNCTION	0.01	0.89	100.21	0	02:10	0.88
STMH114	JUNCTION	0.19	1.51	99.56	0	02:10	1.49
STMH115	JUNCTION	0.00	1.21	102.12	0	02:09	0.78
STMH116	JUNCTION	0.03	1.12	101.75	0	02:09	1.06
STMH119	JUNCTION	0.11	1.95	100.54	0	02:11	1.94
STMH120	JUNCTION	0.40	1.63	98.99	0	02:32	1.63
STORM_CAP	JUNCTION	0.01	1.53	102.68	0	02:12	1.52
SW01-01	JUNCTION	0.01	0.10	100.89	0	02:14	0.10
SW01-02	JUNCTION	0.00	0.05	99.58	0	02:18	0.05
SW02-01	JUNCTION	0.01	0.09	101.49	0	02:13	0.09
SW02-02	JUNCTION	0.00	0.04	100.23	0	02:16	0.04
OF1	OUTFALL	0.00	0.00	0.00	0	00:00	0.00
Outfall	OUTFALL	0.15	0.47	97.80	0	02:33	0.47
CB01-02	STORAGE	0.05	1.67	102.68	0	02:12	1.66
CB03-04	STORAGE	0.07	1.98	102.58	0	02:12	1.98
CB05-06	STORAGE	0.08	2.07	102.01	0	02:10	2.07
CB17	STORAGE	0.14	1.81	100.11	0	02:10	1.81
CB18	STORAGE	0.01	1.02	100.59	0	02:11	1.02
CB20-21	STORAGE	0.05	1.40	101.01	0	02:11	1.40
CB26	STORAGE	0.05	1.86	101.39	0	02:11	1.86
CB27-28	STORAGE	0.07	2.04	101.29	0	02:10	2.04
CB29-30	STORAGE	0.11	1.73	100.20	0	02:10	1.73
CB31	STORAGE	0.03	1.15	101.74	0	02:10	1.15
CB32	STORAGE	0.02	1.35	100.78	0	02:10	1.31
CB33	STORAGE	0.03	1.04	100.12	0	02:10	1.00

CB34	STORAGE	0.02	0.95	100.60	0	02:12	0.95
CB37	STORAGE	0.02	1.19	102.62	0	02:12	1.18
DryPond	STORAGE	0.37	1.62	99.03	0	02:33	1.62
STMH102	STORAGE	0.07	2.06	102.04	0	02:11	2.06
STMH103	STORAGE	0.09	2.10	101.97	0	02:11	2.10
STMH104	STORAGE	0.08	2.01	101.66	0	02:11	2.01
STMH110	STORAGE	0.02	1.12	101.45	0	02:10	1.11
STMH111	STORAGE	0.09	2.05	101.29	0	02:10	2.05
STMH113	STORAGE	0.10	1.73	100.21	0	02:10	1.72
STMH117	STORAGE	0.05	1.25	101.19	0	02:11	1.25
STMH118	STORAGE	0.09	1.92	100.67	0	02:11	1.92

****
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
CB07	JUNCTION	25.73	47.45	0	02:10	0.0372	0.076	-0.376
CB08	JUNCTION	40.30	183.10	0	02:11	0.0611	0.436	-0.062
CB09-10	JUNCTION	48.42	649.71	0	02:11	0.072	1.65	-0.003
CB11-12	JUNCTION	188.95	883.52	0	02:10	0.326	2.1	0.014
CB13	JUNCTION	0.00	883.52	0	02:10	0	2.11	-0.054
CB14	JUNCTION	105.17	693.13	0	02:10	0.172	1.58	-0.043
CB15-16	JUNCTION	82.05	593.22	0	02:10	0.127	1.41	0.006
CB19	JUNCTION	115.97	289.09	0	02:07	0.189	0.701	-0.060
CB22-23	JUNCTION	113.67	198.20	0	02:09	0.193	0.331	0.000
CB24-25	JUNCTION	82.17	83.32	0	02:09	0.138	0.141	-0.104
CB35	JUNCTION	21.64	55.31	0	02:10	0.0227	0.0235	-0.007
CB36	JUNCTION	100.48	100.48	0	02:10	0.158	0.158	0.163

EXSTMH7125	JUNCTION	0.00	584.34	0	02:32	0	3.83	-0.000
J1	JUNCTION	0.00	305.25	0	02:12	0	0.767	-0.062
STMH100	JUNCTION	0.00	37.66	0	02:06	0	0.00383	-4.329
STMH101	JUNCTION	0.00	94.31	0	02:16	0	0.234	-0.132
STMH105	JUNCTION	0.00	621.57	0	02:11	0	1.57	-0.049
STMH106	JUNCTION	0.00	717.71	0	02:10	0	1.77	-0.031
STMH107	JUNCTION	0.00	1577.23	0	02:10	0	3.74	0.100
STMH108-(OGS)	JUNCTION	0.00	1576.53	0	02:10	0	3.73	0.002
STMH109	JUNCTION	0.00	45.21	0	02:03	0	0.038	-0.800
STMH112	JUNCTION	0.00	27.19	0	02:06	0	0.00267	-3.395
STMH114	JUNCTION	0.00	534.18	0	02:11	0	1.28	-0.137
STMH115	JUNCTION	0.00	42.84	0	02:09	0	0.0029	-0.825
STMH116	JUNCTION	0.00	83.45	0	02:09	0	0.139	-0.094
STMH119	JUNCTION	0.00	306.33	0	02:12	0	0.763	-0.056
STMH120	JUNCTION	0.00	584.11	0	02:33	0	3.83	0.004
STORM_CAP	JUNCTION	0.00	24.16	0	02:07	0	0.000895	-19.680
SW01-01	JUNCTION	36.70	36.70	0	02:10	0.0662	0.0662	-0.275
SW01-02	JUNCTION	0.00	35.16	0	02:15	0	0.0664	0.301
SW02-01	JUNCTION	31.50	31.50	0	02:10	0.0469	0.0469	-0.236
SW02-02	JUNCTION	0.00	28.07	0	02:14	0	0.047	0.265
OF1	OUTFALL	27.50	27.50	0	02:10	0.052	0.052	0.000
Outfall	OUTFALL	0.00	583.90	0	02:33	0	3.83	0.000
CB01-02	STORAGE	102.35	102.59	0	02:07	0.166	0.169	0.010
CB03-04	STORAGE	110.41	184.58	0	02:08	0.184	0.417	-0.176
CB05-06	STORAGE	162.33	258.95	0	02:11	0.282	0.699	0.015
CB17	STORAGE	105.17	377.58	0	02:10	0.169	0.933	-0.037
CB18	STORAGE	0.00	37.12	0	02:07	0	0.0668	-0.024
CB20-21	STORAGE	91.32	245.03	0	02:05	0.156	0.51	0.093
CB26	STORAGE	175.08	175.08	0	02:10	0.295	0.303	0.277
CB27-28	STORAGE	53.34	169.11	0	02:10	0.0819	0.375	0.034
CB29-30	STORAGE	113.53	181.74	0	02:10	0.186	0.345	0.182
CB31	STORAGE	108.50	108.50	0	02:10	0.174	0.174	0.043

CB32	STORAGE	24.96	24.96	0	02:10	0.0351	0.0356	0.164
CB33	STORAGE	80.88	80.88	0	02:10	0.127	0.127	-0.029
CB34	STORAGE	28.94	33.71	0	02:06	0.0611	0.0621	0.113
CB37	STORAGE	30.31	58.88	0	02:08	0.066	0.0675	0.084
DryPond	STORAGE	20.11	1605.61	0	02:10	0.0474	3.84	0.037
STMH102	STORAGE	0.00	157.69	0	02:16	0	0.418	0.135
STMH103	STORAGE	0.00	251.83	0	02:13	0	0.698	0.005
STMH104	STORAGE	110.90	416.85	0	02:10	0.19	1.06	-0.062
STMH110	STORAGE	0.00	46.80	0	02:07	0	0.00683	-5.739
STMH111	STORAGE	0.00	137.16	0	02:03	0	0.295	-0.069
STMH113	STORAGE	0.00	100.40	0	02:10	0	0.161	-0.425
STMH117	STORAGE	0.00	211.93	0	02:09	0	0.355	-0.217
STMH118	STORAGE	0.00	218.52	0	02:04	0	0.51	-0.476

****
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
CB07	JUNCTION	0.57	1.599	0.593
CB08	JUNCTION	0.58	1.681	0.394
CB09-10	JUNCTION	0.60	1.831	0.219
CB11-12	JUNCTION	1.08	1.243	0.238
CB13	JUNCTION	1.62	0.853	0.782
CB14	JUNCTION	1.64	0.865	0.714
CB15-16	JUNCTION	1.14	0.889	0.759
CB19	JUNCTION	0.61	1.494	0.185
CB22-23	JUNCTION	0.23	0.837	0.852
CB24-25	JUNCTION	0.16	0.739	0.859
CB35	JUNCTION	0.02	0.523	0.853
CB36	JUNCTION	0.22	0.582	0.909
J1	JUNCTION	0.64	1.485	0.220
STMH100	JUNCTION	0.30	1.176	0.718
STMH101	JUNCTION	0.37	1.540	0.309
STMH105	JUNCTION	0.51	1.511	0.596
STMH106	JUNCTION	1.01	1.303	0.316
STMH107	JUNCTION	1.38	0.709	0.780
STMH108-(OGS)	JUNCTION	1.62	0.843	0.627
STMH109	JUNCTION	0.41	1.072	0.563
STMH112	JUNCTION	0.21	0.517	1.144
STMH114	JUNCTION	1.09	0.910	0.901
STMH115	JUNCTION	0.07	0.839	0.816
STMH116	JUNCTION	0.17	0.750	0.915
STMH119	JUNCTION	0.67	1.471	0.258

STMH120	JUNCTION	0.94	0.403	0.307
STORM_CAP	JUNCTION	0.30	1.150	0.665

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate LPS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
CB05-06	0.02	28.69	0 02:11	0.001	0.000
CB27-28	0.01	12.92	0 02:10	0.000	0.000
STMH102	0.01	8.04	0 02:11	0.000	0.000
STMH111	0.02	29.91	0 02:10	0.002	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
CB01-02	0.000	2	0	0	0.002	81	0 02:12	85.52
CB03-04	0.000	3	0	0	0.002	90	0 02:12	157.69
CB05-06	0.000	4	0	0	0.002	100	0 02:10	251.83
CB17	0.000	6	0	0	0.002	78	0 02:10	369.50
CB18	0.000	1	0	0	0.001	85	0 02:11	55.67
CB20-21	0.000	3	0	0	0.002	66	0 02:11	218.52
CB26	0.000	3	0	0	0.002	92	0 02:11	146.45
CB27-28	0.000	3	0	0	0.002	100	0 02:10	160.62
CB29-30	0.000	5	0	0	0.002	80	0 02:10	164.76
CB31	0.000	2	0	0	0.001	62	0 02:10	92.26
CB32	0.000	1	0	0	0.002	69	0 02:10	28.41
CB33	0.000	2	0	0	0.001	67	0 02:10	75.09
CB34	0.000	2	0	0	0.001	76	0 02:12	32.50
CB37	0.000	1	0	0	0.001	90	0 02:12	45.19

```
  DryPond                  0.286      14     0     0         1.477      73
0  02:33     584.11
  STMH102                  0.000       4     0     0         0.002     100
0  02:11     167.01
  STMH103                  0.000       4     0     0         0.003      99
0  02:11     259.21
  STMH104                  0.000       3     0     0         0.002      89
0  02:11     398.78
  STMH110                  0.000       1     0     0         0.001      54
0  02:10      17.68
  STMH111                  0.000       4     0     0         0.002     100
0  02:10     127.56
  STMH113                  0.000       5     0     0         0.002      80
0  02:10      77.86
  STMH117                  0.000       2     0     0         0.002      58
0  02:11     172.82
  STMH118                  0.000       4     0     0         0.002      93
0  02:11     207.94


  ************************
  Outfall Loading Summary
  ************************

  ------------------------------------------------------------
                        Flow       Avg       Max       Total
                        Freq      Flow      Flow      Volume
  Outfall Node           Pcnt       LPS       LPS    10^6 ltr
  ------------------------------------------------------------
  OF1                   18.69      6.49     27.50       0.052
  Outfall               97.55    127.18    583.90       3.833
  ------------------------------------------------------------
  System                58.12    133.67    598.06       3.885


  ********************
  Link Flow Summary
  ********************

  -------------------------------------------------------------------------------
                                 Maximum  Time of Max   Maximum    Max/    Max/
                                  |Flow|   Occurrence   |Veloc|    Full    Full
  Link                 Type          LPS  days hr:min     m/sec    Flow   Depth
  -------------------------------------------------------------------------------
  C1                   CONDUIT     45.19     0  02:24      0.78    0.18    1.00
  C2                   CONDUIT   1572.48     0  02:10      3.74    1.97    1.00
  C3                   CONDUIT    584.11     0  02:33      1.32    0.94    1.00
  C4                   CONDUIT    583.90     0  02:33      1.95    0.93    0.64
  Pipe_-_(112)_(STORM_SEWER) CONDUIT     34.15     0  02:10      0.53    0.14
1.00
  Pipe_-_(114)_(STORM_SEWER) CONDUIT     92.26     0  02:05      1.67    0.37
1.00
  Pipe_-_(115)_(STORM_SEWER) CONDUIT     75.09     0  02:10      0.97    0.30
1.00
  Pipe_-_(116)_(STORM_SEWER) CONDUIT    100.40     0  02:10      1.64    0.40
1.00
  Pipe_-_(117)_(STORM_SEWER) CONDUIT     32.50     0  02:25      1.19    0.42
1.00
  Pipe_-_(20)_(STORM_SEWER) CONDUIT     24.16     0  02:07      0.27    0.19
1.00
  Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_1 CONDUIT     37.66     0  02:06      0.37
0.30    1.00
  Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_2 CONDUIT     84.90     0  02:05      1.24
0.68    1.00
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  Pipe_-_(22)_(1)_(STORM_SEWER)_1 CONDUIT     98.55     0  02:28      1.08
0.65    1.00
  Pipe_-_(22)_(1)_(STORM_SEWER)_2 CONDUIT    157.69     0  02:16      1.43
1.04    1.00
  Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_1 CONDUIT    167.01     0  02:15      1.05
0.83    1.00
  Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_2 CONDUIT    251.83     0  02:13      1.63
1.24    1.00
  Pipe_-_(24)_(STORM_SEWER) CONDUIT    259.21     0  02:14      1.63    1.29
1.00
  Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_1 CONDUIT    622.43     0  02:11      2.20
1.17    1.00
  Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_2 CONDUIT    650.01     0  02:11      2.30
1.22    1.00
  Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_1 CONDUIT    718.74     0  02:10      2.54
1.35    1.00
  Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_3 CONDUIT    883.52     0  02:10      3.12
1.66    1.00
  Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_4 CONDUIT    885.90     0  02:10      3.13
1.68    1.00
  Pipe_-_(27)_(STORM_SEWER) CONDUIT   1576.53     0  02:10      3.57    0.69
1.00
  Pipe_-_(29)_(STORM_SEWER)_1 CONDUIT     46.80     0  02:07      0.48    0.22
1.00
  Pipe_-_(29)_(STORM_SEWER)_2 CONDUIT    137.16     0  02:03      1.60    0.64
1.00
  Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_2 CONDUIT    183.41     0  02:11      1.66
1.08    1.00
  Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_3 CONDUIT    127.56     0  02:11      1.22
0.82    1.00
  Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_4 CONDUIT    160.62     0  02:12      1.45
1.08    1.00
  Pipe_-_(31)_(STORM_SEWER) CONDUIT     27.19     0  02:06      0.35    0.12
1.00
  Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_1 CONDUIT     77.86     0  02:11      0.70
0.64    1.00
  Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_2 CONDUIT    164.76     0  02:11      1.49
1.34    1.00
  Pipe_-_(34)_(STORM_SEWER)_1 CONDUIT    166.41     0  02:05      1.82    0.85
1.00
  Pipe_-_(34)_(STORM_SEWER)_2 CONDUIT    218.52     0  02:04      1.82    0.69
1.00
  Pipe_-_(35)_(1)_(STORM_SEWER)_1 CONDUIT    207.94     0  02:12      1.31
0.84    1.00
  Pipe_-_(35)_(1)_(STORM_SEWER)_3 CONDUIT    288.55     0  02:07      1.86
1.17    1.00
  Pipe_-_(35)_(1)_(STORM_SEWER)_4 CONDUIT    306.33     0  02:12      1.93
1.23    1.00
  Pipe_-_(36)_(1)_(STORM_SEWER)_1 CONDUIT    306.21     0  02:12      1.93
1.24    1.00
  Pipe_-_(36)_(1)_(STORM_SEWER)_2 CONDUIT    369.50     0  02:11      2.32
1.50    1.00
  Pipe_-_(37)_(2)_(STORM_SEWER)_2 CONDUIT    692.94     0  02:10      2.45
2.51    1.00
  Pipe_-_(37)_(2)_(STORM_SEWER)_3 CONDUIT    533.92     0  02:11      1.89
1.23    1.00
  Pipe_-_(37)_(2)_(STORM_SEWER)_4 CONDUIT    593.02     0  02:10      2.10
1.37    1.00
  Pipe_-_(64)_(STORM_SEWER)_1 CONDUIT     42.98     0  02:03      0.55    0.20
1.00
  Pipe_-_(64)_(STORM_SEWER)_2 CONDUIT     47.68     0  02:10      0.43    0.22
1.00
  Pipe_-_(65)_(STORM_SEWER) CONDUIT     28.41     0  02:11      1.04    0.11
1.00
```

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  Pipe_-_(66)_(3)_(STORM_SEWER)_1 CONDUIT     42.84     0  02:09      0.55
0.35    1.00
  Pipe_-_(66)_(3)_(STORM_SEWER)_2 CONDUIT     83.45     0  02:09      1.37
0.67    1.00
  Pipe_-_(67)_(STORM_SEWER)_1 CONDUIT     85.47     0  02:09      0.98    0.49
1.00
  Pipe_-_(67)_(STORM_SEWER)_2 CONDUIT    198.78     0  02:09      1.87    1.13
1.00
  Pipe_-_(71)_(STORM_SEWER) CONDUIT    398.78     0  02:12      2.51    0.99
1.00
  Pipe_-_(95)_(STORM_SEWER) CONDUIT     55.67     0  02:28      0.93    0.06
1.00
  SW01                  CONDUIT     35.16     0  02:15      0.48    0.04    0.19
  SW01.1                CONDUIT     34.73     0  02:18      0.10    0.02    0.56
  SW02                  CONDUIT     28.07     0  02:14      0.45    0.03    0.17
  SW02.1                CONDUIT     27.56     0  02:16      0.09    0.01    0.55
  C5                    ORIFICE    222.03     0  02:32                      1.00
  OR1                   ORIFICE    362.31     0  02:32                      1.00


  **************************
  Flow Classification Summary
  **************************

  -------------------------------------------------------------------------------
-------
                      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
  -------------------------------------------------------------------------------
-------
  C1                      1.00   0.10  0.61  0.00  0.29  0.00  0.00  0.00  0.90
0.00
  C2                      1.00   0.00  0.01  0.00  0.79  0.21  0.00  0.00  0.81
0.00
  C3                      1.00   0.00  0.00  0.00  1.00  0.00  0.00  0.00  0.73
0.00
  C4                      1.00   0.01  0.00  0.00  0.85  0.14  0.00  0.00  0.00
0.00
  Pipe_-_(112)_(STORM_SEWER)    1.00   0.16  0.04  0.00  0.06  0.04  0.00  0.70
0.03  0.00
  Pipe_-_(114)_(STORM_SEWER)    1.00   0.00  0.00  0.00  0.03  0.11  0.00  0.86
0.04  0.00
  Pipe_-_(115)_(STORM_SEWER)    1.00   0.00  0.00  0.00  0.27  0.13  0.00  0.60
0.12  0.00
  Pipe_-_(116)_(STORM_SEWER)    1.00   0.00  0.00  0.00  0.14  0.01  0.00  0.85
0.04  0.00
  Pipe_-_(117)_(STORM_SEWER)    1.00   0.20  0.00  0.00  0.64  0.16  0.00  0.00
0.79  0.00
  Pipe_-_(20)_(STORM_SEWER)    1.00   0.20  0.00  0.00  0.80  0.00  0.00  0.00
0.90  0.00
  Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_1    1.00   0.00  0.84  0.00  0.16  0.00
0.00  0.00  0.90  0.00
  Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_2    1.00   0.00  0.00  0.00  0.92  0.08
0.00  0.00  0.08  0.00
  Pipe_-_(22)_(1)_(STORM_SEWER)_1    1.00   0.00  0.10  0.00  0.90  0.00  0.00
0.00  0.96  0.00
  Pipe_-_(22)_(1)_(STORM_SEWER)_2    1.00   0.00  0.00  0.00  0.03  0.00  0.00
0.96  0.00  0.00
  Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_1    1.00   0.00  0.02  0.00  0.98  0.00
0.00  0.00  0.93  0.00
```

Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.03 0.00 0.00 0.97 0.00 0.00
Pipe_-_(24)_(STORM_SEWER) 1.00 0.00 0.00 0.00 0.41 0.58 0.00 0.00 0.35 0.00
Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_1 1.00 0.00 0.00 0.00 0.44 0.56 0.00 0.00 0.71 0.00
Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.52 0.48 0.00 0.00 0.86 0.00
Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_1 1.00 0.00 0.00 0.00 0.56 0.44 0.00 0.00 0.60 0.00
Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_3 1.00 0.00 0.00 0.00 0.61 0.39 0.00 0.00 0.84 0.00
Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_4 1.00 0.00 0.00 0.00 0.57 0.43 0.00 0.00 0.20 0.00
Pipe_-_(27)_(STORM_SEWER) 1.00 0.00 0.00 0.00 0.59 0.41 0.00 0.00 0.82 0.00
Pipe_-_(29)_(STORM_SEWER)_1 1.00 0.00 0.80 0.00 0.20 0.00 0.00 0.00 0.90 0.00
Pipe_-_(29)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.03 0.02 0.00 0.95 0.00 0.00
Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.10 0.05 0.00 0.85 0.00 0.00
Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_3 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.30 0.00
Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_4 1.00 0.00 0.00 0.00 0.46 0.54 0.00 0.00 0.92 0.00
Pipe_-_(31)_(STORM_SEWER) 1.00 0.07 0.75 0.00 0.17 0.00 0.00 0.00 0.90 0.00
Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_1 1.00 0.00 0.07 0.00 0.93 0.00 0.00 0.00 0.76 0.00
Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.24 0.00 0.00 0.76 0.03 0.00
Pipe_-_(34)_(STORM_SEWER)_1 1.00 0.00 0.00 0.00 0.35 0.65 0.00 0.00 0.98 0.00
Pipe_-_(34)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.08 0.01 0.00 0.90 0.02 0.00
Pipe_-_(35)_(1)_(STORM_SEWER)_1 1.00 0.00 0.00 0.00 0.99 0.00 0.00 0.00 0.46 0.00
Pipe_-_(35)_(1)_(STORM_SEWER)_3 1.00 0.00 0.00 0.00 0.44 0.56 0.00 0.00 0.88 0.00
Pipe_-_(35)_(1)_(STORM_SEWER)_4 1.00 0.00 0.00 0.00 0.11 0.00 0.00 0.88 0.00 0.00
Pipe_-_(36)_(1)_(STORM_SEWER)_1 1.00 0.00 0.00 0.00 0.56 0.44 0.00 0.00 0.87 0.00
Pipe_-_(36)_(1)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.95 0.05 0.00 0.00 0.74 0.00
Pipe_-_(37)_(2)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.70 0.30 0.00 0.00 0.01 0.00
Pipe_-_(37)_(2)_(STORM_SEWER)_3 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.42 0.00
Pipe_-_(37)_(2)_(STORM_SEWER)_4 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.92 0.00
Pipe_-_(64)_(STORM_SEWER)_1 1.00 0.00 0.78 0.00 0.20 0.02 0.00 0.00 0.89 0.00
Pipe_-_(64)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.39 0.05 0.00 0.56 0.11 0.00
Pipe_-_(65)_(STORM_SEWER) 1.00 0.20 0.00 0.00 0.03 0.00 0.00 0.77 0.00 0.00
Pipe_-_(66)_(3)_(STORM_SEWER)_1 1.00 0.00 0.80 0.00 0.20 0.00 0.00 0.00 0.90 0.00
Pipe_-_(66)_(3)_(STORM_SEWER)_2 1.00 0.00 0.00 0.00 0.39 0.61 0.00 0.00 0.03 0.00
Pipe_-_(67)_(STORM_SEWER)_1 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.99 0.00

```
  Pipe_-_(67)_(STORM_SEWER)_2    1.00   0.00  0.00  0.00  0.32  0.68  0.00  0.00
0.12  0.00
  Pipe_-_(71)_(STORM_SEWER)    1.00   0.00  0.00  0.00  0.37  0.63  0.00  0.00
0.86  0.00
  Pipe_-_(95)_(STORM_SEWER)    1.00   0.09  0.11  0.00  0.11  0.14  0.00  0.55
0.07  0.00
  SW01                    1.00   0.37  0.00  0.00  0.63  0.00  0.00  0.00  0.12
0.00
  SW01.1                  1.00   0.00  0.38  0.00  0.62  0.00  0.00  0.00  0.91
0.00
  SW02                    1.00   0.33  0.00  0.00  0.67  0.00  0.00  0.00  0.00
0.00
  SW02.1                  1.00   0.00  0.36  0.00  0.64  0.00  0.00  0.00  0.91
0.00


  ************************
  Conduit Surcharge Summary
  ************************

  ------------------------------------------------------------------------------
                                                              Hours        Hours
                          --------- Hours Full --------   Above Full   Capacity
  Conduit                 Both Ends  Upstream  Dnstream   Normal Flow   Limited
  ------------------------------------------------------------------------------
  C1                           0.24      0.24      0.37      0.01          0.01
  C2                           1.58      1.62      1.71      0.43          0.34
  C3                           1.71      1.71      1.79      0.01          0.01
  Pipe_-_(112)_(STORM_SEWER)        0.02      0.02      0.29      0.01
0.01
  Pipe_-_(114)_(STORM_SEWER)        0.24      0.24      0.44      0.01
0.01
  Pipe_-_(115)_(STORM_SEWER)        0.37      0.37      1.20      0.01
0.01
  Pipe_-_(116)_(STORM_SEWER)        0.22      0.22      0.81      0.01
0.01
  Pipe_-_(117)_(STORM_SEWER)        0.27      0.27      0.29      0.01
0.01
  Pipe_-_(20)_(STORM_SEWER)        0.30      0.30      0.30      0.01
0.01
  Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_1        0.30      0.30      0.32      0.01
0.01
  Pipe_-_(21)_(1)_(1)_(STORM_SEWER)_2        0.32      0.32      0.37      0.01
0.01
  Pipe_-_(22)_(1)_(STORM_SEWER)_1        0.37      0.37      0.39      0.01
0.01
  Pipe_-_(22)_(1)_(STORM_SEWER)_2        0.39      0.39      0.43      0.12
0.12
  Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_1        0.42      0.42      0.43      0.01
0.01
  Pipe_-_(23)_(1)_(1)_(STORM_SEWER)_2        0.43      0.43      0.43      0.40
0.38
  Pipe_-_(24)_(STORM_SEWER)        0.43      0.43      0.44      0.43
0.41
  Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_1        0.51      0.51      0.60      0.21
0.21
  Pipe_-_(25)_(1)_(1)_(STORM_SEWER)_2        0.60      0.60      1.01      0.27
0.27
  Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_1        1.01      1.01      1.08      0.33
0.33
  Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_3        1.07      1.08      1.62      0.38
0.36
  Pipe_-_(26)_(1)_(1)_(STORM_SEWER)_4        1.61      1.62      1.64      0.38
0.34
```

```
  Pipe_-_(27)_(STORM_SEWER)        1.38      1.38      1.62      0.01
0.01
  Pipe_-_(29)_(STORM_SEWER)_1        0.20      0.20      0.37      0.01
0.01
  Pipe_-_(29)_(STORM_SEWER)_2        0.40      0.40      0.48      0.01
0.01
  Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_2        0.58      0.58      0.66      0.10
0.09
  Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_3        0.48      0.48      0.49      0.01
0.01
  Pipe_-_(30)_(2)_(1)_(STORM_SEWER)_4        0.49      0.49      0.58      0.06
0.05
  Pipe_-_(31)_(STORM_SEWER)        0.21      0.21      0.84      0.01
0.01
  Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_1        0.88      0.88      0.89      0.01
0.01
  Pipe_-_(32)_(1)_(1)_(STORM_SEWER)_2        0.89      0.89      1.31      0.15
0.14
  Pipe_-_(34)_(STORM_SEWER)_1        0.30      0.30      0.35      0.01
0.01
  Pipe_-_(34)_(STORM_SEWER)_2        0.34      0.34      0.52      0.01
0.01
  Pipe_-_(35)_(1)_(STORM_SEWER)_1        0.54      0.54      0.61      0.01
0.01
  Pipe_-_(35)_(1)_(STORM_SEWER)_3        0.61      0.61      0.64      0.23
0.21
  Pipe_-_(35)_(1)_(STORM_SEWER)_4        0.64      0.64      0.67      0.32
0.30
  Pipe_-_(36)_(1)_(STORM_SEWER)_1        0.70      0.70      1.00      0.32
0.32
  Pipe_-_(36)_(1)_(STORM_SEWER)_2        1.00      1.00      1.29      0.39
0.39
  Pipe_-_(37)_(2)_(STORM_SEWER)_2        1.61      1.64      1.64      0.47
0.43
  Pipe_-_(37)_(2)_(STORM_SEWER)_3        1.09      1.09      1.14      0.21
0.21
  Pipe_-_(37)_(2)_(STORM_SEWER)_4        1.14      1.14      1.64      0.28
0.28
  Pipe_-_(64)_(STORM_SEWER)_1        0.42      0.42      0.57      0.01
0.01
  Pipe_-_(64)_(STORM_SEWER)_2        0.57      0.57      0.66      0.01
0.01
  Pipe_-_(65)_(STORM_SEWER)        0.36      0.36      0.41      0.01
0.01
  Pipe_-_(66)_(3)_(STORM_SEWER)_1        0.07      0.07      0.16      0.01
0.01
  Pipe_-_(66)_(3)_(STORM_SEWER)_2        0.16      0.16      0.17      0.01
0.01
  Pipe_-_(67)_(STORM_SEWER)_1        0.17      0.17      0.23      0.01
0.01
  Pipe_-_(67)_(STORM_SEWER)_2        0.23      0.23      0.30      0.02
0.01
  Pipe_-_(71)_(STORM_SEWER)        0.44      0.44      0.65      0.01
0.01
  Pipe_-_(95)_(STORM_SEWER)        0.29      0.29      0.65      0.01
0.01
  SW01.1                      0.01      0.01      2.47      0.01         0.01
  SW02.1                      0.01      0.01      2.47      0.01         0.01


  Analysis begun on:  Mon Jul 25 16:09:21 2022
  Analysis ended on:  Mon Jul 25 16:09:24 2022
  Total elapsed time: 00:00:03
```

APPENDIX

D

MODELED POND STORAGE CURVE

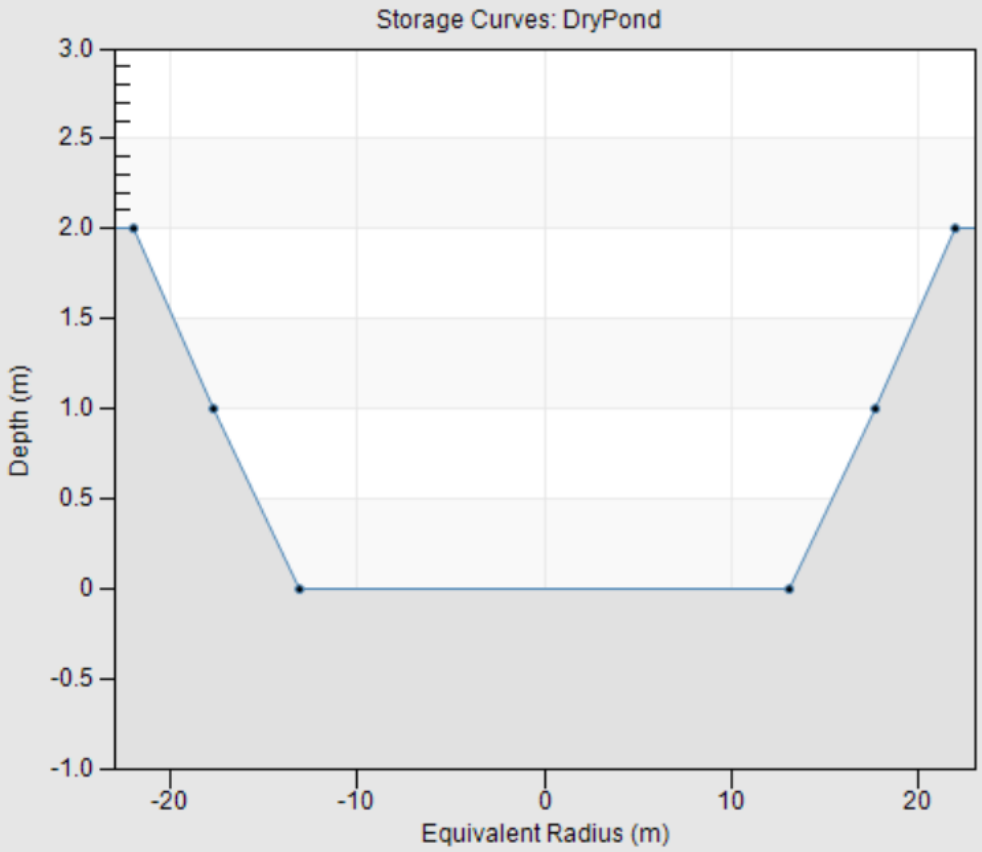
Name:

DryPond

Description:

Data:

	Depth (m)	Area (m^2)
1	0	543
2	1	980
3	2	1524
4		
5		
6		
7		
8		
9		
10		
11		
12		



APPENDIX

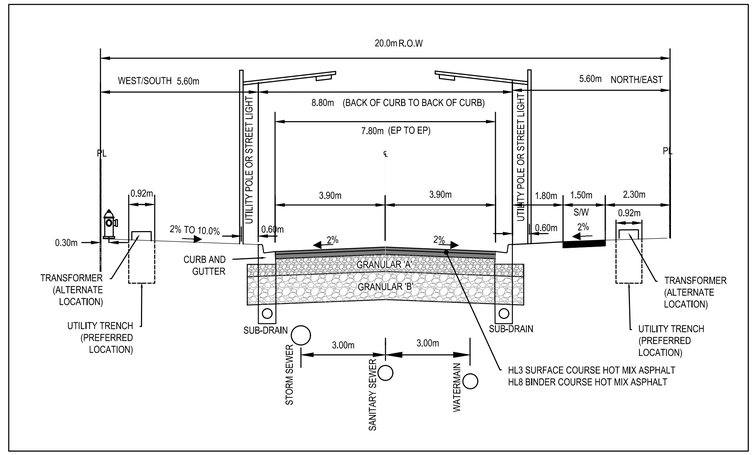
E CIVIL DRAWINGS

EXISTING LEGEND:

- EDGE OF PAVEMENT
- CURB
- BOTTOM OF SLOPE
- TOP OF SLOPE
- WATERMAIN
- STORM SEWER
- SANITARY SEWER
- UNDERGROUND UTILITY
- FENCE
- PROPERTY LINE
- SANITARY MANHOLE
- STORM MANHOLE
- CATCHBASIN
- FIRE HYDRANT
- WATERMAIN VALVE
- TRANSFORMER
- UTILITY POLE
- ROAD SIGN
- CULVERT
- ASPHALT ROAD
- CONCRETE SIDEWALK
- EXISTING GRADE

PROPOSED LEGEND:

- ALIGNMENT
- EDGE OF PAVEMENT
- BARRIER CURB
- WATERMAIN
- STORM SEWER
- SANITARY SEWER
- SWALE
- INFILTRATION TRENCH
- SUB-CATCHMENT BOUNDARY
- PROPERTY LINE
- BOTTOM OF SLOPE
- TOP OF SLOPE
- STORM MANHOLE
- CATCHBASIN
- SANITARY MANHOLE
- FIRE HYDRANT
- WATERMAIN VALVE
- CONCRETE SIDEWALK
- LOT GRADE
- ROAD GRADE
- FLOW ARROW



1 C1.1 WILSON AVENUE - TYPICAL SECTION
SCALE: 1:100

PRELIMINARY
NOT FOR CONSTRUCTION

REV.	DATE	DESCRIPTION	BY
2	2022-08-04	ISSUED AS DRAFT PLAN APPROVAL	SD
1	2022-07-25	ISSUED AS DRAFT FOR CLIENT REVIEW	SD

REVISION:

KEY PLAN:

SEAL:

ORIGINAL SCALE: 1:750
DESIGNED BY: JD
DRAWN BY: JT
APPROVED BY: ZP
DATE: 2022-06-09
IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.
25mm

DISCIPLINE: CIVIL

WSP CANADA INC.
1224 GARDINERS ROAD, SUITE 201
KINGSTON, ONTARIO
CANADA K7P 0G2
PHONE: 613-634-7373
WWW.WSP.COM

PROJECT NUMBER: 221-05962-00

CLIENT: ROMSPEN

CLIENT REF. #: --

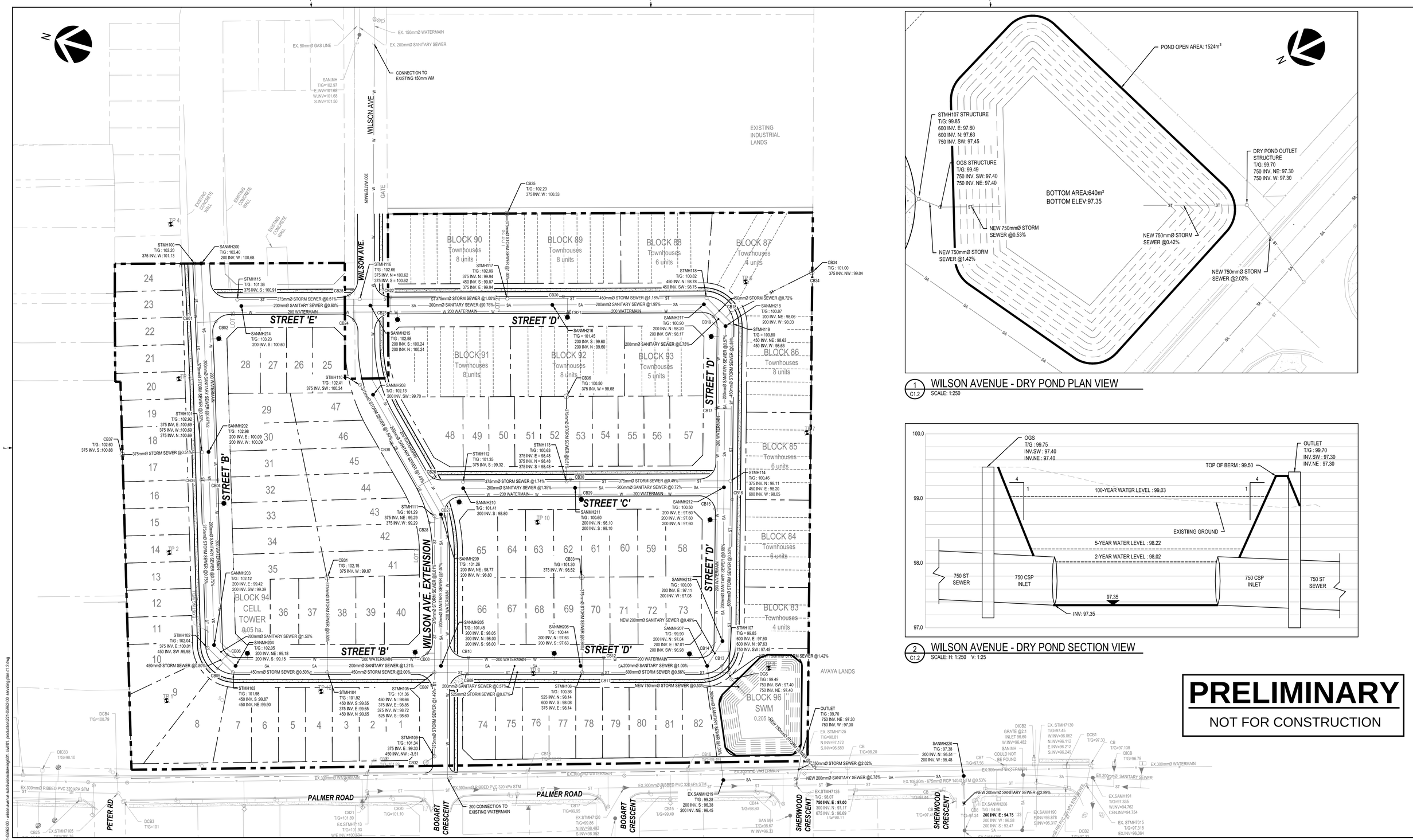
TITLE: PRELIMINARY GRADING PLAN

PROJECT: WILSON AVENUE SUBDIVISION

DRAWING NUMBER: C1.1

REV. 2

FILE: n:\2022\21-05962-00 - wilson avenue subdivision\drawings\01 civil\01 production\221-05962-00 grading plan c1.1.dwg
CTB: ---
PLOTTED: 2022-08-04 - 1:32 PM



1 C1.2 WILSON AVENUE - DRY POND PLAN VIEW
SCALE: 1:250

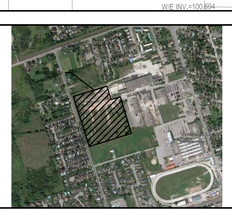
2 C1.2 WILSON AVENUE - DRY POND SECTION VIEW
SCALE: H: 1:250 V: 1:25

PRELIMINARY
NOT FOR CONSTRUCTION

FILE: m:\2022\221-05962-00 - wilson avenue subdivision\drawings\01 civil\01. production\221-05962-00 servicing plan c1.2.dwg
CTB: —
PLOTTED: 2022-08-04 - 2:07 PM

REVISION:			
2	2022-08-04	ISSUED AS DRAFT PLAN APPROVAL	SD
1	2022-07-25	ISSUED AS DRAFT FOR CLIENT REVIEW	SD
REV	DATE	DESCRIPTION	BY

KEY PLAN:



SEAL:

ORIGINAL SCALE: 1:750
DESIGNED BY: JD
DRAWN BY: JT
APPROVED BY: ZP
DATE: 2022-06-09
IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE. 25mm

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DISCIPLINE: CIVIL

WSP CANADA INC.
1224 GARDINERS ROAD, SUITE 201
KINGSTON, ONTARIO
CANADA K7P 0G2
PHONE: 613-634-7373
WWW.WSP.COM

PROJECT NUMBER: 221-05962-00

CLIENT: ROMSPEN

CLIENT REF. #: --

TITLE: PRELIMINARY SERVICING PLAN

PROJECT: WILSON AVENUE SUBDIVISION

DRAWING NUMBER: C1.2

REV.: 2

APPENDIX

F STORMCEPTOR DESIGN

Stormceptor®

FORTERRA

Stormceptor® EF Sizing Report

STORMCEPTOR®
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

07/21/2022

Province:	Ontario
City:	Belleville
Nearest Rainfall Station:	BELLEVILLE
Climate Station Id:	6150689
Years of Rainfall Data:	29

Site Name:	Wilson Ave.

Drainage Area (ha):	5.47
Runoff Coefficient 'c':	0.65

Particle Size Distribution:	Fine

Target TSS Removal (%):	80.0
Required Water Quality Runoff Volume Capture (%):	90.0

Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	

Project Name:	Wilson Ave.
Project Number:	-
Designer Name:	Brandon O'Leary
Designer Company:	Forterra
Designer Email:	brandon.oleary@forterrabp.com
Designer Phone:	905-630-0359
EOR Name:	Zhidong Pan
EOR Company:	WSP Canada Group Ltd.
EOR Email:	Zhidong.Pan@wsp.com
EOR Phone:	613-856-0366

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	46
EFO6	62
EFO8	73
EFO10	80
EFO12	85

Recommended Stormceptor EFO Model: EFO10

Estimated Net Annual Sediment (TSS) Load Reduction (%): 80

Water Quality Runoff Volume Capture (%): > 90

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THIRD-PARTY TESTING AND VERIFICATION

►**Stormceptor® EF and Stormceptor® EFO** are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

PERFORMANCE

►**Stormceptor® EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterways.

PARTICLE SIZE DISTRIBUTION (PSD)

►The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV ***Procedure for Laboratory Testing of Oil-Grit Separators*** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

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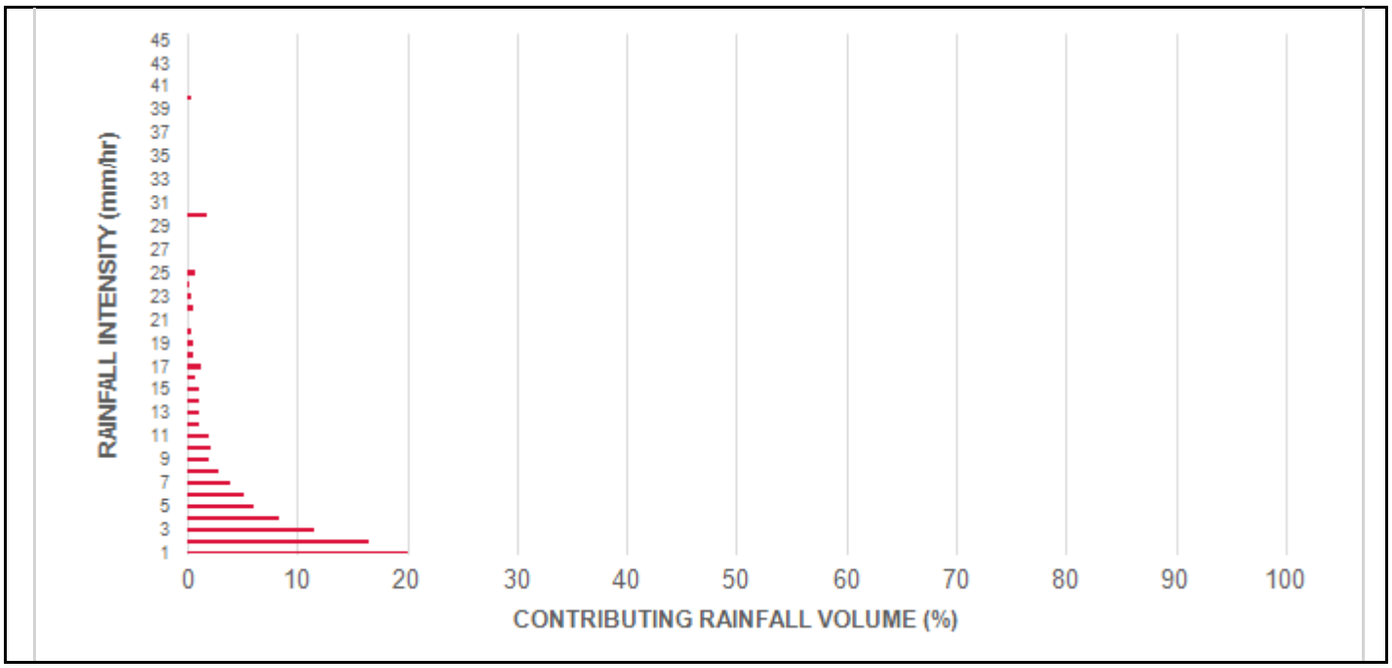
Stormceptor® EF Sizing Report

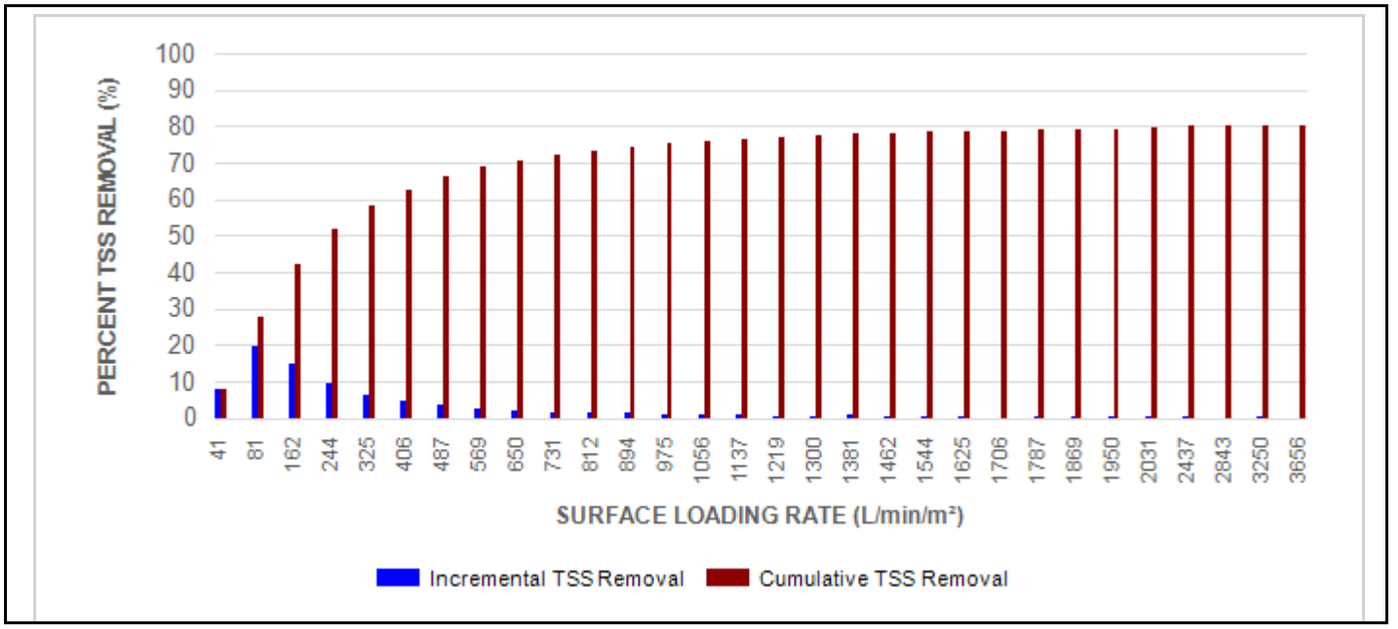
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.5	8.1	8.1	4.94	297.0	41.0	100	8.1	8.1
1	20.0	28.0	9.88	593.0	81.0	98	19.7	27.7
2	16.5	44.5	19.77	1186.0	162.0	88	14.6	42.3
3	11.6	56.2	29.65	1779.0	244.0	81	9.5	51.7
4	8.3	64.5	39.54	2372.0	325.0	78	6.4	58.2
5	6.1	70.6	49.42	2965.0	406.0	74	4.5	62.7
6	5.1	75.7	59.31	3558.0	487.0	70	3.6	66.2
7	3.9	79.6	69.19	4151.0	569.0	66	2.6	68.8
8	2.8	82.3	79.07	4744.0	650.0	64	1.8	70.6
9	2.0	84.3	88.96	5338.0	731.0	64	1.3	71.9
10	2.2	86.6	98.84	5931.0	812.0	63	1.4	73.3
11	1.9	88.5	108.73	6524.0	894.0	62	1.2	74.5
12	1.1	89.6	118.61	7117.0	975.0	62	0.7	75.2
13	1.1	90.7	128.50	7710.0	1056.0	60	0.7	75.9
14	1.1	91.8	138.38	8303.0	1137.0	59	0.6	76.5
15	1.0	92.8	148.26	8896.0	1219.0	57	0.6	77.1
16	0.7	93.5	158.15	9489.0	1300.0	55	0.4	77.4
17	1.2	94.7	168.03	10082.0	1381.0	53	0.6	78.1
18	0.5	95.2	177.92	10675.0	1462.0	50	0.3	78.3
19	0.6	95.8	187.80	11268.0	1544.0	48	0.3	78.6
20	0.4	96.2	197.69	11861.0	1625.0	45	0.2	78.8
21	0.0	96.2	207.57	12454.0	1706.0	43	0.0	78.8
22	0.5	96.7	217.45	13047.0	1787.0	41	0.2	79.0
23	0.3	97.0	227.34	13640.0	1869.0	39	0.1	79.1
24	0.2	97.2	237.22	14233.0	1950.0	38	0.1	79.2
25	0.7	97.9	247.11	14826.0	2031.0	36	0.3	79.4
30	1.8	99.7	296.53	17792.0	2437.0	30	0.5	80.0
35	0.0	99.7	345.95	20757.0	2843.0	26	0.0	80.0
40	0.3	100.0	395.37	23722.0	3250.0	23	0.1	80.1
45	0.0	100.0	444.79	26688.0	3656.0	20	0.0	80.1
Estimated Net Annual Sediment (TSS) Load Reduction =								**80 %**

Climate Station ID: 6150689 *Years of Rainfall Data*: 29

RAINFALL DATA FROM BELLEVILLE RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL
FOR THE RECOMMENDED STORMCEPTOR® MODEL



Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

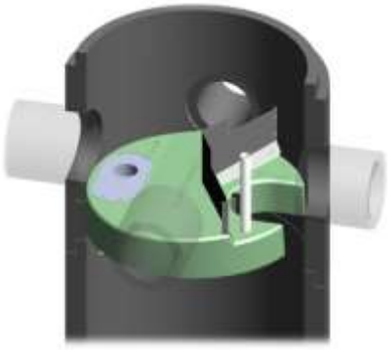
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

DESIGN FLEXIBILITY

►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

►While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, **Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.



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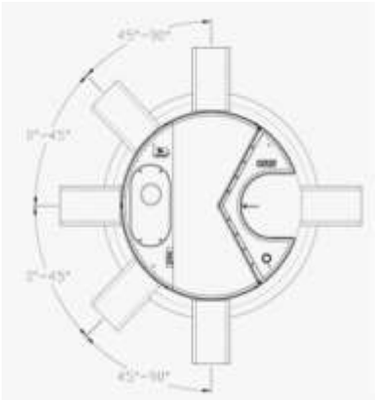

INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.
0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.
45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1. For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft^3)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity
** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft^3)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

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STANDARD PERFORMANCE SPECIFICATION FOR "OIL GRIT SEPARATOR" (OGS) STORMWATER QUALITY TREATMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit** S**eparators**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m^3 sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m^3 sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m^3 sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m^3 sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m^3 sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m^2 to 1400 L/min/m^2, and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m^2 and 1400 L/min/m^2 shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m^2 shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m^2. No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m^2.

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m^2 shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m^2, and shall be calculated using a simple proportioning formula, with 1400 L/min/m^2 in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m^2.

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in

accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators,** with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m^2 to 2600 L/min/m^2) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.** However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

STANDARD PERFORMANCE SPECIFICATION FOR "OIL GRIT SEPARATOR" (OGS) STORMWATER QUALITY TREAMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit Separators**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The **minimum** sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1

4ft (1219mm) Diameter OGS Units:	1.19m^3 sediment / 265L oil
6ft (1829mm) Diameter OGS Units:	3.48m^3 sediment / 609Ll oil
8ft (2438mm) Diameter OGS Units:	8.78m^3 sediment / 1,071L oil
10ft (3048mm) Diameter OGS Units:	17.78m^3 sediment / 1,673L oil
12ft (3657mm) Diameter OGS Units:	31.23m^3 sediment / 2,476L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality

treatment device shall remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing shall be determined using historical rainfall data and a sediment removal performance curve derived from the actual third-party verified laboratory testing data. The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**.

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**, with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m^2 to 2600 L/min/m^2) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**. However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.