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FUNCTIONAL SERVICING REPORT

AVANI HOMES DEVELOPMENT

CITY OF WINDSOR

ONTARIO

PROJECT NO.: 22-070

DATED: MAY 12, 2026

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1. INTRODUCTION

Baird AE Inc. has been retained to prepare this Functional Servicing Report in support of the proposed residential development located at the intersection of Richmond Street and St. Luke Road in the City of Windsor. The subject site is approximately 2.58 hectares in area and is surrounded by a mix of industrial, commercial, and residential land uses. It is bounded by Walker Road to the west, St. Luke Road to the east, Richmond Street to the north, and adjacent industrial/commercial lands to the south.

The proposed development consists of 75 residential units, including twelve four-unit residential buildings (48 units), one three-unit residential building (3 units), and twelve semi-detached residential buildings (24 units), along with internal roads, parking areas, landscaped open space, and a stormwater management facility.

This report outlines the proposed servicing strategy for the development, including stormwater management, sanitary servicing, and water supply. Erosion and sediment control measures to be implemented during construction are also described. The analysis and design presented herein have been completed in accordance with applicable City of Windsor standards, Essex Region Conservation Authority (ERCA) requirements, and the Windsor/Essex Region Stormwater Management Standards Manual (WERSM).



Figure 1: Existing Conditions

2. EXISTING CONDITIONS

2.1 Description of Study Area

The subject site currently consists primarily of grassed open space and will be redeveloped to accommodate the proposed residential development consisting of 75 units. The development will include a mix of semi-detached dwellings and low-rise multi-unit residential buildings. A total of 24 units are proposed to front onto St. Luke Road.

Based on soil mapping provided by ERCA, the site is underlain by Brookston Clay Loam, classified as Hydrologic Soil Group D. The infiltration parameters used in the PCSWMM model are summarized in Table 1.

Table 1: Infiltration Parameters

Attribute		Brookston Clay Loam (Group D)
Horton's Infiltration	Max. Infil. Rate (normal) (mm/hr)	75
	Min. Infil. Rate (mm/hr)	1
	Decay constant (1/hr)	4
	Drying Time (days)	7

2.2 Infrastructure

2.2.1 Storm Sewer

Existing municipal storm sewers are located along St. Luke Road and Richmond Street. A 1050 mm diameter storm sewer is present along St. Luke Road, while a 250 mm diameter storm sewer is located along Richmond Street.

These existing systems will receive stormwater runoff from the proposed development, subject to the applicable release rate restrictions outlined in Section 2.2.4.

2.2.2 Sanitary Sewer

An existing 525 mm diameter sanitary sewer is located along St. Luke Road. The proposed development will discharge sanitary flows to this system.

A capacity assessment of the existing sanitary sewer has been completed to confirm its ability to accommodate the proposed development flows.

2.2.3 Watermain

Existing municipal watermain are located along St. Luke Road, Richmond Street, and Walker Road. A 400 mm diameter watermain is present along each of these roadways, with existing fire hydrants located within proximity to the site.

These watermain will provide both domestic water supply and fire protection for the proposed development.

2.2.4 Allowable Release Rate

A storm sewer capacity analysis was completed for the study area to determine an appropriate allowable release rate for the proposed development. Based on this analysis, an allowable release rate of 26 L/s was established, which has been determined to be sufficient to service the site.

This release rate does not include the uncontrolled drainage area along St. Luke Road, which continues to discharge independently to the existing storm system.

Details of the existing sanitary, storm, and water servicing infrastructure within the surrounding area are provided in Appendix A.

3. PROPOSED DEVELOPMENT CONDITIONS

The proposed development consists of 75 residential units, internal roadways, parking areas, landscaped open space, and a stormwater management facility.

The site will be graded to direct runoff towards the proposed storm sewer system, which will convey flows to the stormwater management facility prior to discharge to the municipal storm sewer system. Overland flow routes will be maintained to safely convey excess runoff during major storm events. The following sections describe the proposed drainage, stormwater management strategy, and servicing approach for the development.



Figure 2: Proposed Development Site Plan

3.1 Drainage

The stormwater management system for the proposed development has been analyzed using PCSWMM to assess both hydrologic and hydraulic performance under minor and major storm events.

The site has been divided into multiple sub-catchments based on the proposed grading plan, with runoff directed to the storm sewer network and ultimately conveyed to the stormwater management facility. Sub-catchment parameters are summarized in Table 2.

Table 2: Sub-Catchment Parameters

Name	Area (ha)	Flow Length (m)	Imperv. (%)
A-1.1	0.4408	106	65
A-1.2	0.1077	85	20
A-2.1	0.0878	45	65
A-2.2	0.0845	32	65
A-2.3	0.0849	32	65
A-2.4	0.0843	61	65
A-2.5	0.0842	43	65
A-2.6	0.0846	64	65
A-2.7	0.0842	47	65
A-2.8	0.1073	50	65
A-2.9	0.0841	67	65
A-2.10	0.0842	43	65
A-2.11	0.0842	61	65
A-2.12	0.0842	60	65
A-2.13	0.0675	45	65
R-1	0.0723	100	80
R-2	0.1241	88	80
R-3	0.1144	88	80
R-4	0.0742	26	80

The model was developed using dynamic wave routing to simulate flow conditions within the storm sewer system and overland flow paths. The infiltration parameters applied in the model are summarized in Table 1.

The minor system has been designed to convey the 5-year storm event, while the major system conveys flows exceeding the minor system capacity through overland flow routes without causing damage to buildings or infrastructure.

3.2 Stormwater Management

The stormwater management system for the proposed development has been designed to control post-development runoff and limit discharge to the allowable release rate of 26 L/s, as established through the storm sewer capacity analysis for the study area.

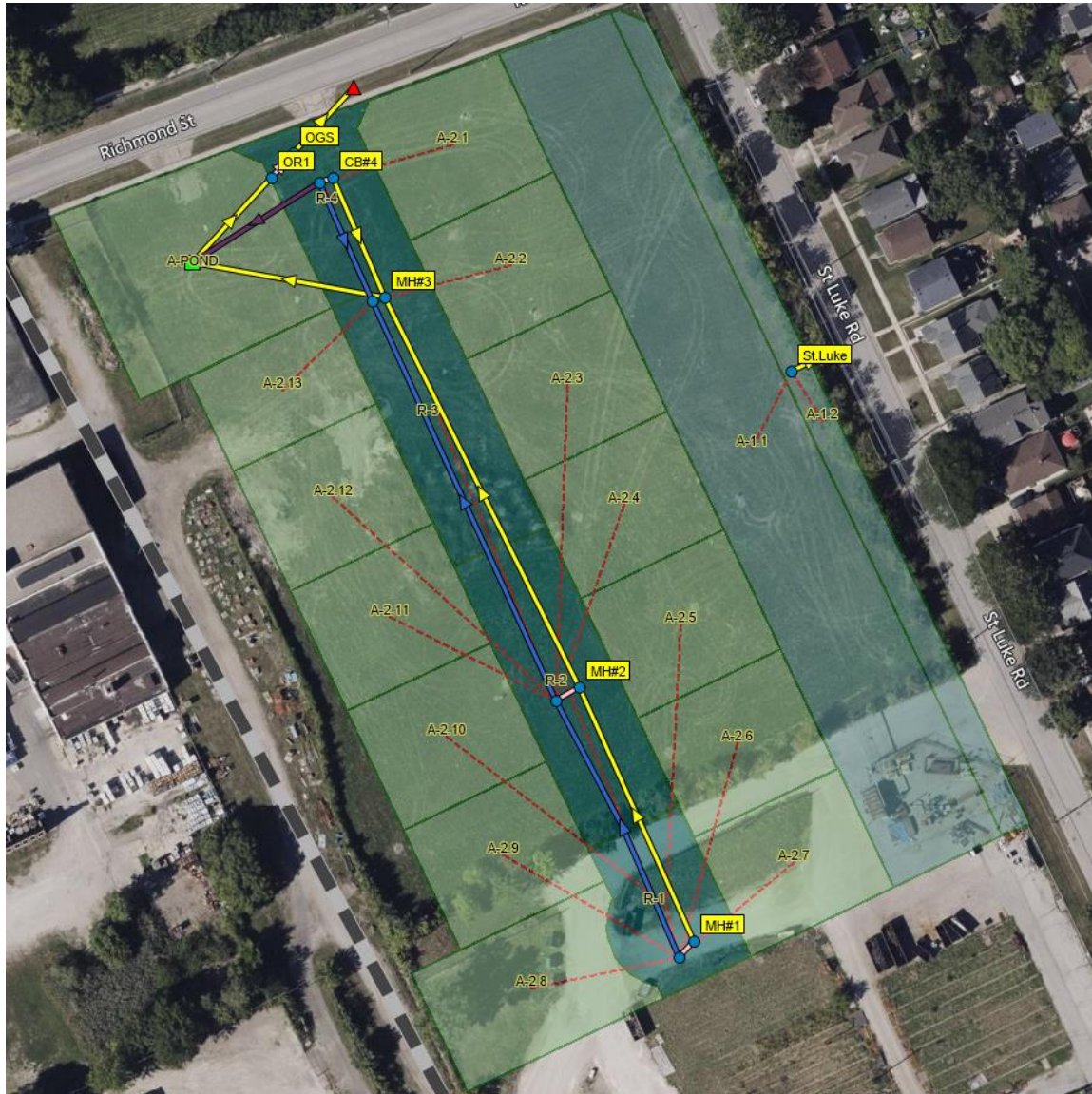


Figure 3: Site Schematic – PCSWMM

The system has been modeled using PCSWMM to evaluate performance under applicable design storm conditions. A schematic of the model setup is provided in Figure 3, with detailed model outputs and results included in Appendix E. Rainfall intensities used in the model are summarized in Table 3.

A 106 mm diameter orifice plate is proposed at the outlet of the stormwater system to regulate discharge and ensure that the allowable release rate is maintained under all design storm conditions.

Table 3: Rainfall Intensities Used for PCSWMM Modelling

Storm Event	Storm Duration	Rainfall Depth
Water Quality Test	4 hours	32.00 mm
Chicago 5-Yr	4 hours	49.50 mm
Chicago 100-Yr	4 hours	81.60 mm
SCS Type II 100-Yr	24 hours	108.00 mm
Urban Stress Test	24 hours	150.00 mm

Stormwater quantity control is achieved through a stormwater management facility, which provides temporary storage of runoff prior to controlled discharge to the municipal storm sewer system. Required storage volumes and corresponding outflow rates are summarized in Table 4.

Hydraulic grade line results for the minor and major storm events are summarized in Table 5 and Table 6, respectively. The results demonstrate that the system operates within acceptable limits, with no surcharging above rim elevation and no adverse impacts to the site or surrounding properties.

Table 4: Required Storage Volumes and Outflow

Stage (m)	Elevation (m)	Storm Events	Required Storage (m ³)	Outflow (L/s)
0.00	181.70	Bottom of the Pond		0.00
0.30	182.12	Water Quality Storm	111	12.60
0.55	182.36	5-Yr Chicago Storm	233	10.30
0.90	182.74	SCS II 100-Yr Storm	456	21.95
0.98	182.80	100-Yr Chicago Storm	513	13.78
1.21	183.03	Urban Stress Test	697	25.45
2.50	184.336	Top of the Pond		26.00

Table 5: Peak Water Surface Elevations – Minor Storms

Structure Name	Rim Elev. (m)	Water Quality Test Max. HGL (m)	Chicago 5-Yr Max. HGL (m)
MH#01	184.196	182.95	182.98
MH#02	183.880	182.53	182.58
MH#03	183.325	182.14	182.36

Table 6: Peak Water Surface Elevations – Major Storms

Structure Name	Rim Elev. (m)	Chicago 100-Yr Max. HGL (m)	SCS II 100-Yr Max. HGL (m)	Urban Stress Test Max. HGL (m)
MH#01	184.196	184.27	184.23	184.27
MH#02	183.880	183.96	183.91	183.96
MH#03	183.325	183.39	183.35	183.40

3.3 Sanitary Sewer

Sanitary servicing for the proposed development is provided via the existing 525 mm diameter sanitary sewer located along St. Luke Road.

The proposed development consists of 75 residential units. A population density of 3.5 persons per unit was applied, resulting in an estimated population of 263 persons. An average per capita flow rate of 420 L/cap/day was used to determine the average daily sanitary flow. An infiltration rate of 0.156 L/ha-s was applied to account for groundwater infiltration into the sanitary system.

A capacity assessment of the existing sanitary sewer was completed to evaluate its ability to accommodate flows from the proposed development. The analysis indicates that the existing sanitary sewer has sufficient capacity to service the development without surcharging. Detailed sanitary design calculations are provided in Appendix B.

3.4 Watermain

Water servicing for the proposed development will be provided through connections to the existing municipal watermain network located along St. Luke Road, Richmond Street, and Walker Road. Based on available municipal records, a 400 mm diameter watermain is present along these roadways.

A 150 mm diameter watermain is proposed within the development to provide both domestic water supply and fire protection. The internal watermain network will be connected to the existing municipal system. Fire hydrants will be provided within the development in accordance with municipal standards to ensure adequate fire protection coverage.

4. WATER QUALITY, EROSION AND SEDIMENT CONTROL

The proposed development will provide a “Normal” level of water quality protection. Water quality treatment will be achieved through the use of a Hydro First oil-grit separator (OGS) unit, model FD-3HC or equivalent, designed to achieve a minimum total suspended solids (TSS) removal efficiency of 72.2%. Shop drawings and specifications for the proposed unit will be provided in Appendix C.

Erosion and sediment control measures will be implemented during construction to minimize sediment transport and protect downstream stormwater infrastructure and receiving systems. The following measures will be incorporated:

- Installation of silt fencing prior to grading to prevent sediment migration to downstream areas through overland flow;
- Placement of filter fabric over all drainage grates to capture sediment-laden runoff;
- Stabilization of disturbed areas through re-vegetation or ground cover restoration as soon as practicable following construction activities.

These measures will minimize sediment transport, protect downstream water quality, and maintain compliance with applicable environmental standards. Detailed erosion and sediment control notes will be included in the engineering drawings at the detailed design stage.

5. CONCLUSION

This report demonstrates that the proposed servicing strategy for the development is feasible and can be accommodated by the existing municipal infrastructure.

Stormwater management system has been designed to control post-development runoff and limit discharge to the allowable release rate, while providing sufficient storage to manage minor and major storm events without adverse impacts to the site or surrounding properties.

Sanitary servicing has been assessed, and the existing system has sufficient capacity to accommodate flows from the proposed development.

Water servicing will be provided through connections to the existing municipal watermain network, ensuring adequate domestic supply and fire protection.

Water quality treatment will be achieved through the proposed OGS unit, and erosion and sediment control measures will be implemented during construction to protect downstream systems.

We trust that the information presented herein is satisfactory and will facilitate the review and approval of this report and the accompanying engineering drawings for the proposed development. Should you have any questions or require further information, please do not hesitate to contact the undersigned.

All of which is respectfully submitted.

Reviewed By:



Shurjeel Tunio, P.Eng.
Principal Engineer

Prepared By:

A handwritten signature in black ink, appearing to read "Melissa Reyes".

Melissa Reyes, B.Eng., E.I.T.
Civil Designer

APPENDIX A: Background Information

ERCA Public Internet Mapping



Essex Region
Conservation
Authority

Public Interactive Mapping

Legend

- Parcel Fabric - City
- Parcel Fabric - County

Essex Soils

- B-s
- B.L.
- Bc
- Bcl
- Bel
- Bes
- Bg
- Bg-s
- C-s
- Cac
- Cacl
- Cc
- Cdl
- Es
- Fl
- Fsl

Location



ERCA
Geomatics

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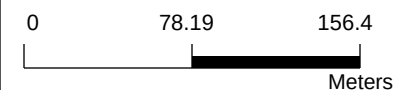
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Notes

Avani Homes Development



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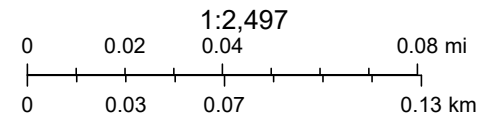
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ArcGIS Web Map

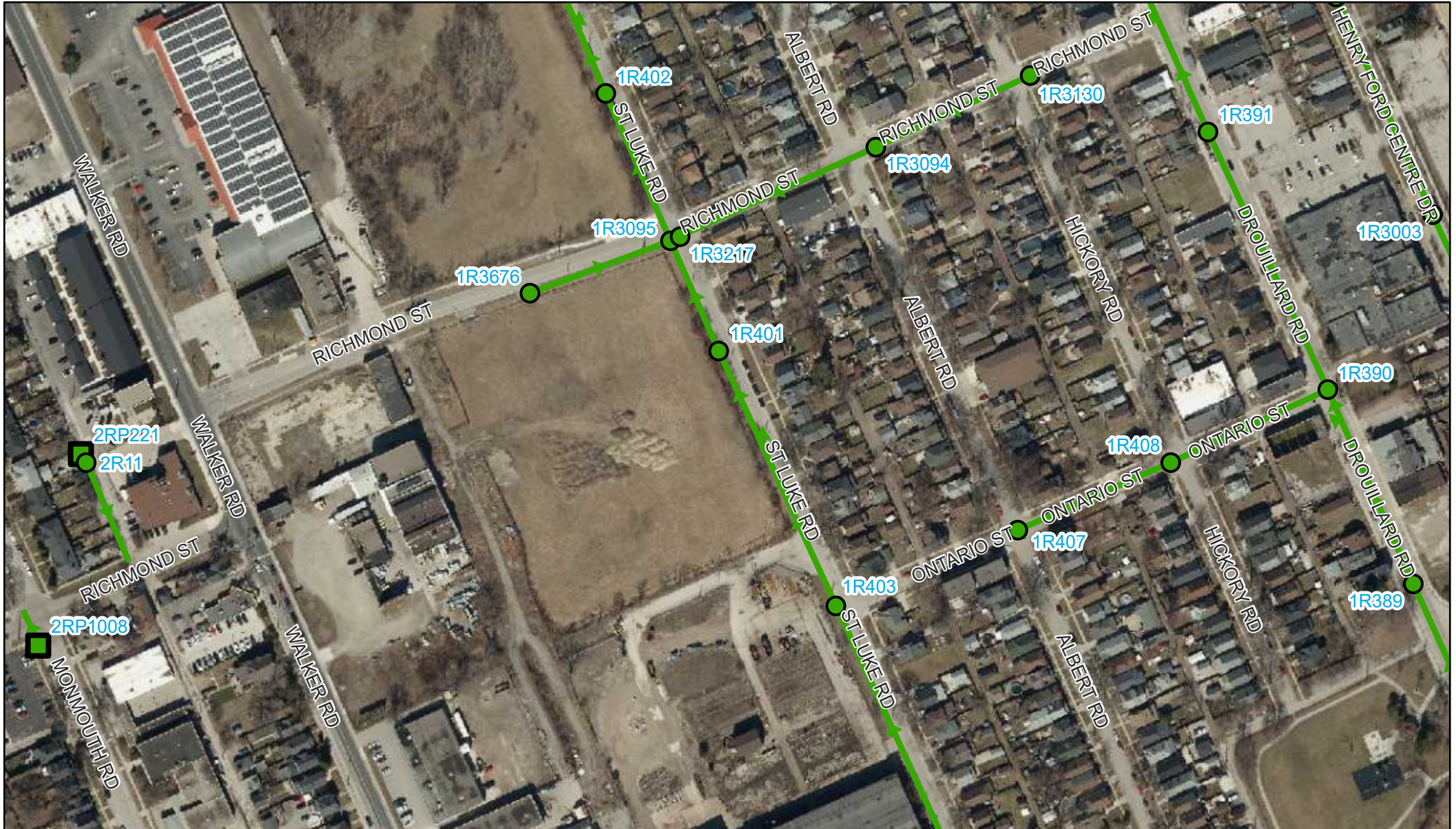


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- | | | | |
|---------------------------|------------------|--------------|--------------|
| ● Combined Sewer Manholes | Address Parcels | ParkPoint | CityBoundary |
| ■ Combined Plugs | CityBoundary | Parcel | CityBoundary |
| → Combined Sewers | EdgeofPavement | CityBoundary | |
| ● Dual Manholes | StreetCentreline | | |



ArcGIS Web Map

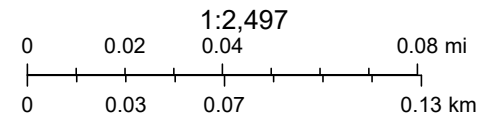


ArcGIS Web Map



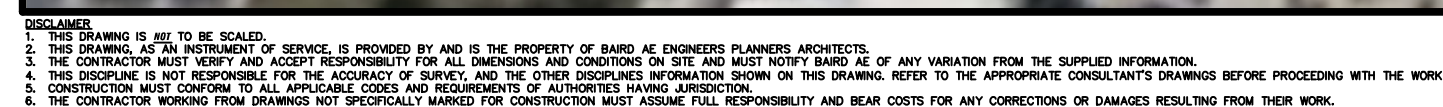
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|--|-------------------------|--|------------------|--|-------------------|--|---------------|
| | Sanitary Sewer Manholes | | Address Parcels | | Street Centreline | | City Boundary |
| | Sanitary Plugs | | City Boundary | | Park Point | | City Boundary |
| | Sanitary Sewers | | Edge of Pavement | | Parcel | | City Boundary |



APPENDIX B: Storm and Sanitary Design Sheets

AVANI HOMES DEVELOPMENT STORM SEWER DESIGN SHEET (5-YEAR EVENT, Computed Tc)																										
LOCATION			AREA (ha)			FLOW							SEWER DATA													
Proposed Area	From Node	To Node	Pavement / Hard Surface 0.90	Landscape 0.20	Total	Indiv 2.78 AC	Accum 5 2.78AC	Time of Conc.	Design Storm	Rainfall Intensity	Peak Flow (L/s)	Qtotall (L/s)*	Dia. (m) Actual	Dia. (mm)	Type	Slope (%)	Length (m)	Capacity (L/s)	Velocity (m/s)	Flow Time (min)	Ratio Q/Qfull					
St. Luke Road																										
A1	-	-	0.0906	0.0226	0.1132																					
A2	-	-	0.0144	0.2737	0.2881																					
R1	-	-	0.1992	0.0498	0.2490																					
	MH 1R 3220	MH 1R 3219	0.3042	0.3461	0.6503	0.95	0.95	15.00	5	88.40	84.29	84.29	0.375	375	PVC	0.26%	124.80	89.3	0.81	2.57	94%					
A4	-	-	0.2395	0.1027	0.3422																					
R2	-	-	0.1229	0.0527	0.1756																					
	MH 1R 3219	MH 1R 3218	0.3625	0.1553	0.5178	0.99	1.95	17.57	5	81.12	157.91	157.91	0.450	450	PVC	0.40%	125.70	180.2	1.13	1.85	88%					
A5	-	-	0.2821	0.1210	0.4031																					
R3	-	-	0.1606	0.0401	0.2007																					
	MH 1R 3218	1R 403	0.1920	0.0435	0.2355	0.50	2.45	19.42	5	76.64	187.86	187.86	0.450	450	PVC	0.86%	123.10	264.2	1.66	1.24	71%					
A6	-	-	0.2284	0.0979	0.3263																					
A3	-	-	3.8192	1.6368	5.4560																					
R3	-	-	0.1914	0.0479	0.2393																					
	1R 403	1R 401	4.2391	1.7826	6.0216	11.60	14.05	20.66	5	73.94	1,038.70	1,038.70	0.900	900	PVC	0.56%	132.89	1,354.0	2.13	1.04	77%					
A7	-	-	0.1980	0.0848	0.2828																					
A8.2	-	-	0.361	0.1549	0.5163																					
R5	-	-	0.4134	0.1033	0.5167																					
	1R 401	1R 3095	0.9727	0.3431	1.3158	2.62	16.67	21.70	5	71.82	1,197.40	1,197.40	1.050	1050	PVC	0.30%	62.10	1,504.9	1.74	0.60	80%					
Richmond Street																										
A8.1	-	-	1.125	0.4821	1.607	26.00																				
R6	-	-	0.2318	0.0579	0.2897																					
	1R 3676	1R 3095	0.2318	0.0579	0.2897	0.61	0.61	15.00	5	88.40	54.11	80.11	0.250	250	PVC	2.03%	71.49	84.6	1.72	0.69	95%					
A10	-	-	0.1226	0.0526	0.1752																					
A11	-	-	0.1406	0.0603	0.2009																					
R7	-	-	0.1234	0.0309	0.1543																					
	1R 3130	1R 3094	0.3867	0.1437	0.5304	1.05	1.05	15.00	5	88.40	92.59	92.59	0.375	375	PVC	0.34%	82.20	102.2	0.92	1.48	91%					
A12	-	-	0.1518	0.0650	0.2168																					
A13	-	-	0.1628	0.0698	0.2325																					
R8	-	-	0.0955	0.0409	0.1364																					
	1R 3094	1R 3095	0.4100	0.1757	0.5857	1.12	2.17	16.48	5	84.04	182.44	182.44	0.450	450	PVC	0.59%	101.90	218.8	1.38	1.23	83%					
St. Luke Road																										
A14	-	-	0.2455	0.1052	0.3507																					
R9	-	-	0.1405	0.0602	0.2007																					
	1R 3095	1R 402	0.3860	0.1654	0.5514	1.06	20.51	22.29	5	70.66	1,475.54	1,475.54	1.050	1050	PVC	0.34%	72.62	1,591.6	1.84	0.66	93%					
A15	-	-	0.2176	0.0933	0.3109																					
R10	-	-	0.1609	0.0402	0.2011																					
A16	-	-	0.9696	0.2424	1.2120																					
	1R 402	1R 491	1.3481	0.3759	1.7240	3.58	3.58	22.95	5	69.43	248.70	248.70	1.200	1200	PVC	0.15%	150.42	1,509.4	1.33	1.88	16%					
Q = 2.78 AIR, where Q = Peak Flow in Litres per second (L/s) A = Area in hectares (ha) I = Rainfall Intensity (mm/hr) R = Runoff Coefficient																	1) Windsor AES Rainfall-Intensity Curve 2) Min Pipe Velocity = 0.76 m/s 3) Max Pipe Velocity = 3.0 m/s 4) Minimum cover = 1.20 m I= A/(T+B)^C *Includes allowable release rates from proposed dev't			A= 1259 B= 8.80 C= 0.838			BAIRD AE architecture + engineering		Date: February 26, 2026	
																				Design By: Melissa Reyes, EIT						
																				Reviewed By: Shurjeel Tunio, P.Eng						
																				Project No.: 22-070						
																				Project Name: Avani Homes Development						
Note: Residential areas were assumed to be 70% hard surface and 30% landscape. Commercial and ROW were assumed to be 80% hard surface and 20% landscape																										



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BY: MR	☐ PRELIMINARY
BY: ST	☐ CONSTRUCTION
BY: ST	☐ RECORD

St Lukes & Richmond St Subdivision SANITARY SEWER DESIGN SHEET																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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RESIDENTIAL	50	People/Ha	AVERAGE DAILY PER CAPITA FLOW										420 L/cap/day																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
COMMERCIAL	74	People/Ha	PEAK EXTRANEIOUS FLOW										0.156 L/ha/s																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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INSTITUTIONAL	22	People/Ha	VELOCITY RANGE										0.75 m/s to 250 mm										3 m/s																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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APPENDIX C: Water Quality Unit

Hydro First Defense® - HC

Water Quality Flow Rate Worksheet

Rev. 12.5



Project Name: **Avani Homes**

Report Date: **24-04-2026**

Paste

Street: **1076 Walker Rd**

City: **Windsor**

Province: **Ontario**

Country: **CANADA**

Designer: **Melissa Reyes**

email: **mreyes@bairdae.ca**

Treatment Parameters:

Structure ID: **OGS- Unit**
 TSS Goal: **70 % Removal**
 TSS Particle Size: **Fine**
 Water Quality Flow: **26 L/s**
 Peak Storm Flow: **26 L/s**
 Peak Storm Return: **5 yrs**

RESULTS SUMMARY

Model	TSS
FD-3HC	72.2%
FD-4HC	78.1%
FD-5HC	80.9%
FD-6HC	82.6%
FD-8HC	84.2%
FD-10HC	84.9%

Performance Statement:

The Hydro International stormwater treatment system, model FD-3HC, achieves the water quality objective of 72.2% TSS using Fine particle size distribution, providing continuous treatment positive removal for the water quality flow of 26 L/s.

Model Specification:

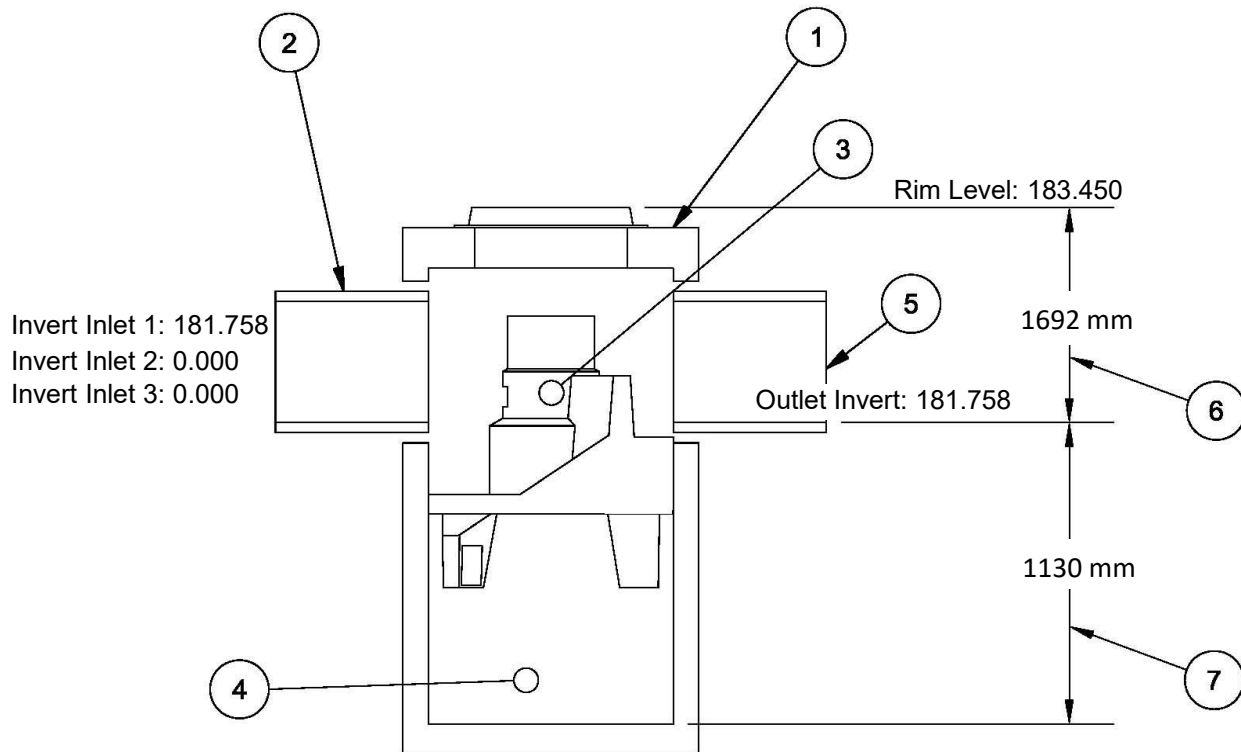
Selected Model: **FD-3HC**
 Diameter: **900 mm**
 Design WQ Flow: **26.00 L/s**
 Peak Flow Capacity: **425.00 L/s**
 Sediment Storage: **0.31 m³**
 Oil Storage: **473.00 L**

Installation Configuration:

Placement: **Online**
 Outlet Pipe Size: **300 mm** OK
 Inlet Pipe 1 Size: **300 mm** OK
 Inlet Pipe 2 Size: **mm** OK
 Inlet Pipe 3 Size: **mm** OK

Rim Level: **183.450 m** **Calc Invs.**
 Outlet Pipe Invert: **181.758 m** OK
 Invert Pipe 1: **181.758 m** OK
 Invert Pipe 2: **m** Inlet below outlet will reduce treatment capacity
 Invert Pipe 3: **m** Inlet below outlet will reduce treatment capacity

Designer Notes:

**FD-3HC Specification**

1	Vortex Chamber Diameter	900 mm
2	Inlet Pipe Diameter	300 mm
3	Oil Storage Capacity	473 L
4	Min. Provided Sediment Storage Capacity	0.31 m ³
5	Outlet Pipe Diameter	300 mm
6	Rim to Invert	1692 mm
7	Invert to Sump	1130 mm
Total Depth		2822 mm

All drawing elevations are metres.

Designer Notes:

APPENDIX D: Civil Drawing Set

RICHMOND & ST. LUKE SUBDIVISION

0 RICHMOND STREET, CITY OF WINDSOR, ON

General Notes

- 1) Owner and BairdAE do not guarantee the accuracy of the utilities shown on the drawings. Other utilities may be present or the utilities shown may differ in location shown. The Contractor assumes full responsibility to contact the various utility companies and to repair any damage he may cause to these utilities or to other third parties. The Contractor agrees to indemnify the Owner and BairdAE against any claims which may arise from his/her actions.
- 2) All work shall be done in accordance with the Standards and Specifications of The City of Windsor. Where no such standards or specifications exist, the Ontario Provincial Standards and Specifications will govern.
- 3) The following is a partial list of abbreviations found in these drawings:

OPSS

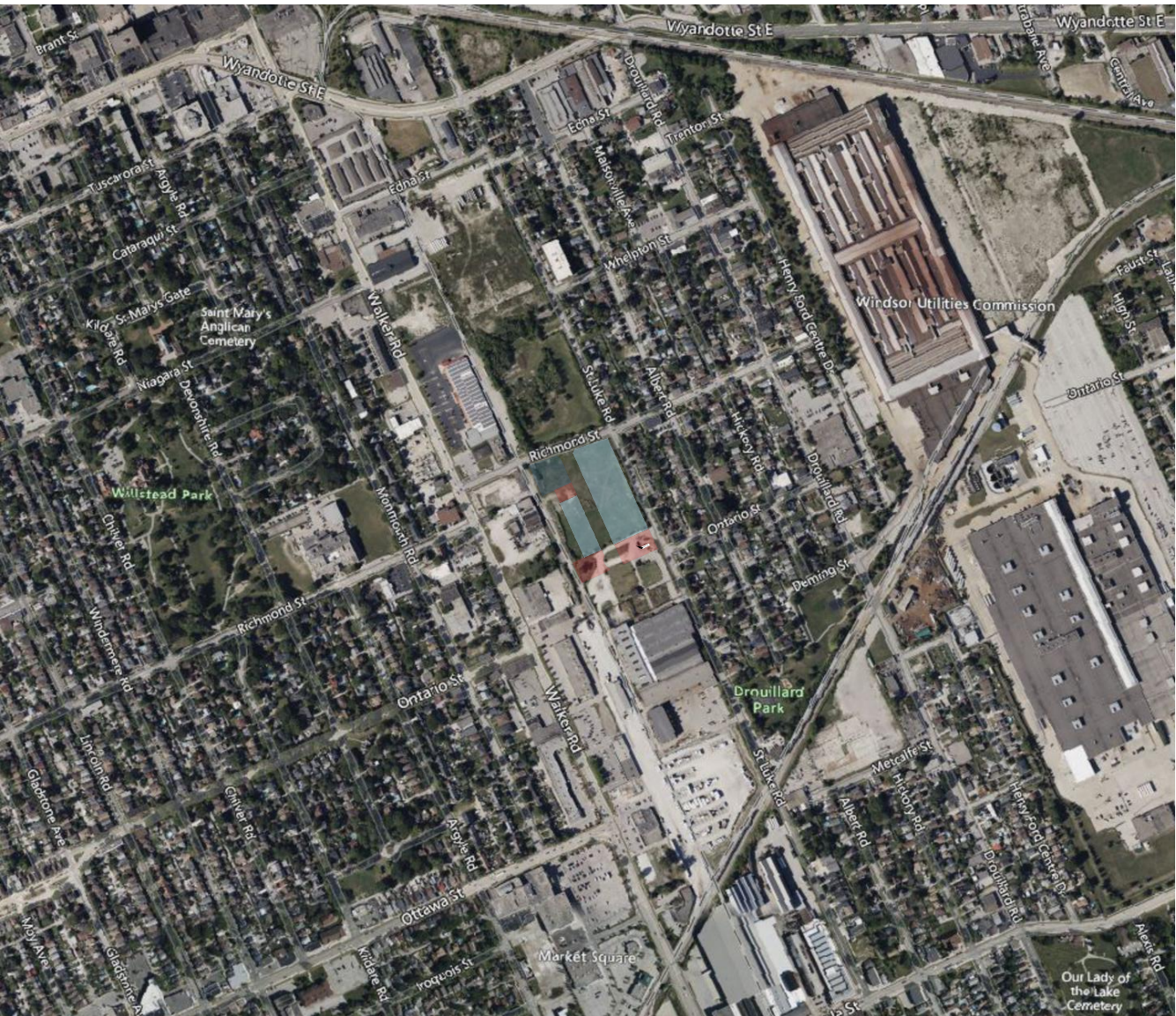
Ontario Provincial Standard Specification

OPSD

Ontario Provincial Standard Drawing

MECP

Ministry of the Environment Conservation & Parks (Ontario)



KEY PLAN
SCALE = 1:10,000

SHEET	TITLE
00	COVER SHEET
01	DRAFT PLAN OF SUBDIVISION
02	CONCEPT PLAN OF SUBDIVISION
03	CONCEPTUAL PHASING PLAN
04	GRADING PLAN
05	OVERLAND FLOW ROUTE
06	SERVICING PLAN
07	STORM DRAINAGE AREAS
08	SANITARY DRAINAGE AREAS

DRAFT PLAN OF SUBDIVISION
OF PART OF
PART OF LOTS 96 & 97, CONCESSION 1,
GEOGRAPHIC TOWNSHIP OF SANDWICH EAST
NOW IN THE
CITY OF WINDSOR
COUNTY OF ESSEX, ONTARIO

- ADDITIONAL INFORMATION IN ACCORDANCE WITH SECTION 51(17) OF THE PLANNING ACT
- | | |
|--|---|
| A) BOUNDARIES OF THE LANDS PROPOSED TO BE SUBDIVIDED: AS SHOWN ON DRAFT PLAN | G) NATURAL AND ARTIFICIAL FEATURES: AS SHOWN ON DRAFT PLAN |
| B) HIGHWAYS: AS SHOWN ON DRAFT PLAN | H) AVAILABILITY AND NATURE OF DOMESTIC WATER SUPPLIES: MUNICIPAL WATER SUPPLY AVAILABLE |
| C) KEY PLAN: AS SHOWN ON DRAFT PLAN | I) SOIL TYPE: BROOKSTON CLAY LOAM |
| D) PROPOSED USES: THE LAND IS TO BE USED ACCORDING TO SCHEDULE OF LAND USE | J) POROSITY: POOR |
| E) EXISTING USES OF ADJOINING LAND: AS SHOWN ON DRAFT PLAN | K) EXISTING CONTOURS: AS SHOWN ON DRAFT PLAN |
| F) APPROXIMATE DIMENSIONS AND LAYOUT THE PROPOSED LOTS: AS SHOWN ON DRAFT PLAN | L) MUNICIPAL SERVICES AVAILABLE OR TO BE AVAILABLE: ALL MUNICIPAL SERVICES AVAILABLE, INCLUDING SANITARY SERVICES |
| F1) AFFORDABLE HOUSING: NONE PROPOSED | L) RESTRICTIONS AFFECTING THE LAND: AS SHOWN |

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

Andrew Mantha
ONTARIO LAND SURVEYOR
ANDREW MANTHA, OLS
VERHAEGEN LAND SURVEYORS

May 12th, 2026
DATE

OWNER'S CERTIFICATE
I AUTHORIZE BAIRD AE INC. & PILLON ABBS INC. TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION FOR APPROVAL.

Pawan Khichi
I HAVE THE AUTHORITY TO BIND THE CORPORATION
PAWAN KHICHI,
14493559 CANADA INC.

May 12, 2026
DATE

BAIRD | AE
architecture + engineering

info@bairdae.ca
www.bairdae.ca
Local 519-326-6161
Toll Free 1-844-942-9188

PARTNER / CONSULTANTS



REVISIONS

Date	Revision
MAY 12, 2026	REVISED LOT LAYOUT
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DATE:	AUG 01, 2025
SCALE:	1:500
DRAWN BY: J.H.	☒ PRELIMINARY
CHECKED BY: B.P.	☐ CONSTRUCTION
APPROVED BY: B.P.	☐ RECORD

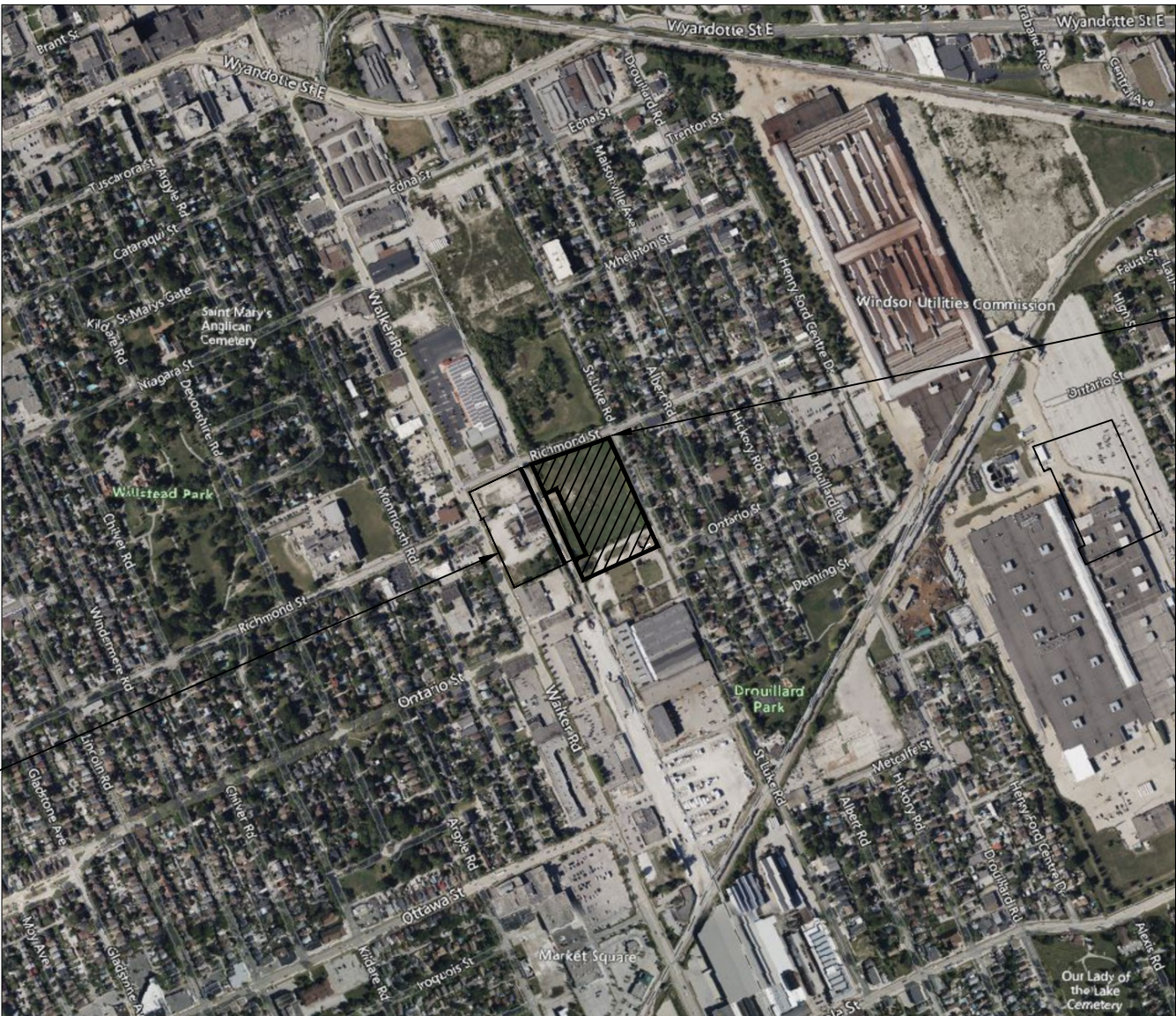
PROJECT TITLE
RICHMOND & ST. LUKE SUBDIVISION
0 RICHMOND STREET, CITY OF WINDSOR, ON
SHEET TITLE
DRAFT PLAN OF SUBDIVISION

JOB NUMBER
22-070

01



SCHEDULE OF LAND USE				
BLOCKS	LAND USE	UNITS	AREA (m²)	PERCENTAGE AREA
1	CORNER CUT-OFF	0	10.52	0.21%
2 - 13	SEMI-DETACHED RESIDENTIAL	24	5,024.29	23.27
14 - 20, 23 - 27	TOWNHOUSE (4-UNIT) RESIDENTIAL	48	10,383.99	48.09
22	TOWNHOUSE (3-UNIT) RESIDENTIAL	3	672.00	3.11
21	STORMWATER MANAGEMENT	0	1,637.26	7.58
28, 29, 30	ROAD RESERVES	0	22.00	0.10%
	STREET A	0	3,855.02	17.85%
TOTAL		75	21,594.56	100.00



KEY PLAN
SCALE = 1:10,000

LEGEND			
PROPOSED PROPERTY LINES	———	ELEVATION CONTOURS	———
FUTURE LOT LINES (SUBJECT TO PAR LOT CONTROL)	----	EXISTING PROPERTY LINES	----
EXISTING BUILDING	////	PROPOSED LOT WIDTHS (WHEN NOT PARALLEL SIDE LOT LINES)	



ZONING PROVISION				
	LAND USE			
	SEMI-DETACHED UNIT (RD 2.5)	SEMI-DETACHED UNIT (PROVIDED)	TOWNHOUSE UNIT (RD 2.5)	TOWNHOUSE UNIT (PROVIDED)
LOT AREA MIN.	450-630 m²	534.27 m²	190 m²	192 m²
LOT WIDTH	15.0 m (MIN) /18.0 m (MAX)	15.8 m	20.0 m (MIN)	26.40 m
FRONT YARD DEPTH MIN.	6.0 m/7.0 m	6.0 m	6.0 m/7.0 m	7.0 m
INTERIOR SIDE YARD WIDTH MIN.	1.2 m	1.2 m	1.2 m	1.2 m
REAR YARD DEPTH MIN.	7.5 m	7.5 m	7.5 m	7.5 m
LOT COVERAGE MAX.	50%	50%	50%	50%
LANDSCAPED OPEN SPACE MIN.	N/A	N/A	N/A	N/A

[illegible]

DATE:	AUG 01, 2025	
SCALE:	1:500	
DRAWN BY: J.H.	☒	PRELIMINARY
CHECKED BY: B.P.	☐	CONSTRUCTION
APPROVED BY: B.P.	☐	RECORD

RICHMOND & ST. LUKE SUBDIVISION

0 RICHMOND STREET, CITY OF WINDSOR, ON

SHEET TITLE

CONCEPT PLAN OF SUBDIVISION

DB NUMBER 22-070

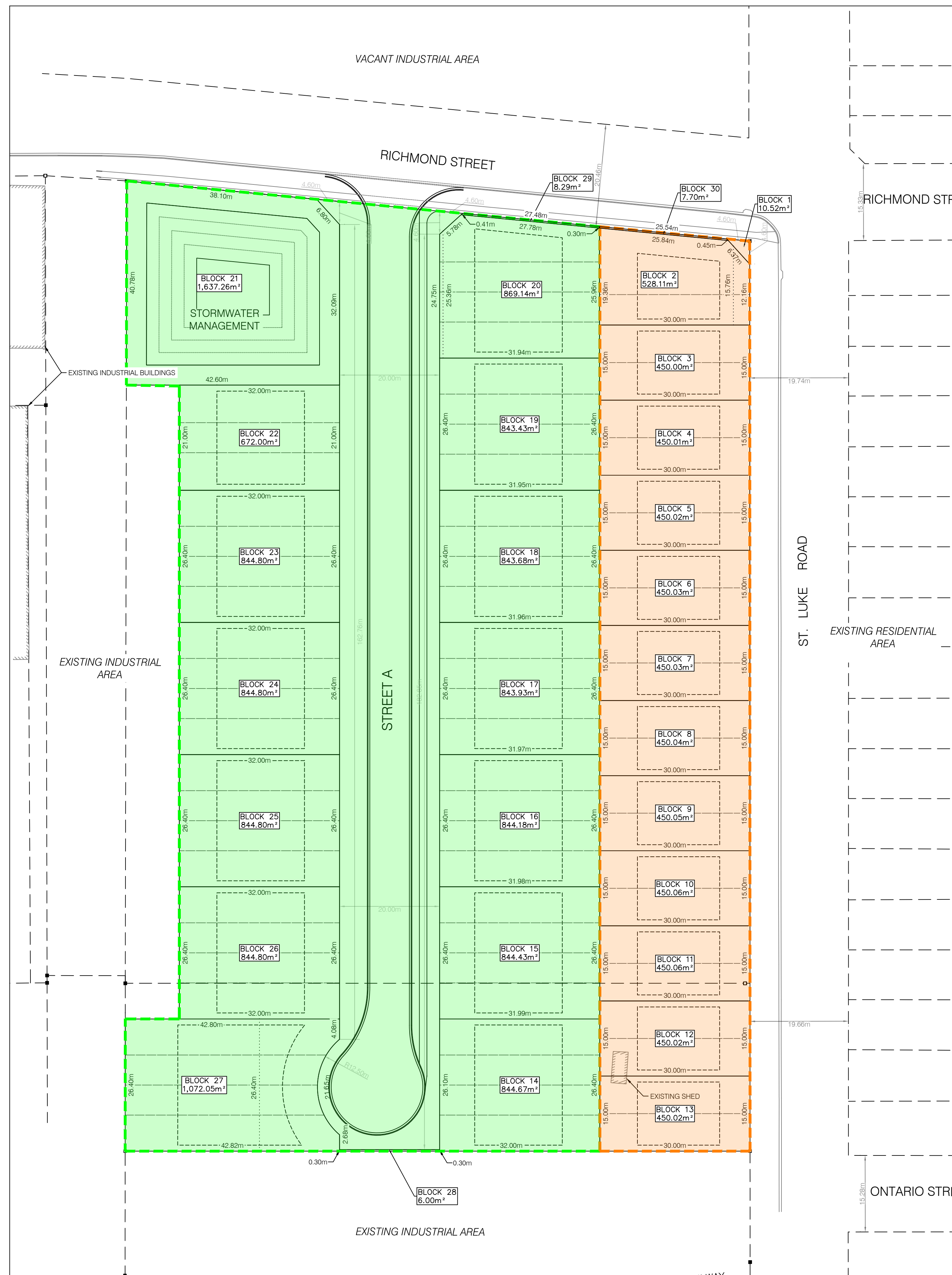
02

DISCLAIMER

1. THIS DRAWING IS NOT TO BE SCALED.
2. THIS DRAWING, AS AN INSTRUMENT OF SERVICE, IS PROVIDED BY AND IS THE PROPERTY OF BAIRD & ENGINEERS PLANNERS ARCHITECTS.
3. THE CONTRACTOR MUST VERIFY AND ACCEPT RESPONSIBILITY FOR ALL DIMENSIONS AND CONDITIONS ON SITE AND MUST NOTIFY BAIRD AE OF ANY VARIATION FROM THE SUPPLIED INFORMATION.
4. THIS DISCLAIMER IS NOT RESPONSIBLE FOR THE ACCURACY OF SURVEY, AND THE OTHER DISCLOSES INFORMATION SHOWN ON THIS DRAWING. REFER TO THE APPROPRIATE CONSULTANTS' DRAWINGS BEFORE PROCEEDING WITH THE WORK.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL APPLICABLE CODES AND REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.
6. THE CONTRACTOR WORKING FROM DRAWINGS NOT SPECIFICALLY MARKED FOR CONSTRUCTION MUST ASSUME FULL RESPONSIBILITY AND BEAR COSTS FOR ANY CORRECTIONS OR DAMAGES RESULTING FROM THEIR WORK.

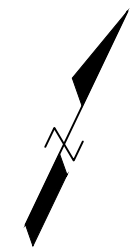
PHASING LEGEND		SEM-DETACHED DWELLING	TOWNHOUSE DWELLINGS	UNITS
PHASE-1		12	0	24
PHASE-2		0	13	51
TOTAL		12	13	75

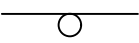
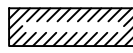
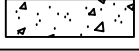
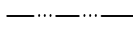
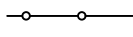
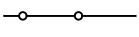
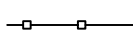
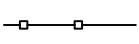
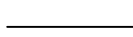
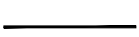
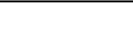
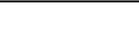
CONTAINED WITHIN PHASE - LEGEND	
PHASE-1	SEMI-DETACHED DWELLINGS, ROAD RESERVE
PHASE-2	TOWNHOUSE DWELLINGS, SWM BLOCK (POND), ROAD RESERVE BLOCK, R.O.W. BLOCK

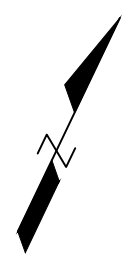
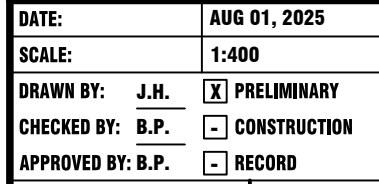




DATE:	AUG 01, 2025	
SCALE:	1:400	
DRAWN BY: J.H.	☒	PRELIMINARY
CHECKED BY: B.P.	☐	CONSTRUCTION
APPROVED BY: B.P.	☐	RECORD



LEGEND		
EXISTING	ITEM	PROPOSED
N/A	NUMBERED PARKING SPACES	
	PARKING/ROAD SIGN	
N/A	ACCESSIBLE SPACE SYMBOL	
	FIRE HYDRANT	
	WATER VALVE	
	BUILDING ENTRANCE	
	BUILDING	
	LANDSCAPE OPEN SPACE	
	SIDEWALK/CONCRETE	
N/A	FIRE ROUTE	
	TREE	
	BUSH	
	HYDRO TRANSFORMER BOX	
	CANADA POST MAILBOX	
	TELECOMMUNICATIONS BOX	
	LIGHT POLE (LP)	
	HYDRO POLE (HP)	
	HYDRO CABLE	
	STORM MANHOLE	
	STORM MAIN	
	SANITARY MANHOLE	
	STORM MAIN	
	WATERMAIN	
	CATCH BASIN	
	BLACK IRON FENCE	
	CHAINLINK FENCE	
	WOODEN BOARD FENCE	
	PROPERTY LINE	

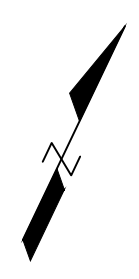
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22-070

SHEET NUMBER

06





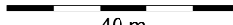
APPENDIX E: Post-Development – PCSWMM Modelling Results



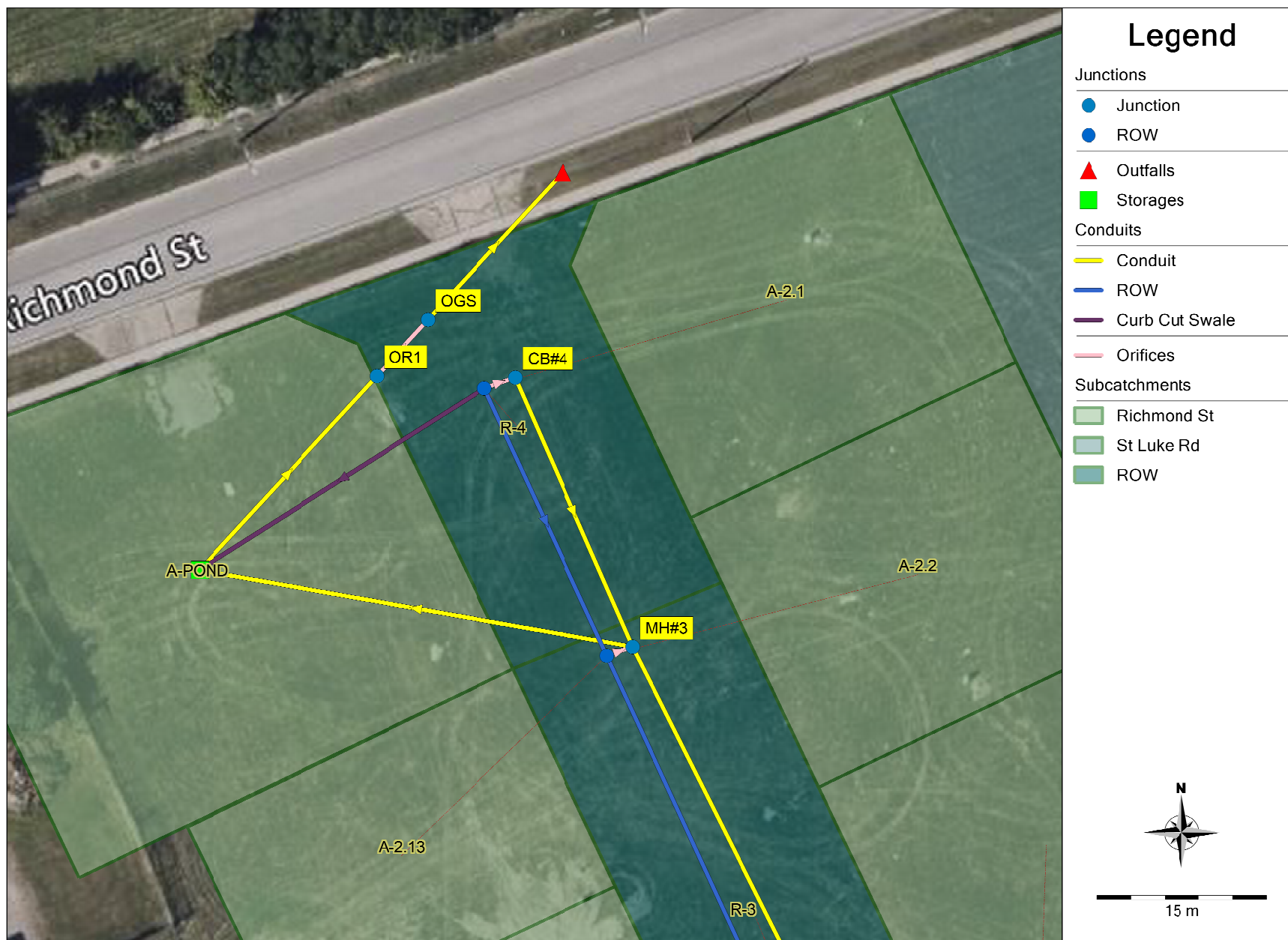
Legend

Junctions	
●	Junction
●	ROW
Conduits	
—	Conduit
—	ROW
—	Curb Cut Swale
—	Orifices
Subcatchments	
	Richmond St
	St Luke Rd
	ROW





 40 m



STORM EVENTS - INPUT VALUES

```
[TITLE]
;;Project Title/Notes

[OPTIONS]
;;Option      Value
FLOW_UNITS    LPS
INFILTRATION  HORTON
FLOW_ROUTING   DYNWAVE
LINK_OFFSETS   ELEVATION
MIN_SLOPE      0
ALLOW_PONDING  YES
SKIP_STEADY_STATE NO

START_DATE     03/26/2024
START_TIME     00:00:00
REPORT_START_DATE 03/26/2024
REPORT_START_TIME 00:00:00
END_DATE       03/28/2024
END_TIME       00:00:00
SWEEP_START    01/01
SWEEP_END      12/31
DRY_DAYS       0
REPORT_STEP    00:01:00
WET_STEP       00:01:00
DRY_STEP       00:01:00
ROUTING_STEP   5
RULE_STEP      00:00:00

INERTIAL_DAMPING FULL
NORMAL_FLOW_LIMITED BOTH
FORCE_MAIN_EQUATION H-W
VARIABLE_STEP    0.75
LENGTHENING_STEP 300
MIN_SURFAREA     0
MAX_TRIALS       8
HEAD_TOLERANCE   0.0015
SYS_FLOW_TOL     5
LAT_FLOW_TOL     5
MINIMUM_STEP     0.5
THREADS          4

[EVAPORATION]
;;Data Source  Parameters
;;-----
CONSTANT       0.0
DRY_ONLY       NO

[RAINGAGES]
;;Name      Format      Interval SCF      Source
;;-----
Raingage     INTENSITY 0:15      1.0      TIMESERIES UrbanStressTest-UST15mins

[SUBCATCHMENTS]
;;Name      Rain Gage      Outlet      Area      %Imperv  Width      %
Slope      CurbLen      SnowPack
;;-----
A-1.1      Raingage      St.Luke      0.4408    65      41.585    0.5
```


A-1.2 0	Raingage	St.Luke	0.1077	20	12.671	0.5
A-2.1 0	Raingage	OV#5	0.0878	65	19.511	0.5
A-2.10 0	Raingage	R-1	0.0842	65	19.581	0.5
A-2.11 0	Raingage	OV#2	0.0842	65	13.803	0.5
A-2.12 0	Raingage	OV#2	0.0842	65	14.033	0.5
A-2.13 0	Raingage	OV#4	0.0675	65	15	0.5
A-2.2 0	Raingage	OV#4	0.0845	65	26.406	0.5
A-2.3 0	Raingage	OV#2	0.0849	65	26.531	0.5
A-2.4 0	Raingage	OV#2	0.0843	65	13.82	0.5
A-2.5 0	Raingage	R-1	0.0842	65	19.581	0.5
A-2.6 0	Raingage	OV#1	0.0846	65	13.219	0.5
A-2.7 0	Raingage	OV#1	0.0842	65	17.915	0.5
A-2.8 0	Raingage	OV#1	0.1073	65	21.46	0.5
A-2.9 0	Raingage	OV#1	0.0841	65	12.552	0.5
A-POND 0	Raingage	Pond	0.1635	25	10.9	0.5
R-1 0	Raingage	OV#1	0.0723	80	7.23	0.5
R-2 0	Raingage	OV#1	0.1241	80	14.102	0.5
R-3 0	Raingage	OV#2	0.1144	80	13	0.5
R-4 0	Raingage	OV#5	0.0742	80	28.538	0.5

[SUBAREAS]

;;Subcatchment PctRouted ;;-----	N-Imperv	N-Perv	S-Imperv	S-Perv	PctZero	RouteTo
A-1.1	0.013	0.15	2.5	7.5	65	OUTLET
A-1.2	0.013	0.15	2.5	7.5	65	OUTLET
A-2.1	0.013	0.15	2.5	7.5	60	OUTLET
A-2.10	0.013	0.15	2.5	7.5	60	OUTLET
A-2.11	0.013	0.15	2.5	7.5	60	OUTLET
A-2.12	0.013	0.15	2.5	7.5	60	OUTLET
A-2.13	0.013	0.15	2.5	7.5	65	OUTLET
A-2.2	0.013	0.15	2.5	7.5	60	OUTLET
A-2.3	0.013	0.15	2.5	7.5	60	OUTLET
A-2.4	0.013	0.15	2.5	7.5	60	OUTLET
A-2.5	0.013	0.15	2.5	7.5	60	OUTLET
A-2.6	0.013	0.15	2.5	7.5	65	OUTLET
A-2.7	0.013	0.15	2.5	7.5	60	OUTLET
A-2.8	0.013	0.15	2.5	7.5	60	OUTLET
A-2.9	0.013	0.15	2.5	7.5	60	OUTLET

A-POND	0.013	0.15	2.5	7.5	0	OUTLET
R-1	0.013	0.15	2.5	7.5	65	OUTLET
R-2	0.013	0.15	2.5	7.5	65	OUTLET
R-3	0.013	0.15	2.5	7.5	65	OUTLET
R-4	0.013	0.15	2.5	7.5	65	OUTLET

[INFILTRATION]

;;Subcatchment	Param1	Param2	Param3	Param4	Param5
;;-----	-----	-----	-----	-----	-----
A-1.1	75	1	4	7	0
A-1.2	75	1	4	7	0
A-2.1	75	1	4	7	0
A-2.10	75	1	4	7	0
A-2.11	75	1	4	7	0
A-2.12	75	1	4	7	0
A-2.13	76	12.7	4	7	0
A-2.2	75	1	4	7	0
A-2.3	75	1	4	7	0
A-2.4	75	1	4	7	0
A-2.5	75	1	4	7	0
A-2.6	76	12.7	4	7	0
A-2.7	75	1	4	7	0
A-2.8	75	1	4	7	0
A-2.9	75	1	4	7	0
A-POND	75	1	4	7	0
R-1	75	1	4	7	0
R-2	75	1	4	7	0
R-3	75	1	4	7	0
R-4	75	1	4	7	0

[JUNCTIONS]

;;Name	Elevation	MaxDepth	InitDepth	SurDepth	Aponded
;;-----	-----	-----	-----	-----	-----
CB#4	181.943	1.146	0	0.301	0
MH#1	182.821	1.375	0	0.3	0
MH#2	182.337	1.543	0	0.3	0
MH#3	181.867	1.458	0	0.3	0
OGS	181.758	1.692	0	0	0
OR1	181.758	1.692	0	0.1	0
OV#1	184.196	0.32	0	0	0
OV#2	183.88	0.31	0	0	0
OV#4	183.325	0.33	0	0	0
OV#5	183.089	0.32	0	0.3	0
St.Luke	178.135	2.25	0	0	0

[OUTFALLS]

;;Name	Elevation	Type	Stage Data	Gated	Route To
;;-----	-----	-----	-----	-----	-----
Outlet1	181.7	FIXED	181.85	NO	
Outlet2	178.068	FREE		NO	

[STORAGE]

;;Name	Elev.	MaxDepth	InitDepth	Shape	Curve Name/Params
SurDepth Fevap	Psi	Ksat	IMD		
;;-----	-----	-----	-----	-----	-----
Pond	181.816	2.5	0	TABULAR	POND
0	0				


```

[CONDUITS]
;;Name      From Node      To Node      Length      Roughness      InOffset
OutOffset  InitFlow      MaxFlow
;;-----
Curb.Cut      OV#5      Pond      5      0.013      183.279
181.816      0      0
Outlet2      St.Luke      Outlet2      9.397      0.013      178.135
178.068      0      0
P1      MH#1      MH#2      55.48      0.013      182.821
182.337      0      0
P2      MH#2      MH#3      87.12      0.013      182.337
181.867      0      0
P3      CB#4      MH#3      18.98      0.013      181.943
181.867      0      0
P4      MH#3      Pond      25.97      0.013      181.867
181.816      0      0
P5      Pond      OR1      10.65      0.013      181.816
181.758      0      0
P6      OGS      Outlet1      8      0.013      181.758
181.7      0      0
R-1.1      OV#1      OV#2      56.752      0.013      184.196
183.88      0      0
R-1.2      OV#2      OV#4      78.32      0.013      183.88
183.325      0      0
R-1.3      OV#5      OV#4      25.34      0.013      183.089
183.325      0      0

```

```

[ORIFICES]
;;Name      From Node      To Node      Type      Offset      Qcoeff
Gated      CloseTime
;;-----
OR#1      OR1      OGS      SIDE      181.758      0.61
NO      0
OR#2      OV#5      CB#4      BOTTOM      183.089      0.61
NO      0
OR#3      OV#4      MH#3      BOTTOM      183.325      0.61
NO      0
OR#4      OV#2      MH#2      BOTTOM      183.88      0.61
NO      0
OR#5      OV#1      MH#1      BOTTOM      184.196      0.61
NO      0

```

```

[XSECTIONS]
;;Link      Shape      Geom1      Geom2      Geom3      Geom4
Barrels      Culvert
;;-----
Curb.Cut      TRAPEZOIDAL      0.1      15      6      6      1
Outlet2      CIRCULAR      0.375      1      1      1      1
P1      CIRCULAR      0.375      1      1      1      1
P2      CIRCULAR      0.45      1      1      1      1
P3      CIRCULAR      0.3      1      1      1      1
P4      CIRCULAR      0.6      1      1      1      1
P5      CIRCULAR      0.3      1      1      1      1
P6      CIRCULAR      0.3      1      1      1      1
R-1.1      IRREGULAR      Road_Section

```

R-1.2	IRREGULAR	Road_Section			
R-1.3	IRREGULAR	Road_Section			
OR#1	CIRCULAR	0.106	0	0	0
OR#2	CIRCULAR	0.8	0	0	0
OR#3	CIRCULAR	0.8	0	0	0
OR#4	CIRCULAR	0.8	0	0	0
OR#5	CIRCULAR	0.8	0	0	0

[STREETS]

;;Name		Tcrown	Hcurb	Sx	nRoad	a	W	Sides
Tback	Sback	nBack						
;;-----								

Street-CS		4.5	0.15	2	0.013	0	0.15	2
3	0.15							5.1

[TRANSECTS]

;;Transect Data in HEC-2 format

;

NC	0.24	0.24	0.013					
X1	Road_Section	10	5.15	14.5	0.0	0.0	0.0	0.0
0.0								
GR	180.985	0	180.835	5	180.835	5.15	180.685	5.15
10								180.772
GR	180.685	14.5	180.835	14.5	180.835	14.5	180.835	14.65
20								180.985

[LOSSES]

;;Link	Kentry	Kexit	Kavg	Flap Gate	Seepage
;;-----					

[CURVES]

;;Name	Type	X-Value	Y-Value
;;-----			
POND	Storage	0	298
POND		0.5	530
POND		1	751
POND		1.8	1061

;26 L/s

POND2	Storage	0	24
POND2		0.6	188
POND2		1.2	284
POND2		1.8	523
POND2		2.5	892

;26L/s

;2m

POND3	Storage	0	135
POND3		0.5	285
POND3		1	480
POND3		1.5	715
POND3		1.81	995

Roadway	Storage	0	1.8
Roadway		0.1	350
Roadway		0.15	550
Roadway		0.3	1100


```

[TIMESERIES]
;;Name          Date          Time          Value
;;-----
100yearSCS-2hr          0:00          0
100yearSCS-2hr          2:00          1.08
100yearSCS-2hr          4:00          1.62
100yearSCS-2hr          6:00          1.62
100yearSCS-2hr          8:00          2.16
100yearSCS-2hr          10:00         3.24
100yearSCS-2hr          12:00         25.92
100yearSCS-2hr          14:00          8.64
100yearSCS-2hr          16:00          3.24
100yearSCS-2hr          18:00          2.16
100yearSCS-2hr          20:00          1.62
100yearSCS-2hr          22:00          1.62
100yearSCS-2hr          24:00          1.08

100yrChicago-15mins     0:00          3.95
100yrChicago-15mins     0:15          4.87
100yrChicago-15mins     0:30          6.36
100yrChicago-15mins     0:45          9.19
100yrChicago-15mins     1:00          16.45
100yrChicago-15mins     1:15          46.45
100yrChicago-15mins     1:30          143.67
100yrChicago-15mins     1:45          32.45
100yrChicago-15mins     2:00          17.25
100yrChicago-15mins     2:15          11.53
100yrChicago-15mins     2:30          8.62
100yrChicago-15mins     2:45          6.87
100yrChicago-15mins     3:00          5.71
100yrChicago-15mins     3:15          4.89
100yrChicago-15mins     3:30          4.28
100yrChicago-15mins     3:45          3.81
100yrChicago-15mins     4:00          0

;2 Year Chicago 20mins
2yearChicago            0:00          2.16
2yearChicago            0:20          2.81
2yearChicago            0:40          4.15
2yearChicago            1:00          8.62
2yearChicago            1:20          57.62
2yearChicago            1:40          15.07
2yearChicago            2:00          7.19
2yearChicago            2:20          4.68
2yearChicago            2:40          3.51
2yearChicago            3:00          2.83
2yearChicago            3:20          2.38
2yearChicago            3:40          2.06
2yearChicago            4:00          0

5YearSCS-30mins         0:00          2.86
5YearSCS-30mins         0:30          4.84
5YearSCS-30mins         1:00          13.11
5YearSCS-30mins         1:30          58.69
5YearSCS-30mins         2:00          8.6
5YearSCS-30mins         2:30          4.82

```

5YearSCS-30mins	3:00	3.39
5YearSCS-30mins	3:30	2.64
5YearSCS-30mins	4:00	0

chicago5yr	0:00	2.58
chicago5yr	0:15	3.13
chicago5yr	0:30	4.02
chicago5yr	0:45	5.66
chicago5yr	1:00	9.76
chicago5yr	1:15	26.72
chicago5yr	1:30	88.40
chicago5yr	1:45	18.73
chicago5yr	2:00	10.21
chicago5yr	2:15	6.99
chicago5yr	2:30	5.33
chicago5yr	2:45	4.31
chicago5yr	3:00	3.64
chicago5yr	3:15	3.15
chicago5yr	3:30	2.78
chicago5yr	3:45	2.49
chicago5yr	4:00	0

UrbanStressTest-UST15mins	0:00	2.41
UrbanStressTest-UST15mins	0:15	2.43
UrbanStressTest-UST15mins	0:30	2.45
UrbanStressTest-UST15mins	0:45	2.46
UrbanStressTest-UST15mins	1:00	2.48
UrbanStressTest-UST15mins	1:15	2.51
UrbanStressTest-UST15mins	1:30	2.53
UrbanStressTest-UST15mins	1:45	2.55
UrbanStressTest-UST15mins	2:00	2.58
UrbanStressTest-UST15mins	2:15	2.61
UrbanStressTest-UST15mins	2:30	2.64
UrbanStressTest-UST15mins	2:45	2.67
UrbanStressTest-UST15mins	3:00	2.71
UrbanStressTest-UST15mins	3:15	2.74
UrbanStressTest-UST15mins	3:30	2.79
UrbanStressTest-UST15mins	3:45	2.83
UrbanStressTest-UST15mins	4:00	2.88
UrbanStressTest-UST15mins	4:15	2.94
UrbanStressTest-UST15mins	4:30	3.00
UrbanStressTest-UST15mins	4:45	3.07
UrbanStressTest-UST15mins	5:00	3.15
UrbanStressTest-UST15mins	5:15	3.23
UrbanStressTest-UST15mins	5:30	3.33
UrbanStressTest-UST15mins	5:45	3.45
UrbanStressTest-UST15mins	6:00	3.59
UrbanStressTest-UST15mins	6:15	3.75
UrbanStressTest-UST15mins	6:30	3.94
UrbanStressTest-UST15mins	6:45	4.18
UrbanStressTest-UST15mins	7:00	4.49
UrbanStressTest-UST15mins	7:15	4.89
UrbanStressTest-UST15mins	7:30	5.43
UrbanStressTest-UST15mins	7:45	6.20
UrbanStressTest-UST15mins	8:00	7.41
UrbanStressTest-UST15mins	8:15	9.56
UrbanStressTest-UST15mins	8:30	14.29

UrbanStressTest-UST15mins	8:45	32.01
UrbanStressTest-UST15mins	9:00	145.13
UrbanStressTest-UST15mins	9:15	48.51
UrbanStressTest-UST15mins	9:30	23.13
UrbanStressTest-UST15mins	9:45	15.08
UrbanStressTest-UST15mins	10:00	11.35
UrbanStressTest-UST15mins	10:15	9.23
UrbanStressTest-UST15mins	10:30	7.88
UrbanStressTest-UST15mins	10:45	6.94
UrbanStressTest-UST15mins	11:00	6.25
UrbanStressTest-UST15mins	11:15	5.73
UrbanStressTest-UST15mins	11:30	5.32
UrbanStressTest-UST15mins	11:45	4.99
UrbanStressTest-UST15mins	12:00	4.72
UrbanStressTest-UST15mins	12:15	4.49
UrbanStressTest-UST15mins	12:30	4.29
UrbanStressTest-UST15mins	12:45	4.12
UrbanStressTest-UST15mins	13:00	3.98
UrbanStressTest-UST15mins	13:15	3.85
UrbanStressTest-UST15mins	13:30	3.74
UrbanStressTest-UST15mins	13:45	3.63
UrbanStressTest-UST15mins	14:00	3.54
UrbanStressTest-UST15mins	14:15	3.46
UrbanStressTest-UST15mins	14:30	3.39
UrbanStressTest-UST15mins	14:45	3.32
UrbanStressTest-UST15mins	15:00	3.26
UrbanStressTest-UST15mins	15:15	3.20
UrbanStressTest-UST15mins	15:30	3.15
UrbanStressTest-UST15mins	15:45	3.10
UrbanStressTest-UST15mins	16:00	3.05
UrbanStressTest-UST15mins	16:15	3.01
UrbanStressTest-UST15mins	16:30	2.97
UrbanStressTest-UST15mins	16:45	2.93
UrbanStressTest-UST15mins	17:00	2.90
UrbanStressTest-UST15mins	17:15	2.87
UrbanStressTest-UST15mins	17:30	2.84
UrbanStressTest-UST15mins	17:45	2.81
UrbanStressTest-UST15mins	18:00	2.78
UrbanStressTest-UST15mins	18:15	2.76
UrbanStressTest-UST15mins	18:30	2.73
UrbanStressTest-UST15mins	18:45	2.71
UrbanStressTest-UST15mins	19:00	2.69
UrbanStressTest-UST15mins	19:15	2.67
UrbanStressTest-UST15mins	19:30	2.65
UrbanStressTest-UST15mins	19:45	2.63
UrbanStressTest-UST15mins	20:00	2.61
UrbanStressTest-UST15mins	20:15	2.59
UrbanStressTest-UST15mins	20:30	2.57
UrbanStressTest-UST15mins	20:45	2.56
UrbanStressTest-UST15mins	21:00	2.54
UrbanStressTest-UST15mins	21:15	2.53
UrbanStressTest-UST15mins	21:30	2.51
UrbanStressTest-UST15mins	21:45	2.50
UrbanStressTest-UST15mins	22:00	2.49
UrbanStressTest-UST15mins	22:15	2.47
UrbanStressTest-UST15mins	22:30	2.46
UrbanStressTest-UST15mins	22:45	2.45

UrbanStressTest-UST15mins	23:00	2.44
UrbanStressTest-UST15mins	23:15	2.43
UrbanStressTest-UST15mins	23:30	2.42
UrbanStressTest-UST15mins	23:45	2.41
UrbanStressTest-UST15mins	24:00	0.00

WQ	0:00	1.78
WQ	0:15	2.13
WQ	0:30	2.70
WQ	0:45	3.72
WQ	1:00	6.21
WQ	1:15	16.41
WQ	1:30	57.83
WQ	1:45	11.58
WQ	2:00	6.48
WQ	2:15	4.53
WQ	2:30	3.51
WQ	2:45	2.88
WQ	3:00	2.45
WQ	3:15	2.14
WQ	3:30	1.91
WQ	3:45	1.72
WQ	4:00	0

[REPORT]

```
;;Reporting Options
INPUT      YES
CONTROLS   YES
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL
```

[TAGS]

Subcatch	A-1.1	Luke
Subcatch	A-1.2	Luke
Subcatch	A-2.1	Residential
Subcatch	A-2.10	Residential
Subcatch	A-2.11	Residential
Subcatch	A-2.12	Residential
Subcatch	A-2.13	Residential
Subcatch	A-2.2	Residential
Subcatch	A-2.3	Residential
Subcatch	A-2.4	Residential
Subcatch	A-2.5	Residential
Subcatch	A-2.6	Residential
Subcatch	A-2.7	Residential
Subcatch	A-2.8	Residential
Subcatch	A-2.9	Residential
Subcatch	A-POND	Pond
Subcatch	R-1	row
Subcatch	R-2	row
Subcatch	R-3	row
Subcatch	R-4	row
Node	OGS	Orifice
Node	OV#1	Road
Node	OV#2	Road
Node	OV#4	Road

Node	OV#5	Road
Link	Curb.Cut	Curb_Cut_Swale
Link	R-1.1	Road
Link	R-1.2	Road
Link	R-1.3	Road

[MAP]

DIMENSIONS	334900.90095	4686894.2792	335113.26805	4687131.1048
UNITS	Meters			

[COORDINATES]

;;Node	X-Coord	Y-Coord
;;-----	-----	-----
CB#4	334966.89	4687088.026
MH#1	335035.693	4686934.209
MH#2	335013.946	4686985.246
MH#3	334976.698	4687063.995
OGS	334959.267	4687093.302
OR1	334954.585	4687088.436
OV#1	335032.601	4686930.975
OV#2	335009.255	4686982.637
OV#4	334974.41	4687063.282
OV#5	334964.118	4687087.138
St.Luke	335057.846	4687047.243
Outlet1	334971.491	4687105.998
Outlet2	335066.457	4687051.005
Pond	334938.509	4687071.685

[VERTICES]

;;Link	X-Coord	Y-Coord
;;-----	-----	-----
R-1.1	335022.065	4686957.361

[POLYGONS]

;;Subcatchment	X-Coord	Y-Coord
;;-----	-----	-----
A-1.1	335023.425	4687119.825
A-1.1	335098.083	4686953.883
A-1.1	335076.102	4686943.884
A-1.1	335054.461	4686992.073
A-1.1	335032.931	4687040.144
A-1.1	335011.287	4687088.338
A-1.1	335000.64	4687112.283
A-1.1	335023.425	4687119.825
A-1.2	335024.938	4687120.34
A-1.2	335030.978	4687117.731
A-1.2	335103.615	4686956.009
A-1.2	335098.084	4686953.892
A-1.2	335023.425	4687119.816
A-1.2	335024.938	4687120.34
A-2.1	334982.116	4687075.258
A-2.1	334972.016	4687097.782
A-2.1	334974.447	4687103.418
A-2.1	335000.64	4687112.274
A-2.1	335011.286	4687088.32
A-2.1	334982.116	4687075.258
A-2.10	334996.323	4686994.701

A-2.10	335007.009	4686970.655
A-2.10	334977.956	4686957.589
A-2.10	334967.12	4686981.728
A-2.10	334996.323	4686994.701
A-2.11	334985.473	4687018.795
A-2.11	334996.323	4686994.71
A-2.11	334967.121	4686981.737
A-2.11	334956.379	4687005.764
A-2.11	334985.473	4687018.795
A-2.12	334985.473	4687018.804
A-2.12	334956.379	4687005.774
A-2.12	334945.585	4687029.911
A-2.12	334974.678	4687042.887
A-2.12	334985.473	4687018.804
A-2.13	334936.858	4687049.002
A-2.13	334966.067	4687062.301
A-2.13	334974.678	4687042.896
A-2.13	334945.585	4687029.92
A-2.13	334936.858	4687049.002
A-2.2	334992.873	4687051.198
A-2.2	334982.116	4687075.267
A-2.2	335011.286	4687088.329
A-2.2	335022.166	4687064.379
A-2.2	335022.149	4687064.363
A-2.2	335022.148	4687064.314
A-2.2	334992.873	4687051.198
A-2.3	335022.148	4687064.323
A-2.3	335032.931	4687040.135
A-2.3	335003.736	4687027.036
A-2.3	334992.874	4687051.207
A-2.3	335022.148	4687064.323
A-2.4	335003.736	4687027.045
A-2.4	335032.931	4687040.144
A-2.4	335043.65	4687016.055
A-2.4	335014.537	4687002.989
A-2.4	335003.736	4687027.045
A-2.5	335014.537	4687002.998
A-2.5	335043.65	4687016.065
A-2.5	335054.46	4686992.063
A-2.5	335025.348	4686978.892
A-2.5	335014.537	4687002.998
A-2.6	335025.348	4686978.901
A-2.6	335054.461	4686992.073
A-2.6	335065.319	4686967.889
A-2.6	335036.119	4686954.78
A-2.6	335025.348	4686978.901
A-2.7	335036.089	4686954.847
A-2.7	335065.359	4686967.844
A-2.7	335076.102	4686943.875
A-2.7	335046.985	4686930.823
A-2.7	335036.089	4686954.847
A-2.8	335017.901	4686946.661
A-2.8	335019.614	4686943.057
A-2.8	335019.21	4686942.088
A-2.8	335018.86	4686940.967
A-2.8	335018.597	4686939.919
A-2.8	335018.48	4686938.982

A-2.8	335018.39	4686937.2
A-2.8	335018.555	4686935.298
A-2.8	335018.933	4686933.941
A-2.8	335019.325	4686932.792
A-2.8	335019.992	4686931.37
A-2.8	335020.864	4686930.025
A-2.8	335021.76	4686928.95
A-2.8	335022.962	4686927.852
A-2.8	335024.338	4686926.885
A-2.8	335025.584	4686926.21
A-2.8	335027.087	4686925.597
A-2.8	335028.019	4686925.371
A-2.8	335029.255	4686922.827
A-2.8	334989.697	4686905.044
A-2.8	334978.902	4686929.147
A-2.8	335017.901	4686946.661
A-2.9	335017.901	4686946.67
A-2.9	334988.705	4686933.559
A-2.9	334977.956	4686957.579
A-2.9	335007.009	4686970.646
A-2.9	335017.901	4686946.67
A-POND	334927.198	4687044.767
A-POND	334910.554	4687081.859
A-POND	334946.552	4687094.164
A-POND	334952.984	4687091.291
A-POND	334966.068	4687062.311
A-POND	334927.198	4687044.767
R-1	335033.212	4686961.18
R-1	335046.985	4686930.813
R-1	335029.256	4686922.837
R-1	335028.02	4686925.38
R-1	335027.087	4686925.606
R-1	335025.584	4686926.219
R-1	335024.338	4686926.894
R-1	335022.962	4686927.861
R-1	335021.76	4686928.959
R-1	335020.865	4686930.034
R-1	335019.993	4686931.38
R-1	335019.325	4686932.802
R-1	335018.933	4686933.95
R-1	335018.555	4686935.307
R-1	335018.39	4686937.209
R-1	335018.48	4686938.992
R-1	335018.86	4686940.976
R-1	335019.614	4686943.066
R-1	335014.986	4686953.096
R-1	335033.212	4686961.18
R-2	334989.344	4687010.222
R-2	335008.155	4687017.139
R-2	335009.101	4687015.022
R-2	335021.125	4686988.383
R-2	335033.213	4686961.189
R-2	335014.986	4686953.106
R-2	335004.079	4686977.258
R-2	334990.87	4687006.825
R-2	334989.344	4687010.222
R-3	335008.155	4687017.139

R-3	334989.344	4687010.222
R-3	334978.307	4687034.801
R-3	334969.429	4687054.736
R-3	334966.068	4687062.311
R-3	334984.692	4687069.511
R-3	334992.874	4687051.207
R-3	334996.691	4687042.79
R-3	335008.155	4687017.139
R-4	334970.899	4687064.183
R-4	334966.068	4687062.32
R-4	334952.985	4687091.3
R-4	334946.552	4687094.173
R-4	334969.738	4687101.821
R-4	334971.2	4687102.299
R-4	334974.447	4687103.409
R-4	334972.016	4687097.773
R-4	334984.692	4687069.502
R-4	334970.899	4687064.183

```
;;Storage Node  X-Coord      Y-Coord
;;-----
```

```
[SYMBOLS]
;;Gage          X-Coord      Y-Coord
;;-----
```

```
[BACKDROP]
FILE          "P:\^2022 Projects\22-070 - Avani Walker Rd
Development\Engineering\Reports\SWM\Drawing\PCSWMM Model 03262024.dwg"
DIMENSIONS    334209.53      4686460.68      335663.42      4687589.97
```


URBAN STRESS TEST - OUTPUT VALUES

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)

Element Count

Number of rain gages 1
Number of subcatchments ... 20
Number of nodes 14
Number of links 16
Number of pollutants 0
Number of land uses 0

Raingage Summary

Name	Data Source	Data Type	Recording Interval
Raingage	UrbanStressTest-UST15mins	INTENSITY	15 min.

Subcatchment Summary

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A-1.1	0.44	41.59	65.00	0.5000	Raingage	St.Luke
A-1.2	0.11	12.67	20.00	0.5000	Raingage	St.Luke
A-2.1	0.09	19.51	65.00	0.5000	Raingage	OV#5
A-2.10	0.08	19.58	65.00	0.5000	Raingage	R-1
A-2.11	0.08	13.80	65.00	0.5000	Raingage	OV#2
A-2.12	0.08	14.03	65.00	0.5000	Raingage	OV#2
A-2.13	0.07	15.00	65.00	0.5000	Raingage	OV#4
A-2.2	0.08	26.41	65.00	0.5000	Raingage	OV#4
A-2.3	0.08	26.53	65.00	0.5000	Raingage	OV#2
A-2.4	0.08	13.82	65.00	0.5000	Raingage	OV#2
A-2.5	0.08	19.58	65.00	0.5000	Raingage	R-1

A-2.6	0.08	13.22	65.00	0.5000	Raingage	OV#1
A-2.7	0.08	17.91	65.00	0.5000	Raingage	OV#1
A-2.8	0.11	21.46	65.00	0.5000	Raingage	OV#1
A-2.9	0.08	12.55	65.00	0.5000	Raingage	OV#1
A-POND	0.16	10.90	25.00	0.5000	Raingage	Pond
R-1	0.07	7.23	80.00	0.5000	Raingage	OV#1
R-2	0.12	14.10	80.00	0.5000	Raingage	OV#1
R-3	0.11	13.00	80.00	0.5000	Raingage	OV#2
R-4	0.07	28.54	80.00	0.5000	Raingage	OV#5

Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
CB#4	JUNCTION	181.94	1.15	0.0	
MH#1	JUNCTION	182.82	1.38	0.0	
MH#2	JUNCTION	182.34	1.54	0.0	
MH#3	JUNCTION	181.87	1.46	0.0	
OGS	JUNCTION	181.76	1.69	0.0	
OR1	JUNCTION	181.76	1.69	0.0	
OV#1	JUNCTION	184.20	0.32	0.0	
OV#2	JUNCTION	183.88	0.31	0.0	
OV#4	JUNCTION	183.32	0.33	0.0	
OV#5	JUNCTION	183.09	0.32	0.0	
St.Luke	JUNCTION	178.13	2.25	0.0	
Outlet1	OUTFALL	181.70	0.30	0.0	
Outlet2	OUTFALL	178.07	0.38	0.0	
Pond	STORAGE	181.82	2.50	0.0	

Link Summary

Name	From Node	To Node	Type	Length	%Slope	Roughness
Curb.Cut	OV#5	Pond	CONDUIT	5.0	30.5992	0.0130
Outlet2	St.Luke	Outlet2	CONDUIT	9.4	0.7130	0.0130
P1	MH#1	MH#2	CONDUIT	55.5	0.8724	0.0130

P2	MH#2	MH#3	CONDUIT	87.1	0.5395	0.0130
P3	CB#4	MH#3	CONDUIT	19.0	0.4004	0.0130
P4	MH#3	Pond	CONDUIT	26.0	0.1964	0.0130
P5	Pond	OR1	CONDUIT	10.7	0.5446	0.0130
P6	OGS	Outlet1	CONDUIT	8.0	0.7250	0.0130
R-1.1	OV#1	OV#2	CONDUIT	56.8	0.5568	0.0130
R-1.2	OV#2	OV#4	CONDUIT	78.3	0.7086	0.0130
R-1.3	OV#5	OV#4	CONDUIT	25.3	-0.9314	0.0130
OR#1	OR1	OGS	ORIFICE			
OR#2	OV#5	CB#4	ORIFICE			
OR#3	OV#4	MH#3	ORIFICE			
OR#4	OV#2	MH#2	ORIFICE			
OR#5	OV#1	MH#1	ORIFICE			

Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
Curb.Cut	TRAPEZOIDAL	0.10	1.56	0.10	16.20	1	13937.12
Outlet2	CIRCULAR	0.38	0.11	0.09	0.38	1	148.06
P1	CIRCULAR	0.38	0.11	0.09	0.38	1	163.77
P2	CIRCULAR	0.45	0.16	0.11	0.45	1	209.42
P3	CIRCULAR	0.30	0.07	0.07	0.30	1	61.20
P4	CIRCULAR	0.60	0.28	0.15	0.60	1	272.11
P5	CIRCULAR	0.30	0.07	0.07	0.30	1	71.37
P6	CIRCULAR	0.30	0.07	0.07	0.30	1	82.34
R-1.1	Road_Section	0.30	3.22	0.16	20.00	1	5472.83
R-1.2	Road_Section	0.30	3.22	0.16	20.00	1	6174.07
R-1.3	Road_Section	0.30	3.22	0.16	20.00	1	7078.12

Transect Summary

Transect Road_Section

Area:

0.0006	0.0024	0.0054	0.0096	0.0150
--------	--------	--------	--------	--------

0.0216	0.0294	0.0385	0.0487	0.0601
0.0727	0.0865	0.1015	0.1178	0.1350
0.1525	0.1699	0.1873	0.2047	0.2222
0.2396	0.2570	0.2744	0.2919	0.3093
0.3277	0.3468	0.3667	0.3874	0.4089
0.4311	0.4541	0.4779	0.5024	0.5277
0.5538	0.5807	0.6083	0.6367	0.6659
0.6958	0.7265	0.7580	0.7903	0.8233
0.8571	0.8917	0.9270	0.9631	1.0000

Hrad:

0.0182	0.0364	0.0546	0.0728	0.0910
0.1092	0.1274	0.1456	0.1638	0.1820
0.2002	0.2184	0.2366	0.2548	0.2819
0.3179	0.3538	0.3896	0.4253	0.4609
0.4964	0.5319	0.5672	0.6025	0.6377
0.6707	0.7014	0.7300	0.7564	0.7808
0.8033	0.8240	0.8431	0.8606	0.8766
0.8913	0.9048	0.9170	0.9283	0.9385
0.9478	0.9562	0.9639	0.9708	0.9771
0.9827	0.9878	0.9923	0.9964	1.0000

Width:

0.0322	0.0645	0.0967	0.1290	0.1612
0.1934	0.2257	0.2579	0.2902	0.3224
0.3547	0.3869	0.4191	0.4514	0.4675
0.4675	0.4675	0.4675	0.4675	0.4675
0.4675	0.4675	0.4675	0.4675	0.4675
0.5032	0.5239	0.5446	0.5653	0.5860
0.6067	0.6274	0.6481	0.6688	0.6895
0.7102	0.7309	0.7516	0.7723	0.7930
0.8137	0.8344	0.8551	0.8758	0.8965
0.9172	0.9379	0.9586	0.9793	1.0000

Street Summary

Street Street-CS
Area:

0.0006	0.0024	0.0053	0.0095	0.0148
0.0213	0.0290	0.0379	0.0479	0.0592

	0.0716	0.0852	0.1000	0.1160	0.1332
	0.1507	0.1683	0.1859	0.2035	0.2211
	0.2386	0.2562	0.2738	0.2914	0.3090
	0.3272	0.3461	0.3659	0.3864	0.4077
	0.4298	0.4528	0.4764	0.5009	0.5262
	0.5523	0.5791	0.6068	0.6352	0.6644
	0.6944	0.7252	0.7568	0.7892	0.8223
	0.8563	0.8910	0.9266	0.9629	1.0000
Hrad:					
	0.0180	0.0360	0.0540	0.0721	0.0901
	0.1081	0.1261	0.1441	0.1621	0.1801
	0.1982	0.2162	0.2342	0.2522	0.2728
	0.3085	0.3440	0.3794	0.4147	0.4500
	0.4851	0.5202	0.5552	0.5900	0.6250
	0.6587	0.6902	0.7195	0.7466	0.7716
	0.7948	0.8161	0.8357	0.8538	0.8704
	0.8856	0.8995	0.9122	0.9239	0.9345
	0.9443	0.9531	0.9612	0.9685	0.9752
	0.9812	0.9867	0.9916	0.9960	1.0000
Width:					
	0.0316	0.0631	0.0947	0.1263	0.1578
	0.1894	0.2209	0.2525	0.2841	0.3156
	0.3472	0.3788	0.4103	0.4419	0.4688
	0.4688	0.4688	0.4688	0.4688	0.4688
	0.4688	0.4688	0.4688	0.4688	0.4740
	0.4950	0.5160	0.5371	0.5581	0.5792
	0.6002	0.6213	0.6423	0.6633	0.6844
	0.7054	0.7265	0.7475	0.7685	0.7896
	0.8106	0.8317	0.8527	0.8738	0.8948
	0.9158	0.9369	0.9579	0.9790	1.0000

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 03/26/2024 00:00:00
 Ending Date 03/28/2024 00:00:00
 Antecedent Dry Days 0.0
 Report Time Step 00:01:00
 Wet Time Step 00:01:00
 Dry Time Step 00:01:00
 Routing Time Step 5.00 sec
 Variable Time Step YES
 Maximum Trials 8
 Number of Threads 4
 Head Tolerance 0.001500 m

 Control Actions Taken

	Volume	Depth
Runoff Quantity Continuity	hectare-m	mm
*****	-----	-----
Total Precipitation	0.330	149.985
Evaporation Loss	0.000	0.000
Infiltration Loss	0.041	18.707
Surface Runoff	0.288	130.693
Final Storage	0.001	0.613
Continuity Error (%)	-0.019	

	Volume	Volume
Flow Routing Continuity	hectare-m	10^6 ltr
*****	-----	-----
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.288	2.879
Groundwater Inflow	0.000	0.000

RDII Inflow	0.000	0.000
External Inflow	0.001	0.009
External Outflow	0.287	2.867
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	0.001	0.012
Continuity Error (%)	0.341	

Time-Step Critical Elements

Link P5 (4.27%)

Link Outlet2 (1.35%)

Highest Flow Instability Indexes

Link OR#1 (13)

Most Frequent Nonconverging Nodes

Convergence obtained at all time steps.

Routing Time Step Summary

Minimum Time Step	:	0.21 sec
Average Time Step	:	4.92 sec
Maximum Time Step	:	5.00 sec
% of Time in Steady State	:	0.00
Average Iterations per Step	:	2.01
% of Steps Not Converging	:	0.08
Time Step Frequencies	:	
5.000 - 3.155 sec	:	98.61 %

3.155	-	1.991 sec	:	0.72 %
1.991	-	1.256 sec	:	0.36 %
1.256	-	0.792 sec	:	0.22 %
0.792	-	0.500 sec	:	0.09 %

Subcatchment Runoff Summary

Peak Runoff		Total Precip	Total Runon	Total Evap	Total Infil	Imperv Runoff	Perv Runoff	Total Runoff	Total Runoff
Runoff Coeff Subcatchment		mm	mm	mm	mm	mm	mm	mm	10^6 ltr
LPS									
A-1.1		149.99	0.00	0.00	15.98	96.94	36.52	133.45	0.59
163.41	0.890								
A-1.2		149.98	0.00	0.00	37.03	29.83	82.97	112.80	0.12
29.59	0.752								
A-2.1		149.99	0.00	0.00	15.79	96.87	36.71	133.58	0.12
34.61	0.891								
A-2.10		149.99	0.00	0.00	15.78	96.87	36.72	133.59	0.11
33.25	0.891								
A-2.11		149.99	0.00	0.00	15.84	96.86	36.65	133.52	0.11
32.69	0.890								
A-2.12		149.99	0.00	0.00	15.84	96.86	36.66	133.52	0.11
32.72	0.890								
A-2.13		149.98	0.00	0.00	38.10	96.95	14.40	111.35	0.08
25.14	0.742								
A-2.2		149.98	0.00	0.00	15.73	96.87	36.77	133.64	0.11
33.67	0.891								
A-2.3		149.98	0.00	0.00	15.73	96.87	36.77	133.64	0.11
33.83	0.891								
A-2.4		149.98	0.00	0.00	15.84	96.86	36.66	133.52	0.11
32.73	0.890								
A-2.5		149.99	0.00	0.00	15.78	96.87	36.72	133.59	0.11
33.25	0.891								
A-2.6		149.99	0.00	0.00	38.31	96.94	14.19	111.13	0.09

A-2.7	149.99	0.00	0.00	15.79	96.87	36.71	133.57	0.11
33.13 0.891								
A-2.8	149.98	0.00	0.00	15.81	96.87	36.69	133.56	0.14
42.11 0.890								
A-2.9	149.99	0.00	0.00	15.87	96.86	36.63	133.50	0.11
32.46 0.890								
A-POND	149.99	0.00	0.00	35.26	36.88	77.23	114.11	0.19
38.61 0.761								
R-1	149.99	311.16	0.00	9.84	368.26	82.39	450.65	0.33
93.81 0.977								
R-2	149.98	0.00	0.00	9.03	119.31	20.97	140.27	0.17
49.09 0.935								
R-3	149.98	0.00	0.00	9.03	119.31	20.97	140.27	0.16
45.25 0.935								
R-4	149.99	0.00	0.00	8.94	119.33	21.06	140.39	0.10
29.86 0.936								

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
CB#4	JUNCTION	0.38	1.23	183.17	0 09:17	1.23
MH#1	JUNCTION	0.04	0.34	183.16	0 09:16	0.34
MH#2	JUNCTION	0.19	0.71	183.05	0 09:16	0.71
MH#3	JUNCTION	0.43	1.16	183.03	0 11:33	1.16
OGS	JUNCTION	0.11	0.13	181.88	0 11:33	0.13
OR1	JUNCTION	0.52	1.26	183.02	0 11:33	1.26
OV#1	JUNCTION	0.01	0.07	184.27	0 09:15	0.07
OV#2	JUNCTION	0.01	0.08	183.96	0 09:15	0.08
OV#4	JUNCTION	0.00	0.07	183.40	0 09:15	0.07
OV#5	JUNCTION	0.00	0.20	183.28	0 09:15	0.20
St.Luke	JUNCTION	0.03	0.35	178.49	0 09:15	0.35
Outlet1	OUTFALL	0.15	0.15	181.85	0 00:00	0.15
Outlet2	OUTFALL	0.03	0.32	178.39	0 09:15	0.32
Pond	STORAGE	0.47	1.21	183.03	0 11:33	1.21

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
CB#4	JUNCTION	0.00	190.38	0 09:06	0	0.463	-0.086
MH#1	JUNCTION	0.00	93.32	0 09:15	0	0.607	-0.026
MH#2	JUNCTION	0.00	195.86	0 09:15	0	1.17	-0.036
MH#3	JUNCTION	0.00	448.36	0 09:10	0	1.93	-0.036
OGS	JUNCTION	0.00	25.45	0 11:33	0	2.17	0.018
OR1	JUNCTION	0.00	25.45	0 11:32	0	2.17	-0.005
OV#1	JUNCTION	281.09	281.09	0 09:15	0.962	0.962	-0.009
OV#2	JUNCTION	177.22	364.07	0 09:15	0.611	0.967	-0.012
OV#4	JUNCTION	58.81	313.41	0 09:15	0.188	0.595	0.017
OV#5	JUNCTION	64.47	286.53	0 09:15	0.221	0.512	-0.027
St.Luke	JUNCTION	193.00	193.00	0 09:15	0.71	0.71	0.010
Outlet1	OUTFALL	0.00	25.45	0 11:33	0	2.17	0.000
Outlet2	OUTFALL	0.00	192.88	0 09:15	0	0.71	0.000
Pond	STORAGE	38.61	592.95	0 09:15	0.187	2.18	0.600

Node Surge 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
CB#4	JUNCTION	11.74	0.428	0.000
MH#3	JUNCTION	13.56	0.363	0.295
OR1	JUNCTION	25.00	0.965	0.427

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m ³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m ³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
Pond	0.233	11.1	0.0	0.0	0.697	33.3	0 11:33	25.45

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10 ⁶ ltr
Outlet1	95.18	13.18	25.45	2.166
Outlet2	54.71	8.35	192.88	0.710
System	74.94	21.53	211.83	2.876

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
Curb.Cut	CONDUIT	122.85	0 09:15	0.15	0.01	0.53
Outlet2	CONDUIT	192.88	0 09:15	1.85	1.30	0.90
P1	CONDUIT	90.32	0 09:11	1.05	0.55	0.96
P2	CONDUIT	188.52	0 09:15	1.19	0.90	1.00
P3	CONDUIT	187.86	0 09:06	2.66	3.07	1.00
P4	CONDUIT	443.01	0 09:10	1.76	1.63	1.00
P5	CONDUIT	25.45	0 11:32	0.43	0.36	1.00
P6	CONDUIT	25.45	0 11:33	0.80	0.31	0.46
R-1.1	CHANNEL	186.88	0 09:15	0.57	0.03	0.26
R-1.2	CHANNEL	254.82	0 09:15	0.81	0.04	0.26
R-1.3	CHANNEL	222.32	0 09:15	0.35	0.03	0.45
OR#1	ORIFICE	25.45	0 11:33			1.00
OR#2	ORIFICE	190.38	0 09:06			
OR#3	ORIFICE	89.11	0 09:15			
OR#4	ORIFICE	106.85	0 09:15			
OR#5	ORIFICE	93.32	0 09:15			

Flow Classification Summary

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class								
		Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl	
Curb.Cut	9.91	0.00	1.00	0.00	0.00	0.00	0.00	0.81	0.00	
Outlet2	1.73	0.00	0.00	0.00	0.43	0.57	0.00	0.07	0.00	
P1	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.76	0.00	
P2	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.53	0.00	
P3	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.29	0.00	
P4	1.00	0.00	0.00	0.00	0.97	0.02	0.00	0.21	0.00	
P5	1.28	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	
P6	1.80	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	
R-1.1	1.00	0.05	0.05	0.00	0.86	0.04	0.00	0.03	0.00	
R-1.2	1.00	0.15	0.01	0.00	0.32	0.53	0.00	0.00	0.00	

R-1.3 1.00 0.27 0.07 0.00 0.61 0.05 0.00 0.00 0.28 0.00

Conduit Surcharge Summary

Conduit	Hours Full			Hours	
	Both Ends	Upstream	Dnstream	Above Full Normal Flow	Capacity Limited
Curb.Cut	0.01	0.01	38.84	0.01	0.01
Outlet2	0.01	0.01	0.01	0.18	0.01
P1	0.01	0.01	12.50	0.01	0.01
P2	10.51	10.51	19.90	0.01	0.01
P3	21.22	21.22	22.62	0.52	0.52
P4	17.35	17.38	18.16	0.36	0.22
P5	23.65	23.65	25.00	0.01	0.01

Analysis begun on: Fri Apr 24 10:31:46 2026
Analysis ended on: Fri Apr 24 10:31:47 2026
Total elapsed time: 00:00:01

CHICAGO 100-YR STORM EVENT - OUTPUT VALUES

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)

Element Count

Number of rain gages 1
Number of subcatchments ... 20
Number of nodes 14
Number of links 16
Number of pollutants 0
Number of land uses 0

Raingage Summary

Name	Data Source	Data Type	Recording Interval
Raingage	100yrChicago-15mins	INTENSITY	15 min.

Subcatchment Summary

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A-1.1	0.44	41.59	65.00	0.5000	Raingage	St.Luke
A-1.2	0.11	12.67	20.00	0.5000	Raingage	St.Luke
A-2.1	0.09	19.51	65.00	0.5000	Raingage	OV#5
A-2.10	0.08	19.58	65.00	0.5000	Raingage	R-1
A-2.11	0.08	13.80	65.00	0.5000	Raingage	OV#2
A-2.12	0.08	14.03	65.00	0.5000	Raingage	OV#2
A-2.13	0.07	15.00	65.00	0.5000	Raingage	OV#4
A-2.2	0.08	26.41	65.00	0.5000	Raingage	OV#4
A-2.3	0.08	26.53	65.00	0.5000	Raingage	OV#2
A-2.4	0.08	13.82	65.00	0.5000	Raingage	OV#2
A-2.5	0.08	19.58	65.00	0.5000	Raingage	R-1

A-2.6	0.08	13.22	65.00	0.5000	Raingage	OV#1
A-2.7	0.08	17.91	65.00	0.5000	Raingage	OV#1
A-2.8	0.11	21.46	65.00	0.5000	Raingage	OV#1
A-2.9	0.08	12.55	65.00	0.5000	Raingage	OV#1
A-POND	0.16	10.90	25.00	0.5000	Raingage	Pond
R-1	0.07	7.23	80.00	0.5000	Raingage	OV#1
R-2	0.12	14.10	80.00	0.5000	Raingage	OV#1
R-3	0.11	13.00	80.00	0.5000	Raingage	OV#2
R-4	0.07	28.54	80.00	0.5000	Raingage	OV#5

Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
CB#4	JUNCTION	181.94	1.15	0.0	
MH#1	JUNCTION	182.82	1.38	0.0	
MH#2	JUNCTION	182.34	1.54	0.0	
MH#3	JUNCTION	181.87	1.46	0.0	
OGS	JUNCTION	181.76	1.69	0.0	
OR1	JUNCTION	181.76	1.69	0.0	
OV#1	JUNCTION	184.20	0.32	0.0	
OV#2	JUNCTION	183.88	0.31	0.0	
OV#4	JUNCTION	183.32	0.33	0.0	
OV#5	JUNCTION	183.09	0.32	0.0	
St.Luke	JUNCTION	178.13	2.25	0.0	
Outlet1	OUTFALL	181.70	0.30	0.0	
Outlet2	OUTFALL	178.07	0.38	0.0	
Pond	STORAGE	181.82	2.50	0.0	

Link Summary

Name	From Node	To Node	Type	Length	%Slope	Roughness
Curb.Cut	OV#5	Pond	CONDUIT	5.0	30.5992	0.0130
Outlet2	St.Luke	Outlet2	CONDUIT	9.4	0.7130	0.0130
P1	MH#1	MH#2	CONDUIT	55.5	0.8724	0.0130

P2	MH#2	MH#3	CONDUIT	87.1	0.5395	0.0130
P3	CB#4	MH#3	CONDUIT	19.0	0.4004	0.0130
P4	MH#3	Pond	CONDUIT	26.0	0.1964	0.0130
P5	Pond	OR1	CONDUIT	10.7	0.5446	0.0130
P6	OGS	Outlet1	CONDUIT	8.0	0.7250	0.0130
R-1.1	OV#1	OV#2	CONDUIT	56.8	0.5568	0.0130
R-1.2	OV#2	OV#4	CONDUIT	78.3	0.7086	0.0130
R-1.3	OV#5	OV#4	CONDUIT	25.3	-0.9314	0.0130
OR#1	OR1	OGS	ORIFICE			
OR#2	OV#5	CB#4	ORIFICE			
OR#3	OV#4	MH#3	ORIFICE			
OR#4	OV#2	MH#2	ORIFICE			
OR#5	OV#1	MH#1	ORIFICE			

Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
Curb.Cut	TRAPEZOIDAL	0.10	1.56	0.10	16.20	1	13937.12
Outlet2	CIRCULAR	0.38	0.11	0.09	0.38	1	148.06
P1	CIRCULAR	0.38	0.11	0.09	0.38	1	163.77
P2	CIRCULAR	0.45	0.16	0.11	0.45	1	209.42
P3	CIRCULAR	0.30	0.07	0.07	0.30	1	61.20
P4	CIRCULAR	0.60	0.28	0.15	0.60	1	272.11
P5	CIRCULAR	0.30	0.07	0.07	0.30	1	71.37
P6	CIRCULAR	0.30	0.07	0.07	0.30	1	82.34
R-1.1	Road_Section	0.30	3.22	0.16	20.00	1	5472.83
R-1.2	Road_Section	0.30	3.22	0.16	20.00	1	6174.07
R-1.3	Road_Section	0.30	3.22	0.16	20.00	1	7078.12

Transect Summary

Transect Road_Section

Area:

0.0006	0.0024	0.0054	0.0096	0.0150
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0.0216	0.0294	0.0385	0.0487	0.0601
0.0727	0.0865	0.1015	0.1178	0.1350
0.1525	0.1699	0.1873	0.2047	0.2222
0.2396	0.2570	0.2744	0.2919	0.3093
0.3277	0.3468	0.3667	0.3874	0.4089
0.4311	0.4541	0.4779	0.5024	0.5277
0.5538	0.5807	0.6083	0.6367	0.6659
0.6958	0.7265	0.7580	0.7903	0.8233
0.8571	0.8917	0.9270	0.9631	1.0000

Hrad:

0.0182	0.0364	0.0546	0.0728	0.0910
0.1092	0.1274	0.1456	0.1638	0.1820
0.2002	0.2184	0.2366	0.2548	0.2819
0.3179	0.3538	0.3896	0.4253	0.4609
0.4964	0.5319	0.5672	0.6025	0.6377
0.6707	0.7014	0.7300	0.7564	0.7808
0.8033	0.8240	0.8431	0.8606	0.8766
0.8913	0.9048	0.9170	0.9283	0.9385
0.9478	0.9562	0.9639	0.9708	0.9771
0.9827	0.9878	0.9923	0.9964	1.0000

Width:

0.0322	0.0645	0.0967	0.1290	0.1612
0.1934	0.2257	0.2579	0.2902	0.3224
0.3547	0.3869	0.4191	0.4514	0.4675
0.4675	0.4675	0.4675	0.4675	0.4675
0.4675	0.4675	0.4675	0.4675	0.4675
0.5032	0.5239	0.5446	0.5653	0.5860
0.6067	0.6274	0.6481	0.6688	0.6895
0.7102	0.7309	0.7516	0.7723	0.7930
0.8137	0.8344	0.8551	0.8758	0.8965
0.9172	0.9379	0.9586	0.9793	1.0000

Street Summary

Street Street-CS
Area:

0.0006	0.0024	0.0053	0.0095	0.0148
0.0213	0.0290	0.0379	0.0479	0.0592

	0.0716	0.0852	0.1000	0.1160	0.1332
	0.1507	0.1683	0.1859	0.2035	0.2211
	0.2386	0.2562	0.2738	0.2914	0.3090
	0.3272	0.3461	0.3659	0.3864	0.4077
	0.4298	0.4528	0.4764	0.5009	0.5262
	0.5523	0.5791	0.6068	0.6352	0.6644
	0.6944	0.7252	0.7568	0.7892	0.8223
	0.8563	0.8910	0.9266	0.9629	1.0000
Hrad:					
	0.0180	0.0360	0.0540	0.0721	0.0901
	0.1081	0.1261	0.1441	0.1621	0.1801
	0.1982	0.2162	0.2342	0.2522	0.2728
	0.3085	0.3440	0.3794	0.4147	0.4500
	0.4851	0.5202	0.5552	0.5900	0.6250
	0.6587	0.6902	0.7195	0.7466	0.7716
	0.7948	0.8161	0.8357	0.8538	0.8704
	0.8856	0.8995	0.9122	0.9239	0.9345
	0.9443	0.9531	0.9612	0.9685	0.9752
	0.9812	0.9867	0.9916	0.9960	1.0000
Width:					
	0.0316	0.0631	0.0947	0.1263	0.1578
	0.1894	0.2209	0.2525	0.2841	0.3156
	0.3472	0.3788	0.4103	0.4419	0.4688
	0.4688	0.4688	0.4688	0.4688	0.4688
	0.4688	0.4688	0.4688	0.4688	0.4740
	0.4950	0.5160	0.5371	0.5581	0.5792
	0.6002	0.6213	0.6423	0.6633	0.6844
	0.7054	0.7265	0.7475	0.7685	0.7896
	0.8106	0.8317	0.8527	0.8738	0.8948
	0.9158	0.9369	0.9579	0.9790	1.0000

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 03/26/2024 00:00:00
 Ending Date 03/28/2024 00:00:00
 Antecedent Dry Days 0.0
 Report Time Step 00:01:00
 Wet Time Step 00:01:00
 Dry Time Step 00:01:00
 Routing Time Step 5.00 sec
 Variable Time Step YES
 Maximum Trials 8
 Number of Threads 4
 Head Tolerance 0.001500 m

 Control Actions Taken

*****	Volume	Depth
Runoff Quantity Continuity	hectare-m	mm
*****	-----	-----
Total Precipitation	0.180	81.587
Evaporation Loss	0.000	0.000
Infiltration Loss	0.027	12.100
Surface Runoff	0.152	68.906
Final Storage	0.001	0.612
Continuity Error (%)	-0.038	

*****	Volume	Volume
Flow Routing Continuity	hectare-m	10^6 ltr
*****	-----	-----
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.152	1.518
Groundwater Inflow	0.000	0.000

RDII Inflow	0.000	0.000
External Inflow	0.001	0.008
External Outflow	0.150	1.503
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	0.001	0.012
Continuity Error (%)	0.692	

Highest Continuity Errors

Node Pond (1.13%)

Time-Step Critical Elements

Link P5 (3.85%)

Highest Flow Instability Indexes

Link OR#1 (52)

Most Frequent Nonconverging Nodes

Convergence obtained at all time steps.

Routing Time Step Summary

Minimum Time Step	:	0.50 sec
Average Time Step	:	4.93 sec
Maximum Time Step	:	5.00 sec

Subcatchment Runoff Summary

Peak	Runoff	Total	Total	Total	Total	Imperv	Perv	Total	Total
Runoff	Coeff	Precip	Runon	Evap	Infil	Runoff	Runoff	Runoff	Runoff
Subcatchment		mm	mm	mm	mm	mm	mm	mm	10^6 ltr
LPS									

A-1.1		81.59	0.00	0.00	10.79	52.48	17.77	70.25	0.31
150.37	0.861								
A-1.2		81.59	0.00	0.00	25.42	16.15	39.86	56.01	0.06
22.56	0.687								
A-2.1		81.59	0.00	0.00	10.51	52.41	18.06	70.47	0.06
32.92	0.864								
A-2.10		81.59	0.00	0.00	10.50	52.41	18.07	70.48	0.06
31.68	0.864								
A-2.11		81.59	0.00	0.00	10.59	52.40	17.98	70.38	0.06
30.71	0.863								
A-2.12		81.59	0.00	0.00	10.58	52.40	17.98	70.39	0.06
30.76	0.863								
A-2.13		81.59	0.00	0.00	18.02	52.49	10.55	63.03	0.04
24.25	0.773								
A-2.2		81.59	0.00	0.00	10.43	52.41	18.14	70.55	0.06
32.39	0.865								
A-2.3		81.59	0.00	0.00	10.43	52.41	18.14	70.55	0.06
32.54	0.865								

A-2.4	81.59	0.00	0.00	10.59	52.40	17.98	70.38	0.06
30.75 0.863								
A-2.5	81.59	0.00	0.00	10.50	52.41	18.07	70.48	0.06
31.68 0.864								
A-2.6	81.59	0.00	0.00	18.26	52.48	10.30	62.79	0.05
29.33 0.770								
A-2.7	81.59	0.00	0.00	10.52	52.41	18.05	70.46	0.06
31.46 0.864								
A-2.8	81.59	0.00	0.00	10.53	52.41	18.03	70.44	0.08
39.88 0.863								
A-2.9	81.59	0.00	0.00	10.62	52.40	17.95	70.35	0.06
30.37 0.862								
A-POND	81.59	0.00	0.00	24.70	19.78	36.50	56.28	0.09
29.90 0.690								
R-1	81.59	164.16	0.00	6.23	195.94	42.93	238.87	0.17
89.09 0.972								
R-2	81.59	0.00	0.00	6.02	64.59	10.30	74.89	0.09
47.43 0.918								
R-3	81.59	0.00	0.00	6.02	64.59	10.30	74.89	0.09
43.72 0.918								
R-4	81.59	0.00	0.00	5.90	64.61	10.43	75.04	0.06
29.30 0.920								

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
CB#4	JUNCTION	0.17	1.22	183.16	0 01:46	1.22
MH#1	JUNCTION	0.01	0.21	183.03	0 01:45	0.21
MH#2	JUNCTION	0.06	0.55	182.89	0 01:46	0.55
MH#3	JUNCTION	0.20	0.93	182.80	0 03:31	0.93
OGS	JUNCTION	0.10	0.12	181.88	0 03:32	0.12
OR1	JUNCTION	0.29	1.03	182.79	0 03:32	1.03
OV#1	JUNCTION	0.00	0.07	184.27	0 01:45	0.07
OV#2	JUNCTION	0.00	0.08	183.96	0 01:45	0.08
OV#4	JUNCTION	0.00	0.07	183.39	0 01:45	0.07

OV#5	JUNCTION	0.00	0.19	183.28	0	01:45	0.19
St.Luke	JUNCTION	0.01	0.32	178.46	0	01:45	0.32
Outlet1	OUTFALL	0.15	0.15	181.85	0	00:00	0.15
Outlet2	OUTFALL	0.01	0.30	178.37	0	01:45	0.30
Pond	STORAGE	0.24	0.98	182.80	0	03:32	0.98

Node Inflow Summary

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
CB#4	JUNCTION	0.00	194.80	0 01:38	0	0.325	0.007
MH#1	JUNCTION	0.00	90.24	0 01:45	0	0.262	-0.051
MH#2	JUNCTION	0.00	192.40	0 01:44	0	0.532	-0.049
MH#3	JUNCTION	0.00	450.89	0 01:42	0	1.03	-0.088
OGS	JUNCTION	0.00	22.79	0 03:32	0	1.14	0.037
OR1	JUNCTION	0.00	22.79	0 03:31	0	1.14	-0.004
OV#1	JUNCTION	267.57	267.57	0 01:45	0.513	0.513	-0.021
OV#2	JUNCTION	168.49	344.24	0 01:45	0.323	0.575	-0.014
OV#4	JUNCTION	56.64	293.59	0 01:45	0.102	0.407	0.011
OV#5	JUNCTION	62.22	267.09	0 01:45	0.118	0.347	0.033
St.Luke	JUNCTION	172.93	172.93	0 01:45	0.37	0.37	0.021
Outlet1	OUTFALL	0.00	22.79	0 03:32	0	1.14	0.000
Outlet2	OUTFALL	0.00	172.80	0 01:45	0	0.37	0.000
Pond	STORAGE	29.90	550.49	0 01:45	0.092	1.16	1.138

Node Surge Summary

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

Hours	Max. Height Above Crown	Min. Depth Below Rim
-------	----------------------------	-------------------------

Node	Type	Surcharged	Meters	Meters
CB#4	JUNCTION	2.87	0.420	0.000
MH#3	JUNCTION	4.04	0.131	0.527
OR1	JUNCTION	14.83	0.734	0.658

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m ³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m ³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
Pond	0.105	5.0	0.0	0.0	0.513	24.6	0 03:32	22.79

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10 ⁶ ltr
Outlet1	83.34	8.02	22.79	1.141
Outlet2	13.96	17.47	172.80	0.370
System	48.65	25.48	189.86	1.511

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
Curb.Cut	CONDUIT	84.79	0 01:45	0.11	0.01	0.52
Outlet2	CONDUIT	172.80	0 01:45	1.75	1.17	0.84
P1	CONDUIT	89.86	0 01:44	1.05	0.55	0.78
P2	CONDUIT	180.24	0 01:45	1.18	0.86	1.00
P3	CONDUIT	192.84	0 01:38	2.73	3.15	1.00
P4	CONDUIT	444.80	0 01:42	2.07	1.63	1.00
P5	CONDUIT	22.79	0 03:31	0.43	0.32	1.00
P6	CONDUIT	22.79	0 03:32	0.74	0.28	0.45
R-1.1	CHANNEL	175.90	0 01:45	0.57	0.03	0.25
R-1.2	CHANNEL	237.57	0 01:45	0.79	0.04	0.25
R-1.3	CHANNEL	205.56	0 01:45	0.35	0.03	0.44
OR#1	ORIFICE	22.79	0 03:32			1.00
OR#2	ORIFICE	194.80	0 01:38			
OR#3	ORIFICE	85.19	0 01:45			
OR#4	ORIFICE	102.84	0 01:45			
OR#5	ORIFICE	90.24	0 01:45			

Flow Classification Summary

Conduit	Adjusted /Actual Length	----- Up Dry	Down Dry	Sub Crit	Fraction of Time in Flow Class Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
Curb.Cut	9.91	0.00	1.00	0.00	0.00	0.00	0.00	0.96	0.00
Outlet2	1.73	0.00	0.00	0.00	0.84	0.16	0.00	0.04	0.00
P1	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.95	0.00
P2	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.36	0.00

P3	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.35	0.00
P4	1.00	0.00	0.00	0.00	0.97	0.03	0.00	0.00	0.53	0.00
P5	1.28	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
P6	1.80	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
R-1.1	1.00	0.33	0.09	0.00	0.55	0.04	0.00	0.00	0.03	0.00
R-1.2	1.00	0.49	0.02	0.00	0.38	0.11	0.00	0.00	0.00	0.00
R-1.3	1.00	0.66	0.08	0.00	0.23	0.03	0.00	0.00	0.95	0.00

Conduit Surcharge Summary

Conduit	Hours Full			Hours	
	Both Ends	Upstream	Dnstream	Above Full Normal Flow	Capacity Limited
Curb.Cut	0.01	0.01	46.30	0.01	0.01
Outlet2	0.01	0.01	0.01	0.10	0.01
P1	0.01	0.01	3.47	0.01	0.01
P2	1.47	1.47	9.94	0.01	0.01
P3	11.28	11.29	12.67	0.39	0.38
P4	7.37	7.40	8.18	0.30	0.10
P5	13.60	13.60	14.83	0.01	0.01

Analysis begun on: Fri Apr 24 10:46:15 2026

Analysis ended on: Fri Apr 24 10:46:15 2026

Total elapsed time: < 1 sec

SCS II 100-YR STORM EVENT - OUTPUT VALUES

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)

Element Count

Number of rain gages 1

Number of subcatchments ... 20

Number of nodes 14

Number of links 16

Number of pollutants 0

Number of land uses 0

Raingage Summary

Name	Data Source	Data Type	Recording Interval
Raingage	100yearSCS-2hr	INTENSITY	120 min.

Subcatchment Summary

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A-1.1	0.44	41.59	65.00	0.5000	Raingage	St.Luke
A-1.2	0.11	12.67	20.00	0.5000	Raingage	St.Luke
A-2.1	0.09	19.51	65.00	0.5000	Raingage	OV#5
A-2.10	0.08	19.58	65.00	0.5000	Raingage	R-1
A-2.11	0.08	13.80	65.00	0.5000	Raingage	OV#2
A-2.12	0.08	14.03	65.00	0.5000	Raingage	OV#2
A-2.13	0.07	15.00	65.00	0.5000	Raingage	OV#4
A-2.2	0.08	26.41	65.00	0.5000	Raingage	OV#4
A-2.3	0.08	26.53	65.00	0.5000	Raingage	OV#2
A-2.4	0.08	13.82	65.00	0.5000	Raingage	OV#2
A-2.5	0.08	19.58	65.00	0.5000	Raingage	R-1

A-2.6	0.08	13.22	65.00	0.5000	Raingage	OV#1
A-2.7	0.08	17.91	65.00	0.5000	Raingage	OV#1
A-2.8	0.11	21.46	65.00	0.5000	Raingage	OV#1
A-2.9	0.08	12.55	65.00	0.5000	Raingage	OV#1
A-POND	0.16	10.90	25.00	0.5000	Raingage	Pond
R-1	0.07	7.23	80.00	0.5000	Raingage	OV#1
R-2	0.12	14.10	80.00	0.5000	Raingage	OV#1
R-3	0.11	13.00	80.00	0.5000	Raingage	OV#2
R-4	0.07	28.54	80.00	0.5000	Raingage	OV#5

Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
CB#4	JUNCTION	181.94	1.15	0.0	
MH#1	JUNCTION	182.82	1.38	0.0	
MH#2	JUNCTION	182.34	1.54	0.0	
MH#3	JUNCTION	181.87	1.46	0.0	
OGS	JUNCTION	181.76	1.69	0.0	
OR1	JUNCTION	181.76	1.69	0.0	
OV#1	JUNCTION	184.20	0.32	0.0	
OV#2	JUNCTION	183.88	0.31	0.0	
OV#4	JUNCTION	183.32	0.33	0.0	
OV#5	JUNCTION	183.09	0.32	0.0	
St.Luke	JUNCTION	178.13	2.25	0.0	
Outlet1	OUTFALL	181.70	0.30	0.0	
Outlet2	OUTFALL	178.07	0.38	0.0	
Pond	STORAGE	181.82	2.50	0.0	

Link Summary

Name	From Node	To Node	Type	Length	%Slope	Roughness
Curb.Cut	OV#5	Pond	CONDUIT	5.0	30.5992	0.0130
Outlet2	St.Luke	Outlet2	CONDUIT	9.4	0.7130	0.0130
P1	MH#1	MH#2	CONDUIT	55.5	0.8724	0.0130

P2	MH#2	MH#3	CONDUIT	87.1	0.5395	0.0130
P3	CB#4	MH#3	CONDUIT	19.0	0.4004	0.0130
P4	MH#3	Pond	CONDUIT	26.0	0.1964	0.0130
P5	Pond	OR1	CONDUIT	10.7	0.5446	0.0130
P6	OGS	Outlet1	CONDUIT	8.0	0.7250	0.0130
R-1.1	OV#1	OV#2	CONDUIT	56.8	0.5568	0.0130
R-1.2	OV#2	OV#4	CONDUIT	78.3	0.7086	0.0130
R-1.3	OV#5	OV#4	CONDUIT	25.3	-0.9314	0.0130
OR#1	OR1	OGS	ORIFICE			
OR#2	OV#5	CB#4	ORIFICE			
OR#3	OV#4	MH#3	ORIFICE			
OR#4	OV#2	MH#2	ORIFICE			
OR#5	OV#1	MH#1	ORIFICE			

Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
Curb.Cut	TRAPEZOIDAL	0.10	1.56	0.10	16.20	1	13937.12
Outlet2	CIRCULAR	0.38	0.11	0.09	0.38	1	148.06
P1	CIRCULAR	0.38	0.11	0.09	0.38	1	163.77
P2	CIRCULAR	0.45	0.16	0.11	0.45	1	209.42
P3	CIRCULAR	0.30	0.07	0.07	0.30	1	61.20
P4	CIRCULAR	0.60	0.28	0.15	0.60	1	272.11
P5	CIRCULAR	0.30	0.07	0.07	0.30	1	71.37
P6	CIRCULAR	0.30	0.07	0.07	0.30	1	82.34
R-1.1	Road_Section	0.30	3.22	0.16	20.00	1	5472.83
R-1.2	Road_Section	0.30	3.22	0.16	20.00	1	6174.07
R-1.3	Road_Section	0.30	3.22	0.16	20.00	1	7078.12

Transect Summary

Transect Road_Section

Area:

0.0006	0.0024	0.0054	0.0096	0.0150
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0.0216	0.0294	0.0385	0.0487	0.0601
0.0727	0.0865	0.1015	0.1178	0.1350
0.1525	0.1699	0.1873	0.2047	0.2222
0.2396	0.2570	0.2744	0.2919	0.3093
0.3277	0.3468	0.3667	0.3874	0.4089
0.4311	0.4541	0.4779	0.5024	0.5277
0.5538	0.5807	0.6083	0.6367	0.6659
0.6958	0.7265	0.7580	0.7903	0.8233
0.8571	0.8917	0.9270	0.9631	1.0000

Hrad:

0.0182	0.0364	0.0546	0.0728	0.0910
0.1092	0.1274	0.1456	0.1638	0.1820
0.2002	0.2184	0.2366	0.2548	0.2819
0.3179	0.3538	0.3896	0.4253	0.4609
0.4964	0.5319	0.5672	0.6025	0.6377
0.6707	0.7014	0.7300	0.7564	0.7808
0.8033	0.8240	0.8431	0.8606	0.8766
0.8913	0.9048	0.9170	0.9283	0.9385
0.9478	0.9562	0.9639	0.9708	0.9771
0.9827	0.9878	0.9923	0.9964	1.0000

Width:

0.0322	0.0645	0.0967	0.1290	0.1612
0.1934	0.2257	0.2579	0.2902	0.3224
0.3547	0.3869	0.4191	0.4514	0.4675
0.4675	0.4675	0.4675	0.4675	0.4675
0.4675	0.4675	0.4675	0.4675	0.4675
0.5032	0.5239	0.5446	0.5653	0.5860
0.6067	0.6274	0.6481	0.6688	0.6895
0.7102	0.7309	0.7516	0.7723	0.7930
0.8137	0.8344	0.8551	0.8758	0.8965
0.9172	0.9379	0.9586	0.9793	1.0000

Street Summary

Street Street-CS
Area:

0.0006	0.0024	0.0053	0.0095	0.0148
0.0213	0.0290	0.0379	0.0479	0.0592

	0.0716	0.0852	0.1000	0.1160	0.1332
	0.1507	0.1683	0.1859	0.2035	0.2211
	0.2386	0.2562	0.2738	0.2914	0.3090
	0.3272	0.3461	0.3659	0.3864	0.4077
	0.4298	0.4528	0.4764	0.5009	0.5262
	0.5523	0.5791	0.6068	0.6352	0.6644
	0.6944	0.7252	0.7568	0.7892	0.8223
	0.8563	0.8910	0.9266	0.9629	1.0000
Hrad:					
	0.0180	0.0360	0.0540	0.0721	0.0901
	0.1081	0.1261	0.1441	0.1621	0.1801
	0.1982	0.2162	0.2342	0.2522	0.2728
	0.3085	0.3440	0.3794	0.4147	0.4500
	0.4851	0.5202	0.5552	0.5900	0.6250
	0.6587	0.6902	0.7195	0.7466	0.7716
	0.7948	0.8161	0.8357	0.8538	0.8704
	0.8856	0.8995	0.9122	0.9239	0.9345
	0.9443	0.9531	0.9612	0.9685	0.9752
	0.9812	0.9867	0.9916	0.9960	1.0000
Width:					
	0.0316	0.0631	0.0947	0.1263	0.1578
	0.1894	0.2209	0.2525	0.2841	0.3156
	0.3472	0.3788	0.4103	0.4419	0.4688
	0.4688	0.4688	0.4688	0.4688	0.4688
	0.4688	0.4688	0.4688	0.4688	0.4740
	0.4950	0.5160	0.5371	0.5581	0.5792
	0.6002	0.6213	0.6423	0.6633	0.6844
	0.7054	0.7265	0.7475	0.7685	0.7896
	0.8106	0.8317	0.8527	0.8738	0.8948
	0.9158	0.9369	0.9579	0.9790	1.0000

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 03/26/2024 00:00:00
 Ending Date 03/28/2024 00:00:00
 Antecedent Dry Days 0.0
 Report Time Step 00:01:00
 Wet Time Step 00:01:00
 Dry Time Step 00:01:00
 Routing Time Step 5.00 sec
 Variable Time Step YES
 Maximum Trials 8
 Number of Threads 4
 Head Tolerance 0.001500 m

 Control Actions Taken

	Volume	Depth
Runoff Quantity Continuity	hectare-m	mm
*****	-----	-----
Total Precipitation	0.238	108.000
Evaporation Loss	0.000	0.000
Infiltration Loss	0.037	16.959
Surface Runoff	0.199	90.432
Final Storage	0.001	0.613
Continuity Error (%)	-0.003	

	Volume	Volume
Flow Routing Continuity	hectare-m	10^6 ltr
*****	-----	-----
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.199	1.992
Groundwater Inflow	0.000	0.000

RDII Inflow	0.000	0.000
External Inflow	0.002	0.021
External Outflow	0.199	1.989
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	0.001	0.012
Continuity Error (%)	0.580	

Time-Step Critical Elements

Link P5 (4.29%)

Highest Flow Instability Indexes

Link OR#1 (18)

Most Frequent Nonconverging Nodes

Convergence obtained at all time steps.

Routing Time Step Summary

Minimum Time Step	:	0.50 sec
Average Time Step	:	4.93 sec
Maximum Time Step	:	5.00 sec
% of Time in Steady State	:	0.00
Average Iterations per Step	:	2.00
% of Steps Not Converging	:	0.00
Time Step Frequencies	:	
5.000 - 3.155 sec	:	98.50 %
3.155 - 1.991 sec	:	0.71 %

1.991 - 1.256 sec : 0.43 %
 1.256 - 0.792 sec : 0.26 %
 0.792 - 0.500 sec : 0.10 %

 Subcatchment Runoff Summary

Peak Runoff		Total Precip	Total Runon	Total Evap	Total Infil	Imperv Runoff	Perv Runoff	Total Runoff	Total Runoff
Runoff Coeff Subcatchment LPS		mm	mm	mm	mm	mm	mm	mm	10^6 ltr
A-1.1		108.00	0.00	0.00	14.58	69.63	23.22	92.85	0.41
31.26	0.860								
A-1.2		108.00	0.00	0.00	33.65	21.43	52.75	74.18	0.08
7.33	0.687								
A-2.1		108.00	0.00	0.00	14.47	69.55	23.33	92.88	0.08
6.24	0.860								
A-2.10		108.00	0.00	0.00	14.47	69.55	23.33	92.88	0.08
5.98	0.860								
A-2.11		108.00	0.00	0.00	14.50	69.55	23.30	92.85	0.08
5.98	0.860								
A-2.12		108.00	0.00	0.00	14.50	69.55	23.30	92.85	0.08
5.98	0.860								
A-2.13		108.00	0.00	0.00	32.87	69.63	4.93	74.56	0.05
4.02	0.690								
A-2.2		108.00	0.00	0.00	14.45	69.55	23.35	92.91	0.08
6.00	0.860								
A-2.3		108.00	0.00	0.00	14.45	69.55	23.35	92.91	0.08
6.03	0.860								
A-2.4		108.00	0.00	0.00	14.50	69.55	23.30	92.85	0.08
5.99	0.860								
A-2.5		108.00	0.00	0.00	14.47	69.55	23.33	92.88	0.08
5.98	0.860								
A-2.6		108.00	0.00	0.00	33.07	69.63	4.73	74.36	0.06
5.03	0.689								

A-2.7	108.00	0.00	0.00	14.48	69.55	23.32	92.88	0.08
5.98 0.860								
A-2.8	108.00	0.00	0.00	14.48	69.55	23.32	92.87	0.10
7.62 0.860								
A-2.9	108.00	0.00	0.00	14.51	69.55	23.29	92.84	0.08
5.97 0.860								
A-POND	108.00	0.00	0.00	31.94	26.38	49.07	75.44	0.12
10.63 0.699								
R-1	108.00	216.34	0.00	9.28	258.77	55.59	314.36	0.23
17.13 0.969								
R-2	108.00	0.00	0.00	8.28	85.70	13.32	99.02	0.12
8.87 0.917								
R-3	108.00	0.00	0.00	8.28	85.70	13.32	99.02	0.11
8.17 0.917								
R-4	108.00	0.00	0.00	8.24	85.70	13.36	99.07	0.07
5.30 0.917								

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
CB#4	JUNCTION	0.21	0.78	182.73	0 16:11	0.78
MH#1	JUNCTION	0.02	0.11	182.93	0 14:00	0.11
MH#2	JUNCTION	0.08	0.39	182.73	0 16:08	0.39
MH#3	JUNCTION	0.25	0.86	182.73	0 16:12	0.86
OGS	JUNCTION	0.10	0.12	181.88	0 00:01	0.12
OR1	JUNCTION	0.34	0.96	182.72	0 16:11	0.96
OV#1	JUNCTION	0.01	0.03	184.23	0 14:00	0.03
OV#2	JUNCTION	0.00	0.03	183.91	0 14:00	0.03
OV#4	JUNCTION	0.00	0.03	183.35	0 14:00	0.03
OV#5	JUNCTION	0.00	0.03	183.12	0 14:00	0.03
St.Luke	JUNCTION	0.02	0.13	178.27	0 14:00	0.13
Outlet1	OUTFALL	0.15	0.15	181.85	0 00:00	0.15
Outlet2	OUTFALL	0.02	0.13	178.20	0 14:00	0.13
Pond	STORAGE	0.29	0.91	182.73	0 16:11	0.91

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
CB#4	JUNCTION	0.00	26.68	0 14:00	0	0.263	-0.004
MH#1	JUNCTION	0.00	28.19	0 14:00	0	0.467	-0.017
MH#2	JUNCTION	0.00	58.08	0 14:00	0	0.895	-0.035
MH#3	JUNCTION	0.00	103.99	0 13:34	0	1.38	0.014
OGS	JUNCTION	0.00	21.92	0 16:12	0	1.52	0.025
OR1	JUNCTION	0.00	21.92	0 16:10	0	1.52	0.009
OV#1	JUNCTION	50.59	50.59	0 14:00	0.669	0.669	-0.004
OV#2	JUNCTION	32.15	54.55	0 14:00	0.427	0.629	0.003
OV#4	JUNCTION	10.02	34.68	0 14:00	0.129	0.329	0.004
OV#5	JUNCTION	11.54	26.68	0 14:00	0.155	0.263	-0.007
St.Luke	JUNCTION	38.60	38.60	0 14:00	0.489	0.489	0.004
Outlet1	OUTFALL	0.00	21.92	0 16:12	0	1.52	0.000
Outlet2	OUTFALL	0.00	38.59	0 14:00	0	0.489	0.000
Pond	STORAGE	10.63	112.04	0 13:34	0.123	1.52	0.857

Node Surge 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
MH#3	JUNCTION	3.65	0.060	0.598
OR1	JUNCTION	18.74	0.663	0.729

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m ³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m ³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
Pond	0.126	6.0	0.0	0.0	0.462	22.1	0 16:11	21.92

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10 ⁶ ltr
Outlet1	94.12	9.41	21.92	1.521
Outlet2	54.14	5.37	38.59	0.489
System	74.13	14.78	58.50	2.010

Link Flow Summary

	Maximum	Time of Max	Maximum	Max/ Max	Max/ Max
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Link	Type	Flow LPS	Occurrence days hr:min	Veloc m/sec	Full Flow	Full Depth
Curb.Cut	CONDUIT	0.00	0 00:00	0.00	0.00	0.50
Outlet2	CONDUIT	38.59	0 14:00	1.13	0.26	0.35
P1	CONDUIT	28.19	0 14:00	0.80	0.17	0.59
P2	CONDUIT	57.99	0 13:34	0.80	0.28	0.94
P3	CONDUIT	26.58	0 14:00	0.40	0.43	1.00
P4	CONDUIT	102.33	0 13:34	1.01	0.38	1.00
P5	CONDUIT	21.92	0 16:10	0.43	0.31	1.00
P6	CONDUIT	21.92	0 16:12	0.71	0.27	0.45
R-1.1	CHANNEL	22.40	0 14:00	0.36	0.00	0.11
R-1.2	CHANNEL	24.66	0 14:00	0.49	0.00	0.10
R-1.3	CHANNEL	15.15	0 14:00	0.34	0.00	0.10
OR#1	ORIFICE	21.92	0 16:12			1.00
OR#2	ORIFICE	26.68	0 14:00			
OR#3	ORIFICE	19.53	0 14:00			
OR#4	ORIFICE	29.89	0 14:00			
OR#5	ORIFICE	28.19	0 14:00			

Flow Classification Summary

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class								
		Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
Curb.Cut	9.91	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Outlet2	1.73	0.04	0.00	0.00	0.41	0.55	0.00	0.00	0.04	0.00
P1	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.91	0.00
P2	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.68	0.00
P3	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.45	0.00
P4	1.00	0.00	0.04	0.00	0.96	0.00	0.00	0.00	0.36	0.00
P5	1.28	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
P6	1.80	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
R-1.1	1.00	0.08	0.04	0.00	0.83	0.05	0.00	0.00	0.04	0.00
R-1.2	1.00	0.16	0.01	0.00	0.31	0.52	0.00	0.00	0.00	0.00
R-1.3	1.00	0.27	0.07	0.00	0.34	0.32	0.00	0.00	0.38	0.00

 Conduit Surcharge Summary

Conduit	Hours Full			Hours	Hours
	Both Ends	Upstream	Dnstream	Above Full Normal Flow	Capacity Limited
P1	0.01	0.01	1.37	0.01	0.01
P2	0.01	0.01	13.18	0.01	0.01
P3	14.73	14.73	16.31	0.01	0.01
P4	9.57	9.57	10.86	0.01	0.01
P5	17.39	17.39	18.74	0.01	0.01

Analysis begun on: Fri Apr 24 10:57:01 2026
 Analysis ended on: Fri Apr 24 10:57:01 2026
 Total elapsed time: < 1 sec

CHICAGO 5-YR STORM EVENT - OUTPUT VALUES

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)

Element Count

Number of rain gages 1
Number of subcatchments ... 20
Number of nodes 14
Number of links 16
Number of pollutants 0
Number of land uses 0

Raingage Summary

Name	Data Source	Data Type	Recording Interval
Raingage	chicago5yr	INTENSITY	15 min.

Subcatchment Summary

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A-1.1	0.44	41.59	65.00	0.5000	Raingage	St.Luke
A-1.2	0.11	12.67	20.00	0.5000	Raingage	St.Luke
A-2.1	0.09	19.51	65.00	0.5000	Raingage	OV#5
A-2.10	0.08	19.58	65.00	0.5000	Raingage	R-1
A-2.11	0.08	13.80	65.00	0.5000	Raingage	OV#2
A-2.12	0.08	14.03	65.00	0.5000	Raingage	OV#2
A-2.13	0.07	15.00	65.00	0.5000	Raingage	OV#4
A-2.2	0.08	26.41	65.00	0.5000	Raingage	OV#4
A-2.3	0.08	26.53	65.00	0.5000	Raingage	OV#2
A-2.4	0.08	13.82	65.00	0.5000	Raingage	OV#2
A-2.5	0.08	19.58	65.00	0.5000	Raingage	R-1

A-2.6	0.08	13.22	65.00	0.5000	Raingage	OV#1
A-2.7	0.08	17.91	65.00	0.5000	Raingage	OV#1
A-2.8	0.11	21.46	65.00	0.5000	Raingage	OV#1
A-2.9	0.08	12.55	65.00	0.5000	Raingage	OV#1
A-POND	0.16	10.90	25.00	0.5000	Raingage	Pond
R-1	0.07	7.23	80.00	0.5000	Raingage	OV#1
R-2	0.12	14.10	80.00	0.5000	Raingage	OV#1
R-3	0.11	13.00	80.00	0.5000	Raingage	OV#2
R-4	0.07	28.54	80.00	0.5000	Raingage	OV#5

Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
CB#4	JUNCTION	181.94	1.15	0.0	
MH#1	JUNCTION	182.82	1.38	0.0	
MH#2	JUNCTION	182.34	1.54	0.0	
MH#3	JUNCTION	181.87	1.46	0.0	
OGS	JUNCTION	181.76	1.69	0.0	
OR1	JUNCTION	181.76	1.69	0.0	
OV#1	JUNCTION	184.20	0.32	0.0	
OV#2	JUNCTION	183.88	0.31	0.0	
OV#4	JUNCTION	183.32	0.33	0.0	
OV#5	JUNCTION	183.09	0.32	0.0	
St.Luke	JUNCTION	178.13	2.25	0.0	
Outlet1	OUTFALL	181.70	0.30	0.0	
Outlet2	OUTFALL	178.07	0.38	0.0	
Pond	STORAGE	181.82	2.50	0.0	

Link Summary

Name	From Node	To Node	Type	Length	%Slope	Roughness
Curb.Cut	OV#5	Pond	CONDUIT	5.0	30.5992	0.0130
Outlet2	St.Luke	Outlet2	CONDUIT	9.4	0.7130	0.0130
P1	MH#1	MH#2	CONDUIT	55.5	0.8724	0.0130

P2	MH#2	MH#3	CONDUIT	87.1	0.5395	0.0130
P3	CB#4	MH#3	CONDUIT	19.0	0.4004	0.0130
P4	MH#3	Pond	CONDUIT	26.0	0.1964	0.0130
P5	Pond	OR1	CONDUIT	10.7	0.5446	0.0130
P6	OGS	Outlet1	CONDUIT	8.0	0.7250	0.0130
R-1.1	OV#1	OV#2	CONDUIT	56.8	0.5568	0.0130
R-1.2	OV#2	OV#4	CONDUIT	78.3	0.7086	0.0130
R-1.3	OV#5	OV#4	CONDUIT	25.3	-0.9314	0.0130
OR#1	OR1	OGS	ORIFICE			
OR#2	OV#5	CB#4	ORIFICE			
OR#3	OV#4	MH#3	ORIFICE			
OR#4	OV#2	MH#2	ORIFICE			
OR#5	OV#1	MH#1	ORIFICE			

Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
Curb.Cut	TRAPEZOIDAL	0.10	1.56	0.10	16.20	1	13937.12
Outlet2	CIRCULAR	0.38	0.11	0.09	0.38	1	148.06
P1	CIRCULAR	0.38	0.11	0.09	0.38	1	163.77
P2	CIRCULAR	0.45	0.16	0.11	0.45	1	209.42
P3	CIRCULAR	0.30	0.07	0.07	0.30	1	61.20
P4	CIRCULAR	0.60	0.28	0.15	0.60	1	272.11
P5	CIRCULAR	0.30	0.07	0.07	0.30	1	71.37
P6	CIRCULAR	0.30	0.07	0.07	0.30	1	82.34
R-1.1	Road_Section	0.30	3.22	0.16	20.00	1	5472.83
R-1.2	Road_Section	0.30	3.22	0.16	20.00	1	6174.07
R-1.3	Road_Section	0.30	3.22	0.16	20.00	1	7078.12

Transect Summary

Transect Road_Section

Area:

0.0006	0.0024	0.0054	0.0096	0.0150
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0.0216	0.0294	0.0385	0.0487	0.0601
0.0727	0.0865	0.1015	0.1178	0.1350
0.1525	0.1699	0.1873	0.2047	0.2222
0.2396	0.2570	0.2744	0.2919	0.3093
0.3277	0.3468	0.3667	0.3874	0.4089
0.4311	0.4541	0.4779	0.5024	0.5277
0.5538	0.5807	0.6083	0.6367	0.6659
0.6958	0.7265	0.7580	0.7903	0.8233
0.8571	0.8917	0.9270	0.9631	1.0000

Hrad:

0.0182	0.0364	0.0546	0.0728	0.0910
0.1092	0.1274	0.1456	0.1638	0.1820
0.2002	0.2184	0.2366	0.2548	0.2819
0.3179	0.3538	0.3896	0.4253	0.4609
0.4964	0.5319	0.5672	0.6025	0.6377
0.6707	0.7014	0.7300	0.7564	0.7808
0.8033	0.8240	0.8431	0.8606	0.8766
0.8913	0.9048	0.9170	0.9283	0.9385
0.9478	0.9562	0.9639	0.9708	0.9771
0.9827	0.9878	0.9923	0.9964	1.0000

Width:

0.0322	0.0645	0.0967	0.1290	0.1612
0.1934	0.2257	0.2579	0.2902	0.3224
0.3547	0.3869	0.4191	0.4514	0.4675
0.4675	0.4675	0.4675	0.4675	0.4675
0.4675	0.4675	0.4675	0.4675	0.4675
0.5032	0.5239	0.5446	0.5653	0.5860
0.6067	0.6274	0.6481	0.6688	0.6895
0.7102	0.7309	0.7516	0.7723	0.7930
0.8137	0.8344	0.8551	0.8758	0.8965
0.9172	0.9379	0.9586	0.9793	1.0000

Street Summary

Street Street-CS
Area:

0.0006	0.0024	0.0053	0.0095	0.0148
0.0213	0.0290	0.0379	0.0479	0.0592

	0.0716	0.0852	0.1000	0.1160	0.1332
	0.1507	0.1683	0.1859	0.2035	0.2211
	0.2386	0.2562	0.2738	0.2914	0.3090
	0.3272	0.3461	0.3659	0.3864	0.4077
	0.4298	0.4528	0.4764	0.5009	0.5262
	0.5523	0.5791	0.6068	0.6352	0.6644
	0.6944	0.7252	0.7568	0.7892	0.8223
	0.8563	0.8910	0.9266	0.9629	1.0000
Hrad:					
	0.0180	0.0360	0.0540	0.0721	0.0901
	0.1081	0.1261	0.1441	0.1621	0.1801
	0.1982	0.2162	0.2342	0.2522	0.2728
	0.3085	0.3440	0.3794	0.4147	0.4500
	0.4851	0.5202	0.5552	0.5900	0.6250
	0.6587	0.6902	0.7195	0.7466	0.7716
	0.7948	0.8161	0.8357	0.8538	0.8704
	0.8856	0.8995	0.9122	0.9239	0.9345
	0.9443	0.9531	0.9612	0.9685	0.9752
	0.9812	0.9867	0.9916	0.9960	1.0000
Width:					
	0.0316	0.0631	0.0947	0.1263	0.1578
	0.1894	0.2209	0.2525	0.2841	0.3156
	0.3472	0.3788	0.4103	0.4419	0.4688
	0.4688	0.4688	0.4688	0.4688	0.4688
	0.4688	0.4688	0.4688	0.4688	0.4740
	0.4950	0.5160	0.5371	0.5581	0.5792
	0.6002	0.6213	0.6423	0.6633	0.6844
	0.7054	0.7265	0.7475	0.7685	0.7896
	0.8106	0.8317	0.8527	0.8738	0.8948
	0.9158	0.9369	0.9579	0.9790	1.0000

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 03/26/2024 00:00:00
 Ending Date 03/28/2024 00:00:00
 Antecedent Dry Days 0.0
 Report Time Step 00:01:00
 Wet Time Step 00:01:00
 Dry Time Step 00:01:00
 Routing Time Step 5.00 sec
 Variable Time Step YES
 Maximum Trials 8
 Number of Threads 4
 Head Tolerance 0.001500 m

 Control Actions Taken

	Volume	Depth
Runoff Quantity Continuity	hectare-m	mm
*****	-----	-----
Total Precipitation	0.109	49.475
Evaporation Loss	0.000	0.000
Infiltration Loss	0.026	11.775
Surface Runoff	0.082	37.103
Final Storage	0.001	0.612
Continuity Error (%)	-0.031	

	Volume	Volume
Flow Routing Continuity	hectare-m	10^6 ltr
*****	-----	-----
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.082	0.817
Groundwater Inflow	0.000	0.000

RDII Inflow	0.000	0.000
External Inflow	0.001	0.010
External Outflow	0.080	0.803
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	0.001	0.012
Continuity Error (%)	1.432	

Highest Continuity Errors

Node Pond (2.06%)

Time-Step Critical Elements

Link P5 (3.94%)

Highest Flow Instability Indexes

Link OR#1 (67)

Most Frequent Nonconverging Nodes

Convergence obtained at all time steps.

Routing Time Step Summary

Minimum Time Step	:	0.54 sec
Average Time Step	:	4.94 sec
Maximum Time Step	:	5.00 sec

A-2.4	49.48	0.00	0.00	10.47	31.52	6.85	38.37	0.03
15.94 0.776								
A-2.5	49.47	0.00	0.00	10.39	31.52	6.93	38.46	0.03
16.61 0.777								
A-2.6	49.48	0.00	0.00	15.56	31.60	1.75	33.36	0.03
15.00 0.674								
A-2.7	49.47	0.00	0.00	10.41	31.52	6.91	38.44	0.03
16.43 0.777								
A-2.8	49.48	0.00	0.00	10.42	31.52	6.90	38.42	0.04
20.78 0.777								
A-2.9	49.48	0.00	0.00	10.50	31.52	6.82	38.34	0.03
15.72 0.775								
A-POND	49.48	0.00	0.00	24.22	11.75	12.89	24.64	0.04
12.53 0.498								
R-1	49.48	89.57	0.00	6.16	110.56	21.66	132.21	0.10
46.85 0.951								
R-2	49.48	0.00	0.00	5.96	38.89	3.94	42.83	0.05
26.53 0.866								
R-3	49.48	0.00	0.00	5.96	38.89	3.94	42.83	0.05
24.46 0.866								
R-4	49.48	0.00	0.00	5.85	38.90	4.05	42.95	0.03
17.23 0.868								

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
CB#4	JUNCTION	0.06	0.56	182.50	0 01:45	0.55
MH#1	JUNCTION	0.01	0.15	182.98	0 01:45	0.15
MH#2	JUNCTION	0.01	0.25	182.58	0 01:45	0.25
MH#3	JUNCTION	0.08	0.51	182.37	0 03:15	0.51
OGS	JUNCTION	0.09	0.12	181.88	0 00:01	0.12
OR1	JUNCTION	0.17	0.61	182.37	0 03:16	0.61
OV#1	JUNCTION	0.00	0.05	184.25	0 01:45	0.05
OV#2	JUNCTION	0.00	0.06	183.94	0 01:45	0.06
OV#4	JUNCTION	0.00	0.05	183.37	0 01:45	0.05

OV#5	JUNCTION	0.00	0.08	183.17	0	01:45	0.08
St.Luke	JUNCTION	0.01	0.21	178.34	0	01:45	0.21
Outlet1	OUTFALL	0.15	0.15	181.85	0	00:00	0.15
Outlet2	OUTFALL	0.01	0.21	178.27	0	01:45	0.21
Pond	STORAGE	0.12	0.56	182.37	0	03:16	0.56

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
CB#4	JUNCTION	0.00	110.12	0 01:45	0	0.149	0.002
MH#1	JUNCTION	0.00	58.49	0 01:45	0	0.169	-0.005
MH#2	JUNCTION	0.00	123.17	0 01:45	0	0.335	-0.097
MH#3	JUNCTION	0.00	282.09	0 01:45	0	0.583	0.025
OGS	JUNCTION	0.00	16.92	0 03:16	0	0.618	0.061
OR1	JUNCTION	0.00	16.92	0 03:15	0	0.617	0.031
OV#1	JUNCTION	141.31	141.31	0 01:45	0.283	0.283	-0.022
OV#2	JUNCTION	89.63	170.89	0 01:45	0.179	0.293	-0.008
OV#4	JUNCTION	29.65	131.14	0 01:45	0.0552	0.182	0.055
OV#5	JUNCTION	34.45	112.66	0 01:45	0.0656	0.149	-0.017
St.Luke	JUNCTION	86.25	86.25	0 01:45	0.195	0.195	0.023
Outlet1	OUTFALL	0.00	16.92	0 03:16	0	0.619	0.000
Outlet2	OUTFALL	0.00	86.11	0 01:45	0	0.195	0.000
Pond	STORAGE	12.53	289.11	0 01:45	0.0403	0.632	2.107

Node Surge Summary

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

Hours	Max. Height Above Crown	Min. Depth Below Rim
-------	----------------------------	-------------------------

Node	Type	Surcharged	Meters	Meters
OR1	JUNCTION	8.21	0.313	1.079

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m ³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m ³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
Pond	0.044	2.1	0.0	0.0	0.238	11.4	0 03:16	16.92

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10 ⁶ ltr
Outlet1	77.51	4.74	16.92	0.619
Outlet2	13.44	8.84	86.11	0.195
System	45.47	13.58	98.71	0.813

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
Curb.Cut	CONDUIT	0.00	0 00:00	0.00	0.00	0.50
Outlet2	CONDUIT	86.11	0 01:45	1.39	0.58	0.55
P1	CONDUIT	58.39	0 01:45	0.97	0.36	0.54
P2	CONDUIT	122.48	0 01:45	1.06	0.58	0.71
P3	CONDUIT	109.98	0 01:45	1.56	1.80	1.00
P4	CONDUIT	278.56	0 01:45	1.92	1.02	0.89
P5	CONDUIT	16.92	0 03:15	0.43	0.24	1.00
P6	CONDUIT	16.92	0 03:16	0.65	0.21	0.45
R-1.1	CHANNEL	81.39	0 01:45	0.48	0.01	0.19
R-1.2	CHANNEL	102.06	0 01:45	0.66	0.02	0.18
R-1.3	CHANNEL	78.91	0 01:45	0.34	0.01	0.22
OR#1	ORIFICE	16.92	0 03:16			1.00
OR#2	ORIFICE	110.12	0 01:45			
OR#3	ORIFICE	49.71	0 01:45			
OR#4	ORIFICE	64.78	0 01:45			
OR#5	ORIFICE	58.49	0 01:45			

Flow Classification Summary

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class								
		Up Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
Curb.Cut	9.91	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Outlet2	1.73	0.00	0.00	0.00	0.84	0.16	0.00	0.00	0.03	0.00
P1	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.95	0.00
P2	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.54	0.00
P3	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.35	0.00
P4	1.00	0.00	0.00	0.00	0.96	0.03	0.00	0.00	0.67	0.00

P5	1.28	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
P6	1.80	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
R-1.1	1.00	0.33	0.09	0.00	0.54	0.04	0.00	0.00	0.02	0.00
R-1.2	1.00	0.49	0.02	0.00	0.38	0.11	0.00	0.00	0.00	0.00
R-1.3	1.00	0.66	0.08	0.00	0.23	0.03	0.00	0.00	0.95	0.00

Conduit Surcharge Summary

Conduit	----- Both Ends	Hours Full Upstream	----- Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
P2	0.01	0.01	2.89	0.01	0.01
P3	4.68	4.70	6.07	0.23	0.20
P4	0.01	0.01	0.01	0.03	0.01
P5	6.96	6.96	8.21	0.01	0.01

Analysis begun on: Fri Apr 24 11:01:16 2026

Analysis ended on: Fri Apr 24 11:01:17 2026

Total elapsed time: 00:00:01

WATER QUALITY TEST - OUTPUT VALUES

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)

Element Count

Number of rain gages 1
Number of subcatchments ... 20
Number of nodes 14
Number of links 16
Number of pollutants 0
Number of land uses 0

Raingage Summary

Name	Data Source	Data Type	Recording Interval
Raingage	WQ	INTENSITY	15 min.

Subcatchment Summary

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A-1.1	0.44	41.59	65.00	0.5000	Raingage	St.Luke
A-1.2	0.11	12.67	20.00	0.5000	Raingage	St.Luke
A-2.1	0.09	19.51	65.00	0.5000	Raingage	OV#5
A-2.10	0.08	19.58	65.00	0.5000	Raingage	R-1
A-2.11	0.08	13.80	65.00	0.5000	Raingage	OV#2
A-2.12	0.08	14.03	65.00	0.5000	Raingage	OV#2
A-2.13	0.07	15.00	65.00	0.5000	Raingage	OV#4
A-2.2	0.08	26.41	65.00	0.5000	Raingage	OV#4
A-2.3	0.08	26.53	65.00	0.5000	Raingage	OV#2
A-2.4	0.08	13.82	65.00	0.5000	Raingage	OV#2
A-2.5	0.08	19.58	65.00	0.5000	Raingage	R-1

A-2.6	0.08	13.22	65.00	0.5000	Raingage	OV#1
A-2.7	0.08	17.91	65.00	0.5000	Raingage	OV#1
A-2.8	0.11	21.46	65.00	0.5000	Raingage	OV#1
A-2.9	0.08	12.55	65.00	0.5000	Raingage	OV#1
A-POND	0.16	10.90	25.00	0.5000	Raingage	Pond
R-1	0.07	7.23	80.00	0.5000	Raingage	OV#1
R-2	0.12	14.10	80.00	0.5000	Raingage	OV#1
R-3	0.11	13.00	80.00	0.5000	Raingage	OV#2
R-4	0.07	28.54	80.00	0.5000	Raingage	OV#5

Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
CB#4	JUNCTION	181.94	1.15	0.0	
MH#1	JUNCTION	182.82	1.38	0.0	
MH#2	JUNCTION	182.34	1.54	0.0	
MH#3	JUNCTION	181.87	1.46	0.0	
OGS	JUNCTION	181.76	1.69	0.0	
OR1	JUNCTION	181.76	1.69	0.0	
OV#1	JUNCTION	184.20	0.32	0.0	
OV#2	JUNCTION	183.88	0.31	0.0	
OV#4	JUNCTION	183.32	0.33	0.0	
OV#5	JUNCTION	183.09	0.32	0.0	
St.Luke	JUNCTION	178.13	2.25	0.0	
Outlet1	OUTFALL	181.70	0.30	0.0	
Outlet2	OUTFALL	178.07	0.38	0.0	
Pond	STORAGE	181.82	2.50	0.0	

Link Summary

Name	From Node	To Node	Type	Length	%Slope	Roughness
Curb.Cut	OV#5	Pond	CONDUIT	5.0	30.5992	0.0130
Outlet2	St.Luke	Outlet2	CONDUIT	9.4	0.7130	0.0130
P1	MH#1	MH#2	CONDUIT	55.5	0.8724	0.0130

P2	MH#2	MH#3	CONDUIT	87.1	0.5395	0.0130
P3	CB#4	MH#3	CONDUIT	19.0	0.4004	0.0130
P4	MH#3	Pond	CONDUIT	26.0	0.1964	0.0130
P5	Pond	OR1	CONDUIT	10.7	0.5446	0.0130
P6	OGS	Outlet1	CONDUIT	8.0	0.7250	0.0130
R-1.1	OV#1	OV#2	CONDUIT	56.8	0.5568	0.0130
R-1.2	OV#2	OV#4	CONDUIT	78.3	0.7086	0.0130
R-1.3	OV#5	OV#4	CONDUIT	25.3	-0.9314	0.0130
OR#1	OR1	OGS	ORIFICE			
OR#2	OV#5	CB#4	ORIFICE			
OR#3	OV#4	MH#3	ORIFICE			
OR#4	OV#2	MH#2	ORIFICE			
OR#5	OV#1	MH#1	ORIFICE			

Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
Curb.Cut	TRAPEZOIDAL	0.10	1.56	0.10	16.20	1	13937.12
Outlet2	CIRCULAR	0.38	0.11	0.09	0.38	1	148.06
P1	CIRCULAR	0.38	0.11	0.09	0.38	1	163.77
P2	CIRCULAR	0.45	0.16	0.11	0.45	1	209.42
P3	CIRCULAR	0.30	0.07	0.07	0.30	1	61.20
P4	CIRCULAR	0.60	0.28	0.15	0.60	1	272.11
P5	CIRCULAR	0.30	0.07	0.07	0.30	1	71.37
P6	CIRCULAR	0.30	0.07	0.07	0.30	1	82.34
R-1.1	Road_Section	0.30	3.22	0.16	20.00	1	5472.83
R-1.2	Road_Section	0.30	3.22	0.16	20.00	1	6174.07
R-1.3	Road_Section	0.30	3.22	0.16	20.00	1	7078.12

Transect Summary

Transect Road_Section

Area:

0.0006	0.0024	0.0054	0.0096	0.0150
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0.0216	0.0294	0.0385	0.0487	0.0601
0.0727	0.0865	0.1015	0.1178	0.1350
0.1525	0.1699	0.1873	0.2047	0.2222
0.2396	0.2570	0.2744	0.2919	0.3093
0.3277	0.3468	0.3667	0.3874	0.4089
0.4311	0.4541	0.4779	0.5024	0.5277
0.5538	0.5807	0.6083	0.6367	0.6659
0.6958	0.7265	0.7580	0.7903	0.8233
0.8571	0.8917	0.9270	0.9631	1.0000

Hrad:

0.0182	0.0364	0.0546	0.0728	0.0910
0.1092	0.1274	0.1456	0.1638	0.1820
0.2002	0.2184	0.2366	0.2548	0.2819
0.3179	0.3538	0.3896	0.4253	0.4609
0.4964	0.5319	0.5672	0.6025	0.6377
0.6707	0.7014	0.7300	0.7564	0.7808
0.8033	0.8240	0.8431	0.8606	0.8766
0.8913	0.9048	0.9170	0.9283	0.9385
0.9478	0.9562	0.9639	0.9708	0.9771
0.9827	0.9878	0.9923	0.9964	1.0000

Width:

0.0322	0.0645	0.0967	0.1290	0.1612
0.1934	0.2257	0.2579	0.2902	0.3224
0.3547	0.3869	0.4191	0.4514	0.4675
0.4675	0.4675	0.4675	0.4675	0.4675
0.4675	0.4675	0.4675	0.4675	0.4675
0.5032	0.5239	0.5446	0.5653	0.5860
0.6067	0.6274	0.6481	0.6688	0.6895
0.7102	0.7309	0.7516	0.7723	0.7930
0.8137	0.8344	0.8551	0.8758	0.8965
0.9172	0.9379	0.9586	0.9793	1.0000

Street Summary

Street Street-CS
Area:

0.0006	0.0024	0.0053	0.0095	0.0148
0.0213	0.0290	0.0379	0.0479	0.0592

	0.0716	0.0852	0.1000	0.1160	0.1332
	0.1507	0.1683	0.1859	0.2035	0.2211
	0.2386	0.2562	0.2738	0.2914	0.3090
	0.3272	0.3461	0.3659	0.3864	0.4077
	0.4298	0.4528	0.4764	0.5009	0.5262
	0.5523	0.5791	0.6068	0.6352	0.6644
	0.6944	0.7252	0.7568	0.7892	0.8223
	0.8563	0.8910	0.9266	0.9629	1.0000
Hrad:					
	0.0180	0.0360	0.0540	0.0721	0.0901
	0.1081	0.1261	0.1441	0.1621	0.1801
	0.1982	0.2162	0.2342	0.2522	0.2728
	0.3085	0.3440	0.3794	0.4147	0.4500
	0.4851	0.5202	0.5552	0.5900	0.6250
	0.6587	0.6902	0.7195	0.7466	0.7716
	0.7948	0.8161	0.8357	0.8538	0.8704
	0.8856	0.8995	0.9122	0.9239	0.9345
	0.9443	0.9531	0.9612	0.9685	0.9752
	0.9812	0.9867	0.9916	0.9960	1.0000
Width:					
	0.0316	0.0631	0.0947	0.1263	0.1578
	0.1894	0.2209	0.2525	0.2841	0.3156
	0.3472	0.3788	0.4103	0.4419	0.4688
	0.4688	0.4688	0.4688	0.4688	0.4688
	0.4688	0.4688	0.4688	0.4688	0.4740
	0.4950	0.5160	0.5371	0.5581	0.5792
	0.6002	0.6213	0.6423	0.6633	0.6844
	0.7054	0.7265	0.7475	0.7685	0.7896
	0.8106	0.8317	0.8527	0.8738	0.8948
	0.9158	0.9369	0.9579	0.9790	1.0000

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 03/26/2024 00:00:00
 Ending Date 03/28/2024 00:00:00
 Antecedent Dry Days 0.0
 Report Time Step 00:01:00
 Wet Time Step 00:01:00
 Dry Time Step 00:01:00
 Routing Time Step 5.00 sec
 Variable Time Step YES
 Maximum Trials 8
 Number of Threads 4
 Head Tolerance 0.001500 m

 Control Actions Taken

	Volume	Depth
Runoff Quantity Continuity	hectare-m	mm
*****	-----	-----
Total Precipitation	0.070	31.995
Evaporation Loss	0.000	0.000
Infiltration Loss	0.025	11.246
Surface Runoff	0.044	20.144
Final Storage	0.001	0.612
Continuity Error (%)	-0.023	

	Volume	Volume
Flow Routing Continuity	hectare-m	10^6 ltr
*****	-----	-----
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.044	0.444
Groundwater Inflow	0.000	0.000

RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.044	0.441
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	0.001
Continuity Error (%)	0.252	

Time-Step Critical Elements

Link P5 (9.46%)

Highest Flow Instability Indexes

All links are stable.

Most Frequent Nonconverging Nodes

Convergence obtained at all time steps.

Routing Time Step Summary

Minimum Time Step	:	0.57 sec
Average Time Step	:	4.78 sec
Maximum Time Step	:	5.00 sec
% of Time in Steady State	:	0.00
Average Iterations per Step	:	2.00
% of Steps Not Converging	:	0.00
Time Step Frequencies	:	
5.000 - 3.155 sec	:	94.65 %
3.155 - 1.991 sec	:	1.94 %

1.991 - 1.256 sec : 1.59 %
 1.256 - 0.792 sec : 1.22 %
 0.792 - 0.500 sec : 0.61 %

 Subcatchment Runoff Summary

Peak Runoff		Total	Total	Total	Total	Imperv	Perv	Total	Total
Runoff Coeff		Precip	Runon	Evap	Infil	Runoff	Runoff	Runoff	Runoff
Subcatchment		mm	mm	mm	mm	mm	mm	mm	10^6 ltr
LPS									
A-1.1		31.99	0.00	0.00	10.45	20.23	0.75	20.98	0.09
45.03	0.656								
A-1.2		32.00	0.00	0.00	24.24	6.23	1.36	7.59	0.01
3.46	0.237								
A-2.1		31.99	0.00	0.00	10.28	20.15	0.92	21.07	0.02
9.16	0.659								
A-2.10		31.99	0.00	0.00	10.27	20.16	0.92	21.08	0.02
8.78	0.659								
A-2.11		31.99	0.00	0.00	10.34	20.15	0.86	21.02	0.02
8.75	0.657								
A-2.12		31.99	0.00	0.00	10.33	20.15	0.87	21.02	0.02
8.76	0.657								
A-2.13		32.00	0.00	0.00	11.20	20.24	0.00	20.24	0.01
7.04	0.632								
A-2.2		31.99	0.00	0.00	10.23	20.16	0.97	21.12	0.02
8.82	0.660								
A-2.3		32.00	0.00	0.00	10.23	20.16	0.97	21.12	0.02
8.87	0.660								
A-2.4		32.00	0.00	0.00	10.34	20.15	0.86	21.02	0.02
8.77	0.657								
A-2.5		31.99	0.00	0.00	10.27	20.16	0.92	21.08	0.02
8.78	0.659								
A-2.6		31.99	0.00	0.00	11.20	20.23	0.00	20.23	0.02
8.79	0.632								

A-2.7	31.99	0.00	0.00	10.29	20.15	0.91	21.06	0.02
8.78 0.658								
A-2.8	32.00	0.00	0.00	10.30	20.15	0.90	21.05	0.02
11.18 0.658								
A-2.9	31.99	0.00	0.00	10.35	20.15	0.84	21.00	0.02
8.73 0.656								
A-POND	31.99	0.00	0.00	23.00	7.38	1.00	8.38	0.01
6.54 0.262								
R-1	31.99	49.10	0.00	6.10	64.19	10.12	74.31	0.05
26.61 0.916								
R-2	31.99	0.00	0.00	5.89	24.90	0.51	25.41	0.03
15.58 0.794								
R-3	32.00	0.00	0.00	5.89	24.90	0.51	25.41	0.03
14.37 0.794								
R-4	32.00	0.00	0.00	5.80	24.91	0.60	25.51	0.02
9.54 0.797								

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
CB#4	JUNCTION	0.02	0.24	182.18	0 01:45	0.24
MH#1	JUNCTION	0.01	0.12	182.95	0 01:45	0.12
MH#2	JUNCTION	0.01	0.19	182.53	0 01:45	0.19
MH#3	JUNCTION	0.04	0.27	182.14	0 01:45	0.27
OGS	JUNCTION	0.02	0.08	181.84	0 02:48	0.08
OR1	JUNCTION	0.07	0.36	182.12	0 02:48	0.36
OV#1	JUNCTION	0.00	0.04	184.24	0 01:45	0.04
OV#2	JUNCTION	0.00	0.04	183.92	0 01:45	0.04
OV#4	JUNCTION	0.00	0.03	183.36	0 01:45	0.03
OV#5	JUNCTION	0.00	0.05	183.14	0 01:45	0.05
St.Luke	JUNCTION	0.01	0.15	178.28	0 01:45	0.15
Outlet1	OUTFALL	0.02	0.08	181.78	0 02:49	0.08
Outlet2	OUTFALL	0.01	0.15	178.22	0 01:45	0.15
Pond	STORAGE	0.05	0.30	182.12	0 02:48	0.30

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
CB#4	JUNCTION	0.00	50.33	0 01:45	0	0.0689	-0.010
MH#1	JUNCTION	0.00	39.25	0 01:45	0	0.108	-0.008
MH#2	JUNCTION	0.00	81.38	0 01:45	0	0.207	-0.137
MH#3	JUNCTION	0.00	161.21	0 01:45	0	0.33	0.039
OGS	JUNCTION	0.00	12.60	0 02:48	0	0.341	0.002
OR1	JUNCTION	0.00	12.60	0 02:48	0	0.341	0.002
OV#1	JUNCTION	79.67	79.67	0 01:45	0.16	0.16	-0.027
OV#2	JUNCTION	49.51	89.54	0 01:45	0.1	0.153	-0.009
OV#4	JUNCTION	15.86	62.39	0 01:45	0.0315	0.0852	0.072
OV#5	JUNCTION	18.69	50.62	0 01:45	0.0374	0.0688	-0.050
St.Luke	JUNCTION	48.49	48.49	0 01:45	0.101	0.101	0.019
Outlet1	OUTFALL	0.00	12.60	0 02:49	0	0.341	0.000
Outlet2	OUTFALL	0.00	48.47	0 01:45	0	0.101	0.000
Pond	STORAGE	6.54	165.63	0 01:45	0.0137	0.343	0.415

Node Surge 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
OR1	JUNCTION	3.20	0.059	1.333

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
Pond	0.019	0.9	0.0	0.0	0.111	5.3	0 02:48	12.60

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
Outlet1	75.47	3.20	12.60	0.341
Outlet2	17.02	4.19	48.47	0.101
System	46.25	7.40	58.47	0.441

Link Flow Summary

	Maximum Flow	Time of Max Occurrence	Maximum Veloc	Max/ Full	Max/ Full
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Link	Type	LPS	days	hr:min	m/sec	Flow	Depth
-----	-----	-----	-----	-----	-----	-----	-----
Curb.Cut	CONDUIT	0.00	0	00:00	0.00	0.00	0.50
Outlet2	CONDUIT	48.47	0	01:45	1.20	0.33	0.39
P1	CONDUIT	39.22	0	01:45	0.87	0.24	0.43
P2	CONDUIT	81.14	0	01:45	0.99	0.39	0.52
P3	CONDUIT	50.26	0	01:45	0.79	0.82	0.85
P4	CONDUIT	159.66	0	01:45	1.94	0.59	0.46
P5	CONDUIT	12.60	0	02:48	0.35	0.18	1.00
P6	CONDUIT	12.60	0	02:49	0.84	0.15	0.26
R-1.1	CHANNEL	40.06	0	01:45	0.41	0.01	0.14
R-1.2	CHANNEL	46.60	0	01:45	0.56	0.01	0.13
R-1.3	CHANNEL	32.00	0	01:45	0.35	0.00	0.14
OR#1	ORIFICE	12.60	0	02:48			1.00
OR#2	ORIFICE	50.33	0	01:45			
OR#3	ORIFICE	29.87	0	01:45			
OR#4	ORIFICE	42.17	0	01:45			
OR#5	ORIFICE	39.25	0	01:45			

Flow Classification Summary

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class								Norm Ltd	Inlet Ctrl
		Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit			
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Curb.Cut	9.91	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Outlet2	1.73	0.00	0.00	0.00	0.84	0.16	0.00	0.00	0.02	0.00	0.00
P1	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.96	0.00	0.00
P2	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.55	0.00	0.00
P3	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.36	0.00	0.00
P4	1.00	0.00	0.02	0.00	0.95	0.03	0.00	0.00	0.79	0.00	0.00
P5	1.28	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.80	0.00	0.00
P6	1.80	0.01	0.00	0.00	0.06	0.93	0.00	0.00	0.04	0.00	0.00
R-1.1	1.00	0.33	0.09	0.00	0.54	0.04	0.00	0.00	0.01	0.00	0.00
R-1.2	1.00	0.50	0.02	0.00	0.38	0.11	0.00	0.00	0.00	0.00	0.00
R-1.3	1.00	0.66	0.08	0.00	0.21	0.04	0.00	0.00	0.05	0.00	0.00

 Conduit Surcharge Summary

Conduit	----- Hours Full -----		-----	Hours	Hours	
	Both Ends	Upstream		Above Full	Capacity	

P5	0.71	0.71	3.20	0.01	0.01	

Analysis begun on: Fri Apr 24 11:18:44 2026
 Analysis ended on: Fri Apr 24 11:18:45 2026
 Total elapsed time: 00:00:01