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Site Servicing Report

NAVAN RESIDENTIAL AND COMMERCIAL BLOCK 14 2983 Navan Road



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1.0 INTRODUCTION

1.1 General

In 2023, J.L. Richards & Associates Limited (JLR) was retained by 12714001 Canada Inc. (the Owner) to prepare the detailed design of municipal infrastructure for Site Plan Approval (SPA) of the Mixed-Use Site Plan (Block 14). This Site Servicing Report (SSR) presents the servicing constraints and strategies for water, wastewater, stormwater servicing, and stormwater management in accordance with the City of Ottawa Design Guidelines, the associated technical bulletins and relevant design excerpts.

1.2 Site Description

The Mixed-Use Site Plan (Block 14) is located within the City of Ottawa's Official Plan boundary and consists of a 0.57 ha parcel bounded by Brian Coburn to the northwest, existing Page properties to the northeast and the proposed East Ridge Orleans Subdivision in the remaining directions (refer to the East Ridge Orleans Subdivision Site Servicing Report prepared by J.L. Richards and Associates, dated September 22, 2023). The legal description of the subject property can be found in the Draft Plan of Subdivision attached to Appendix A.

A topographical survey was completed by Stantec Inc. in August 2023 (Appendix A1). The survey indicates that the existing ground surface generally slopes in a southerly direction towards the future subdivision lands.

1.3 Proposed Development

The proposed development will consist of two mid-rise residential condominiums (Building A and B) with combined underground parking garage. Building A has 48 units whereas Building B has 36 units and one (1) storey of commercial space on the first floor. The Concept Plan for the Mixed-Use Site Plan (Block 14) is attached to Appendix A.

1.4 Proposed Connections to Existing Infrastructure

Block 14 is proposed to be serviced by the infrastructure that is part of the East Ridge Orleans Subdivision. One sanitary, storm and water service lateral will extend to the parking garage footprint from the subdivision as shown in the servicing drawings.

1.5 Consultation and Permits

A pre-consultation meeting was held on September 13, 2023, to discuss the planning process, design criteria, and servicing constraints. A copy of the pre-consultation meeting notes and the site servicing checklist has been provided in Appendix B.

2.0 WATER SERVICING

2.1 Water Supply Design Criteria

A Hydraulic Network Analysis (HNA) was completed as part of the detailed design for the East Ridge Orleans subdivision to confirm that the proposed watermains could provide adequate supply while complying with both the Ottawa Design Guidelines for Water Distribution (July 2010) and Technical Bulletins ISDTB-2014-02, ISTB-2018-02 and ISTB-2021-03. These documents are herein referred to as the Design Guidelines and TB-2014-02, TB-2018-02, and TB-2021-03, respectively.

The HNA completed as part of the East Ridge Orleans Subdivision design included water demands for the Mixed Used Site Plan (Block 14). The HNA has since been updated to reflect the proposed water service lateral for Block 14 but is based on the same demands and the boundary conditions used in the original East Ridge Orleans Subdivision HNA (refer to Appendix C for a copy of City correspondence for boundary conditions).

Section 4.2.2 of the Design Guidelines states the following criteria for development additions to the public water distribution system:

- Under maximum hourly demand conditions (peak hour), the residual pressures shall not be less than 276 kPa (40 psi);
- During periods of maximum day and fire flow demand, the residual pressure at any point in the distribution system shall not be less than 140 kPa (20 psi);
- In accordance with the Ontario Building Code (OBC) in areas that may be occupied, the static pressure at any fixture shall not exceed 552 kPa (80 psi);
- The maximum pressure at any point in the distribution system in unoccupied areas shall not exceed 689 kPa (100 psi); and
- Feeder mains, which have been provided primarily for the purpose of redundancy, shall meet, at a minimum, the basic day plus fire flow demand.

2.2 Domestic Water Demands

The water demands presented in this section are based on the site layout and unit count shown in the Site Plan (Appendix A) and commercial flows. Domestic water demands were calculated for 84 apartment units with an average density of 1.8 persons per unit, giving a total population of 151 people. Commercial flows were calculated for a commercial area of 0.09 ha.

The residential and commercial consumption rates for average day, maximum day, and peak hour demand were set in accordance with Table 4-2 of the Design Guidelines. Table 1 summarizes the water consumption rates and peaking factors used in the HNA.

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Table 1: Water Demands

Demand Scenario	Residential Water Consumption or Peaking Factor	Commercial Water Consumption or Peaking Factor	Total Demands (L/s)
Average Day Demand	280 L/c/d	28,000 L/ ha /d	0.52
Maximum Day Demand	2.5 x Avg Day	1.5 x Avg Day	1.27
Peak Hour Demand	2.2 x Max Day	1.8 x Max Day	2.78

2.3 Fire Flow Requirements

The City has specified that the Fire Underwriters Survey (FUS) method shall be used for any public or private site where new fire hydrants are being designed. Specifically, the required fire flow (RFF) for each structure was calculated in accordance with TB-2018-02.

The required fire flow for the Mixed-Use Site Plan (Block 14) was calculated to be 233 L/s. Refer to Appendix C for the detailed RFF calculations for the critical fire area.

Both buildings within Block 14 will be equipped with a fully supervised automatic sprinkler designed and installed in accordance with NFPA 13. In the analysis, a sprinkler flow of 1500 L/min (25 L/s) was applied to each building as recommended by the Owner's Mechanical Engineer (refer to Appendix C).

2.4 Proposed Water Servicing, Boundary Conditions and Water Model

2.4.1 Proposed Water Servicing

Water will be supplied to the Mixed-Use Site Plan (Block 14) by a 150 mm diameter water service that will connect to the 200 mm diameter watermain loop within the East Ridge Orleans subdivision. Fire protection will be provided by each building's sprinkler system, proposed hydrants within the East Ridge Orleans Subdivision, and a new proposed hydrant for Block 14 off the 150 mm diameter water service lateral. The Siamese connection for each building is shown on the Servicing Drawings and is located no more than 45 m away from a hydrant as required by the OBC (refer to hydrant coverage markup in Appendix C).

2.4.2 Boundary Conditions

Hydraulic boundary conditions were provided by the City at the two proposed connection locations for the East Ridge Orleans subdivision (Connection 1-Page Road and Connection 2-Navan Road East). Table 2 summarizes the hydraulic boundary conditions received (refer to Appendix C for a copy of the City correspondence).

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The City boundary condition for fire flow demand scenario #3 was used in this HNA (Max Day plus Fire Flow #3), as this considers the most critical fire flow of 233 L/s required for Block 14.

Table 2: Hydraulic Boundary Conditions

Demand Scenarios	Connection 1 Head (m)	Connection 2 Head (m)
Maximum HGL	130.7	130.7
Peak Hour	127.0	126.8
Max Day plus Fire Flow #3 14,000 L/min (233 L/s)	124.9	122.7

2.4.3 Water Model

A hydraulic water model within the WaterCAD® software platform was used to carry out the HNA (refer to the overall schematic presented in Appendix C). The water demands from Table 1 and the boundary conditions from Table 2 were input into the model for each demand scenario. Table 3 summarizes the watermain diameters and roughness coefficients used in the model, based on Sections 4.2.12 and 4.3.5 of the Design Guidelines.

Table 3: Watermain Internal Diameters and C-Factors

Nominal Diameter	Inside Diameter	C-Factor
150 mm	155 mm	100
200 mm	204 mm	110
300 mm	297 mm	120

2.5 Simulation Results

The HNA was carried out under steady-state peak hour, maximum day plus fire flow, and maximum pressure conditions to confirm that the proposed water servicing can meet the design criteria outlined in Section 2.1.

2.5.1 Peak Hour

The simulation results found the minimum pressure at the site (node J-22 in the model) during the peak hour condition to be 396 kPa (57.44 psi) (refer to Appendix C), which exceeds the minimum pressure criterion of 276 kPa (40 psi) per the Design Guidelines.

2.5.2 Maximum Day Plus Fire Flow

Fire water supply will be provided by the fully automatic sprinkler system, the hydrants within the East Ridge Orleans subdivision, and by a proposed hydrant off the 150 mm

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diameter water lateral within Block 14. To ensure adequate fire protection, the maximum day demand shown in Table 1 was analyzed simultaneously with the fire flow requirements. As mentioned in Section 2.3, a sprinkler system flow of 1500 L/min (25 L/s) was applied for Block 14, and it was assumed that only one (1) building would require fire flow at once.

Once the maximum day demands, the sprinkler system demands and the 14,000 L/min (233 L/s) boundary condition provided by the City (refer to Table 2) were input in the model, the fire flow simulation was carried out by allowing WaterCAD® to calculate the available fire flow that can be drawn from a hydrant without allowing any part of the system to experience pressures less than 140 kPa (20 psi).

From the simulation results, the system is expected to deliver 14,000 L/min (233 L/s) to the site through the contribution of the sprinkler system and the nearby hydrants. Attached to Appendix C is a map of the hydrant coverage for Block 14 which confirms that both buildings within the block meet the RFF of 233 L/s through the aggregate sum of hydrant flows. Based on Appendix I of TB-2018-02 hydrants within 75 m of a building can provide 95 L/s of fire flow and hydrants within 75 to 150 m of a building can provide 63 L/s of fire flow.

2.5.3 Maximum Pressure

Based on a zero (0 L/s) demand condition, the simulation results found the maximum pressure at the site (node J-22) to be 435 kPa (63.09 psi). This value is below the maximum pressure constraint of 552 kPa (80 psi), therefore pressure reducing valves (PRVs) are not anticipated to be required.

2.6 Internal Pumping Requirements

Based on the results presented above, internal building pumps are anticipated to be required due to the height of the building. The pumps should be designed by the Owner's mechanical engineer.

2.7 Summary and Conclusions

Based on the water simulation results, the proposed development can be serviced by the proposed 150 mm water service lateral connected to the 200 mm watermain loop within the East Ridge Orleans Subdivision. Furthermore, adequate fire water supply can be achieved with the proposed hydrants within the East Ridge Orleans Subdivision and the proposed hydrant off the 150 mm water lateral servicing Block 14. Internal building pumps are anticipated to be required.

3.0 WASTEWATER SERVICING

3.1 Design Criteria

The sanitary sewer system within the Mixed-Use Site Plan (Block 14) is designed in accordance with the Ottawa Sewer Design Guidelines and subsequent technical bulletins. The design parameters are applied under two scenarios as per ISTB Technical Bulletin 2018-01. The key design parameters have been summarized in the table below.

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Table 4: Wastewater Key Design Parameters

Design Parameter	Design Value
Commercial Average Flow	28,000 L/gross ha/Day
Residential Average Flow	280 L/Cap/Day
Residential Peaking Factor	Harmon's Formula
Commercial Peaking Factor	1.5
Harmon's Correction Factor (K)	0.8
Infiltration Allowance	0.33 L/s/ha
Manning's Roughness Coefficient (n)	0.013
Allowable Slopes	Varies (Refer to Section 6.1.2.2 of ODSG)
Allowable Velocities	0.6 m/s – 3.0 m/s
Allowable Freeboard	-

3.2 Proposed Sanitary Servicing and Design Flows

Wastewater generated from Block 14 will be conveyed via a proposed 200 mm diameter sanitary service lateral, which will then discharge into the East Ridge Orleans Subdivision. Based on the design criteria above and the site constraints, a total design peak flow of 1.97 L/s is calculated for the development. The table below summarizes the peak sanitary flow for the site plan. A detailed design sheet can be found in Appendix E.

Table 5: Sanitary Design Flow Summary

Area	Site Area	Unit Count	Unit Density	Pop.	Harmon's Peaking Factor	Res. Peak Flow	Comm. Peak Flow	Infilt. Flow	Total Flow
Block 14	0.57 ha	84	1.8 ppu	151 persons	3.55	1.74 L/s	0.05 L/s	0.19 L/s	1.97 L/s

A 200 mm diameter sanitary service lateral is expected to have sufficient capacity to convey the wastewater flows for the site. The flows from this block were already incorporated in the design of the sanitary sewer for the subdivision (refer to the East Ridge Orleans Subdivision Site Servicing Report prepared by J.L. Richards and Associates, dated February 16, 2024). As shown in this report, the subdivision will consist of 200 mm diameter pipes which will have, at minimum, 20.24 L/s of capacity. Furthermore, the overall subdivision inclusive of the Site Plan Blocks 14, 15 and 17 is expected to generate 12.98 L/s of wastewater flows which is less than the minimum expected capacity of the pipes by 35%. Therefore, it is anticipated that the sanitary sewer system downstream will have sufficient capacity for the 1.97 L/s of wastewater flows generated by Block 14.

Furthermore, it has been confirmed by the Owner's Mechanical Engineer that a 200mm diameter service will be sufficient to convey the flows generated by the mechanical fixtures (refer to Appendix E).

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3.3 Summary and Conclusions

Wastewater servicing for Block 14 will be designed in accordance with the City of Ottawa Sewer Design Guidelines, the associated technical bulletins, and various background documents as highlighted throughout this section. Wastewater will be conveyed via a proposed 200 mm diameter sanitary service lateral which will then discharge into the East Ridge Orleans Subdivision. It is recommended that this wastewater servicing plan be implemented to provide adequate sanitary servicing for the proposed development.

4.0 STORM SERVICING AND STORMWATER MANAGEMENT

4.1 Design Criteria

Storm and stormwater management servicing for the Mixed-Use Site Plan (Block 14) was developed in accordance with the City of Ottawa 2012 Sewer Design Guidelines (OSDG) and the more recent Technical Bulletin PIEDTB-2016-01 (September 6, 2016). These two documents are herein referred to as the Design Guidelines in this section. A summary of the key storm and stormwater management criteria follows:

- Control minor system flows to the allowable release rates of 58 L/s as identified in Table 5-3 Site Servicing Report 2983, 3053 and 3079 Navan Road & 2690 Pagé Road, Ottawa, Ontario (JLR November 2024);
- The runoff coefficients (C-factors) to be calculated based on the ratio of pervious and impervious surfaces depicted on proposed site plans;
- Minimum roadway slope of 0.1% from crest-to-crest for overland flow route;
- Minimum rear yard slope in the absence of perforated pipe system of 1.5% along with swale side slopes of 3 horizontal to 1 vertical;
- Maximum parking ponding depth of 350 mm (static and dynamic) as per the Design Guidelines and maximum depth of surface flow to be 300 mm;
- Minimum vertical clearance of 0.15 m between the spill elevation on the street and the finished grade (garage elevation);
- Minimum vertical clearance of 0.30 m between the surface spill elevation and the ground elevation at the building in the rear yards;
- Major system flows, up to and including the 1:100-year design storm event, are contained within the site using the parking lot area and surface drainage.
- Quality control will be accommodated by Pond #3 to meet an MECP Enhanced Level of Protection (80% TSS removal) as identified in Site Servicing Report 2983, 3053 and 3079 Navan Road & 2690 Pagé Road, Ottawa, Ontario (JLR November 2024).
- Provide measures to ensure that site preparation and construction is in accordance with the current Best Management Practices for Erosion and Sediment Control.

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4.2 Proposed Stormwater Management Approach

In order to achieve the allowable release rates, the stormwater management of the site will include:

- Rooftop control with rooftop storage and released at a cumulative controlled release rate of 2 L/s for each building; per WATTS RD-200 detail for Small Area Roof Drain (Appendix D) and as recommended by the landowner's mechanical engineer.
- Surface storage within the parking lots in greater than a 1:2-year event with captured flows conveyed to the building plumbing system and internal cistern;
- Ramp runoff captured and conveyed to the building plumbing system and internal cistern;
- Storage in the building cistern with flows pumped at a controlled rate to the minor system with a backwater valve at the connection; and,
- Controlled release of the flows captured in the ditch drainage system for the surrounding landscaped areas.

Foundation drains will be connected to the internal building plumbing system therefore no HGL analysis is required.

4.3 Proposed Minor System Servicing

A minor system connection will be provided from the building envelope to the minor system within the subdivision. The connection will be sized based on the 1:2-year release from the site. The runoff coefficient is based on the ratio of impervious surfaces and grassed or landscaped areas. The breakdown between pervious and impervious surfaces is shown on the figure entitled Overall Site Imperviousness in Appendix D. A design sheet for sizing of the connection is provided in Appendix D.

4.4 Stormwater Management Modelling Approach

4.4.1 Dual Drainage Model

The analysis of both major and minor drainage systems was carried out to demonstrate their compliance with respect to the design criteria described in Section 4.1. The performance of the major overland system and minor storm sewer system was analyzed with PCSWMM. This software is a dynamic model which allows both hydrologic and hydraulic components to be simulated in the same platform and also allows the simulation of the interaction between the major and minor systems. The PCSWMM software platform was used to:

- Generate the surface runoff hydrograph for each sub-area under various recurrences.
- Subdivide each inflow hydrograph into its minor and major system components based on the proposed inlet capture rates and roadway sag storage.
- Assess cascading, if any, and carry out dynamic routing of storm flows to determine flow depths along the roadways. As previously stated, the maximum

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major overland flow depths within the parking lot areas are to be limited to 350 mm or less, as per Technical Bulletin PIEDTB-2016-01.

PCSWMM was set-up to evaluate the proposed servicing as detailed on Drawing C01 and C02. Subcatchments were delineated for the structure roof areas, parking lot low points and landscaped low points. Model schematics are prepared in Appendix D.

4.4.2 Boundary Conditions

Boundary conditions are taken from the downstream subdivision model issued as part of the Site Servicing Report 2983, 3053 and 3079 Navan Road & 2690 Pagé Road, Ottawa, Ontario (JLR 2023).

The downstream 1:100-year HGL at the connection to the Subdivision at MH525 from the building internal system outlet is identified as 81.17 m, which is lower than the proposed building connection and therefore there is no backflow from the boundary condition and no impacts on the system.

There are two connections to the subdivision system from landscaped areas, one connection is a T-connection into the pipe from MH526-MH525 which has controlled release. The HGL at this point in the system is 81.45 m which is below the catchbasin invert of 83.09m and therefore there is no backflow from the boundary condition and no impacts on HGL.

A second landscaped area connection is a connection directly into MH 527 upstream of the inline ICD. The HGL at this manhole is 85.11m which is higher than the catch basin invert of 83.9 meters. For this reason, a timeseries representing the head in the manhole over the storm period has been applied to the outfall representing MH 527 in the Block 14 PCSWMM model.

4.4.3 Hydrological Modelling Parameters

The following parameters were used in the hydrologic component of PCSWMM:

- **Areas and Imperviousness:** Catchment ID and drainage areas used by PCSWMM match those shown on either Drawing DST or Figure E-1 (Appendix E1).
- **Catchment Width:** The catchment width is estimated at the width of overland sheet flow based on the grading of the catchment and slope direction.
- **Manning's Roughness Coefficient:** Manning's Roughness Coefficients of 0.013 and 0.25 were used for the impervious and pervious surfaces, respectively.

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- **Horton Infiltration parameters:** City of Ottawa OSDG Horton Infiltration Parameters have been used in the modelling.
- **Initial Abstraction:** Initial abstraction of 4.67 mm and 1.57 mm was used for the pervious and impervious surfaces respectively, consistent with the OSDG.

4.4.4 Simulation of Storm Distributions

To assess peak flow rates and peak volume storage requirements the 3-hour Chicago storm has been simulated for the site for the 1:2-year event and 1:100-year event and the 24-hour SCS storms for the 1:100-year event.

4.5 Simulation Results

4.5.1 Low Point Ponding Analysis

Ponding depths in the low points in the parking area and landscaped areas are shown in Table 6.

Table 6: Catchbasin Ponding Depths

Low Point ID	Top of Grate (m)	Maximum Static Depth (mm)	3-hour Chicago 1:2 year Depth (mm)	3-hour Chicago 1:100 year Depth (mm)	24-hour SCS 1:100 year Depth (mm)
1	85.70	150	20*	40	30
2	85.50	150	20*	40	30
3	85.60	300	0	130	130
4	85.65	300	0	80	80
5	85.05	250	0	230	210
6	85.70	150	20*	30	20

Those values marked with * are greater than 0 mm in the 2-year event due to the model setup. In order to represent the Zurn inlet control device, the orifice has been set at the top of grate elevation as the control is at the surface. Therefore, the model requires a head buildup over the structure for simulation of flows.

The simulation results compiled in Table 6 shows that:

- No ponding nor dynamic flow will occur in the 1:2-year event;
- Maximum ponding depth of 230 mm during the 1:100-year event; and,
- There is no spill from the site in the 1:100-year event.

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4.5.2 Roof Drainage

The roof drainage system is to be designed by the Mechanical Engineer to achieve a flow rate of 2L/s from each roof structure. The maximum depth of ponding required, assuming storage across 60% of the rooftop area, is 90 mm.

4.5.3 Parking Lot Drainage

The parking lot drainage system connects to the building cistern and is controlled by the ZURN_Z150F-6NH (detail provided in Appendix D) to allow the 1:2-year event to drain and for the surface to provide storage during greater events up to the 1:100 year. Capture rates are shown in Table 7.

Table 7: Parking Area ICD Capture Analysis

Low Point	Control Structure	1:2 year Rational Flow (l/s)	1:100 year 3-hour Chicago Flow (l/s)	1:100 year 3-hour Chicago Head (m)
1	ZURN_Z150F-6NH	9	24	0.04
2		11	30	0.04
6		7	19	0.03

The table shows that the parking lot control structures capture the 1:2-year design flow.

4.5.4 Landscaped Drainage

The landscaped drainage consists of two outlets into the subdivision minor system. The drainage system represents a typical rear yard system of swales and perforated pipes. At one downstream end the MHF_IPEX_TYPE_B ICD provides flow control to 38 L/s and discharges into the pipe downstream of MH 526 in the 1:100-year event with a head of 2.19 m. The release is greater than the rational method 1:2-year design flow of 14 L/s for the combined upstream catchments.

At the second outlet, the Vortex ICD 70 provides flow control to 6 L/s into MH 527 in the 1:100-year event with a head of 1.83 m. The release rare meets the 1:2-year rational flow of 6 L/s for the upstream catchments.

Low Point	Control Structure	1:2 year Rational Flow (l/s)	1:100 year 3-hour Chicago Flow (l/s)	1:100 year 3-hour Chicago Head (m)
3	NO ICD	4	6	1.53
4	Vortex ICD 70	2		1.83
5	MHF_IPEX_TYPE_B	14	38	2.19
Total:		20	44	-

The table shows that the landscaped control structures capture the 1:2-year design flow.

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4.5.5 Building Release Rates

To maintain overall release rate from the site at the allowable flow rate of 58 L/s, the building drainage system must be controlled to 10 L/s. Based on a pumped rate of 10 L/s a cistern size of 64 m³ is required in the building basement.

4.6 Summary and Conclusions

The stormwater servicing achieves a release rate from the site to the minor system limited to the allowable release rate and contains up to the 1:100 year on site.

5.0 Erosion and Sedimentation Control

Erosion and sediment control measures, as outlined in the Ontario Ministry of Natural Resources (MNR) Guidelines on Erosion and Sediment Control for Urban Construction Sites, will be implemented to trap sediment on site. The following erosion and sediment control measures can be implemented during construction as shown on the Erosion and Sediment Control Plan (Drawing ESC):

- Supply and installation of a silt fence barrier, as per OPSD 219.110.
- Supply and installation of siltsack or sentinel CB inserts between the frame and cover of catch basins and maintenance holes adjacent to the project area during construction, to prevent sediment from entering the sewer system.
- Stockpiling of material during construction is to be located along flat areas away from drainage paths. For material placed on sloped areas, stockpiles are to be enclosed with a silt fence to protect watercourses.
- All catch basins are to be equipped with sumps, inspected frequently, and cleaned as required.
- Temporary ICD to be placed blocking part of the sanitary sewer pipe in the connecting maintenance holes to eliminate construction debris from entering the existing sanitary sewer system. The ICDs are to be removed after the proposed sanitary sewers have been fully cleaned.

The proposed removal and reinstatement measures as well as the erosion control measures shall conform to the following documents:

- “Guidelines on Erosion and Sediment Control for Urban Construction Sites” published by Ontario Ministries of Natural Resources, Environment, Municipal Affairs, and Transportation & Communication, Association of Construction Authorities of Ontario and Urban Development Institute, Ontario, May 1987.
- “MTO Drainage Manual”, Chapter F: “Erosion of Materials and Sediment Control”, Ministry of Transportation & Communications, 1985.
- “Erosion and Sediment Control” Training Manual by Ministry of Environment, Spring 1998.
- Applicable Regulations and Guidelines of the Ministry of Natural Resources.

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2983, 3053 and 3079 Navan Road & 2690 Pagé Road, Ottawa, Ontario

Appendix A

Concept Plan, Draft Plan of
Subdivision and Topographical
Survey



LOTS AREAS		LOTS AREAS	
LOT NUMBER	AREAS (M2)	LOT NUMBER	AREAS (M2)
B01-1	394	B06-4	154
B01-2	184	B06-5	163
B01-3	184	B06-6	154
B01-4	189	B06-7	369
B01-5	189	B07	2,002
B01-6	184	B08-1	525
B01-7	184	B08-2	174
B01-8	299	B08-3	184
B02-1	281	B08-4	174
B02-2	176	B08-5	184
B02-3	184	B08-6	174
B02-4	184	B08-7	234
B02-5	174	B09-1	234
B02-6	233	B09-2	174
B03-1	250	B09-3	184
B03-2	182	B09-4	184
B03-3	182	B09-5	174
B03-4	182	B09-6	234
B03-5	182	B10-1	234
B03-6	182	B10-2	174
B03-7	250	B10-3	184
B04-1	233	B10-4	184
B04-2	174	B10-5	174
B04-3	184	B10-6	487
B04-4	174	B11-1	748
B04-5	184	B11-2	286
B04-6	174	B11-3	265
B04-7	278	B11-4	246
B05-1	368	B11-5	242
B05-2	154	B11-6	242
B05-3	163	B11-7	321
B05-4	163	B12	240
B05-5	154	B13	1,232
B05-6	206	B14	5,728
B06-1	206	B16	7,811
B06-2	154	B17	5,312
B06-3	163		

SITE PLAN LEGEND			
[Symbol]	EXISTING BUILDING	[Symbol]	LOT LINE
[Symbol]	NEW BUILDING	[Symbol]	SETBACKS
[Symbol]	NEW BUILDING WITH COMMERCIAL SPACE AT-GRADE	[Symbol]	NEW TREE
[Symbol]	GRASS	[Symbol]	FIREWALL
[Symbol]	ASPHALT	[Symbol]	SIDEWALK

SITE INFORMATION & DEVELOPMENT STATISTICS			
LOTS		PIN	
		04756-0303	
		04756-0315	
		04756-0316	
		04756-1337	
ZONING		GM(2546) H(14.5)	
SITE AREA			
TOTAL SITE AREA:		~53,441.14 m ²	(5.34ha)
TOTAL DEVELOPABLE AREA:		~45,956.28 m ²	(4.59ha)
NET SITE AREA:		~38,956.28 m ²	(3.89ha)
UNITS			
TOWNHOUSES:			67 UNITS
BLOCK 01:			
1 X RESIDENTIAL APARTMENT BUILDING			48 UNITS
1 X MIXED USE BUILDING			36 UNITS
RESIDENTIAL:			~899 m ²
COMMERCIAL SPACES:			
BLOCK 02:			
1 X RESIDENTIAL APARTMENT BUILDING			47 UNITS
1 X MIXED USE BUILDING			36 UNITS
RESIDENTIAL:			~899 m ²
COMMERCIAL SPACES:			
BLOCK 03:			
2 X RESIDENTIAL APARTMENT BUILDING			96 UNITS
TOTAL NUMBER OF UNITS:			330 UNITS
TOTAL COMMERCIAL SPACES:			~1,798 m ²
	REQUIRED	PROVIDED	
MAXIMUM DENSITY	NO MAX.	84.8 units/net ha	
MINIMUM LOT WIDTH	NO MIN.	5.8 m	
MINIMUM LOT AREA	NO MIN.	174 m ²	
MAXIMUM BUILDING HEIGHT	14.5 m	14.5 m	
SETBACKS			
MINIMUM FRONT YARD:	3 m	3 m	
MINIMUM CORNER SIDE YARD:	3 m	3 m	
MINIMUM INTERIOR SIDE YARD:			
NON-RESIDENTIAL OR MIXED-USE:	5 m	5 m	
LOW-RISE RESIDENTIAL:	1.2 m	1.2 m	
MID-RISE RESIDENTIAL:	3 m	3 m	
MINIMUM REAR YARD:			
ABUTTING A STREET:	3 m	3 m	
FROM A RESIDENTIAL ZONE:	7.5 m	7.5 m	
FOR A RESIDENTIAL BUILDING:	7.5 m	7.5 m	
PARKING RATES			
R9 - TOWNHOUSES:	1 p/unit = 67	67 (GARAGES)	
VISITOR:	0	67 DRIVE AISLES	
BLOCK 14:			
R12 - APARTEMENTS	1.0 p/unit = 84	84 (UNDERGROUND)	
VISITOR:	0.2 p/unit = 17	18 (UNDERGROUND)	
N79 - RETAIL STORE:	3.4 p/100 m ² GFA = 30.6	32 (EXTERIOR)	
		TOTAL: 134	
BLOCK 15:			
R12 - APARTEMENTS	1.0 p/unit = 83	83 (UNDERGROUND)	
VISITOR:	0.2 p/unit = 16.6	16 (UNDERGROUND)	
N79 - RETAIL STORE:	3.4 p/100 m ² GFA = 30.6	32 (EXTERIOR)	
		TOTAL: 131	
BLOCK 17:			
R12 - APARTEMENTS	1.0 p/unit = 96	96 (UNDERGROUND)	
VISITOR:	0.2 p/unit = 19.2	19 (15 EXT. + 4 UND.)	
		TOTAL: 115	
GROSS FLOOR AREA			
TOWNHOUSE A:		267 m ²	
TOWNHOUSE B:		239 m ²	
TOWNHOUSE C:		232 m ²	
TOWNHOUSE C (CORNER UNIT):		236 m ²	
TOWNHOUSE D:		225 m ²	
TOTAL MODEL 01 (ABBBBBBA)		1,968 m ²	
TOTAL MODEL 02 (ABBBBBBA)		1,729 m ²	
TOTAL MODEL 03 (ABBBBBBA)		1,490 m ²	
TOTAL MODEL 04 (CDDCCDC)		1,611 m ²	
TOTAL MODEL 05 (CDDCCDC)		1,386 m ²	
MIXED USE BUILDING (TOTAL OF 2 BUILDINGS):			
RESIDENTIAL:		3,927 m ²	
COMMERCIAL:		899 m ²	
RESIDENTIAL APARTMENT BUILDING (TOTAL OF 4 BUILDINGS):		3,927 m ²	
RESIDENTIAL:		3,927 m ²	

PROJECT

NAVAN ROAD DEVELOPMENT

2983, Navan Road, Orleans, ON K1C 7G4

OWNER

Heafey GROUP

788, BOUL. SAINT-JOSEPH, SUITE 100 GATINEAU, QC J8Y 4B8

ARCHITECTURAL

PMA ARCHITECTES

(418) 851-8954
INFO@PMAARCHITECTES.COM
3070, CHEMIN DES QUATRE-BORGEDES QUÉBEC (QC) G1W 2W4
PMAARCHITECTES.COM

L'Atelier architectes

53, BOUL. SAINT-RAYMOND, GATINEAU, QC J8Y 4B8

ENGINEERS / PLANNER

J.L. Richards

ENGINEERS - ARCHITECTS - PLANNERS

1565 CARLING AVENUE, SUITE 700, OTTAWA, ON K2K 6R1

SURVEYOR

Stantec

1331 CLYDE AVENUE, SUITE 400, OTTAWA, ON K2C 3G4

KEY PLAN

ARCHITECT SEAL

REVISIONS

NO	DESCRIPTION	DATE
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NOTE

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON THE SITE AND TO REPORT ALL ERRORS AND/OR OMISSIONS TO THE ARCHITECT. ALL CONTRACTORS MUST COMPLY WITH ALL PERTINENT CODES AND BY-LAWS. DO NOT SCALE DRAWINGS.

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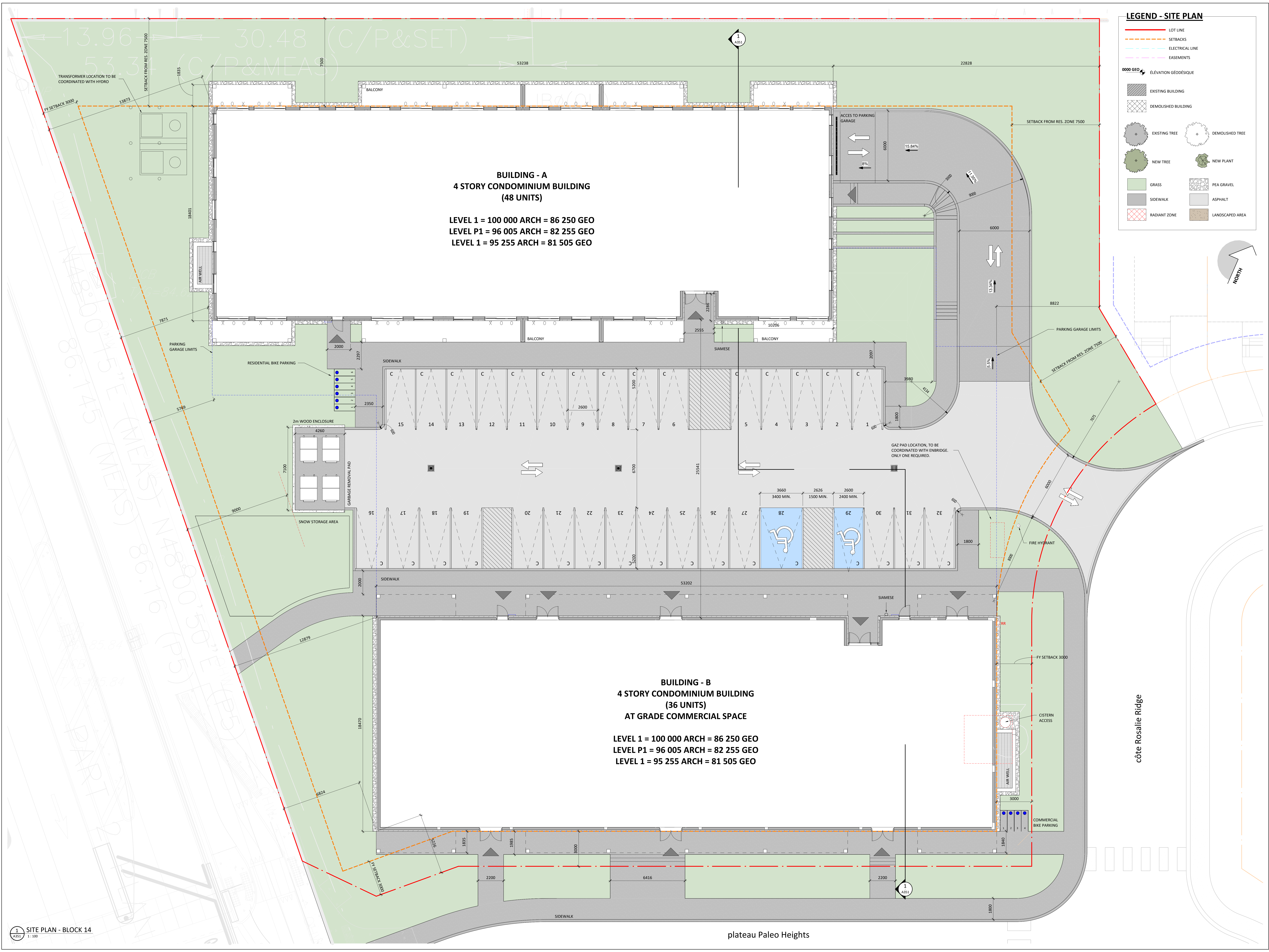
DATE	DESIGNED
2024-07-17	P.POMERLEAU
DATE	DRAWN
	P.POMERLEAU
PROJECT NO	CHECKED
2054	P.MARTIN
DATE	SHEET TITLE
	GLOBAL SITE PLAN

SHEET NO
A100

Autodesk Docs://NAVAN ROAD/2054_DEV/NAVAN_SITE_PLAN_LR24.rvt



2983, NAVAN ROAD - SITE PLAN
1:500



LEGEND - SITE PLAN

- LOT LINE
- SETBACKS
- ELECTRICAL LINE
- EASEMENTS
- ELEVATION GÉODÉSIQUE
- EXISTING BUILDING
- DEMOLISHED BUILDING
- EXISTING TREE
- DEMOLISHED TREE
- NEW TREE
- NEW PLANT
- GRASS
- PEA GRAVEL
- SIDEWALK
- ASPHALT
- RADIANT ZONE
- LANDSCAPED AREA

BUILDING - A
4 STORY CONDOMINIUM BUILDING
(48 UNITS)
 LEVEL 1 = 100 000 ARCH = 86 250 GEO
 LEVEL P1 = 96 005 ARCH = 82 255 GEO
 LEVEL 1 = 95 255 ARCH = 81 505 GEO

BUILDING - B
4 STORY CONDOMINIUM BUILDING
(36 UNITS)
AT GRADE COMMERCIAL SPACE
 LEVEL 1 = 100 000 ARCH = 86 250 GEO
 LEVEL P1 = 96 005 ARCH = 82 255 GEO
 LEVEL 1 = 95 255 ARCH = 81 505 GEO

PROJECT
NAVAN ROAD DEVELOPMENT
 2983, Navan Road, Orleans, ON K1C 7G4
 OWNER
GROUPHEAFEY
 788, BOUL. SAINT-JOSEPH, SUITE 100
 GATINEAU, QC J8Y 4B8
 ARCHITECTURAL
PMA ARCHITECTES
 (418) 851-8954
 INFO@PMAARCHITECTES.COM
 3070, CHEMIN DES QUATRE-BOURGEOIS
 QUÉBEC (QC) G1W 2W4
 PMAARCHITECTES.COM
L'Atelier architectes
 53, BOUL. SAINT-RAYMOND,
 GATINEAU, QC J8Y 1R8
 CIVIL ENGINEERS / PLANNER
J.L. Richards
 ENGINEERS - ARCHITECTS - PLANNERS
 1585 CARLING AVENUE, SUITE 700,
 OTTAWA, ON K1Z 8R1
 MECHANICAL & ELECTRICAL ENGINEERS
M&E ENGINEERING
 9 GURDWARA ROAD, UNIT 200,
 OTTAWA, ON K2E 7X6
 SURVEYOR
Stantec
 1331 CLYDE AVENUE, SUITE 400,
 OTTAWA, ON K2C 3G4
 ARCHITECT SEAL

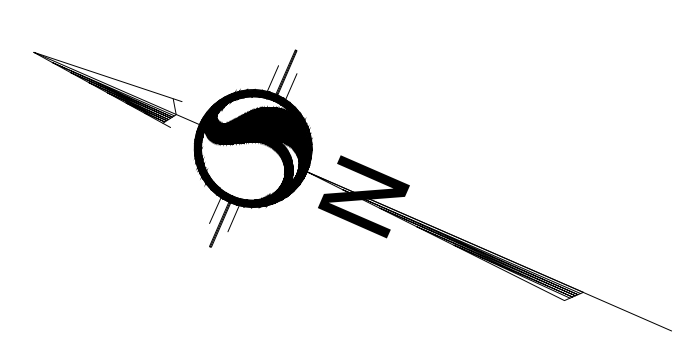
REVISIONS

NO	DESCRIPTION	DATE
1		
2		
3		
4		

NOTE
 IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON THE SITE AND TO REPORT ALL ERRORS AND/OR OMISSIONS TO THE ARCHITECT. ALL CONTRACTORS MUST COMPLY WITH ALL PERTINENT CODES AND BY-LAWS. DO NOT SCALE DRAWINGS.
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DO NOT USE FOR CONSTRUCTION

DATE	DESIGNED
2024-07-17	P.POMERLEAU
PROJECT NO	CHECKED
20554	P.MARTIN
SHEET TITLE	SHEET NO
SITE PLAN	A101



PAGE ROAD

PIN 04404-0409



**TOPOGRAPHIC SKETCH OF
PART OF LOT 6
CONCESSION 3 (OTTAWA FRONT)**
(GEOGRAPHIC TOWNSHIP OF GLOUCESTER)
CITY OF OTTAWA

Scale 1:500

METRIC CONVERSION
DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES
AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

GRID SCALE CONVERSION
DISTANCES ARE SHOWN ON GRID AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE
COMBINED SCALE FACTOR OF 0.99974

BEARING NOTE
BEARINGS ARE ASTRONOMIC AND ARE REFERRED TO THE WESTERN LIMIT OF PAGE ROAD,
AS SHOWN ON PLAN 04404-0409, HAVING A BEARING OF 272°32'30.0"

A BEARING ROTATION CLOCKWISE OF 0°41'20" HAVE BEEN APPLIED TO BEARINGS SHOWN
ON P3, P6, AND P7.

ELEVATION NOTE
ELEVATIONS SHOWN HEREON ARE GEODETIC [CGVD-1928/1978] AND ARE DERIVED FROM THE
CANADIAN VES NETWORK.

LEGEND (IF APPLICABLE)

- | | |
|---|---------------------------------------|
| ■ | DEVIOTES |
| ■ | FOUND MONUMENTS |
| ■ | IRON BAR |
| ■ | IRON ROD |
| ■ | STANDARD IRON BAR |
| ■ | SHORT STANDARD IRON BAR |
| ■ | CUT CROSS |
| ■ | CONCRETE PIN |
| ■ | WITNESS |
| ■ | PROBING CENTRATION NUMBER |
| ■ | MEASURED |
| ■ | PROPOSED |
| ■ | ORIGIN UNKNOWN |
| ■ | STANTEC GEOMETRICS LTD. |
| ■ | OBSERVED REFERENCE POINT |
| ■ | PLAN 4415 |
| ■ | PLAN SR-11975 |
| ■ | PLAN SR-8032 |
| ■ | PLAN SR-8893 |
| ■ | PLAN SR-8952 |
| ■ | PLAN SR-13545 |
| ■ | PLAN SR-8495 |
| ■ | PLAN SR-8659 |
| ■ | PLAN BY 1175 DATED SEPTEMBER 9, 2015 |
| ■ | PLAN BY 1175 DATED SEPTEMBER 30, 1987 |
| ■ | REGISTERED PLAN 446-1133 |
| ■ | CALCULATION POINT |
| ■ | A/CU |
| ■ | AIR CONDITIONING UNIT |
| ■ | AIR FLUAP |
| ■ | ARISTIMA |
| ■ | BORSHOLE |
| ■ | BENCH |
| ■ | BKE RACK |
| ■ | BOLARD |
| ■ | BOLARD |
| ■ | CATCH BASIN |
| ■ | CB |
| ■ | DITCH |
| ■ | DOUBLE CS MANHOLE |
| ■ | CHIMNEY |
| ■ | CHIMNEY |
| ■ | CURB STOP |
| ■ | DRINK |
| ■ | ELECTRIC OUTLET |
| ■ | FLAG POLE |
| ■ | FLOOD LIGHT |
| ■ | FUEL TANK FILLER CAP |
| ■ | GAS TIE TRUMP |
| ■ | PIPE FLANGE (GAS) |
| ■ | GF |
| ■ | GAS SERVICE REGULATOR |
| ■ | GAS VALVE |
| ■ | HEADBOTTOM |
| ■ | HEADSTONE |
| ■ | LIGHT STAKE/AD HEDRO |
| ■ | HYDRO METER |
| ■ | HYDRO TRANSFORMER |
| ■ | HAND WELL |
| ■ | IRB |
| ■ | JUNCTION BOX |
| ■ | MARBLE |
| ■ | MONITORING PIN |
| ■ | MAINTENANCE HOLE UNIDENTIFIED |
| ■ | MAINTENANCE HOLE BELL |
| ■ | MAINTENANCE HOLE FIRE OPTIC |
| ■ | MAINTENANCE HOLE HYDRO |
| ■ | MAINTENANCE HOLE INVERT |
| ■ | MAINTENANCE HOLE SANITARY |
| ■ | MAINTENANCE HOLE SUDAM |
| ■ | MAINTENANCE HOLE TRAFFIC |
| ■ | MONITORING WELL |
| ■ | NEWS PAPER BOX |
| ■ | LIGHT STAKE/AD ORNAMENTAL |
| ■ | OBSERVATION WELL |
| ■ | PANORAMIC METER |
| ■ | FULL BOX |
| ■ | FILLER |
| ■ | FRIDGE |
| ■ | FRIDGE |
| ■ | RED LIGHT CAMERA |
| ■ | RAILWAY SIGNAL LIGHT |
| ■ | RAILWAY SWITCH STAND |
| ■ | SAFETY LIGHT |
| ■ | SCULPTURE |
| ■ | SMOKE CHIMNEY |
| ■ | SPRINKLER HEAD |
| ■ | SPRINKLER CONTROL VALVE |
| ■ | SIAMSE CONNECTION |
| ■ | SIAMSE CONNECTION |
| ■ | SOLAR PANEL |
| ■ | SERVICE TANK ID |
| ■ | TABLE |
| ■ | TERMINAL BOX - BELL |
| ■ | TERMINAL BOX - CABLE |
| ■ | TRF CAP |
| ■ | TRF CONTROL BOX |
| ■ | TRAFFIC SIGNAL LIGHT |
| ■ | MARKER BELL UNDERGROUND |
| ■ | MARKER CABLE UNDERGROUND |
| ■ | NATURAL GAS LOCATE |
| ■ | UTILITY POLE |
| ■ | UTILITY POLE |
| ■ | VALVE BOX |
| ■ | VALVE CHAMBER |
| ■ | WATER VALVE |
| ○ | TREE CONIFEROUS @ centimeters |
| ○ | TREE DECIDUOUS @ centimeters |

SURVEYOR'S CERTIFICATE
I CERTIFY THAT:
1. THE SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS
ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM;
2. THE SURVEY WAS COMPLETED ON THE 14th DAY OF DECEMBER, 2020.

DATE _____
FRANCIS LAU
ONARIO LAND SURVEYOR

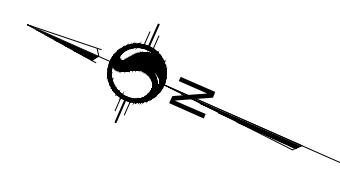
UPDATE NOTE:
1. TOPOGRAPHIC INFORMATION SHOWN HEREON UPDATED PER FIELD
SURVEY DATED AUGUST 1, 2023.

DATE _____
FRANCIS LAU
ONARIO LAND SURVEYOR

UPDATE NOTE:
1. TOPOGRAPHIC INFORMATION SHOWN HEREON UPDATED PER FIELD
SURVEY DATED MARCH 29, 2022.

DATE _____
FRANCIS LAU
ONARIO LAND SURVEYOR

44-20-2033



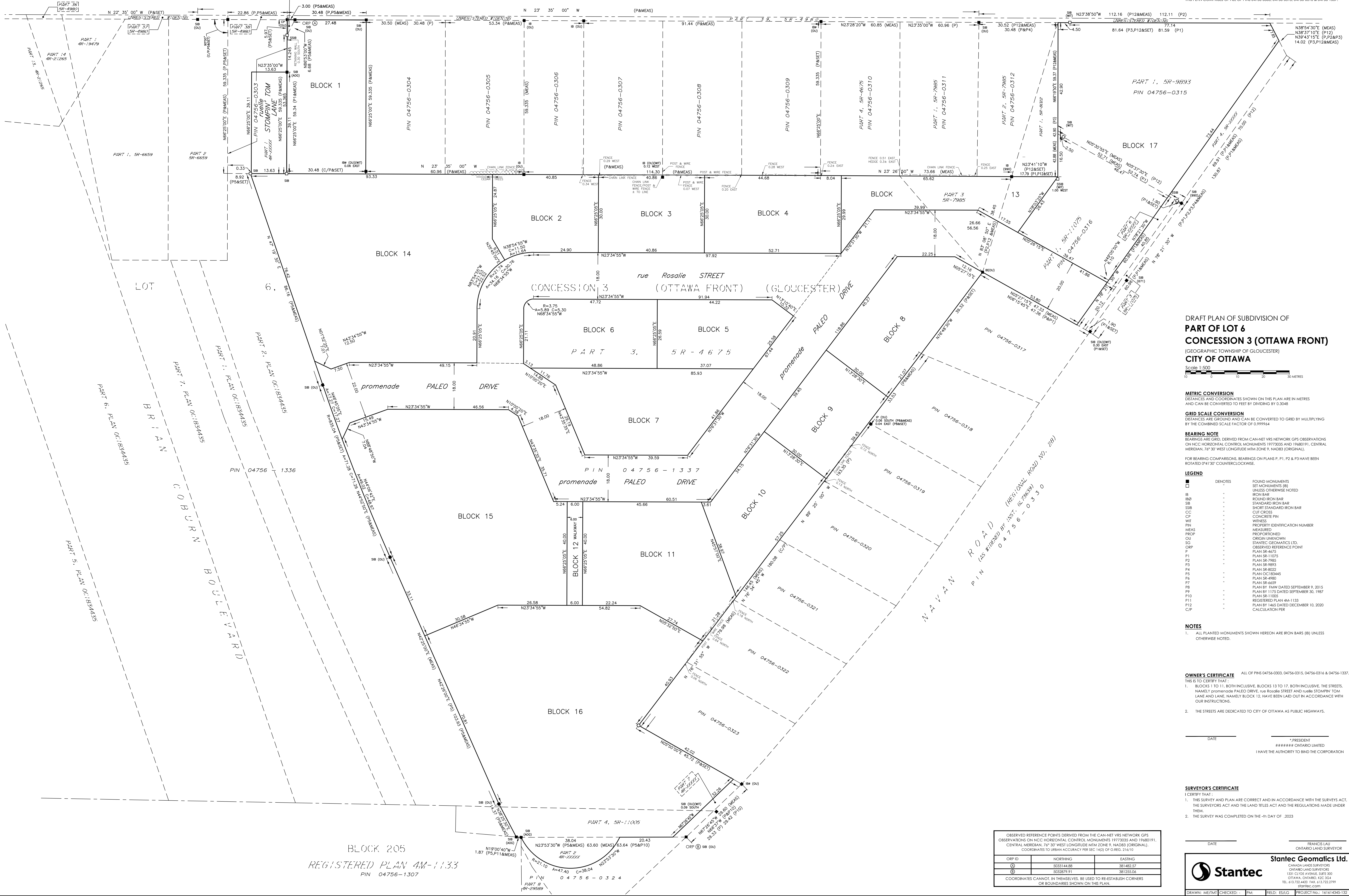
PAGE ROAD
ROAD ALLOWANCE BETWEEN LOTS 5 & 6 (AS WIDENED)
PIN 04404-0409

APPROVED UNDER SECTION 51 OF THE PLANNING ACT BY THE
CITY OF OTTAWA THIS ____ DAY OF _____ 20____

DON HERWEYER, M.C.P., R.P.P., ACTING GENERAL
MANAGER PLANNING, REAL ESTATE AND
ECONOMIC DEVELOPMENT DEPARTMENT,
CITY OF OTTAWA

PLAN 4M-
I HEREBY CERTIFY THAT THIS PLAN 4M-_____ IS REGISTERED IN THE
LAND REGISTRY OFFICE FOR THE LAND TITLES DIVISION OF
OTTAWA-CARLETON (No.4) AT _____ O'CLOCK ON THE _____ DAY OF
_____ 2023 AND ENTERED IN THE REGISTER FOR P.L.N.'s
04756-0303, 04756-0315, 04756-0316 & 04756-1337, AND THE REQUIRED
CONSENTS ARE REGISTERED AS PLAN DOCUMENT NUMBER
OC-_____
REPRESENTATIVE FOR LAND REGISTRAR

THIS PLAN COMPRISES OF ALL OF PINS 04756-0303, 04756-0315, 04756-0316 & 04756-1337.



DRAFT PLAN OF SUBDIVISION OF
**PART OF LOT 6
CONCESSION 3 (OTTAWA FRONT)**
(GEOGRAPHIC TOWNSHIP OF GLOUCESTER)
CITY OF OTTAWA

Scale 1:500
0 5 10 15 20 30 METRES

METRIC CONVERSION
DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES
AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

GRID SCALE CONVERSION
DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING
BY THE COMBINED SCALE FACTOR OF 0.999964

BEARING NOTE
BEARINGS ARE GRID, DERIVED FROM CAN-NET VRS NETWORK GPS OBSERVATIONS
ON NCC HORIZONTAL CONTROL MONUMENTS 1977035 AND 1980191, CENTRAL
MERIDIAN, 76° 30' WEST LONGITUDE MAM ZONE 9, NAD83 (ORIGINAL).

FOR BEARING COMPARISONS, BEARINGS ON PLANS P. 1, P. 2 & P. 3 HAVE BEEN
ROTATED 0°41'30" COUNTERCLOCKWISE.

LEGEND

SYMBOL	DENOTES	FOUND MONUMENTS
□	SET MONUMENTS (B)	UNLESS OTHERWISE NOTED
IB	IRON BAR	IRON BAR
IBD	ROUND IRON BAR	ROUND IRON BAR
SB	STANDARD IRON BAR	STANDARD IRON BAR
SIB	SHORT STANDARD IRON BAR	SHORT STANDARD IRON BAR
CC	CUT CROSS	CUT CROSS
CF	CONCRETE PIN	CONCRETE PIN
WIT	WITNESS	WITNESS
FIN	PROPERTY IDENTIFICATION NUMBER	PROPERTY IDENTIFICATION NUMBER
MEAS	MEASURED	MEASURED
PROP	PROPORTIONED	PROPORTIONED
CU	CORNER UNDERNOWN	CORNER UNDERNOWN
SG	STANTEC GEOMATICS LTD.	STANTEC GEOMATICS LTD.
CRP	OBSERVED REFERENCE POINT	OBSERVED REFERENCE POINT
P1	PLAN SR-4475	PLAN SR-4475
P2	PLAN SR-7995	PLAN SR-7995
P3	PLAN SR-8893	PLAN SR-8893
P4	PLAN SR-8822	PLAN SR-8822
P5	PLAN OC18345	PLAN OC18345
P6	PLAN SR-4990	PLAN SR-4990
P7	PLAN SR-6659	PLAN SR-6659
P8	PLAN BY FIRM DATED SEPTEMBER 9, 2015	PLAN BY FIRM DATED SEPTEMBER 9, 2015
P9	PLAN BY 1175 DATED SEPTEMBER 30, 1987	PLAN BY 1175 DATED SEPTEMBER 30, 1987
P10	PLAN SR-11025	PLAN SR-11025
P11	REGISTERED PLAN 4M-1133	REGISTERED PLAN 4M-1133
P12	PLAN BY 1465 DATED DECEMBER 10, 2020	PLAN BY 1465 DATED DECEMBER 10, 2020
CIP	CALCULATION PIN	CALCULATION PIN

NOTES
1. ALL PLANTED MONUMENTS SHOWN HEREON ARE IRON BARS (B) UNLESS
OTHERWISE NOTED.

OWNER'S CERTIFICATE
ALL OF PINS 04756-0303, 04756-0315, 04756-0316 & 04756-1337.
THIS IS TO CERTIFY THAT:
1. BLOCKS 1 TO 11, BOTH INCLUSIVE, BLOCKS 13 TO 17, BOTH INCLUSIVE, THE STREETS,
NAMELY PROMENADE PALEO DRIVE, rue Rosalie STREET and rue STONPIN TOM
LANE and LANE, NAMELY BLOCK 12, HAVE BEEN Laid OUT IN ACCORDANCE WITH
OUR INSTRUCTIONS.
2. THE STREETS ARE DEDICATED TO CITY OF OTTAWA AS PUBLIC HIGHWAYS.

DATE _____ PRESIDENT
ONTARIO LIMITED
I HAVE THE AUTHORITY TO BIND THE CORPORATION

SURVEYOR'S CERTIFICATE
I CERTIFY THAT:
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT,
THE SURVEYS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER
THEM.
2. THE SURVEY WAS COMPLETED ON THE ____ DAY OF _____ 2023.

DATE _____
FRANCOIS LAU
ONTARIO LAND SURVEYOR
I HAVE THE AUTHORITY TO BIND THE CORPORATION

Stantec
CANADA LAND SURVEYORS
ONTARIO LAND SURVEYORS
1331 CYCLO AVENUE SUITE 300
OTTAWA, ONTARIO, CANADA K1P 1J9
TEL: 416-752-4400 FAX: 416-752-2799
dgn@stn.com

DRAWN: ME/MTM CHECKED: _____ FILED: ES/LG PROJECT NO.: 16161436-132

OBSERVED REFERENCE POINTS DERIVED FROM THE CAN-NET VRS NETWORK GPS
OBSERVATIONS ON NCC HORIZONTAL CONTROL MONUMENTS 1977035 AND 1980191,
CENTRAL MERIDIAN, 76° 30' WEST LONGITUDE MAM ZONE 9, NAD83 (ORIGINAL).
COORDINATES TO UTM ACCURACY PER SEC 1403.0-9 REG 31410

CRP ID	NORTHING	EASTING
(1)	9333144.68	381482.57
(2)	9332879.91	381255.06

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS
OR BOUNDARIES SHOWN ON THIS PLAN.

BLOCK 205
REGISTERED PLAN 4M-1133
PIN 04756-1307

Site Servicing Report

2983, 3053 and 3079 Navan Road & 2690 Pagé Road, Ottawa, Ontario

Appendix B

Pre Consultation Meeting
Notes and Site Servicing Report
Checklist

Carmine Zayoun
12714001 Canada Inc (Zayoun Group)
Via email: carmine@zayoungroup.com

**Subject: Pre-Consultation: Meeting Feedback
Proposed Site Plan Application – 2983 Navan Road
Four residential and two mixed-use buildings – PC2023-0226**

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on September 13, 2023.

Pre-Consultation Preliminary Assessment

1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input checked="" type="checkbox"/>	5 <input type="checkbox"/>
----------------------------	----------------------------	----------------------------	---------------------------------------	----------------------------

One (1) indicates that considerable major revisions are required while five (5) suggests that the proposal appears to meet the City's key land use policies and guidelines. This assessment is purely advisory and does not consider technical aspects of the proposal or in any way guarantee application approval.

Next Steps

1. A review of the proposal and materials submitted for the above-noted pre-consultation has been undertaken. Please proceed to complete a Phase 2 / Phase 3 Pre-consultation Application Form and submit it together with the necessary studies and/or plans to planningcirculations@ottawa.ca.
2. In your subsequent pre-consultation submission, please ensure that all comments or issues detailed herein are addressed. A detailed cover letter stating how each issue has been addressed must be included with the submission materials. Please coordinate the numbering of your responses within the cover letter with the comment number(s) herein.
3. Please note, if your development proposal changes significantly in scope, design, or density before the Phase 3 pre-consultation, you may be required to complete or repeat the Phase 2 pre-consultation process.

Supporting Information and Material Requirements

1. The attached **Study and Plan Identification List** outlines the information and material that has been identified, during this phase of pre-consultation, as either required (R) or advised (A) as part of a future complete application submission.
 - a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline

the specific requirements that must be met for each plan or study to be deemed adequate.

Consultation with Technical Agencies

1. You are encouraged to consult with technical agencies early in the development process and throughout the development of your project concept. A list of technical agencies and their contact information is enclosed.

Planning

Comments:

1. In the Official Plan the subject site is designated as Neighbourhood is modified with the Evolving Neighbourhood overlay. Brian Coburn Boulevard is also designated as a Minor Corridor. The property is further identified as Low-density residential in the EUC – Phases 1 Community Design Plans (CDP). The subject lands are currently zoned GM[2546]H(14.5) General Mixed-Use, Exception and DR Development Reserve.

2. Committee of Adjustment

No variances have been identified at this point. I would be supportive of reducing the parking requirement for the residential units if it will result in addition landscaping and tree cover. Staff will set up a meeting with a Committee of Adjustment Plan if any required.

3. Design guidelines

The following guidelines are meant as a starting place to help guide the design. I realize that they are specifically related to your project. [Urban Design Guidelines for Low-rise Infill Housing](#)

4. Landscape requirements

All required yards are to be landscaped with parking located between the buildings. Green spaces and tree canopy needs to be maximized.

5. Parking requirements

Parking should comply with Sections 100, 101, 106, 109 and 111

Vehicle and bicycle parking should be situated with easily access while minimizing pavement.

6. Easements

Will there be any easements required?

7. Commercial units should be orientated to the streets as much as possible.
8. Provide locations of signage and ensure that space is made available for tree planting

Urban Design

9. This proposal does not run along or does not meet the threshold in one of the City's Design Priority Areas and need not attend the City's UDRP. Staff will be responsible for evaluating the Urban Design Brief and providing design direction.
10. An Urban Design Brief is a required submittal Re-zoning applications. The Urban Design Brief should be structured by generally following the headings highlighted under Section 3 – Contents of these Terms of Reference. Please see the Urban Design Brief Terms of Reference provided.
11. We recommend further detail be provided about the low-rise apartments to better understand their relationship to the surrounding buildings and properties.
12. If this site is located outside the greenbelt, a shadow analysis will be required.
13. We recommend the low-rise buildings fronting City streets consider grade related units accessed from the street to further 'fit-in' with the surrounding low-rise residential community where feasible.
14. We recommend additional landscaping detail be provided around the low-rise apartments to better understand how the buildings relate to their context.
15. We recommend additional detail be provided of the front yards of the townhouse units facing City streets to better understand how they will integrate with the public realm.
16. We recommend tree planting in front yards facing public right-of-way.
17. When a wind and/or shadow studies are required please refer to the Terms of Reference for the wind analysis and shadow analysis to conduct the studies and evaluate the impacts.
18. Note. The Urban Design Brief submittal should have a section which addresses these pre-consultation comments.

This is an exciting project in an area full of potential. We look forward to helping you achieve its goals with the highest level of design resolution. We are happy to assist and answer any questions regarding the above. Feel free to contact the Urban Design Planner, Christopher Moise, at Christopher.Moise@ottawa.ca, for follow-up questions

Engineering

Comments:

19. The Stormwater Management Criteria, for the subject site, is to be based on the following:
 - a. The 5-yr storm event using the IDF information derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997.
 - b. For separated sewer system built pre-1970 the design of the storm sewers are based on a 2 year storm.
 - c. The pre-development runoff coefficient or a maximum equivalent 'C' of 0.5, whichever is less (§ 8.3.7.3).
 - d. A calculated time of concentration (Cannot be less than 10 minutes).
 - e. Flows to the storm sewer in excess of the 5-year storm release rate, up to and including the 100-year storm event, must be detained on site.
 - f. For a combined sewer system the maximum C= 0.4 or the pre-development C value, whichever is less. In the absence of other information the allowable release rate shall be based on a 2 year storm event.
20. Deep Services (Storm, Sanitary & Water Supply)
 - a. Provide existing servicing information and the recommended location for the proposed connections. Services should ideally be grouped in a common trench to minimize the number of road cuts.
 - b. Connections to trunk sewers and easement sewers are typically not permitted.
 - c. Provide information on the monitoring manhole requirements – should be located in an accessible location on private property near the property line (ie. Not in a parking area).
 - d. Review provision of a high-level sewer.

- e. Sewer connections to be made above the springline of the sewermain as per:
 - i. Std Dwg S11.1 for flexible main sewers – connections made using approved tee or wye fittings.
 - ii. Std Dwg S11 (For rigid main sewers) – lateral must be less than 50% the diameter of the sewermain,
 - iii. Std Dwg S11.2 (for rigid main sewers using bell end insert method) – for larger diameter laterals where manufactured inserts are not available; lateral must be less than 50% the diameter of the sewermain,
 - iv. Connections to manholes permitted when the connection is to rigid main sewers where the lateral exceeds 50% the diameter of the sewermain. – Connect obvert to obvert with the outlet pipe unless pipes are a similar size.
 - v. No submerged outlet connections.

21. Water Boundary condition requests must include the location of the service (map or plan with connection location(s) indicated) and the expected loads required by the proposed development, including calculations. Please provide the following information:

no BCR will be requested for res site plans, no watermains built, navaan connection already provided as part of subdivision

- a. Location of service
- b. Type of development and the amount of fire flow required (as per FUS).
- c. Average daily demand: ___ l/s.
- d. Maximum daily demand: ___ l/s.
- e. Maximum hourly daily demand: ___ l/s.

22. An MECP Environmental Compliance Approval **[Industrial Sewage Works or Municipal/Private Sewage Works]** will be required for the proposed development. Please contact the Ministry of the Environment, Conservation and Parks, Ottawa District Office to arrange a pre-submission consultation:

a. Charlie Primeau at (613) 521-3450, ext. 251 or Charlie.Primeau@ontario.ca

b. Emily Diamond at (613) 521-3450, ext. 238 or Emily.Diamond@ontario.ca

General Comments:

23. Review of the Phase 3 submission for this application will not occur until the detailed design of the subdivision that it is within (D07-16-21-0027) is approved.
24. At the stage of site plan approval, a condition will be imposed detailing that a commence work notification will not be issued until the subdivision's infrastructure is in-service.
25. Engineering Studies:
26. All engineering studies (detailed in the Study and Plan Identification List form) are to follow the to be approved draft plan of subdivision D07-16-21-0027

Feel free to contact **Derek Unrau, Infrastructure Project Manager**, for follow-up questions.

Noise

Comments:

27. Noise report is required to identify and mitigate traffic noise from Brian Coburn Boulevard and Navan Road

Feel free to contact the Senior Transportation Engineer, Mike Giampa, at Mike.Giampa@ottawa.ca , for follow-up questions.

Transportation

Comments:

- a. A full TIA is not required as this site is covered under the recent subdivision TIA.
- b. A memo including the pertinent subdivision trips is sufficient.
- c. The right of way protection on Brian Coburn and Navan Roads is 40m and 37.5m, respectively

Feel free to contact the Senior Transportation Engineer, Mike Giampa, at Mike.Giampa@ottawa.ca , for follow-up questions.

Planning Forestry

Comments:

28. A Tree Conservation Report and Landscape Plan must be submitted with both SPC applications
29. A permit is required prior to any tree removal on site. The tree permit will be released upon site plan approval. Please contact the File Lead or the Planning Forester, Hayley Murray (hayley.murray@ottawa.ca) for information on obtaining the tree permit.
30. If marine clay soils are present, setbacks on City properties must adhere to the 2017 SMC guidelines (attached). The Geotechnical report must address the implications of these soils, if present, on tree planting in relation to private land.
31. If underground parking is planned, a design must be provided for the site to support tree planting
32. We expect a very strong landscape plan to re-establish canopy cover across the properties. Tree planting and protecting existing urban forest canopy is imperative to reach the City's target of 40% canopy cover.

Feel free to contact Hayley Murray, Planning Forester, for follow-up questions.

Parkland

Comments:

33. Parkland contributions were made through the Subdivision process.

Feel free to contact Jessica Button, Parks Planner, for follow-up questions

Conservation Authority

Comments:

34. The Rideau Valley Conservation authority will be commenting on this application

Feel free to contact RVCA, for follow-up questions.

Other

35. The High Performance Development Standard (HPDS) is a collection of voluntary and required standards that raise the performance of new building projects to achieve sustainable and resilient design. The HPDS was passed by Council on April 13, 2022.



- a. At this time, the HPDS is not in effect and Council has referred the 2023 HPDS Update Report back to staff with direction to bring forward an updated report to Committee with recommendations for revised phasing timelines, resource requirements and associated amendments to the Site Plan Control By-law by no later than Q1 2024.
- b. Please refer to the HPDS information attached and ottawa.ca/HPDS for more information.

Submission Requirements and Fees

1. Outlines the application type/subtype required and the associated fees
 - a. Additional information regarding fees related to planning applications can be found [here](#).
2. The attached **Study and Plan Identification List** outlines the information and material that has been identified as either required (R) or advised (A) as part of a future complete application submission.
 - a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.
3. All of the above comments or issues should be addressed to ensure the effectiveness of the application submission review.

Should there be any questions, please do not hesitate to contact myself or the contact identified for the above areas / disciplines.

Yours Truly,
Steve Belan

cc.

Tim Chadder
Raad Akrawi
Madelen Fellows
Karla Ferrey
Tatyana Roumie
Christopher Moise
Derek Unrau
Mike Giampa
Haley Murray
Jessica Button

12714001 Canada Inc – Mixed Use Site Plan (Block 14)
2983, 3053 and 3079 Navan Road & 2690 Pagé Road
SITE SERVICING REPORT CHECKLIST

REFERENCED STUDIES AND REPORTS	REFERENCE
Site Servicing Report for 12714001 Canada Inc, Mixed Used Site Plan (Block 14) 2983, 3053 and 3079 Navan Road & 2690 Pagé Road (J.L. Richards & Associates Limited, December 8, 2023)	Site Servicing Report

4.1	GENERAL CONTENT	REFERENCE
<input type="checkbox"/>	Executive Summary (for larger reports only).	N/A
<input checked="" type="checkbox"/>	Date and revision number of the report.	Site Servicing Report
<input checked="" type="checkbox"/>	Location map and plan showing municipal address, boundary, and layout of proposed development.	Site Servicing Report (Appendix A) All Drawings
<input checked="" type="checkbox"/>	Plan showing the site and location of all existing services.	Servicing Plan
<input checked="" type="checkbox"/>	Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	Site Servicing Report
<input checked="" type="checkbox"/>	Summary of Pre-consultation Meetings with City and other approval agencies.	Site Servicing Report (Appendix 'A')
<input checked="" type="checkbox"/>	Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defensible design criteria.	Reference made to Stantec 2005 EUC ISSU
<input checked="" type="checkbox"/>	Statement of objectives and servicing criteria.	Site Servicing Report
<input checked="" type="checkbox"/>	Identification of existing and proposed infrastructure available in the immediate area.	Site Servicing Report Servicing Plan
<input type="checkbox"/>	Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	N/A

<input checked="" type="checkbox"/>	Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	Grading Plan
<input type="checkbox"/>	Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A
<input type="checkbox"/>	Proposed phasing of the development, if applicable.	N/A
<input checked="" type="checkbox"/>	Reference to geotechnical studies and recommendations concerning servicing.	Site Servicing Report and Drawings
<input checked="" type="checkbox"/>	All preliminary and formal site plan submissions should have the following information: <ul style="list-style-type: none"> ▪ Metric scale ▪ North arrow (including construction North) ▪ Key plan ▪ Name and contact information of applicant and property owner ▪ Property limits, including bearings and dimensions ▪ Existing and proposed structures and parking areas ▪ Easements, road widening and rights-of-way ▪ Adjacent street names 	All Drawings

4.2	SITE SERVICING REPORT: WATER	REFERENCE
<input type="checkbox"/>	Confirm consistency with Master Servicing Study, if available.	N/A
<input checked="" type="checkbox"/>	Availability of public infrastructure to service proposed development.	Site Servicing Report (Section 2.0) Servicing Plan
<input checked="" type="checkbox"/>	Identification of system constraints.	Site Servicing Report (Section 2.0) Servicing Plan
<input checked="" type="checkbox"/>	Identify boundary conditions.	Site Servicing Report (Section 2.0)
<input checked="" type="checkbox"/>	Confirmation of adequate domestic supply and pressure.	Site Servicing Report (Section 2.0)
<input checked="" type="checkbox"/>	Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	Site Servicing Report (Section 2.0)
<input checked="" type="checkbox"/>	Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	Site Servicing Report (Section 2.0)

<input type="checkbox"/>	Definition of phasing constraints. Hydraulic modelling is required to confirm servicing for all defined phases of the project, including the ultimate design.	N/A
<input checked="" type="checkbox"/>	Address reliability requirements, such as appropriate location of shutoff valves.	Site Servicing Report (Section 2.0)
<input type="checkbox"/>	Check on the necessity of a pressure zone boundary modification.	N/A
<input checked="" type="checkbox"/>	Reference to water supply analysis to show that major infrastructure can deliver sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range.	Site Servicing Report (Section 2.0)
<input checked="" type="checkbox"/>	Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants), including special metering provisions.	Site Servicing Report (Section 2.0) Servicing Plan
<input type="checkbox"/>	Description of off-site required feeder mains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	N/A
<input checked="" type="checkbox"/>	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Site Servicing Report (Section 2.0)
<input checked="" type="checkbox"/>	Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	Site Servicing Report (Section 2.0)

4.3	SITE SERVICING REPORT: WASTEWATER	REFERENCE
<input checked="" type="checkbox"/>	Summary of proposed design criteria (Note: Wet weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).	Site Servicing Report (Section 3.0,
<input type="checkbox"/>	Confirm consistency with Master Servicing Study and/or justifications for deviations.	Stantec 2005 EUC ISSU
<input type="checkbox"/>	Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the Guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	N/A
<input checked="" type="checkbox"/>	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Site Servicing Report (Section 3.0) Servicing Plan

<input checked="" type="checkbox"/>	Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable.)	Site Servicing Report (Section 3.0)
<input checked="" type="checkbox"/>	Calculations related to dry weather and wet weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	Site Servicing Report (Section 3.0)
<input checked="" type="checkbox"/>	Description of proposed sewer network, including sewers, pumping stations and forcemains.	Site Servicing Report (Section 3.0) Servicing Plan
<input type="checkbox"/>	Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	N/A
<input type="checkbox"/>	Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	N/A
<input type="checkbox"/>	Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
<input type="checkbox"/>	Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	N/A
<input type="checkbox"/>	Special considerations, such as contamination, corrosive environment, etc.	N/A

4.4	SITE SERVICING REPORT: STORMWATER	REFERENCE
<input checked="" type="checkbox"/>	Description of drainage outlets and downstream constraints, including legality of outlets (i.e., municipal drain, right-of-way, watercourse, or private property).	Site Servicing Report (Section 4.0)
<input checked="" type="checkbox"/>	Analysis of available capacity in existing public infrastructure.	Site Servicing Report (Section 4.0)
<input checked="" type="checkbox"/>	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Servicing, Grading and Drainage Plans
<input checked="" type="checkbox"/>	Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.	Site Servicing Report (Section 4.0)

<input checked="" type="checkbox"/>	Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Site Servicing Report (Section 4.0)
<input checked="" type="checkbox"/>	Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	Site Servicing Report (Section 4.0) Servicing, Grading and Drainage Plans
<input type="checkbox"/>	Setback from private sewage disposal systems.	N/A
<input type="checkbox"/>	Watercourse and hazard lands setbacks.	N/A
<input checked="" type="checkbox"/>	Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	Site Servicing Report (Appendix 'A')
<input type="checkbox"/>	Confirm consistency with subwatershed and Master Servicing Study, if applicable study exists.	Stantec 2005 EUC ISSU
<input checked="" type="checkbox"/>	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:2 year return period) and major events (1:100 year return period).	Site Servicing Report (Section 4.0)
<input type="checkbox"/>	Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	N/A
<input checked="" type="checkbox"/>	Calculate pre- and post-development peak flow rates, including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Site Servicing Report (Section 4.0)
<input checked="" type="checkbox"/>	Any proposed diversion of drainage catchment areas from one outlet to another.	Site Servicing Report (Section 4.0)
<input checked="" type="checkbox"/>	Proposed minor and major systems, including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Servicing, Grading and Drainage Plans
<input type="checkbox"/>	If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	Quantity control proposed per Site Servicing Report (Section 4.0)
<input type="checkbox"/>	Identification of potential impacts to receiving watercourses.	N/A
<input type="checkbox"/>	Identification of municipal drains and related approval requirements.	N/A
<input checked="" type="checkbox"/>	Description of how the conveyance and storage capacity will be achieved for the development.	Site Servicing Report (Section 4.0)

<input checked="" type="checkbox"/>	100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	Site Servicing Report (Section 4.0) Servicing, Grading and Drainage Plans
<input checked="" type="checkbox"/>	Inclusion of hydraulic analysis, including hydraulic grade line elevations.	Site Servicing Report (Section 4.0)
<input checked="" type="checkbox"/>	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Site Servicing Report (Section 5.0) Servicing Plan
<input type="checkbox"/>	Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	N/A
<input type="checkbox"/>	Identification of fill constraints related to floodplain and geotechnical investigation.	N/A

4.5	APPROVAL AND PERMIT REQUIREMENTS	REFERENCE
The Site Servicing Report shall provide a list of applicable permits and regulatory approvals necessary for the proposed development, as well as the relevant issues affecting such approval. The approval and permitting shall include but not be limited to the following:		
<input type="checkbox"/>	Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams, as defined in the Act.	N/A
<input type="checkbox"/>	Application for Environmental Compliance Approval (ECA) under the Ontario Water Resources Act.	As part of future submission
<input type="checkbox"/>	Changes to Municipal Drains.	N/A
<input type="checkbox"/>	Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation, etc.).	N/A

4.6	CONCLUSION CHECKLIST	REFERENCE
<input checked="" type="checkbox"/>	Clearly stated conclusions and recommendations.	Site Servicing Report
<input checked="" type="checkbox"/>	Comments received from review agencies, including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.	Not yet applicable

<input checked="" type="checkbox"/>	All draft and final reports shall be signed and stamped by a Professional Engineer registered in Ontario.	Site Servicing Report All Drawings

Site Servicing Report

2983, 3053 and 3079 Navan Road & 2690 Pagé Road, Ottawa, Ontario

Appendix C

Water Servicing

WATERMAIN DEMAND CALCULATION SHEET

PROJECT : NAVAN ROAD DEVELOPMENT PROJECT
LOCATION : CITY OF OTTAWA
DEVELOPER : 12714001 Canada Inc.

NODE	RESIDENTIAL			NON-RESIDENTIAL COMM (ha.)	AVERAGE DAILY DEMAND (l/s)			MAXIMUM DAILY DEMAND (l/s)			PEAK HOUR DEMAND (l/s)		
	UNITS		POP'N		Res.	Non-res.	Total	Res.	Non-res.	Total	Res.	Non-res.	Total
	Townhouses (TH)	Condo Units (CU)											
J-22	0	84	151	0.09	0.49	0.03	0.52	1.23	0.05	1.27	2.70	0.08	2.78
TOTALS	0	84	151	0.09	0.49	0.03	0.52	1.23	0.05	1.27	2.70	0.08	2.78

ASSUMPTIONS			
RESIDENTIAL DENSITIES			
- Townhouse (TH)	<u>2.7</u> p / p / u	AVG. DAILY DEMAND	
- Condo Units (CU)	<u>1.8</u> p / p / u	- Residential	<u>280</u> l / cap / day
		- Institutional	<u>28,000</u> l / ha / day
		- Commercial	<u>28,000</u> l / ha / day
		MAX. DAILY DEMAND	
		- Residential	<u>700</u> l / cap / day
		- Institutional	<u>42,000</u> l / ha / day
		- Commercial	<u>42,000</u> l / ha / day
		MAX. HOURLY DEMAND	
		- Residential	<u>1,540</u> l / cap / day
		- Institutional	<u>75,600</u> l / ha / day
		- Commercial	<u>75,600</u> l / ha / day

FUS Fire Flow Calculations

NAVAN ROAD DEVELOPMENT PROJECT - Commercial Building
(JLR 29899-002)

Step	Parameter	Value	Note
A	Type of Construction	Wood Frame	Building A (4 Story Mixed Use Condominium Building)
	Coefficient (C)	1.5	
B	Ground Floor Area	929 m ²	
C	Height in storeys	4 storeys	Basements are excluded.
	Total Floor Area	3716 m ²	
D	Fire Flow Formula	F=220C ^{1/4} A	
	Fire Flow	20116	L/min
	Rounded Fire Flow	20000	L/min
E	Occupancy Class	Limited Combustible	Residential buildings have a limited combustible occupancy.
	Occupancy Charge	-15%	
	Occupancy Increase or Decrease	-3000	
	Fire Flow	17000	
F	Sprinkler Protection	Automatic Fully Supervised	
	Sprinkler Credit	-50%	
	Decrease for Sprinkler	-8500	L/min
G	<i>North Side Exposure</i>		
	Exposing Wall:	Wood Frame	Building A
	Exposed Wall:	Wood Frame	Townhomes
	Length of Exposed Wall:	15.1	m
	Height of Exposed Wall:	2	storeys
	Length-Height Factor	30.1	m-storeys
	Separation Distance	10.41	m
	North Side Exposure Charge	12%	
	<i>East Side Exposure</i>		
	Exposing Wall:	Wood Frame	Building A
	Exposed Wall:	Wood Frame	Townhomes
	Length of Exposed Wall:	14.4	m
	Height of Exposed Wall:	0	storeys
	Length-Height Factor	0.0	m-storeys
	Separation Distance	25.84	m
	East Side Exposure Charge	8%	
	<i>South Side Exposure</i>		
	Exposing Wall:	Wood Frame	Building A
	Exposed Wall:	Wood Frame	Building B
	Length of Exposed Wall:	39.2	m
	Height of Exposed Wall:	4	storeys
	Length-Height Factor	156.8	m-storeys
	Separation Distance	25.25	m
	South Side Exposure Charge	10%	
	<i>West Side Exposure</i>		
	Exposing Wall:	Wood Frame	
	Exposed Wall:	Wood Frame	
	Length of Exposed Wall:	0.0	m
	Height of Exposed Wall:	0	storeys
	Length-Height Factor	0.0	m-storeys
	Separation Distance	50	m
	West Side Exposure Charge	0%	
Total Exposure Charge	30%		The total exposure charge is below the maximum value of 75%.
Increase for Exposures	5100	L/min	
H	Fire Flow	13600	L/min
	Rounded Fire Flow	14000	L/min
City Cap	Required Fire Flow (RFF)	14000	L/min
		233	L/s

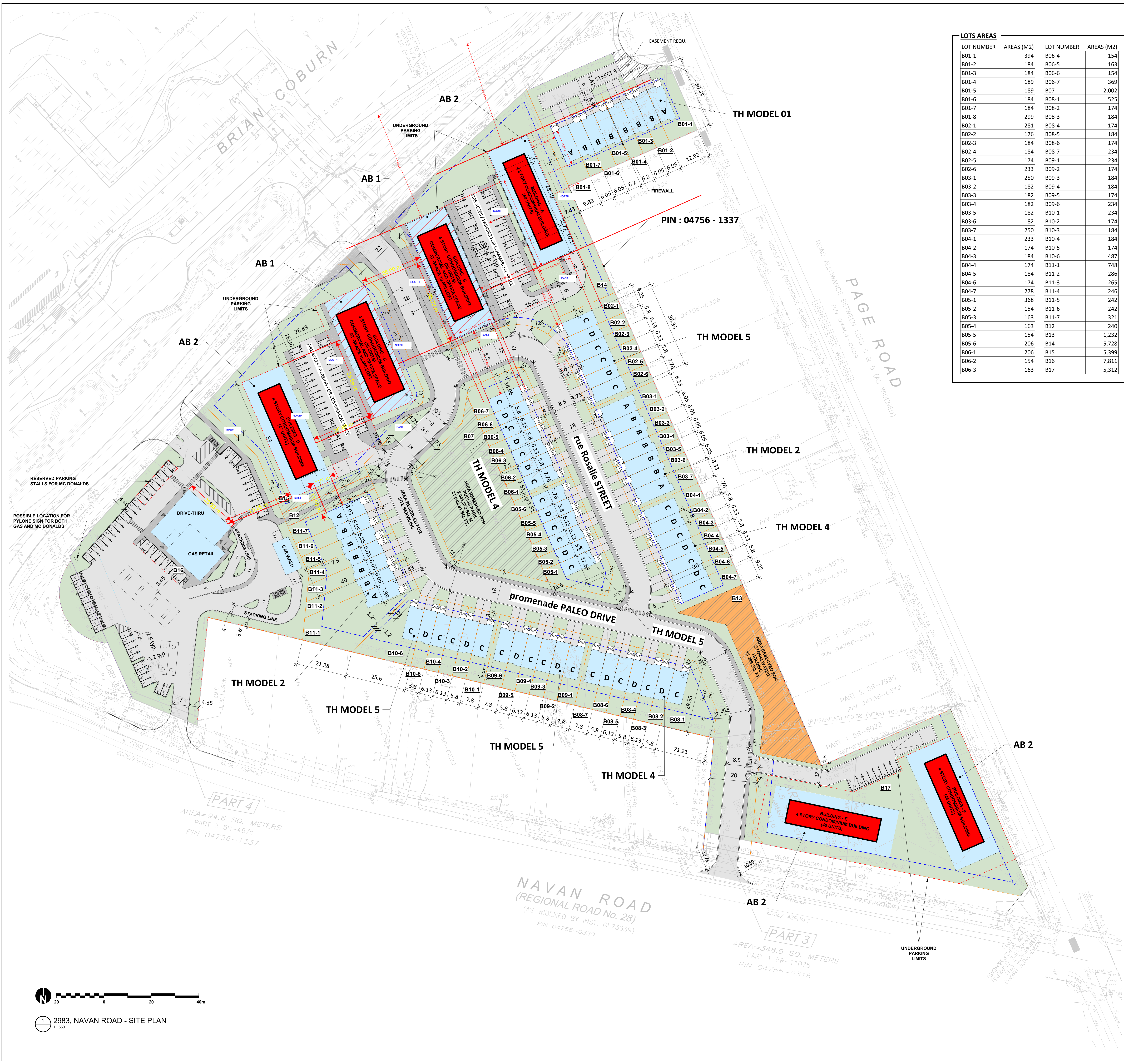
Fire Underwriters Survey (FUS) Fire Flow Calculations
In accordance with City of Ottawa Technical Bulletin ISTB-2018-02 dated March 21, 2018

FUS Fire Flow Calculations

NAVAN ROAD DEVELOPMENT PROJECT - Commercial Building
(JLR 29899-002)

Step	Parameter	Value	Note
A	Type of Construction	Wood Frame	Building B (4 Story Mixed Use Condominium Building)
	Coefficient (C)	1.5	
B	Ground Floor Area	929 m ²	
C	Height in storeys	4 storeys	Basements are excluded.
	Total Floor Area	3716 m ²	
D	Fire Flow Formula	F=220C [√] A	
	Fire Flow	20116	L/min
	Rounded Fire Flow	20000	L/min
E	Occupancy Class	Limited Combustible	Residential buildings have a limited combustible occupancy.
	Occupancy Charge	-15%	
	Occupancy Increase or Decrease	-3000	
	Fire Flow	17000	
F	Sprinkler Protection	Automatic Fully Supervised	
	Sprinkler Credit	-50%	
	Decrease for Sprinkler	-8500	L/min
G	<i>North Side Exposure</i>		
	Exposing Wall:	Wood Frame	Building B
	Exposed Wall:	Wood Frame	Building A
	Length of Exposed Wall:	39.2	m
	Height of Exposed Wall:	4	storeys
	Length-Height Factor	156.8	m-storeys
	Separation Distance	25.25	m
	North Side Exposure Charge	10%	
	<i>East Side Exposure</i>		
	Exposing Wall:	Wood Frame	Building B
	Exposed Wall:	Wood Frame	Townhomes
	Length of Exposed Wall:	14.3	m
	Height of Exposed Wall:	0	storeys
	Length-Height Factor	0.0	m-storeys
	Separation Distance	28.76	m
	East Side Exposure Charge	8%	
	<i>South Side Exposure</i>		
	Exposing Wall:	Wood Frame	Building B
	Exposed Wall:	Wood Frame	Building C
	Length of Exposed Wall:	36.1	m
	Height of Exposed Wall:	4	storeys
	Length-Height Factor	144.5	m-storeys
	Separation Distance	26.02	m
	South Side Exposure Charge	10%	
	<i>West Side Exposure</i>		
	Exposing Wall:	Wood Frame	
	Exposed Wall:	Wood Frame	
	Length of Exposed Wall:	0.0	m
	Height of Exposed Wall:	0	storeys
	Length-Height Factor	0.0	m-storeys
Separation Distance	50	m	
West Side Exposure Charge	0%		
Total Exposure Charge	28%		The total exposure charge is below the maximum value of 75%.
Increase for Exposures	4760	L/min	
H	Fire Flow	13260	L/min
	Rounded Fire Flow	13000	L/min
City Cap	Required Fire Flow (RFF)	13000	L/min
		217	L/s

Fire Underwriters Survey (FUS) Fire Flow Calculations
In accordance with City of Ottawa Technical Bulletin ISTB-2018-02 dated March 21, 2018



LOTS AREAS		LOTS AREAS	
LOT NUMBER	AREAS (M2)	LOT NUMBER	AREAS (M2)
B01-1	394	B06-4	154
B01-2	184	B06-5	163
B01-3	184	B06-6	154
B01-4	189	B06-7	369
B01-5	189	B07	2,002
B01-6	184	B08-1	525
B01-7	184	B08-2	174
B01-8	299	B08-3	184
B02-1	281	B08-4	174
B02-2	176	B08-5	184
B02-3	184	B08-6	174
B02-4	184	B08-7	234
B02-5	174	B09-1	234
B02-6	233	B09-2	174
B03-1	250	B09-3	184
B03-2	182	B09-4	184
B03-3	182	B09-5	174
B03-4	182	B09-6	234
B03-5	182	B10-1	234
B03-6	182	B10-2	174
B03-7	250	B10-3	184
B04-1	233	B10-4	184
B04-2	174	B10-5	174
B04-3	184	B10-6	487
B04-4	174	B11-1	748
B04-5	184	B11-2	286
B04-6	174	B11-3	265
B04-7	278	B11-4	246
B05-1	368	B11-5	242
B05-2	154	B11-6	242
B05-3	163	B11-7	321
B05-4	163	B12	240
B05-5	154	B13	1,232
B05-6	206	B14	5,728
B06-1	206	B15	5,399
B06-2	154	B16	7,811
B06-3	163	B17	5,312

SITE PLAN LEGEND			
[Symbol]	EXISTING BUILDING	[Symbol]	LOT LINE
[Symbol]	NEW BUILDING	[Symbol]	SETBACKS
[Symbol]	NEW BUILDING WITH COMMERCIAL SPACE AT-GRADE	[Symbol]	NEW TREE
[Symbol]	GRASS	[Symbol]	FIREWALL
[Symbol]	ASPHALT	[Symbol]	SIDEWALK

SITE INFORMATION & DEVELOPMENT STATISTICS		
LOTS		PIN
		04756-0303
		04756-0315
		04756-0316
		04756-1337
ZONING		GM(2546) H(14.5)

SITE AREA		
TOTAL SITE AREA:	~53,441.14 m ²	(5.34ha)
TOTAL DEVELOPABLE AREA:	~45,956.28 m ²	(4.59ha)
NET SITE AREA:	~38,956.28 m ²	(3.89ha)
UNITS		
TOWNHOUSES:		67 UNITS
BLOCK 01:		
1 X RESIDENTIAL APARTMENT BUILDING		48 UNITS
1 X MIXED USE BUILDING		
RESIDENTIAL:		36 UNITS
COMMERCIAL SPACES:		~929 m ²
BLOCK 02:		
1 X RESIDENTIAL APARTMENT BUILDING		47 UNITS
1 X MIXED USE BUILDING		
RESIDENTIAL:		36 UNITS
COMMERCIAL SPACES:		~929 m ²
BLOCK 03:		
2 X RESIDENTIAL APARTMENT BUILDING		96 UNITS
TOTAL NUMBER OF UNITS:		330 UNITS
TOTAL COMMERCIAL SPACES:		~1,858 m ²

	REQUIRED	PROVIDED
MAXIMUM DENSITY	NO MAX.	84.8 units/net ha
MINIMUM LOT WIDTH	NO MIN.	5.8 m
MINIMUM LOT AREA	NO MIN.	174 m ²
MAXIMUM BUILDING HEIGHT	14.5 m	14.5 m
SETBACKS		
MINIMUM FRONT YARD:	3 m	3 m
MINIMUM CORNER SIDE YARD:	3 m	3 m
MINIMUM INTERIOR SIDE YARD:		
NON-RESIDENTIAL OR MIXED-USE:	5 m	5 m
LOW-RISE RESIDENTIAL :	1.2 m	1.2 m
MID-RISE RESIDENTIAL :	3 m	3 m
MINIMUM REAR YARD:		
ABUTTING A STREET:	3 m	3 m
FROM A RESIDENTIAL ZONE:	7.5 m	7.5 m
FOR A RESIDENTIAL BUILDING:	7.5 m	7.5 m

PARKING RATES			
R9 - TOWNHOUSES:	1 p/unit = 67		67 (GARAGES)
VISITOR:	0		67 DRIVE AISLES
BLOCK 14:			
R12 - APARTEMENTS	1.2 p/unit = 101		101 (UNDERGROUND)
VISITOR:	0.2 p/unit = 17		17 (UNDERGROUND)
N79 - RETAIL STORE:	3.4 p/100 m ² GFA = 32		32 (EXTERIOR)
			TOTAL: 150
BLOCK 15:			
R12 - APARTEMENTS	1.2 p/unit = 100		100 (UNDERGROUND)
VISITOR:	0.2 p/unit = 17		17 (UNDERGROUND)
N79 - RETAIL STORE:	3.4 p/100 m ² GFA = 32		32 (EXTERIOR)
			TOTAL: 150
BLOCK 18:			
R12 - APARTEMENTS	1.2 p/unit = 116		145 (UNDERGROUND)
VISITOR:	0.2 p/unit = 17		17 (8 EXT. + 12 UND.)
			TOTAL: 162

GROSS FLOOR AREA		
TOWNHOUSE A:		267 m ²
TOWNHOUSE B:		239 m ²
TOWNHOUSE C:		232 m ²
TOWNHOUSE C (CORNER UNIT):		236 m ²
TOWNHOUSE D:		225 m ²
TOTAL MODEL 01 (ABBBBBBA)		1,968 m ²
TOTAL MODEL 02 (ABBBBBBA)		1,729 m ²
TOTAL MODEL 03 (ABBBBBA)		1,490 m ²
TOTAL MODEL 04 (CDDCCDC)		1,611 m ²
TOTAL MODEL 05 (CDDCCDC)		1,386 m ²

MIXED USE BUILDING (TOTAL OF 2 BUILDINGS):		TOTAL: 4,130 m ²
RESIDENTIAL:		3,201 m ²
COMMERCIAL:		929 m ²
RESIDENTIAL APARTMENT BUILDING (TOTAL OF 4 BUILDINGS) :		TOTAL: 4,130 m ²
RESIDENTIAL:		4,130 m ²

- NOTE
1. ASSUMES TYPICAL RESIDENTIAL FLOOR HEIGHT OF 3m.
 2. THE BASE PLAN (LOT LINES, EXISTING ROADS AND SURROUNDING AREAS) IS BASED ON THE TOPOGRAPHICAL PLAN OF SURVEY, SURVEYED STANTEC GEOMATICS LTD.
 3. DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

PROJECT

NAVAN ROAD DEVELOPMENT

2983, Navan Road, Orleans, ON K1C 7G4

OWNER

Heafey GROUP

788, BOUL. SAINT-JOSEPH, SUITE 100 GATINEAU, QC J8Y 4B8

ARCHITECTURAL

PMA ARCHITECTES

(418) 851-8954
INFO@PMAARCHITECTES.COM
3070, CHEMIN DES QUATRE-BOURGEOIS QUÉBEC (CQ) G1R 2M4
PMAARCHITECTES.COM

ARCHITECTES ASSOCIÉS

LAPALME RHEAULT

53, BOUL. SAINT-RAYMOND, GATINEAU, QC J8Y 1R8

ENGINEERS / PLANNER

J.L. Richards

ENGINEERS - ARCHITECTS - PLANNERS

1585 CARLING AVENUE, SUITE 700, OTTAWA, ON K1Z 6R1

SURVEYOR

Stantec

1331 GLYDE AVENUE, SUITE 400, OTTAWA, ON K2C 3G4

KEY PLAN

ARCHITECT SEAL

REVISIONS

NO	DESCRIPTION	DATE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

NOTE

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON THE SITE AND TO REPORT ALL ERRORS AND/OR OMISSIONS TO THE ARCHITECT. ALL CONTRACTORS MUST COMPLY WITH ALL PERTINENT CODES AND BY-LAWS. DO NOT SCALE DRAWINGS.

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DATE	DESIGNED
2023-11-29	PP
PROJECT No	CHECKED
2054	PM
DATE	DRAWN
2023-11-29	PP
PROJECT No	CHECKED
2054	PM
DATE	SHEET TITLE
2023-11-29	SITE PLAN

SHEET No

A100

Autodesk Docs://NAVAN ROAD/2054_DEV/NAVAN_SITE_PLAN_LR24.rvt



2983, NAVAN ROAD - SITE PLAN
1:500

Table 1. Maximum flow to be considered from a given hydrant

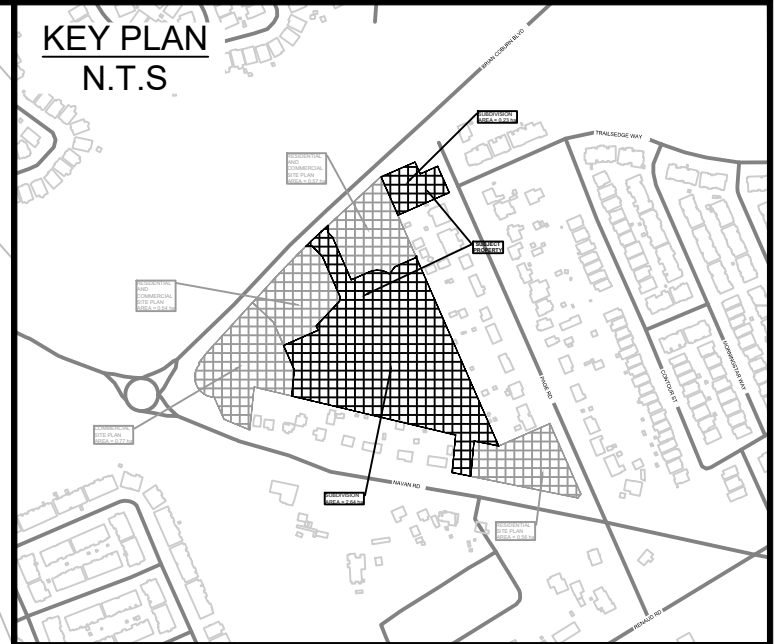
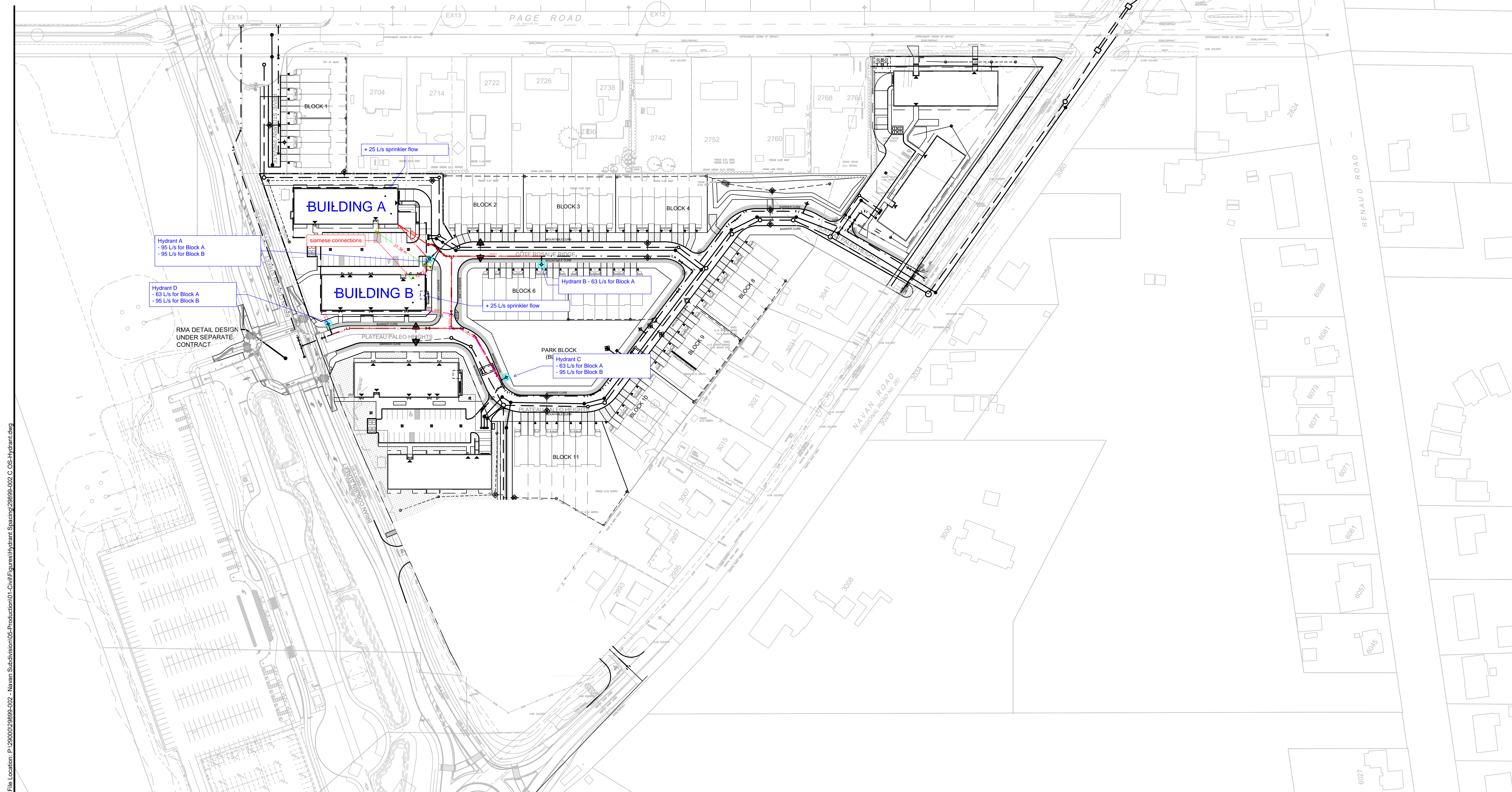
Block 14

Required Fire Flow = 233 L/s

Hydrant Class	Distance to asset/structure/building (m) ^a	Contribution to required fire flow (L/min) ^b
AA	≤ 75	5,700
	> 75 and ≤ 150	3,800
A	≤ 75	3,800
	> 75 and ≤ 150	2,850
B	≤ 75	1,900
	> 75 and ≤ 150	1,500
C	≤ 75	800
	> 75 and ≤ 150	800

^a Distance of contributing hydrant from the structure, measured in accordance with NFPA 1 (Appendix A).

^b Maximum flow contribution to be considered for a given asset/structure/building, at a residual pressure of 20 psi, measured at the location of the main, at ground level.



LEGEND

- PROPOSED WATERMAIN, VALVE & HYDRANT
- EXISTING WATERMAIN, VALVE & HYDRANT
- EXISTING SANITARY SEWER & MANHOLE
- EXISTING STORM SEWER & MANHOLE
- PROPOSED SANITARY SEWER & MANHOLE
- PROPOSED STORM SEWER & MANHOLE
- STEPPED FOOTING
- FIREWALL
- PROPOSED CULVERT
- DRAWING NUMBER
- RIP-RAP TO OPSD 810.010 (TYPE B)
- EXISTING CATCH BASIN
- PROPOSED CATCH BASIN w/ CO
- PROPOSED CATCH BASIN & LEAD
- PROPOSED TEE CATCHBASIN
- PROPOSED 3-WAY CATCHBASIN
- CONC. SIDEWALK
- ASPHALT
- INFILTRATION TRENCH
- TACTILE WALKING SURFACE INDICATOR (TWSI)
- SPEED HUMP PER CITY DETAIL R19

Draft Print

2024-07-24 8:19:37 AM

04	RE-ISSUED TO CITY FOR ENGINEERING REVIEW (SECOND SUBMISSION)	16/02/24
03	ISSUED FOR MUNICIPAL CONSENT	09/02/24
02	ISSUED TO CITY FOR ENGINEERING REVIEW	22/09/23

NO. ISSUE / REVISION DDMMYY

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VERIFY SHEET SIZE AND SCALES. THE BAR TO THE RIGHT IS 25mm IF THIS IS A FULL SIZE DRAWING.

SCALE: 1:1000

CLIENT:

CONSULTANT:

J.L. Richards
ENGINEERS - ARCHITECTS - PLANNERS

CONSULTANT:

PROFESSIONAL STAMP

PROJECT NORTH

PROJECT:

NAVAN SUBDIVISION

2983, 3053, & 3079 NAVAN ROAD & 2690 PAGE ROAD
OTTAWA, ONTARIO

DRAWING:

OVERALL SERVICING

DESIGN: TR	DRAWING #:
DRAWN: KT	OS
CHECKED: KF	
JLR #: 29899-002	

William Rugamba

From: William Rugamba
Sent: July 22, 2024 8:18 AM
To: William Rugamba
Subject: FW: Re-confirmation of Mechanical Items for Servicing Report

William Rugamba, M.Eng., B.A.Sc., EIT
Civil Engineering Graduate
Ottawa, ON
Work: [343-804-4374](tel:343-804-4374)

From: Sarith Lopez <slopez@qmeengineering.com>
Sent: Wednesday, July 17, 2024 8:07 PM
To: Mahad Musse <mmusse@jlrichards.ca>; Chuck Clark <CWC@qmeengineering.com>
Cc: Karla Ferrey <kferrey@jlrichards.ca>; Raad Akrawi <rakrawi@groupeheafey.com>; Carmine Zayoun <carmine@zayoungroup.com>
Subject: RE: Re-confirmation of Mechanical Items for Servicing Report

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Hi Mahad,

All items below confirmed

Regards

Sarith López
Project Manager

9 Gurdwara Road, Unit 200
Ottawa, ON K2E 7X6
T: 613-366-4763 ext. 129
slopez@qmeengineering.com



From: Mahad Musse <mmusse@jlrichards.ca>

Sent: Tuesday, July 16, 2024 3:08 PM

To: Sarith Lopez <slopez@qmeengineering.com>; Chuck Clark <CWC@qmeengineering.com>

Cc: Karla Ferrey <kferrey@jlrichards.ca>; Raad Akrawi <rakrawi@groupeheafey.com>; Carmine Zayoun <carmine@zayoungroup.com>

Subject: Re-confirmation of Mechanical Items for Servicing Report

Hi Sarith/Chuck,

Thank you for the information below and in our meetings. I understand all these items have been discussed before but we need to submit something as part of our report. Can you just re-confirm the following questions below and then we will attach your confirmation to the Report.

1. Please confirm that the sanitary service size of 200mm diameter for the Site Plan Blocks (Block 14, 15 and 17) is preferred by the mechanical engineer on file;
2. Please confirm that a sprinkler flow of 25 L/s can be assumed for the Site Plan Blocks (Block 14, 15 and 17) at this stage.

Thanks
Mahad



Mahad Musse, B.Eng., EIT
Civil Engineering Graduate

1000-343 Preston Street
Ottawa, ON, K1S 1N4



Work: [343-633-1501](tel:343-633-1501)
mmusse@jlrichards.ca



William Rugamba

From: William Rugamba
Sent: July 15, 2024 4:00 PM
To: William Rugamba
Subject: FW: Navan Subdivision - Boundary Condition Request
Attachments: NavanSubdivision_Boundary Condition(4july2024).docx

William Rugamba, M.Eng., B.A.Sc., EIT
Civil Engineering Graduate
Ottawa, ON
Work: [343-804-4374](tel:343-804-4374)

From: Polyak, Alex <alex.polyak@ottawa.ca>
Sent: Monday, July 15, 2024 10:12 AM
To: Mahad Musse <mmusse@jlrichards.ca>
Cc: Karla Ferrey <kferrey@jlrichards.ca>; Raad Akrawi <rakrawi@groupeheafey.com>; Carmine Zayoun <carmine@zayoungroup.com>; Armstrong, Justin <justin.armstrong@ottawa.ca>; Tatyana Roumie <troumie@jlrichards.ca>
Subject: RE: Navan Subdivision - Boundary Condition Request

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Good morning Mahad,

Please find the boundary conditions attached.

Regards,

Oleksandr (Alex) Polyak, B.Eng., C.E.T., P.Eng. 

Project Manager, Infrastructure Approvals, Development Review East Branch | Gestionnaire de projet, Direction de l'examen des projets d'aménagement – Est.
Planning, Development and Building Services Department (PDBS) | Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)

City of Ottawa | Ville d'Ottawa
110 Laurier Ave., 4th Fl East, Ottawa ON K1P 1J1
Email: alex.polyak@ottawa.ca
Cell : 613-857-4380
www.Ottawa.ca



From: Mahad Musse <mmusse@jlrichards.ca>

Sent: July 12, 2024 1:31 PM

To: Polyak, Alex <alex.polyak@ottawa.ca>

Cc: Karla Ferrey <kferrey@jlrichards.ca>; Raad Akrawi <rakrawi@groupeheafey.com>; Carmine Zayoun <carmine@zayoungroup.com>; Armstrong, Justin <justin.armstrong@ottawa.ca>; Tatyana Roumie <troumie@jlrichards.ca>

Subject: RE: Navan Subdivision - Boundary Condition Request

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Hi Alex,

Just wondering if you have a status update for the boundary conditions for Navan.

Thanks
Mahad



Mahad Musse, B.Eng., EIT
Civil Engineering Graduate

1000-343 Preston Street
Ottawa, ON, K1S 1N4

Work: [343-633-1501](tel:343-633-1501)
mmusse@jlrichards.ca

From: Mahad Musse <mmusse@jlrichards.ca>

Sent: Wednesday, July 3, 2024 11:02 AM

To: Polyak, Alex <alex.polyak@ottawa.ca>

Cc: Karla Ferrey <kferrey@jlrichards.ca>; Raad Akrawi <rakrawi@groupeheafey.com>; Carmine Zayoun <carmine@zayoungroup.com>; Armstrong, Justin <justin.armstrong@ottawa.ca>; Tatyana Roumie <troumie@jlrichards.ca>

Subject: RE: Navan Subdivision - Boundary Condition Request

Good morning Alex,

As we discussed last week our Client is looking into the option of converting the row townhouse units into duplex units (townhouse units with apartments in the basement). As a result, this will increase the total demand on the site and we will therefore require new water boundary conditions. We'd like to note that the footprint of the blocks will not change and neither will their layout or any of the offsets.

As a summary:

- Domestic demands were calculated based on a daily consumption rate of 280 L/cap/day with peaking factors consistent with City of Ottawa Guidelines
- Required Fire Flow (RFF) was calculated in accordance to the Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection and the City of Ottawa FUS protocol (Bulletin ISDTB-2014-02 & Bulletin ISDTB-2018-02), which considers material, expose distance & height. We have attached the calculation spreadsheet and the figure.

We request boundary conditions under high pressure, peak hour, and maximum day + fire flow conditions (for each of the below fire flows). Domestic demand and fire flow calculations are attached. Please provide the boundary conditions at the proposed connection locations as shown in the attached figure.

Average Day Demand: 6.74 L/s

Maximum Day Demand: 10.53 L/s

Peak Hour Demand: 18.17 L/s

Required Fire Flow (per FUS): 6,000 L/min (100 L/s)

Required Fire Flow (per FUS): 10,000 L/min (167 L/s)

Required Fire Flow (per FUS): 14,000 L/min (233 L/s)

Required Fire Flow (per FUS): 15,000 L/min (250 L/s)

For your reference, the previous boundary condition received from the City is attached and below is the email chain.

If you have any questions or comments please let us know.

Thanks
Mahad



Mahad Musse, B.Eng., EIT
Civil Engineering Graduate

1000-343 Preston Street
Ottawa, ON, K1S 1N4

Work: [343-633-1501](tel:343-633-1501)
mmusse@jlrichards.ca

From: Polyak, Alex <alex.polyak@ottawa.ca>

Sent: Thursday, August 17, 2023 3:01 PM

To: William Rugamba <wrugamba@jlrichards.ca>

Cc: Karla Ferrey <kferrey@jlrichards.ca>; Raad Akrawi <rakrawi@groupeheafey.com>; Carmine Zayoun <carmine@zayoungroup.com>; Shahira Jalal <sjalal@jlrichards.ca>

Subject: RE: Navan Subdivision - Boundary Condition Request

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Hello William,

Sorry that I missed your call, I was in a meeting. The boundary conditions are attached.

Regards,

Oleksandr (Alex) Polyak, B.Eng., P.Eng

Project Manager, Infrastructure Approvals, Development Review East Branch | Gestionnaire de projet, Direction de l'examen des projets d'aménagement – Est.
Planning, Real Estate and Economic Development Department | Direction générale de la planification, des biens immobiliers et du développement économique

City of Ottawa | Ville d'Ottawa
110 Laurier Ave., 4th Fl East, Ottawa ON K1P 1J1
Email: alex.polyak@ottawa.ca
Cell : 613-857-4380
www.Ottawa.ca



From: William Rugamba <wrugamba@jlrichards.ca>
Sent: August 15, 2023 9:26 AM
To: Polyak, Alex <alex.polyak@ottawa.ca>
Cc: Karla Ferrey <kferrey@jlrichards.ca>; Raad Akrawi <rakrawi@groupeheafey.com>; Carmine Zayoun <carmine@zayoungroup.com>; Shahira Jalal <sjalal@jlrichards.ca>
Subject: RE: Navan Subdivision - Boundary Condition Request

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Good morning Alex,

Just wanted to follow up on the status of this boundary request. Please let me know if you need anything else from us.

Thanks,
William

William Rugamba, M.Eng.
Civil Engineering Intern

J.L. Richards & Associates Limited
1000-343 Preston Street, Ottawa, ON K1S 1N4
Direct: 343-804-4374



From: Tatyana Roumie
Sent: Tuesday, July 25, 2023 3:53 PM
To: 'alex.polyak@ottawa.ca' <alex.polyak@ottawa.ca>
Cc: Karla Ferrey <kferrey@jlrichards.ca>; Raad Akrawi <rakrawi@groupeheafey.com>; carmine@zayoungroup.com; Shahira Jalal <sjalal@jlrichards.ca>
Subject: Navan Subdivision - Boundary Condition Request

Hello Alex.

To support our upcoming detailed design for the site, we are requesting updated boundary conditions for the 3079 Navan Road Development.

As a brief history, we received boundary conditions from the City in July 2021 (attached, but with incorrect connection locations) and again in April 2022 (also attached) in support of the functional servicing design. We understand from the April 2022 boundary conditions that the maximum available fire flow for the site is 250 L/s.

We are currently requesting updated boundary conditions for this site as we are commencing the detailed servicing design and this request will accommodate the recent site plan changes and proposed connection points. This request is also applicable to the upcoming site plan designs which will be submitted as separate applications.

We request boundary conditions under high pressure, peak hour, and maximum day + fire flow conditions (for each of the below fire flows). Domestic demand and fire flow calculations are attached. Please provide the boundary conditions at the proposed connection locations as shown in the attached figure.

Average Day Demand: 6.44 L/s
Maximum Day Demand: 9.77 L/s
Peak Hour Demand: 16.50 L/s
Required Fire Flow (per FUS): 6,000 L/min (100 L/s)
Required Fire Flow (per FUS): 10,000 L/min (167 L/s)
Required Fire Flow (per FUS): 14,000 L/min (233 L/s)
Required Fire Flow (per FUS): 15,000 L/min (250 L/s)

Thanks,
Tatyana

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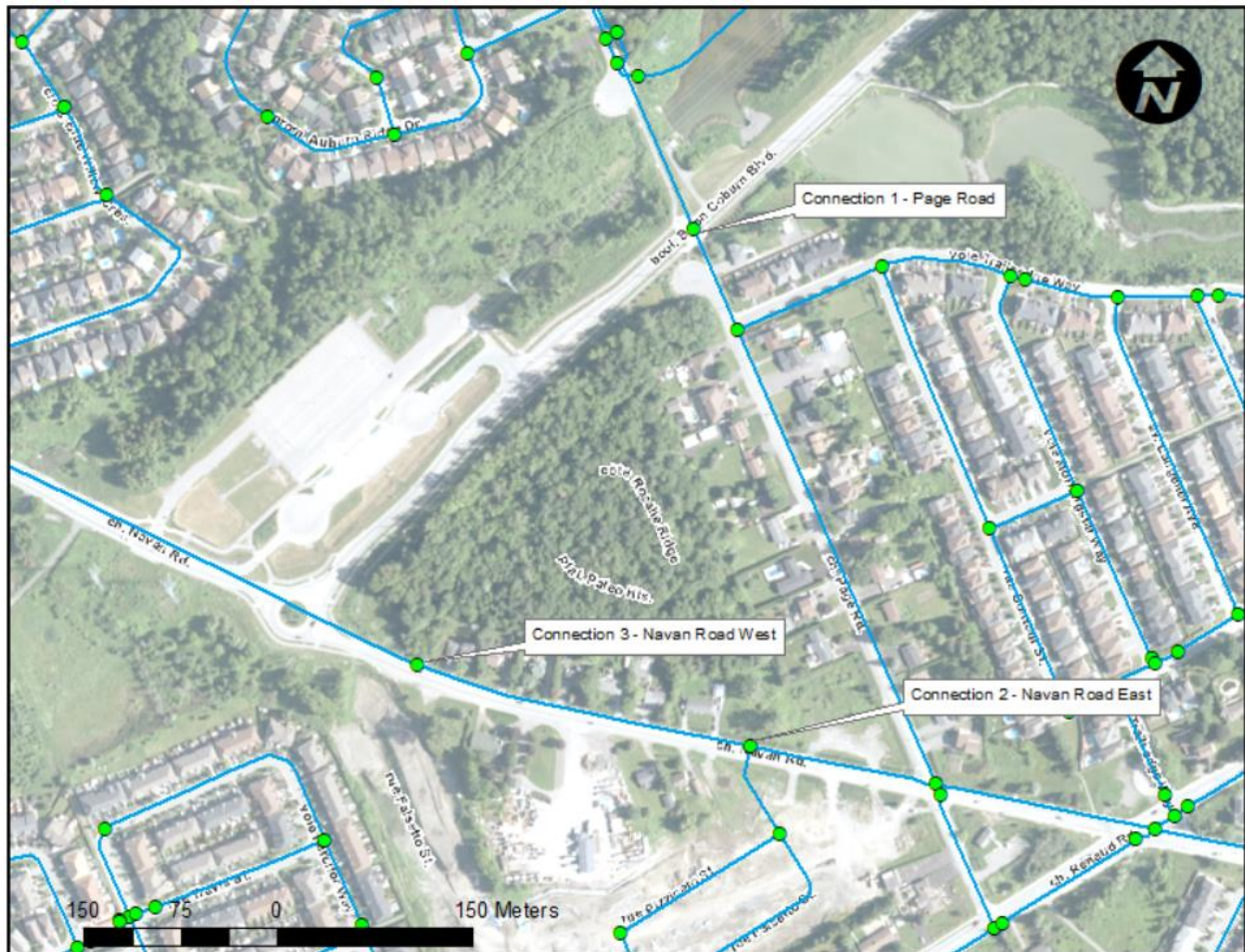
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Boundary Conditions Navan Subdivision

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	404	6.74
Maximum Daily Demand	632	10.53
Peak Hour	1,090	18.17
Fire Flow Demand #1	6,000	100.00
Fire Flow Demand #2	10,000	166.67
Fire Flow Demand #3	14,000	233.33
Fire Flow Demand #4	15,000	250.00

Location



Results

Connection 1 - Page Road

Demand Scenario	Head (m)	Pressure ¹ (psi)
Maximum HGL	130.7	64.0
Peak Hour	127.0	58.6
Max Day plus Fire Flow #1	128.2	60.4
Max Day plus Fire Flow #2	126.8	58.3
Max Day plus Fire Flow #3	124.9	55.7
Max Day plus Fire Flow #4	124.4	55.0

¹ Ground Elevation = 85.7 m

Connection 2 - Navan Road East

Demand Scenario	Head (m)	Pressure ¹ (psi)
Maximum HGL	130.7	71.4
Peak Hour	126.8	65.9
Max Day plus Fire Flow #1	127.7	67.1
Max Day plus Fire Flow #2	125.5	64.1
Max Day plus Fire Flow #3	122.7	60.1
Max Day plus Fire Flow #4	121.9	58.9

¹ Ground Elevation = 80.5 m

Connection 3 - Navan Road West

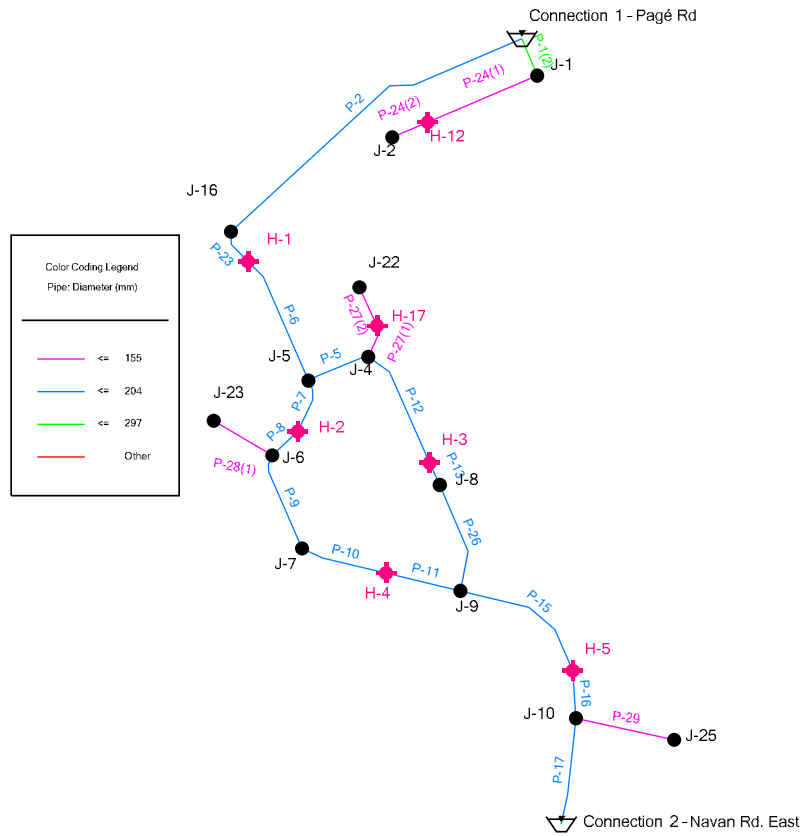
Demand Scenario	Head (m)	Pressure ¹ (psi)
Maximum HGL	130.7	69.3
Peak Hour	126.8	63.8
Max Day plus Fire Flow #1	127.3	64.5
Max Day plus Fire Flow #2	124.6	60.6
Max Day plus Fire Flow #3	120.9	55.3
Max Day plus Fire Flow #4	119.8	53.8

¹ Ground Elevation = 81.9 m

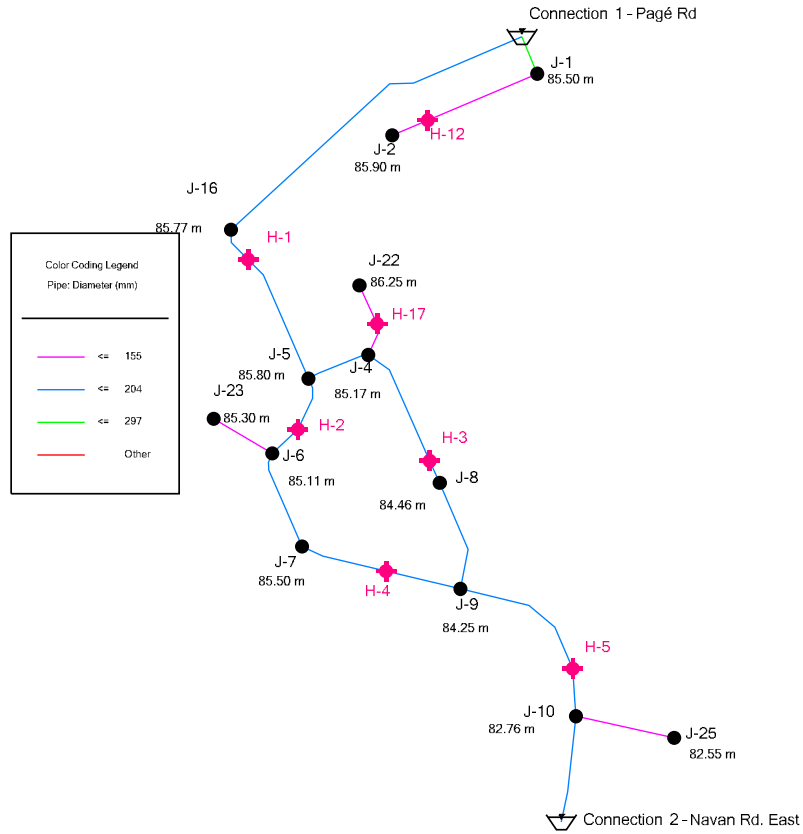
Disclaimer

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

Mixed-Use Site Plan (Block 14) Model Schematic

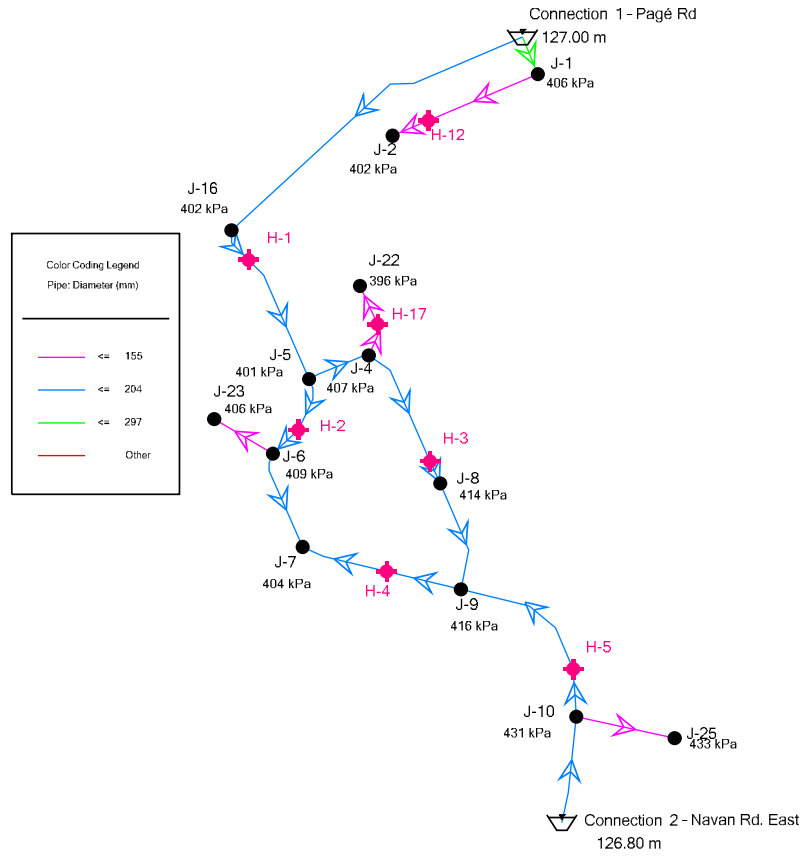


Mixed-Use Site Plan (Block 14) Model Schematic Elevation Model



Mixed-Use Site Plan (Block 14)

Peak Hour Demand



Mixed-Use Site Plan (Block 14)
 Peak Hour Demand
 Junction Table

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-22	86.25	2.78	126.76	396
J-5	85.80	0.00	126.78	401
J-16	85.77	0.00	126.85	402
J-2	85.90	0.58	127.00	402
J-7	85.50	4.95	126.77	404
J-23	85.30	2.74	126.76	406
J-1	85.50	0.00	127.00	406
J-4	85.17	0.00	126.78	407
J-6	85.03	0.00	126.77	409
J-8	84.46	1.90	126.77	414
J-9	84.25	1.46	126.77	416
J-10	82.76	0.00	126.78	431
J-25	82.55	3.08	126.76	433

Mixed-Use Site Plan (Block 14)

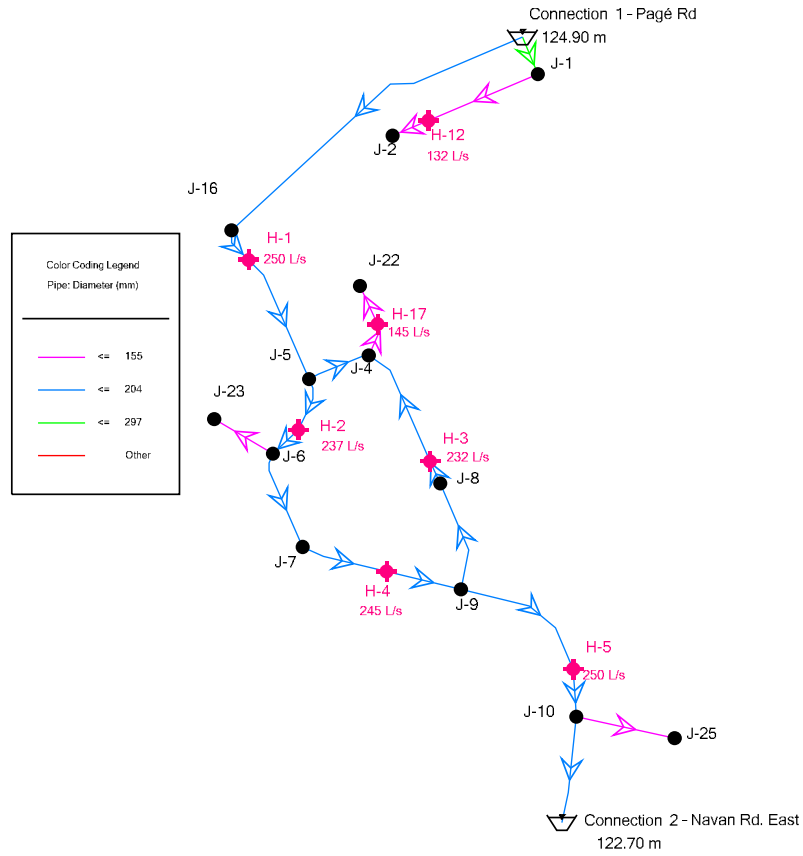
Peak Hour Demand

Pipe Table

ID	Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)
114	P-1(2)	19	297	PVC	120.0	-1	0.01
49	P-2	168	204	PVC	110.0	10	0.32
52	P-5	31	204	PVC	110.0	-5	0.15
82	P-6	64	204	PVC	110.0	-10	0.32
85	P-7	26	204	PVC	110.0	5	0.17
86	P-8	16	204	PVC	110.0	5	0.17
54	P-9	48	204	PVC	110.0	3	0.08
91	P-10	41	204	PVC	110.0	-2	0.07
92	P-11	36	204	PVC	110.0	-2	0.07
104	P-12	59	204	PVC	110.0	2	0.07
105	P-13	11	204	PVC	110.0	2	0.07
108	P-15	70	204	PVC	110.0	-3	0.10
109	P-16	23	204	PVC	110.0	-3	0.10
97	P-17	50	204	PVC	110.0	-6	0.20
110	P-23	17	204	PVC	110.0	10	0.32
129	P-24(1)	56	155	PVC	100.0	1	0.03
130	P-24(2)	18	155	PVC	100.0	1	0.03
123	P-26	53	204	PVC	110.0	0	0.01
154	P-27(1)	16	155	PVC	100.0	3	0.15
155	P-27(2)	20	155	PVC	100.0	3	0.15
171	P-28(1)	32	155	PVC	100.0	3	0.15
183	P-29	47	155	PVC	100.0	3	0.16

Mixed-Use Site Plan (Block 14)

Max Day + Fire Flow Requirement

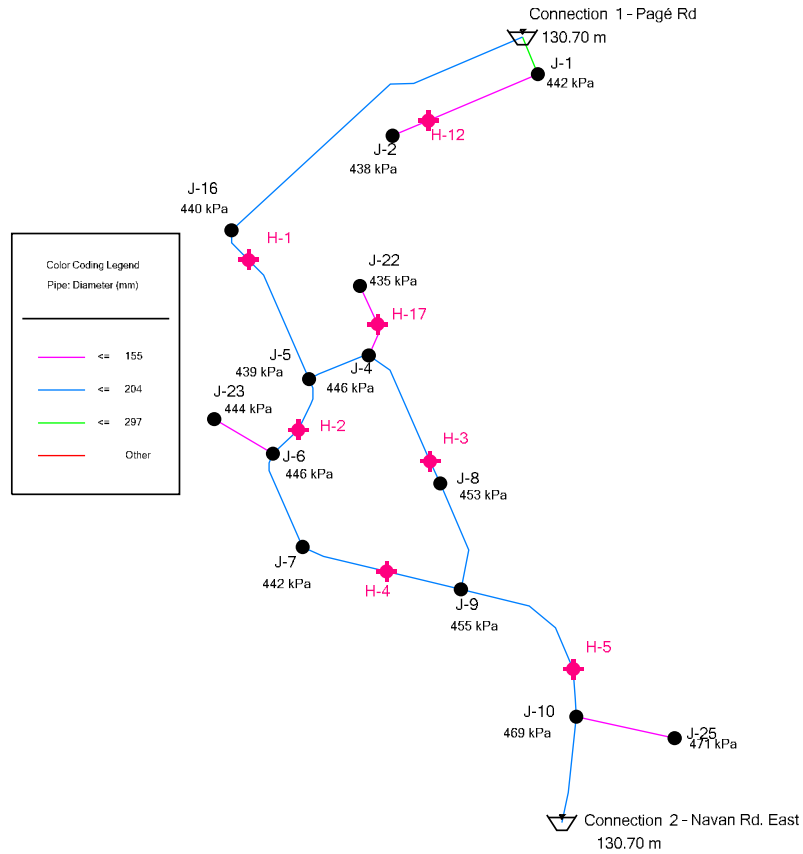


Mixed-Use Site Plan (Block 14)
Max Day + Fire Flow Requirement

Label	Satisfies Fire Flow Constraints?	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated System Lower Limit) (kPa)	Junction w/ Minimum Pressure (System)
H-1	True	250	250	140	152	177	J-16
H-2	True	237	237	140	140	151	J-23
H-4	True	245	245	140	140	144	J-7
H-3	True	232	232	140	140	155	J-22
H-5	True	250	250	140	256	238	J-22
H-12	True	132	132	140	142	140	J-2
H-17	True	145	145	140	147	140	J-22

Mixed-Use Site Plan (Block 14)

Maximum Pressure Analysis



Mixed-Use Site Plan (Block 14)

Maximum Pressure Analysis

Junction Table

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-22	86.25	0	130.70	435
J-2	85.90	0	130.70	438
J-5	85.80	0	130.70	439
J-16	85.77	0	130.70	440
J-7	85.50	0	130.70	442
J-1	85.50	0	130.70	442
J-23	85.30	0	130.70	444
J-4	85.17	0	130.70	446
J-6	85.11	0	130.70	446
J-8	84.46	0	130.70	453
J-9	84.25	0	130.70	455
J-10	82.76	0	130.70	469
J-25	82.55	0	130.70	471

Mixed-Use Site Plan (Block 14)

Maximum Pressure Analysis

Pipe Table

ID	Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)
114	P-1(2)	19	297	PVC	120.0	0	0.00
49	P-2	168	204	PVC	110.0	0	0.00
52	P-5	31	204	PVC	110.0	0	0.00
82	P-6	64	204	PVC	110.0	0	0.00
85	P-7	26	204	PVC	110.0	0	0.00
86	P-8	16	204	PVC	110.0	0	0.00
54	P-9	48	204	PVC	110.0	0	0.00
91	P-10	41	204	PVC	110.0	0	0.00
92	P-11	36	204	PVC	110.0	0	0.00
104	P-12	59	204	PVC	110.0	0	0.00
105	P-13	11	204	PVC	110.0	0	0.00
108	P-15	70	204	PVC	110.0	0	0.00
109	P-16	23	204	PVC	110.0	0	0.00
97	P-17	50	204	PVC	110.0	0	0.00
110	P-23	17	204	PVC	110.0	0	0.00
129	P-24(1)	56	155	PVC	100.0	0	0.00
130	P-24(2)	18	155	PVC	100.0	0	0.00
123	P-26	53	204	PVC	110.0	0	0.00
154	P-27(1)	16	155	PVC	100.0	0	0.00
155	P-27(2)	20	155	PVC	100.0	0	0.00
171	P-28(1)	32	155	PVC	100.0	0	0.00
183	P-29	47	155	PVC	100.0	0	0.00

Site Servicing Report

2983, 3053 and 3079 Navan Road & 2690 Pagé Road, Ottawa, Ontario

Appendix D

Stormwater Management

PIPE REACH		Peak Flow Estimation														Sewer Data					Upstream Geometry				Downstream Geometry				Self-Cleansing Velocities																		
LOCATION	From MH	To MH	C-Factor (1-2 Year)			Total Area (ha)	Cum. Total Area (ha)	Inlet Time (min.)	In Pipe Flow Time (min)	Total Time	1.2 Year Storm (RATIONAL METHOD)				Plug Flows				Total Peak Flow ⁽⁶⁾ (L/s)	Type	Nominal Dia. (mm)	Actual Dia. (mm)	Slope	Length (m)	Q Full (L/s)	V Full (m/s)	Residual Capacity ⁽⁶⁾ (L/s)	% Full	TG From	Obvert	Invert	Cover	TG To	Obvert	Invert	Cover	Q/D Ratio	Flow Depth (mm)	Actual Velocity ⁽⁷⁾ (m/s)	Flow Depth to Dia. Ratio (d/D)							
			0.20	0.30	0.50						Cum. 2.78AR	1.2 Year Peak Flow (L/s)	1.2 Year Peak Flow (L/s)	ICD Flow ⁽¹⁾ EXST MH527 (L/s)	ICD Flow ⁽²⁾ CB100 (L/s)	Roof Drain Flow ⁽³⁾ (L/s)	Cistern Flow ⁽⁴⁾ (L/s)																														
EAST ORLEANS RIDGE SUBDIVISION	UPSTREAM ⁽⁸⁾	EXST MH527	Refer to Note 8				0.14	14.00	0.54	10.54	0.20	70.81	10.73		14.00						CONCRETE	675	650.80	0.05%	57.39	650.30	1.70	638.62	3%	Refer to Note 8																	
BLOCK 14	EXST MH527	EXST MH528	0.09	0.01	0.10	0.24	10.54	1.80	12.34	0.07	0.33	74.75	24.41	14.00	14.00	PVC	300	304.90	0.26%	89.00	60.10	0.82	35.78	41%	85.31	82.30	81.61	3.01	85.83	81.98	81.30	3.84															
BLOCK 14	EXST MH528	EXST MH529	0.05	0.15	0.01	0.23	0.47	12.34	0.65	12.99	0.10	0.51	69.85	35.14	38.00	38.00	PVC	300	302.90	0.30%	29.56	65.26	0.76	28.11	64%	85.63	81.98	81.68	3.84	85.68	81.67	81.36	4.92	0.94	235.00	0.99	0.77										
BLOCK 14	EXST MH529	EXST MH525	0.02	0.38	0.38	0.38	10.00	0.05	10.05	0.91	0.91	70.81	70.00						4.00	10.00	14.00	PVC	300	304.80	2.00%	5.80	142.67	1.90	72.67	89%	85.85	81.54	81.24	4.31	85.75	81.42	81.12	4.33	0.10	64.31	1.24	0.21					
EAST ORLEANS RIDGE SUBDIVISION	EXST MH525	EXST MH524				0.81	12.89	0.21	13.20	0.00	1.42	66.96	95.00							CONCRETE	450	457.20	0.25%	11.93	148.72	0.91	63.62	84%	85.75	81.58	81.12	4.17	84.90	81.65	81.09	3.55	0.44	213.06	0.88	0.47							

Design Parameters (Per OSDG)
 Manning's Coefficient: 0.013
 1.2 Year Intensity: 1.72 (2.51 / (Tc + 6.19970.810)
 Note: Tc is the time of concentration in minutes

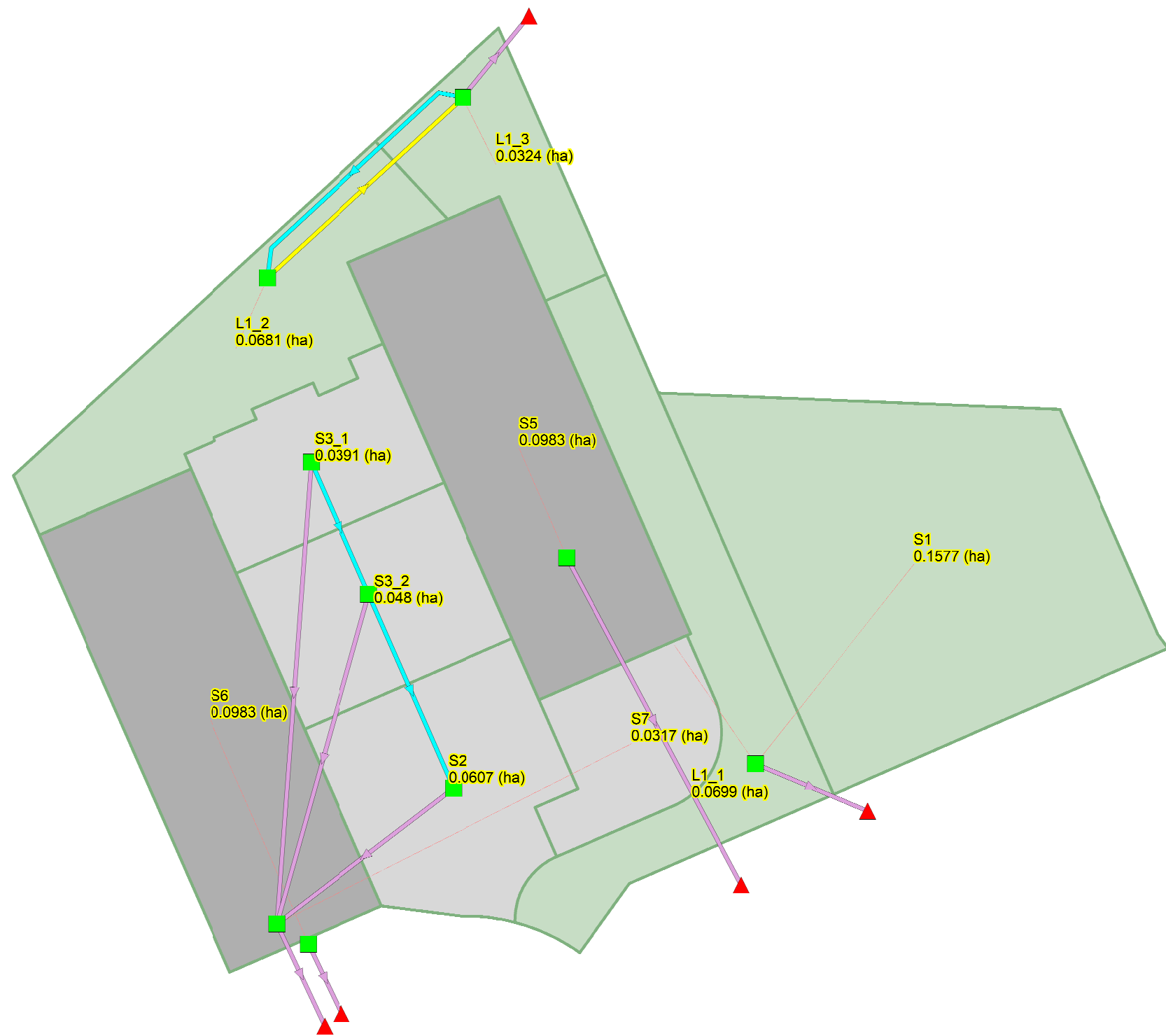
Drainage Areas Breakdown
 Total Site Area: 0.57 ha
 Controlled Area Within Site Property Line: 0.56 ha -- This area is part of the total site area (0.57 ha)
 Existing Areas Captured Within Site: 0.16 ha
 Total Captured Areas: 0.71 ha
 Uncontrolled Area - Outlet to Subdivision: 0.02 ha -- This area is part of the total site area (0.57 ha)

Notes on Plug Flows
 (1) Flow rate controlled downstream of EXST MH527 as part of the East Orleans Ridge Subdivision
 (2) ICD Flow Rate at CB100
 (3) Total flow rates of roof drains for Buildings A and B
 (4) Cistern Outflow Rate

Notes on Peak Flow and Pipe Sizing
 Note that peak flow (66 L/s) is a sum of the allowable release rate of 58 L/s (which is made of 6 L/s from (5) CB100, 10 L/s from Cistern, 4 L/s from Roof Drain and 38 L/s from CB100) as well as the remaining control from upstream of MH527
 (6) Pipes are conservatively sized for 1.2 Year Peak Flow Rate
 (7) Actual Velocities based on actual peak flow from Note 9
 (8) Details from Existing Sewers Upstream of EXST MH527 can be found within East Orleans Ridge Subdivision Design Sheet. This line is only used to carry over the upstream values for time of concentration and 1.2 year peak flow

REAR YARD CATCH BASIN TABLE

LOCATION	CB ID Number	T/G	Inlet					Outlet					CATCH BASIN TYPE	ICD TYPE
			Pipe Dia. (mm)	Pipe Length (m)	Pipe Slope (%)	Invert	COVER (m)	Pipe Dia. (mm)	Pipe Length (m)	Pipe Slope (%)	Invert	COVER (m)		
BLOCK 14	CB102	85.60	-	-	-	-	-	250	29.7	1.0	84.20	1.15	CATCH BASIN ELBOW PER CITY STANDARD S30	NO ICD
	CB101	85.65	250	29.7	1.0	83.90	1.50	250	5.75	0.5	83.90	1.50	600 mm x 600 mm CATCH BASIN PER OPSD 705.010	Vortex_ICD_70
	CB100	85.05	-	-	-	-	-	250	4.6	0.5	83.09	1.71	600 mm x 600 mm CATCH BASIN PER OPSD 705.010	MHF_IPEX_TYPE_B



- ▲ Outfalls
- Storages
- Conduits
- Weirs
- Outlets

Legend

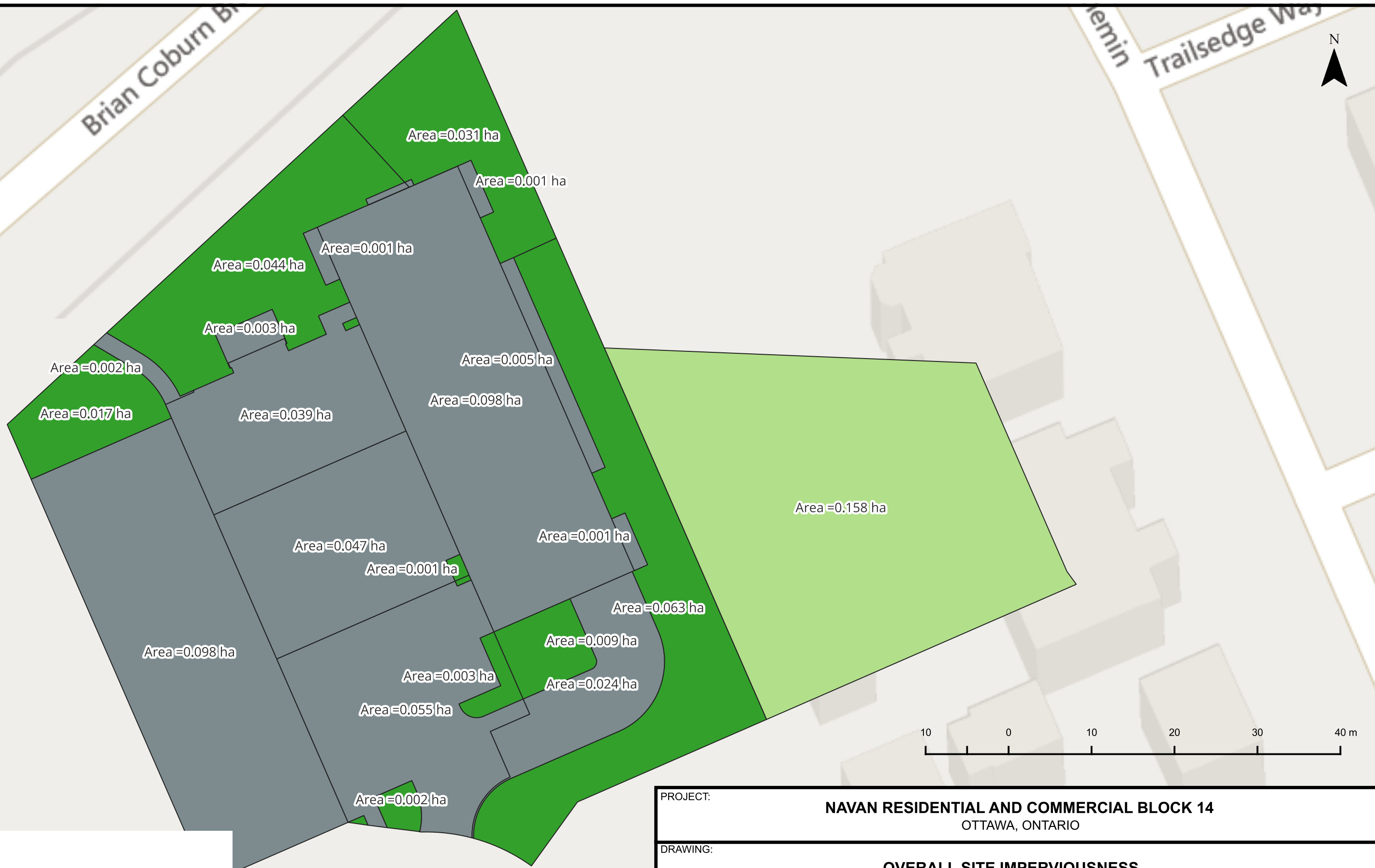
Subcatchments

- Rear-Yard
- Parking Lot Area
- Ramp to Garage
- Building

N

150 m

NAVAN RESIDENTIAL AND COMMERCIAL SITE PLAN - BLOCK 14			
Ottawa, ON			
DRAWING: Overall System Model Schematic			
 J.L. Richards <small>ENGINEERS · ARCHITECTS · PLANNERS</small>	This drawing is copyright protected and may not be reproduced or use for purposes other than execution of the described work without the express written consent of J.L. Richards & Associates Limited.		DESIGN: ML
			DRAWN: ML
			CHECKED: BP
JLR NO.: 29899-002 DRAWING NO.: <h2 style="margin: 0;">Figure 1</h2>			



Legend

IMP

■	Landscaped Areas (C-Factor - 0.2)
■	Pavement Areas (C-Factor - 0.9)
■	Area Tributary to Subdivision (C-Factor - 0.3)

PROJECT:		NAVAN RESIDENTIAL AND COMMERCIAL BLOCK 14		
		OTTAWA, ONTARIO		
DRAWING:		OVERALL SITE IMPERVIOUSNESS		
 J.L. Richards <small>ENGINEERS · ARCHITECTS · PLANNERS</small>	This drawing is copyright protected and may not be reproduced or used for purposes other than execution of the described work without express written consent of J.L. Richards & Associates Limited.		DESIGN: ML	
			DRAWING NO: 29899-002	
			DRAWN: ML	DRAWING NO:
CHECKED: BP	Figure			

Post-Development 3-hour Chicago 1:2 year Event

```

[TITLE]
;;Project Title/Notes

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

START_DATE 01/01/2000
START_TIME 00:00:00
REPORT_START_DATE 01/01/2000
REPORT_START_TIME 00:00:00
END_DATE 01/01/2000
END_TIME 06:00:00
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 1
RULE_STEP 00:00:00

INERTIAL_DAMPING PARTIAL
NORMAL_FLOW_LIMITED BOTH
FORCE_MAIN_EQUATION H-W
VARIABLE_STEP 0.75
LENGTHENING_STEP 0
MIN_SURFAREA 0
MAX_TRIALS 8
HEAD_TOLERANCE 0.0015
SYS_FLOW_TOL 5
LAT_FLOW_TOL 5
MINIMUM_STEP 0.5
THREADS 12

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

[RAINGAGES]
;;Name Format Interval SCF Source
Rainfall INTENSITY 0:10 1.0 TIMESERIES 3CHI2

[SUBCATCHMENTS]
;;Name Rain Gage Outlet Area %Imperv Width %Slope CurbLen
SnowPack

L1_1 Rainfall St_L3 0.0699 10.014 134.062 2 0
L1_2 Rainfall St_L1 0.0681 8.447 15.82 2 0
L1_3 Rainfall St_L2 0.0324 3.893 77.605 2 0
S1 Rainfall St_L3 0.1577 14.286 38.49 2 0
S2 Rainfall St_P2 0.0607 90.737 16.17 2 0
S3_1 Rainfall SU1 0.0391 99.287 10.808 2 0
S3_2 Rainfall St_P1 0.048 98.957 13.267 2 0
S5 Rainfall Roof2 0.0983 100 22.118 1 0
S6 Rainfall Roof1 0.0983 100 22.118 1 0
S7 Rainfall St_UnGrd 0.0317 72.194 28.53 15 0

[SUBAREAS]
;;Subcatchment N-Imperv N-Perv S-Imperv S-Perv PctZero RouteTo PctRouted
L1_1 0.013 0.25 1.57 4.67 0 PERVIOUS 100
L1_2 0.013 0.25 1.57 4.67 0 PERVIOUS 100
L1_3 0.013 0.25 1.57 4.67 0 PERVIOUS 100
S1 0.013 0.25 1.57 4.67 0 PERVIOUS 80
S2 0.013 0.25 1.57 4.67 0 OUTLET
S3_1 0.013 0.25 1.57 4.67 0 OUTLET
S3_2 0.013 0.25 1.57 4.67 0 OUTLET
S5 0.013 0.25 1.57 4.67 0 OUTLET
S6 0.013 0.25 1.57 4.67 0 OUTLET
S7 0.013 0.25 1.57 4.67 0 OUTLET

[INFILTRATION]
;;Subcatchment Param1 Param2 Param3 Param4 Param5
L1_1 76.2 13.2 4.14 7 0
L1_2 76.2 13.2 4.14 7 0
L1_3 76.2 13.2 4.14 7 0
S1 76.2 13.2 4.14 7 0
S2 76.2 13.2 4.14 7 0
S3_1 76.2 13.2 4.14 7 0
S3_2 76.2 13.2 4.14 7 0
S5 76.2 13.2 4.14 7 0
S6 76.2 13.2 4.14 7 0
S7 76.2 13.2 4.14 7 0

[OUTFALLS]
;;Name Elevation Type Stage Data Gated Route To
527_(P-Stm) 81.228 TIMESERIES 527_CHI2yr NO NO
OF1 80.67 FIXED 81.17 NO NO
OF2 80.911 FIXED 81.46 NO NO
OF3 80.67 FIXED 81.17 NO NO
OF7 80.67 FIXED 81.17 NO NO

[STORAGE]
;;Name Elev. Ps1 MaxDepth Ksat InitDepth IMD Shape Curve Name/Params
SurDepth Fevap
Roof1 96.85 0.15 0 FUNCTIONAL 0 0 559.44 0
Roof2 96.85 0.15 0 FUNCTIONAL 0 0 559.44 0
St_L1 84.2 1.7 0 TABULAR St_L1 1 0.0181
St_L2 83.9 2.1 0 TABULAR St_L2 1 0.0198
St_L3 83.09 2.21 0 TABULAR St_L3 1 0.0229
St_P1 85.7 0.31 0 TABULAR St_P1 1 0.0243
St_P2 85.5 0.15 0 TABULAR St_P2 1 0.0256
St_UnGrd 81.971 1 0 FUNCTIONAL 0 0 64 0
SU1 85.7 0.25 0 TABULAR St_P3 1 0.0286

[CONDUITS]
;;Name From Node To Node Length Roughness InOffset OutOffset
InitFlow MaxFlow
C1 0 0.04 St_L1 St_L2 33.149 0.013 84.2 83.9

[WEIRS]
;;Name From Node To Node Type CrestHt Qcoeff Gated
EndCon EndCoeff Surcharge RoadWidth RoadSurf Coeff. Curve
W_L1 0 St_L2 St_L1 TRANSVERSE 85.95 1.84 NO
NO NO

W1 0 St_P1 St_P2 TRANSVERSE 85.85 1.84 NO
W2 0 SU1 St_P1 TRANSVERSE 85.87 1.84 NO
0 0 YES

[OUTLETS]
;;Name From Node To Node Offset Type QTable/Qcoeff
Qexpon Gated
O_St_L3 St_L3 OF2 83.09 TABULAR/HEAD MHF_IPEX_TYPE_B
OL1 NO SU1 St_UnGrd 85.7 TABULAR/HEAD ZURN_Z150F-6NH
OL2 St_P1 St_UnGrd 85.7 TABULAR/HEAD ZURN_Z150F-6NH
OL3 St_P2 St_UnGrd 85.5 TABULAR/HEAD ZURN_Z150F-6NH
NO NO
OL4 St_L2 527_(P-Stm) 83.9 TABULAR/HEAD Vortex_ICD_70
OR1 St_UnGrd OF1 81.971 TABULAR/HEAD O_St_UnGrd
NO NO
ROOF1 Roof1 OF3 96.85 TABULAR/HEAD O_Roof1
NO NO
ROOF2 Roof2 OF7 96.85 TABULAR/HEAD O_Roof2
NO NO

[XSECTIONS]
;;Link Shape Geom1 Geom2 Geom3 Geom4 Barrels
Culvert
C1 CIRCULAR 0.25 0 0 0 1
W_L1 RECT_OPEN 0.05 3 0 0
W2 RECT_OPEN 0.16 15 0 0
W2 RECT_OPEN 0.08 15 0 0

[LOSSES]
;;Link Kentry Kexit Kavg Flap Gate Seepage

[INFLOWS]
;;Node Constituent Time Series Type Mfactor Sfactor Baseline Pattern
St_UnGrd FLOW InfiltratedInflow FLOW 1.0 1 0

[CURVES]
;;Name Type X-Value Y-Value
CBMH Inlet Capture Curve based on the OSDG Appendix 7-A Rating 0
CBMH 0.122 0.06
CBMH 0.183 0.073
CBMH 0.2 0.076
CBMH 0.243 0.084
CBMH 0.305 0.094
DI_GRATE_A_OPD403.01 Rating 0.02 0.00762
DI_GRATE_A_OPD403.01 Rating 0.04 0.01524
DI_GRATE_A_OPD403.01 Rating 0.08 0.0381
DI_GRATE_A_OPD403.01 Rating 0.12 0.06858
DI_GRATE_A_OPD403.01 Rating 0.2 0.1524
DI_GRATE_A_OPD403.01 Rating 0.26 0.23622
DI_GRATE_A_OPD403.01 Rating 0.36 0.4572
DI_GRATE_A_OPD403.01 Rating 0.46 0.6858
DI_GRATE_C_OPD403.01 Rating 0.02 0.01465
DI_GRATE_C_OPD403.01 Rating 0.04 0.0293
DI_GRATE_C_OPD403.01 Rating 0.08 0.07325
DI_GRATE_C_OPD403.01 Rating 0.12 0.13185
DI_GRATE_C_OPD403.01 Rating 0.2 0.293
DI_GRATE_C_OPD403.01 Rating 0.26 0.45415
DI_GRATE_C_OPD403.01 Rating 0.36 0.879
DI_GRATE_C_OPD403.01 Rating 0.46 1.3185
Les Produits MURPHCO Ltée Rating 0 0
Les Produits MURPHCO Ltée 0.0127 4E-05
Les Produits MURPHCO Ltée 0.0254 0.00019
Les Produits MURPHCO Ltée 0.0381 0.00032
Les Produits MURPHCO Ltée 0.0508 0.00051
Les Produits MURPHCO Ltée 0.0635 0.00064
Les Produits MURPHCO Ltée 0.0762 0.00083
Les Produits MURPHCO Ltée 0.0889 0.00093
Les Produits MURPHCO Ltée 0.1016 0.00101
Les Produits MURPHCO Ltée 0.1143 0.00111
Les Produits MURPHCO Ltée 0.127 0.0012
Les Produits MURPHCO Ltée 0.1397 0.00128
Les Produits MURPHCO Ltée 0.1524 0.00135
;Reversed Flow from rear yard manhole_Lid to the Street
Manhole_Lid Rating 0
Manhole_Lid 0.11 0
Manhole_Lid 0.2 0.187
Manhole_Lid 0.3 0.395
Manhole_Lid 0.4 0.602
Manhole_Lid 0.5 0.81
Manhole_Lid 0.6 1.018
Manhole_Lid 0.7 1.225
Manhole_Lid 0.8 1.433
Manhole_Lid 0.9 1.641
Manhole_Lid 1 1.848
;Tempest Rating Curve for MHF IPEX TYPE A, No grate allowance
MHF_IPEX_TYPE_A Rating 0
MHF_IPEX_TYPE_A 0.1 0.0057
MHF_IPEX_TYPE_A 0.2 0.0081
MHF_IPEX_TYPE_A 0.3 0.0099
MHF_IPEX_TYPE_A 0.4 0.0114
MHF_IPEX_TYPE_A 0.5 0.0128
MHF_IPEX_TYPE_A 0.6 0.014
MHF_IPEX_TYPE_A 0.7 0.0151
MHF_IPEX_TYPE_A 0.8 0.0162
MHF_IPEX_TYPE_A 0.9 0.0172
MHF_IPEX_TYPE_A 1 0.0181
MHF_IPEX_TYPE_A 1.2 0.0198
MHF_IPEX_TYPE_A 1.4 0.0215
MHF_IPEX_TYPE_A 1.6 0.0229
MHF_IPEX_TYPE_A 1.8 0.0243
MHF_IPEX_TYPE_A 2 0.0256
MHF_IPEX_TYPE_A 2.5 0.0286
MHF_IPEX_TYPE_A 3 0.0313
;Tempest Rating Curve for MHF IPEX TYPE B, No grate allowance
MHF_IPEX_TYPE_B Rating 0
MHF_IPEX_TYPE_B 0.1 0.0081
MHF_IPEX_TYPE_B 0.2 0.0115
MHF_IPEX_TYPE_B 0.3 0.0141
MHF_IPEX_TYPE_B 0.4 0.0162
MHF_IPEX_TYPE_B 0.5 0.0182
MHF_IPEX_TYPE_B 0.6 0.0199
MHF_IPEX_TYPE_B 0.7 0.0215
MHF_IPEX_TYPE_B 0.8 0.023
MHF_IPEX_TYPE_B 0.9 0.0244
MHF_IPEX_TYPE_B 1 0.0257
MHF_IPEX_TYPE_B 1.2 0.0281
MHF_IPEX_TYPE_B 1.4 0.0304
MHF_IPEX_TYPE_B 1.6 0.0325
MHF_IPEX_TYPE_B 1.8 0.0344
MHF_IPEX_TYPE_B 2 0.0363
MHF_IPEX_TYPE_B 2.5 0.0406
MHF_IPEX_TYPE_B 3 0.0445
;Tempest Rating Curve for MHF IPEX TYPE C, No grate allowance
MHF_IPEX_TYPE_C Rating 0
MHF_IPEX_TYPE_C 0 0

```

MHF_IPEX_TYPE_C	0.1	0.0106	Vortex_ICD_45	0.6	0.0014
MHF_IPEX_TYPE_C	0.2	0.015	Vortex_ICD_45	0.7	0.0015
MHF_IPEX_TYPE_C	0.3	0.0183	Vortex_ICD_45	0.8	0.0016
MHF_IPEX_TYPE_C	0.4	0.0212	Vortex_ICD_45	0.9	0.0017
MHF_IPEX_TYPE_C	0.5	0.0237	Vortex_ICD_45	1.0	0.0018
MHF_IPEX_TYPE_C	0.6	0.0259	Vortex_ICD_45	1.2	0.002
MHF_IPEX_TYPE_C	0.7	0.028	Vortex_ICD_45	1.4	0.0021
MHF_IPEX_TYPE_C	0.8	0.0299	Vortex_ICD_45	1.6	0.0023
MHF_IPEX_TYPE_C	0.9	0.0317	Vortex_ICD_45	1.8	0.0024
MHF_IPEX_TYPE_C	1	0.0335	Vortex_ICD_45	2	0.0026
MHF_IPEX_TYPE_C	1.2	0.0366	Vortex_ICD_45	2.5	0.0029
MHF_IPEX_TYPE_C	1.4	0.0396	Vortex_ICD_45	3	0.0031
MHF_IPEX_TYPE_C	1.6	0.0423			
MHF_IPEX_TYPE_C	1.8	0.0449			
MHF_IPEX_TYPE_C	2	0.0473			
MHF_IPEX_TYPE_C	2.5	0.0529			
MHF_IPEX_TYPE_C	3	0.0579			
;Tempest Rating Curve for MHF IPEX TYPE D, No grate allowance			;Tempest Rating Curve for Vortex ICD 50, No grate allowance		
MHF_IPEX_TYPE_D	Rating	0	Vortex_ICD_50	Rating	0
MHF_IPEX_TYPE_D	0.1	0.0154	Vortex_ICD_50	0.1	0.0007
MHF_IPEX_TYPE_D	0.2	0.0217	Vortex_ICD_50	0.2	0.001
MHF_IPEX_TYPE_D	0.3	0.0266	Vortex_ICD_50	0.3	0.0012
MHF_IPEX_TYPE_D	0.4	0.0307	Vortex_ICD_50	0.4	0.0014
MHF_IPEX_TYPE_D	0.5	0.0343	Vortex_ICD_50	0.5	0.0016
MHF_IPEX_TYPE_D	0.6	0.0376	Vortex_ICD_50	0.6	0.0018
MHF_IPEX_TYPE_D	0.7	0.0406	Vortex_ICD_50	0.7	0.0019
MHF_IPEX_TYPE_D	0.8	0.0434	Vortex_ICD_50	0.8	0.002
MHF_IPEX_TYPE_D	0.9	0.0461	Vortex_ICD_50	0.9	0.0021
MHF_IPEX_TYPE_D	1	0.0485	Vortex_ICD_50	1.0	0.0023
MHF_IPEX_TYPE_D	1.2	0.0532	Vortex_ICD_50	1.2	0.0025
MHF_IPEX_TYPE_D	1.4	0.0574	Vortex_ICD_50	1.4	0.0027
MHF_IPEX_TYPE_D	1.6	0.0614	Vortex_ICD_50	1.6	0.0029
MHF_IPEX_TYPE_D	1.8	0.0651	Vortex_ICD_50	1.8	0.003
MHF_IPEX_TYPE_D	2	0.0687	Vortex_ICD_50	2	0.0032
MHF_IPEX_TYPE_D	2.5	0.0768	Vortex_ICD_50	2.5	0.0036
MHF_IPEX_TYPE_D	3	0.0841	Vortex_ICD_50	3	0.0039
;Tempest Rating Curve for MHF IPEX TYPE E, No grate allowance			;Tempest Rating Curve for Vortex ICD 55, No grate allowance		
MHF_IPEX_TYPE_E	Rating	0	Vortex_ICD_55	Rating	0
MHF_IPEX_TYPE_E	0.1	0.0205	Vortex_ICD_55	0.1	0.0009
MHF_IPEX_TYPE_E	0.2	0.0289	Vortex_ICD_55	0.2	0.0015
MHF_IPEX_TYPE_E	0.3	0.0355	Vortex_ICD_55	0.3	0.0015
MHF_IPEX_TYPE_E	0.4	0.0409	Vortex_ICD_55	0.4	0.0017
MHF_IPEX_TYPE_E	0.5	0.0458	Vortex_ICD_55	0.5	0.0019
MHF_IPEX_TYPE_E	0.6	0.0501	Vortex_ICD_55	0.6	0.0023
MHF_IPEX_TYPE_E	0.7	0.0542	Vortex_ICD_55	0.7	0.0024
MHF_IPEX_TYPE_E	0.8	0.0579	Vortex_ICD_55	0.8	0.0026
MHF_IPEX_TYPE_E	0.9	0.0614	Vortex_ICD_55	0.9	0.0027
MHF_IPEX_TYPE_E	1	0.0647	Vortex_ICD_55	1.0	0.003
MHF_IPEX_TYPE_E	1.2	0.0709	Vortex_ICD_55	1.2	0.0032
MHF_IPEX_TYPE_E	1.4	0.0766	Vortex_ICD_55	1.4	0.0034
MHF_IPEX_TYPE_E	1.6	0.0819	Vortex_ICD_55	1.6	0.0037
MHF_IPEX_TYPE_E	1.8	0.0868	Vortex_ICD_55	1.8	0.0038
MHF_IPEX_TYPE_E	2	0.0915	Vortex_ICD_55	2	0.0043
MHF_IPEX_TYPE_E	2.5	0.1023	Vortex_ICD_55	2.5	0.0047
MHF_IPEX_TYPE_E	3	0.1121	Vortex_ICD_55	3	0.0047
;Tempest Rating Curve for Vortex ICD 60, No grate allowance			;Tempest Rating Curve for Vortex ICD 65, No grate allowance		
O_Roof1	Rating	0	Vortex_ICD_60	Rating	0
O_Roof1	0.001	0.002	Vortex_ICD_60	0.1	0.0011
O_Roof1	0.15	0.002	Vortex_ICD_60	0.2	0.0015
O_Roof2	Rating	0	Vortex_ICD_60	0.3	0.0018
O_Roof2	0.001	0.002	Vortex_ICD_60	0.4	0.0021
O_Roof2	0.15	0.002	Vortex_ICD_60	0.5	0.0023
O_St_L1	Rating	0	Vortex_ICD_60	0.6	0.0025
O_St_L1	0.001	0.003	Vortex_ICD_60	0.7	0.0027
O_St_L1	0.35	0.003	Vortex_ICD_60	0.8	0.0029
O_St_L2	Rating	0	Vortex_ICD_60	0.9	0.0031
O_St_L2	0.001	0.002	Vortex_ICD_60	1	0.0032
O_St_L2	0.35	0.002	Vortex_ICD_60	1.2	0.0036
O_St_L3	Rating	0	Vortex_ICD_60	1.4	0.0038
O_St_L3	0.001	0.0137	Vortex_ICD_60	1.6	0.0041
O_St_L3	0.35	0.0137	Vortex_ICD_60	1.8	0.0043
O_St_UnGrd	Rating	0	Vortex_ICD_60	2	0.0046
O_St_UnGrd	0.01	0.01	Vortex_ICD_60	2.5	0.0051
O_St_UnGrd	1	0.01	Vortex_ICD_60	3	0.0056
;Tempest Rating Curve for Vortex ICD 100, No grate allowance			;Tempest Rating Curve for Vortex ICD 70, No grate allowance		
Vortex_ICD_100	Rating	0	Vortex_ICD_70	Rating	0
Vortex_ICD_100	0.1	0.0028	Vortex_ICD_70	0.1	0.0013
Vortex_ICD_100	0.2	0.004	Vortex_ICD_70	0.2	0.0019
Vortex_ICD_100	0.3	0.0049	Vortex_ICD_70	0.3	0.0023
Vortex_ICD_100	0.4	0.0056	Vortex_ICD_70	0.4	0.0027
Vortex_ICD_100	0.5	0.0063	Vortex_ICD_70	0.5	0.003
Vortex_ICD_100	0.6	0.0069	Vortex_ICD_70	0.6	0.0033
Vortex_ICD_100	0.7	0.0075	Vortex_ICD_70	0.7	0.0036
Vortex_ICD_100	0.8	0.008	Vortex_ICD_70	0.8	0.0038
Vortex_ICD_100	0.9	0.0085	Vortex_ICD_70	0.9	0.0041
Vortex_ICD_100	1	0.0089	Vortex_ICD_70	1	0.0043
Vortex_ICD_100	1.2	0.0098	Vortex_ICD_70	1.2	0.0047
Vortex_ICD_100	1.4	0.0106	Vortex_ICD_70	1.4	0.0051
Vortex_ICD_100	1.6	0.0113	Vortex_ICD_70	1.6	0.0055
Vortex_ICD_100	1.8	0.012	Vortex_ICD_70	1.8	0.0058
Vortex_ICD_100	2	0.0126	Vortex_ICD_70	2	0.0061
Vortex_ICD_100	2.5	0.0141	Vortex_ICD_70	2.5	0.0068
Vortex_ICD_100	3	0.0155	Vortex_ICD_70	3	0.0075
;Tempest Rating Curve for Vortex ICD 105, No grate allowance			;Tempest Rating Curve for Vortex ICD 75, No grate allowance		
Vortex_ICD_105	Rating	0	Vortex_ICD_75	Rating	0
Vortex_ICD_105	0.1	0.0031	Vortex_ICD_75	0.1	0.0016
Vortex_ICD_105	0.2	0.0044	Vortex_ICD_75	0.2	0.0022
Vortex_ICD_105	0.3	0.0054	Vortex_ICD_75	0.3	0.0027
Vortex_ICD_105	0.4	0.0062	Vortex_ICD_75	0.4	0.0032
Vortex_ICD_105	0.5	0.0069	Vortex_ICD_75	0.5	0.0035
Vortex_ICD_105	0.6	0.0076	Vortex_ICD_75	0.6	0.0039
Vortex_ICD_105	0.7	0.0082	Vortex_ICD_75	0.7	0.0042
Vortex_ICD_105	0.8	0.0088	Vortex_ICD_75	0.8	0.0045
Vortex_ICD_105	0.9	0.0093	Vortex_ICD_75	0.9	0.0048
Vortex_ICD_105	1	0.0098	Vortex_ICD_75	1	0.005
Vortex_ICD_105	1.2	0.0107	Vortex_ICD_75	1.2	0.0055
Vortex_ICD_105	1.4	0.0116	Vortex_ICD_75	1.4	0.0063
Vortex_ICD_105	1.6	0.0124	Vortex_ICD_75	1.6	0.0067
Vortex_ICD_105	1.8	0.0131	Vortex_ICD_75	1.8	0.0071
Vortex_ICD_105	2	0.0139	Vortex_ICD_75	2	0.0079
Vortex_ICD_105	2.5	0.0155	Vortex_ICD_75	2.5	0.0087
Vortex_ICD_105	3	0.017	Vortex_ICD_75	3	0.0087
;Tempest Rating Curve for Vortex ICD 40, No grate allowance			;Tempest Rating Curve for Vortex ICD 80, No grate allowance		
Vortex_ICD_40	Rating	0	Vortex_ICD_80	Rating	0
Vortex_ICD_40	0.1	0.0004	Vortex_ICD_80	0.1	0.0018
Vortex_ICD_40	0.2	0.0006	Vortex_ICD_80	0.2	0.0026
Vortex_ICD_40	0.3	0.0007	Vortex_ICD_80	0.3	0.0031
Vortex_ICD_40	0.4	0.0009	Vortex_ICD_80	0.4	0.0036
Vortex_ICD_40	0.5	0.001	Vortex_ICD_80	0.5	0.004
Vortex_ICD_40	0.6	0.001	Vortex_ICD_80	0.6	0.0044
Vortex_ICD_40	0.7	0.0011	Vortex_ICD_80	0.7	0.0048
Vortex_ICD_40	0.8	0.0012	Vortex_ICD_80	0.8	0.0054
Vortex_ICD_40	0.9	0.0013	Vortex_ICD_80	0.9	0.0057
Vortex_ICD_40	1	0.0014	Vortex_ICD_80	1	0.0063
Vortex_ICD_40	1.2	0.0015	Vortex_ICD_80	1.2	0.0066
Vortex_ICD_40	1.4	0.0016	Vortex_ICD_80	1.4	0.0072
Vortex_ICD_40	1.6	0.0017	Vortex_ICD_80	1.6	0.0077
Vortex_ICD_40	1.8	0.0018	Vortex_ICD_80	1.8	0.0077
Vortex_ICD_40	2	0.0019			
Vortex_ICD_40	2.5	0.0022			
Vortex_ICD_40	3	0.0024			
;Tempest Rating Curve for Vortex ICD 45, No grate allowance					
Vortex_ICD_45	Rating	0			
Vortex_ICD_45	0.1	0.0006			
Vortex_ICD_45	0.2	0.0008			
Vortex_ICD_45	0.3	0.001			
Vortex_ICD_45	0.4	0.0011			
Vortex_ICD_45	0.5	0.0013			

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Vortex_ICD_80      2      0.0081
Vortex_ICD_80      2.5    0.009
Vortex_ICD_80      3      0.0099

;Tempest Rating Curve for Vortex ICD 85, No grate allowance
Vortex_ICD_85      Rating  0
Vortex_ICD_85      0.1    0.002
Vortex_ICD_85      0.2    0.0029
Vortex_ICD_85      0.3    0.0035
Vortex_ICD_85      0.4    0.0041
Vortex_ICD_85      0.5    0.0045
Vortex_ICD_85      0.6    0.005
Vortex_ICD_85      0.7    0.0054
Vortex_ICD_85      0.8    0.0057
Vortex_ICD_85      0.9    0.0061
Vortex_ICD_85      1      0.0064
Vortex_ICD_85      1.2    0.007
Vortex_ICD_85      1.4    0.0076
Vortex_ICD_85      1.6    0.0081
Vortex_ICD_85      1.8    0.0086
Vortex_ICD_85      2      0.0091
Vortex_ICD_85      2.5    0.0101
Vortex_ICD_85      3      0.0111
    
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;Tempest Rating Curve for Vortex ICD 90, No grate allowance
Vortex_ICD_90      Rating  0
Vortex_ICD_90      0.1    0.0022
Vortex_ICD_90      0.2    0.0032
Vortex_ICD_90      0.3    0.0039
Vortex_ICD_90      0.4    0.0045
Vortex_ICD_90      0.5    0.0051
Vortex_ICD_90      0.6    0.0055
Vortex_ICD_90      0.7    0.006
Vortex_ICD_90      0.8    0.0064
Vortex_ICD_90      0.9    0.0068
Vortex_ICD_90      1      0.0072
Vortex_ICD_90      1.2    0.0079
Vortex_ICD_90      1.4    0.0085
Vortex_ICD_90      1.6    0.0091
Vortex_ICD_90      1.8    0.0096
Vortex_ICD_90      2      0.0102
Vortex_ICD_90      2.5    0.0114
Vortex_ICD_90      3      0.0125
    
```

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;Tempest Rating Curve for Vortex ICD 95, No grate allowance
Vortex_ICD_95      Rating  0
Vortex_ICD_95      0.1    0.0026
Vortex_ICD_95      0.2    0.0036
Vortex_ICD_95      0.3    0.0044
Vortex_ICD_95      0.4    0.0051
Vortex_ICD_95      0.5    0.0057
Vortex_ICD_95      0.6    0.0062
Vortex_ICD_95      0.7    0.0067
Vortex_ICD_95      0.8    0.0071
Vortex_ICD_95      0.9    0.0076
Vortex_ICD_95      1      0.008
Vortex_ICD_95      1.2    0.0087
Vortex_ICD_95      1.4    0.0094
Vortex_ICD_95      1.6    0.0101
Vortex_ICD_95      1.8    0.0107
Vortex_ICD_95      2      0.0113
Vortex_ICD_95      2.5    0.0126
Vortex_ICD_95      3      0.0138
    
```

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;From Zurn Manual RD178
ZURN_Z150F-6NH      Rating  0
ZURN_Z150F-6NH      0.0127 0
ZURN_Z150F-6NH      0.0257 0.0132420013231177
ZURN_Z150F-6NH      0.0384 0.0234992054543888
ZURN_Z150F-6NH      0.0508 0.035128365761305
ZURN_Z150F-6NH      0.0765 0.0425019726111045
ZURN_Z150F-6NH      0.1024 0.0433196215564931
    
```

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St_L1      Storage  0      0.073
St_L1      1.4      0.073
St_L1      1.7      198.79

St_L2      Storage  0      0.36
St_L2      1.75     0.36
St_L2      2.05     129.41
St_L2      2.1      129.41

St_L3      Storage  0      0.36
St_L3      1.96     0.36
St_L3      2.21     62.31

St_P1      Storage  0      0.36
St_P1      0.15     114.4
St_P1      0.31     114.4

St_P2      Storage  0      0.36
St_P2      0.15     100.57

St_P3      Storage  0      0.36
St_P3      0.15     92.14
St_P3      0.25     92.14
    
```

```

[;TIMESERIES]
;;Name      Date      Time      Value
;;-----
;Rainfall (mm/hr)
    
```

```

24SCS10      01/01/2000 00:00:00 1.08
24SCS10      01/01/2000 00:15:00 1.08
24SCS10      01/01/2000 00:30:00 1.08
24SCS10      01/01/2000 00:45:00 1.08
24SCS10      01/01/2000 01:00:00 0.504
24SCS10      01/01/2000 01:15:00 0.504
24SCS10      01/01/2000 01:30:00 0.504
24SCS10      01/01/2000 01:45:00 0.504
24SCS10      01/01/2000 02:00:00 0.936
24SCS10      01/01/2000 02:15:00 0.936
24SCS10      01/01/2000 02:30:00 0.936
24SCS10      01/01/2000 02:45:00 0.936
24SCS10      01/01/2000 03:00:00 0.936
24SCS10      01/01/2000 03:15:00 0.936
24SCS10      01/01/2000 03:30:00 0.936
24SCS10      01/01/2000 03:45:00 0.936
24SCS10      01/01/2000 04:00:00 1.224
24SCS10      01/01/2000 04:15:00 1.224
24SCS10      01/01/2000 04:30:00 1.224
24SCS10      01/01/2000 04:45:00 1.224
24SCS10      01/01/2000 05:00:00 1.08
24SCS10      01/01/2000 05:15:00 1.08
24SCS10      01/01/2000 05:30:00 1.08
24SCS10      01/01/2000 05:45:00 1.08
24SCS10      01/01/2000 06:00:00 1.44
24SCS10      01/01/2000 06:15:00 1.44
24SCS10      01/01/2000 06:30:00 1.44
24SCS10      01/01/2000 06:45:00 1.44
24SCS10      01/01/2000 07:00:00 1.44
24SCS10      01/01/2000 07:15:00 1.44
24SCS10      01/01/2000 07:30:00 1.44
24SCS10      01/01/2000 07:45:00 1.44
24SCS10      01/01/2000 08:00:00 1.944
24SCS10      01/01/2000 08:15:00 1.944
24SCS10      01/01/2000 08:30:00 1.944
24SCS10      01/01/2000 08:45:00 1.944
24SCS10      01/01/2000 09:00:00 2.304
24SCS10      01/01/2000 09:15:00 2.304
24SCS10      01/01/2000 09:30:00 2.592
24SCS10      01/01/2000 09:45:00 2.592
24SCS10      01/01/2000 10:00:00 3.312
24SCS10      01/01/2000 10:15:00 3.312
24SCS10      01/01/2000 10:30:00 4.464
24SCS10      01/01/2000 10:45:00 4.464
24SCS10      01/01/2000 11:00:00 6.912
24SCS10      01/01/2000 11:15:00 6.912
24SCS10      01/01/2000 11:30:00 29.952
24SCS10      01/01/2000 11:45:00 79.488
    
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24SCS10      01/01/2000 12:00:00 10.368
24SCS10      01/01/2000 12:15:00 10.368
24SCS10      01/01/2000 12:30:00 5.328
24SCS10      01/01/2000 12:45:00 5.328
24SCS10      01/01/2000 13:00:00 3.888
24SCS10      01/01/2000 13:15:00 3.888
24SCS10      01/01/2000 13:30:00 3.024
24SCS10      01/01/2000 13:45:00 3.024
24SCS10      01/01/2000 14:00:00 2.304
24SCS10      01/01/2000 14:15:00 2.304
24SCS10      01/01/2000 14:30:00 2.304
24SCS10      01/01/2000 14:45:00 2.304
24SCS10      01/01/2000 15:00:00 2.016
24SCS10      01/01/2000 15:15:00 2.016
24SCS10      01/01/2000 15:30:00 2.016
24SCS10      01/01/2000 15:45:00 2.016
24SCS10      01/01/2000 16:00:00 1.584
24SCS10      01/01/2000 16:15:00 1.584
24SCS10      01/01/2000 16:30:00 1.584
24SCS10      01/01/2000 16:45:00 1.584
24SCS10      01/01/2000 17:00:00 1.656
24SCS10      01/01/2000 17:15:00 1.656
24SCS10      01/01/2000 17:30:00 1.656
24SCS10      01/01/2000 17:45:00 1.656
24SCS10      01/01/2000 18:00:00 1.08
24SCS10      01/01/2000 18:15:00 1.08
24SCS10      01/01/2000 18:30:00 1.08
24SCS10      01/01/2000 18:45:00 1.08
24SCS10      01/01/2000 19:00:00 0.864
24SCS10      01/01/2000 19:15:00 0.864
24SCS10      01/01/2000 19:30:00 0.864
24SCS10      01/01/2000 19:45:00 0.864
24SCS10      01/01/2000 20:00:00 1.224
24SCS10      01/01/2000 20:15:00 1.224
24SCS10      01/01/2000 20:30:00 1.224
24SCS10      01/01/2000 20:45:00 1.224
24SCS10      01/01/2000 21:00:00 0.792
24SCS10      01/01/2000 21:15:00 0.792
24SCS10      01/01/2000 21:30:00 0.792
24SCS10      01/01/2000 21:45:00 0.792
24SCS10      01/01/2000 22:00:00 0.72
24SCS10      01/01/2000 22:15:00 0.72
24SCS10      01/01/2000 22:30:00 0.72
24SCS10      01/01/2000 22:45:00 0.72
24SCS10      01/01/2000 23:00:00 0.72
24SCS10      01/01/2000 23:15:00 0.72
24SCS10      01/01/2000 23:30:00 0.72
24SCS10      01/01/2000 23:45:00 0.72
24SCS10      01/02/2000 00:00:00 0
    
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;Rainfall (mm/hr)
24SCS100      01/01/2000 00:00:00 1.548
24SCS100      01/01/2000 00:15:00 1.548
24SCS100      01/01/2000 00:30:00 1.548
24SCS100      01/01/2000 00:45:00 1.548
24SCS100      01/01/2000 01:00:00 0.7224
24SCS100      01/01/2000 01:15:00 0.7224
24SCS100      01/01/2000 01:30:00 0.724
24SCS100      01/01/2000 01:45:00 0.724
24SCS100      01/01/2000 02:00:00 1.3416
24SCS100      01/01/2000 02:15:00 1.3416
24SCS100      01/01/2000 02:30:00 1.3416
24SCS100      01/01/2000 02:45:00 1.3416
24SCS100      01/01/2000 03:00:00 1.3416
24SCS100      01/01/2000 03:15:00 1.3416
24SCS100      01/01/2000 03:30:00 1.3416
24SCS100      01/01/2000 03:45:00 1.3416
24SCS100      01/01/2000 04:00:00 1.7544
24SCS100      01/01/2000 04:15:00 1.7544
24SCS100      01/01/2000 04:30:00 1.7544
24SCS100      01/01/2000 04:45:00 1.7544
24SCS100      01/01/2000 05:00:00 1.548
24SCS100      01/01/2000 05:15:00 1.548
24SCS100      01/01/2000 05:30:00 1.548
24SCS100      01/01/2000 05:45:00 1.548
24SCS100      01/01/2000 06:00:00 2.064
24SCS100      01/01/2000 06:15:00 2.064
24SCS100      01/01/2000 06:30:00 2.064
24SCS100      01/01/2000 06:45:00 2.064
24SCS100      01/01/2000 07:00:00 2.064
24SCS100      01/01/2000 07:15:00 2.064
24SCS100      01/01/2000 07:30:00 2.064
24SCS100      01/01/2000 07:45:00 2.064
24SCS100      01/01/2000 08:00:00 2.7864
24SCS100      01/01/2000 08:15:00 2.7864
24SCS100      01/01/2000 08:30:00 2.7864
24SCS100      01/01/2000 08:45:00 2.7864
24SCS100      01/01/2000 09:00:00 3.3024
24SCS100      01/01/2000 09:15:00 3.3024
24SCS100      01/01/2000 09:30:00 3.7152
24SCS100      01/01/2000 09:45:00 3.7152
24SCS100      01/01/2000 10:00:00 4.7472
24SCS100      01/01/2000 10:15:00 4.7472
24SCS100      01/01/2000 10:30:00 6.3984
24SCS100      01/01/2000 10:45:00 6.3984
24SCS100      01/01/2000 11:00:00 9.9072
24SCS100      01/01/2000 11:15:00 9.9072
24SCS100      01/01/2000 11:30:00 42.9312
24SCS100      01/01/2000 11:45:00 113.9328
24SCS100      01/01/2000 12:00:00 14.8608
24SCS100      01/01/2000 12:15:00 14.8608
24SCS100      01/01/2000 12:30:00 7.6368
24SCS100      01/01/2000 12:45:00 7.6368
24SCS100      01/01/2000 13:00:00 5.5728
24SCS100      01/01/2000 13:15:00 5.5728
24SCS100      01/01/2000 13:30:00 4.3344
24SCS100      01/01/2000 13:45:00 4.3344
24SCS100      01/01/2000 14:00:00 3.3024
24SCS100      01/01/2000 14:15:00 3.3024
24SCS100      01/01/2000 14:30:00 3.3024
24SCS100      01/01/2000 14:45:00 3.3024
24SCS100      01/01/2000 15:00:00 2.8896
24SCS100      01/01/2000 15:15:00 2.8896
24SCS100      01/01/2000 15:30:00 2.8896
24SCS100      01/01/2000 15:45:00 2.8896
24SCS100      01/01/2000 16:00:00 2.2704
24SCS100      01/01/2000 16:15:00 2.2704
24SCS100      01/01/2000 16:30:00 2.2704
24SCS100      01/01/2000 16:45:00 2.2704
24SCS100      01/01/2000 17:00:00 2.3736
24SCS100      01/01/2000 17:15:00 2.3736
24SCS100      01/01/2000 17:30:00 2.3736
24SCS100      01/01/2000 17:45:00 2.3736
24SCS100      01/01/2000 18:00:00 1.548
24SCS100      01/01/2000 18:15:00 1.548
24SCS100      01/01/2000 18:30:00 1.548
24SCS100      01/01/2000 18:45:00 1.548
24SCS100      01/01/2000 19:00:00 1.2384
24SCS100      01/01/2000 19:15:00 1.2384
24SCS100      01/01/2000 19:30:00 1.2384
24SCS100      01/01/2000 19:45:00 1.2384
24SCS100      01/01/2000 20:00:00 1.7544
24SCS100      01/01/2000 20:15:00 1.7544
24SCS100      01/01/2000 20:30:00 1.7544
24SCS100      01/01/2000 20:45:00 1.7544
24SCS100      01/01/2000 21:00:00 1.1352
24SCS100      01/01/2000 21:15:00 1.1352
24SCS100      01/01/2000 21:30:00 1.1352
24SCS100      01/01/2000 21:45:00 1.1352
24SCS100      01/01/2000 22:00:00 1.032
24SCS100      01/01/2000 22:15:00 1.032
24SCS100      01/01/2000 22:30:00 1.032
24SCS100      01/01/2000 22:45:00 1.032
24SCS100      01/01/2000 23:00:00 1.032
24SCS100      01/01/2000 23:15:00 1.032
24SCS100      01/01/2000 23:30:00 1.032
24SCS100      01/01/2000 23:45:00 1.032
24SCS100      01/02/2000 00:00:00 0
    
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L1_2	381373.676	5033092.727	S7	381427.822	5033044.209
L1_2	381375.266	5033094.193	S7	381425.421	5033049.708
L1_2	381382.117	5033100.508	S7	381430.18	5033051.785
L1_2	381407.635	5033124.034	S7	381425.847	5033061.708
L1_3	381425.929	5033107.688			
L1_3	381421.474	5033117.892	;;Storage Node	X-Coord	Y-Coord
L1_3	381415.643	5033115.347	;;	-----	-----
L1_3	381407.635	5033124.034			
L1_3	381421.373	5033136.698	{SYMBOLS]		
L1_3	381433.371	5033109.212	;;Gage	X-Coord	Y-Coord
L1_3	381426.561	5033106.239	;;	-----	-----
L1_3	381425.929	5033107.688			
S1	381496.059	5033067.453			
S1	381458.719	5033051.155			
S1	381439.156	5033095.96			
S1	381483.973	5033094.136			
S1	381494.933	5033069			
S1	381496.059	5033067.453			
S2	381422.855	5033068.564			
S2	381425.847	5033061.708			
S2	381430.18	5033051.785			
S2	381425.421	5033049.708			
S2	381427.822	5033044.209			
S2	381427.583	5033044.099			
S2	381427.347	5033043.982			
S2	381427.116	5033043.856			
S2	381426.889	5033043.723			
S2	381426.667	5033043.582			
S2	381426.45	5033043.433			
S2	381426.238	5033043.278			
S2	381426.032	5033043.114			
S2	381425.831	5033042.944			
S2	381425.636	5033042.768			
S2	381425.448	5033042.584			
S2	381425.266	5033042.395			
S2	381425.09	5033042.199			
S2	381424.921	5033041.997			
S2	381424.759	5033041.789			
S2	381424.605	5033041.577			
S2	381424.458	5033041.359			
S2	381424.318	5033041.136			
S2	381424.186	5033040.908			
S2	381424.062	5033040.676			
S2	381423.946	5033040.44			
S2	381423.838	5033040.2			
S2	381423.738	5033039.957			
S2	381423.647	5033039.71			
S2	381423.564	5033039.46			
S2	381423.49	5033039.208			
S2	381423.425	5033038.953			
S2	381423.368	5033038.696			
S2	381423.32	5033038.438			
S2	381423.281	5033038.177			
S2	381423.251	5033037.916			
S2	381423.23	5033037.654			
S2	381423.218	5033037.391			
S2	381423.215	5033037.128			
S2	381423.221	5033036.865			
S2	381422.554	5033037.03			
S2	381421.883	5033037.174			
S2	381421.207	5033037.296			
S2	381420.528	5033037.397			
S2	381419.846	5033037.477			
S2	381419.162	5033037.535			
S2	381418.476	5033037.571			
S2	381417.789	5033037.586			
S2	381417.102	5033037.579			
S2	381408.289	5033038.705			
S2	381399.672	5033058.444			
S2	381422.855	5033068.564			
S3_1	381386.988	5033087.5			
S3_1	381386.265	5033089.146			
S3_1	381389.672	5033090.633			
S3_1	381389.532	5033090.954			
S3_1	381394.298	5033093.034			
S3_1	381393.818	5033094.134			
S3_1	381400.599	5033097.094			
S3_1	381401.22	5033095.674			
S3_1	381405.665	5033097.614			
S3_1	381404.701	5033099.821			
S3_1	381408.488	5033101.475			
S3_1	381415.264	5033085.953			
S3_1	381392.081	5033075.833			
S3_1	381386.988	5033087.5			
S3_2	381392.081	5033075.833			
S3_2	381415.264	5033085.953			
S3_2	381422.855	5033068.564			
S3_2	381399.672	5033058.444			
S3_2	381392.081	5033075.833			
S5	381421.474	5033117.892			
S5	381432.346	5033092.987			
S5	381442.775	5033069.097			
S5	381425.847	5033061.708			
S5	381404.547	5033110.503			
S5	381421.474	5033117.892			
S6	381386.988	5033087.5			
S6	381408.289	5033038.705			
S6	381391.361	5033031.316			
S6	381370.061	5033080.111			
S6	381386.988	5033087.5			
S7	381425.847	5033061.708			
S7	381436.845	5033066.509			
S7	381442.344	5033068.909			
S7	381445.479	5033061.744			
S7	381445.6	5033061.454			
S7	381445.711	5033061.16			
S7	381445.811	5033060.862			
S7	381445.901	5033060.561			
S7	381445.98	5033060.257			
S7	381446.048	5033059.95			
S7	381446.106	5033059.641			
S7	381446.153	5033059.331			
S7	381446.189	5033059.019			
S7	381446.215	5033058.705			
S7	381446.229	5033058.392			
S7	381446.232	5033058.077			
S7	381446.224	5033057.763			
S7	381446.206	5033057.449			
S7	381446.176	5033057.137			
S7	381446.136	5033056.825			
S7	381446.085	5033056.515			
S7	381446.022	5033056.207			
S7	381445.95	5033055.901			
S7	381445.866	5033055.598			
S7	381445.772	5033055.299			
S7	381445.668	5033055.002			
S7	381445.553	5033054.71			
S7	381445.428	5033054.421			
S7	381445.294	5033054.137			
S7	381445.149	5033053.858			
S7	381444.995	5033053.585			
S7	381444.831	5033053.316			
S7	381444.658	5033053.054			
S7	381444.476	5033052.798			
S7	381444.285	5033052.548			
S7	381444.086	5033052.305			
S7	381443.878	5033052.07			
S7	381443.662	5033051.841			
S7	381443.438	5033051.621			
S7	381443.207	5033051.408			
S7	381442.969	5033051.204			
S7	381442.723	5033051.008			
S7	381442.471	5033050.82			
S7	381442.212	5033050.642			
S7	381441.947	5033050.472			
S7	381441.677	5033050.313			
S7	381441.401	5033050.162			
S7	381441.12	5033050.021			
S7	381440.834	5033049.891			

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.3)

Element Count

Number of rain gages 1
Number of subcatchments ... 10
Number of nodes 14
Number of links 12
Number of pollutants 0
Number of land uses 0

Raingage Summary

Name	Data Source	Data Type	Recording Interval
Rainfall	3CHI2	INTENSITY	10 min.

Subcatchment Summary

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
L1_1	0.07	134.06	10.01	2.0000	Rainfall	St_L3
L1_2	0.07	15.82	8.45	2.0000	Rainfall	St_L1
L1_3	0.03	77.61	3.89	2.0000	Rainfall	St_L2
S1	0.16	38.49	14.29	2.0000	Rainfall	St_L3
S2	0.06	16.17	90.74	2.0000	Rainfall	St_P2
S3_1	0.04	10.81	99.29	2.0000	Rainfall	SU1
S3_2	0.05	13.27	98.96	2.0000	Rainfall	St_P1
S5	0.10	22.12	100.00	1.0000	Rainfall	Roof2
S6	0.10	22.12	100.00	1.0000	Rainfall	Roof1
S7	0.03	28.53	72.19	15.0000	Rainfall	St_UnGrd

Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
527_(P-Stm)	OUTFALL	81.23	0.00	0.0	0.0
OF1	OUTFALL	80.67	0.00	0.0	0.0
OF2	OUTFALL	80.91	0.00	0.0	0.0
OF3	OUTFALL	80.67	0.00	0.0	0.0
OF7	OUTFALL	80.67	0.00	0.0	0.0
Roof1	STORAGE	96.85	0.15	0.0	0.0
Roof2	STORAGE	96.85	0.15	0.0	0.0
St_L1	STORAGE	84.20	1.70	0.0	0.0
St_L2	STORAGE	83.90	2.10	0.0	0.0
St_L3	STORAGE	83.09	2.21	0.0	0.0
St_P1	STORAGE	85.70	0.31	0.0	0.0
St_P2	STORAGE	85.50	0.15	0.0	0.0
St_UnGrd	STORAGE	81.97	1.00	0.0	Yes
SU1	STORAGE	85.70	0.25	0.0	0.0

Link Summary

Name	From Node	To Node	Type	Roughness	Length	%Slope
C1	St_L1	St_L2	CONDUIT	0.130	33.1	0.9050
W_L1	St_L2	St_L1	WEIR			
W1	St_P1	St_P1	WEIR			
W2	SU1	St_P1	WEIR			
O_St_L3	St_L3	OF2	OUTLET			
OL1	SU1	St_UnGrd	OUTLET			
OL2	St_P1	St_UnGrd	OUTLET			
OL3	St_P2	St_UnGrd	OUTLET			
OL4	St_L2	527_(P-Stm)	OUTLET			
OR1	St_UnGrd	OF1	OUTLET			
ROOF1	Roof1	OF3	OUTLET			
ROOF2	Roof2	OF7	OUTLET			

Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	CIRCULAR	0.25	0.05	0.06	0.25	1	0.06

Analysis Options

Flow Units CMS
Process Models:
Rainfall/Runoff YES
RDII NO
Snowmelt NO
Groundwater NO
Flow Routing YES
Ponding Allowed NO
Water Quality NO
Infiltration Method HORTON
Flow Routing Method DYNWAVE
Surcharge Method EXTRAN
Starting Date 01/01/2000 00:00:00
Ending Date 01/01/2000 06:00:00
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 1.00 sec
Variable Time Step YES
Maximum Trials 8
Number of Threads 1
Head Tolerance 0.001500 m

Runoff Quantity Continuity

	Volume hectare-m	Depth mm
Total Precipitation	0.022	31.879
Evaporation Loss	0.000	0.000
Infiltration Loss	0.010	14.896
Surface Runoff	0.011	16.108
Final Storage	0.001	0.893
Continuity Error (%)	-0.053	

Flow Routing Continuity

	Volume hectare-m	Volume 10 ⁶ ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.011	0.113
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.011	0.114
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000

Initial Stored Volume 0.000 0.000
Final Stored Volume 0.000 0.000
Continuity Error (%) 0.000

Time-Step Critical Elements

None

Highest Flow Instability Indexes

Link ROOF1 (3)
Link ROOF2 (3)

Most Frequent Nonconverging Nodes

Convergence obtained at all time steps.

Routing Time Step Summary

Minimum Time Step : 0.50 sec
Average Time Step : 1.00 sec
Maximum Time Step : 1.00 sec
% of Time in Steady State : 0.00
Average Iterations per Step : 2.00
% of Steps Not Converging : 0.00
Time Step Frequencies :
1.000 - 0.871 sec : 100.00 %
0.871 - 0.758 sec : 0.00 %
0.758 - 0.660 sec : 0.00 %
0.660 - 0.574 sec : 0.00 %
0.574 - 0.500 sec : 0.00 %

Subcatchment Runoff Summary

Total Runoff mm	Total Subcatchment Runoff 10 ⁶ ltr	Peak Runoff CMS	Total Runoff Precip Coeff mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm
L1_1	0.00	0.00	31.88	0.00	0.00	30.21	3.04	1.53
L1_2	0.00	0.00	0.012	0.00	0.00	31.38	2.56	0.37
L1_3	0.00	0.00	0.022	0.00	0.00	31.14	1.18	0.69
S1	0.00	0.00	31.88	0.00	0.00	30.14	4.34	0.66
S2	0.00	0.00	0.048	0.00	0.00	2.93	27.52	0.03
S3_1	0.01	0.01	0.864	0.00	0.00	0.22	30.11	0.01
S3_2	0.01	0.01	0.945	0.00	0.00	0.33	30.01	0.01
S5	0.01	0.01	0.942	0.00	0.00	0.00	30.31	0.00
S6	0.03	0.03	0.951	0.00	0.00	0.00	30.31	0.00
S7	0.03	0.03	0.951	0.00	0.00	8.73	21.92	0.15
SU1	0.01	0.01	0.692	0.00	0.00			

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
527_(P-Stm)	OUTFALL	0.43	1.04	82.27	0 01:34	1.04
OF1	OUTFALL	0.50	0.50	81.17	0 00:00	0.50
OF2	OUTFALL	0.55	0.55	81.46	0 00:00	0.55
OF3	OUTFALL	0.50	0.50	81.17	0 00:00	0.50
OF7	OUTFALL	0.50	0.50	81.17	0 00:00	0.50
Roof1	STORAGE	0.01	0.03	96.88	0 01:43	0.03
Roof2	STORAGE	0.01	0.03	96.88	0 01:43	0.03
St_L1	STORAGE	0.00	0.01	84.21	0 01:11	0.01
St_L2	STORAGE	0.00	0.05	83.95	0 01:13	0.05
St_L3	STORAGE	0.00	0.06	83.15	0 01:10	0.06
St_P1	STORAGE	0.00	0.02	85.72	0 01:10	0.02
St_P2	STORAGE	0.00	0.02	85.52	0 01:10	0.02
St_UnGrd	STORAGE	0.03	0.25	82.22	0 01:20	0.25
SU1	STORAGE	0.00	0.02	85.72	0 01:10	0.02

Node Inflow Summary

Flow Balance	Error Percent	Type	Maximum Inflow CMS	Maximum Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow 10 ⁶ ltr	Total Inflow 10 ⁶ ltr
527_(P-Stm)	0.000	OUTFALL	0.000	0.001	0 01:13	0	0.000476
OF1	0.000	OUTFALL	0.000	0.010	0 01:00	0	0.0503
OF2	0.000	OUTFALL	0.000	0.005	0 01:10	0	0.00347
OF3	0.000	OUTFALL	0.000	0.002	0 00:52	0	0.0298
OF7	0.000	OUTFALL	0.000	0.002	0 00:52	0	0.0298
Roof1	0.013	STORAGE	0.021	0.021	0 01:10	0.0298	0.0298
Roof2	0.013	STORAGE	0.021	0.021	0 01:10	0.0298	0.0298
St_L1	0.013	STORAGE	0.000	0.000	0 01:10	0.000253	0.000253
St_L2	0.023	STORAGE	0.001	0.001	0 01:10	0.000224	0.000477
St_L3	0.004	STORAGE	0.005	0.005	0 01:10	0.00347	0.00347
St_P1	0.014	STORAGE	0.010	0.010	0 01:10	0.0144	0.0144
St_P2	0.012	STORAGE	0.012	0.012	0 01:10	0.0167	0.0167
St_UnGrd	0.006	STORAGE	0.005	0.036	0 01:10	0.00743	0.0503
SU1	0.017	STORAGE	0.008	0.008	0 01:10	0.0118	0.0118

Node Surcharge Summary

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Maximum Outflow Storage Unit CMS	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
Roof1	0.007	8.4	0.0	0.0	0.017	20.5	0 01:43
0.002 Roof2	0.007	8.4	0.0	0.0	0.017	20.5	0 01:43
0.002 St_L1	0.000	0.0	0.0	0.0	0.000	0.0	0 01:11
0.000 St_L2	0.000	0.0	0.0	0.0	0.000	0.1	0 01:13
0.001 St_L3	0.000	0.0	0.0	0.0	0.000	0.3	0 01:10
0.005 St_P1	0.000	0.0	0.0	0.0	0.000	0.6	0 01:10
0.010 St_P2	0.000	0.1	0.0	0.0	0.000	2.5	0 01:10
0.012 St_UnGrd	0.002	2.7	0.0	0.0	0.016	24.8	0 01:20
0.010 SU1	0.000	0.0	0.0	0.0	0.000	0.6	0 01:10
0.008							

Outfall Loading Summary

Outfall Node	Flow Freg Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10 ⁶ ltr
527_(P-Stm)	6.86	0.000	0.001	0.000
OF1	56.63	0.004	0.010	0.050
OF2	40.99	0.000	0.005	0.003
OF3	77.70	0.002	0.002	0.030
OF7	77.70	0.002	0.002	0.030
System	51.98	0.008	0.019	0.114

Link Flow Summary

Link	Type	Maximum Flow CMS	Time of Max Occurrence days hr:min	Maximum Veloc m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	0.000	0 01:11	0.16	0.01	0.12
W_L1	WEIR	0.000	0 00:00			0.00
W1	WEIR	0.000	0 00:00			0.00
W2	WEIR	0.000	0 00:00			0.00
O_St_L3	DUMMY	0.005	0 01:10			
OL1	DUMMY	0.008	0 01:10			
OL2	DUMMY	0.010	0 01:10			
OL3	DUMMY	0.012	0 01:10			
OL4	DUMMY	0.001	0 01:13			
OR1	DUMMY	0.010	0 01:00			
ROOF1	DUMMY	0.002	0 00:52			
ROOF2	DUMMY	0.002	0 00:52			

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	
C1	1.00	0.19	0.00	0.00	0.81	0.00	0.00	0.00	0.06	0.00

Conduit Surcharge Summary

No conduits were surcharged.

Analysis begun on: Mon Oct 7 14:30:32 2024
Analysis ended on: Mon Oct 7 14:30:32 2024
Total elapsed time: < 1 sec

Post-Development 3-hour Chicago 1:100 year Event

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[;TITLE]
;;Project Title/Notes

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

START_DATE 01/01/2000
START_TIME 00:00:00
REPORT_START_DATE 01/01/2000
REPORT_START_TIME 00:00:00
END_DATE 01/01/2000
END_TIME 06:00:00
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 1
RULE_STEP 00:00:00

INERTIAL_DAMPING PARTIAL
NORMAL_FLOW_LIMITED BOTH
FORCE_MAIN_EQUATION H-W
VARIABLE_STEP 0.75
LENGTHENING_STEP 0
MIN_SURFAREA 0
MAX_TRIALS 8
HEAD_TOLERANCE 0.0015
SYS_FLOW_TOL 5
LAT_FLOW_TOL 5
MINIMUM_STEP 0.5
THREADS 12

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

[;RAINGAGES]
;;Name Format Interval SCF Source
Rainfall INTENSITY 0:10 1.0 TIMESERIES 3CHI100

[;SUBCATCHMENTS]
Rain Gage Outlet Area %Imperv Width %Slope CurbLen
L1_1 Rainfall St_L3 0.0699 10.014 134.062 2 0
L1_2 Rainfall St_L1 0.0681 8.447 15.82 2 0
L1_3 Rainfall St_L2 0.0324 3.893 77.605 2 0
S1 Rainfall St_L3 0.1577 14.286 38.49 2 0
S2 Rainfall St_P2 0.0607 90.737 16.17 2 0
S3_1 Rainfall SUI 0.0391 99.287 10.808 2 0
S3_2 Rainfall St_P1 0.048 98.957 13.267 2 0
S5 Rainfall Roof2 0.0983 100 22.118 1 0
S6 Rainfall Roof1 0.0983 100 22.118 1 0
S7 Rainfall St_UnGrd 0.0317 72.194 28.53 15 0

[;SUBAREAS]
;;Subcatchment N-Imperv N-Perv S-Imperv S-Perv PctZero RouteTo PctRouted
L1_1 0.013 0.25 1.57 4.67 0 PERVIOUS 100
L1_2 0.013 0.25 1.57 4.67 0 PERVIOUS 100
L1_3 0.013 0.25 1.57 4.67 0 PERVIOUS 100
S1 0.013 0.25 1.57 4.67 0 PERVIOUS 80
S2 0.013 0.25 1.57 4.67 0 OUTLET
S3_1 0.013 0.25 1.57 4.67 0 OUTLET
S3_2 0.013 0.25 1.57 4.67 0 OUTLET
S5 0.013 0.25 1.57 4.67 0 OUTLET
S6 0.013 0.25 1.57 4.67 0 OUTLET
S7 0.013 0.25 1.57 4.67 0 OUTLET

[;INFILTRATION]
;;Subcatchment Param1 Param2 Param3 Param4 Param5
L1_1 76.2 13.2 4.14 7 0
L1_2 76.2 13.2 4.14 7 0
L1_3 76.2 13.2 4.14 7 0
S1 76.2 13.2 4.14 7 0
S2 76.2 13.2 4.14 7 0
S3_1 76.2 13.2 4.14 7 0
S3_2 76.2 13.2 4.14 7 0
S5 76.2 13.2 4.14 7 0
S6 76.2 13.2 4.14 7 0
S7 76.2 13.2 4.14 7 0

[;OUTFALLS]
;;Name Elevation Type Stage Data Gated Route To
527_(P-Stm) 81.228 TIMESERIES 527_CHI100yr NO
OF1 80.67 FIXED 81.17 NO
OF2 80.911 FIXED 81.46 NO
OF3 80.67 FIXED 81.17 NO
OF7 80.67 FIXED 81.17 NO

[;STORAGE]
;;Name Elev. Psi MaxDepth Ksat InitDepth Shape Curve Name/Params
SurDepth Fevap
Roof1 96.85 0.15 0 FUNCTIONAL 0 0 559.44 0
Roof2 96.85 0.15 0 FUNCTIONAL 0 0 559.44 0
St_L1 84.2 1.7 0 TABULAR St_L1
St_L2 83.9 2.1 0 TABULAR St_L2
St_L3 83.09 2.21 0 TABULAR St_L3
St_P1 85.7 0.31 0 TABULAR St_P1
St_P2 85.5 0.15 0 TABULAR St_P2
St_UnGrd 81.971 1 0 FUNCTIONAL 0 0 64 0
SUI 85.7 0.25 0 TABULAR St_P3

[;CONDUITS]
;;Name From Node To Node Length Roughness InOffset OutOffset
InitFlow MaxFlow
C1 0.04 St_L1 St_L2 33.149 0.013 84.2 83.9

[;WEIRS]
;;Name From Node To Node Type CrestHt Qcoeff Gated
EndCon EndCoeff Surcharge RoadWidth RoadSurf Coeff. Curve
MHF_IPEX_TYPE_A Rating 0 0
MHF_IPEX_TYPE_A 0.1 0.0057
MHF_IPEX_TYPE_A 0.2 0.0081
MHF_IPEX_TYPE_A 0.3 0.0099
MHF_IPEX_TYPE_A 0.4 0.0114
MHF_IPEX_TYPE_A 0.5 0.0128
MHF_IPEX_TYPE_A 0.6 0.014
MHF_IPEX_TYPE_A 0.7 0.0151
MHF_IPEX_TYPE_A 0.8 0.0162
MHF_IPEX_TYPE_A 0.9 0.0172
MHF_IPEX_TYPE_A 1 0.0181
MHF_IPEX_TYPE_A 1.2 0.0198
MHF_IPEX_TYPE_A 1.4 0.0214
MHF_IPEX_TYPE_A 1.6 0.0229
MHF_IPEX_TYPE_A 1.8 0.0243
MHF_IPEX_TYPE_A 2 0.0256
MHF_IPEX_TYPE_A 2.5 0.0286
MHF_IPEX_TYPE_A 3 0.0313

MHF_IPEX_TYPE_B Rating 0 0
MHF_IPEX_TYPE_B 0.1 0.0081
MHF_IPEX_TYPE_B 0.2 0.0115
MHF_IPEX_TYPE_B 0.3 0.0141
MHF_IPEX_TYPE_B 0.4 0.0162
MHF_IPEX_TYPE_B 0.5 0.0182
MHF_IPEX_TYPE_B 0.6 0.0199
MHF_IPEX_TYPE_B 0.7 0.0215
MHF_IPEX_TYPE_B 0.8 0.023
MHF_IPEX_TYPE_B 0.9 0.0244
MHF_IPEX_TYPE_B 1 0.0257
MHF_IPEX_TYPE_B 1.2 0.0281
MHF_IPEX_TYPE_B 1.4 0.0304
    
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MHF_IPEX_TYPE_B	1.6	0.0325
MHF_IPEX_TYPE_B	1.8	0.0344
MHF_IPEX_TYPE_B	2	0.0363
MHF_IPEX_TYPE_B	2.5	0.0406
MHF_IPEX_TYPE_B	3	0.0445

;Tempest Rating Curve for MHF IPEX TYPE C, No grate allowance		
MHF_IPEX_TYPE_C	Rating	0
MHF_IPEX_TYPE_C	0.1	0.0106
MHF_IPEX_TYPE_C	0.2	0.015
MHF_IPEX_TYPE_C	0.3	0.0183
MHF_IPEX_TYPE_C	0.4	0.0212
MHF_IPEX_TYPE_C	0.5	0.0237
MHF_IPEX_TYPE_C	0.6	0.0259
MHF_IPEX_TYPE_C	0.7	0.028
MHF_IPEX_TYPE_C	0.8	0.0299
MHF_IPEX_TYPE_C	0.9	0.0317
MHF_IPEX_TYPE_C	1	0.0335
MHF_IPEX_TYPE_C	1.2	0.0366
MHF_IPEX_TYPE_C	1.4	0.0396
MHF_IPEX_TYPE_C	1.6	0.0423
MHF_IPEX_TYPE_C	1.8	0.0449
MHF_IPEX_TYPE_C	2	0.0473
MHF_IPEX_TYPE_C	2.5	0.0529
MHF_IPEX_TYPE_C	3	0.0579

;Tempest Rating Curve for MHF IPEX TYPE D, No grate allowance		
MHF_IPEX_TYPE_D	Rating	0
MHF_IPEX_TYPE_D	0.1	0.0154
MHF_IPEX_TYPE_D	0.2	0.0217
MHF_IPEX_TYPE_D	0.3	0.0266
MHF_IPEX_TYPE_D	0.4	0.0307
MHF_IPEX_TYPE_D	0.5	0.0343
MHF_IPEX_TYPE_D	0.6	0.0376
MHF_IPEX_TYPE_D	0.7	0.0406
MHF_IPEX_TYPE_D	0.8	0.0434
MHF_IPEX_TYPE_D	0.9	0.0461
MHF_IPEX_TYPE_D	1	0.0485
MHF_IPEX_TYPE_D	1.2	0.0532
MHF_IPEX_TYPE_D	1.4	0.0574
MHF_IPEX_TYPE_D	1.6	0.0614
MHF_IPEX_TYPE_D	1.8	0.0651
MHF_IPEX_TYPE_D	2	0.0687
MHF_IPEX_TYPE_D	2.5	0.0768
MHF_IPEX_TYPE_D	3	0.0841

;Tempest Rating Curve for MHF IPEX TYPE E, No grate allowance		
MHF_IPEX_TYPE_E	Rating	0
MHF_IPEX_TYPE_E	0.1	0.0205
MHF_IPEX_TYPE_E	0.2	0.0289
MHF_IPEX_TYPE_E	0.3	0.0355
MHF_IPEX_TYPE_E	0.4	0.0409
MHF_IPEX_TYPE_E	0.5	0.0458
MHF_IPEX_TYPE_E	0.6	0.0501
MHF_IPEX_TYPE_E	0.7	0.0542
MHF_IPEX_TYPE_E	0.8	0.0579
MHF_IPEX_TYPE_E	0.9	0.0614
MHF_IPEX_TYPE_E	1	0.0647
MHF_IPEX_TYPE_E	1.2	0.0709
MHF_IPEX_TYPE_E	1.4	0.0766
MHF_IPEX_TYPE_E	1.6	0.0819
MHF_IPEX_TYPE_E	1.8	0.0868
MHF_IPEX_TYPE_E	2	0.0915
MHF_IPEX_TYPE_E	2.5	0.1023
MHF_IPEX_TYPE_E	3	0.1121

O_Roof1	Rating	0
O_Roof1	0.001	0.002
O_Roof1	0.15	0.002

O_Roof2	Rating	0
O_Roof2	0.001	0.002
O_Roof2	0.15	0.002

O_St_L1	Rating	0
O_St_L1	0.001	0.003
O_St_L1	0.35	0.003

O_St_L2	Rating	0
O_St_L2	0.001	0.002
O_St_L2	0.35	0.002

O_St_L3	Rating	0
O_St_L3	0.001	0.0137
O_St_L3	0.35	0.0137

O_St_UnGrd	Rating	0
O_St_UnGrd	0.01	0.01
O_St_UnGrd	1	0.01

;Tempest Rating Curve for Vortex ICD 100, No grate allowance		
Vortex_ICD_100	Rating	0
Vortex_ICD_100	0.1	0.0028
Vortex_ICD_100	0.2	0.004
Vortex_ICD_100	0.3	0.0049
Vortex_ICD_100	0.4	0.0056
Vortex_ICD_100	0.5	0.0063
Vortex_ICD_100	0.6	0.0069
Vortex_ICD_100	0.7	0.0075
Vortex_ICD_100	0.8	0.008
Vortex_ICD_100	0.9	0.0085
Vortex_ICD_100	1	0.0089
Vortex_ICD_100	1.2	0.0098
Vortex_ICD_100	1.4	0.0106
Vortex_ICD_100	1.6	0.0113
Vortex_ICD_100	1.8	0.012
Vortex_ICD_100	2	0.0126
Vortex_ICD_100	2.5	0.0141
Vortex_ICD_100	3	0.0155

;Tempest Rating Curve for Vortex ICD 105, No grate allowance		
Vortex_ICD_105	Rating	0
Vortex_ICD_105	0.1	0.0031
Vortex_ICD_105	0.2	0.0044
Vortex_ICD_105	0.3	0.0054
Vortex_ICD_105	0.4	0.0062
Vortex_ICD_105	0.5	0.0069
Vortex_ICD_105	0.6	0.0076
Vortex_ICD_105	0.7	0.0082
Vortex_ICD_105	0.8	0.0088
Vortex_ICD_105	0.9	0.0093
Vortex_ICD_105	1	0.0098
Vortex_ICD_105	1.2	0.0107
Vortex_ICD_105	1.4	0.0116
Vortex_ICD_105	1.6	0.0124
Vortex_ICD_105	1.8	0.0131
Vortex_ICD_105	2	0.0139
Vortex_ICD_105	2.5	0.0155
Vortex_ICD_105	3	0.017

;Tempest Rating Curve for Vortex ICD 40, No grate allowance		
Vortex_ICD_40	Rating	0
Vortex_ICD_40	0.1	0.0004
Vortex_ICD_40	0.2	0.0006
Vortex_ICD_40	0.3	0.0007
Vortex_ICD_40	0.4	0.0009
Vortex_ICD_40	0.5	0.001
Vortex_ICD_40	0.6	0.001
Vortex_ICD_40	0.7	0.0011
Vortex_ICD_40	0.8	0.0012
Vortex_ICD_40	0.9	0.0013
Vortex_ICD_40	1	0.0014
Vortex_ICD_40	1.2	0.0015
Vortex_ICD_40	1.4	0.0016
Vortex_ICD_40	1.6	0.0017
Vortex_ICD_40	1.8	0.0018
Vortex_ICD_40	2	0.0019
Vortex_ICD_40	2.5	0.0022
Vortex_ICD_40	3	0.0024

;Tempest Rating Curve for Vortex ICD 45, No grate allowance		
Vortex_ICD_45	Rating	0
Vortex_ICD_45	0.1	0.0006
Vortex_ICD_45	0.2	0.0008
Vortex_ICD_45	0.3	0.001
Vortex_ICD_45	0.4	0.0011
Vortex_ICD_45	0.5	0.0013
Vortex_ICD_45	0.6	0.0014
Vortex_ICD_45	0.7	0.0015
Vortex_ICD_45	0.8	0.0016
Vortex_ICD_45	0.9	0.0017
Vortex_ICD_45	1	0.0018
Vortex_ICD_45	1.2	0.002
Vortex_ICD_45	1.4	0.0021
Vortex_ICD_45	1.6	0.0023
Vortex_ICD_45	1.8	0.0024
Vortex_ICD_45	2	0.0026
Vortex_ICD_45	2.5	0.0029
Vortex_ICD_45	3	0.0031

;Tempest Rating Curve for Vortex ICD 50, No grate allowance		
Vortex_ICD_50	Rating	0
Vortex_ICD_50	0.1	0.0007
Vortex_ICD_50	0.2	0.001
Vortex_ICD_50	0.3	0.0012
Vortex_ICD_50	0.4	0.0014
Vortex_ICD_50	0.5	0.0016
Vortex_ICD_50	0.6	0.0018
Vortex_ICD_50	0.7	0.0019
Vortex_ICD_50	0.8	0.002
Vortex_ICD_50	0.9	0.0021
Vortex_ICD_50	1	0.0023
Vortex_ICD_50	1.2	0.0025
Vortex_ICD_50	1.4	0.0027
Vortex_ICD_50	1.6	0.0029
Vortex_ICD_50	1.8	0.003
Vortex_ICD_50	2	0.0032
Vortex_ICD_50	2.5	0.0036
Vortex_ICD_50	3	0.0039

;Tempest Rating Curve for Vortex ICD 55, No grate allowance		
Vortex_ICD_55	Rating	0
Vortex_ICD_55	0.1	0.0009
Vortex_ICD_55	0.2	0.0012
Vortex_ICD_55	0.3	0.0015
Vortex_ICD_55	0.4	0.0017
Vortex_ICD_55	0.5	0.0019
Vortex_ICD_55	0.6	0.0021
Vortex_ICD_55	0.7	0.0023
Vortex_ICD_55	0.8	0.0024
Vortex_ICD_55	0.9	0.0026
Vortex_ICD_55	1	0.0027
Vortex_ICD_55	1.2	0.003
Vortex_ICD_55	1.4	0.0032
Vortex_ICD_55	1.6	0.0034
Vortex_ICD_55	1.8	0.0036
Vortex_ICD_55	2	0.0038
Vortex_ICD_55	2.5	0.0043
Vortex_ICD_55	3	0.0047

;Tempest Rating Curve for Vortex ICD 60, No grate allowance		
Vortex_ICD_60	Rating	0
Vortex_ICD_60	0.1	0.0011
Vortex_ICD_60	0.2	0.0015
Vortex_ICD_60	0.3	0.0018
Vortex_ICD_60	0.4	0.0021
Vortex_ICD_60	0.5	0.0023
Vortex_ICD_60	0.6	0.0025
Vortex_ICD_60	0.7	0.0027
Vortex_ICD_60	0.8	0.0029
Vortex_ICD_60	0.9	0.0031
Vortex_ICD_60	1	0.0032
Vortex_ICD_60	1.2	0.0036
Vortex_ICD_60	1.4	0.0038
Vortex_ICD_60	1.6	0.0041
Vortex_ICD_60	1.8	0.0043
Vortex_ICD_60	2	0.0046
Vortex_ICD_60	2.5	0.0051
Vortex_ICD_60	3	0.0056

;Tempest Rating Curve for Vortex ICD 65, No grate allowance		
Vortex_ICD_65	Rating	0
Vortex_ICD_65	0.1	0.0012
Vortex_ICD_65	0.2	0.0016
Vortex_ICD_65	0.3	0.002
Vortex_ICD_65	0.4	0.0023
Vortex_ICD_65	0.5	0.0025
Vortex_ICD_65	0.6	0.0028
Vortex_ICD_65	0.7	0.003
Vortex_ICD_65	0.8	0.0032
Vortex_ICD_65	0.9	0.0034
Vortex_ICD_65	1	0.0036
Vortex_ICD_65	1.2	0.004
Vortex_ICD_65	1.4	0.0043
Vortex_ICD_65	1.6	0.0046
Vortex_ICD_65	1.8	0.0049
Vortex_ICD_65	2	0.0051
Vortex_ICD_65	2.5	0.0057
Vortex_ICD_65	3	0.0063

;Tempest Rating Curve for Vortex ICD 70, No grate allowance		
Vortex_ICD_70	Rating	0
Vortex_ICD_70	0.1	0.0013
Vortex_ICD_70	0.2	0.0019
Vortex_ICD_70	0.3	0.0023
Vortex_ICD_70	0.4	0.0027
Vortex_ICD_70	0.5	0.003
Vortex_ICD_70	0.6	0.0033
Vortex_ICD_70	0.7	0.0036
Vortex_ICD_70	0.8	0.0038
Vortex_ICD_70	0.9	0.0041
Vortex_ICD_70	1	0.0043
Vortex_ICD_70	1.2	0.0047
Vortex_ICD_70	1.4	0.0051
Vortex_ICD_70	1.6	0.0055
Vortex_ICD_70	1.8	0.0058
Vortex_ICD_70	2	0.0061
Vortex_ICD_70	2.5	0.0068
Vortex_ICD_70	3	0.0075

;Tempest Rating Curve for Vortex ICD 75, No grate allowance		
Vortex_ICD_75	Rating	0
Vortex_ICD_75	0.1	0.0016
Vortex_ICD_75	0.2	0.0022
Vortex_ICD_75	0.3	0.0027
Vortex_ICD_75	0.4	0.0032
Vortex_ICD_75	0.5	0.0035
Vortex_ICD_75	0.6	0.0039
Vortex_ICD_75	0.7	0.0042
Vortex_ICD_75	0.8	0.0045
Vortex_ICD_75	0.9	0.0048
Vortex_ICD_75	1	0.005
Vortex_ICD_75	1.2	0.0055
Vortex_ICD_75	1.4	0.0059
Vortex_ICD_75	1.6	0.0063
Vortex_ICD_75	1.8	0.0067
Vortex_ICD_75	2	0.0071
Vortex_ICD_75	2.5	0.0079
Vortex_ICD_75	3	0.0087

;Tempest Rating Curve for Vortex ICD 80, No grate allowance		
Vortex_ICD_80	Rating	0
Vortex_ICD_80	0.1	0.0018
Vortex_ICD_80	0.2	0.0026
Vortex_ICD_80	0.3	0.0031
Vortex_ICD_80	0.4	0.0036
Vortex_ICD_80	0.5	0.004
Vortex_ICD_80	0.6	0.0044

Table with columns for station ID, date, time, rainfall (mm/hr), and numerical values. Includes sub-sections for 'Rainfall (mm/hr)' and 'Rainfall (mm/hr)' for stations 24SCS50, 24SCS55, 3CHI10, 3CHI12, 3CHI25, and 3CHI25.

Post-Development 3-hour Chicago 1:100-year Event

July 2024

3CHI25	01/01/2000	01:20:00	21.286	InfiltratedInflow	01/01/2000	01:19:00	6.991814E-05
3CHI25	01/01/2000	01:30:00	14.308	InfiltratedInflow	01/01/2000	01:20:00	6.865804E-05
3CHI25	01/01/2000	01:40:00	10.818	InfiltratedInflow	01/01/2000	01:21:00	6.748195E-05
3CHI25	01/01/2000	01:50:00	8.732	InfiltratedInflow	01/01/2000	01:22:00	6.638427E-05
3CHI25	01/01/2000	02:00:00	7.345	InfiltratedInflow	01/01/2000	01:23:00	6.535978E-05
3CHI25	01/01/2000	02:10:00	6.356	InfiltratedInflow	01/01/2000	01:24:00	6.44036E-05
3CHI25	01/01/2000	02:20:00	5.615	InfiltratedInflow	01/01/2000	01:25:00	6.351116E-05
3CHI25	01/01/2000	02:30:00	5.038	InfiltratedInflow	01/01/2000	01:26:00	6.267823E-05
3CHI25	01/01/2000	02:40:00	4.576	InfiltratedInflow	01/01/2000	01:27:00	6.190084E-05
3CHI25	01/01/2000	02:50:00	4.197	InfiltratedInflow	01/01/2000	01:28:00	6.117527E-05
3CHI25	01/01/2000	03:00:00	0	InfiltratedInflow	01/01/2000	01:29:00	6.049809E-05
				InfiltratedInflow	01/01/2000	01:30:00	5.986804E-05
				InfiltratedInflow	01/01/2000	01:31:00	5.927615E-05
				InfiltratedInflow	01/01/2000	01:32:00	5.872558E-05
				InfiltratedInflow	01/01/2000	01:33:00	5.821172E-05
				InfiltratedInflow	01/01/2000	01:34:00	5.773212E-05
				InfiltratedInflow	01/01/2000	01:35:00	5.728449E-05
				InfiltratedInflow	01/01/2000	01:36:00	5.686672E-05
				InfiltratedInflow	01/01/2000	01:37:00	5.64768E-05
				InfiltratedInflow	01/01/2000	01:38:00	5.611287E-05
				InfiltratedInflow	01/01/2000	01:39:00	5.577321E-05
				InfiltratedInflow	01/01/2000	01:40:00	5.545619E-05
				InfiltratedInflow	01/01/2000	01:41:00	5.516031E-05
				InfiltratedInflow	01/01/2000	01:42:00	5.488416E-05
				InfiltratedInflow	01/01/2000	01:43:00	5.462642E-05
				InfiltratedInflow	01/01/2000	01:44:00	5.438587E-05
				InfiltratedInflow	01/01/2000	01:45:00	5.416135E-05
				InfiltratedInflow	01/01/2000	01:46:00	5.39519E-05
				InfiltratedInflow	01/01/2000	01:47:00	5.375623E-05
				InfiltratedInflow	01/01/2000	01:48:00	5.357369E-05
				InfiltratedInflow	01/01/2000	01:49:00	5.340332E-05
				InfiltratedInflow	01/01/2000	01:50:00	5.324431E-05
				InfiltratedInflow	01/01/2000	01:51:00	5.309591E-05
				InfiltratedInflow	01/01/2000	01:52:00	5.29574E-05
				InfiltratedInflow	01/01/2000	01:53:00	5.282812E-05
				InfiltratedInflow	01/01/2000	01:54:00	5.270747E-05
				InfiltratedInflow	01/01/2000	01:55:00	5.259432E-05
				InfiltratedInflow	01/01/2000	01:56:00	5.248975E-05
				InfiltratedInflow	01/01/2000	01:57:00	5.239165E-05
				InfiltratedInflow	01/01/2000	01:58:00	5.23001E-05
				InfiltratedInflow	01/01/2000	02:00:00	5.214404E-05
				InfiltratedInflow	01/01/2000	02:00:00	5.213489E-05
				InfiltratedInflow	01/01/2000	02:01:00	5.206045E-05
				InfiltratedInflow	01/01/2000	02:02:00	5.199098E-05
				InfiltratedInflow	01/01/2000	02:03:00	5.192610E-05
				InfiltratedInflow	01/01/2000	02:04:00	5.186562E-05
				InfiltratedInflow	01/01/2000	02:05:00	5.180913E-05
				InfiltratedInflow	01/01/2000	02:06:00	5.175642E-05
				InfiltratedInflow	01/01/2000	02:07:00	5.170721E-05
				InfiltratedInflow	01/01/2000	02:08:00	5.166129E-05
				InfiltratedInflow	01/01/2000	02:09:00	5.161843E-05
				InfiltratedInflow	01/01/2000	02:10:00	5.157843E-05
				InfiltratedInflow	01/01/2000	02:11:00	5.154109E-05
				InfiltratedInflow	01/01/2000	02:12:00	5.150625E-05
				InfiltratedInflow	01/01/2000	02:13:00	5.147372E-05
				InfiltratedInflow	01/01/2000	02:14:00	5.144337E-05
				InfiltratedInflow	01/01/2000	02:15:00	5.141504E-05
				InfiltratedInflow	01/01/2000	02:16:00	5.13886E-05
				InfiltratedInflow	01/01/2000	02:17:00	5.136392E-05
				InfiltratedInflow	01/01/2000	02:18:00	5.134088E-05
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				InfiltratedInflow	01/01/2000	02:28:00	5.118017E-05
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				InfiltratedInflow	01/01/2000	02:32:00	5.114117E-05
				InfiltratedInflow	01/01/2000	02:33:00	5.113299E-05
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InfiltratedInflow 01/01/2000 06:00:00 0

```

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Subcatch S5 Building
Subcatch S6 Building
Subcatch S7 Ramp
Node St_L1 RYCB
Node St_L2 RYCB
Node St_L3 RYCB
Node St_UnGrd Underground_Storage
Link CL RV_Storm

[MAP]
DIMENSIONS 381360.7266 5033019.65495 381502.5034 5033143.67005
UNITS Meters

[COORDINATES]
;;Node X-Coord Y-Coord
;; (P-Stm)
OF1 381424.754 5033138.033
OF2 381401.916 5033025.292
OF3 381462.548 5033049.302
OF7 381403.805 5033026.688
Roof1 381448.424 5033041.047
Roof2 381400.098 5033034.455
St_L1 381428.95 5033077.584
St_L2 381395.548 5033108.811
St_L3 381417.381 5033128.938
St_P1 381450.027 5033054.56
St_P2 381406.853 5033073.521
St_UnGrd 381416.312 5033051.852
SUI 381396.599 5033036.713
SUI 381400.429 5033088.237

[VERTICES]
;;Link X-Coord Y-Coord
W_L1 381414.65 5033129.488
W_L1 381395.979 5033112.147

[POLYGONS]
;;Subcatchment X-Coord Y-Coord
LL_1 381426.561 5033106.239
LL_1 381433.371 5033109.212
LL_1 381439.156 5033095.96
LL_1 381458.719 5033051.155
LL_1 381435.928 5033044.204
LL_1 381430.376 5033033.492
LL_1 381429.744 5033033.928
LL_1 381429.096 5033034.342
LL_1 381428.435 5033034.734
LL_1 381427.76 5033035.102
LL_1 381427.074 5033035.446
LL_1 381426.375 5033035.767
LL_1 381425.758 5033036.025
LL_1 381425.134 5033036.264
LL_1 381424.503 5033036.484
LL_1 381423.865 5033036.685
LL_1 381423.22 5033036.866
LL_1 381423.215 5033037.128
LL_1 381423.218 5033037.391
LL_1 381423.23 5033037.654
LL_1 381423.251 5033037.916
LL_1 381423.281 5033038.178
LL_1 381423.32 5033038.438
LL_1 381423.368 5033038.696
LL_1 381423.425 5033038.953
LL_1 381423.49 5033039.208
LL_1 381423.564 5033039.46
LL_1 381423.647 5033039.71
LL_1 381423.738 5033039.957
LL_1 381423.8304 5033040.2
LL_1 381423.946 5033040.44
LL_1 381424.062 5033040.676
LL_1 381424.186 5033040.908
LL_1 381424.314 5033041.136
LL_1 381424.458 5033041.359
LL_1 381424.605 5033041.577
LL_1 381424.76 5033041.79
LL_1 381424.921 5033041.997
LL_1 381425.09 5033042.199
LL_1 381425.266 5033042.395
LL_1 381425.448 5033042.584
LL_1 381425.637 5033042.768
LL_1 381425.831 5033042.945
LL_1 381426.032 5033043.115
LL_1 381426.239 5033043.278
LL_1 381426.45 5033043.434
LL_1 381426.668 5033043.582
LL_1 381426.89 5033043.723
LL_1 381427.116 5033043.857
LL_1 381427.348 5033044.982
LL_1 381427.583 5033044.1
LL_1 381427.822 5033044.209
LL_1 381440.834 5033049.891
LL_1 381441.12 5033050.021
LL_1 381441.401 5033050.162
LL_1 381441.677 5033050.313
LL_1 381441.947 5033050.472
LL_1 381442.212 5033050.642
LL_1 381442.471 5033050.82
LL_1 381442.723 5033051.008
LL_1 381442.969 5033051.204
LL_1 381443.207 5033051.408
LL_1 381443.438 5033051.621
LL_1 381443.662 5033051.841
LL_1 381443.878 5033052.07
LL_1 381444.086 5033052.305
LL_1 381444.285 5033052.548
LL_1 381444.476 5033052.798
LL_1 381444.658 5033053.054
LL_1 381444.831 5033053.316
LL_1 381444.991 5033053.585
LL_1 381445.149 5033053.858
LL_1 381445.294 5033054.137
LL_1 381445.428 5033054.421
LL_1 381445.543 5033054.71
LL_1 381445.668 5033055.002
LL_1 381445.772 5033055.299
LL_1 381445.866 5033055.598
LL_1 381445.95 5033055.901
LL_1 381446.022 5033056.207
LL_1 381446.085 5033056.515
LL_1 381446.136 5033056.825
LL_1 381446.176 5033057.137
LL_1 381446.206 5033057.449
LL_1 381446.224 5033057.763
LL_1 381446.232 5033058.077
LL_1 381446.229 5033058.392
LL_1 381446.215 5033058.705
LL_1 381446.189 5033059.019
LL_1 381446.153 5033059.331
LL_1 381446.109 5033059.641
LL_1 381446.048 5033059.95
LL_1 381445.98 5033060.257
LL_1 381445.901 5033060.561
LL_1 381445.811 5033060.862
LL_1 381445.711 5033061.16
LL_1 381445.6 5033061.454
LL_1 381445.479 5033061.744
LL_1 381442.341 5033068.909
LL_1 381442.775 5033069.097
LL_1 381426.561 5033106.239
LL_2 381407.635 5033124.034
LL_2 381415.643 5033115.347
LL_2 381404.547 5033110.503
LL_2 381408.488 5033101.475
LL_2 381404.701 5033099.821
LL_2 381405.665 5033097.614
LL_2 381401.22 5033095.674
LL_2 381400.599 5033097.094

```

```

[REPORT]
;;Reporting Options
INPUT YES
CONTROLS NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]
Subcatch LL_1 Landscape
Subcatch LL_2 Landscape
Subcatch LL_3 Landscape
Subcatch S2 Parking_Lot
Subcatch S3_1 Parking_Lot
Subcatch S3_2 Parking_Lot

```


L1_2	381393.818	5033094.134	S7	381442.723	5033051.008
L1_2	381394.298	5033093.034	S7	381442.471	5033050.82
L1_2	381389.532	5033090.954	S7	381442.212	5033050.642
L1_2	381389.672	5033090.633	S7	381441.947	5033050.472
L1_2	381386.265	5033089.146	S7	381441.677	5033050.313
L1_2	381386.988	5033087.5	S7	381441.401	5033050.162
L1_2	381370.061	5033080.111	S7	381441.12	5033050.021
L1_2	381367.171	5033086.731	S7	381440.834	5033049.891
L1_3	381373.676	5033092.777	S7	381427.822	5033044.209
L1_2	381375.266	5033094.193	S7	381425.421	5033049.708
L1_2	381382.117	5033100.508	S7	381430.18	5033051.785
L1_2	381407.635	5033124.034	S7	381425.847	5033061.708
L1_2	381425.929	5033107.688			
L1_3	381421.474	5033117.892			
L1_3	381415.643	5033115.347			
L1_3	381407.635	5033124.034			
L1_3	381421.373	5033136.698			
L1_3	381433.371	5033109.212			
L1_3	381426.561	5033106.239			
L1_3	381425.929	5033107.688			
S1	381496.059	5033067.453			
S1	381458.719	5033051.155			
S1	381439.156	5033095.96			
S1	381483.973	5033094.136			
S1	381494.933	5033069			
S2	381496.059	5033067.453			
S2	381422.855	5033068.564			
S2	381425.847	5033061.708			
S2	381430.18	5033051.785			
S2	381425.421	5033049.708			
S2	381427.822	5033044.209			
S2	381427.583	5033044.099			
S2	381427.347	5033043.982			
S2	381427.116	5033043.856			
S2	381426.889	5033043.723			
S2	381426.667	5033043.582			
S2	381426.45	5033043.433			
S2	381426.238	5033043.278			
S2	381426.032	5033043.114			
S2	381425.831	5033042.944			
S2	381425.636	5033042.768			
S2	381425.448	5033042.584			
S2	381425.266	5033042.395			
S2	381425.09	5033042.199			
S2	381424.921	5033041.997			
S2	381424.759	5033041.789			
S2	381424.605	5033041.577			
S2	381424.458	5033041.359			
S2	381424.318	5033041.136			
S2	381424.186	5033040.908			
S2	381424.062	5033040.676			
S2	381423.946	5033040.44			
S2	381423.838	5033040.2			
S2	381423.738	5033039.957			
S2	381423.647	5033039.71			
S2	381423.564	5033039.46			
S2	381423.49	5033039.208			
S2	381423.425	5033038.953			
S2	381423.368	5033038.696			
S2	381423.32	5033038.438			
S2	381423.281	5033038.177			
S2	381423.251	5033037.916			
S2	381423.23	5033037.654			
S2	381423.218	5033037.391			
S2	381423.215	5033037.128			
S2	381423.21	5033036.865			
S2	381422.554	5033037.03			
S2	381421.883	5033037.174			
S2	381421.207	5033037.296			
S2	381420.528	5033037.397			
S2	381419.846	5033037.477			
S2	381419.162	5033037.535			
S2	381418.476	5033037.571			
S2	381417.789	5033037.586			
S2	381417.102	5033037.579			
S2	381408.289	5033038.705			
S2	381399.672	5033058.444			
S2	381422.855	5033068.564			
S3_1	381386.988	5033087.5			
S3_1	381386.265	5033089.146			
S3_1	381389.672	5033090.633			
S3_1	381389.532	5033090.954			
S3_1	381394.298	5033093.034			
S3_1	381393.818	5033094.134			
S3_1	381400.599	5033097.094			
S3_1	381401.22	5033095.674			
S3_1	381405.665	5033097.614			
S3_1	381404.701	5033099.821			
S3_1	381408.488	5033101.475			
S3_1	381415.264	5033085.953			
S3_1	381392.081	5033075.833			
S3_1	381386.988	5033087.5			
S3_2	381392.081	5033075.833			
S3_2	381415.264	5033085.953			
S3_2	381422.855	5033068.564			
S3_2	381399.672	5033058.444			
S5	381392.081	5033075.833			
S5	381421.474	5033117.892			
S5	381432.346	5033092.987			
S5	381442.775	5033069.097			
S5	381425.847	5033061.708			
S5	381404.547	5033110.503			
S5	381421.474	5033117.892			
S6	381386.988	5033087.5			
S6	381408.289	5033038.705			
S6	381391.361	5033031.316			
S6	381370.061	5033080.111			
S6	381386.988	5033087.5			
S7	381425.847	5033061.708			
S7	381436.845	5033066.509			
S7	381442.344	5033068.909			
S7	381445.479	5033061.744			
S7	381445.6	5033061.454			
S7	381445.711	5033061.16			
S7	381445.811	5033060.862			
S7	381445.901	5033060.561			
S7	381445.98	5033060.257			
S7	381446.048	5033059.95			
S7	381446.106	5033059.641			
S7	381446.153	5033059.331			
S7	381446.189	5033059.019			
S7	381446.215	5033058.705			
S7	381446.229	5033058.392			
S7	381446.232	5033058.077			
S7	381446.224	5033057.763			
S7	381446.206	5033057.449			
S7	381446.176	5033057.137			
S7	381446.136	5033056.825			
S7	381446.085	5033056.515			
S7	381446.022	5033056.207			
S7	381445.95	5033055.901			
S7	381445.866	5033055.598			
S7	381445.772	5033055.299			
S7	381445.668	5033055.002			
S7	381445.553	5033054.71			
S7	381445.428	5033054.421			
S7	381445.294	5033054.137			
S7	381445.149	5033053.858			
S7	381444.995	5033053.585			
S7	381444.831	5033053.316			
S7	381444.658	5033053.054			
S7	381444.476	5033052.798			
S7	381444.285	5033052.548			
S7	381444.086	5033052.305			
S7	381443.878	5033052.07			
S7	381443.662	5033051.841			
S7	381443.438	5033051.621			
S7	381443.207	5033051.408			
S7	381442.969	5033051.204			

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.3)

Element Count

Number of rain gages 1
Number of subcatchments ... 10
Number of nodes 14
Number of links 12
Number of pollutants 0
Number of land uses 0

Raingage Summary

Name	Data Source	Data Type	Recording Interval
Rainfall	3CHI100	INTENSITY	10 min.

Subcatchment Summary

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
L1_1	0.07	134.06	10.01	2.0000	Rainfall	St_L3
L1_2	0.07	15.82	8.45	2.0000	Rainfall	St_L1
L1_3	0.03	77.61	3.89	2.0000	Rainfall	St_L2
S1	0.16	38.49	14.29	2.0000	Rainfall	St_L3
S2	0.06	16.17	90.74	2.0000	Rainfall	St_P2
S3_1	0.04	10.81	99.29	2.0000	Rainfall	SU1
S3_2	0.05	13.27	98.96	2.0000	Rainfall	St_P1
S5	0.10	22.12	100.00	1.0000	Rainfall	Roof2
S6	0.10	22.12	100.00	1.0000	Rainfall	Roof1
S7	0.03	28.53	72.19	15.0000	Rainfall	St_UnGrd

Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
527_(P-Stm)	OUTFALL	81.23	0.00	0.0	0.0
OF2	OUTFALL	80.67	0.00	0.0	0.0
OF3	OUTFALL	80.91	0.00	0.0	0.0
OF7	OUTFALL	80.67	0.00	0.0	0.0
Roof1	STORAGE	96.85	0.15	0.0	0.0
Roof2	STORAGE	96.85	0.15	0.0	0.0
St_L1	STORAGE	84.20	1.70	0.0	0.0
St_L2	STORAGE	83.90	2.10	0.0	0.0
St_L3	STORAGE	83.09	2.21	0.0	0.0
St_P1	STORAGE	85.70	0.31	0.0	0.0
St_P2	STORAGE	85.50	0.15	0.0	0.0
St_UnGrd	STORAGE	81.97	1.00	0.0	Yes
SU1	STORAGE	85.70	0.25	0.0	0.0

Link Summary

Name	From Node	To Node	Type	Length	%Slope
C1	St_L1	St_L2	CONDUIT	33.1	0.9050
W_L1	St_L2	St_L1	WEIR		
W1	St_P1	St_P1	WEIR		
W2	SU1	St_P1	WEIR		
O_St_L3	St_L3	OF2	OUTLET		
OL1	SU1	St_UnGrd	OUTLET		
OL2	St_P1	St_UnGrd	OUTLET		
OL3	St_P2	St_UnGrd	OUTLET		
OL4	St_L2	527_(P-Stm)	OUTLET		
OR1	St_UnGrd	OF1	OUTLET		
ROOF1	Roof1	OF3	OUTLET		
ROOF2	Roof2	OF7	OUTLET		

Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	CIRCULAR	0.25	0.05	0.06	0.25	1	0.06

Analysis Options

Flow Units CMS
Process Models:
Rainfall/Runoff YES
RDII NO
Snowmelt NO
Groundwater NO
Flow Routing YES
Ponding Allowed NO
Water Quality NO
Infiltration Method HORTON
Flow Routing Method DYNWAVE
Surcharge Method EXTRAN
Starting Date 01/01/2000 00:00:00
Ending Date 01/01/2000 06:00:00
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 1.00 sec
Variable Time Step YES
Maximum Trials 8
Number of Threads 1
Head Tolerance 0.001500 m

Runoff Quantity Continuity

	Volume hectare-m	Depth mm
Total Precipitation	0.050	71.708
Evaporation Loss	0.000	0.000
Infiltration Loss	0.014	20.257
Surface Runoff	0.036	50.621
Final Storage	0.001	0.893
Continuity Error (%)	-0.089	

Flow Routing Continuity

	Volume 10 ⁶ ltr	Volume 10 ⁶ ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.036	0.356
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.001
External Outflow	0.030	0.299
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 0.006 0.058
Continuity Error (%) 0.000

Time-Step Critical Elements

None

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 : 0.50 sec
Average Time Step : 1.00 sec
Maximum Time Step : 1.00 sec
% of Time in Steady State : 0.00 %
Average Iterations per Step : 2.00
% of Steps Not Converging : 0.00
Time Step Frequencies
1.000 - 0.871 sec : 100.00 %
0.871 - 0.758 sec : 0.00 %
0.758 - 0.660 sec : 0.00 %
0.660 - 0.574 sec : 0.00 %
0.574 - 0.500 sec : 0.00 %

Subcatchment Runoff Summary

Total Runoff	Total Runoff	Peak Runoff	Total Runoff Precip Coeff	Total Runoff	Total Evap	Total Infil	Imperv Runoff	Perv Runoff
mm	10 ⁶ ltr	CMS		mm	mm	mm	mm	mm
L1_1		0.03	71.71	0.00	0.00	40.38	7.03	31.27
L1_2	0.02	0.03	0.436	0.00	0.00	43.58	5.93	28.03
L1_3	0.02	0.01	0.391	0.00	0.00	42.30	2.73	29.46
S1	0.01	0.01	0.411	0.00	0.00	40.87	10.04	28.64
S2	0.05	0.04	0.427	0.00	0.00	30.65	10.04	28.64
S3_1	0.04	0.03	0.925	0.00	0.00	4.03	63.70	2.63
S3_2	0.03	0.02	0.975	0.00	0.00	0.31	69.70	0.21
S5	0.03	0.02	0.973	0.00	0.00	0.45	69.47	0.30
S6	0.03	0.02	0.973	0.00	0.00	0.00	70.17	0.00
S7	0.07	0.05	0.979	0.00	0.00	0.00	70.17	0.00
SU1	0.07	0.05	0.979	0.00	0.00	0.00	70.17	0.00
SU1	0.02	0.02	0.818	0.00	0.00	12.02	50.69	7.98

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
527_(P-Stm)	OUTFALL	1.63	3.88	85.11	0 01:57	3.88
OF1	OUTFALL	0.50	0.50	81.17	0 00:00	0.50
OF2	OUTFALL	0.55	0.55	81.46	0 00:00	0.55
OF3	OUTFALL	0.50	0.50	81.17	0 00:00	0.50
OF7	OUTFALL	0.50	0.50	81.17	0 00:00	0.50
Roof1	STORAGE	0.06	0.09	96.94	0 02:24	0.09
Roof2	STORAGE	0.06	0.09	96.94	0 02:24	0.09
St_L1	STORAGE	0.40	1.53	85.73	0 01:35	1.53
St_L2	STORAGE	0.51	1.83	85.73	0 01:36	1.83
St_L3	STORAGE	0.14	2.19	85.28	0 01:14	2.19
St_P1	STORAGE	0.00	0.04	85.74	0 01:10	0.04
St_P2	STORAGE	0.00	0.04	85.54	0 01:10	0.04
St_UnGrd	STORAGE	0.30	0.98	82.95	0 01:32	0.98
SU1	STORAGE	0.00	0.03	85.73	0 01:10	0.03

Node Inflow Summary

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

Node	Type	Maximum Inflow	Maximum Inflow	Time of Max Occurrence	Lateral Inflow	Total Inflow
Balance	Type	CMS	CMS	days hr:min	10 ⁶ ltr	10 ⁶ ltr
527_(P-Stm)	OUTFALL	0.000	0.006	0 01:24	0	0.0286
OF1	OUTFALL	0.000	0.010	0 00:51	0	0.12
OF2	OUTFALL	0.000	0.038	0 01:14	0	0.0702
OF3	OUTFALL	0.000	0.002	0 00:36	0	0.0398
OF7	OUTFALL	0.000	0.002	0 00:36	0	0.0398
Roof1	STORAGE	0.049	0.049	0 01:10	0.069	0.069
Roof2	STORAGE	0.049	0.049	0 01:10	0.069	0.069
St_L1	STORAGE	0.013	0.021	0 01:11	0.0191	0.0197
St_L2	STORAGE	0.014	0.019	0 01:09	0.00955	0.0293
St_L3	STORAGE	0.066	0.066	0 01:10	0.0702	0.0702
St_P1	STORAGE	0.024	0.024	0 01:10	0.0335	0.0335
St_P2	STORAGE	0.030	0.030	0 01:10	0.0403	0.0403
St_UnGrd	STORAGE	0.015	0.088	0 01:10	0.0192	0.12
SU1	STORAGE	0.019	0.019	0 01:10	0.0273	0.0273

Node Surcharge Summary

 No nodes were surcharged.

 Node Flooding Summary

 No nodes were flooded.

 Storage Volume Summary

Maximum	Average	Avg	Evap	Exfil	Maximum	Max	Time of Max
Outflow	Volume	Pcnt	Pcnt	Pcnt	Volume	Pcnt	Occurrence
Storage Unit	1000 m ³	Full	Loss	Loss	1000 m ³	Full	days hr:min
CMS							
Roof1	0.035	42.0	0.0	0.0	0.051	60.3	0 02:24
0.002							
Roof2	0.035	42.0	0.0	0.0	0.051	60.3	0 02:24
0.002							
St_L1	0.001	3.1	0.0	0.0	0.006	19.7	0 01:35
0.006							
St_L2	0.000	1.4	0.0	0.0	0.002	7.8	0 01:36
0.014							
St_L3	0.000	3.2	0.0	0.0	0.007	86.0	0 01:14
0.038							
St_P1	0.000	0.1	0.0	0.0	0.001	2.2	0 01:10
0.024							
St_P2	0.000	0.4	0.0	0.0	0.001	9.0	0 01:10
0.030							
St_UnGrd	0.019	30.3	0.0	0.0	0.063	98.3	0 01:32
0.010							
SU1	0.000	0.1	0.0	0.0	0.000	2.2	0 01:10
0.019							

 Outfall Loading Summary

Outfall Node	Flow	Avg	Max	Total
	Freq	Flow	Flow	Volume
	Pcnt	CMS	CMS	10 ⁶ ltr
527_(P-Stm)	40.19	0.003	0.006	0.029
OF1	65.18	0.009	0.010	0.120
OF2	45.47	0.007	0.038	0.070
OF3	94.60	0.002	0.002	0.040
OF7	94.60	0.002	0.002	0.040
System	68.01	0.023	0.058	0.299

 Link Flow Summary

Link	Type	Maximum	Time of Max	Maximum	Max/	Max/
		Flow	Occurrence	Veloc	Full	Full
		CMS	days hr:min	m/sec	Flow	Depth
C1	CONDUIT	0.008	0 01:05	0.21	0.14	1.00
W_L1	WEIR	0.000	0 00:00			0.00
W1	WEIR	0.000	0 00:00			0.00
W2	WEIR	0.000	0 00:00			0.00
O_St_L3	DUMMY	0.038	0 01:14			
OL1	DUMMY	0.019	0 01:10			
OL2	DUMMY	0.024	0 01:10			
OL3	DUMMY	0.030	0 01:10			
OL4	DUMMY	0.006	0 01:24			
OR1	DUMMY	0.010	0 00:51			
ROOF1	DUMMY	0.002	0 00:36			
ROOF2	DUMMY	0.002	0 00:36			

 Flow Classification Summary

Conduit	Adjusted	Fraction of Time in Flow Class								
		Up	Down	Sub	Sup	Up	Down	Norm	Inlet	
	/Actual	Dry	Dry	Dry	Crit	Crit	Crit	Crit	Ltd	Ctrl
	Length									
C1	1.00	0.17	0.00	0.00	0.83	0.00	0.00	0.00	0.07	0.00

 Conduit Surcharge Summary

Conduit	Hours Full			Hours	
	Both Ends	Upstream	Dnstream	Above Full	Capacity
				Normal Flow	Limited
C1	1.81	1.81	2.07	0.01	0.01

Analysis begun on: Tue Oct 8 09:00:27 2024
 Analysis ended on: Tue Oct 8 09:00:28 2024
 Total elapsed time: 00:00:01

Post-Development 24-hour SCS 1:100-year Event

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

START_DATE 01/01/2000
START_TIME 00:00:00
REPORT_START_DATE 01/01/2000
REPORT_START_TIME 00:00:00
END_DATE 01/02/2000
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 1
RULE_STEP 00:00:00

INERTIAL_DAMPING PARTIAL
NORMAL_FLOW_LIMITED BOTH
FORCE_MAIN_EQUATION H-W
VARIABLE_STEP 0.75
LENGTHENING_STEP 0
MIN_SURFAREA 0
MAX_TRIALS 8
HEAD_TOLERANCE 0.0015
SYS_FLOW_TOL 5
LAT_FLOW_TOL 5
MINIMUM_STEP 0.5
THREADS 12

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

[RAINGAGES]
;;Name Format Interval SCF Source
Rainfall INTENSITY 0:15 1.0 TIMESERIES 24SCS100

[SUBCATCHMENTS]
Rain Gage Outlet Area %Imperv Width %Slope CurbLen
L1_1 Rainfall St_L3 0.0699 10.014 134.062 2 0
L1_2 Rainfall St_L1 0.0681 8.447 15.82 2 0
L1_3 Rainfall St_L2 0.0324 3.893 77.605 2 0
S1 Rainfall St_L3 0.1577 14.286 38.49 2 0
S2 Rainfall St_P2 0.0607 90.737 16.17 2 0
S3_1 Rainfall SUI 0.0391 99.287 10.808 2 0
S3_2 Rainfall St_P1 0.048 98.957 13.267 2 0
S5 Rainfall Roof2 0.0983 100 22.118 1 0
S6 Rainfall Roof1 0.0983 100 22.118 1 0
S7 Rainfall St_UnGrd 0.0317 72.194 28.53 15 0

[SUBAREAS]
;;Subcatchment N-Imperv N-Perv S-Imperv S-Perv PctZero RouteTo PctRouted
L1_1 0.013 0.25 1.57 4.67 0 PERVIOUS 100
L1_2 0.013 0.25 1.57 4.67 0 PERVIOUS 100
L1_3 0.013 0.25 1.57 4.67 0 PERVIOUS 100
S1 0.013 0.25 1.57 4.67 0 PERVIOUS 80
S2 0.013 0.25 1.57 4.67 0 OUTLET
S3_1 0.013 0.25 1.57 4.67 0 OUTLET
S3_2 0.013 0.25 1.57 4.67 0 OUTLET
S5 0.013 0.25 1.57 4.67 0 OUTLET
S6 0.013 0.25 1.57 4.67 0 OUTLET
S7 0.013 0.25 1.57 4.67 0 OUTLET

[INFILTRATION]
;;Subcatchment Param1 Param2 Param3 Param4 Param5
L1_1 76.2 13.2 4.14 7 0
L1_2 76.2 13.2 4.14 7 0
L1_3 76.2 13.2 4.14 7 0
S1 76.2 13.2 4.14 7 0
S2 76.2 13.2 4.14 7 0
S3_1 76.2 13.2 4.14 7 0
S3_2 76.2 13.2 4.14 7 0
S5 76.2 13.2 4.14 7 0
S6 76.2 13.2 4.14 7 0
S7 76.2 13.2 4.14 7 0

[OUTFALLS]
;;Name Elevation Type Stage Data Gated Route To
527_(P-Stm) 81.228 TIMESERIES 527_24SCS100 NO
OF1 80.67 FIXED 81.17 NO
OF2 80.911 FIXED 81.46 NO
OF3 80.67 FIXED 81.17 NO
OF7 80.67 FIXED 81.17 NO

[STORAGE]
;;Name Elev. MaxDepth InitDepth Shape Curve Name/Params
SurDepth Evap Psi Ksat IMD
Roof1 96.85 0.15 0 FUNCTIONAL 0 0 559.44 0
Roof2 96.85 0.15 0 FUNCTIONAL 0 0 559.44 0
St_L1 84.2 1.7 0 TABULAR St_L1
St_L2 83.9 2.1 0 TABULAR St_L2
St_L3 83.09 2.21 0 TABULAR St_L3
St_P1 85.7 0.31 0 TABULAR St_P1
St_P2 85.5 0.15 0 TABULAR St_P2
St_UnGrd 81.971 1 0 FUNCTIONAL 0 0 64 0
SUI 85.7 0.25 0 TABULAR St_P3

[CONDUITS]
;;Name From Node To Node Length Roughness InOffset OutOffset
InitFlow MaxFlow
C1 0.04 St_L1 St_L2 33.149 0.013 84.2 83.9

[WEIRS]
;;Name From Node To Node RoadSurf Type CrestHt Qcoeff Gated
EndCon EndCoeff Surcharge RoadWidth Coeff. Curve

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;;
W_L1 0 St_L2 St_L1 TRANSVERSE 85.95 1.84 NO
W1 0 St_P1 St_P2 TRANSVERSE 85.85 1.84 NO
W2 0 SUI St_P1 TRANSVERSE 85.87 1.84 NO
0 0 YES

[OUTLETS]
;;Name From Node To Node Offset Type QTable/Qcoeff
Q_St_L3 St_L3 OF2 83.09 TABULAR/HEAD MHF_IPEX_TYPE_B
OL1 NO St_UnGrd 85.7 TABULAR/HEAD ZURN_Z150F-6NH
OL2 St_P1 St_UnGrd 85.7 TABULAR/HEAD ZURN_Z150F-6NH
OL3 St_P2 St_UnGrd 85.5 TABULAR/HEAD ZURN_Z150F-6NH
OL4 St_L2 527_(P-Stm) 83.9 TABULAR/HEAD Vortex_ICD_70
OR1 St_UnGrd OF1 81.971 TABULAR/HEAD O_St_UnGrd
ROOF1 Roof1 OF3 96.85 TABULAR/HEAD O_Roof1
ROOF2 Roof2 OF7 96.85 TABULAR/HEAD O_Roof2
NO

[XSECTIONS]
;;Link Shape Geom1 Geom2 Geom3 Geom4 Barrels
Culvert
C1 CIRCULAR 0.25 0 0 0 1
W_L1 RECT_OPEN 0.05 3 0 0 0
W1 RECT_OPEN 0.16 15 0 0 0
W2 RECT_OPEN 0.08 15 0 0 0

[LOSSES]
;;Link Kentry Kexit Kavg Flap Gate Seepage

[INFLOWS]
;;Node Constituent Time Series Type Mfactor Sfactor Baseline Pattern
St_UnGrd FLOW InfiltratedInflow FLOW 1.0 1 0

[CURVES]
;;Name Type X-Value Y-Value
CBMH Inlet Capture Curve based on the OSDG Appendix 7-A
CBMH Rating 0 0
CBMH 0.122 0.06
CBMH 0.183 0.073
CBMH 0.2 0.076
CBMH 0.243 0.084
CBMH 0.305 0.094
DI_GRATE_A_OPSD403.01 Rating 0.02 0.00762
DI_GRATE_A_OPSD403.01 0.04 0.01524
DI_GRATE_A_OPSD403.01 0.08 0.0381
DI_GRATE_A_OPSD403.01 0.12 0.06858
DI_GRATE_A_OPSD403.01 0.2 0.1524
DI_GRATE_A_OPSD403.01 0.26 0.23622
DI_GRATE_A_OPSD403.01 0.36 0.4572
DI_GRATE_A_OPSD403.01 0.46 0.6858
DI_GRATE_C_OPSD403.01 Rating 0.02 0.01465
DI_GRATE_C_OPSD403.01 0.04 0.0293
DI_GRATE_C_OPSD403.01 0.08 0.07325
DI_GRATE_C_OPSD403.01 0.12 0.13185
DI_GRATE_C_OPSD403.01 0.2 0.293
DI_GRATE_C_OPSD403.01 0.26 0.45415
DI_GRATE_C_OPSD403.01 0.36 0.879
DI_GRATE_C_OPSD403.01 0.46 1.3185
Les Produits MURPHCO Ltée Rating 0 0
Les Produits MURPHCO Ltée 0.0127 4E-05
Les Produits MURPHCO Ltée 0.0254 0.00019
Les Produits MURPHCO Ltée 0.0381 0.00032
Les Produits MURPHCO Ltée 0.0508 0.00051
Les Produits MURPHCO Ltée 0.0635 0.00064
Les Produits MURPHCO Ltée 0.0762 0.00083
Les Produits MURPHCO Ltée 0.0889 0.00093
Les Produits MURPHCO Ltée 0.1016 0.00101
Les Produits MURPHCO Ltée 0.1143 0.00111
Les Produits MURPHCO Ltée 0.127 0.0012
Les Produits MURPHCO Ltée 0.1397 0.00128
Les Produits MURPHCO Ltée 0.1524 0.00135
;;Reversed Flow from rear yard manhole_Lid to the Street
Manhole_Lid Rating 0 0
Manhole_Lid 0.11 0
Manhole_Lid 0.2 0.187
Manhole_Lid 0.3 0.395
Manhole_Lid 0.4 0.602
Manhole_Lid 0.5 0.81
Manhole_Lid 0.6 1.018
Manhole_Lid 0.7 1.225
Manhole_Lid 0.8 1.433
Manhole_Lid 0.9 1.641
Manhole_Lid 1 1.848
;;Tempest Rating Curve for MHF IPEX TYPE A, No grate allowance
MHF_IPEX_TYPE_A Rating 0 0
MHF_IPEX_TYPE_A 0.1 0.0057
MHF_IPEX_TYPE_A 0.2 0.0081
MHF_IPEX_TYPE_A 0.3 0.0099
MHF_IPEX_TYPE_A 0.4 0.0114
MHF_IPEX_TYPE_A 0.5 0.0128
MHF_IPEX_TYPE_A 0.6 0.014
MHF_IPEX_TYPE_A 0.7 0.0151
MHF_IPEX_TYPE_A 0.8 0.0162
MHF_IPEX_TYPE_A 0.9 0.0172
MHF_IPEX_TYPE_A 1 0.0181
MHF_IPEX_TYPE_A 1.2 0.0198
MHF_IPEX_TYPE_A 1.4 0.0214
MHF_IPEX_TYPE_A 1.6 0.0229
MHF_IPEX_TYPE_A 1.8 0.0243
MHF_IPEX_TYPE_A 2 0.0256
MHF_IPEX_TYPE_A 2.5 0.0286
MHF_IPEX_TYPE_A 3 0.0313
;;Tempest Rating Curve for MHF IPEX TYPE B, No grate allowance
MHF_IPEX_TYPE_B Rating 0 0
MHF_IPEX_TYPE_B 0.1 0.0081
MHF_IPEX_TYPE_B 0.2 0.0115
MHF_IPEX_TYPE_B 0.3 0.0141
MHF_IPEX_TYPE_B 0.4 0.0162
MHF_IPEX_TYPE_B 0.5 0.0182
MHF_IPEX_TYPE_B 0.6 0.0199
MHF_IPEX_TYPE_B 0.7 0.0215
MHF_IPEX_TYPE_B 0.8 0.023
MHF_IPEX_TYPE_B 0.9 0.0244
MHF_IPEX_TYPE_B 1 0.0257
MHF_IPEX_TYPE_B 1.2 0.0281
MHF_IPEX_TYPE_B 1.4 0.0304
MHF_IPEX_TYPE_B 1.6 0.0325
MHF_IPEX_TYPE_B 1.8 0.0344
MHF_IPEX_TYPE_B 2 0.0363
MHF_IPEX_TYPE_B 2.5 0.0406
MHF_IPEX_TYPE_B 3 0.0445
;;Tempest Rating Curve for MHF IPEX TYPE C, No grate allowance
MHF_IPEX_TYPE_C Rating 0 0

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MHF_IPEX_TYPE_C	0.1	0.0106	Vortex_ICD_45	0.6	0.0014
MHF_IPEX_TYPE_C	0.2	0.015	Vortex_ICD_45	0.7	0.0015
MHF_IPEX_TYPE_C	0.3	0.0183	Vortex_ICD_45	0.8	0.0016
MHF_IPEX_TYPE_C	0.4	0.0212	Vortex_ICD_45	0.9	0.0017
MHF_IPEX_TYPE_C	0.5	0.0237	Vortex_ICD_45	1	0.0018
MHF_IPEX_TYPE_C	0.6	0.0259	Vortex_ICD_45	1.2	0.002
MHF_IPEX_TYPE_C	0.7	0.028	Vortex_ICD_45	1.4	0.0021
MHF_IPEX_TYPE_C	0.8	0.0299	Vortex_ICD_45	1.6	0.0023
MHF_IPEX_TYPE_C	0.9	0.0317	Vortex_ICD_45	1.8	0.0024
MHF_IPEX_TYPE_C	1	0.0335	Vortex_ICD_45	2	0.0026
MHF_IPEX_TYPE_C	1.2	0.0366	Vortex_ICD_45	2.5	0.0029
MHF_IPEX_TYPE_C	1.4	0.0396	Vortex_ICD_45	3	0.0031
MHF_IPEX_TYPE_C	1.6	0.0423			
MHF_IPEX_TYPE_C	1.8	0.0449			
MHF_IPEX_TYPE_C	2	0.0473			
MHF_IPEX_TYPE_C	2.5	0.0529			
MHF_IPEX_TYPE_C		0.0579			
;Tempest Rating Curve for MHF IPEX TYPE D, No grate allowance					
MHF_IPEX_TYPE_D	Rating	0	Vortex_ICD_50	Rating	0
MHF_IPEX_TYPE_D	0.1	0.0154	Vortex_ICD_50	0.1	0.0007
MHF_IPEX_TYPE_D	0.2	0.0217	Vortex_ICD_50	0.2	0.001
MHF_IPEX_TYPE_D	0.3	0.0266	Vortex_ICD_50	0.3	0.0012
MHF_IPEX_TYPE_D	0.4	0.0307	Vortex_ICD_50	0.4	0.0014
MHF_IPEX_TYPE_D	0.5	0.0343	Vortex_ICD_50	0.5	0.0016
MHF_IPEX_TYPE_D	0.6	0.0376	Vortex_ICD_50	0.6	0.0018
MHF_IPEX_TYPE_D	0.7	0.0406	Vortex_ICD_50	0.7	0.0019
MHF_IPEX_TYPE_D	0.8	0.0434	Vortex_ICD_50	0.8	0.002
MHF_IPEX_TYPE_D	0.9	0.0461	Vortex_ICD_50	0.9	0.0021
MHF_IPEX_TYPE_D	1	0.0485	Vortex_ICD_50	1	0.0023
MHF_IPEX_TYPE_D	1.2	0.0532	Vortex_ICD_50	1.2	0.0025
MHF_IPEX_TYPE_D	1.4	0.0574	Vortex_ICD_50	1.4	0.0027
MHF_IPEX_TYPE_D	1.6	0.0614	Vortex_ICD_50	1.6	0.0029
MHF_IPEX_TYPE_D	1.8	0.0651	Vortex_ICD_50	1.8	0.003
MHF_IPEX_TYPE_D	2	0.0687	Vortex_ICD_50	2	0.0032
MHF_IPEX_TYPE_D	2.5	0.0768	Vortex_ICD_50	2.5	0.0036
MHF_IPEX_TYPE_D	3	0.0841	Vortex_ICD_50	3	0.0039
;Tempest Rating Curve for MHF IPEX TYPE E, No grate allowance					
MHF_IPEX_TYPE_E	Rating	0	Vortex_ICD_55	Rating	0
MHF_IPEX_TYPE_E	0.1	0.0205	Vortex_ICD_55	0.1	0.0009
MHF_IPEX_TYPE_E	0.2	0.0289	Vortex_ICD_55	0.2	0.0015
MHF_IPEX_TYPE_E	0.3	0.0355	Vortex_ICD_55	0.3	0.0015
MHF_IPEX_TYPE_E	0.4	0.0409	Vortex_ICD_55	0.4	0.0017
MHF_IPEX_TYPE_E	0.5	0.0458	Vortex_ICD_55	0.5	0.0019
MHF_IPEX_TYPE_E	0.6	0.0501	Vortex_ICD_55	0.6	0.0023
MHF_IPEX_TYPE_E	0.7	0.0542	Vortex_ICD_55	0.7	0.0024
MHF_IPEX_TYPE_E	0.8	0.0579	Vortex_ICD_55	0.8	0.0026
MHF_IPEX_TYPE_E	0.9	0.0614	Vortex_ICD_55	0.9	0.0027
MHF_IPEX_TYPE_E	1	0.0647	Vortex_ICD_55	1	0.003
MHF_IPEX_TYPE_E	1.2	0.0709	Vortex_ICD_55	1.2	0.0032
MHF_IPEX_TYPE_E	1.4	0.0766	Vortex_ICD_55	1.4	0.0034
MHF_IPEX_TYPE_E	1.6	0.0819	Vortex_ICD_55	1.6	0.0037
MHF_IPEX_TYPE_E	1.8	0.0868	Vortex_ICD_55	1.8	0.0038
MHF_IPEX_TYPE_E	2	0.0915	Vortex_ICD_55	2	0.0043
MHF_IPEX_TYPE_E	2.5	0.1023	Vortex_ICD_55	2.5	0.0047
MHF_IPEX_TYPE_E	3	0.1121	Vortex_ICD_55	3	0.0047
;Tempest Rating Curve for Vortex ICD 60, No grate allowance					
O_Roof1	Rating	0	Vortex_ICD_60	Rating	0
O_Roof1	0.001	0.002	Vortex_ICD_60	0.1	0.0011
O_Roof1	0.15	0.002	Vortex_ICD_60	0.2	0.0015
			Vortex_ICD_60	0.3	0.0018
			Vortex_ICD_60	0.4	0.0021
			Vortex_ICD_60	0.5	0.0023
			Vortex_ICD_60	0.6	0.0025
			Vortex_ICD_60	0.7	0.0027
			Vortex_ICD_60	0.8	0.0029
			Vortex_ICD_60	0.9	0.0031
			Vortex_ICD_60	1	0.0032
			Vortex_ICD_60	1.2	0.0036
			Vortex_ICD_60	1.4	0.0038
			Vortex_ICD_60	1.6	0.0041
			Vortex_ICD_60	1.8	0.0043
			Vortex_ICD_60	2	0.0046
			Vortex_ICD_60	2.5	0.0051
			Vortex_ICD_60	3	0.0056
;Tempest Rating Curve for Vortex ICD 65, No grate allowance					
O_St_L1	Rating	0	Vortex_ICD_65	Rating	0
O_St_L1	0.001	0.003	Vortex_ICD_65	0.1	0.0012
O_St_L1	0.35	0.003	Vortex_ICD_65	0.2	0.0016
			Vortex_ICD_65	0.3	0.002
			Vortex_ICD_65	0.4	0.0023
			Vortex_ICD_65	0.5	0.0025
			Vortex_ICD_65	0.6	0.0028
			Vortex_ICD_65	0.7	0.003
			Vortex_ICD_65	0.8	0.0032
			Vortex_ICD_65	0.9	0.0034
			Vortex_ICD_65	1	0.0036
			Vortex_ICD_65	1.2	0.004
			Vortex_ICD_65	1.4	0.0043
			Vortex_ICD_65	1.6	0.0046
			Vortex_ICD_65	1.8	0.0049
			Vortex_ICD_65	2	0.0052
			Vortex_ICD_65	2.5	0.0057
			Vortex_ICD_65	3	0.0063
;Tempest Rating Curve for Vortex ICD 70, No grate allowance					
O_St_L2	Rating	0	Vortex_ICD_70	Rating	0
O_St_L2	0.001	0.002	Vortex_ICD_70	0.1	0.0013
O_St_L2	0.15	0.002	Vortex_ICD_70	0.2	0.0019
			Vortex_ICD_70	0.3	0.0023
			Vortex_ICD_70	0.4	0.0027
			Vortex_ICD_70	0.5	0.003
			Vortex_ICD_70	0.6	0.0033
			Vortex_ICD_70	0.7	0.0036
			Vortex_ICD_70	0.8	0.0038
			Vortex_ICD_70	0.9	0.0041
			Vortex_ICD_70	1	0.0043
			Vortex_ICD_70	1.2	0.0047
			Vortex_ICD_70	1.4	0.0051
			Vortex_ICD_70	1.6	0.0055
			Vortex_ICD_70	1.8	0.0058
			Vortex_ICD_70	2	0.0061
			Vortex_ICD_70	2.5	0.0068
			Vortex_ICD_70	3	0.0075
;Tempest Rating Curve for Vortex ICD 75, No grate allowance					
O_St_L3	Rating	0	Vortex_ICD_75	Rating	0
O_St_L3	0.001	0.0137	Vortex_ICD_75	0.1	0.0016
O_St_L3	0.35	0.0137	Vortex_ICD_75	0.2	0.0022
			Vortex_ICD_75	0.3	0.0027
			Vortex_ICD_75	0.4	0.003
			Vortex_ICD_75	0.5	0.0033
			Vortex_ICD_75	0.6	0.0036
			Vortex_ICD_75	0.7	0.0039
			Vortex_ICD_75	0.8	0.0041
			Vortex_ICD_75	0.9	0.0044
			Vortex_ICD_75	1	0.0047
			Vortex_ICD_75	1.2	0.0051
			Vortex_ICD_75	1.4	0.0055
			Vortex_ICD_75	1.6	0.0058
			Vortex_ICD_75	1.8	0.0061
			Vortex_ICD_75	2	0.0067
			Vortex_ICD_75	2.5	0.0071
			Vortex_ICD_75	3	0.0079
;Tempest Rating Curve for Vortex ICD 80, No grate allowance					
O_St_UnGrd	Rating	0	Vortex_ICD_80	Rating	0
O_St_UnGrd	0.01	0.01	Vortex_ICD_80	0.1	0.0018
O_St_UnGrd	1	0.01	Vortex_ICD_80	0.2	0.0026
			Vortex_ICD_80	0.3	0.0031
			Vortex_ICD_80	0.4	0.0036
			Vortex_ICD_80	0.5	0.004
			Vortex_ICD_80	0.6	0.0044
			Vortex_ICD_80	0.7	0.0048
			Vortex_ICD_80	0.8	0.005
			Vortex_ICD_80	0.9	0.0054
			Vortex_ICD_80	1	0.0057
			Vortex_ICD_80	1.2	0.0063
			Vortex_ICD_80	1.4	0.0066
			Vortex_ICD_80	1.6	0.0072
			Vortex_ICD_80	1.8	0.0077
			Vortex_ICD_80	2	0.008
			Vortex_ICD_80	2.5	0.0087
			Vortex_ICD_80	3	0.0097
;Tempest Rating Curve for Vortex ICD 85, No grate allowance					
O_St_UnGrd	Rating	0	Vortex_ICD_85	Rating	0
O_St_UnGrd	0.1	0.0004	Vortex_ICD_85	0.1	0.0018
O_St_UnGrd	0.2	0.0006	Vortex_ICD_85	0.2	0.0026
O_St_UnGrd	0.3	0.0007	Vortex_ICD_85	0.3	0.0031
O_St_UnGrd	0.4	0.0009	Vortex_ICD_85	0.4	0.0036
O_St_UnGrd	0.5	0.001	Vortex_ICD_85	0.5	0.004
O_St_UnGrd	0.6	0.001	Vortex_ICD_85	0.6	0.0044
O_St_UnGrd	0.7	0.0011	Vortex_ICD_85	0.7	0.0048
O_St_UnGrd	0.8	0.0012	Vortex_ICD_85	0.8	0.005
O_St_UnGrd	0.9	0.0013	Vortex_ICD_85	0.9	0.0054
O_St_UnGrd	1	0.0014	Vortex_ICD_85	1	0.0057
O_St_UnGrd	1.2	0.0015	Vortex_ICD_85	1.2	0.0063
O_St_UnGrd	1.4	0.0016	Vortex_ICD_85	1.4	0.0066
O_St_UnGrd	1.6	0.0017	Vortex_ICD_85	1.6	0.0072
O_St_UnGrd	1.8	0.0018	Vortex_ICD_85	1.8	0.0077
O_St_UnGrd	2	0.0019	Vortex_ICD_85	2	0.008
O_St_UnGrd	2.5	0.0022	Vortex_ICD_85	2.5	0.0087
O_St_UnGrd	3	0.0024	Vortex_ICD_85	3	0.0097
;Tempest Rating Curve for Vortex ICD 45, No grate allowance					
Vortex_ICD_45	Rating	0	Vortex_ICD_45	Rating	0
Vortex_ICD_45	0.1	0.0006	Vortex_ICD_45	0.1	0.0006
Vortex_ICD_45	0.2	0.0008	Vortex_ICD_45	0.2	0.0008
Vortex_ICD_45	0.3	0.001	Vortex_ICD_45	0.3	0.001
Vortex_ICD_45	0.4	0.0011	Vortex_ICD_45	0.4	0.0011
Vortex_ICD_45	0.5	0.0013	Vortex_ICD_45	0.5	0.0013


```

Vortex_ICD_80      2       0.0081
Vortex_ICD_80     2.5     0.009
Vortex_ICD_80      3     0.0099

;Tempest Rating Curve for Vortex ICD 85, No grate allowance
Vortex_ICD_85      0
Vortex_ICD_85     0.1    0.002
Vortex_ICD_85     0.2    0.0029
Vortex_ICD_85     0.3    0.0035
Vortex_ICD_85     0.4    0.0041
Vortex_ICD_85     0.5    0.0045
Vortex_ICD_85     0.6    0.005
Vortex_ICD_85     0.7    0.0054
Vortex_ICD_85     0.8    0.0057
Vortex_ICD_85     0.9    0.0061
Vortex_ICD_85     1     0.0064
Vortex_ICD_85     1.2    0.007
Vortex_ICD_85     1.4    0.0076
Vortex_ICD_85     1.6    0.0081
Vortex_ICD_85     1.8    0.0086
Vortex_ICD_85     2     0.0091
Vortex_ICD_85     2.5    0.0101
Vortex_ICD_85     3     0.0111

;Tempest Rating Curve for Vortex ICD 90, No grate allowance
Vortex_ICD_90      0
Vortex_ICD_90     0.1    0.0022
Vortex_ICD_90     0.2    0.0032
Vortex_ICD_90     0.3    0.0039
Vortex_ICD_90     0.4    0.0045
Vortex_ICD_90     0.5    0.0051
Vortex_ICD_90     0.6    0.0055
Vortex_ICD_90     0.7    0.006
Vortex_ICD_90     0.8    0.0064
Vortex_ICD_90     0.9    0.0068
Vortex_ICD_90     1     0.0072
Vortex_ICD_90     1.2    0.0079
Vortex_ICD_90     1.4    0.0085
Vortex_ICD_90     1.6    0.0091
Vortex_ICD_90     1.8    0.0096
Vortex_ICD_90     2     0.0102
Vortex_ICD_90     2.5    0.0114
Vortex_ICD_90     3     0.0125

;Tempest Rating Curve for Vortex ICD 95, No grate allowance
Vortex_ICD_95      0
Vortex_ICD_95     0.1    0.0026
Vortex_ICD_95     0.2    0.0036
Vortex_ICD_95     0.3    0.0044
Vortex_ICD_95     0.4    0.0051
Vortex_ICD_95     0.5    0.0057
Vortex_ICD_95     0.6    0.0062
Vortex_ICD_95     0.7    0.0067
Vortex_ICD_95     0.8    0.0071
Vortex_ICD_95     0.9    0.0076
Vortex_ICD_95     1     0.008
Vortex_ICD_95     1.2    0.0087
Vortex_ICD_95     1.4    0.0094
Vortex_ICD_95     1.6    0.0101
Vortex_ICD_95     1.8    0.0107
Vortex_ICD_95     2     0.0113
Vortex_ICD_95     2.5    0.0126
Vortex_ICD_95     3     0.0138

;From Zurn Manual RD178
ZURN_Z150F-6NH    Rating 0      0
ZURN_Z150F-6NH    0.0127 0.00503838308477861
ZURN_Z150F-6NH    0.0257 0.0132420013231177
ZURN_Z150F-6NH    0.0384 0.0234992054543888
ZURN_Z150F-6NH    0.0508 0.035128365761305
ZURN_Z150F-6NH    0.0765 0.0425019726111045
ZURN_Z150F-6NH    0.1024 0.0433196215564931

St_L1      Storage 0      0.073
St_L1      1.4     0.073
St_L1      1.7     198.79

St_L2      Storage 0      0.36
St_L2      1.75    0.36
St_L2      2.05    129.41
St_L2      2.1     129.41

St_L3      Storage 0      0.36
St_L3      1.96    0.36
St_L3      2.21    62.31

St_P1      Storage 0      0.36
St_P1      0.15    114.4
St_P1      0.31    114.4

St_P2      Storage 0      0.36
St_P2      0.15    100.57

St_P3      Storage 0      0.36
St_P3      0.15    92.14
St_P3      0.25    92.14

[;TIMESERIES]
;Name      Date      Time      Value
;-----
;Rainfall (mm/hr)
24SCS10    01/01/2000 00:00:00 1.08
24SCS10    01/01/2000 00:15:00 1.08
24SCS10    01/01/2000 00:30:00 1.08
24SCS10    01/01/2000 00:45:00 1.08
24SCS10    01/01/2000 01:00:00 0.504
24SCS10    01/01/2000 01:15:00 0.504
24SCS10    01/01/2000 01:30:00 0.504
24SCS10    01/01/2000 01:45:00 0.504
24SCS10    01/01/2000 02:00:00 0.936
24SCS10    01/01/2000 02:15:00 0.936
24SCS10    01/01/2000 02:30:00 0.936
24SCS10    01/01/2000 02:45:00 0.936
24SCS10    01/01/2000 03:00:00 0.936
24SCS10    01/01/2000 03:15:00 0.936
24SCS10    01/01/2000 03:30:00 0.936
24SCS10    01/01/2000 03:45:00 0.936
24SCS10    01/01/2000 04:00:00 1.224
24SCS10    01/01/2000 04:15:00 1.224
24SCS10    01/01/2000 04:30:00 1.224
24SCS10    01/01/2000 04:45:00 1.224
24SCS10    01/01/2000 05:00:00 1.08
24SCS10    01/01/2000 05:15:00 1.08
24SCS10    01/01/2000 05:30:00 1.08
24SCS10    01/01/2000 05:45:00 1.08
24SCS10    01/01/2000 06:00:00 1.44
24SCS10    01/01/2000 06:15:00 1.44
24SCS10    01/01/2000 06:30:00 1.44
24SCS10    01/01/2000 06:45:00 1.44
24SCS10    01/01/2000 07:00:00 1.44
24SCS10    01/01/2000 07:15:00 1.44
24SCS10    01/01/2000 07:30:00 1.44
24SCS10    01/01/2000 07:45:00 1.44
24SCS10    01/01/2000 08:00:00 1.944
24SCS10    01/01/2000 08:15:00 1.944
24SCS10    01/01/2000 08:30:00 1.944
24SCS10    01/01/2000 08:45:00 1.944
24SCS10    01/01/2000 09:00:00 2.304
24SCS10    01/01/2000 09:15:00 2.304
24SCS10    01/01/2000 09:30:00 2.592
24SCS10    01/01/2000 09:45:00 2.592
24SCS10    01/01/2000 10:00:00 3.312
24SCS10    01/01/2000 10:15:00 3.312
24SCS10    01/01/2000 10:30:00 4.464
24SCS10    01/01/2000 10:45:00 4.464
24SCS10    01/01/2000 11:00:00 6.912
24SCS10    01/01/2000 11:15:00 6.912
24SCS10    01/01/2000 11:30:00 29.952
24SCS10    01/01/2000 11:45:00 79.488

24SCS10    01/01/2000 12:00:00 10.368
24SCS10    01/01/2000 12:15:00 10.368
24SCS10    01/01/2000 12:30:00 5.328
24SCS10    01/01/2000 12:45:00 5.328
24SCS10    01/01/2000 13:00:00 3.888
24SCS10    01/01/2000 13:15:00 3.888
24SCS10    01/01/2000 13:30:00 3.024
24SCS10    01/01/2000 13:45:00 3.024
24SCS10    01/01/2000 14:00:00 2.304
24SCS10    01/01/2000 14:15:00 2.304
24SCS10    01/01/2000 14:30:00 2.304
24SCS10    01/01/2000 14:45:00 2.304
24SCS10    01/01/2000 15:00:00 2.016
24SCS10    01/01/2000 15:15:00 2.016
24SCS10    01/01/2000 15:30:00 2.016
24SCS10    01/01/2000 15:45:00 2.016
24SCS10    01/01/2000 16:00:00 1.584
24SCS10    01/01/2000 16:15:00 1.584
24SCS10    01/01/2000 16:30:00 1.584
24SCS10    01/01/2000 16:45:00 1.584
24SCS10    01/01/2000 17:00:00 1.584
24SCS10    01/01/2000 17:15:00 1.656
24SCS10    01/01/2000 17:30:00 1.656
24SCS10    01/01/2000 17:45:00 1.656
24SCS10    01/01/2000 18:00:00 1.08
24SCS10    01/01/2000 18:15:00 1.08
24SCS10    01/01/2000 18:30:00 1.08
24SCS10    01/01/2000 18:45:00 1.08
24SCS10    01/01/2000 19:00:00 0.864
24SCS10    01/01/2000 19:15:00 0.864
24SCS10    01/01/2000 19:30:00 0.864
24SCS10    01/01/2000 19:45:00 0.864
24SCS10    01/01/2000 20:00:00 1.224
24SCS10    01/01/2000 20:15:00 1.224
24SCS10    01/01/2000 20:30:00 1.224
24SCS10    01/01/2000 20:45:00 0.792
24SCS10    01/01/2000 21:00:00 0.792
24SCS10    01/01/2000 21:15:00 0.792
24SCS10    01/01/2000 21:30:00 0.792
24SCS10    01/01/2000 21:45:00 0.792
24SCS10    01/01/2000 22:00:00 0.72
24SCS10    01/01/2000 22:15:00 0.72
24SCS10    01/01/2000 22:30:00 0.72
24SCS10    01/01/2000 22:45:00 0.72
24SCS10    01/01/2000 23:00:00 0.72
24SCS10    01/01/2000 23:15:00 0.72
24SCS10    01/01/2000 23:30:00 0.72
24SCS10    01/01/2000 23:45:00 0.72
24SCS10    01/02/2000 00:00:00 0

;Rainfall (mm/hr)
24SCS100    01/01/2000 00:00:00 1.548
24SCS100    01/01/2000 00:15:00 1.548
24SCS100    01/01/2000 00:30:00 1.548
24SCS100    01/01/2000 00:45:00 1.548
24SCS100    01/01/2000 01:00:00 0.7224
24SCS100    01/01/2000 01:15:00 0.7224
24SCS100    01/01/2000 01:30:00 0.7224
24SCS100    01/01/2000 01:45:00 0.7224
24SCS100    01/01/2000 02:00:00 1.3416
24SCS100    01/01/2000 02:15:00 1.3416
24SCS100    01/01/2000 02:30:00 1.3416
24SCS100    01/01/2000 02:45:00 1.3416
24SCS100    01/01/2000 03:00:00 1.3416
24SCS100    01/01/2000 03:15:00 1.3416
24SCS100    01/01/2000 03:30:00 1.3416
24SCS100    01/01/2000 03:45:00 1.3416
24SCS100    01/01/2000 04:00:00 1.7544
24SCS100    01/01/2000 04:15:00 1.7544
24SCS100    01/01/2000 04:30:00 1.7544
24SCS100    01/01/2000 04:45:00 1.7544
24SCS100    01/01/2000 05:00:00 1.548
24SCS100    01/01/2000 05:15:00 1.548
24SCS100    01/01/2000 05:30:00 1.548
24SCS100    01/01/2000 05:45:00 1.548
24SCS100    01/01/2000 06:00:00 2.064
24SCS100    01/01/2000 06:15:00 2.064
24SCS100    01/01/2000 06:30:00 2.064
24SCS100    01/01/2000 06:45:00 2.064
24SCS100    01/01/2000 07:00:00 2.064
24SCS100    01/01/2000 07:15:00 2.064
24SCS100    01/01/2000 07:30:00 2.064
24SCS100    01/01/2000 07:45:00 2.064
24SCS100    01/01/2000 08:00:00 2.7864
24SCS100    01/01/2000 08:15:00 2.7864
24SCS100    01/01/2000 08:30:00 2.7864
24SCS100    01/01/2000 08:45:00 2.7864
24SCS100    01/01/2000 09:00:00 3.3024
24SCS100    01/01/2000 09:15:00 3.3024
24SCS100    01/01/2000 09:30:00 3.7152
24SCS100    01/01/2000 09:45:00 3.7152
24SCS100    01/01/2000 10:00:00 4.7472
24SCS100    01/01/2000 10:15:00 4.7472
24SCS100    01/01/2000 10:30:00 6.3984
24SCS100    01/01/2000 10:45:00 6.3984
24SCS100    01/01/2000 11:00:00 9.9072
24SCS100    01/01/2000 11:15:00 9.9072
24SCS100    01/01/2000 11:30:00 42.9312
24SCS100    01/01/2000 11:45:00 113.9328
24SCS100    01/01/2000 12:00:00 14.8608
24SCS100    01/01/2000 12:15:00 14.8608
24SCS100    01/01/2000 12:30:00 7.6368
24SCS100    01/01/2000 12:45:00 7.6368
24SCS100    01/01/2000 13:00:00 5.5728
24SCS100    01/01/2000 13:15:00 5.5728
24SCS100    01/01/2000 13:30:00 4.3344
24SCS100    01/01/2000 13:45:00 4.3344
24SCS100    01/01/2000 14:00:00 3.3024
24SCS100    01/01/2000 14:15:00 3.3024
24SCS100    01/01/2000 14:30:00 3.3024
24SCS100    01/01/2000 14:45:00 3.3024
24SCS100    01/01/2000 15:00:00 2.8896
24SCS100    01/01/2000 15:15:00 2.8896
24SCS100    01/01/2000 15:30:00 2.8896
24SCS100    01/01/2000 15:45:00 2.8896
24SCS100    01/01/2000 16:00:00 2.2704
24SCS100    01/01/2000 16:15:00 2.2704
24SCS100    01/01/2000 16:30:00 2.2704
24SCS100    01/01/2000 16:45:00 2.2704
24SCS100    01/01/2000 17:00:00 2.3736
24SCS100    01/01/2000 17:15:00 2.3736
24SCS100    01/01/2000 17:30:00 2.3736
24SCS100    01/01/2000 17:45:00 2.3736
24SCS100    01/01/2000 18:00:00 1.548
24SCS100    01/01/2000 18:15:00 1.548
24SCS100    01/01/2000 18:30:00 1.548
24SCS100    01/01/2000 18:45:00 1.548
24SCS100    01/01/2000 19:00:00 1.2384
24SCS100    01/01/2000 19:15:00 1.2384
24SCS100    01/01/2000 19:30:00 1.2384
24SCS100    01/01/2000 19:45:00 1.2384
24SCS100    01/01/2000 20:00:00 1.7544
24SCS100    01/01/2000 20:15:00 1.7544
24SCS100    01/01/2000 20:30:00 1.7544
24SCS100    01/01/2000 20:45:00 1.7544
24SCS100    01/01/2000 21:00:00 1.1352
24SCS100    01/01/2000 21:15:00 1.1352
24SCS100    01/01/2000 21:30:00 1.1352
24SCS100    01/01/2000 21:45:00 1.1352
24SCS100    01/01/2000 22:00:00 1.032
24SCS100    01/01/2000 22:15:00 1.032
24SCS100    01/01/2000 22:30:00 1.032
24SCS100    01/01/2000 22:45:00 1.032
24SCS100    01/01/2000 23:00:00 1.032
24SCS100    01/01/2000 23:15:00 1.032
24SCS100    01/01/2000 23:30:00 1.032
24SCS100    01/01/2000 23:45:00 1.032
24SCS100    01/02/2000 00:00:00 0

```

Table with 4 columns: Station ID (e.g., 24SCS120), Time (mm/yr), Rainfall (mm/hr), and Value (e.g., 1.8576). This table contains 40 rows of data for station 24SCS120.

Table with 4 columns: Station ID (e.g., 24SCS2), Time (mm/yr), Rainfall (mm/hr), and Value (e.g., 0.72). This table contains 40 rows of data for station 24SCS2.


```

3CHI25      01/01/2000 02:40:00  4.576
3CHI25      01/01/2000 02:50:00  4.197
3CHI25      01/01/2000 03:00:00    0

;Rainfall (mm/hr)
3CHI5       01/01/2000 00:00:00  3.256
3CHI5       01/01/2000 00:10:00  3.881
3CHI5       01/01/2000 00:20:00  4.844
3CHI5       01/01/2000 00:30:00  6.532
3CHI5       01/01/2000 00:40:00  10.308
3CHI5       01/01/2000 00:50:00  26.792
3CHI5       01/01/2000 01:00:00  103.93
3CHI5       01/01/2000 01:10:00  30.286
3CHI5       01/01/2000 01:20:00  15.655
3CHI5       01/01/2000 01:30:00  10.568
3CHI5       01/01/2000 01:40:00  8.203
3CHI5       01/01/2000 01:50:00  6.482
3CHI5       01/01/2000 02:00:00  5.462
3CHI5       01/01/2000 02:10:00  4.733
3CHI5       01/01/2000 02:20:00  4.186
3CHI5       01/01/2000 02:30:00  3.76
3CHI5       01/01/2000 02:40:00  3.418
3CHI5       01/01/2000 02:50:00  3.137
3CHI5       01/01/2000 03:00:00    0

;Rainfall (mm/hr)
3CHI50      01/01/2000 00:00:00  4.828
3CHI50      01/01/2000 00:10:00  5.766
3CHI50      01/01/2000 00:20:00  7.214
3CHI50      01/01/2000 00:30:00  9.763
3CHI50      01/01/2000 00:40:00  15.496
3CHI50      01/01/2000 00:50:00  40.401
3CHI50      01/01/2000 01:00:00  161.471
3CHI50      01/01/2000 01:10:00  46.17
3CHI50      01/01/2000 01:20:00  23.66
3CHI50      01/01/2000 01:30:00  15.89
3CHI50      01/01/2000 01:40:00  12.006
3CHI50      01/01/2000 01:50:00  9.687
3CHI50      01/01/2000 02:00:00  8.146
3CHI50      01/01/2000 02:10:00  7.047
3CHI50      01/01/2000 02:20:00  6.224
3CHI50      01/01/2000 02:30:00  5.583
3CHI50      01/01/2000 02:40:00  5.07
3CHI50      01/01/2000 02:50:00  4.649
3CHI50      01/01/2000 03:00:00    0

;Head (m)
527_24SCS100 01/01/2000 00:01:00  81.228
527_24SCS100 01/01/2000 00:02:00  81.228
527_24SCS100 01/01/2000 00:03:00  81.228
527_24SCS100 01/01/2000 00:04:00  81.228
527_24SCS100 01/01/2000 00:05:00  81.228
527_24SCS100 01/01/2000 00:06:00  81.228
527_24SCS100 01/01/2000 00:07:00  81.228
527_24SCS100 01/01/2000 00:08:00  81.228
527_24SCS100 01/01/2000 00:09:00  81.228
527_24SCS100 01/01/2000 00:10:00  81.228
527_24SCS100 01/01/2000 00:11:00  81.228
.....
Too many data points (1440 in total).

;Sum of Infiltrated flow from above the garage slab calculated from Infiltration graphs for S7
multiplied by the total pervious area above the garage.
InfiltratedInflow 01/01/2000 00:01:00  5.983073E-06
InfiltratedInflow 01/01/2000 00:02:00  5.983073E-06
InfiltratedInflow 01/01/2000 00:03:00  5.983073E-06
InfiltratedInflow 01/01/2000 00:04:00  5.983073E-06
InfiltratedInflow 01/01/2000 00:05:00  5.983073E-06
InfiltratedInflow 01/01/2000 00:06:00  5.983073E-06
InfiltratedInflow 01/01/2000 00:07:00  5.983073E-06
InfiltratedInflow 01/01/2000 00:08:00  5.983073E-06
InfiltratedInflow 01/01/2000 00:09:00  5.983073E-06
InfiltratedInflow 01/01/2000 00:10:00  5.983073E-06
InfiltratedInflow 01/01/2000 00:11:00  5.983073E-06
.....
Too many data points (1440 in total).

[REPORT]
;;Reporting Options
INPUT YES
CONTROLS NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]
Subcatch L1_1 Landscape
Subcatch L1_2 Landscape
Subcatch L1_3 Landscape
Subcatch S2 Parking_Lot
Subcatch S3_1 Parking_Lot
Subcatch S3_2 Parking_Lot
Subcatch S5 Building
Subcatch S6 Building
Subcatch S7 Ramp
Node St_L1 RYCB
Node St_L2 RYCB
Node St_L3 RYCB
Node St_UnGrd Uncderground_Storage
Link C1 RV_Storm

[MAP]
DIMENSIONS 381360.7266 5033019.65495 381502.5034 5033143.67005
UNITS Meters

[COORDINATES]
;;Node X-Coord Y-Coord
;;-----
527_(P-Stm) 381424.754 5033138.033
OF1 381401.916 5033025.292
OF2 381462.548 5033049.302
OF3 381403.805 5033026.688
OF7 381448.424 5033041.047
Roof1 381400.098 5033034.455
Roof2 381428.95 5033077.584
St_L1 381395.548 5033108.811
St_L2 381417.381 5033128.938
St_L3 381450.027 5033054.56
St_P1 381406.853 5033073.521
St_P2 381416.312 5033051.852
St_UnGrd 381396.599 5033036.713
SUI 381400.429 5033088.237

[VERTICES]
;;Link X-Coord Y-Coord
;;-----
W_L1 381414.65 5033129.488
W_L1 381395.979 5033112.147

[POLYGONS]
;;Subcatchment X-Coord Y-Coord
;;-----
L1_1 381426.561 5033106.239
L1_1 381433.371 5033109.212
L1_1 381439.156 5033095.96
L1_1 381458.719 5033051.155
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L1_1 381429.744 5033033.928
L1_1 381429.096 5033034.342
L1_1 381428.435 5033034.734
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L1_1 381427.074 5033035.446
L1_1 381426.375 5033035.767
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L1_1 381425.134 5033036.264
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L1_1 381423.368 5033038.696
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L1_1 381423.738 5033039.957
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L1_1 381424.062 5033040.676
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L1_1 381424.318 5033041.136
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L1_1 381424.605 5033041.577
L1_1 381424.76 5033041.79
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L1_1 381425.09 5033042.199
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L1_1 381425.448 5033042.584
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L1_1 381425.831 5033042.945
L1_1 381426.032 5033043.115
L1_1 381426.239 5033043.278
L1_1 381426.45 5033043.434
L1_1 381426.668 5033043.582
L1_1 381426.89 5033043.723
L1_1 381427.116 5033043.857
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L1_1 381427.583 5033044.1
L1_1 381427.822 5033044.209
L1_1 381440.834 5033049.891
L1_1 381441.12 5033050.021
L1_1 381441.401 5033050.162
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L1_1 381441.947 5033050.472
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L1_1 381442.723 5033051.008
L1_1 381442.969 5033051.204
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L1_1 381444.285 5033052.548
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L1_1 381446.085 5033056.515
L1_1 381446.136 5033056.825
L1_1 381446.176 5033057.133
L1_1 381446.206 5033057.449
L1_1 381446.224 5033057.763
L1_1 381446.232 5033058.077
L1_1 381446.229 5033058.392
L1_1 381446.215 5033058.705
L1_1 381446.189 5033059.019
L1_1 381446.153 5033059.331
L1_1 381446.106 5033059.641
L1_1 381446.048 5033059.95
L1_1 381445.98 5033060.257
L1_1 381445.901 5033060.561
L1_1 381445.811 5033060.862
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L1_1 381445.6 5033061.454
L1_1 381445.479 5033061.744
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L1_2 381415.643 5033115.347
L1_2 381404.547 5033110.503
L1_2 381408.488 5033101.475
L1_2 381404.701 5033099.821
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L1_3 381421.474 5033117.892
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L1_3 381425.929 5033107.688
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S2 381425.266 5033042.395
S2 381425.09 5033042.199
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S2 381424.759 5033041.789
S2 381424.605 5033041.577
S2 381424.458 5033041.359
S2 381424.318 5033041.136
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S2 381424.062 5033040.676
S2 381423.946 5033040.44
S2 381423.838 5033040.2
S2 381423.738 5033039.957
S2 381423.647 5033039.71
S2 381423.564 5033039.46
S2 381423.49 5033039.208

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S2 381423.425 5033038.953
S2 381423.368 5033038.696
S2 381423.32 5033038.438
S2 381423.281 5033038.177
S2 381423.251 5033037.916
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S3_1 381386.265 5033089.146
S3_1 381389.672 5033090.633
S3_1 381389.532 5033090.954
S3_1 381394.298 5033093.034
S3_1 381393.818 5033094.134
S3_1 381400.599 5033097.094
S3_1 381401.22 5033095.674
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S3_1 381404.701 5033099.821
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S3_1 381392.081 5033075.833
S3_1 381386.988 5033087.5
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S3_2 381415.264 5033085.953
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S3_2 381399.672 5033058.444
S3_2 381392.081 5033075.833
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S7 381441.677 5033050.313
S7 381441.401 5033050.162
S7 381441.12 5033050.021
S7 381440.834 5033049.891
S7 381427.822 5033044.209
S7 381425.421 5033049.708
S7 381430.18 5033051.785
S7 381425.847 5033061.708

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

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.3)

```
*****
Element Count
*****
Number of rain gages ..... 1
Number of subcatchments ... 10
Number of nodes ..... 14
Number of links ..... 12
Number of pollutants ..... 0
Number of land uses ..... 0
```

```
*****
Raingage Summary
*****
```

Name	Data Source	Data Type	Recording Interval
Rainfall	24SCS100	INTENSITY	15 min.

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

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
L1_1	0.07	134.06	10.01	2.0000	Rainfall	St_L3
L1_2	0.07	15.82	8.45	2.0000	Rainfall	St_L1
L1_3	0.03	77.61	3.89	2.0000	Rainfall	St_L2
S1	0.16	38.49	14.29	2.0000	Rainfall	St_L3
S2	0.06	16.17	90.74	2.0000	Rainfall	St_P2
S3_1	0.04	10.81	99.29	2.0000	Rainfall	SU1
S3_2	0.05	13.27	98.96	2.0000	Rainfall	St_P1
S5	0.10	22.12	100.00	1.0000	Rainfall	Roof2
S6	0.10	22.12	100.00	1.0000	Rainfall	Roof1
S7	0.03	28.53	72.19	15.0000	Rainfall	St_UnGrd

```
*****
Node Summary
*****
```

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
527 (P-Stm)	OUTFALL	81.23	0.00	0.0	
OF1	OUTFALL	80.67	0.00	0.0	
OF2	OUTFALL	80.91	0.00	0.0	
OF3	OUTFALL	80.67	0.00	0.0	
OF7	OUTFALL	80.67	0.00	0.0	
Roof1	STORAGE	96.85	0.15	0.0	
Roof2	STORAGE	96.85	0.15	0.0	
St_L1	STORAGE	84.20	1.70	0.0	
St_L2	STORAGE	83.90	2.00	0.0	
St_L3	STORAGE	83.09	2.21	0.0	
St_P1	STORAGE	85.70	0.31	0.0	
St_P2	STORAGE	85.50	0.15	0.0	
St_UnGrd	STORAGE	81.97	1.00	0.0	Yes
SU1	STORAGE	85.70	0.25	0.0	

```
*****
Link Summary
*****
```

Name	From Node	To Node	Type	Length	%Slope
C1	St_L1	St_L2	CONDUIT	33.1	0.9050
0_0130	W_L1	St_L2	WEIR		
	St_P1	St_P1	WEIR		
	St_P1	St_P1	WEIR		
	St_L3	St_L3	OUTLET		
	OL1	St_UnGrd	OUTLET		
	OL2	St_UnGrd	OUTLET		
	OL3	St_UnGrd	OUTLET		
	OL4	St_L2	OUTLET		
	OR1	St_UnGrd	OUTLET		
	ROOF1	Roof1	OUTLET		
	ROOF2	Roof2	OUTLET		

```
*****
Cross Section Summary
*****
```

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	CIRCULAR	0.25	0.05	0.06	0.25	1	0.06

```
*****
Analysis Options
*****
Flow Units ..... CMS
Process Models:
Rainfall/Runoff ..... YES
RDII ..... NO
Snowmelt ..... NO
Groundwater ..... NO
Flow Routing ..... YES
Ponding Allowed ..... NO
Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Surcharge Method ..... EXTRAN
Starting Date ..... 01/01/2000 00:00:00
Ending Date ..... 01/02/2000 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 ..... 1.00 sec
Variable Time Step ..... YES
Maximum Trials ..... 8
Number of Threads ..... 1
Head Tolerance ..... 0.001500 m
```

```
*****
Volume Depth
-----
Runoff Quantity Continuity hectare-m mm
*****
Total Precipitation ..... 0.073 103.200
Evaporation Loss ..... 0.000 0.000
Infiltration Loss ..... 0.025 36.112
Surface Runoff ..... 0.047 66.091
Final Storage ..... 0.001 1.034
Continuity Error (%) ..... -0.036
```

```
*****
Volume Volume
-----
Flow Routing Continuity hectare-m 10^6 ltr
*****
Dry Weather Inflow ..... 0.000 0.000
Wet Weather Inflow ..... 0.047 0.465
Groundwater Inflow ..... 0.000 0.000
RDII Inflow ..... 0.000 0.000
External Inflow ..... 0.000 0.001
External Outflow ..... 0.047 0.466
Flooding Loss ..... 0.000 0.000
Evaporation Loss ..... 0.000 0.000
Exfiltration Loss ..... 0.000 0.000
Initial Stored Volume ..... 0.000 0.000
Final Stored Volume ..... 0.000 0.000
```

Continuity Error (%) 0.000

Time-Step Critical Elements

None

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 : 0.50 sec
Average Time Step : 1.00 sec
Maximum Time Step : 1.00 sec
% of Time in Steady State : 0.00
Average Iterations per Step : 2.00
% of Steps Not Converging : 0.00
Time Step Frequencies :
1.000 - 0.871 sec : 100.00 %
0.871 - 0.758 sec : 0.00 %
0.758 - 0.660 sec : 0.00 %
0.660 - 0.574 sec : 0.00 %
0.574 - 0.500 sec : 0.00 %

Subcatchment Runoff Summary

Subcatchment	Total Runoff	Peak Runoff	Total Runoff Precip Coeff	Total Runoff	Total Evap	Total Infil	Imperv Runoff	Perv Runoff
mm	10 ⁶ ltr	CMS	mm	mm	mm	mm	mm	mm
L1_1		0.02	103.20	0.00	0.00	73.20	10.18	29.88
29_88		0.02	103.20	0.00	0.00	76.53	8.59	26.55
L1_2		0.01	103.20	0.00	0.00	74.35	3.95	28.83
L1_3		0.01	103.20	0.00	0.00	73.26	14.52	26.83
S1		0.05	103.20	0.00	0.00	6.95	92.05	2.61
29_73		0.06	103.20	0.00	0.00	0.53	100.71	0.20
S2		0.04	103.20	0.00	0.00	0.78	100.38	0.30
94_66		0.05	103.20	0.00	0.00	0.00	101.33	0.00
S3_1		0.03	103.20	0.00	0.00	0.00	101.33	0.00
100_92		0.10	103.20	0.00	0.00	0.00	101.33	0.00
S3_2		0.10	103.20	0.00	0.00	20.80	73.39	7.91
100_68		0.03	103.20	0.00	0.00			
S5		0.01	103.20	0.00	0.00			
101_33		0.03	103.20	0.00	0.00			
S6		0.03	103.20	0.00	0.00			
101_33		0.03	103.20	0.00	0.00			
S7		0.03	103.20	0.00	0.00			
81_30		0.03	103.20	0.00	0.00			

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
527_(P-Stm)	OUTFALL	0.59	3.67	84.90	0 12:28	3.67
OF1	OUTFALL	0.50	0.50	81.17	0 00:00	0.50
OF2	OUTFALL	0.55	0.55	81.46	0 00:00	0.55
OF3	OUTFALL	0.50	0.50	81.17	0 00:00	0.50
OF7	OUTFALL	0.50	0.50	81.17	0 00:00	0.50
Roof1	STORAGE	0.02	0.07	96.92	0 13:00	0.07
Roof2	STORAGE	0.02	0.07	96.92	0 13:00	0.07
St_L1	STORAGE	0.08	1.53	85.73	0 12:13	1.53
St_L2	STORAGE	0.11	1.83	85.73	0 12:15	1.83
St_L3	STORAGE	0.03	2.17	85.26	0 12:01	2.17
St_P1	STORAGE	0.00	0.03	85.73	0 12:00	0.03
St_P2	STORAGE	0.00	0.03	85.53	0 12:00	0.03
St_UnGrd	STORAGE	0.05	0.77	82.75	0 12:05	0.77
SU1	STORAGE	0.00	0.02	85.72	0 12:00	0.02

Node Inflow Summary

Flow	Maximum Lateral	Maximum Total	Time of Max Occurrence	Lateral Inflow	Total Inflow	
Node	Type	CMS	CMS	10 ⁶ ltr	10 ⁶ ltr	
527_(P-Stm)	OUTFALL	0.000	0.006	0 12:08	0	0.0274
OF1	OUTFALL	0.000	0.010	0 11:32	0	0.172
OF2	OUTFALL	0.000	0.038	0 12:01	0	0.0678
OF3	OUTFALL	0.000	0.002	0 11:05	0	0.0995
OF7	OUTFALL	0.000	0.002	0 11:05	0	0.0995
Roof1	STORAGE	0.031	0.031	0 12:00	0.0996	0.0996
Roof2	STORAGE	0.031	0.031	0 12:00	0.0996	0.0996
St_L1	STORAGE	0.014	0.018	0 11:56	0.0181	0.0187
St_L2	STORAGE	0.009	0.015	0 11:55	0.00934	0.028
St_L3	STORAGE	0.054	0.054	0 12:00	0.0678	0.0678
St_P1	STORAGE	0.015	0.015	0 12:00	0.0483	0.0483
St_P2	STORAGE	0.019	0.019	0 12:00	0.0575	0.0575
St_UnGrd	STORAGE	0.010	0.056	0 12:00	0.0268	0.172
SU1	STORAGE	0.012	0.012	0 12:00	0.0395	0.0395

Node Surcharge Summary

Flow	Maximum Lateral	Maximum Total	Time of Max Occurrence	Lateral Inflow	Total Inflow	
Node	Type	CMS	CMS	10 ⁶ ltr	10 ⁶ ltr	
527_(P-Stm)	OUTFALL	0.000	0.006	0 12:08	0	0.0274
OF1	OUTFALL	0.000	0.010	0 11:32	0	0.172
OF2	OUTFALL	0.000	0.038	0 12:01	0	0.0678
OF3	OUTFALL	0.000	0.002	0 11:05	0	0.0995
OF7	OUTFALL	0.000	0.002	0 11:05	0	0.0995
Roof1	STORAGE	0.031	0.031	0 12:00	0.0996	0.0996
Roof2	STORAGE	0.031	0.031	0 12:00	0.0996	0.0996
St_L1	STORAGE	0.014	0.018	0 11:56	0.0181	0.0187
St_L2	STORAGE	0.009	0.015	0 11:55	0.00934	0.028
St_L3	STORAGE	0.054	0.054	0 12:00	0.0678	0.0678
St_P1	STORAGE	0.015	0.015	0 12:00	0.0483	0.0483
St_P2	STORAGE	0.019	0.019	0 12:00	0.0575	0.0575
St_UnGrd	STORAGE	0.010	0.056	0 12:00	0.0268	0.172
SU1	STORAGE	0.012	0.012	0 12:00	0.0395	0.0395

Node Surcharge Summary

Flow	Maximum Lateral	Maximum Total	Time of Max Occurrence	Lateral Inflow	Total Inflow	
Node	Type	CMS	CMS	10 ⁶ ltr	10 ⁶ ltr	
527_(P-Stm)	OUTFALL	0.000	0.006	0 12:08	0	0.0274
OF1	OUTFALL	0.000	0.010	0 11:32	0	0.172
OF2	OUTFALL	0.000	0.038	0 12:01	0	0.0678
OF3	OUTFALL	0.000	0.002	0 11:05	0	0.0995
OF7	OUTFALL	0.000	0.002	0 11:05	0	0.0995
Roof1	STORAGE	0.031	0.031	0 12:00	0.0996	0.0996
Roof2	STORAGE	0.031	0.031	0 12:00	0.0996	0.0996
St_L1	STORAGE	0.014	0.018	0 11:56	0.0181	0.0187
St_L2	STORAGE	0.009	0.015	0 11:55	0.00934	0.028
St_L3	STORAGE	0.054	0.054	0 12:00	0.0678	0.0678
St_P1	STORAGE	0.015	0.015	0 12:00	0.0483	0.0483
St_P2	STORAGE	0.019	0.019	0 12:00	0.0575	0.0575
St_UnGrd	STORAGE	0.010	0.056	0 12:00	0.0268	0.172
SU1	STORAGE	0.012	0.012	0 12:00	0.0395	0.0395

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume	Avg Pcnt	Evap Pcnt	Exfil Pcnt	Maximum Volume	Max Pcnt	Time of Max Occurrence
CMS	1000 m ³	Full	Loss	Loss	1000 m ³	Full	days hr:min
Roof1	0.010	12.1	0.0	0.0	0.041	48.3	0 13:00
0.002							
Roof2	0.010	12.1	0.0	0.0	0.041	48.3	0 13:00
0.002							
St_L1	0.000	0.6	0.0	0.0	0.006	18.8	0 12:13
0.006							
St_L2	0.000	0.3	0.0	0.0	0.002	7.3	0 12:15
0.012							
St_L3	0.000	0.5	0.0	0.0	0.006	73.6	0 12:01
0.038							
St_P1	0.000	0.0	0.0	0.0	0.000	1.2	0 12:00
0.015							
St_P2	0.000	0.1	0.0	0.0	0.000	4.9	0 12:00
0.019							
St_UnGrd	0.003	4.8	0.0	0.0	0.050	77.5	0 12:05
0.010							
SU1	0.000	0.0	0.0	0.0	0.000	1.2	0 12:00
0.012							

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10 ⁶ ltr
527_(P-Stm)	9.11	0.003	0.006	0.027
OF1	95.58	0.002	0.010	0.172
OF2	41.64	0.002	0.038	0.068
OF3	94.85	0.001	0.002	0.100
OF7	94.85	0.001	0.002	0.100
System	67.21	0.010	0.058	0.466

Link Flow Summary

Link	Type	Maximum [Flow] CMS	Time of Max Occurrence days hr:min	Maximum [Veloc] m/sec	Max/Full Flow	Max/Full Depth
C1	CONDUIT	0.006	0 11:56	0.13	0.11	1.00
W_L1	WEIR	0.000	0 00:00			0.00
W1	WEIR	0.000	0 00:00			0.00
W2	WEIR	0.000	0 00:00			0.00
O_St_L3	DUMMY	0.038	0 12:01			
OL1	DUMMY	0.012	0 12:00			
OL2	DUMMY	0.015	0 12:00			
OL3	DUMMY	0.019	0 12:00			
OL4	DUMMY	0.006	0 12:08			
OR1	DUMMY	0.010	0 11:32			
ROOF1	DUMMY	0.002	0 11:05			
ROOF2	DUMMY	0.002	0 11:05			

Flow Classification Summary

Conduit	Adjusted /Actual Length	Up Dry	Down Dry	Sub Dry	Sup Crit	Time in Flow Class	Flow	Norm	Inlet
C1	1.00	0.48	0.00	0.00	0.52	0.00	0.00	0.00	0.02

Conduit Surcharge Summary

Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C1	1.53	1.53	1.76	0.01	0.01

Analysis begun on: Mon Oct 7 14:30:08 2024
Analysis ended on: Mon Oct 7 14:30:08 2024
Total elapsed time: < 1 sec

Engineering Specification

Job Name _____
 Job Location _____
 Engineer _____
 Approval _____
 Tag _____

Contractor _____
 Approval _____
 Contractor's P.O. No. _____
 Representative _____

RD-200 Small Area Roof Drain Specification

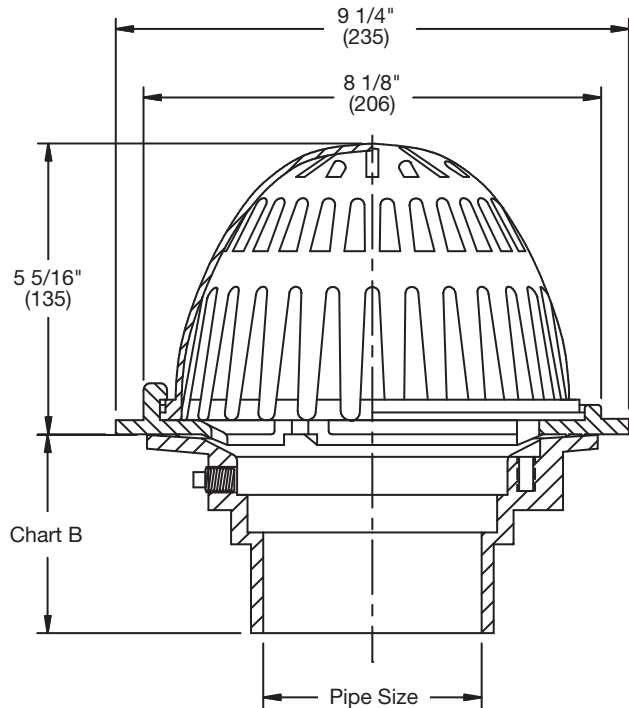
Watts RD-200 epoxy coated cast iron roof drain with flashing clamp with integral gravel stop, self-locking polyethylene dome (standard), and no hub (standard) outlet.

Pipe Sizing	
Suffix	Description
2	2"(51) Pipe Size <input type="checkbox"/>
3	3"(76) Pipe Size <input type="checkbox"/>
4	4"(102) Pipe Size (NH Only) <input type="checkbox"/>

Outlet Type	
Suffix	Description
NH	No Hub (MJ) <input type="checkbox"/>
P	Push On <input type="checkbox"/>
T	Threaded <input type="checkbox"/>
X	Inside Caulk <input type="checkbox"/>

Options	
Suffix	Description
-13	Galvanized Body & Flashing Clamp <input type="checkbox"/>
-B	Sump Receiver <input type="checkbox"/>
-D	Underdeck Clamp <input type="checkbox"/>
-F	Deck Flange/Adj. Extension <input type="checkbox"/>
-GSS	Stainless Steel Ballast Guard <input type="checkbox"/>
-K	Ductile Iron Dome <input type="checkbox"/>
-K13	Galvanized Dome <input type="checkbox"/>
-K80	Aluminum Dome <input type="checkbox"/>
-K81	Rough Bronze Dome <input type="checkbox"/>
-K83	SS Mesh Covered Dome <input type="checkbox"/>
-L	Vandal Proof Dome <input type="checkbox"/>
-R	2" External Water Dam <input type="checkbox"/>
-SO	Side Outlet <input type="checkbox"/>
-W	Adjustable Internal Water Dam <input type="checkbox"/>

Optional Body Material	
Suffix	Description
-60	PVC Body w/Socket Outlet <input type="checkbox"/>
-61	ABS Body w/Socket Outlet <input type="checkbox"/>



**Deck Opening 6 1/2"(165)
with Sump Receiver 8"(203)**

Free Area
Sq. In.
35

	Std.	P	T	X	60/61
Pipe Size	No Hub	Push On	Female Thread	Inside Caulk	PVC/ABS
2"(51)	3 5/8"(92)	4 1/4"(108)	4 1/4"(108)	4 1/2"(108)	4"(102)
3"(76)	3 5/8"(92)	4 1/4"(108)	4 1/4"(108)	4 1/2"(108)	4"(102)
4"(102)	3 5/8"(92)	4 1/4"(108)	4 1/4"(108)	4 1/2"(108)	4"(102)

NOTICE
 The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

Watts product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Watts Technical Service. Watts reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Watts products previously or subsequently sold.



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Adjustable Accutrol Weir

Tag: _____

Adjustable Flow Control for Roof Drains

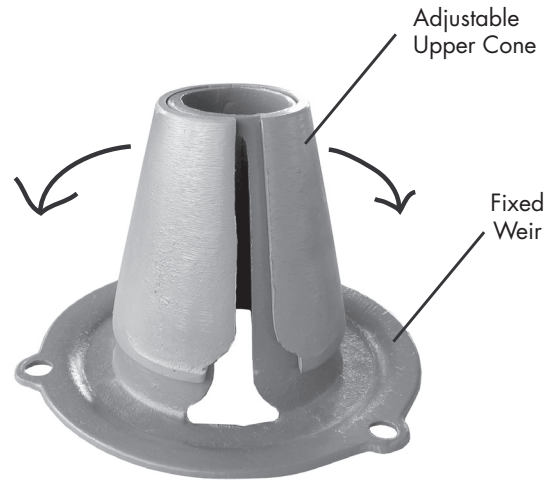
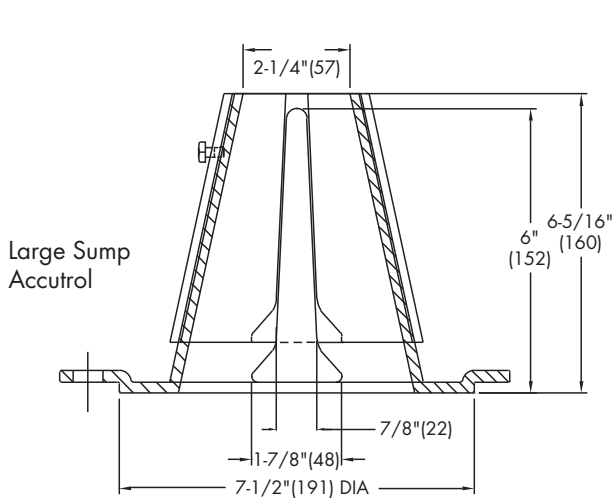
ADJUSTABLE ACCUTROL (for Large Sump Roof Drains only)

For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the flow rate for depths over 2" of head, set the slot in the adjustable upper cone according to the flow rate required. Refer to Table 1 below.
 Note: Flow rates are directly proportional to the amount of weir opening that is exposed.

EXAMPLE:

For example, if the adjustable upper cone is set to cover 1/2 of the weir opening, flow rates above 2" of head will be restricted to 2-1/2 gpm per inch of head.

Therefore, at 3" of head, the flow rate through the Accutrol Weir that has 1/2 the slot exposed will be:
 [5 gpm (per inch of head) x 2 inches of head] + 2-1/2 gpm (for the third inch of head) = 12-1/2 gpm.



1/2 Weir Opening Exposed Shown Above

TABLE 1. Adjustable Accutrol Flow Rate Settings

Weir Opening Exposed	1"	2"	3"	4"	5"	6"
	Flow Rate (gallons per minute)					
Fully Exposed	5	10	15	20	25	30
3/4	5	10	13.75	17.5	21.25	25
1/2	5	10	12.5	15	17.5	20
1/4	5	10	11.25	12.5	13.75	15
Closed	5	5	5	5	5	5

Job Name _____
 Job Location _____
 Engineer _____

Contractor _____
 Contractor's P.O. No. _____
 Representative _____

Watts product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Watts Technical Service. Watts reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Watts products previously or subsequently sold.

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A Watts Water Technologies Company



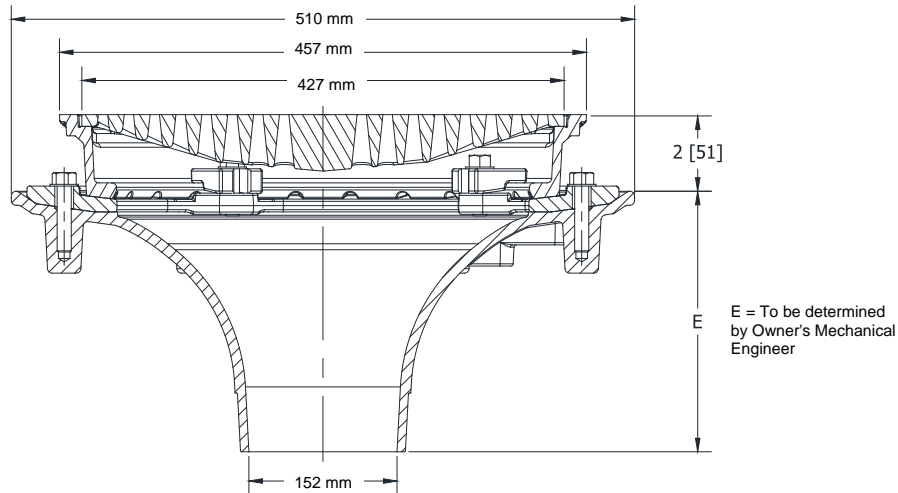
Z150F

FLOFORCE™ HIGH PERFORMANCE PROMENADE DECK DRAIN WITH ROTATABLE FRAME AND HEEL-PROOF GRATE

SPECIFICATION SHEET

TAG _____

Design and Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



4 [102] No-Hub Illustrated

A Outlet Size In. [mm]	B Body Diameter In [mm]	C Frame Size In [mm]	D Grate Size In [mm]	Weight lbs [kg]	Grate Open Area Sq. In. [cm ²]
2,3,4 [51,76,102]	16-9/16 [421]	14 [356]	12-13/16 [325]	66 [30]	44 [284]
6,8 [152, 203]	20-3/32 [510]	18 [457]	16-13/16 [427]	94 [43]	70 [452]

ENGINEERING SPECIFICATION: ZURN Z150F

FLOFORCE™ High efficient flow performing roof drain for promenade deck roof drain applications. Drain incorporates a smooth funnel-shaped interior surface, providing a seamless transition to outlet connection and eliminating internal obstructions within the body. Complete with Dura-Coated cast iron body with membrane flashing clamp, rotatable square promenade frame, seepage openings, securing clamps, and heavy-duty ductile iron heel-proof grate.

OPTIONS (Check/specify appropriate options)

PIPE SIZE

(Specify size/type) **OUTLET**

E BODY HT. DIM.

2, 3, 4 [51, 76, 102]	NH	No-Hub	6-15/16 [176]
6, 8 [152, 203]	NH	No-Hub	7-7/16 [189]
2, 3, 4 [51, 76, 102]	NL	Neo-Loc	7-3/8 [187]
6 [152]	NL	Neo-Loc	8-1/32 [204]
2, 3, 4 [51, 76, 102]	IP	Threaded	5-15/16, 6-3/16, 6-5/16 [151, 157, 160]
6, 8 [152, 203]	IP	Threaded	6-11/16, 6-3/4 [170, 171]
3, 4 [76, 102]	IC	Inside Caulk	5-13/16 [148]
6 [152]	IC	Inside Caulk	6-1/16 [154]

PREFIXES

___ Z	D.C.C.I. Body and Frame with Ductile Iron Grate*
___ ZN	D.C.C.I. Body and Frame with Ductile Iron Grate and Polished Nickel Bronze Veneer Finish

SUFFIXES

___ -AR	Acid Resistant Epoxy Coated	___ -R	Roof Sump Receiver
___ -C	Underdeck Clamp	___ -SC	Secondary Clamp Collar
___ -DP	Top-Set® Deck Plate (Replaces both the -C and -R)	___ -TC	Neo-Loc Test Cap Gasket (2, 3, 4 [51, 76, 102] NL Bottom Outlet Only)
___ -DR	Top-Set® Drain Riser	___ -VP	Vandal-Proof Secured Top
___ -E	Static Extension 1 [25] thru 4 [102] (Specify Ht.)	___ -Y	Type 304 [CF8] SS Sediment Bucket
___ -EA	Adjustable Extension Assembly 2-1/8 [54] thru 3-1/2 [89]	___ -85	Type 304 [CF8] Stainless Steel Perforated Extension
___ -G	Galvanized Cast Iron	___ -89	2 [51] High Overflow Dam and Low-Profile Pedestal Paver Dome
___ -PD	Low-Profile Pedestal Paver Dome		

* Regularly furnished unless otherwise specified

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⚠ ADVERTENCIA: Cáncer y daño reproductivo - www.P65Warnings.ca.gov

⚠ AVERTISSEMENT: Cancer et effets néfastes sur la reproduction - www.P65Warnings.ca.gov

Zurn Industries, LLC | Specification Drainage Operation
1801 Pittsburgh Avenue, Erie, PA 16502, Ph. 855.663.9876

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7900 Goreway Drive, Unit 10, Brampton, Ontario L6T 5W6, Ph. 877.892.5216

www.zurn.com

Rev. -

Date: 08/08/2022

C.N. No. 144780

Prod. | Dwg. No. Z150F FLOFORCE™ Page 1 of 1

Site Servicing Report

2983, 3053 and 3079 Navan Road & 2690 Pagé Road, Ottawa, Ontario

Appendix E

Sanitary Servicing

Street Name	Pipe Reach							Commercial/Institutional				Infiltration			Peak Design Flow L/s	Pipe Data						Upstream Geometry					Downstream Geometry				Self Cleansing Velocities						
	From	To	Apartments	Pop.	Cum. Pop.	Peaking Factor	Residential Flow (L/s)	Area (ha)	Cum. Area (ha)	Peaking Factor	Inst. Flow (L/s)	Area (ha)	Cum. Area (ha)	Peak Extr. Flow L/s		Dia	Type	Actual Diameter	Slope	Q Full (L/s)	V Full	Length	Residual Capacity	% Full	TG From	Obvert	Invert	Cover	TG TO	Drop	Obvert	Invert	Cover	Q/QT Ratio	Flow Depth (mm)	Actual Velocity (m/s)	Flow Depth to Dia. Ratio (d/D)
BLOCK 14	BLOCK 14	18	84	151	151	3.55	1.74	0.09	0.09	1.50	0.05	0.57	0.57	0.19	1.97	200	Circular	203.20	1.50%	41.91	1.29	4.50	39.93	5%	85.850	82.615	82.412	3.235	85.840	0.090	82.547	82.344	3.293	0.05	29.87	0.66	0.15
EAST ORLEANS RIDGE SUBDIVISION	BLOCK 14	17			151	3.55	1.74	0.09	0.09	1.50	0.05	0.57	0.57	0.19	1.97	200	Circular	203.20	1.50%	41.91	1.29	11.60	39.93	5%	85.840	82.487	82.284	3.353	84.940		82.313	82.110	2.627	0.05	26.87	0.66	0.15

Design Parameters		
Apartments Population	1.8	Cap/Unit
Residential Flow	280	L/Cap/Day
Infiltration Flow	0.33	L/ha
Harmon's Correction Factor	0.8	unitless
Commercial Peak Factor	1.5	unitless
Institutional/Commercial Average Flow	28000	L/acre/hour
Manning Coefficient	0.013	unitless

William Rugamba

From: William Rugamba
Sent: July 22, 2024 8:18 AM
To: William Rugamba
Subject: FW: Re-confirmation of Mechanical Items for Servicing Report

William Rugamba, M.Eng., B.A.Sc., EIT
Civil Engineering Graduate
Ottawa, ON
Work: [343-804-4374](tel:343-804-4374)

From: Sarith Lopez <slopez@qmeengineering.com>
Sent: Wednesday, July 17, 2024 8:07 PM
To: Mahad Musse <mmusse@jlrichards.ca>; Chuck Clark <CWC@qmeengineering.com>
Cc: Karla Ferrey <kferrey@jlrichards.ca>; Raad Akrawi <rakrawi@groupeheafey.com>; Carmine Zayoun <carmine@zayoungroup.com>
Subject: RE: Re-confirmation of Mechanical Items for Servicing Report

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Hi Mahad,

All items below confirmed

Regards

Sarith López
Project Manager

9 Gurdwara Road, Unit 200
Ottawa, ON K2E 7X6
T: 613-366-4763 ext. 129
slopez@qmeengineering.com



From: Mahad Musse <mmusse@jlrichards.ca>

Sent: Tuesday, July 16, 2024 3:08 PM

To: Sarith Lopez <slopez@qmeengineering.com>; Chuck Clark <CWC@qmeengineering.com>

Cc: Karla Ferrey <kferrey@jlrichards.ca>; Raad Akrawi <rakrawi@groupeheafey.com>; Carmine Zayoun <carmine@zayoungroup.com>

Subject: Re-confirmation of Mechanical Items for Servicing Report

Hi Sarith/Chuck,

Thank you for the information below and in our meetings. I understand all these items have been discussed before but we need to submit something as part of our report. Can you just re-confirm the following questions below and then we will attach your confirmation to the Report.

1. Please confirm that the sanitary service size of 200mm diameter for the Site Plan Blocks (Block 14, 15 and 17) is preferred by the mechanical engineer on file;
2. Please confirm that a sprinkler flow of 25 L/s can be assumed for the Site Plan Blocks (Block 14, 15 and 17) at this stage.

Thanks
Mahad



Mahad Musse, B.Eng., EIT
Civil Engineering Graduate

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Ottawa, ON, K1S 1N4



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