

Prepared for:

12714001 CANADA INC.
100-768 Boulevard St-Joseph
Gatineau, QC
J8Y 4B8

Prepared by:

J.L. RICHARDS & ASSOCIATES LIMITED
343 Preston Street, Suite 900 and 1000
Ottawa, ON
K1S 1N4

Site Servicing Report

Mixed-Use Site Plan (Block 15) **2983, 3053 and 3079 Navan Road & 2690 Pagé Road**

Site Servicing Report

2983, 3053 and 3079 Navan Road & 2690 Pagé 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 15). 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 15) is located within the City of Ottawa's Official Plan boundary and consists of a 0.54 ha parcel bounded by Brian Coburn to the northwest 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 A). The survey indicates that a portion of Block 15 adjacent to Brian Coburn conveys overland flow to existing ditch inlet catch basins along Brian Coburn. The remaining existing ground surface generally slopes in a southeasterly direction towards the future subdivision lands.

1.3 Proposed Development

The proposed development will consist of two (2) mid-rise residential condominiums with underground parking and one (1) storey of commercial space. One (1) of the condominium buildings consists of 47 units, and the second (2) consists of 36 units. Mixed-Use Site Plan (Block 15) has a total of 83 units. The Concept Plan for the Mixed-Use Site Plan (Block 15) is attached to Appendix A.

1.4 Proposed Connections to Existing Infrastructure

Block 15 is proposed to be serviced by the infrastructure that is part of the East Ridge Orleans Subdivision. One sanitary, storm and water service 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.

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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 watermain 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 15). The HNA has since been updated to reflect the proposed water service lateral for Block 15 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 83 apartment units with an average density of 1.8 persons per unit, giving a total population of 149 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 of 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	1.26
Peak Hour Demand	2.2 x Max Day	1.8 x Max Day	2.74

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 15) was calculated as 200 L/s for Building C and 217 L/s for Building D. Refer to Appendix C for the detailed RFF calculations for the critical fire area.

Both buildings within Block 15 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 15) 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 and the proposed hydrants within the East Ridge Orleans Subdivision. 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 and Connection 2). Table 2 summarizes the hydraulic boundary conditions received (refer to Appendix C for a copy of the City correspondence).

The boundary condition for 233 L/s was used in this analysis since this is above the maximum required fire flow for the site (refer to Section 2.3).

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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 13,980 L/min (233.00 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 schematics 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-23 in the model) during the peak hour condition to be 406 kPa (58.9 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 and the hydrants within the East Ridge Orleans subdivision. 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)

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was assumed for Block 15 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 a minimum of 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 15 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 to be 444 kPa (64.40 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 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.

3.0 WASTEWATER SERVICING

3.1 Design Criteria

The sanitary sewer system within the Mixed-Use Site Plan (Block 15) 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.

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

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Design Parameter	Design Value
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 15 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 1.95 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 15	0.54 ha	83	1.8 ppu	149 persons	3.55	1.72 L/s	0.05 L/s	0.18 L/s	1.95 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 1.95 L/s of wastewater flows generated by Block 15.

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

3.3 Summary and Conclusions

Wastewater servicing for Block 15 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.

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4.0 STORM SERVICING AND STORMWATER MANAGEMENT

4.1 Design Criteria

Storm and stormwater management servicing for the Mixed-Use Site Plan (Block 15) 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 44 L/s as identified in Table 5-4 Site Servicing Report 2983, 3053 and 3079 Navan Road & 2690 Pagé Road, Ottawa, Ontario (JLR 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 2024).
- Provide measures to ensure that site preparation and construction is in accordance with the current Best Management Practices for Erosion and Sediment Control.

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.

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

4.3 Proposed Minor System Servicing

4.3.1 Runoff Coefficient

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.

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 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 2024).

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The downstream 1:100-year HGL at the connection to the Subdivision at MH514 is identified as 81.07 m which is lower than any minor system within the site and therefore there is no backflow from the boundary condition and no impacts on HGL.

The rear-yard outlet connection into the subdivision connects directly into the pipe from STM STUB 16 to EXST MH514. The downstream 1:100-year HGL at STM STUB 16 is 81.28 m which is below the catch basin invert of 83.28 m at CB112.

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 1 (Appendix D).
- **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.
- **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.

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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	85.30	200	10*	30	30
2	85.25	200	20*	50	40
3	85.20	150	20*	30	30
4	85.15	150	20*	40	30
5	85.22	180	0*	10	10
6	85.30	300	0	0	0
7	85.20	180	0	0	0
8	85.15	100	0	0	0

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 50 mm during the 1:100-year event; and,
- There is no spill from the site in the 1:100-year event.

4.5.2 Roof Drainage

The roof drainage system is to be designed by the Mechanical Engineer to achieve a flow rate of 2 L/s from each roof structure. The maximum depth of ponding required, assuming storage across 66% of the rooftop area, is 80 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 **Error! Reference source not found..**

Table 7: Parking Area ICD Capture Analysis

Low Point	ICD Type	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	3	20	30
2		11	36	50

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Low Point	ICD Type	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		7	20	30
4		10	27	40
5		1	6	10

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

4.5.4 Landscaped Drainage

The landscaped drainage consists of typical rear yard system of swales and perforated pipes. At the downstream end the Vortex ICD 95 provides flow control to 10 L/s in the 1:100-year event with a head of 1.63m. The release is greater than the rational method 1:2-year design flow of 4 L/s for the combined upstream catchments. The Vortex ICD sizing ensures that there is no spill from Low Point 8 in the 1:100 year event.

4.5.5 Building Release Rates

To maintain overall release rate from the site at the allowable flow rate of 44 L/s, the building drainage system must be controlled to 29 L/s. Based on a pumped rate of 29 L/s a cistern size of 49 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.

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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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J.L. RICHARDS & ASSOCIATES LIMITED

Water and Wastewater
Prepared by:

Stormwater
Prepared by:

Mahad Musse, EIT
Engineering Graduate

Mathieu Lacelle, EIT
Engineering Graduate

Reviewed by:

Reviewed by:

Karla Ferrey, P.Eng.,
Senior Associate, Manager, Ottawa, Civil
Development, Senior Civil Engineer

Bobby Pettigrew, P. Eng.,
Associate, Senior Water Resources Engineer,
Water Resources Practice Lead

Appendix A

Concept Plan, Draft Plan of
Subdivision and Topographical
Survey

NAVAN ROAD
DEVELOPMENT2983, Navan Road, Orleans,
ON K1C 7G4

OWNER

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

ARCHITECTURAL

(416) 851-8954
INFO@PMAARCHITECTES.COM
3070, CHEMIN DES QUATRE-BORGEAIS
QUÉBEC (CQ) G1W 2M4
PMAARCHITECTES.COM53, BOUL. SAINT-RAYMOND,
GATINEAU, QC J8Y 1R8

ENGINEERS / PLANNER

J.L. Richards
ENGINEERS - ARCHITECTS - PLANNERS1965 CARLING AVENUE, SUITE 700,
OTTAWA, ON K1Z 8R1

SURVEYOR

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

KEY PLAN

ARCHITECT SEAL

ARCHITECT SEAL

ARCHITECT SEAL

ARCHITECT SEAL

ARCHITECT SEAL

ARCHITECT SEAL

ARCHITECT SEAL

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SITE PLAN LEGEND

	EXISTING BUILDING		LOT LINE
	NEW BUILDING		SETBACKS
	NEW BUILDING WITH COMMERCIAL SPACE AT-GRADE		NEW TREE
	GRASS		FIREWALL
	ASPHALT		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:	~53,411.14 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:	~899 m ²

BLOCK 02:	
1 X RESIDENTIAL APARTMENT BUILDING	47 UNITS
1 X MIXED USE BUILDING	
RESIDENTIAL:	36 UNITS
COMMERCIAL SPACES:	~899 m ²

BLOCK 03:	
2 X RESIDENTIAL APARTMENT BUILDING	96 UNITS
TOTAL NUMBER OF UNITS:	330 UNITS
TOTAL COMMERCIAL SPACES:	~1,798 m ²

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

MINIMUM REAR YARD:		
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ABUTTING A STREET:	3 m	3 m
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FROM A RESIDENTIAL ZONE:	7.5 m	7.5 m
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FOR A RESIDENTIAL BUILDING:	7.5 m	7.5 m
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PARKING RATES		
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R9 - TOWNHOUSES:	1 p/unit = 67	67 (GARAGES)
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VISITOR:	0	67 DRIVE AISLES
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BLOCK 14:		
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R12 - APARTEMENTS	1.0 p/unit = 84	84 (UNDERGROUND)
-------------------	-----------------	------------------

VISITOR:	0.2 p/unit = 17	18 (UNDERGROUND)
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N79 - RETAIL STORE:	3.4 p/100 m ² GFA = 30.6	32 (EXTERIOR)
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		TOTAL: 134
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BLOCK 15:		
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R12 - APARTEMENTS	1.0 p/unit = 83	83 (UNDERGROUND)
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VISITOR:	0.2 p/unit = 16.6	16 (UNDERGROUND)
----------	-------------------	------------------

N79 - RETAIL STORE:	3.4 p/100 m ² GFA = 30.6	32 (EXTERIOR)
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		TOTAL: 131
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BLOCK 17:		
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R12 - APARTEMENTS	1.0 p/unit = 96	96 (UNDERGROUND)
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VISITOR:	0.2 p/unit = 19.2	19 (15 EXT. + 4 UND.)
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		TOTAL: 115
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GROSS FLOOR AREA		
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TOWNHOUSE A:	267 m ²	
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TOWNHOUSE B:	239 m ²	
--------------	--------------------	--

TOWNHOUSE C:	232 m ²	
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TOWNHOUSE C (CORNER UNIT):	236 m ²	
----------------------------	--------------------	--

TOWNHOUSE D:	225 m ²	
--------------	--------------------	--

TOTAL MODEL 01 (ABBBBBA)	1,968 m ²	
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TOTAL MODEL 02 (ABBBBBA)	1,729 m ²	
--------------------------	----------------------	--

TOTAL MODEL 03 (ABBBBBA)	1,490 m ²	
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TOTAL MODEL 04 (CDCDCDC)	1,611 m ²	
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TOTAL MODEL 05 (CCCCDC)	1,386 m ²	
-------------------------	----------------------	--

MIXED USE BUILDING (TOTAL OF 2 BUILDINGS):		TOTAL: 3,926 m ²
--	--	-----------------------------

RESIDENTIAL:		3,027 m ²
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COMMERCIAL:		899 m ²
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RESIDENTIAL APARTMENT BUILDING (TOTAL OF 4 BUILDINGS):		TOTAL: 3,927 m ²
--	--	-----------------------------

RESIDENTIAL:		3,927 m ²
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NOTE		
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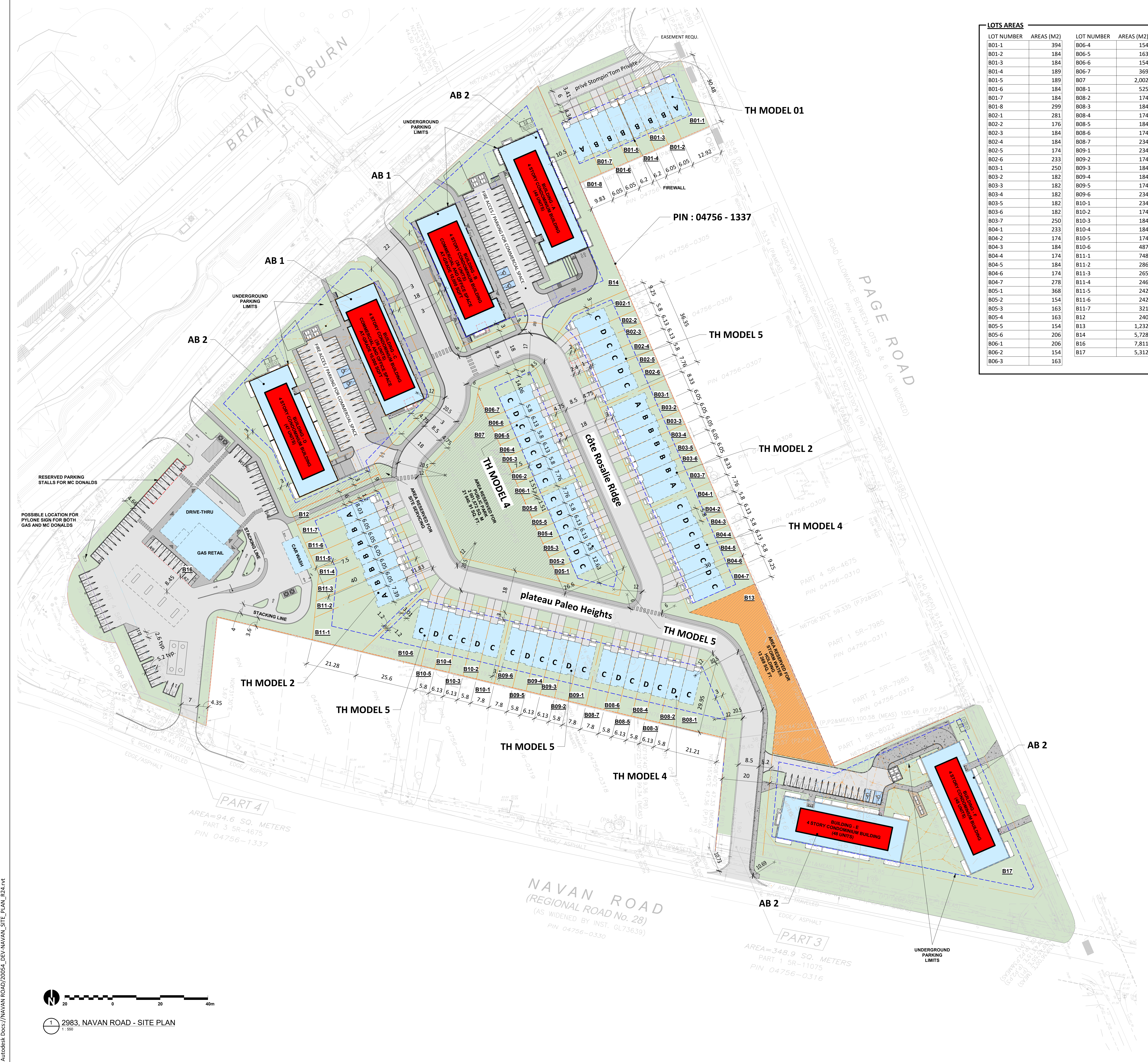
1. ASSUMES TYPICAL RESIDENTIAL FLOOR HEIGHT OF 3m.		
--	--	--

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.		
---	--	--

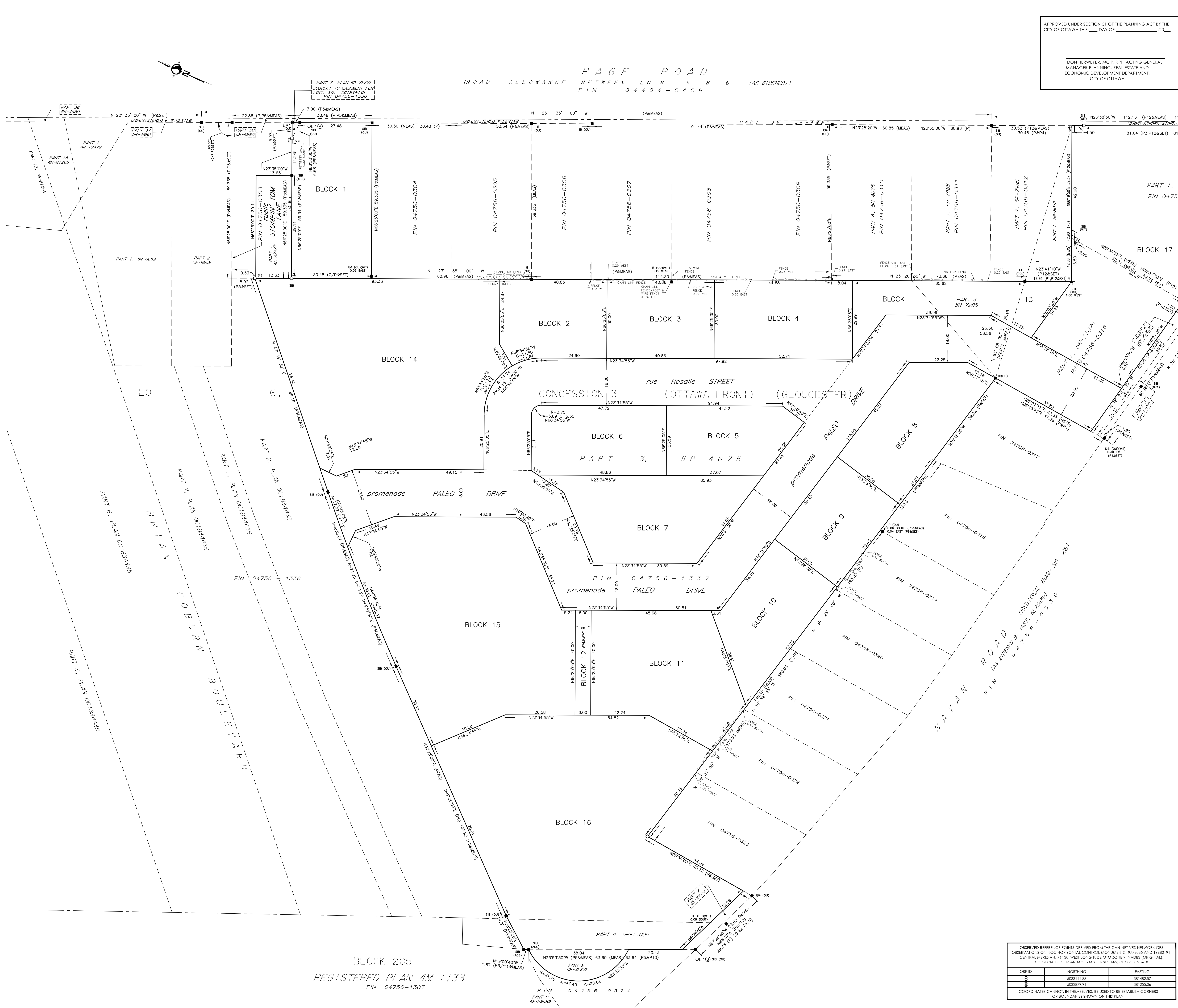
LOTS AREAS

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		

2983, NAVAN ROAD - SITE PLAN
1:500

SHEET NO.

A100



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

DON HERWEYER, MCIP, RPP, 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 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 0.999994

BEARING NOTE
BEARINGS ARE GRID, DERIVED FROM CAN-NET VRS NETWORK GPS OBSERVATIONS
ON NCC HORIZONTAL CONTROL MONUMENTS 1977035 AND 19480191, CENTRAL
MERIDIAN, 74° 30' WEST LONGITUDE WITH ZONE 9, NAD83 (ORIGINAL).
FOR BEARING COMPARISONS, BEARINGS ON PLANS P. P1, P2 & P3 HAVE BEEN
ROTATED 0°41'30" COUNTERCLOCKWISE.

LEGEND

DENOTES	FOUND MONUMENTS
■	SET MONUMENTS (SB)
□	UNLESS OTHERWISE NOTED
IB	IRON BAR
IBD	ROUND IRON BAR
SB	STANDARD IRON BAR
SSB	SHORT STANDARD IRON BAR
CC	CUT CROSS
CP	CONCRETE PIN
WIT	WITNESS
PN	MEASURED
MEAS	PROPERTY IDENTIFICATION NUMBER
PROP	PROPORTIONED
CU	ORIGIN UNKNOWN
SG	STANTEC GEOMATICS LTD.
ORP	OBSERVED REFERENCE POINT
P	PLAN SR-4475
P1	PLAN SR-11075
P2	PLAN SR-7995
P3	PLAN SR-9893
P4	PLAN SR-8022
P5	PLAN OC183445
P6	PLAN SR-4900
P7	PLAN SR-6659
P8	PLAN BY FRM DATED SEPTEMBER 9, 2015
P9	PLAN BY 1175 DATED SEPTEMBER 30, 1987
P10	PLAN SR-11065
P11	REGISTERED PLAN 4M-1133
P12	PLAN BY 1465 DATED DECEMBER 10, 2020
C/P	CALCULATION FOR

NOTES

1. ALL PLANTED MONUMENTS SHOWN HEREON ARE IRON BARS (IB) 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,
NAMESLY PROMENADE PALEO DRIVE, rue Rosalie STREET AND rue STOMPIN TOM
LANE AND LANE, NAMESLY 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 SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER
THEM.

2. THE SURVEY WAS COMPLETED ON THE -th DAY OF _____, 2023.

OBSERVED REFERENCE POINTS DERIVED FROM THE CAN-NET VRS NETWORK GPS OBSERVATIONS ON NCC HORIZONTAL CONTROL MONUMENTS 1977035 AND 19480191, CENTRAL MERIDIAN, 74° 30' WEST LONGITUDE WITH ZONE 9, NAD83 (ORIGINAL). COORDINATES TO UTM ACCURACY PER SEC 1401 OF OREG 216/10			
ORP ID	NORTHING	EASTING	
①	933144.88	381482.57	
②	933287.91	381255.06	
COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.			

DATE _____

FRANÇOIS LAU
ONTARIO LAND SURVEYOR

Stantec Geomatics Ltd.
CANADA LAND SURVEYORS
ONTARIO LAND SURVEYORS
1331 CLOVE AVENUE, SUITE 300
OTTAWA, ONTARIO, K1C 3Z4
TEL: 416-752-4400 FAX: 416-722-2799
stantec.com

DRAWN: ME/MTM CHECKED: _____ PK: _____ FIELD: ES/LG PROJECT No.: 161614345-132

Site Servicing Report
2983, 3053 and 3079 Navan Road & 2690 Pagé Road

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 ☐	2 ☐	3 ☐	4 ☒	5 ☐
----------------------------	----------------------------	----------------------------	---------------------------------------	----------------------------

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 15)
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 15) 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
☐	Executive Summary (for larger reports only).	N/A
☒	Date and revision number of the report.	Site Servicing Report
☒	Location map and plan showing municipal address, boundary, and layout of proposed development.	Site Servicing Report (Appendix A) All Drawings
☒	Plan showing the site and location of all existing services.	Servicing Plan
☒	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
☒	Summary of Pre-consultation Meetings with City and other approval agencies.	Site Servicing Report (Appendix 'A')
☒	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
☒	Statement of objectives and servicing criteria.	Site Servicing Report
☒	Identification of existing and proposed infrastructure available in the immediate area.	Site Servicing Report Servicing Plan
☐	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

☒	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
☐	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
☐	Proposed phasing of the development, if applicable.	N/A
☒	Reference to geotechnical studies and recommendations concerning servicing.	Site Servicing Report and Drawings
☒	All preliminary and formal site plan submissions should have the following information: ▪ 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
☐	Confirm consistency with Master Servicing Study, if available.	N/A
☒	Availability of public infrastructure to service proposed development.	Site Servicing Report (Section 2.0) Servicing Plan
☒	Identification of system constraints.	Site Servicing Report (Section 2.0) Servicing Plan
☒	Identify boundary conditions.	Site Servicing Report (Section 2.0)
☒	Confirmation of adequate domestic supply and pressure.	Site Servicing Report (Section 2.0)
☒	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)
☒	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)

☐	Definition of phasing constraints. Hydraulic modelling is required to confirm servicing for all defined phases of the project, including the ultimate design.	N/A
☒	Address reliability requirements, such as appropriate location of shutoff valves.	Site Servicing Report (Section 2.0)
☐	Check on the necessity of a pressure zone boundary modification.	N/A
☒	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)
☒	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
☐	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
☒	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Site Servicing Report (Section 2.0)
☒	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
☒	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,
☐	Confirm consistency with Master Servicing Study and/or justifications for deviations.	Stantec 2005 EUC ISSU
☐	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
☒	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Site Servicing Report (Section 3.0) Servicing Plan

☒	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)
☒	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)
☒	Description of proposed sewer network, including sewers, pumping stations and forcemains.	Site Servicing Report (Section 3.0) Servicing Plan
☐	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
☐	Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	N/A
☐	Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
☐	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
☐	Special considerations, such as contamination, corrosive environment, etc.	N/A

4.4	SITE SERVICING REPORT: STORMWATER	REFERENCE
☒	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)
☒	Analysis of available capacity in existing public infrastructure.	Site Servicing Report (Section 4.0)
☒	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Servicing, Grading and Drainage Plans
☒	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)

☒	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)
☒	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
☐	Setback from private sewage disposal systems.	N/A
☐	Watercourse and hazard lands setbacks.	N/A
☒	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')
☐	Confirm consistency with subwatershed and Master Servicing Study, if applicable study exists.	Stantec 2005 EUC ISSU
☒	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)
☐	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
☒	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)
☒	Any proposed diversion of drainage catchment areas from one outlet to another.	Site Servicing Report (Section 4.0)
☒	Proposed minor and major systems, including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Servicing, Grading and Drainage Plans
☐	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)
☐	Identification of potential impacts to receiving watercourses.	N/A
☐	Identification of municipal drains and related approval requirements.	N/A
☒	Description of how the conveyance and storage capacity will be achieved for the development.	Site Servicing Report (Section 4.0)

☒	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
☒	Inclusion of hydraulic analysis, including hydraulic grade line elevations.	Site Servicing Report (Section 4.0)
☒	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
☐	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
☐	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:		
☐	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
☐	Application for Environmental Compliance Approval (ECA) under the Ontario Water Resources Act.	As part of future submission
☐	Changes to Municipal Drains.	N/A
☐	Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation, etc.).	N/A

4.6	CONCLUSION CHECKLIST	REFERENCE
☒	Clearly stated conclusions and recommendations.	Site Servicing Report
☒	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

☒	All draft and final reports shall be signed and stamped by a Professional Engineer registered in Ontario.	Site Servicing Report All Drawings

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-23	0	83	149	0.09	0.48	0.03	0.52	1.21	0.05	1.26	2.66	0.08	2.74
TOTALS	0	83	149	0.09	0.48	0.03	0.52	1.21	0.05	1.26	2.66	0.08	2.74

ASSUMPTIONS											
RESIDENTIAL DENSITIES				AVG. DAILY DEMAND				MAX. HOURLY DEMAND			
- Townhouse (TH)	2.7	p / p / u		- Residential	280	l / cap / day		- Residential	1,540	l / cap / day	
				- Institutional	28,000	l / ha / day		- Institutional	75,600	l / ha / day	
- Condo Units (CU)	1.8	p / p / u		- Commercial	28,000	l / ha / day		- Commercial	75,600	l / ha / day	
		p / p / u		MAX. DAILY DEMAND							
				- Residential	700	l / cap / day					
		p / p / u		- Institutional	42,000	l / ha / day					
				- Commercial	42,000	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 C (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	Flow rounded to nearest 1000 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	L/min	No rounding applied.
F	Sprinkler Protection	Automatic Fully Supervised		
	Sprinkler Credit	-50%		
	Decrease for Sprinkler	-8500	L/min	
G	North Side Exposure			
	Exposing Wall:	Wood Frame		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	35.7	m	
	Height of Exposed Wall:	4	storeys	
	Length-Height Factor	142.9	m-storeys	
	Separation Distance	26	m	
	North Side Exposure Charge			
	10%			
	East Side Exposure			
	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	
	East Side Exposure Charge			
	0%			
	South Side Exposure			
	Exposing Wall:	Wood Frame		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	35.9	m	
	Height of Exposed Wall:	4	storeys	
	Length-Height Factor	143.5	m-storeys	
	Separation Distance	26.89	m	
	South Side Exposure Charge			
	10%			
	West Side Exposure			
	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				
20%				
The total exposure charge is below the maximum value of 75%.				
Increase for Exposures				
3400				
L/min				
H	Fire Flow	11900	L/min	
	Rounded Fire Flow	12000	L/min	Flow rounded to nearest 1000 L/min.
City Cap	Required Fire Flow (RFF)	12000	L/min	
		200	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 D (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	Flow rounded to nearest 1000 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	L/min	No rounding applied.
F	Sprinkler Protection	Automatic Fully Supervised		
	Sprinkler Credit	-50%		
	Decrease for Sprinkler	-8500	L/min	
G	North Side Exposure			
	Exposing Wall:	Wood Frame		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	35.9	m	
	Height of Exposed Wall:	4	storeys	
	Length-Height Factor	143.5	m-storeys	
	Separation Distance	26.89	m	
	North Side Exposure Charge	10%		
	East Side Exposure			
	Exposing Wall:	Wood Frame		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	7.8	m	
	Height of Exposed Wall:	2	storeys	
	Length-Height Factor	15.5	m-storeys	
	Separation Distance	11.5	m	
	East Side Exposure Charge	12%		
	South Side Exposure			
	Exposing Wall:	Wood Frame		
	Exposed Wall:	Non-combustible		
	Length of Exposed Wall:	23.9	m	
	Height of Exposed Wall:	1	storeys	
	Length-Height Factor	23.9	m-storeys	
	Separation Distance	32.28	m	
	South Side Exposure Charge	5%		
	West Side Exposure			
	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	27%		The total exposure charge is below the maximum value of 75%.
	Increase for Exposures	4590	L/min	
H	Fire Flow	13090	L/min	
	Rounded Fire Flow	13000	L/min	Flow rounded to nearest 1000 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

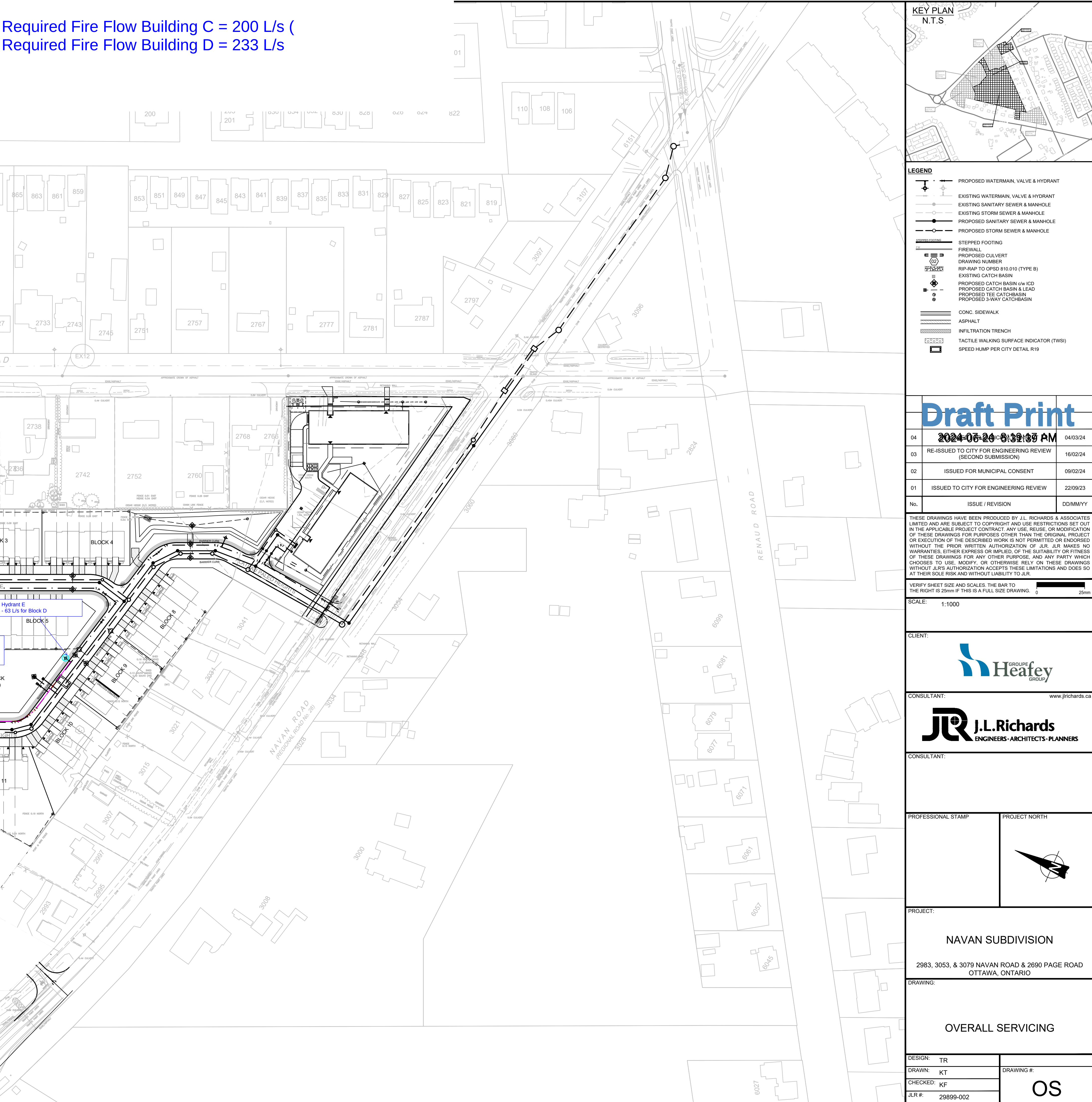
Table 1. Maximum flow to be considered from a given hydrant		
Hydrant Class	Distance to asset/structure/building (m) ^a	Contribution to required fire flow (L/min) ^b
AA	≤ 75	5,700
	> 75 and ≤ 150	3,800
A	≤ 75	3,800
	> 75 and ≤ 150	2,850
B	≤ 75	1,900
	> 75 and ≤ 150	1,500
C	≤ 75	800
	> 75 and ≤ 150	800

^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.

Block 15

Required Fire Flow Building C = 200 L/s (
Required Fire Flow Building D = 233 L/s



KEY PLAN
N.T.S.

LEGEND

Draft Print

2024-07-24 8:39:38 AM

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

No.	ISSUE / REVISION	DD/MM/YY
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SCALE: 1:1000

CLIENT:

CONSULTANT:

CONSULTANT:

PROFESSIONAL STAMP

PROJECT NORTH

PROJECT:

NAVAN SUBDIVISION

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

DRAWING:

OVERALL SERVICING

DESIGN:	TR	DRAWING #: OS
DRAWN:	KT	
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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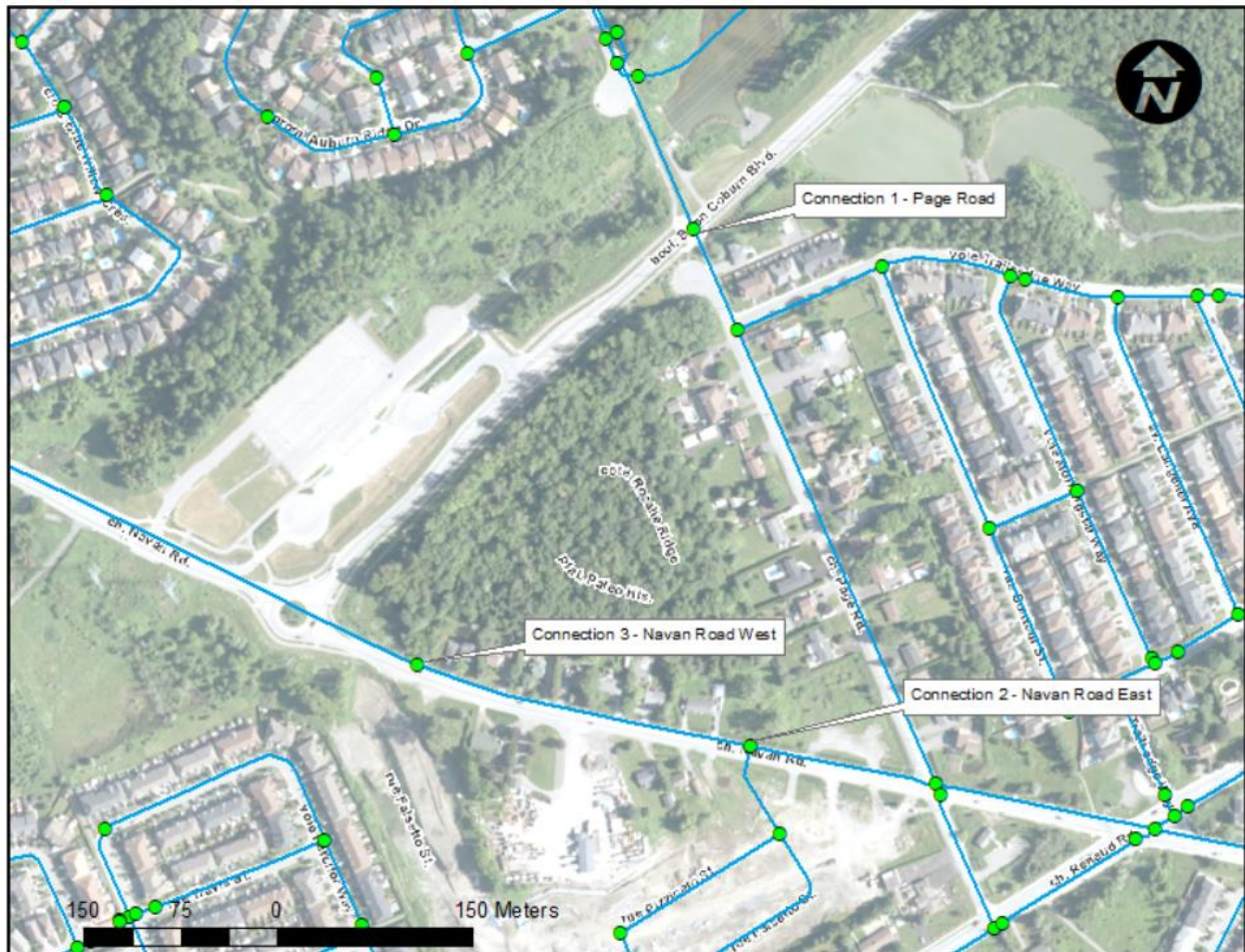
'

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)	Pressure¹ (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)	Pressure¹ (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

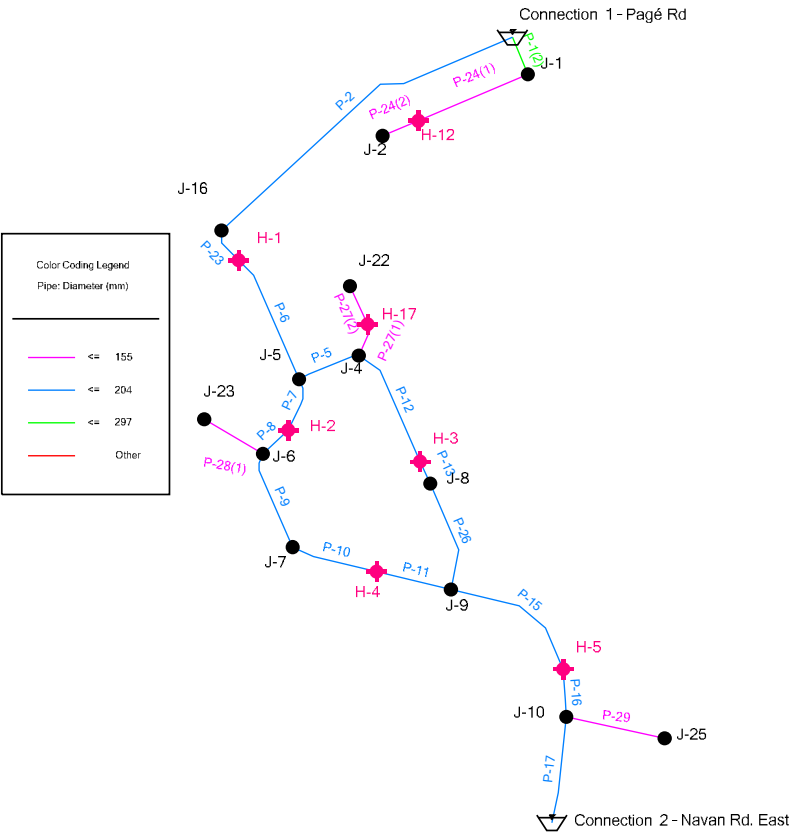
Demand Scenario	Head (m)	Pressure¹ (psi)
Maximum HGL	130.7	69.3
Peak Hour	126.8	63.8
Max Day plus Fire Flow #1	127.3	64.5
Max Day plus Fire Flow #2	124.6	60.6
Max Day plus Fire Flow #3	120.9	55.3
Max Day plus Fire Flow #4	119.8	53.8

¹ Ground Elevation = 81.9 m

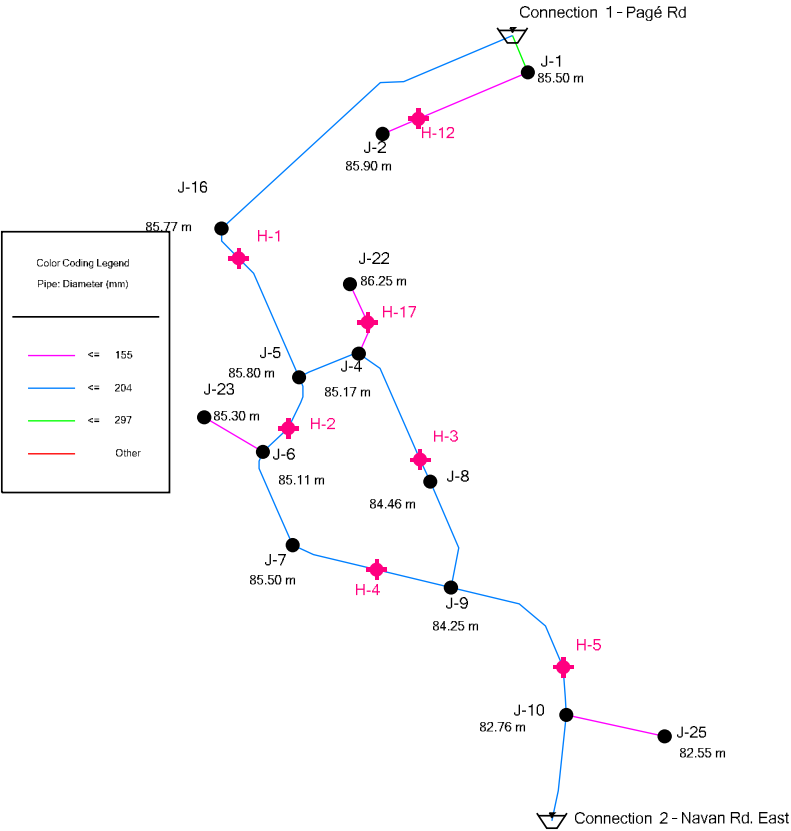
Disclaimer

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.

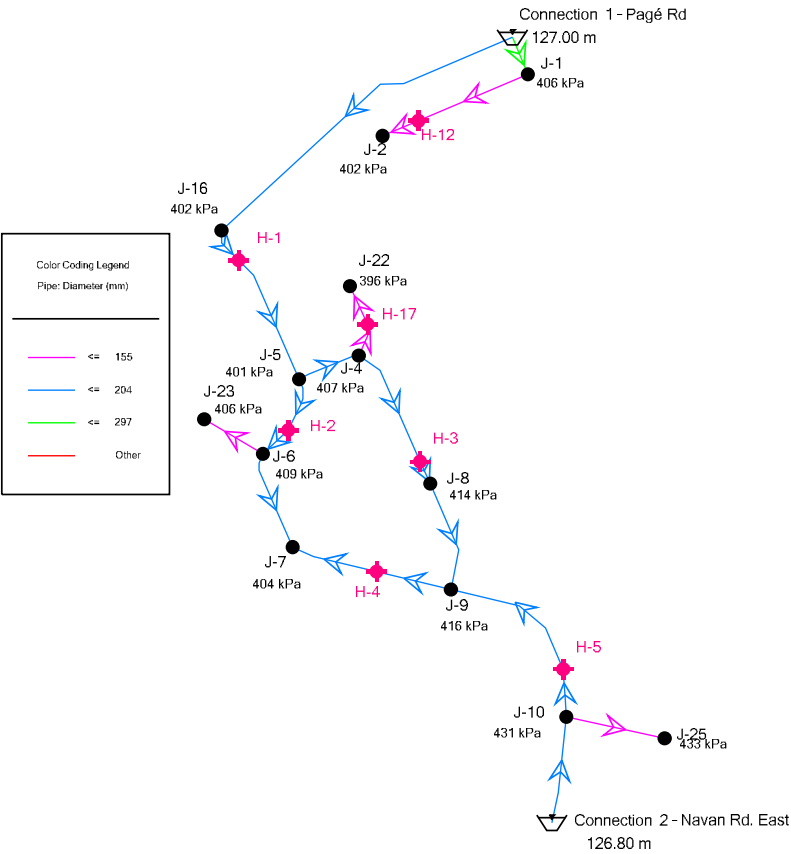
Mixed-Use Site Plan (Block 15)
Model Schematic



Mixed-Use Site Plan (Block 15)
Model Schematic
Elevation Model



Mixed-Use Site Plan (Block 15)
Peak Hour Demand



Mixed-Use Site Plan (Block 15)
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 15)

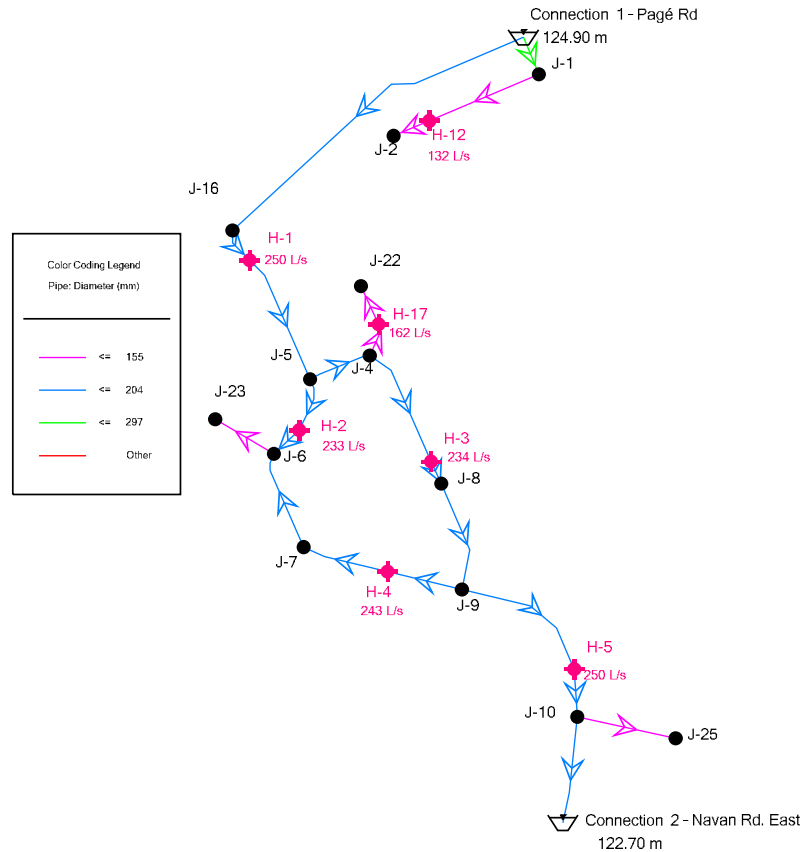
Peak Hour Demand

Pipe Table

ID	Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)
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 15)

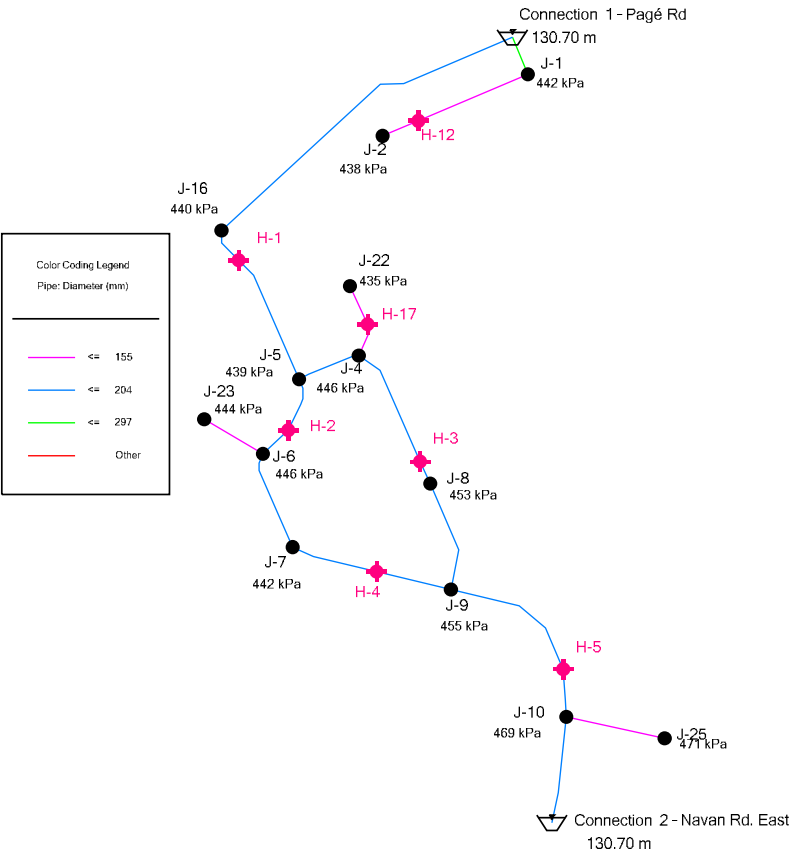
Max Day + Fire Flow Requirement



Mixed-Use Site Plan (Block 15)
Max Day + Fire Flow Requirement
Hydrant Table

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	178	J-16
H-2	True	233	233	140	140	142	J-23
H-4	True	243	243	140	140	142	J-7
H-3	True	234	234	140	140	158	J-8
H-5	True	250	250	140	256	247	J-23
H-12	True	132	132	140	142	140	J-2
H-17	True	162	162	140	143	140	J-22

Mixed-Use Site Plan (Block 15)
Maximum Pressure Analysis



Mixed-Use Site Plan (Block 15)

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 15)

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

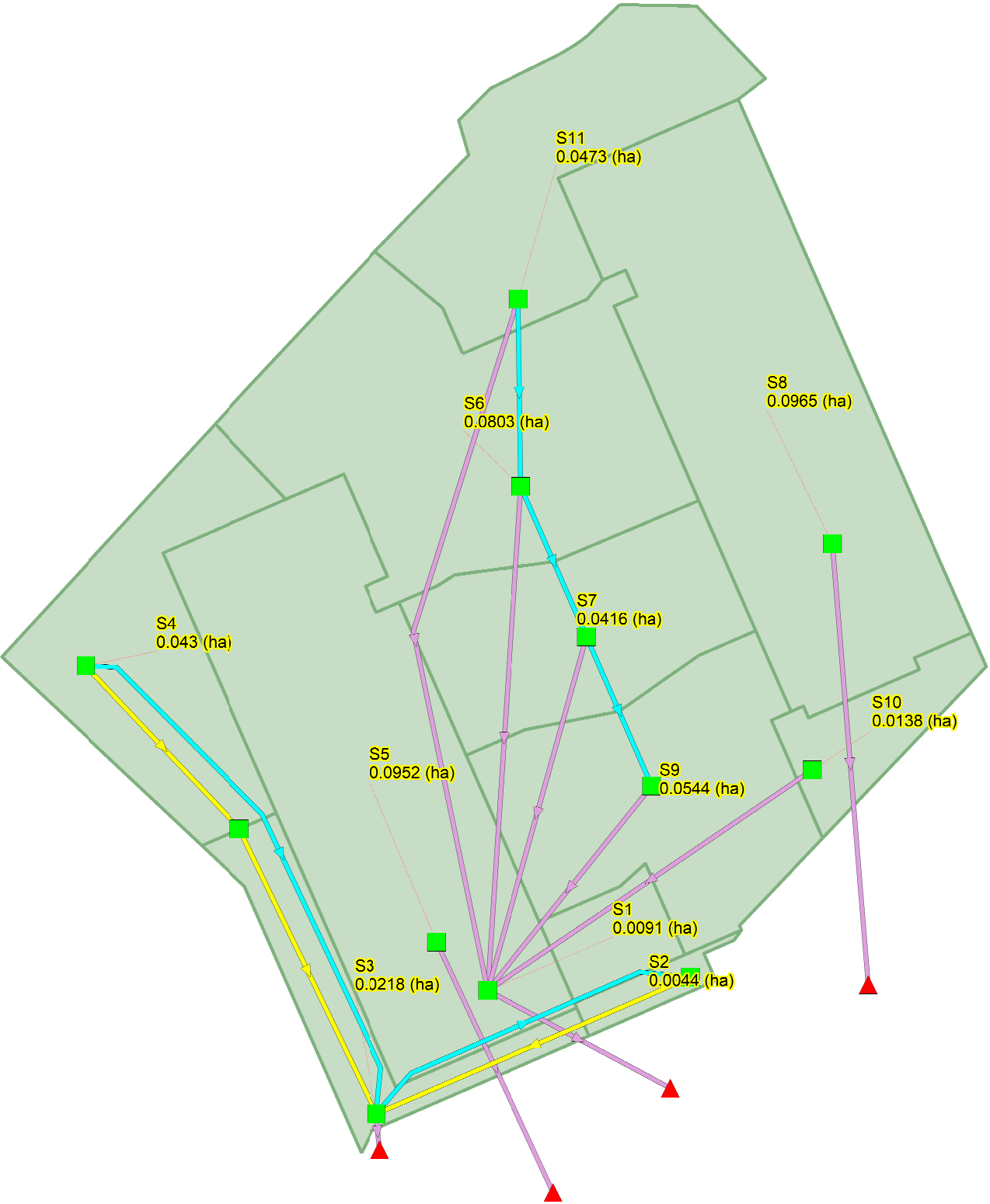
Appendix D

Stormwater Management

[illegible]

REAR YARD CATCH BASIN TABLE	
-----------------------------	--

Street Name	CB ID Number	T/G	Inlet				Outlet			COVER (m)	1:100 Yr Restricted Capture Rate (L/s)	CATCH BASIN TYPE	ICD TYPE
			Pipe Dia. (mm)	Pipe Length (m)	Slope	Invert	Pipe Dia. (mm)	Pipe Length (m)	Invert				
BLOCK 15	CB113	85.15	-	-	-	-	150	31.32	83.55	1.45	-	-	NO ICD
	CB110	85.30	-	-	-	-	150	20.47	83.75	1.40	-	-	NO ICD
	CB111	85.60	150	20.47	0.8%	83.59	150	28.91	83.59	1.86	-	-	NO ICD
	CB112 (NE)	85.20	150	31.32	0.6%	83.36	150	4.21	83.28	1.69	10.00	600 mm x 600 mm CATCH BASIN PER OPSD 705.010	Vortex_ICD_95
	CB112 (NW)	85.20	150	28.91	0.8%	83.34							



Legend

- ▲ Outfalls
- Storages
- Conduits
- Weirs
- Outlets
- Subcatchments



150 m

PROJECT:

NAVAN RESIDENTIAL AND COMMERCIAL SITE PLAN - BLOCK 15

Ottawa, ON

DRAWING:

Overall System Model Schematic



J.L.Richards

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DESIGN:ML

DRAWN:ML

CHECKED:BP

JLR NO.: 29899-002

DRAWING NO.:
Figure 1



Legend

IMPERVIOUSNESS

Landscaped Areas (C-Factor - 0.2)

Pavement Areas (C-Factor - 0.9)

PROJECT:				NAVAN RESIDENTIAL AND COMMERCIAL BLOCK 15 OTTAWA, ONTARIO			
DRAWING:				OVERALL SITE IMPERVIOUSNESS			
 J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS		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		JLR NO: 29899-002	
				DRAWN: ML		DRAWING NO: Figure	
				CHECKED: BP			

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

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	5					
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	3CHI002	
[SUBCATCHMENTS]						
;;Name	Rain Gage	Outlet	Area	%Imperv	Width	%Slope
CurbLen	SnowPack					
;;						
S1	Rainfall	St_UnGrd	0.0091	100	6.1	15
S10	Rainfall	CB118	0.0138	8.79	28.998	1
S11	Rainfall	CB114	0.0473	18.805	70.001	2
S2	Rainfall	CB113	0.0044	0.002	4.3	1.9
S3	Rainfall	CB112	0.0218	17.802	75	1
S4	Rainfall	CB110	0.043	8.51	52.001	3.5
S5	Rainfall	Roof_1	0.0952	99.998	104.996	1
S6	Rainfall	CB115	0.0803	66.775	45.001	2.5
S7	Rainfall	CB116	0.0416	90.416	28.601	2.7
S8	Rainfall	Roof_2	0.0965	100	105.005	1
S9	Rainfall	CB117	0.0544	93.568	50	2.4
[SUBAREAS]						
;;Subcatchment	N-Imperv	N-Perv	S-Imperv	S-Perv	PctZero	RouteTo
PctRouted						
;;						
--	0.013	0.25	1.57	4.67	0	OUTLET
S10	0.013	0.25	1.57	4.67	0	PERVIOUS 100
S11	0.013	0.25	1.57	4.67	0	PERVIOUS 100
S2	0.013	0.25	1.57	4.67	0	OUTLET
S3	0.013	0.25	1.57	4.67	0	PERVIOUS 100
S4	0.013	0.25	1.57	4.67	0	PERVIOUS 100
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
S8	0.013	0.25	1.57	4.67	0	OUTLET
S9	0.013	0.25	1.57	4.67	0	OUTLET
[INFILTRATION]						
;;Subcatchment	Param1	Param2	Param3	Param4	Param5	
;;						
S1	76.2	13.2	4.14	7	0	
S10	76.2	13.2	4.14	7	0	
S11	76.2	13.2	4.14	7	0	
S2	76.2	13.2	4.14	7	0	
S3	76.2	13.2	4.14	7	0	
S4	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	
S8	76.2	13.2	4.14	7	0	
S9	76.2	13.2	4.14	7	0	
[OUTFALLS]						
;;Name	Elevation	Type	Stage Data	Gated	Route To	
;;						
OF4	80.628	FIXED	81.11	NO		
OF7	80.628	FIXED	81.11	NO		
STUB15	80.628	FIXED	81.11	NO		
STUB16	80.646	FIXED	81.28	NO		
[STORAGE]						
;;Name	Elev. Psi	MaxDepth Ksat	InitDepth IMD	Shape	Curve Name/Params	
SurDepth	Fevap					
;;						
CB110	83.75	1.9	0	TABULAR	CB110	0
0						
CB111	83.59	2.01	0	TABULAR	CB111	0
0						
CB112	83.28	2.12	0	TABULAR	CB112	0
0						
CB113	83.55	1.7	0	TABULAR	CB113	0
0						
CB114	85.3	0.25	0	TABULAR	CB114	0
0						
CB115	85.25	0.31	0	TABULAR	CB115	0
0						
CB116	85.2	0.4	0	TABULAR	CB116	0
0						
CB117	85.15	0.15	0	TABULAR	CB117	0
0						
CB118	85.22	0.18	0	TABULAR	CB118	0
0						
Roof_1	96.35	0.15	0	FUNCTIONAL	0 0 635	0
0						
Roof_2	96.35	0.15	0	FUNCTIONAL	0 0 643	0
0						
St_UnGrd	81.8	1	0	FUNCTIONAL	0 0 49	0
[CONDUITS]						
;;Name	From Node	To Node	Length	Roughness	InOffset	
OutOffset	InitFlow	MaxFlow				
;;						
;;						

C1			CB111	CB112	28.913	0.013	83.59	83.34					
0													
C3	0.08		CB113	CB112	31.317	0.013	83.55	83.36					
0													
C5	0.04		CB110	CB111	20.475	0.013	83.75	83.59					
0													
[WEIRS]													
;;Name	From Node	To Node	Type	CrestHt	Qcoeff	Gated							
EndCon	EndCoeff	Surcharge	RoadWidth	RoadSurf	Coeff. Curve								
;;													
W1		CB115	CB116	TRANSVERSE	85.45	1.84	NO						
W2	0	CB116	CB117	TRANSVERSE	85.35	1.84	NO						
0		NO											
W3	0	CB112	CB113	TRANSVERSE	85.38	1.84	NO						
0		NO											
W4	0	CB114	CB115	TRANSVERSE	85.5	1.84	NO						
0		NO											
W5	0	CB110	CB112	TRANSVERSE	85.6	1.84	NO						
0		NO											
[OUTLETS]													
;;Name	From Node	To Node	Offset	Type									
QTable/Qcoeff	Qexpon	Gated											
;;													
C2	CB112	STUB16	83.28	TABULAR/HEAD									
Vortex_ICD_95	NO	St_UnGrd	85.25	TABULAR/HEAD	ZURN_Z150F-								
OL1	CB115	St_UnGrd	85.2	TABULAR/HEAD	ZURN_Z150F-								
6NH	NO												
OL2	CB116	St_UnGrd	85.2	TABULAR/HEAD	ZURN_Z150F-								
6NH	NO												
OL3	CB117	St_UnGrd	85.15	TABULAR/HEAD	ZURN_Z150F-								
6NH	NO												
OL4	Roof_1	STUB15	96.35	TABULAR/HEAD	O_Roof1								
NO	Roof_2	OF4	96.35	TABULAR/HEAD	O_Roof1								
OL5	CB114	St_UnGrd	85.3	TABULAR/HEAD	ZURN_Z150F-								
OL6	NO												
6NH	NO	OF7	81.8	TABULAR/HEAD	O_St_UnGrd								
OL7	St_UnGrd												
NO													
OL8	CB118	St_UnGrd	85.22	TABULAR/HEAD	ZURN_Z150F-								
6NH	NO												
[XSECTIONS]													
;;Link	Shape	Geom1	Geom2	Geom3	Geom4	Barrels							
Culvert													
;;													
C1	CIRCULAR	0.15	0	0	0	1							
C3	CIRCULAR	0.15	0	0	0	1							
C5	CIRCULAR	0.15	0	0	0	1							
W1	RECT_OPEN	0.11	17.1	0	0								
W2	RECT_OPEN	0.25	17.1	0	0								
W3	RECT_OPEN	0.02	4.58	0	0								
W4	RECT_OPEN	0.05	7	0	0								
W5	RECT_OPEN	0.05	3.487	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										
;;													
;;Tempest Rating	Curve for MHF IPEX TYPE A, No grate allowance												
MHF_IPEX_TYPE_A	Rating	0	0.0057										
MHF_IPEX_TYPE_A		0.1	0.0081										
MHF_IPEX_TYPE_A		0.2	0.0099										
MHF_IPEX_TYPE_A		0.3	0.0114										
MHF_IPEX_TYPE_A		0.4	0.0128										
MHF_IPEX_TYPE_A		0.5	0.014										
MHF_IPEX_TYPE_A		0.6	0.0151										
MHF_IPEX_TYPE_A		0.7	0.0214										
MHF_IPEX_TYPE_A		0.8	0.0172										
MHF_IPEX_TYPE_A		0.9	0.0181										
MHF_IPEX_TYPE_A		1	0.0198										
MHF_IPEX_TYPE_A		1.2	0.0214										
MHF_IPEX_TYPE_A		1.4	0.0229										
MHF_IPEX_TYPE_A		1.6	0.0243										
MHF_IPEX_TYPE_A		1.8	0.0256										
MHF_IPEX_TYPE_A		2	0.0286										
MHF_IPEX_TYPE_A		2.5	0.0313										
MHF_IPEX_TYPE_A		3											
;;Tempest Rating	Curve for MHF IPEX TYPE B, No grate allowance												
MHF_IPEX_TYPE_B	Rating	0	0.0081										
MHF_IPEX_TYPE_B		0.1	0.0115										
MHF_IPEX_TYPE_B		0.2	0.0141										
MHF_IPEX_TYPE_B		0.3	0.0162										
MHF_IPEX_TYPE_B		0.4	0.0182										
MHF_IPEX_TYPE_B		0.5	0.0199										
MHF_IPEX_TYPE_B		0.6	0.0215										
MHF_IPEX_TYPE_B		0.7	0.023										
MHF_IPEX_TYPE_B		0.8	0.0244										
MHF_IPEX_TYPE_B		0.9	0.0257										
MHF_IPEX_TYPE_B		1	0.0281										
MHF_IPEX_TYPE_B		1.2	0.0304										
MHF_IPEX_TYPE_B		1.4	0.0325										
MHF_IPEX_TYPE_B		1.6	0.0344										
MHF_IPEX_TYPE_B		1.8	0.0363										
MHF_IPEX_TYPE_B		2	0.0406										
MHF_IPEX_TYPE_B		2.5	0.0445										
MHF_IPEX_TYPE_B		3											
;;Tempest Rating	Curve for MHF IPEX TYPE C, No grate allowance												
MHF_IPEX_TYPE_C	Rating	0	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	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										

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MHF_IPEX_TYPE_D	0.9	0.0461	Vortex_ICD_55	0.6	0.0021
MHF_IPEX_TYPE_D	1	0.0485	Vortex_ICD_55	0.7	0.0023
MHF_IPEX_TYPE_D	1.2	0.0532	Vortex_ICD_55	0.8	0.0024
MHF_IPEX_TYPE_D	1.4	0.0574	Vortex_ICD_55	0.9	0.0026
MHF_IPEX_TYPE_D	1.6	0.0614	Vortex_ICD_55	1	0.0027
MHF_IPEX_TYPE_D	1.8	0.0651	Vortex_ICD_55	1.2	0.003
MHF_IPEX_TYPE_D	2	0.0687	Vortex_ICD_55	1.4	0.0032
MHF_IPEX_TYPE_D	2.5	0.0768	Vortex_ICD_55	1.6	0.0034
MHF_IPEX_TYPE_D	3	0.0841	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 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	0.0025			
O_Roof2	0.15	0.0025			
O_St_UnGrd	Rating	0			
O_St_UnGrd	0.01	0.029			
O_St_UnGrd	1	0.029			
;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			
;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			
Vortex_ICD_80	0.7	0.0048			
Vortex_ICD_80	0.8	0.0051			
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	0.0068			
Vortex_ICD_80	1.6	0.0072			
Vortex_ICD_80	1.8	0.0077			
Vortex_ICD_80	2	0.0081			
Vortex_ICD_80	2.5	0.009			

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Vortex_ICD_90	2	0.0102	InfiltratedInflow	01/01/2000	00:35:00	9.126959E-05	
Vortex_ICD_90	2.5	0.0114	InfiltratedInflow	01/01/2000	00:36:00	9.129378E-05	
Vortex_ICD_90	3	0.0125	InfiltratedInflow	01/01/2000	00:37:00	9.12985E-05	
;Tempest Rating Curve for Vortex ICD 95, No grate allowance							
Vortex_ICD_95	Rating	0	InfiltratedInflow	01/01/2000	00:38:00	9.129943E-05	
Vortex_ICD_95	0.1	0.0026	InfiltratedInflow	01/01/2000	00:39:00	9.12996E-05	
Vortex_ICD_95	0.2	0.0036	InfiltratedInflow	01/01/2000	00:40:00	0.0001337878	
Vortex_ICD_95	0.3	0.0044	InfiltratedInflow	01/01/2000	00:41:00	0.0001420377	
Vortex_ICD_95	0.4	0.0051	InfiltratedInflow	01/01/2000	00:42:00	0.0001433881	
Vortex_ICD_95	0.5	0.0057	InfiltratedInflow	01/01/2000	00:43:00	0.0001439922	
Vortex_ICD_95	0.6	0.0062	InfiltratedInflow	01/01/2000	00:44:00	0.0001436228	
Vortex_ICD_95	0.7	0.0067	InfiltratedInflow	01/01/2000	00:45:00	0.0001436273	
Vortex_ICD_95	0.8	0.0071	InfiltratedInflow	01/01/2000	00:46:00	0.000143628	
Vortex_ICD_95	0.9	0.0076	InfiltratedInflow	01/01/2000	00:47:00	0.0001436281	
Vortex_ICD_95	1	0.008	InfiltratedInflow	01/01/2000	00:48:00	0.0001436281	
Vortex_ICD_95	1.2	0.0087	InfiltratedInflow	01/01/2000	00:49:00	0.0001436281	
Vortex_ICD_95	1.4	0.0094	InfiltratedInflow	01/01/2000	00:50:00	0.000324559	
Vortex_ICD_95	1.6	0.0101	InfiltratedInflow	01/01/2000	00:51:00	0.0003631043	
Vortex_ICD_95	1.8	0.0107	InfiltratedInflow	01/01/2000	00:52:00	0.0003661426	
Vortex_ICD_95	2	0.0113	InfiltratedInflow	01/01/2000	00:53:00	0.0003662956	
Vortex_ICD_95	2.5	0.0126	InfiltratedInflow	01/01/2000	00:54:00	0.0003663276	
Vortex_ICD_95	3	0.0138	InfiltratedInflow	01/01/2000	00:55:00	0.0003663344	
;From Zurn Manual RD178							
ZURN_Z150F-6NH	Rating	0	InfiltratedInflow	01/01/2000	00:56:00	0.0003663358	
ZURN_Z150F-6NH	0.0127	0.00503838308477861	InfiltratedInflow	01/01/2000	00:57:00	0.0003663361	
ZURN_Z150F-6NH	0.0257	0.0132420013231177	InfiltratedInflow	01/01/2000	00:58:00	0.0003663362	
ZURN_Z150F-6NH	0.0384	0.023492054543888	InfiltratedInflow	01/01/2000	00:59:00	0.0003663362	
ZURN_Z150F-6NH	0.0508	0.0357128365761305	InfiltratedInflow	01/01/2000	01:00:00	0.0007217364	
ZURN_Z150F-6NH	0.0765	0.0425019726111045	InfiltratedInflow	01/01/2000	01:01:00	0.0006867272	
ZURN_Z150F-6NH	0.1024	0.0433196215564931	InfiltratedInflow	01/01/2000	01:02:00	0.0005640552	
CB110	Storage	0	0.073	InfiltratedInflow	01/01/2000	01:03:00	0.0005235554
CB110	1.55	0.073	InfiltratedInflow	01/01/2000	01:04:00	0.0005590921	
CB110	1.85	120.85	InfiltratedInflow	01/01/2000	01:05:00	0.0005685266	
CB110	1.9	120.85	InfiltratedInflow	01/01/2000	01:06:00	0.0005437324	
CB111	Storage	0	0.073	InfiltratedInflow	01/01/2000	01:07:00	0.0005205912
CB111	2.01	0.073	InfiltratedInflow	01/01/2000	01:08:00	0.0004989929	
CB112	Storage	0	0.36	InfiltratedInflow	01/01/2000	01:09:00	0.0004788346
CB112	1.92	0.36	InfiltratedInflow	01/01/2000	01:10:00	0.0004600203	
CB112	2.1	19.13	InfiltratedInflow	01/01/2000	01:11:00	0.000424605	
CB112	2.12	19.13	InfiltratedInflow	01/01/2000	01:12:00	0.0004260715	
CB113	Storage	0	0.073	InfiltratedInflow	01/01/2000	01:13:00	0.0004107751
CB113	1.6	0.073	InfiltratedInflow	01/01/2000	01:14:00	0.0003964986	
CB113	1.7	3.62	InfiltratedInflow	01/01/2000	01:15:00	0.000383174	
CB114	Storage	0	0.36	InfiltratedInflow	01/01/2000	01:16:00	0.0003707377
CB114	0.2	19.2	InfiltratedInflow	01/01/2000	01:17:00	0.0003591307	
CB114	0.25	19.2	InfiltratedInflow	01/01/2000	01:18:00	0.0003482975	
CB115	Storage	0	0.36	InfiltratedInflow	01/01/2000	01:19:00	0.0003381866
CB115	0.2	155.53	InfiltratedInflow	01/01/2000	01:20:00	0.0003287498	
CB115	0.31	155.53	InfiltratedInflow	01/01/2000	01:21:00	0.0003199422	
CB116	Storage	0	0.36	InfiltratedInflow	01/01/2000	01:22:00	0.0003117218
CB116	0.15	73.19	InfiltratedInflow	01/01/2000	01:23:00	0.0003040496	
CB116	0.4	73.19	InfiltratedInflow	01/01/2000	01:24:00	0.0002968888	
CB117	Storage	0	0.36	InfiltratedInflow	01/01/2000	01:25:00	0.0002902055
CB117	0.15	122.26	InfiltratedInflow	01/01/2000	01:26:00	0.0002839678	
CB118	Storage	0	0.36	InfiltratedInflow	01/01/2000	01:27:00	0.000278146
CB118	0.18	37.7	InfiltratedInflow	01/01/2000	01:28:00	0.0002727123	
[TIMESERIES]							
;Name Date Time Value							
;Rainfall (mm/hr)							
3CHI002	01/01/2000	00:00:00	2.491	InfiltratedInflow	01/01/2000	01:29:00	0.0002676409
3CHI002	01/01/2000	00:10:00	2.966	InfiltratedInflow	01/01/2000	01:30:00	0.0002629076
3CHI002	01/01/2000	00:20:00	3.696	InfiltratedInflow	01/01/2000	01:31:00	0.00025849
3CHI002	01/01/2000	00:30:00	4.976	InfiltratedInflow	01/01/2000	01:32:00	0.0002543668
3CHI002	01/01/2000	00:40:00	7.828	InfiltratedInflow	01/01/2000	01:33:00	0.0002505186
3CHI002	01/01/2000	00:50:00	19.966	InfiltratedInflow	01/01/2000	01:34:00	0.0002469269
3CHI002	01/01/2000	01:00:00	76.805	InfiltratedInflow	01/01/2000	01:35:00	0.0002435747
3CHI002	01/01/2000	01:10:00	22.777	InfiltratedInflow	01/01/2000	01:36:00	0.0002404461
3CHI002	01/01/2000	01:20:00	11.852	InfiltratedInflow	01/01/2000	01:37:00	0.000237526
3CHI002	01/01/2000	01:30:00	8.025	InfiltratedInflow	01/01/2000	01:38:00	0.0002348006
3CHI002	01/01/2000	01:40:00	6.096	InfiltratedInflow	01/01/2000	01:39:00	0.0002322569
3CHI002	01/01/2000	01:50:00	4.938	InfiltratedInflow	01/01/2000	01:40:00	0.0002298928
3CHI002	01/01/2000	02:00:00	4.165	InfiltratedInflow	01/01/2000	01:41:00	0.000227667
3CHI002	01/01/2000	02:10:00	3.613	InfiltratedInflow	01/01/2000	01:42:00	0.0002255989
3CHI002	01/01/2000	02:20:00	3.197	InfiltratedInflow	01/01/2000	01:43:00	0.0002236687
3CHI002	01/01/2000	02:30:00	2.873	InfiltratedInflow	01/01/2000	01:44:00	0.0002218673
3CHI002	01/01/2000	02:40:00	2.613	InfiltratedInflow	01/01/2000	01:45:00	0.0002201859
3CHI002	01/01/2000	02:50:00	2.4	InfiltratedInflow	01/01/2000	01:46:00	0.0002186166
3CHI002	01/01/2000	03:00:00	0	InfiltratedInflow	01/01/2000	01:47:00	0.000217152
;Rainfall (mm/hr)							
3CHI100	01/01/2000	00:00:00	5.339	InfiltratedInflow	01/01/2000	01:48:00	0.0002159785
3CHI100	01/01/2000	00:10:00	6.376	InfiltratedInflow	01/01/2000	01:49:00	0.0002145091
3CHI100	01/01/2000	00:20:00	7.977	InfiltratedInflow	01/01/2000	01:50:00	0.0002133183
3CHI100	01/01/2000	00:30:00	10.797	InfiltratedInflow	01/01/2000	01:51:00	0.0002122069
3CHI100	01/01/2000	00:40:00	17.136	InfiltratedInflow	01/01/2000	01:52:00	0.0002111690
3CHI100	01/01/2000	00:50:00	45.128	InfiltratedInflow	01/01/2000	01:53:00	0.0002102015
3CHI100	01/01/2000	01:00:00	178.107	InfiltratedInflow	01/01/2000	01:54:00	0.0002092979
3CHI100	01/01/2000	01:10:00	51.056	InfiltratedInflow	01/01/2000	01:55:00	0.0002084546
3CHI100	01/01/2000	01:20:00	26.163	InfiltratedInflow	01/01/2000	01:56:00	0.0002076575
3CHI100	01/01/2000	01:30:00	17.571	InfiltratedInflow	01/01/2000	01:57:00	0.0002069328
3CHI100	01/01/2000	01:40:00	13.277	InfiltratedInflow	01/01/2000	01:58:00	0.0002062472
3CHI100	01/01/2000	01:50:00	10.712	InfiltratedInflow	01/01/2000	01:59:00	0.0002056073
3CHI100	01/01/2000	02:00:00	9.008	InfiltratedInflow	01/01/2000	02:00:00	0.000205051
3CHI100	01/01/2000	02:10:00	7.793	InfiltratedInflow	01/01/2000	02:01:00	0.0002044525
3CHI100	01/01/2000	02:20:00	6.883	InfiltratedInflow	01/01/2000	02:02:00	0.0002039323
3CHI100	01/01/2000	02:30:00	6.174	InfiltratedInflow	01/01/2000	02:03:00	0.0002034467
3CHI100	01/01/2000	02:40:00	5.507	InfiltratedInflow	01/01/2000	02:04:00	0.0002029934
3CHI100	01/01/2000	02:50:00	5.142	InfiltratedInflow	01/01/2000	02:05:00	0.0002025704
3CHI100	01/01/2000	03:00:00	0	InfiltratedInflow	01/01/2000	02:06:00	0.0002021757
;Sum of Infiltrated flow from above the garage slab calculated from Infiltration graphs for							
S11 multiplied by the total pervious area above the garage.							
InfiltratedInflow	01/01/2000	00:01:00	3.711007E-05	InfiltratedInflow	01/01/2000	02:07:00	0.0002018072
InfiltratedInflow	01/01/2000	00:02:00	3.711007E-05	InfiltratedInflow	01/01/2000	02:08:00	0.0002014633
InfiltratedInflow	01/01/2000	00:03:00	3.711007E-05	InfiltratedInflow	01/01/2000	02:09:00	0.0001072742
InfiltratedInflow	01/01/2000	00:04:00	3.711007E-05	InfiltratedInflow	01/01/2000	02:10:00	6.819591E-05
InfiltratedInflow	01/01/2000	00:05:00	3.711007E-05	InfiltratedInflow	01/01/2000	02:11:00	6.67217E-05
InfiltratedInflow	01/01/2000	00:06:00	3.711007E-05	InfiltratedInflow	01/01/2000	02:12:00	6.639183E-05
InfiltratedInflow	01/01/2000	00:07:00	3.711007E-05	InfiltratedInflow	01/01/2000	02:13:00	6.631498E-05
InfiltratedInflow	01/01/2000	00:08:00	3.711007E-05	InfiltratedInflow	01/01/2000	02:14:00	6.62969E-05
InfiltratedInflow	01/01/2000	00:09:00	3.711007E-05	InfiltratedInflow	01/01/2000	02:15:00	6.629264E-05
InfiltratedInflow	01/01/2000	00:10:00	4.418645E-05	InfiltratedInflow	01/01/2000	02:16:00	6.629164E-05
InfiltratedInflow	01/01/2000	00:11:00	4.418645E-05	InfiltratedInflow	01/01/2000	02:17:00	6.62914E-05
InfiltratedInflow	01/01/2000	00:12:00	4.418645E-05	InfiltratedInflow	01/01/2000	02:18:00	6.629134E-05
InfiltratedInflow	01/01/2000	00:13:00	4.418645E-05	InfiltratedInflow	01/01/2000	02:19:00	6.629133E-05
InfiltratedInflow	01/01/2000	00:14:00	4.418645E-05	InfiltratedInflow	01/01/2000		

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

InfiltratedInflow	01/01/2000	03:04:00	5.458821E-07	InfiltratedInflow	01/01/2000	05:33:00	0
InfiltratedInflow	01/01/2000	03:05:00	3.720303E-07	InfiltratedInflow	01/01/2000	05:34:00	0
InfiltratedInflow	01/01/2000	03:06:00	2.668294E-07	InfiltratedInflow	01/01/2000	05:35:00	0
InfiltratedInflow	01/01/2000	03:07:00	1.989971E-07	InfiltratedInflow	01/01/2000	05:36:00	1.673315E-09
InfiltratedInflow	01/01/2000	03:08:00	1.530554E-07	InfiltratedInflow	01/01/2000	05:37:00	0
InfiltratedInflow	01/01/2000	03:09:00	1.206954E-07	InfiltratedInflow	01/01/2000	05:38:00	0
InfiltratedInflow	01/01/2000	03:10:00	9.71604E-08	InfiltratedInflow	01/01/2000	05:39:00	0
InfiltratedInflow	01/01/2000	03:11:00	7.958157E-08	InfiltratedInflow	01/01/2000	05:40:00	0
InfiltratedInflow	01/01/2000	03:12:00	6.615256E-08	InfiltratedInflow	01/01/2000	05:41:00	0
InfiltratedInflow	01/01/2000	03:13:00	5.5694E-08	InfiltratedInflow	01/01/2000	05:42:00	0
InfiltratedInflow	01/01/2000	03:14:00	4.741166E-08	InfiltratedInflow	01/01/2000	05:43:00	0
InfiltratedInflow	01/01/2000	03:15:00	4.075622E-08	InfiltratedInflow	01/01/2000	05:44:00	0
InfiltratedInflow	01/01/2000	03:16:00	3.53877E-08	InfiltratedInflow	01/01/2000	05:45:00	0
InfiltratedInflow	01/01/2000	03:17:00	3.087828E-08	InfiltratedInflow	01/01/2000	05:46:00	0
InfiltratedInflow	01/01/2000	03:18:00	2.716789E-08	InfiltratedInflow	01/01/2000	05:47:00	0
InfiltratedInflow	01/01/2000	03:19:00	2.405291E-08	InfiltratedInflow	01/01/2000	05:48:00	1.689672E-09
InfiltratedInflow	01/01/2000	03:20:00	2.14159E-08	InfiltratedInflow	01/01/2000	05:49:00	0
InfiltratedInflow	01/01/2000	03:21:00	1.916655E-08	InfiltratedInflow	01/01/2000	05:50:00	0
InfiltratedInflow	01/01/2000	03:22:00	1.723456E-08	InfiltratedInflow	01/01/2000	05:51:00	0
InfiltratedInflow	01/01/2000	03:23:00	1.556459E-08	InfiltratedInflow	01/01/2000	05:52:00	0
InfiltratedInflow	01/01/2000	03:24:00	1.411267E-08	InfiltratedInflow	01/01/2000	05:53:00	0
InfiltratedInflow	01/01/2000	03:25:00	1.284352E-08	InfiltratedInflow	01/01/2000	05:54:00	0
InfiltratedInflow	01/01/2000	03:26:00	1.172859E-08	InfiltratedInflow	01/01/2000	05:55:00	0
InfiltratedInflow	01/01/2000	03:27:00	1.074458E-08	InfiltratedInflow	01/01/2000	05:56:00	0
InfiltratedInflow	01/01/2000	03:28:00	9.872395E-09	InfiltratedInflow	01/01/2000	05:57:00	0
InfiltratedInflow	01/01/2000	03:29:00	9.096196E-09	InfiltratedInflow	01/01/2000	05:58:00	0
InfiltratedInflow	01/01/2000	03:30:00	8.402821E-09	InfiltratedInflow	01/01/2000	05:59:00	0
InfiltratedInflow	01/01/2000	03:31:00	7.781243E-09	InfiltratedInflow	01/01/2000	06:00:00	0
InfiltratedInflow	01/01/2000	03:32:00	7.222181E-09				
InfiltratedInflow	01/01/2000	03:33:00	6.717776E-09				
InfiltratedInflow	01/01/2000	03:34:00	6.261347E-09				
InfiltratedInflow	01/01/2000	03:35:00	5.84718E-09				
InfiltratedInflow	01/01/2000	03:36:00	5.470376E-09				
InfiltratedInflow	01/01/2000	03:37:00	5.12671E-09				
InfiltratedInflow	01/01/2000	03:38:00	4.812527E-09				
InfiltratedInflow	01/01/2000	03:39:00	4.524653E-09				
InfiltratedInflow	01/01/2000	03:40:00	4.260322E-09				
InfiltratedInflow	01/01/2000	03:41:00	4.017116E-09				
InfiltratedInflow	01/01/2000	03:42:00	3.79291E-09				
InfiltratedInflow	01/01/2000	03:43:00	3.585841E-09				
InfiltratedInflow	01/01/2000	03:44:00	3.394259E-09				
InfiltratedInflow	01/01/2000	03:45:00	3.216707E-09				
InfiltratedInflow	01/01/2000	03:46:00	3.05189E-09				
InfiltratedInflow	01/01/2000	03:47:00	2.898658E-09				
InfiltratedInflow	01/01/2000	03:48:00	2.755984E-09				
InfiltratedInflow	01/01/2000	03:49:00	2.622951E-09				
InfiltratedInflow	01/01/2000	03:50:00	2.498738E-09				
InfiltratedInflow	01/01/2000	03:51:00	2.382607E-09				
InfiltratedInflow	01/01/2000	03:52:00	2.273894E-09				
InfiltratedInflow	01/01/2000	03:53:00	2.172E-09				
InfiltratedInflow	01/01/2000	03:54:00	2.076386E-09				
InfiltratedInflow	01/01/2000	03:55:00	1.986563E-09				
InfiltratedInflow	01/01/2000	03:56:00	1.902086E-09				
InfiltratedInflow	01/01/2000	03:57:00	1.822555E-09				
InfiltratedInflow	01/01/2000	03:58:00	1.747602E-09				
InfiltratedInflow	01/01/2000	03:59:00	1.676895E-09				
InfiltratedInflow	01/01/2000	04:00:00	0				
InfiltratedInflow	01/01/2000	04:01:00	1.157155E-09				
InfiltratedInflow	01/01/2000	04:02:00	0				
InfiltratedInflow	01/01/2000	04:03:00	2.918146E-09				
InfiltratedInflow	01/01/2000	04:04:00	0				
InfiltratedInflow	01/01/2000	04:05:00	7.03723E-09				
InfiltratedInflow	01/01/2000	04:06:00	0				
InfiltratedInflow	01/01/2000	04:07:00	2.510726E-09				
InfiltratedInflow	01/01/2000	04:08:00	0				
InfiltratedInflow	01/01/2000	04:09:00	1.33648E-09				
InfiltratedInflow	01/01/2000	04:10:00	0				
InfiltratedInflow	01/01/2000	04:11:00	2.178706E-09				
InfiltratedInflow	01/01/2000	04:12:00	0				
InfiltratedInflow	01/01/2000	04:13:00	0.035454E-09				
InfiltratedInflow	01/01/2000	04:14:00	0				
InfiltratedInflow	01/01/2000	04:15:00	1.905051E-09				
InfiltratedInflow	01/01/2000	04:16:00	0				
InfiltratedInflow	01/01/2000	04:17:00	7.786051E-09				
InfiltratedInflow	01/01/2000	04:18:00	0				
InfiltratedInflow	01/01/2000	04:19:00	1.677204E-09				
InfiltratedInflow	01/01/2000	04:20:00	0				
InfiltratedInflow	01/01/2000	04:21:00	0				
InfiltratedInflow	01/01/2000	04:22:00	2.331285E-09				
InfiltratedInflow	01/01/2000	04:23:00	0				
InfiltratedInflow	01/01/2000	04:24:00	0				
InfiltratedInflow	01/01/2000	04:25:00	1.133276E-09				
InfiltratedInflow	01/01/2000	04:26:00	0				
InfiltratedInflow	01/01/2000	04:27:00	0				
InfiltratedInflow	01/01/2000	04:28:00	1.958036E-09				
InfiltratedInflow	01/01/2000	04:29:00	0				
InfiltratedInflow	01/01/2000	04:30:00	0				
InfiltratedInflow	01/01/2000	04:31:00	1.802308E-09				
InfiltratedInflow	01/01/2000	04:32:00	0				
InfiltratedInflow	01/01/2000	04:33:00	0				
InfiltratedInflow	01/01/2000	04:34:00	1.663384E-09				
InfiltratedInflow	01/01/2000	04:35:00	0				
InfiltratedInflow	01/01/2000	04:36:00	0				
InfiltratedInflow	01/01/2000	04:37:00	0				
InfiltratedInflow	01/01/2000	04:38:00	2.026598E-09				
InfiltratedInflow	01/01/2000	04:39:00	0				
InfiltratedInflow	01/01/2000	04:40:00	0				
InfiltratedInflow	01/01/2000	04:41:00	0				
InfiltratedInflow	01/01/2000	04:42:00	1.83461E-09				
InfiltratedInflow	01/01/2000	04:43:00	0				
InfiltratedInflow	01/01/2000	04:44:00	0				
InfiltratedInflow	01/01/2000	04:45:00	0				
InfiltratedInflow	01/01/2000	04:46:00	1.667155E-09				
InfiltratedInflow	01/01/2000	04:47:00	0				
InfiltratedInflow	01/01/2000	04:48:00	0				
InfiltratedInflow	01/01/2000	04:49:00	0				
InfiltratedInflow	01/01/2000	04:50:00	0				
InfiltratedInflow	01/01/2000	04:51:00	1.879599E-09				
InfiltratedInflow	01/01/2000	04:52:00	0				
InfiltratedInflow	01/01/2000	04:53:00	0				
InfiltratedInflow	01/01/2000	04:54:00	0				
InfiltratedInflow	01/01/2000	04:55:00	0				
InfiltratedInflow	01/01/2000	04:56:00	1.683509E-09				
InfiltratedInflow	01/01/2000	04:57:00	0				
InfiltratedInflow	01/01/2000	04:58:00	0				
InfiltratedInflow	01/01/2000	04:59:00	0				
InfiltratedInflow	01/01/2000	05:00:00	0				
InfiltratedInflow	01/01/2000	05:01:00	0				
InfiltratedInflow	01/01/2000	05:02:00	1.799732E-09				
InfiltratedInflow	01/01/2000	05:03:00	0				
InfiltratedInflow	01/01/2000	05:04:00	0				
InfiltratedInflow	01/01/2000	05:05:00	0				
InfiltratedInflow	01/01/2000	05:06:00	0				
InfiltratedInflow	01/01/2000	05:07:00	0				
InfiltratedInflow	01/01/2000	05:08:00	0				
InfiltratedInflow	01/01/2000	05:09:00	1.843631E-09				
InfiltratedInflow	01/01/2000	05:10:00	0				
InfiltratedInflow	01/01/2000	05:11:00	0				
InfiltratedInflow	01/01/2000	05:12:00	0				
InfiltratedInflow	01/01/2000	05:13:00	0				
InfiltratedInflow	01/01/2000	05:14:00	0				
InfiltratedInflow	01/01/2000	05:15:00	0				
InfiltratedInflow	01/01/2000	05:16:00	0				
InfiltratedInflow	01/01/2000	05:17:00	1.827837E-09				
InfiltratedInflow	01/01/2000	05:18:00	0				
InfiltratedInflow	01/01/2000	05:19:00	0				
InfiltratedInflow	01/01/2000	05:20:00	0				
InfiltratedInflow	01/01/2000	05:21:00	0				
InfiltratedInflow	01/01/2000	05:22:00	0				
InfiltratedInflow	01/01/2000	05:23:00	0				
InfiltratedInflow	01/01/2000	05:24:00	0				
InfiltratedInflow	01/01/2000	05:25:00	0				
InfiltratedInflow	01/01/2000	05:26:00	1.766506E-09				
InfiltratedInflow	01/01/2000	05:27:00	0				
InfiltratedInflow	01/01/2000	05:28:00	0				
InfiltratedInflow	01/01/2000	05:29:00	0				
InfiltratedInflow	01/01/2000	05:30:00	0				
InfiltratedInflow	01/01/2000	05:31:00	0				
InfiltratedInflow	01/01/2000	05:32:00	0				

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

[TAGS]
Subcatch  S1      Ramp
Subcatch  S5      Building
Subcatch  S6      ParkingLot
Subcatch  S7      ParkingLot
Subcatch  S8      Building
Subcatch  S9      ParkingLot
Node       St_UnGrd Underground_Storage

[MAP]
DIMENSIONS      381280,91645      5032948,93205      381379,86255      5033068,41295
UNITS            Meters

[COORDINATES]
;;Node          X-Coord          Y-Coord
-----
OF4             381364.593        5032973.357
OF7             381346.502        5032963.916
STUB15         381335.776        5032954.363
STUB16         381319.979        5032958.277
CB110          381293.102        5033002.513
CB111          381307.131        5032987.6
CB112          381319.643        5032961.536
CB113          381348.344        5032974.068
CB114          381332.566        5032992.996
CB115          381332.827        5033018.906
CB116          381338.815        5033005.189
CB117          381344.774        5032991.539
CB118          381359.473        5032997.774
Roof_1         381325.164        5032977.273
Roof_2         381361.335        5033013.684
St_UnGrd       381329.806        5032972.84

[VERTICES]
;;Link          X-Coord          Y-Coord
-----
W1             381322.829        5032965.271
W3             381343.656        5032974.514
W5             381295.919        5033002.386
W5             381309.233        5032988.935
W5             381320.071        5033005.693
OL6            381323.041        5033005.693

[POLYGONS]
;;Subcatchment X-Coord          Y-Coord
-----
S1             381344.215        5032984.464
S1             381347.856        5032976.123
S1             381337.733        5032971.705
S1             381334.493        5032979.128
S1             381341.864        5032982.351
S1             381344.215        5032984.464
S10            381360.442        5032986.777
S10            381355.738        5032997.554
S10            381357.523        5032998.333
S10            381358.678        5032998.837
S10            381359.142        5032997.774
S10            381369.264        5033002.193
S10            381368.8        5033003.256
S10            381374.019
```

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

*****	Volume	Depth
Runoff Quantity Continuity	hectare-m	mm
*****	-----	-----
Total Precipitation	0.016	31.879
Evaporation Loss	0.000	0.000
Infiltration Loss	0.005	9.717
Surface Runoff	0.011	21.078
Final Storage	0.001	1.137
Continuity Error (%)	-0.103	

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

*****			Volume	Volume			
Flow Routing Continuity			hectare-m	10^6 ltr			
*****			-----	-----			
Dry Weather Inflow			0.000	0.000			
Wet Weather Inflow			0.011	0.107			
Groundwater Inflow			0.000	0.000			
RDII Inflow			0.000	0.000			
External Inflow			0.000	0.002			
External Outflow			0.011	0.109			
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				

Highest Continuity Errors							

Node CB113 (18.32%)							

Time-Step Critical Elements							

None							

Highest Flow Instability Indexes							

Link OL7 (7)							

Most Frequent Nonconverging Nodes							

Convergence obtained at all time steps.							

Routing Time Step Summary							

Minimum Time Step :			4.50 sec				
Average Time Step :			5.00 sec				
Maximum Time Step :			5.00 sec				
% of Time in Steady State :			0.00				
Average Iterations per Step :			2.00				
% of Steps Not Converging :			0.00				
Time Step Frequencies :							
5.000 - 3.155 sec :			100.00 %				
3.155 - 1.991 sec :			0.00 %				
1.991 - 1.256 sec :			0.00 %				
1.256 - 0.792 sec :			0.00 %				
0.792 - 0.500 sec :			0.00 %				

Subcatchment Runoff Summary							

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

S1		31.88	0.00	0.00		30.36	0.00
30.36	0.00	0.952					
S10		31.88	0.00	0.00	30.55	2.67	1.20
1.20	0.00	0.038					
S11		31.88	0.00	0.00	28.60	5.71	3.00
3.00	0.00	0.094					
S2		31.88	0.00	0.00	31.75	0.00	0.13
0.13	0.00	0.004					
S3		31.88	0.00	0.00	28.56	5.40	3.07
3.07	0.00	0.096					
S4		31.88	0.00	0.00	30.56	2.58	1.20
1.20	0.00	0.038					
S5		31.88	0.00	0.00	0.00	30.35	0.00
30.35	0.03	0.952					
S6		31.88	0.00	0.00	10.52	20.27	0.07
20.34	0.02	0.638					
S7		31.88	0.00	0.00	3.01	27.44	0.05
27.49	0.01	0.862					
S8		31.88	0.00	0.00	0.00	30.35	0.00
30.35	0.03	0.952					
S9		31.88	0.00	0.00	2.01	28.40	0.04
28.44	0.02	0.892					

Node Depth Summary							

Node	Type	Average	Maximum	Maximum	Time of Max	Reported	
		Depth	Depth	HGL	Occurrence	Max Depth	
		Meters	Meters	Meters	days hr:min	Meters	
OF4	OUTFALL	0.48	0.48	81.11	0 00:00	0.48	
OF7	OUTFALL	0.48	0.48	81.11	0 00:00	0.48	
STUB15	OUTFALL	0.48	0.48	81.11	0 00:00	0.48	
STUB16	OUTFALL	0.63	0.63	81.28	0 00:00	0.63	
CB110	STORAGE	0.00	0.03	83.78	0 01:10	0.03	
CB111	STORAGE	0.00	0.03	83.62	0 01:11	0.03	
CB112	STORAGE	0.00	0.09	83.37	0 01:11	0.09	
CB113	STORAGE	0.00	0.00	83.55	0 01:14	0.00	
CB114	STORAGE	0.00	0.01	85.31	0 01:10	0.01	
CB115	STORAGE	0.00	0.02	85.27	0 01:10	0.02	
CB116	STORAGE	0.00	0.02	85.22	0 01:10	0.02	
CB117	STORAGE	0.00	0.02	85.17	0 01:10	0.02	
CB118	STORAGE	0.00	0.00	85.22	0 01:10	0.00	
Roof_1	STORAGE	0.01	0.03	96.38	0 01:40	0.03	
Roof_2	STORAGE	0.01	0.03	96.38	0 01:40	0.03	
St_UnGrd	STORAGE	0.00	0.06	81.86	0 01:10	0.06	

Node Inflow Summary							

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

OF4	OUTFALL	0.000	0.002	0 00:51	0	0.0293	
0.000							
OF7	OUTFALL	0.000	0.029	0 01:02	0	0.0495	
0.000							
STUB15	OUTFALL	0.000	0.002	0 00:51	0	0.0289	
0.000							
STUB16	OUTFALL	0.000	0.002	0 01:11	0	0.00119	
0.000							
CB110	STORAGE	0.001	0.001	0 01:10	0.000515	0.000515	
-0.097							

0.658	STORAGE	0.000	0.001	0	01:10	0	0.000515
CB112	STORAGE	0.002	0.002	0	01:10	0.000669	0.00119
0.004							
CB113	STORAGE	0.000	0.000	0	01:10	5.84e-06	5.84e-06
1.070 ltr							
CB114	STORAGE	0.003	0.003	0	01:10	0.00142	0.00142
-0.001							
CB115	STORAGE	0.012	0.012	0	01:10	0.0163	0.0163
-0.013							
CB116	STORAGE	0.008	0.008	0	01:10	0.0114	0.0114
-0.017							
CB117	STORAGE	0.011	0.011	0	01:10	0.0155	0.0155
-0.013							
CB118	STORAGE	0.000	0.000	0	01:10	0.000166	0.000166
0.006							
Roof_1	STORAGE	0.020	0.020	0	01:10	0.0289	0.0289
-0.002							
Roof_2	STORAGE	0.021	0.021	0	01:10	0.0293	0.0293
-0.002							
St_UnGrd	STORAGE	0.003	0.037	0	01:10	0.00465	0.0495
0.005							

Node Surcharge Summary							

No nodes were surcharged.							

Node Flooding Summary							

No nodes were flooded.							

Storage Volume Summary							

	Average	Avg	Evap	Exfil	Maximum	Max	Time of Max
Maximum	Volume	Pcnt	Pcnt	Pcnt	Volume	Pcnt	Occurrence
Outflow	1000 m³	Full	Loss	Loss	1000 m³	Full	days hr:min
Storage Unit							
CMS							
-----	-----	-----	-----	-----	-----	-----	-----
CB110	0.000	0.0	0.0	0.0	0.000	0.0	0 01:10
0.001							
CB111	0.000	0.1	0.0	0.0	0.000	1.4	0 01:11
0.001							
CB112	0.000	0.0	0.0	0.0	0.000	1.1	0 01:11
0.002							
CB113	0.000	0.0	0.0	0.0	0.000	0.1	0 01:14
0.000							
CB114	0.000	0.0	0.0	0.0	0.000	0.2	0 01:10
0.003							
CB115	0.000	0.0	0.0	0.0	0.000	0.7	0 01:10
0.012							
CB116	0.000	0.0	0.0	0.0	0.000	0.3	0 01:10
0.008							
CB117	0.000	0.1	0.0	0.0	0.000	2.3	0 01:10
0.011							
CB118	0.000	0.0	0.0	0.0	0.000	0.0	0 01:10
0.000							
Roof_1	0.007	6.9	0.0	0.0	0.017	17.6	0 01:40
0.002							
Roof_2	0.007	7.1	0.0	0.0	0.017	17.7	0 01:40
0.002							
St_UnGrd	0.000	0.1	0.0	0.0	0.003	5.6	0 01:10
0.029							

Outfall Loading Summary							

	Flow	Avg	Max	Total
Outfall Node	Freq	Flow	Flow	Volume
	Pcnt	CMS	CMS	10^6 ltr
-----	-----	-----	-----	-----
OF4	74.27	0.002	0.002	0.029
OF7	58.74	0.004	0.029	0.049
STUB15	73.34	0.002	0.002	0.029
STUB16	6.60	0.001	0.002	0.001
System	53.23	0.008	0.035	0.109

Link Flow Summary							

		Maximum	Time of Max	Maximum	Max/	Max/
Link	Type	[Flow]	Occurrence	[Veloc]	Full	Full
		CMS	days hr:min	m/sec	Flow	Depth
C1	CONDUIT	0.001	0 01:11	0.47	0.08	0.19
C3	CONDUIT	0.000	0 01:12	0.07	0.00	0.03
C5	CONDUIT	0.001	0 01:10	0.61	0.10	0.19
W1	WEIR	0.000	0 00:00			0.00
W2	WEIR	0.000	0 00:00			0.00
W3	WEIR	0.000	0 00:00			0.00
W4	WEIR	0.000	0 00:00			0.00
W5	WEIR	0.000	0 00:00			0.00
C2	DUMMY	0.002	0 01:11			
OL1	DUMMY	0.012	0 01:10			
OL2	DUMMY	0.008	0 01:10			
OL3	DUMMY	0.011	0 01:10			
OL4	DUMMY	0.002	0 00:51			
OL5	DUMMY	0.002	0 00:51			
OL6	DUMMY	0.003	0 01:10			
OL7	DUMMY	0.029	0 01:02			
OL8	DUMMY	0.000	0 01:10			

Flow Classification Summary										

	Adjusted	-----		Fraction of Time in Flow Class						-----	
Conduit	/Actual	Dry	Up	Dry	Sub	Down	Norm	Inlet			
	Length	Dry	Dry	Dry	Crit	Crit	Crit	Crit	Ltd	Ctrl	
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
C1	1.00	0.19	0.00	0.00	0.00	0.00	0.00	0.81	0.00	0.00	
C3	1.00	0.19	0.00	0.00	0.01	0.00	0.00	0.80	0.00	0.00	
C5	1.00	0.19	0.00	0.00	0.80	0.01	0.00	0.00	0.80	0.00	

Conduit Surcharge Summary										

No conduits were surcharged.										
Analysis begun on: Thu Oct 10 10:09:49 2024										
Analysis ended on: Thu Oct 10 10:09:49 2024										
Total elapsed time: < 1 sec										

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

Post-Development 3-hour Chicago 1:100-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	5					
RULE_STEP	00:00:00					
INERTIAL_DAMPING	PARTIAL					
NORMAL_FLOW_LIMITED	BOTH					
FORCE_MAIN_EQUATION	H-W					
VARIABLE_STEP	0.75					
LENGHTENING_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]						
;;Name	Rain Gage	Outlet	Area	%Imperv	Width	%Slope
CurbLen	SnowPack					
;;						
S1	Rainfall	St_UnGrd	0.0091	100	6.1	15
S10	Rainfall	CB118	0.0138	8.79	28.998	1
S11	Rainfall	CB114	0.0473	18.805	70.001	2
S2	Rainfall	CB113	0.0044	0.002	4.3	1.9
S3	Rainfall	CB112	0.0218	17.802	75	1
S4	Rainfall	CB110	0.043	8.51	52.001	3.5
S5	Rainfall	Roof_1	0.0952	99.998	104.996	1
S6	Rainfall	CB115	0.0803	66.775	45.001	2.5
S7	Rainfall	CB116	0.0416	90.416	28.601	2.7
S8	Rainfall	Roof_2	0.0965	100	105.005	1
S9	Rainfall	CB117	0.0544	93.568	50	2.4
[SUBAREAS]						
;;Subcatchment	N-Imperv	N-Perv	S-Imperv	S-Perv	PctZero	RouteTo
PctRouted						
;;						
--						
S1	0.013	0.25	1.57	4.67	0	OUTLET
S10	0.013	0.25	1.57	4.67	0	PERVIOUS 100
S11	0.013	0.25	1.57	4.67	0	PERVIOUS 100
S2	0.013	0.25	1.57	4.67	0	OUTLET
S3	0.013	0.25	1.57	4.67	0	PERVIOUS 100
S4	0.013	0.25	1.57	4.67	0	PERVIOUS 100
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
S8	0.013	0.25	1.57	4.67	0	OUTLET
S9	0.013	0.25	1.57	4.67	0	OUTLET
[INFILTRATION]						
;;Subcatchment	Param1	Param2	Param3	Param4	Param5	
;;						
S1	76.2	13.2	4.14	7	0	
S10	76.2	13.2	4.14	7	0	
S11	76.2	13.2	4.14	7	0	
S2	76.2	13.2	4.14	7	0	
S3	76.2	13.2	4.14	7	0	
S4	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	
S8	76.2	13.2	4.14	7	0	
S9	76.2	13.2	4.14	7	0	
[OUTFALLS]						
;;Name	Elevation	Type	Stage Data	Gated	Route To	
;;						
OF4	80.628	FIXED	81.11	NO		
OF7	80.628	FIXED	81.11	NO		
STUB15	80.628	FIXED	81.11	NO		
STUB16	80.646	FIXED	81.28	NO		
[STORAGE]						
;;Name	Elev.	MaxDepth	InitDepth	Shape	Curve Name/Params	
SurDepth	Ps1	Ksat	IMD			
;;						
CB110	83.75	1.9	0	TABULAR	CB110	0
0						
CB111	83.59	2.01	0	TABULAR	CB111	0
0						
CB112	83.28	2.12	0	TABULAR	CB112	0
0						
CB113	83.55	1.7	0	TABULAR	CB113	0
0						
CB114	85.3	0.25	0	TABULAR	CB114	0
0						
CB115	85.25	0.31	0	TABULAR	CB115	0
0						
CB116	85.2	0.4	0	TABULAR	CB116	0
0						
CB117	85.15	0.15	0	TABULAR	CB117	0
0						
CB118	85.22	0.18	0	TABULAR	CB118	0
0						
Roof_1	96.35	0.15	0	FUNCTIONAL	0	635
0						
Roof_2	96.35	0.15	0	FUNCTIONAL	0	643
0						
St_UnGrd	81.8	1	0	FUNCTIONAL	0	49
0						
[CONDUITS]						
;;Name	From Node	To Node	Length	Roughness	InOffset	
OutOffset	InitFlow	MaxFlow				
;;						

	0.08	CB111		CB112		28.913	0.013	83.59	83.34
C3		CB113		CB112		31.317	0.013	83.55	83.36
C5	0.04	CB110		CB111		20.475	0.013	83.75	83.59
0									
[WEIRS]									
;;Name		From Node		To Node		Type		CrestHt	
EndCoeff	EndCoeff	Surcharge		RoadWidth	RoadSurf	Coeff. Curve		Qcoeff	Gated
;;									
W1		CB115		CB116		TRANSVERSE		85.45	
0	0	NO							
W2		CB116		CB117		TRANSVERSE		85.35	
0	0	NO							
W3		CB112		CB113		TRANSVERSE		85.38	
0	0	NO							
W4		CB114		CB115		TRANSVERSE		85.5	
0	0	NO							
W5		CB110		CB112		TRANSVERSE		85.6	
0	0	NO							
[OUTLETS]									
;;Name		From Node		To Node		Offset		Type	
Qtable/Qcoeff		Qexpon	Gated						
;;									
C2		CB112		STUB16		83.28		TABULAR/HEAD	
Vortex_ICD_95		NO							
OL1		CB115		St_UnGrd		85.25		TABULAR/HEAD	ZURN_Z150F-
6NH		NO							
OL2		CB116		St_UnGrd		85.2		TABULAR/HEAD	ZURN_Z150F-
6NH		NO							
OL3		CB117		St_UnGrd		85.15		TABULAR/HEAD	ZURN_Z150F-
6NH		NO							
OL4		Roof_1		STUB15		96.35		TABULAR/HEAD	O_Roof1
NO									
OL5		Roof_2		OF4		96.35		TABULAR/HEAD	O_Roof1
NO									
OL6		CB114		St_UnGrd		85.3		TABULAR/HEAD	ZURN_Z150F-
6NH		NO							
OL7		St_UnGrd		OF7		81.8		TABULAR/HEAD	O_St_UnGrd
NO									
OL8		CB118		St_UnGrd		85.22		TABULAR/HEAD	ZURN_Z150F-
6NH		NO							
[XSECTIONS]									
;;Link		Shape		Geom1		Geom2		Geom3	
Culvert								Geom4	Barrels
;;									
C1		CIRCULAR		0.15		0		0	1
C3		CIRCULAR		0.15		0		0	1
C5		CIRCULAR		0.15		0		0	1
W1		RECT_OPEN		0.11		17.1		0	
W2		RECT_OPEN		0.25		17.1		0	
W3		RECT_OPEN		0.02		4.58		0	
W4		RECT_OPEN		0.05		7		0	
W5		RECT_OPEN		0.05		3.487		0	
[LOSSES]									
;;Link		Kentry		Kexit		Kavg		Flap Gate	Seepage
;;									
[INFLOWS]									
;;Node		Constituent		Time Series		Type		Mfactor	Sfactor
Pattern								Baseline	
;;									
St_UnGrd		FLOW		InfiltratedInflow		FLOW		1.0	1
									0
[CURVES]									
;;Name		Type		X-Value		Y-Value			
;;									
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			
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		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			

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MHF_IPEX_TYPE_D	1.6	0.0614	Vortex_ICD_55	1	0.0027
MHF_IPEX_TYPE_D	1.8	0.0651	Vortex_ICD_55	1.2	0.003
MHF_IPEX_TYPE_D	2	0.0687	Vortex_ICD_55	1.4	0.0032
MHF_IPEX_TYPE_D	2.5	0.0768	Vortex_ICD_55	1.6	0.0034
MHF_IPEX_TYPE_D	3	0.0841	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 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	0.0025			
O_RooF2	0.15	0.0025			
O_St_UnGrd	Rating	0			
O_St_UnGrd	0.01	0.029			
O_St_UnGrd	1	0.029			
;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			
;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	0.006			
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			
Vortex_ICD_80	0.7	0.0048			
Vortex_ICD_80	0.8	0.0051			
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	0.0068			
Vortex_ICD_80	1.6	0.0072			
Vortex_ICD_80	1.8	0.0077			
Vortex_ICD_80	2	0.0081			
Vortex_ICD_80	2.5	0.009			
Vortex_ICD_80	3	0.0099			

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;Tempest Rating Curve for Vortex ICD 95, No grate allowance				InfiltratedInflow	01/01/2000	01:00:00	0.0004344156
Vortex_ICD_95	Rating	0	0	InfiltratedInflow	01/01/2000	01:01:00	0.0004185629
Vortex_ICD_95	0.1	0.0026		InfiltratedInflow	01/01/2000	01:02:00	0.0004037672
Vortex_ICD_95	0.2	0.0036		InfiltratedInflow	01/01/2000	01:03:00	0.0003895979
Vortex_ICD_95	0.3	0.0044		InfiltratedInflow	01/01/2000	01:04:00	0.0003770694
Vortex_ICD_95	0.4	0.0051		InfiltratedInflow	01/01/2000	01:05:00	0.0003650402
Vortex_ICD_95	0.5	0.0057		InfiltratedInflow	01/01/2000	01:06:00	0.0003538131
Vortex_ICD_95	0.6	0.0062		InfiltratedInflow	01/01/2000	01:07:00	0.0003433344
Vortex_ICD_95	0.7	0.0067		InfiltratedInflow	01/01/2000	01:08:00	0.0003335544
Vortex_ICD_95	0.8	0.0071		InfiltratedInflow	01/01/2000	01:09:00	0.0003244265
Vortex_ICD_95	0.9	0.0076		InfiltratedInflow	01/01/2000	01:10:00	0.0003159071
Vortex_ICD_95	1.0	0.008		InfiltratedInflow	01/01/2000	01:11:00	0.0003079558
Vortex_ICD_95	1.2	0.0087		InfiltratedInflow	01/01/2000	01:12:00	0.0003005346
Vortex_ICD_95	1.4	0.0094		InfiltratedInflow	01/01/2000	01:13:00	0.0002936082
Vortex_ICD_95	1.6	0.0101		InfiltratedInflow	01/01/2000	01:14:00	0.0002871436
Vortex_ICD_95	1.8	0.0107		InfiltratedInflow	01/01/2000	01:15:00	0.0002811101
Vortex_ICD_95	2	0.0113		InfiltratedInflow	01/01/2000	01:16:00	0.0002754788
Vortex_ICD_95	2.5	0.0126		InfiltratedInflow	01/01/2000	01:17:00	0.0002702229
Vortex_ICD_95	3	0.0138		InfiltratedInflow	01/01/2000	01:18:00	0.0002653175
;From Zurn Manual RD178				InfiltratedInflow	01/01/2000	01:19:00	0.0002607392
ZURN_Z150F-6NH	Rating	0	0	InfiltratedInflow	01/01/2000	01:20:00	0.0002564661
ZURN_Z150F-6NH	0.0127	0.00503838308477861		InfiltratedInflow	01/01/2000	01:21:00	0.0002524779
ZURN_Z150F-6NH	0.0257	0.0132420013231177		InfiltratedInflow	01/01/2000	01:22:00	0.0002487556
ZURN_Z150F-6NH	0.0384	0.0234992054543888		InfiltratedInflow	01/01/2000	01:23:00	0.0002452815
ZURN_Z150F-6NH	0.0508	0.0357128365761305		InfiltratedInflow	01/01/2000	01:24:00	0.000242039
ZURN_Z150F-6NH	0.0765	0.0425019726111045		InfiltratedInflow	01/01/2000	01:25:00	0.0002390127
ZURN_Z150F-6NH	0.1024	0.0433196215564931		InfiltratedInflow	01/01/2000	01:26:00	0.0002361882
				InfiltratedInflow	01/01/2000	01:27:00	0.000233552
CB110	Storage	0	0.073	InfiltratedInflow	01/01/2000	01:28:00	0.0002310915
CB110	1.55	0.073		InfiltratedInflow	01/01/2000	01:29:00	0.0002287951
CB110	1.85	120.85		InfiltratedInflow	01/01/2000	01:30:00	0.0002266519
CB110	1.9	120.85		InfiltratedInflow	01/01/2000	01:31:00	0.0002246515
				InfiltratedInflow	01/01/2000	01:32:00	0.0002227845
CB111	Storage	0	0.073	InfiltratedInflow	01/01/2000	01:33:00	0.0002210419
CB111	2.01	0.073		InfiltratedInflow	01/01/2000	01:34:00	0.0002194156
				InfiltratedInflow	01/01/2000	01:35:00	0.0002178977
CB112	Storage	0	0.36	InfiltratedInflow	01/01/2000	01:36:00	0.0002164805
CB112	1.92	0.36		InfiltratedInflow	01/01/2000	01:37:00	0.0002151587
CB112	2.11	19.13		InfiltratedInflow	01/01/2000	01:38:00	0.0002139246
CB112	2.12	19.13		InfiltratedInflow	01/01/2000	01:39:00	0.0002127728
				InfiltratedInflow	01/01/2000	01:40:00	0.0002116978
CB113	Storage	0	0.073	InfiltratedInflow	01/01/2000	01:41:00	0.0002106944
CB113	1.6	0.073		InfiltratedInflow	01/01/2000	01:42:00	0.000209758
CB113	1.7	3.62		InfiltratedInflow	01/01/2000	01:43:00	0.000208884
				InfiltratedInflow	01/01/2000	01:44:00	0.0002080682
CB114	Storage	0	0.36	InfiltratedInflow	01/01/2000	01:45:00	0.0002073069
CB114	1.2	19.2		InfiltratedInflow	01/01/2000	01:46:00	0.0002065963
CB114	0.25	19.2		InfiltratedInflow	01/01/2000	01:47:00	0.0002059331
				InfiltratedInflow	01/01/2000	01:48:00	0.0002053141
CB115	Storage	0	0.36	InfiltratedInflow	01/01/2000	01:49:00	0.0002047364
CB115	0.2	155.53		InfiltratedInflow	01/01/2000	01:50:00	0.0002041971
CB115	0.31	155.53		InfiltratedInflow	01/01/2000	01:51:00	0.0002036939
				InfiltratedInflow	01/01/2000	01:52:00	0.0002032242
CB116	Storage	0	0.36	InfiltratedInflow	01/01/2000	01:53:00	0.0002027858
CB116	0.15	73.19		InfiltratedInflow	01/01/2000	01:54:00	0.0002023767
CB116	0.4	73.19		InfiltratedInflow	01/01/2000	01:55:00	0.0002019948
				InfiltratedInflow	01/01/2000	01:56:00	0.0002016384
CB117	Storage	0	0.36	InfiltratedInflow	01/01/2000	01:57:00	0.0002013057
CB117	0.15	122.26		InfiltratedInflow	01/01/2000	01:58:00	0.0002009952
				InfiltratedInflow	01/01/2000	01:59:00	0.0002007055
CB118	Storage	0	0.36	InfiltratedInflow	01/01/2000	02:00:00	0.000200435
CB118	0.18	37.7		InfiltratedInflow	01/01/2000	02:01:00	0.0002001826
				InfiltratedInflow	01/01/2000	02:02:00	0.000199947
[TIMESERIES]				InfiltratedInflow	01/01/2000	02:03:00	0.0001997271
;Name	Date	Time	Value	InfiltratedInflow	01/01/2000	02:04:00	0.0001995219
;;				InfiltratedInflow	01/01/2000	02:05:00	0.0001993304
;Rainfall (mm/hr)				InfiltratedInflow	01/01/2000	02:06:00	0.0001991516
3CHI100	01/01/2000	00:00:00	5.339	InfiltratedInflow	01/01/2000	02:07:00	0.0001989848
3CHI100	01/01/2000	00:10:00	6.376	InfiltratedInflow	01/01/2000	02:08:00	0.0001988829
3CHI100	01/01/2000	00:20:00	7.977	InfiltratedInflow	01/01/2000	02:09:00	0.0001986877
3CHI100	01/01/2000	00:30:00	10.797	InfiltratedInflow	01/01/2000	02:10:00	0.000198548
3CHI100	01/01/2000	00:40:00	17.136	InfiltratedInflow	01/01/2000	02:11:00	0.0001984214
3CHI100	01/01/2000	00:50:00	45.128	InfiltratedInflow	01/01/2000	02:12:00	0.0001983033
3CHI100	01/01/2000	01:00:00	178.107	InfiltratedInflow	01/01/2000	02:13:00	0.000198193
3CHI100	01/01/2000	01:10:00	51.056	InfiltratedInflow	01/01/2000	02:14:00	0.00019809
3CHI100	01/01/2000	01:20:00	26.163	InfiltratedInflow	01/01/2000	02:15:00	0.000197994
3CHI100	01/01/2000	01:30:00	17.571	InfiltratedInflow	01/01/2000	02:16:00	0.0001979043
3CHI100	01/01/2000	01:40:00	13.277	InfiltratedInflow	01/01/2000	02:17:00	0.0001978206
3CHI100	01/01/2000	01:50:00	10.712	InfiltratedInflow	01/01/2000	02:18:00	0.0001977425
3CHI100	01/01/2000	02:00:00	9.008	InfiltratedInflow	01/01/2000	02:19:00	0.0001976696
3CHI100	01/01/2000	02:10:00	7.793	InfiltratedInflow	01/01/2000	02:20:00	0.0001976015
3CHI100	01/01/2000	02:20:00	6.883	InfiltratedInflow	01/01/2000	02:21:00	0.000197538
3CHI100	01/01/2000	02:30:00	6.174	InfiltratedInflow	01/01/2000	02:22:00	0.0001974788
3CHI100	01/01/2000	02:40:00	5.607	InfiltratedInflow	01/01/2000	02:23:00	0.0001974234
3CHI100	01/01/2000	02:50:00	5.142	InfiltratedInflow	01/01/2000	02:24:00	0.0001973718
3CHI100	01/01/2000	03:00:00	0	InfiltratedInflow	01/01/2000	02:25:00	0.0001973237
				InfiltratedInflow	01/01/2000	02:26:00	0.0001972787
				InfiltratedInflow	01/01/2000	02:27:00	0.0001972367
				InfiltratedInflow	01/01/2000	02:28:00	0.0001971975
				InfiltratedInflow	01/01/2000	02:29:00	0.0001971609
				InfiltratedInflow	01/01/2000	02:30:00	0.0001971268
				InfiltratedInflow	01/01/2000	02:31:00	0.000197092
				InfiltratedInflow	01/01/2000	02:32:00	0.0001970653
				InfiltratedInflow	01/01/2000	02:33:00	0.0001970375
				InfiltratedInflow	01/01/2000	02:34:00	0.0001970116
				InfiltratedInflow	01/01/2000	02:35:00	0.0001969874
				InfiltratedInflow	01/01/2000	02:36:00	0.0001969649
				InfiltratedInflow	01/01/2000	02:37:00	0.0001969438
				InfiltratedInflow	01/01/2000	02:38:00	0.0001969242
				InfiltratedInflow	01/01/2000	02:39:00	0.0001969058
				InfiltratedInflow	01/01/2000	02:40:00	0.0001968887
				InfiltratedInflow	01/01/2000	02:41:00	0.0001968727
				InfiltratedInflow	01/01/2000	02:42:00	0.0001968578
				InfiltratedInflow	01/01/2000	02:43:00	0.0001968439
				InfiltratedInflow	01/01/2000	02:44:00	0.0001968309
				InfiltratedInflow	01/01/2000	02:45:00	0.0001968188
				InfiltratedInflow	01/01/2000	02:46:00	0.0001968077
				InfiltratedInflow	01/01/2000	02:47:00	0.0001967969
				InfiltratedInflow	01/01/2000	02:48:00	0.0001967871
				InfiltratedInflow	01/01/2000	02:49:00	0.0001967779
				InfiltratedInflow	01/01/2000	02:50:00	0.0001967693
				InfiltratedInflow	01/01/2000	02:51:00	0.0001967613
				InfiltratedInflow	01/01/2000	02:52:00	0.0001967538
				InfiltratedInflow	01/01/2000	02:53:00	0.0001967468
				InfiltratedInflow	01/01/2000	02:54:00	0.0001967403
				InfiltratedInflow	01/01/2000	02:55:00	0.0001967342
				InfiltratedInflow	01/01/2000	02:56:00	0.0001967285
				InfiltratedInflow	01/01/2000	02:57:00	0.0001967232
				InfiltratedInflow	01/01/2000	02:58:00	0.0001967183
				InfiltratedInflow	01/01/2000	02:59:00	0.0001967137
				InfiltratedInflow	01/01/2000	03:00:00	0.0001967094
				InfiltratedInflow	01/01/2000	03:01:00	5.729975E-05
				InfiltratedInflow	01/01/2000	03:02:00	2.133145E-06
				InfiltratedInflow	01/01/2000	03:03:00	1.137592E-06
				InfiltratedInflow	01/01/2000	03:04:00	6.886548E-07
				InfiltratedInflow	01/01/2000	03:05:00	4.534706E-07
				InfiltratedInflow	01/01/2000	03:06:00	3.170437E-07
				InfiltratedInflow	01/01/2000	03:07:00	2.318394E-07
				InfiltratedInflow	01/01/2000	03:08:00	1.755464E-07
				InfiltratedInflow	01/01/2000	03:09:00	1.366786E-07
				InfiltratedInflow	01/01/2000	03:10:00	1.088696E-07
				InfiltratedInflow	01/01/2000	03:11:00	8.387281E-08
				InfiltratedInflow	01/01/2000	03:12:00	7.290916E-08
				InfiltratedInflow	01/01/2000	03:13:00	6.097933E-08
				InfiltratedInflow	01/01/2000	03:14:00	5.161327E-08
				InfiltratedInflow	01/01/2000	03:15:00	4.382678E-08
				InfiltratedInflow	01/01/2000	03:16:00	3.810444E-08
				InfiltratedInflow</			

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

InfiltratedInflow	01/01/2000	03:29:00	9.500691E-09	InfiltratedInflow	01/01/2000	05:58:00	0	
InfiltratedInflow	01/01/2000	03:30:00	8.764469E-09	InfiltratedInflow	01/01/2000	05:59:00	0	
InfiltratedInflow	01/01/2000	03:31:00	8.105708E-09	InfiltratedInflow	01/01/2000	06:00:00	0	
InfiltratedInflow	01/01/2000	03:32:00	7.514236E-09					
InfiltratedInflow	01/01/2000	03:33:00	6.981469E-09	[REPORT]				
InfiltratedInflow	01/01/2000	03:34:00	6.500121E-09	;;Reporting Options				
InfiltratedInflow	01/01/2000	03:35:00	6.063984E-09	INPUT YES				
InfiltratedInflow	01/01/2000	03:36:00	5.667742E-09	CONTROLS NO				
InfiltratedInflow	01/01/2000	03:37:00	5.306823E-09	SUBCATCHMENTS ALL				
InfiltratedInflow	01/01/2000	03:38:00	4.977278E-09	NODES ALL				
InfiltratedInflow	01/01/2000	03:39:00	4.675687E-09	LINKS ALL				
InfiltratedInflow	01/01/2000	03:40:00	4.399072E-09					
InfiltratedInflow	01/01/2000	03:41:00	4.144837E-09	[TAGS]				
InfiltratedInflow	01/01/2000	03:42:00	3.910706E-09	Subcatch S1	Ramp			
InfiltratedInflow	01/01/2000	03:43:00	3.69468E-09	Subcatch S5	Building			
InfiltratedInflow	01/01/2000	03:44:00	3.494999E-09	Subcatch S6	ParkingLot			
InfiltratedInflow	01/01/2000	03:45:00	3.310106E-09	Subcatch S7	ParkingLot			
InfiltratedInflow	01/01/2000	03:46:00	3.138622E-09	Subcatch S8	Building			
InfiltratedInflow	01/01/2000	03:47:00	2.979323E-09	Subcatch S9	ParkingLot			
InfiltratedInflow	01/01/2000	03:48:00	2.831117E-09	Node St_UnGrd	Underground_Storage			
InfiltratedInflow	01/01/2000	03:49:00	2.69303E-09					
InfiltratedInflow	01/01/2000	03:50:00	2.564192E-09	[MAP]				
InfiltratedInflow	01/01/2000	03:51:00	2.443821E-09	DIMENSIONS	381280.91645	5032948.93205	381379.86255	5033068.41295
InfiltratedInflow	01/01/2000	03:52:00	2.331215E-09	UNITS	Meters			
InfiltratedInflow	01/01/2000	03:53:00	2.22574E-09					
InfiltratedInflow	01/01/2000	03:54:00	2.126828E-09	[COORDINATES]				
InfiltratedInflow	01/01/2000	03:55:00	2.033962E-09	;;Node X-Coord Y-Coord				
InfiltratedInflow	01/01/2000	03:56:00	1.946675E-09	;;-----				
InfiltratedInflow	01/01/2000	03:57:00	1.864544E-09	OP4	381364.593	5032973.357		
InfiltratedInflow	01/01/2000	03:58:00	1.787184E-09	OP7	381346.502	5032963.916		
InfiltratedInflow	01/01/2000	03:59:00	1.714243E-09	STUB15	381335.776	5032954.363		
InfiltratedInflow	01/01/2000	04:00:00	1.645403E-09	STUB16	381319.979	5032958.277		
InfiltratedInflow	01/01/2000	04:01:00	1.572101E-09	CB110	381293.102	5033002.513		
InfiltratedInflow	01/01/2000	04:02:00	3.099256E-09	CB111	381307.131	5032987.6		
InfiltratedInflow	01/01/2000	04:03:00	0	CB112	381319.643	5032961.536		
InfiltratedInflow	01/01/2000	04:04:00	2.866268E-09	CB113	381348.344	5032974.064		
InfiltratedInflow	01/01/2000	04:05:00	2.657084E-09	CB114	381332.566	5033036.058		
InfiltratedInflow	01/01/2000	04:06:00	2.657084E-09	CB115	381332.827	5033018.906		
InfiltratedInflow	01/01/2000	04:07:00	0	CB116	381338.815	5033005.189		
InfiltratedInflow	01/01/2000	04:08:00	2.468666E-09	CB117	381344.774	5032991.539		
InfiltratedInflow	01/01/2000	04:09:00	2.298437E-09	CB118	381359.473	5032992.996		
InfiltratedInflow	01/01/2000	04:10:00	0	Roof_1	381325.164	5032977.273		
InfiltratedInflow	01/01/2000	04:11:00	0	Roof_2	381361.335	5033013.684		
InfiltratedInflow	01/01/2000	04:12:00	2.144199E-09	St_UnGrd	381329.806	5032972.84		
InfiltratedInflow	01/01/2000	04:13:00	2.004073E-09					
InfiltratedInflow	01/01/2000	04:14:00	0	[VERTICES]				
InfiltratedInflow	01/01/2000	04:15:00	0	;;Link X-Coord Y-Coord				
InfiltratedInflow	01/01/2000	04:16:00	1.876439E-09	;;-----				
InfiltratedInflow	01/01/2000	04:17:00	1.759903E-09	W1	381322.829	5032965.271		
InfiltratedInflow	01/01/2000	04:18:00	0	W3	381343.656	5032974.514		
InfiltratedInflow	01/01/2000	04:19:00	0	W5	381295.919	5033002.386		
InfiltratedInflow	01/01/2000	04:20:00	1.653253E-09	W6	381309.233	5032988.935		
InfiltratedInflow	01/01/2000	04:21:00	0	W7	381320.071	5033005.693		
InfiltratedInflow	01/01/2000	04:22:00	2.298981E-09	OL6	381323.041			
InfiltratedInflow	01/01/2000	04:23:00	0					
InfiltratedInflow	01/01/2000	04:24:00	0	[POLYGONS]				
InfiltratedInflow	01/01/2000	04:25:00	0	;;Subcatchment X-Coord Y-Coord				
InfiltratedInflow	01/01/2000	04:26:00	1.104736E-09	;;-----				
InfiltratedInflow	01/01/2000	04:27:00	0	S1	381344.215	5032984.464		
InfiltratedInflow	01/01/2000	04:28:00	0	S1	381347.856	5032976.123		
InfiltratedInflow	01/01/2000	04:29:00	1.932717E-09	S1	381337.733	5032971.705		
InfiltratedInflow	01/01/2000	04:30:00	0	S1	381334.498	5032979.128		
InfiltratedInflow	01/01/2000	04:31:00	0	S1	381341.864	5032982.351		
InfiltratedInflow	01/01/2000	04:32:00	1.779756E-09	S1	381344.215	5032984.464		
InfiltratedInflow	01/01/2000	04:33:00	0	S10	381360.442	5032986.777		
InfiltratedInflow	01/01/2000	04:34:00	0	S10	381355.738	5032997.554		
InfiltratedInflow	01/01/2000	04:35:00	1.643222E-09	S10	381357.523	5032998.333		
InfiltratedInflow	01/01/2000	04:36:00	0	S10	381358.678	5032998.837		
InfiltratedInflow	01/01/2000	04:37:00	0	S10	381359.142	5032997.774		
InfiltratedInflow	01/01/2000	04:38:00	0	S10	381369.264	5033002.193		
InfiltratedInflow	01/01/2000	04:39:00	2.002893E-09	S10	381368.8	5033003.256		
InfiltratedInflow	01/01/2000	04:40:00	0	S10	381374.019	5033005.534		
InfiltratedInflow	01/01/2000	04:41:00	0	S10	381375.365	5033002.452		
InfiltratedInflow	01/01/2000	04:42:00	0	S10	381360.442	5032986.777		
InfiltratedInflow	01/01/2000	04:43:00	1.813983E-09	S11	381341.862	5033062.982		
InfiltratedInflow	01/01/2000	04:44:00	0	S11	381348.903	5033062.839		
InfiltratedInflow	01/01/2000	04:45:00	0	S11	381355.186	5033056.237		
InfiltratedInflow	01/01/2000	04:46:00	0	S11	381352.72	5033054.268		
InfiltratedInflow	01/01/2000	04:47:00	1.649109E-09	S11	381336.223	5033047.127		
InfiltratedInflow	01/01/2000	04:48:00	0	S11	381340.298	5033037.792		
InfiltratedInflow	01/01/2000	04:49:00	0	S11	381338.894	5033036.045		
InfiltratedInflow	01/01/2000	04:50:00	0	S11	381327.521	5033031.891		
InfiltratedInflow	01/01/2000	04:51:00	0	S11	381325.697	5033035.259		
InfiltratedInflow	01/01/2000	04:52:00	1.860069E-09	S11	381319.536	5033040.417		
InfiltratedInflow	01/01/2000	04:53:00	0	S11	381328.068	5033049.243		
InfiltratedInflow	01/01/2000	04:54:00	0	S11	381327.155	5033052.472		
InfiltratedInflow	01/01/2000	04:55:00	0	S11	381330.052	5033055.329		
InfiltratedInflow	01/01/2000	04:56:00	0	S11	381335.192	5033057.864		
InfiltratedInflow	01/01/2000	04:57:00	1.666766E-09	S11	381336.099	5033058.311		
InfiltratedInflow	01/01/2000	04:58:00	0	S11	381336.581	5033059.572		
InfiltratedInflow	01/01/2000	04:59:00	0	S11	381337.055	5033058.848		
InfiltratedInflow	01/01/2000	05:00:00	0	S11	381337.521	5033059.137		
InfiltratedInflow	01/01/2000	05:01:00	0	S11	381337.977	5033059.441		
InfiltratedInflow	01/01/2000	05:02:00	0	S11	381338.424	5033059.758		
InfiltratedInflow	01/01/2000	05:03:00	1.782635E-09	S11	381338.861	5033060.089		
InfiltratedInflow	01/01/2000	05:04:00	0	S11	381341.862	5033062.982		
InfiltratedInflow	01/01/2000	05:05:00	0	S2	381339.051	5032968.685		
InfiltratedInflow	01/01/2000	05:06:00	0	S2	381337.931	5032971.251		
InfiltratedInflow	01/01/2000	05:07:00	0	S2	381337.733	5032971.705		
InfiltratedInflow	01/01/2000	05:08:00	0	S2	381347.856	5032976.123		
InfiltratedInflow	01/01/2000	05:09:00	0	S2	381352.652	5032978.217		
InfiltratedInflow	01/01/2000	05:10:00	1.826997E-09	S2	381352.769	5032978.266		
InfiltratedInflow	01/01/2000	05:11:00	0	S2	381352.887	5032978.313		
InfiltratedInflow	01/01/2000	05:12:00	0	S2	381353.006	5032978.356		
InfiltratedInflow	01/01/2000	05:13:00	0	S2	381352.331	5032977.428		
InfiltratedInflow	01/01/2000	05:14:00	0	S2	381349.581	5032976.228		
InfiltratedInflow	01/01/2000	05:15:00	0	S2	381350.662	5032973.753		
InfiltratedInflow	01/01/2000	05:16:00	0	S2	381339.051	5032968.685		
InfiltratedInflow	01/01/2000	05:17:00	0	S3	381318.259	5032957.972		
InfiltratedInflow	01/01/2000	05:18:00	1.812251E-09	S3	381307.625	5032982.332		
InfiltratedInflow	01/01/2000	05:19:00	0	S3	381303.659	5032986.085		
InfiltratedInflow	01/01/2000	05:20:00	0	S3	381310.51	5032989.076		
InfiltratedInflow	01/01/2000	05:21:00	0	S3	381321.435	5032964.05		
InfiltratedInflow	01/01/2000	05:22:00	0	S3	381337.931	5032971.251		
InfiltratedInflow	01/01/2000	05:23:00	0	S3	381339.051	5032968.685		
InfiltratedInflow	01/01/2000	05:24:00	0	S3	381319.267	5032960.048		
InfiltratedInflow	01/01/2000	05:25:00	0	S3	381318.259	5032957.972		
InfiltratedInflow	01/01/2000	05:26:00	0	S4	381303.659	5032986.085		
InfiltratedInflow	01/01/2000	05:27:00	1.752325E-09	S4	381285.414	5033003.349		
InfiltratedInflow	01/01/2000	05:28:00	0	S4	381304.879	5033024.646		
InfiltratedInflow	01/01/2000	05:29:00	0	S4	381311.368	5033017.747		
InfiltratedInflow	01/01/2000	05:30:00	0	S4	381300.135	5033012.843		
InfiltratedInflow	01/01/2000	05:31:00	0	S4	381310.51	5032989.076		
InfiltratedInflow	01/01/2000	05:32:00	0	S4	381303.659	5032986.085		
InfiltratedInflow	01/01/2000	05:33:00	0	S5	381316.631	5033020.045		
InfiltratedInflow	01/01/2000	05:34:00	0	S5	381320.706	5033010.711		
InfiltratedInflow	01/01/2000	05:35:00	0	S5	381318.612	5032999.076		
InfiltratedInflow	01/01/2000	05:36:00	0	S5	381319.652	5033007.414		
InfiltratedInflow	01/01/2000	05:37:00	1.660708E-09	S5	381321.746	5033008.328		
InfiltratedInflow	01/01/2000	05:38:00	0	S5	381327.851	5032994.342		
InfiltratedInflow	01/01/2000	05:39:00	0	S5	381334.493	5032979.128		
InfiltratedInflow	01/01/2000	05:40:00	0	S5	381337.733	5032971.705		
InfiltratedInflow	01/01/2000	05:41:00	0	S5	381337.931	5032971.251</		

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

S6	381321.746	5033008.328
S6	381319.652	5033007.414
S6	381318.612	5033009.797
S6	381320.706	5033010.711
S6	381316.631	5033020.045
S6	381311.368	5033017.747
S6	381304.879	5033024.646
S6	381307.751	5033027.787
S6	381319.536	5033040.417
S6	381325.697	5033035.259
S6	381327.521	5033031.08
S7	381354.292	5033005.735
S7	381349.118	5033003.477
S7	381341.795	5032998.364
S7	381333.208	5032996.68
S7	381327.851	5032994.342
S7	381321.746	5033008.328
S7	381325.27	5033009.866
S7	381326.803	5033010.853
S7	381335.821	5033012.047
S7	381349.093	5033017.644
S7	381354.292	5033005.735
S8	381336.223	5033047.127
S8	381352.72	5033054.328
S8	381374.019	5033005.534
S8	381368.8	5033003.256
S8	381369.264	5033002.193
S8	381359.142	5032997.774
S8	381358.678	5032998.837
S8	381357.523	5032998.333
S8	381355.797	5033002.286
S8	381341.338	5033035.409
S8	381343.432	5033036.323
S8	381342.392	5033038.706
S8	381340.298	5033037.792
S8	381336.223	5033047.127
S9	381360.442	5032986.777
S9	381352.823	5032978.774
S9	381353.006	5032978.356
S9	381352.846	5032978.297
S9	381352.688	5032978.233
S9	381347.856	5032976.123
S9	381344.215	5032984.464
S9	381341.866	5032982.347
S9	381334.493	5032979.128
S9	381327.851	5032994.342
S9	381333.208	5032996.68
S9	381341.795	5032998.364
S9	381349.118	5033003.477
S9	381354.292	5033005.735
S9	381357.523	5032998.333
S9	381355.738	5032997.554
S9	381360.442	5032986.777

;;Storage Node

X-Coord

Y-Coord

;;-----

[SYMBOLS]

;;Gage

X-Coord

Y-Coord

;;-----

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

Element Count									

Number of rain gages 1									
Number of subcatchments ... 11									
Number of nodes 16									
Number of links 17									
Number of pollutants 0									
Number of land uses 0									

Raiingage Summary									

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

Subcatchment Summary									

Name		Area	Width	%Imperv	%Slope	Rain Gage		Outlet	

S1		0.01	6.10	100.00	15.0000	Rainfall			
St_UnGrd									
S10		0.01	29.00	8.79	1.0000	Rainfall		CB118	
S11		0.05	70.00	18.80	2.0000	Rainfall		CB114	
S2		0.00	4.30	0.00	1.9000	Rainfall		CB113	
S3		0.02	75.00	17.80	1.0000	Rainfall		CB112	
S4		0.04	52.00	8.51	3.5000	Rainfall		CB110	
S5		0.10	105.00	100.00	1.0000	Rainfall		Roof_1	
S6		0.08	45.00	66.78	2.5000	Rainfall		CB115	
S7		0.04	28.60	90.42	2.7000	Rainfall		CB116	
S8		0.10	105.00	100.00	1.0000	Rainfall		Roof_2	
S9		0.05	50.00	93.57	2.4000	Rainfall		CB117	

Node Summary									

Name		Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow			

OF4		OUTFALL	80.63	0.00	0.0				
OF7		OUTFALL	80.63	0.00	0.0				
STUB15		OUTFALL	80.63	0.00	0.0				
STUB16		OUTFALL	80.65	0.00	0.0				
CB110		STORAGE	83.75	1.90	0.0				
CB111		STORAGE	83.59	2.01	0.0				
CB112		STORAGE	83.28	2.12	0.0				
CB113		STORAGE	83.55	1.70	0.0				
CB114		STORAGE	85.30	0.25	0.0				
CB115		STORAGE	85.25	0.31	0.0				
CB116		STORAGE	85.20	0.40	0.0				
CB117		STORAGE	85.15	0.15	0.0				
CB118		STORAGE	85.22	0.18	0.0				
Roof_1		STORAGE	96.35	0.15	0.0				
Roof_2		STORAGE	96.35	0.15	0.0				
St_UnGrd		STORAGE	81.80	1.00	0.0	Yes			

Link Summary									

Name		From Node	To Node	Type	Length	%Slope			

Roughness									

C1		CB111	CB112	CONDUIT	28.9	0.8647			
0.130									
C3		CB113	CB112	CONDUIT	31.3	0.6067			
0.0130									
C5		CB110	CB111	CONDUIT	20.5	0.7815			
0.0130									
W1		CB115	CB116	WEIR					
W2		CB116	CB117	WEIR					
W3		CB112	CB113	WEIR					
W4		CB114	CB115	WEIR					
W5		CB110	CB112	WEIR					
C2		CB112	STUB16	OUTLET					
OL1		CB115	St_UnGrd	OUTLET					
OL2		CB116	St_UnGrd	OUTLET					
OL3		CB117	St_UnGrd	OUTLET					
OL4		Roof_1	STUB15	OUTLET					
OL5		Roof_2	OF4	OUTLET					
OL6		CB114	St_UnGrd	OUTLET					
OL7		St_UnGrd	OF7	OUTLET					
OL8		CB118	St_UnGrd	OUTLET					

Cross Section Summary									

Conduit		Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow	

C1		CIRCULAR	0.15	0.02	0.04	0.15	1	0.01	
C3		CIRCULAR	0.15	0.02	0.04	0.15	1	0.01	
C5		CIRCULAR	0.15	0.02	0.04	0.15	1	0.01	

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 5.00 sec									
Variable Time Step YES									
Maximum Trials 8									
Number of Threads 1									
Head Tolerance 0.001500 m									

Runoff Quantity Continuity			Volume	Depth					
			hectare-m	mm					
Total Precipitation			0.036	71.708					
Evaporation Loss			0.000	0.000					
Infiltration Loss			0.007	13.013					
Surface Runoff			0.029	57.684					
Final Storage			0.001	1.117					
Continuity Error (%)			-0.149						

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

***** Flow Routing Continuity *****	Volume hectare-m	Volume 10^6 ltr	CB114 -0.000	STORAGE	0.020	0.020	0	01:10	0.0161	0.0161
Dry Weather Inflow	0.000	0.000	CB115 -0.005	STORAGE	0.037	0.037	0	01:10	0.0452	0.0452
Wet Weather Inflow	0.029	0.293	CB116 -0.008	STORAGE	0.020	0.020	0	01:10	0.0276	0.0276
Groundwater Inflow	0.000	0.000	CB117 -0.006	STORAGE	0.027	0.027	0	01:10	0.0368	0.0368
RDII Inflow	0.000	0.000	CB118 -0.001	STORAGE	0.006	0.006	0	01:10	0.00424	0.00424
External Inflow	0.000	0.002	Roof_1 0.000	STORAGE	0.047	0.047	0	01:10	0.0669	0.0669
External Outflow	0.024	0.241	Roof_2 0.003	STORAGE	0.048	0.048	0	01:10	0.0678	0.0678
Flooding Loss	0.000	0.000	St_UnGrd 0.005	STORAGE	0.005	0.114	0	01:10	0.00886	0.139
Evaporation Loss	0.000	0.000	***** Node Surge Summary *****							
Exfiltration Loss	0.000	0.000	No nodes were surcharged.							
Initial Stored Volume	0.000	0.000	***** Node Flooding Summary *****							
Final Stored Volume	0.005	0.054	No nodes were flooded.							
Continuity Error (%)	-0.013		***** Storage Volume Summary *****							
***** Time-Step Critical Elements ***** None			----- Maximum Outflow Storage Unit CMS	Average Volume 1000 m³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m³	Max Pcnt Full	Time of Max Occurrence days hr:min
***** Highest Flow Instability Indexes ***** Link OL7 (6)			----- CB110 0.014	0.000	0.0	0.0	0.0	0.000	0.4	0 01:13
***** Most Frequent Nonconverging Nodes ***** Convergence obtained at all time steps.			CB111 0.009	0.000	4.5	0.0	0.0	0.000	68.3	0 01:14
***** Routing Time Step Summary *****			CB112 0.011	0.000	1.6	0.0	0.0	0.001	20.7	0 01:15
Minimum Time Step : 0.29 sec			CB113 0.001	0.000	2.2	0.0	0.0	0.000	32.9	0 01:15
Average Time Step : 5.00 sec			CB114 0.020	0.000	0.1	0.0	0.0	0.000	2.4	0 01:10
Maximum Time Step : 5.00 sec			CB115 0.036	0.000	0.1	0.0	0.0	0.001	3.5	0 01:10
% of Time in Steady State : 0.00			CB116 0.020	0.000	0.1	0.0	0.0	0.000	1.3	0 01:10
Average Iterations per Step : 2.00			CB117 0.027	0.000	0.3	0.0	0.0	0.001	7.8	0 01:10
% of Steps Not Converging : 0.00			CB118 0.006	0.000	0.0	0.0	0.0	0.000	0.7	0 01:10
Time Step Frequencies :			Roof_1 0.002	0.034	35.4	0.0	0.0	0.049	51.3	0 02:20
5.000 - 3.155 sec : 99.98 %			Roof_2 0.002	0.034	35.7	0.0	0.0	0.050	51.5	0 02:21
3.155 - 1.991 sec : 0.00 %			St_UnGrd 0.029	0.005	10.2	0.0	0.0	0.048	98.1	0 01:20
1.991 - 1.256 sec : 0.02 %			***** Outfall Loading Summary *****							
1.256 - 0.792 sec : 0.00 %			----- Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr			
0.792 - 0.500 sec : 0.00 %			OF4	94.93	0.002	0.002	0.040			
***** Subcatchment Runoff Summary *****			OF7	59.70	0.011	0.029	0.139			
-----			STUB15	94.93	0.002	0.002	0.040			
Total	Total	Peak	STUB16	18.62	0.005	0.010	0.022			
Runoff	Runoff	Runoff	System	67.05	0.020	0.043	0.241			
mm	mm	CMS	-----							
Subcatchment	10^6 ltr		Link Flow Summary *****							
10^6 ltr			----- Link	Type	Maximum Flow CMS	Time of Max Occurrence days hr:min	Maximum Veloc m/sec	Max/ Full Flow	Max/ Full Depth	
-----			C1	CONDUIT	0.009	0 01:10	0.56	0.63	1.00	
S1	71.71	0.00	C3	CONDUIT	0.006	0 01:05	0.38	0.52	1.00	
70.25	0.980		C5	CONDUIT	0.014	0 01:10	0.87	1.02	1.00	
S10	71.71	0.00	W1	WEIR	0.000	0 00:00			0.00	
34.01	0.429		W2	WEIR	0.000	0 00:00			0.00	
S11	71.71	0.00	W3	WEIR	0.000	0 00:00			0.00	
34.01	0.474		W4	WEIR	0.000	0 00:00			0.00	
S2	71.71	0.00	W5	WEIR	0.000	0 00:00			0.00	
27.60	0.385		W6	WEIR	0.000	0 00:00			0.00	
S3	71.71	0.00	C2	DUMMY	0.010	0 01:15			0.00	
33.87	0.472		OL1	DUMMY	0.036	0 01:10			0.00	
S4	71.71	0.00	OL2	DUMMY	0.020	0 01:10			0.00	
30.70	0.428		OL3	DUMMY	0.027	0 01:10			0.00	
S5	71.71	0.00	OL4	DUMMY	0.002	0 00:32			0.00	
70.24	0.980		OL5	DUMMY	0.002	0 00:32			0.00	
S6	71.71	0.00	OL6	DUMMY	0.020	0 01:10			0.00	
56.26	0.785		OL7	DUMMY	0.029	0 01:00			0.00	
S7	71.71	0.00	OL8	DUMMY	0.006	0 01:10			0.00	
66.26	0.924		-----							
S8	71.71	0.00	Flow Classification Summary *****							
70.24	0.980		----- Conduit	Adjusted /Actual Length	Up Dry	Down Dry	Sub Crit	Sup Crit	Time in Flow Class Down Crit	Norm Ltd
S9	71.71	0.00	C1	1.00	0.17	0.00	0.00	0.14	0.00	0.69
67.59	0.943		C3	1.00	0.17	0.00	0.00	0.14	0.00	0.69
-----			C5	1.00	0.17	0.00	0.00	0.82	0.01	0.72
Node Depth Summary *****			-----							
-----			Conduit Surcharge Summary *****							
Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters	----- Conduit	Hours Full Upstream	Hours Above Full Normal Flow	Hours Capacity Limited
OF4	OUTFALL	0.48	0.48	81.11	0 00:00	0.48	Both Ends	Full	Dnstream	
OF7	OUTFALL	0.48	0.48	81.11	0 00:00	0.48	0.61	0.61	0.74	0.01
STUB15	OUTFALL	0.48	0.48	81.11	0 00:00	0.48	0.62	0.62	0.73	0.01
STUB16	OUTFALL	0.63	0.63	81.28	0 00:00	0.63	0.55	0.55	0.61	0.01
CB110	STORAGE	0.08	1.25	85.00	0 01:13	1.25				
CB111	STORAGE	0.09	1.37	84.96	0 01:14	1.37				
CB112	STORAGE	0.13	1.63	84.91	0 01:15	1.63				
CB113	STORAGE	0.09	1.36	84.91	0 01:15	1.36				
CB114	STORAGE	0.00	0.03	85.33	0 01:10	0.03				
CB115	STORAGE	0.00	0.05	85.30	0 01:10	0.05				
CB116	STORAGE	0.00	0.03	85.23	0 01:10	0.03				
CB117	STORAGE	0.00	0.04	85.19	0 01:10	0.04				
CB118	STORAGE	0.00	0.01	85.23	0 01:10	0.01				
Roof_1	STORAGE	0.05	0.08	96.43	0 02:20	0.08				
Roof_2	STORAGE	0.05	0.08	96.43	0 02:21	0.08				
St_UnGrd	STORAGE	0.10	0.98	82.78	0 01:20	0.98				
***** Node Inflow Summary *****			-----							
-----			Flow	Maximum Lateral	Maximum Total	Time of Max Occurrence	Lateral Inflow	Total Inflow		
Flow	Type	CMS	CMS	days hr:min	10^6 ltr	10^6 ltr				
Balance										
Error										
Node	Type	CMS	CMS	days hr:min	10^6 ltr	10^6 ltr				
Percent										

OF4	OUTFALL	0.000	0.002	0 00:32	0	0.0402				
0.000										
OF7	OUTFALL	0.000	0.029	0 01:00	0	0.139				
0.000										
STUB15	OUTFALL	0.000	0.002	0 00:32	0	0.0402				
0.000										
STUB16	OUTFALL	0.000	0.010	0 01:15	0	0.0218				
0.000										
CB110	STORAGE	0.018	0.018	0 01:10	0.0132	0.0132				
-0.017										
CB111	STORAGE	0.000	0.014	0 01:10	0	0.0132				
-0.319										
CB112	STORAGE	0.010	0.018	0 01:10	0.00739	0.0229				
0.020										
CB113	STORAGE	0.002	0.007	0 01:05	0.00121	0.00227				
-0.044										

Analysis begun on: Thu Oct 10 10:10:11 2024										
Analysis ended on: Thu Oct 10 10:10:12 2024										
Total elapsed time: 00:00:01										

[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		01/02/2000							
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		5							
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]									
;;Name		Rain Gage	Outlet	Area	%Imperv	Width	%Slope	CurbLen	
SnowPack									

S1	Rainfall	St_UnGrd	0.0091	100	6.1	15	0		
S10	Rainfall	CB118	0.0138	8.79	28.998	1	0		
S11	Rainfall	CB114	0.0473	18.805	70.001	2	0		
S12	Rainfall	CB113	0.0044	0.002	4.3	1.9	0		
S3	Rainfall	CB112	0.0218	17.802	75	1	0		
S4	Rainfall	CB110	0.043	8.51	52.001	3.5	0		
S5	Rainfall	Roof_1	0.0852	99.998	104.996	1	0		
S16	Rainfall	CB115	0.0803	66.775	45.001	2.5	0		
S7	Rainfall	CB116	0.0416	90.416	28.601	2.7	0		
S8	Rainfall	Roof_2	0.0965	100	105.005	1	0		
S9	Rainfall	CB117	0.0544	93.568	50	2.4	0		
[SUBAREAS]									
;;Subcatchment		N-Imperv	N-Perv	S-Imperv	S-Perv	PctZero	RouteTo	PctRouted	

S1	0.013	0.25	1.57	4.67	0	0	OUTLET		
S10	0.013	0.25	1.57	4.67	0	0	PERVIOUS	100	
S11	0.013	0.25	1.57	4.67	0	0	PERVIOUS	100	
S12	0.013	0.25	1.57	4.67	0	0	OUTLET		
S3	0.013	0.25	1.57	4.67	0	0	PERVIOUS	100	
S4	0.013	0.25	1.57	4.67	0	0	PERVIOUS	100	
S5	0.013	0.25	1.57	4.67	0	0	OUTLET		
S6	0.013	0.25	1.57	4.67	0	0	OUTLET		
S7	0.013	0.25	1.57	4.67	0	0	OUTLET		
S8	0.013	0.25	1.57	4.67	0	0	OUTLET		
S9	0.013	0.25	1.57	4.67	0	0	OUTLET		
[INFILTRATION]									
;;Subcatchment		Param1	Param2	Param3	Param4	Param5			

S1	76.2	13.2	4.14	7	0				
S10	76.2	13.2	4.14	7	0				
S11	76.2	13.2	4.14	7	0				
S2	76.2	13.2	4.14	7	0				
S3	76.2	13.2	4.14	7	0				
S4	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				
S8	76.2	13.2	4.14	7	0				
S9	76.2	13.2	4.14	7	0				
[OUTFALLS]									
;;Name		Elevation	Type	Stage Data	Gated	Route To			

S1	80.628	FIXED	81.11	NO					
OF7	80.628	FIXED	81.11	NO		</			

C1	0.08	CB111	CB112	28.913	0.013	83.59	83.34	
C3		CB113	CB112	31.317	0.013	83.55	83.36	
C5		0.04	CB110	CB111	20.475	0.013	83.75	83.59
C0								
[WEIRS]								
;;Name		From Node	To Node	Type	CrestHt	Qcoeff	Gated	
EndConc	EndCoeff	Surcharge	RoadWidth	RoadSurf	Coeff. Curve			
;;								
W1		CB115	CB116	TRANSVERSE	85.45	1.84	NO	
W2	0	CB116	CB117	TRANSVERSE	85.35	1.84	NO	
W3	0	CB112	CB113	TRANSVERSE	85.38	1.84	NO	
W4	0	CB114	CB115	TRANSVERSE	85.5	1.84	NO	
W5	0	CB110	CB112	TRANSVERSE	85.6	1.84	NO	
C0	0	NO						
[OUTLETS]								
;;Name		From Node	To Node	Offset	Type	QTable/Qcoeff		
Qexpon	Gated							
;;								
C2		CB112	STUB16	83.28	TABULAR/HEAD	Vortex_ICD_95		
NO		CB115	St_UnGrd	85.25	TABULAR/HEAD	ZURN_2150F-6NH		
OL1		CB116	St_UnGrd	85.2	TABULAR/HEAD	ZURN_2150F-6NH		
NO		CB117	St_UnGrd	85.15	TABULAR/HEAD	ZURN_2150F-6NH		
OL3		Roof_1	STUB15	96.35	TABULAR/HEAD	O_Roof1		
NO		Roof_2	OF4	96.35	TABULAR/HEAD	O_Roof1		
OL4		CB114	St_UnGrd	85.3	TABULAR/HEAD	ZURN_2150F-6NH		
NO		St_UnGrd	OF7	81.8	TABULAR/HEAD	O_St_UnGrd		
OL7		CB118	St_UnGrd	85.22	TABULAR/HEAD	ZURN_2150F-6NH		
NO								
C0								
[XSECTIONS]								
;;Link		Shape	Geom1	Geom2	Geom3	Geom4	Barrels	
Culvert								
;;								
C1		CIRCULAR	0.15	0	0	0	1	
C3		CIRCULAR	0.15	0	0	0	1	
C5		CIRCULAR	0.15	0	0	0	1	
W1		RECT_OPEN	0.11	17.1	0	0		
W2		RECT_OPEN	0.25	17.1	0	0		
W3		RECT_OPEN	0.02	4.58	0	0		
W4		RECT_OPEN	0.05	7	0	0		
W5		RECT_OPEN	0.05	3.487	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				
;;								
Tempest Rating		Curve for MHF	IPEX	TYPE A, No grade 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 grade 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 grade allowance				
MHF_IPEX_TYPE_C		Rating	0	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 grade allowance				
MHF_IPEX_TYPE_D		Rating	0	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				

Page 2 of 5

;Tempest Rating Curve for Vortex ICD 95, No grate allowance			
Vortex_ICD_95	Rating	0	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	0.0357128365761305	
ZURN_Z150F-6NH	0.0765	0.0425019726111045	
ZURN_Z150F-6NH	0.1024	0.0433196215564931	

CB110	Storage	0	0.073
CB110		1.55	0.073
CB110		1.85	120.85
CB110		1.9	120.85
CB111	Storage	0	0.073
CB111		2.01	0.073
CB112	Storage	0	0.36
CB112		1.92	0.36
CB112		2.12	19.13
CB112		2.12	19.13
CB113	Storage	0	0.073
CB113		1.6	0.073
CB113		1.7	3.62
CB114	Storage	0	0.36
CB114		0.2	19.2
CB114		0.25	19.2
CB115	Storage	0	0.36
CB115		0.2	155.53
CB115		0.31	155.53
CB116	Storage	0	0.36
CB116		0.15	73.19
CB116		0.4	73.19
CB117	Storage	0	0.36
CB117		0.15	122.26
CB118	Storage	0	0.36
CB118		0.18	37.7

[TIMESERIES]			
;;Name Date Time Value			
;-----			
;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

;Rainfall (mm/hr)			
3CHI100	01/01/2000	00:00:00	5.339
3CHI100	01/01/2000	00:10:00	6.376
3CHI100	01/01/2000	00:20:00	7.977
3CHI100	01/01/2000	00:30:00	10.797
3CHI100	01/01/2000	00:40:00	17.136
3CHI100	01/01/2000	00:50:00	45.128
3CHI100	01/01/2000	01:00:00	178.107
3CHI100	01/01/2000	01:10:00	51.056
3CHI100	01/01/2000	01:20:00	26.163
3CHI100	01/01/2000	01:30:00	17.571
3CHI100	01/01/2000	01:40:00	13.277
3CHI100	01/01/2000	01:50:00	10.712
3CHI100	01/01/2000	02:00:00	9.008
3CHI100	01/01/2000	02:10:00	7.793
3CHI100	01/01/2000	02:20:00	6.883
3CHI100	01/01/2000	02:30:00	6.174
3CHI100	01/01/2000	02:40:00	5.607
3CHI100	01/01/2000	02:50:00	5.142
3CHI100	01/01/2000	03:00:00	0

;Sum of Infiltrated flow from above the garage slab calculated from Infiltration graphs for S11 multiplied by the total pervious area above the garage.			
InfiltratedInflow	01/01/2000	00:01:00	2.306158E-05
InfiltratedInflow	01/01/2000	00:02:00	2.306158E-05
InfiltratedInflow	01/01/2000	00:03:00	2.306158E-05
InfiltratedInflow	01/01/2000	00:04:00	2.306158E-05
InfiltratedInflow	01/01/2000	00:05:00	2.306158E-05
InfiltratedInflow	01/01/2000	00:06:00	2.306158E-05
InfiltratedInflow	01/01/2000	00:07:00	2.306158E-05
InfiltratedInflow	01/01/2000	00:08:00	2.306158E-05
InfiltratedInflow	01/01/2000	00:09:00	2.306158E-05
InfiltratedInflow	01/01/2000	00:10:00	2.306158E-05
InfiltratedInflow	01/01/2000	00:11:00	2.306158E-05
.....			
Too many data points (1440 in total).			

[REPORT]					
;;Reporting Options					
INPUT YES					
CONTROLS NO					
SUBCATCHMENTS ALL					
NODES ALL					
LINKS ALL					
[TAGS]					
Subcatch	S1	Ramp			
Subcatch	S5	Building			
Subcatch	S6	ParkingLot			
Subcatch	S7	ParkingLot			
Subcatch	S8	Building			
Subcatch	S9	ParkingLot			
Node	St_UnGrd	Underground_Storage			
[MAP]					
DIMENSIONS	381280.91645	5032948.93205	381379.86255	5033068.41295	
UNITS	Meters				
[COORDINATES]					
;;Node	X-Coord	Y-Coord			
;;					
OF4	381364.593	5032973.357			
OF7	381346.502	5032963.916			
STUB15	381335.776	5032954.363			
STUB16	381319.979	5032958.277			
CB110	381293.102	5033002.513			
CB111	381307.131	5032987.6			
CB112	381319.643	5032961.536			
CB113	381348.344	5032974.064			
CB114	381332.566	5033036.058			
CB115	381332.827	5033018.906			
CB116	381338.815	5033005.189			
CB117	381344.774	5032991.539			
CB118	381359.473	5032992.996			
Roof_1	381325.164	5032977.273			
Roof_2	381361.335	5033013.684			
St_UnGrd	381329.806	5032972.84			
[VERTICES]					
;;Link	X-Coord	Y-Coord			
;;					
W3	381322.829	5032965.271			
W3	381343.656	5032974.514			
W5	381295.919	5033002.386			
W5	381309.233	5032988.935			
W5	381320.071	5032965.768			
OL6	381323.041	5033005.693			
[POLYGONS]					
;;Subcatchment	X-Coord	Y-Coord			
;;					
S1	381344.215	5032984.464			
S1	381347.856	5032976.123			
S1	381337.733	5032971.705			
S1	381334.493	5032979.128			
S1	381341.864	5032982.351			
S1	381344.215	5032984.464			
S10	381360.442	5032986.777			
S10	381365.738	5032987.554			
S10	381357.523	5032998.333			
S10	381358.678	5032998.837			
S10	381359.142	5032997.774			
S10	381369.264	5033002.193			
S10	381368.8	5033003.256			
S10	381374.019	5033005.534			
S10	381375.365	5033002.452			
S10	381360.442	5032986.777			
S11	381341.862	5033062.982			
S11	381348.903	5033062.839			
S11	381355.186	5033056.237			
S11	381352.72	5033054.328			
S11	381336.223	5033047.127			
S11	381340.298	5033037.792			
S11	381338.894	5033036.045			
S11	381327.521	5033031.08			
S11	381325.697	5033035.259			
S11	381319.536	5033040.417			
S11	381328.068	5033049.243			
S11	381327.155	5033052.4			
S11	381330.052	5033055.329			
S11	381335.192	5033057.864			
S11	381336.099	5033058.311			
S11	381336.581	5033058.572			
S11	381337.055	5033058.848			
S11	381337.521	5033059.137			
S11	381337.977	5033059.441			
S11	381338.424	5033059.758			
S11	381338.861	5033060.089			
S11	381341.862	5033062.982			
S2	381339.051	5032968.685			
S2	381337.931	5032971.251			

S2	381337.733	5032971.705
S2	381347.856	5032976.123
S2	381352.652	5032978.217
S2	381352.769	5032978.266
S2	381352.887	5032978.313
S2	381353.006	5032978.356
S2	381352.331	5032977.428
S2	381349.581	5032976.228
S2	381350.662	5032973.753
S2	381339.051	5032968.685
S3	381318.259	5032957.972
S3	381307.625	5032982.332
S3	381303.659	5032986.085
S3	381310.51	5032989.076
S3	381321.435	5032964.05
S3	381337.931	5032971.251
S3	381339.051	5032968.685
S3	381319.267	5032960.048
S3	381318.259	5032957.972
S4	381303.659	5032986.085
S4	381285.414	5033003.349
S4	381304.879	5033024.646
S4	381311.368	5033017.747
S4	381300.135	5033012.843
S4	381310.51	5032989.076
S4	381303.659	5032986.085
S5	381316.631	5033020.045
S5	381320.706	5033010.711
S5	381318.612	5033009.797
S5	381319.652	5033007.414
S5	381321.746	5033008.328
S5	381327.851	5032994.342
S5	381334.493	5032979.128
S5	381337.733	5032971.705
S5	381337.931	5032971.251
S5	381321.435	5032964.05
S5	381310.51	5032989.076
S5	381300.135	5033012.843
S5	381311.368	5033017.747
S5	381316.631	5033020.045
S6	381327.521	5033031.08
S6	381338.894	5033036.045
S6	381340.298	5033037.792
S6	381342.392	5033038.706
S6	381343.432	5033036.323
S6	381341.338	5033035.409
S6	381349.093	5033017.644
S6	381343.736	5033015.306
S6	381335.821	5033012.047
S6	381326.803	5033010.853
S6	381325.27	5033009.866
S6	381321.746	5033008.328
S6	381319.652	5033007.414
S6	381318.612	5033009.797
S6	381320.706	5033010.711
S6	381316.631	5033020.045
S6	381311.368	5033017.747
S6	381304.879	5033024.646
S6	381307.751	5033027.787
S6	381319.536	5033040.417
S6	381325.697	5033035.259
S6	381327.521	5033031.08
S7	381354.292	5033005.735
S7	381349.118	5033003.477
S7	381341.795	5032998.364
S7	381333.208	5032996.68
S7	381327.851	5032994.342
S7	381321.746	5033008.328
S7	381325.27	5033009.866
S7	381326.803	5033010.853
S7	381335.821	5033012.047
S7	381349.093	5033017.644
S7	381354.292	5033005.735
S8	381336.223	5033047.127
S8	381352.72	5033054.328
S8	381374.019	5033005.534
S8	381368.8	5033003.256
S8	381369.264	5033002.193
S8	381359.142	5032997.774
S8	381358.678	5032998.837
S8	381357.523	5032998.333
S8	381355.797	5033002.286
S8	381341.338	5033035.409
S8	381343.432	5033036.323
S8	381342.392	5033038.706
S8	381340.298	5033037.792
S8	381336.223	5033047.127
S9	381360.442	5032986.777
S9	381352.823	5032978.774
S9	381353.006	5032978.356
S9	381352.846	5032978.297
S9	381352.688	5032978.233
S9	381347.856	5032976.123
S9	381344.215	5032984.464
S9	381341.866	5032982.347
S9	381334.493	5032979.128
S9	381327.851	5032994.342
S9	381333.208	5032996.68
S9	381341.795	5032998.364
S9	381349.118	5033003.477
S9	381354.292	5033005.735
S9	381357.523	5032998.333
S9	381355.738	5032997.554
S9	381360.442	5032986.777

;;Storage Node

X-Coord

Y-Coord

;;

[SYMBOLS]

X-Coord

Y-Coord

;;Gage

;;

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

Element Count							

Number of rain gages 1							
Number of subcatchments ... 11							
Number of nodes 16							
Number of links 17							
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	
S1	0.01	6.10	100.00	15.0000	Rainfall	St_UnGrd	
S10	0.01	29.00	8.79	1.0000	Rainfall	CB118	
S11	0.05	70.00	18.80	2.0000	Rainfall	CB114	
S2	0.00	4.30	0.00	1.9000	Rainfall	CB113	
S3	0.02	75.00	17.80	1.0000	Rainfall	CB112	
S4	0.04	52.00	8.51	3.5000	Rainfall	CB110	
S5	0.10	105.00	100.00	1.0000	Rainfall	Roof_1	
S6	0.08	45.00	66.78	2.5000	Rainfall	CB115	
S7	0.04	28.60	90.42	2.7000	Rainfall	CB116	
S8	0.10	105.00	100.00	1.0000	Rainfall	Roof_2	
S9	0.05	50.00	93.57	2.4000	Rainfall	CB117	

Node Summary							

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow		
OF4	OUTFALL	80.63	0.00	0.0			
OF7	OUTFALL	80.63	0.00	0.0			
STUB15	OUTFALL	80.63	0.00	0.0			
STUB16	OUTFALL	80.65	0.00	0.0			
CB110	STORAGE	83.75	1.90	0.0			
CB111	STORAGE	83.59	2.01	0.0			
CB112	STORAGE	83.28	2.12	0.0			
CB113	STORAGE	83.55	1.70	0.0			
CB114	STORAGE	85.30	0.25	0.0			
CB115	STORAGE	85.25	0.31	0.0			
CB116	STORAGE	85.20	0.40	0.0			
CB117	STORAGE	85.15	0.15	0.0			
CB118	STORAGE	85.22	0.18	0.0			
Roof_1	STORAGE	96.35	0.15	0.0			
Roof_2	STORAGE	96.35	0.15	0.0			
St_UnGrd	STORAGE	81.80	1.00	0.0	Yes		

Link Summary							

Name	From Node	To Node	Type	Length	%Slope		
Roughness							
C1	CB111	CB112	CONDUIT	28.9	0.8647		
0.0130	CB113	CB112	CONDUIT	31.3	0.6067		
C3	CB110	CB111	CONDUIT	20.5	0.7815		
0.0130	CB115	CB116	WEIR				
W2	CB116	CB117	WEIR				
W3	CB112	CB113	WEIR				
W4	CB114	CB115	WEIR				
W5	CB110	CB112	WEIR				
C2	CB112	STUB16	OUTLET				
OL1	CB115	St_UnGrd	OUTLET				
OL2	CB116	St_UnGrd	OUTLET				
OL3	CB117	St_UnGrd	OUTLET				
OL4	Roof_1	STUB15	OUTLET				
OL5	Roof_2	OF4	OUTLET				
OL6	CB114	St_UnGrd	OUTLET				
OL7	St_UnGrd	OF7	OUTLET				
OL8	CB118	St_UnGrd	OUTLET				

Cross Section Summary							

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	CIRCULAR	0.15	0.02	0.04	0.15	1	0.01
C3	CIRCULAR	0.15	0.02	0.04	0.15	1	0.01
C5	CIRCULAR	0.15	0.02	0.04	0.15	1	0.01

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 5.00 sec							
Variable Time Step YES							
Maximum Trials 8							
Number of Threads 1							
Head Tolerance 0.001500 m							

Runoff Quantity Continuity							

Total Precipitation	0.052	103.200					
Evaporation Loss	0.000	0.000					
Infiltration Loss	0.012	23.698					
Surface Runoff	0.040	78.367					
Final Storage	0.001	1.200					
Continuity Error (%)	-0.062						

Flow Routing Continuity							

	Volume	Volume					
	hectare-m	10^6 ltr					

Engineering Specification

Job Name _____

Contractor _____

Job Location _____

Approval _____

Engineer _____

Contractor's P.O. No. _____

Approval _____

Representative _____

Tag _____

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.

Suffix	Pipe Sizing Description	
2	2"(51) Pipe Size	☐
3	3"(76) Pipe Size	☐
4	4"(102) Pipe Size (NH Only)	☐

Suffix	Outlet Type Description	
NH	No Hub (MJ)	☐
P	Push On	☐
T	Threaded	☐
X	Inside Caulk	☐

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

Suffix	Optional Body Material Description	
-60	PVC Body w/Socket Outlet	☐
-61	ABS Body w/Socket Outlet	☐

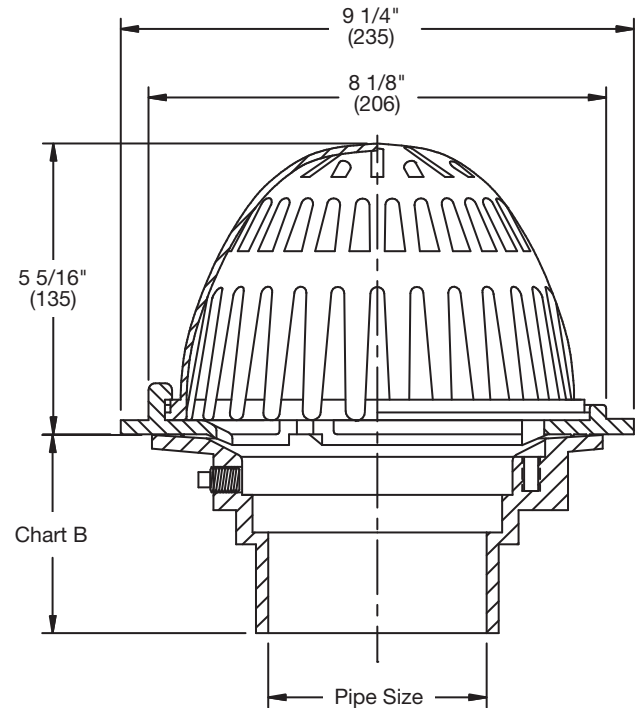


Chart B

Pipe Size	Std. No Hub	P Push On	T Female Thread	X Inside Caulk	60/61 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)

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

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.

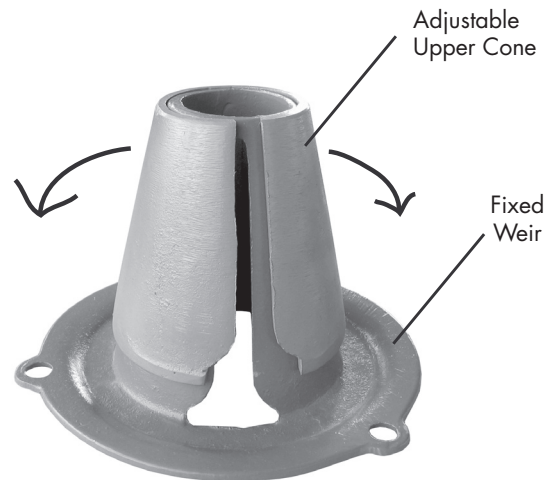
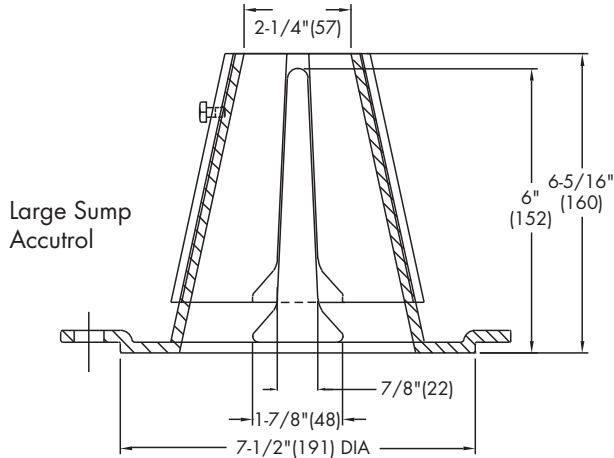


TABLE 1. Adjustable Accutrol Flow Rate Settings

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 _____

Contractor _____

Job Location _____

Contractor's P.O. No. _____

Engineer _____

Representative _____

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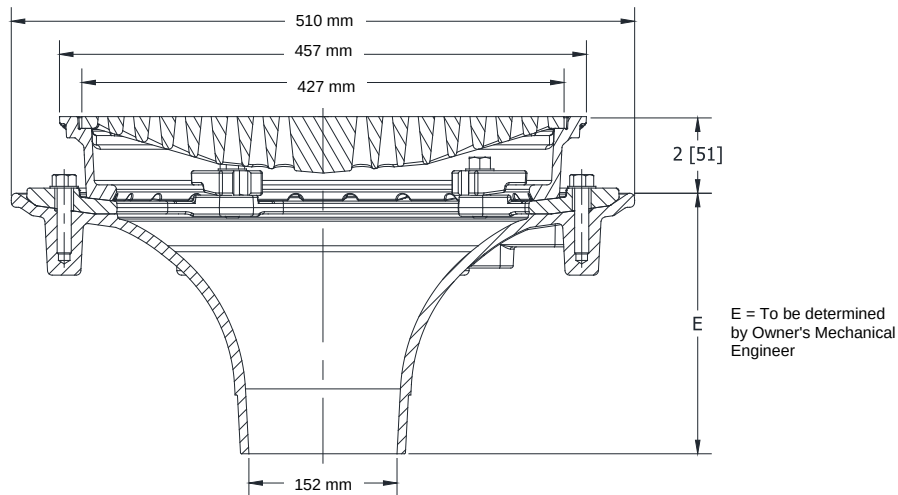
A Watts Water Technologies Company

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

In Canada | Zurn Industries Limited
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

JLR NO. 29899-002 (NAVAN BLOCK 15)																																					
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/Qf Ratio	Flow Depth (mm)	Actual Velocity (7) (m/s)	Flow Depth to Dia. Ratio (d/D)
BLOCK 15	BLOCK 15	14	83	149	149	3.55	1.72	0.09	0.09	1.50	0.05	0.57	0.57	0.19	1.95	200	Circular	203.20	1.50%	41.91	1.29	6.10	39.95	5%	85.850	82.467	82.264	3.383	85.840	0.060	82.376	82.173	3.464	0.05	29.67	0.66	0.15
EAST ORLEANS RIDGE SUBDIVISION	14	13			149	3.55	1.72		0.09	1.50	0.05		0.57	0.19	1.95	200	Circular	203.20	1.50%	41.91	1.29	13.50	39.95	5%	85.840	82.316	82.113	3.524	84.940		82.113	81.910	2.827	0.05	29.67	0.66	0.15

Design Parameters		
Apartments Population	1.8	Cap/Unit
Residential Flows	280	L/Cap/Day
Infiltration Flows	0.33	L/s/ha
Harmon's Correction Factor	0.8	unitless
Commercial Peak Factor	1.5	unitless
Institutional/Commercial A	28000	L/gross ha/d
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

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

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



Platinum
member

www.jlrichards.ca

Ottawa

343 Preston Street
Tower II, Suite 1000
Ottawa ON Canada
K1S 1N4
Tel: 613 728-3571
ottawa@jlrichards.ca

Kingston

203-863 Princess Street
Kingston ON Canada
K7L 5N4
Tel: 613 544-1424
kingston@jlrichards.ca

Sudbury

314 Countryside Drive
Sudbury ON Canada
P3E 6G2
Tel: 705 522-8174
sudbury@jlrichards.ca

Timmins

834 Mountjoy Street S
Timmins ON Canada
P4N 7C5
Tel: 705 360-1899
timmins@jlrichards.ca

North Bay

501-555 Oak Street E
North Bay ON Canada
P1B 8E3
Tel: 705 495-7597
northbay@jlrichards.ca

Hawkesbury

326 Bertha Street
Hawkesbury ON Canada
K6A 2A8
Tel: 613 632-0287
hawkesbury@jlrichards.ca

Guelph

107-450 Speedvale Ave. West
Guelph ON Canada
N1H 7Y6
Tel: 519 763-0713
guelph@jlrichards.ca

