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Site Servicing Report

Residential Site Plan (Block 17)

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



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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 17). 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 Residential Site Plan (Block 17) is located within the City of Ottawa's Official Plan boundary and consists of a 0.55 ha parcel bounded by Navan Road to the south, Page Road to the west, an existing property to the north, and the proposed East Ridge Orleans Subdivision to the east (as per the Site Servicing Report prepared by J.L. Richards and Associates, dated December 2024). 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 2024 (Appendix A). The survey indicates that the existing topography generally slopes downwards towards the intersection between Page Road and Navan Road.

1.3 Proposed Development

The proposed development will consist of two 4-story condominium buildings. Each building has 48 residential units, for a total of 96 residential units. The Concept Plan for the Residential Site Plan (Block 17) is attached to Appendix A.

1.4 Proposed Connections to Existing Infrastructure

Block 17 is proposed to be serviced by the infrastructure that is part of the East Ridge Orleans Subdivision. One sanitary, storm and water service lateral will extend to the parking garage footprint from the subdivision as shown in the servicing drawings.

1.5 Consultation and Permits

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

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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 watermains could provide adequate supply while complying with both the Ottawa Design Guidelines for Water Distribution (July 2010) and Technical Bulletins ISDTB-2014-02, ISTB-2018-02 and ISTB-2021-03. These documents are herein referred to as the Design Guidelines and TB-2014-02, TB-2018-02, and TB-2021-03, respectively.

The HNA completed as part of the East Ridge Orleans Subdivision design included water demands for the Residential Site Plan (Block 17). The HNA has since been updated to reflect the proposed water service lateral for Block 17 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). Domestic water demands were calculated for 52 one-bedroom apartment units, and 44 two-bedroom units as shown in the Site Plan. The total population for Block 17 is 165 people which is based on unit densities found in the City of Ottawa Design Guidelines.

The residential 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	Total Demands (L/s)
Average Day Demand	280 L/c/d	0.54
Maximum Day Demand	2.5 x Avg Day	1.34
Peak Hour Demand	2.2 x Max Day	2.94

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 Residential Site Plan (Block 17) was calculated as 233 L/s for Building E and 250 L/s for Building F. Refer to Appendix C for the detailed RFF calculations for the critical fire area.

Both buildings within Block 17 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 Residential Site Plan (Block 17) 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, the proposed hydrants within the East Ridge Orleans Subdivision, and the existing hydrants on Navan Road and Page Road. The Siamese connection for each building is located no more than 45 m way 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 250 L/s was used in this analysis since this is 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 #4 15,000 L/min (250.00 L/s)	124.4	121.9

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 during the peak hour condition to be 433 kPa (62.8psi) (refer to Appendix C), which exceeds the minimum pressure criterion of 276 kPa (40 psi) per the Design Guidelines.

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2.5.2 Maximum Day Plus Fire Flow

Fire water supply will be provided by the fully automatic sprinkler system, a proposed hydrant within the East Ridge Orleans subdivision, and existing hydrants on Page Road and Navan Road. 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 1,500 L/min (25 L/s) was assumed for Block 17, and it was assumed that only one (1) building would require fire flow at once.

Once the maximum day demands, the sprinkler demands, and the 15,000 L/min (250 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 15,000 L/min (250 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 17 which confirms that both buildings within the block meet the RFF of 250 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 468 kPa (67.9 psi). This value is below the maximum pressure constraint of 552 kPa (80 psi), therefore pressure reducing valves 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 water supply can be achieved from the proposed hydrants within the East Ridge Orleans Subdivision, and existing hydrants on Page Road and Navan Road.

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3.0 WASTEWATER SERVICING

3.1 Design Criteria

The sanitary sewer system within the Residential Site Plan (Block 17) 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 Table 4.

Table 4: Wastewater Key Design Parameters

Design Parameter	Design Value
Average Apartment	1.8 ppu
Residential Average Flow	280 L/Cap/Day
Residential Peaking Factor	Harmon's Formula
Harmon's Correction Factor (K)	0.8
Infiltration Allowance	0.33 L/s/ha
Manning's Roughness Coefficient (n)	0.013
Allowable Slopes	Varies (Refer to Section 6.1.2.2 of ODSG)
Allowable Velocities	0.6 m/s – 3.0 m/s
Allowable Freeboard	-

3.2 Proposed Sanitary Servicing and Design Flows

Wastewater generated from the Residential Site Plan (Block 17) will be conveyed via a proposed 200 mm diameter sanitary service lateral, which will then discharge into the East Ridge Orleans Subdivision as shown in the Servicing Drawing.

Wastewater flows from the proposed development are presented in the Residential Site Plan (Block 17) Sanitary Design Sheet (refer to Appendix E). Based on the design criteria (Table 4) and the site constraints, a total design peak flow of 2.16 L/s is calculated for the development. Table 5 summarizes the results from the sanitary design sheet.

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 17	0.55 ha	96	1.8 ppu	173 persons	3.54	1.98 L/s	0.0 L/s	0.18 L/s	2.16 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 December 2024). As shown in this report, the subdivision will consist of 200 mm diameter pipes which will have, at minimum,

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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 2.16 L/s of wastewater flows generated by Block 17.

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

3.3 Summary and Conclusions

Wastewater servicing for Block 17 will be designed in accordance with the City of Ottawa Sewer Design Guidelines, the associated technical bulletins, and various background documents as highlighted throughout this section. Wastewater will be conveyed via a proposed 200 mm diameter sanitary service lateral which will then discharge into the East Ridge Orleans Subdivision. It is recommended that this wastewater servicing plan be implemented to provide adequate sanitary servicing for the proposed development.

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4.0 STORM SERVICING AND STORMWATER MANAGEMENT

4.1 Design Criteria

Storm and stormwater management servicing for the Residential Site Plan (Block 17) 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 48 L/s as identified in Table 5-4 Site Servicing Report 2983, 3053 and 3079 Navan Road & 2690 Pagé Road, Ottawa, Ontario (JLR December 2024);
- Proposed Storm sewers are designed to capture the 1:2-year storm event and the 1:10-year peak flows on Navan Road as a minimum using the Rational Method and using the regressions derived from Intensity-Duration-Frequency (IDF) equations as per the Design Guidelines;
- Provide a freeboard in the sewer network to the underside of footing (USF) of 300 mm during the 1:100-year storm where weeping tile connections are present;
- 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 rear yard 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 rear yard 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;
- Peak flows estimated based on an inlet time of ten (10) minutes, as per the Technical Bulletin ISDTB-2012-4.
- Quality control will be accommodated by Pond #3 to meet an MECP Enhanced Level of Protection (80% TSS removal).
- 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.

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- Surface storage within the parking lots in greater than a 1:2-year event with captured flows conveyed to the building plumbing system and internal cistern;
- Ramp runoff captured and conveyed to the building plumbing system and internal cistern;
- Storage in the building cistern with flows pumped at a controlled rate to the minor system with a backwater valve at the connection; and,
- Controlled release of the flows captured in the ditch drainage system for the surrounding landscaped areas.

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

4.3 Proposed Minor System Servicing

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

4.4 Stormwater Management Modelling Approach

4.4.1 Dual Drainage Model

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

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

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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 December 2024).

The downstream 1:100-year HGL at the connection to the Subdivision at MH504 is identified as 78.75 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.

4.5 Modelling Parameters

4.5.1 Hydrological Parameters

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

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

4.5.2 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.

4.6 Simulation Results

4.6.1 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	82.10	300	29*	101	52
2	82.28	300	13*	65	47
3	80.80	250	0	162	169
4	81.05	200	0	0	0
5	82.00	200	0	180	162

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

4.6.2 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 77 mm.

4.6.3 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 the table below.

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 (mm)
1	ZURN_Z150F-6NH	14	43	101
2		8	40	65

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

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4.6.4 Landscaped Drainage

The landscaped drainage consists of typical rear yard system of swales and perforated pipes. The rear-yard system is connected to the building internal piping, upstream of the cistern. Flows are controlled using inlet control devices sized to ensure that the ponding criteria is met and sizing of the cistern is optimized. Capture rates and ponding depths are shown in Table 8.

Table 8: Landscaped 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 (mm)
3	Vortex_ICD_70	2	6	160
4		1		0
5	Vortex_ICD_70	2	6	180

The table above demonstrates that the landscaped area ICDs capture the 1:2-year design flow.

4.6.5 Building Release Rates

The allowable release rate from the site is calculated based on 85 L/s/ha for areas within the site extents and 43 L/s/ha for existing rear-yards draining into the site. In order to maintain the overall release rate from the site at the allowable flow rate of 48 L/s, the building drainage system must be controlled to 36 L/s, both roof drains will each account for an additional 2 L/s and the other 8 L/s will flow uncontrolled towards Pagé Road. Based on a pumped rate of 36 L/s a cistern size of 57 m³ is required in the building basement.

4.7 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 C04):

- 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 ICDs are to be placed blocking part of the sewer pipe in the connecting storm maintenance holes to eliminate construction debris from entering the existing storm sewer system. The ICDs are to be removed after the proposed storm 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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This report has been prepared by J.L. Richards & Associates Limited for 12714001 CANADA INC.'s exclusive use. Its discussions and conclusions are summary in nature and cannot properly be used, interpreted or extended to other purposes without a detailed understanding and discussions with the client as to its mandated purpose, scope and limitations. This report is based on information, drawings, data, or reports provided by the named client, its agents, and certain other suppliers or third parties, as applicable, and relies upon the accuracy and completeness of such information. Any inaccuracy or omissions in information provided, or changes to applications, designs, or materials may have a significant impact on the accuracy, reliability, findings, or conclusions of this report.

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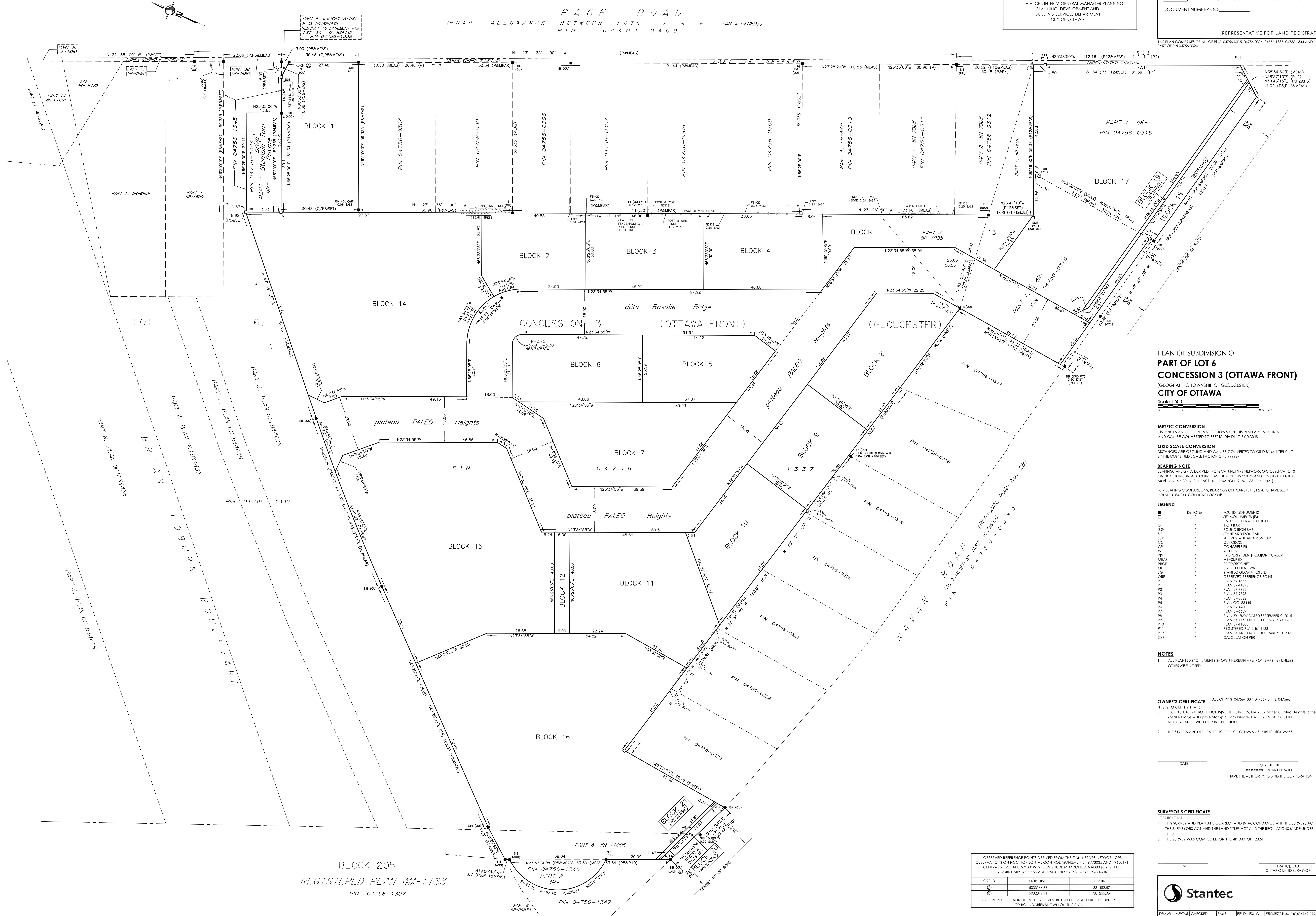
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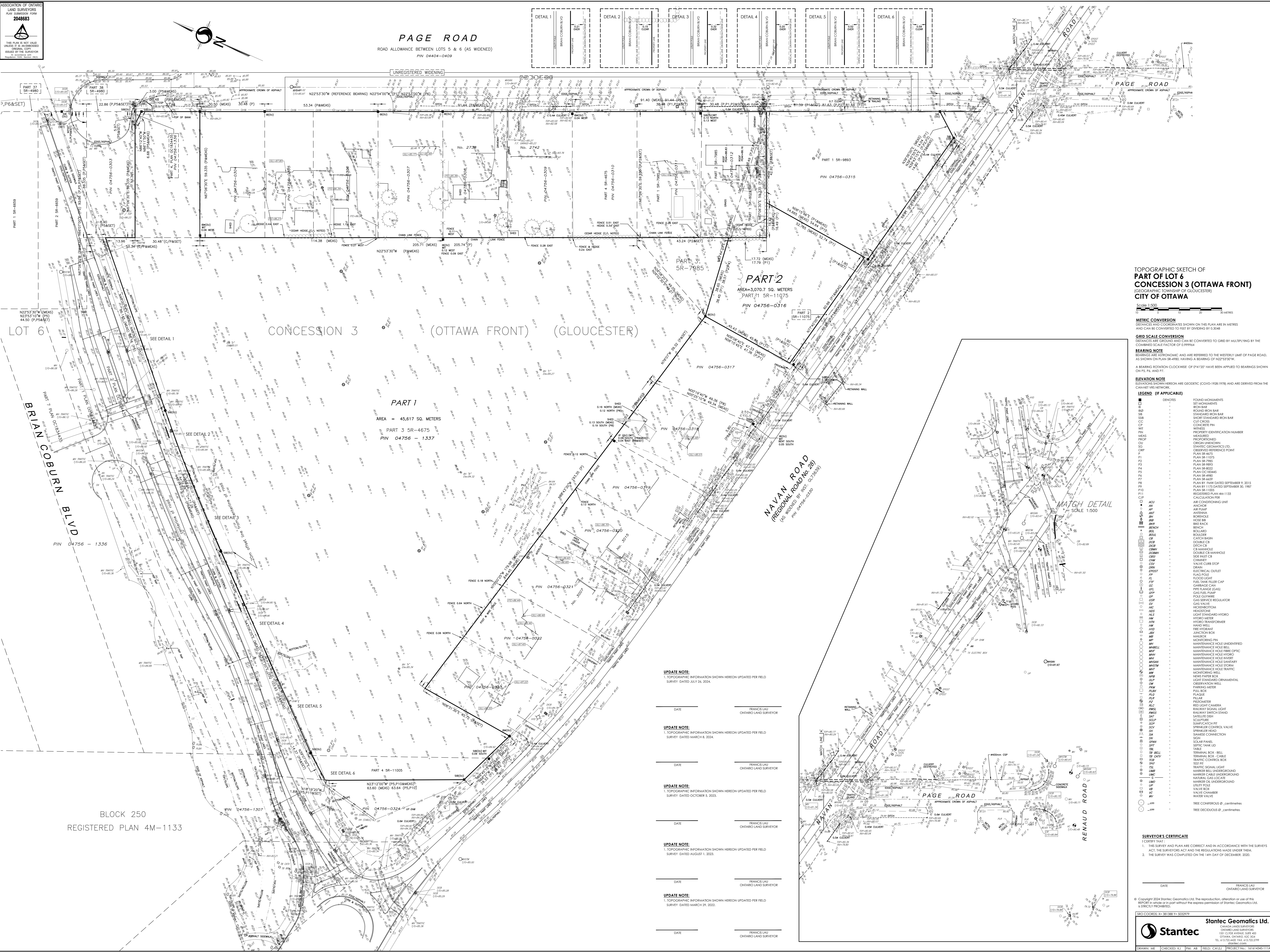
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Appendix A

Concept Plan, Draft Plan of
Subdivision and Topographical
Survey





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

Scale 1:500



A horizontal scale bar with alternating black and white segments. Below the bar, numerical markings are provided at 10, 0, 10, 20, and 30 METRES.

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

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

BEARING NOTE
BEARINGS ARE ASTRONOMIC AND ARE REFERRED TO THE WESTERLY LIMIT OF PAGE ROAD,
AS SHOWN ON PLAN SR-4980, HAVING A BEARING OF N22°53'30"W.

A BEARING ROTATION CLOCKWISE OF 0°41'20" HAVE BEEN APPLIED TO BEARINGS SHOWN ON P5, P6, AND P7.

ELEVATION NOTE
ELEVATIONS SHOWN HEREON ARE GEODETIC [CGVD-1928:1978] AND ARE DERIVED FROM THE CAN-NET VRS NETWORK.

LEGEND (IF APPLICABLE)

■	DENOTES	FOUND MONUMENTS
□	"	SET MONUMENTS

B1	IRON BAR
B2	ROUNDER IRON BAR
B3	STANDARD IRON BAR
B4	SHOCK STANDARD IRON BAR
C1	CUT CROSS
C2	CONCRETE PIP
W1	WITNESS
PN1	PROPERTY IDENTIFICATION NUMBER
MEAS	MEASURED
PROP	PROPOSED
OU	ORIGIN UNKNOWN
SG	STANTEC GEOGRAPHICS LTD.
ORP	OBSERVED REFERENCE POINT
P1	PLAN 58-4675
P2	PLAN 58-11075
P3	PLAN 58-7885
P4	PLAN 58-9693
P5	PLAN 58-8022
P6	PLAN 58-6459
P7	PLAN 58-4650
P8	PLAN BY FHW DATED SEPTEMBER 9, 2015
P9	PLAN BY 1175 DATED SEPTEMBER 30, 1987
P10	PLAN 58-1050
P11	REGISTERED PLAN AM-11-133
CIP	REGISTERED PLAN AM-11-133

[illegible]

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 REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 14th DAY OF DECEMBER, 2020.

DATE _____ FRANCIS LAU
ONTARIO LAND SURVEYOR

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SRO COORDS: X= 381388 Y= 5032979

Stantec Geomatics Ltd.

 **Stantec**
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stanlec.com

DRAWN: ME	CHECKED: KJ	PM: AB	FIELD: CA\SJ	PROJECT No.: 161614345-111A
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Site Servicing Report

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

Appendix B

Pre Consultation Meeting
Notes and Site Servicing Report
Checklist

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

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

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

Pre-Consultation Preliminary Assessment

1 ☐	2 ☐	3 ☐	4 ☒	5 ☐
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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 17)
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, Residential Site Plan (Block 17) 2983, 3053 and 3079 Navan Road & 2690 Pagé Road (J.L. Richards & Associates Limited, August 16, 2024)	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 'B')
☒	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 'B')
☐	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
	1 Bedroom	2 Bedroom											
	Apartment Units	Apartment Units											
J-25	52	44	165	0.00	0.54	0.00	0.54	1.34	0.00	1.34	2.94	0.00	2.94
TOTALS	52	44	165	0.00	0.54	0.00	0.54	1.34	0.00	1.34	2.94	0.00	2.94

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	
- Condo Units (CU)	1.8	p / p / u		- Institutional	28,000	l / ha / day		- Institutional	75,600	l / ha / day	
				- Commercial	28,000	l / ha / day		- Commercial	75,600	l / ha / day	
- 1 Bedroom Apartment	1.4	p / p / u		MAX. DAILY DEMAND							
- 2 Bedroom Apartment	2.1	p / p / u		- Residential	700	l / cap / day					
				- 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 E (4 Story Mixed Use Condominium Building)
	Coefficient (C)	1.5		
B	Ground Floor Area	958.32	m ²	Per architectural drawing A101
C	Height in storeys	4	storeys	Basements are excluded.
	Total Floor Area	3833.28	m ²	
D	Fire Flow Formula	F=220C√A		
	Fire Flow	20431	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	
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:	38.8	m	
	Height of Exposed Wall:	1	storeys	
	Length-Height Factor	38.8	m-storeys	
	Separation Distance	39.47	m	
	North Side Exposure Charge	5%		
	East Side Exposure			
	Exposing Wall:	Wood Frame		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	24.9	m	
	Height of Exposed Wall:	4	storeys	
	Length-Height Factor	99.7	m-storeys	
	Separation Distance	17.15	m	
	East Side Exposure Charge	15%		
	South Side Exposure			
	Exposing Wall:			
	Exposed Wall:			
	Length of Exposed Wall:		m	
	Height of Exposed Wall:		storeys	
	Length-Height Factor	0.0	m-storeys	
	Separation Distance		m	
	South Side Exposure Charge	0%		
	West Side Exposure			
	Exposing Wall:	Wood Frame		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	10.4	m	
	Height of Exposed Wall:	1	storeys	
	Length-Height Factor	10.4	m-storeys	
	Separation Distance	42.94	m	
	West Side Exposure Charge	5%		
	Total Exposure Charge	25%		The total exposure charge is below the maximum value of 75%.
	Increase for Exposures	4250	L/min	
H	Fire Flow	12750	L/min	
	Rounded Fire Flow	13000	L/min	Flow rounded to nearest 1000 L/min.
City Cap (RFF)	Required Fire Flow	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

FUS Fire Flow Calculations

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

Step	Parameter	Value		Note
A	Type of Construction	Wood Frame		Building F (4 Story Mixed Use Condominium Building)
	Coefficient (C)	1.5		
B	Ground Floor Area	958.32	m ²	Per architectural drawing A101
C	Height in storeys	4	storeys	Basements are excluded.
	Total Floor Area	3833.28	m ²	
D	Fire Flow Formula	F=220C√A		
	Fire Flow	20431	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	
F	Sprinkler Protection	Automatic Fully Supervised		
	Sprinkler Credit	-50%		
	Decrease for Sprinkler	-8500	L/min	
G	North Side Exposure			
	Exposing Wall:	Wood Frame		Building F Existing One Storey House
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	8.4	m	
	Height of Exposed Wall:	1	storeys	
	Length-Height Factor	8.4	m-storeys	
	Separation Distance	15.03	m	
	North Side Exposure Charge	12%		
	East Side Exposure			
	Exposing Wall:	Wood Frame		Building F Existing One Storey House
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	40.9	m	
	Height of Exposed Wall:	1	storeys	
	Length-Height Factor	40.9	m-storeys	
	Separation Distance	40.15	m	
	East Side Exposure Charge	5%		
	South Side Exposure			
	Exposing Wall:	Wood Frame		Building F Navan Road R.O.W
	Exposed Wall:	Non-combustible		
	Length of Exposed Wall:		m	
	Height of Exposed Wall:		storeys	
	Length-Height Factor	0.0	m-storeys	
	Separation Distance		m	
	South Side Exposure Charge	0%		
	West Side Exposure			
	Exposing Wall:	Wood Frame		Building F Building E
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	56.0	m	
	Height of Exposed Wall:	4	storeys	
	Length-Height Factor	223.8	m-storeys	
	Separation Distance	14.76	m	
	West Side Exposure Charge	15%		
	Total Exposure Charge	32%		The total exposure charge is below the maximum value of 75%.
	Increase for Exposures	5440	L/min	
H	Fire Flow	13940	L/min	
	Rounded Fire Flow	14000	L/min	Flow rounded to nearest 1000 L/min.
City Cap	Required Fire Flow (RFF)	14000	L/min	
		233	L/s	

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

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

OWNER

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

ARCHITECTURAL

(418) 651-8954
INFO@PMAARCHITECTES.COM
3070, CHEMIN DES QUATRE-BOURGEOIS
QUÉBEC (QC) G1W 2M4
PMAARCHITECTES.COM53, BOUL. SAINT-RAYMOND,
GATINEAU, QC J8Y 1R8

CIVIL ENGINEERS / PLANNER



ENGINEERS - ARCHITECTS - PLANNERS

1965 CARLING AVENUE, SUITE 700,
OTTAWA, ON K1Z 8R1

MECHANICAL & ELECTRICAL ENGINEERS

9 GURDWARA ROAD, UNIT 200,
OTTAWA, ON K2E 7X6

SURVEYOR

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

ARCHITECT SEAL

REVISIONS

NO	DESCRIPTION	DATE
13	FOR REVISION 30%	2024-10-23
12	FOR CITY REVIEW	2024-09-20
11	FOR CITY REVIEW	2024-07-17
10	FOR CITY REVIEW	2024-03-25
9	FOR CITY REVIEW	2024-03-08
8	FOR COORDINATION	2023-11-08
7	FOR CITY REVIEW	2022-11-28
6	FOR COORDINATION	2022-11-01
5	FOR COORDINATION	2022-04-14
4	FOR COORDINATION	2021-11-03
3	FOR COORDINATION	2021-09-30
2	FOR COORDINATION	2021-08-26
1	FOR COORDINATION	2021-06-18

NOTE

IT IS THE RESPONSIBILITY OF THE APPROPRIATE
CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS
ON THE SITE AND TO REPORT ALL ERRORS AND/OR
OMISSIONS TO THE ARCHITECT. ALL CONTRACTORS
MUST COMPLY WITH ALL PERTINENT CODES AND BY-
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BY THE ARCHITECT.**FOR REVISION 30%**
DO NOT USE FOR
CONSTRUCTION
2024-10-23DATE
2024-11-07DESIGNED
P.POMERLEAUDRAWN
P.POMERLEAUCHECKED
P.MARTIN

SHEET TITLE

GLOBAL SITE PLAN

SHEET NO

A100

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		
B06-3	163		

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:	~53,441.14 m ² (5.34ha)
TOTAL DEVELOPABLE AREA:	~45,956.28 m ² (4.59ha)
NET SITE AREA:	~38,956.28 m ² (3.89ha)

UNITS	
TOWNHOUSES:	
MAIN UNIT:	67 UNITS
BASEMENT UNIT:	48 UNITS
TOTAL NUMBER OF UNITS:	115 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:	397 UNITS
TOTAL COMMERCIAL SPACES:	~1,798 m ²

	REQUIRED	PROVIDED
MAXIMUM DENSITY	NO MAX.	102 units/net ha
MINIMUM LOT WIDTH	NO MIN.	5.8 m

MINIMUM LOT AREA	NO MIN.	174 m ²
MAXIMUM BUILDING HEIGHT	14.5 m	14.5 m

SETBACKS		
MINIMUM FRONT YARD:	3 m	3 m
MINIMUM CORNER SIDE YARD:	3 m	3 m
MINIMUM INTERIOR SIDE YARD:		
NON-RESIDENTIAL OR MIXED-USE:	5 m	5 m
LOW-RISE RESIDENTIAL :	1.2 m	1.2 m
MID-RISE RESIDENTIAL :	3 m	3 m
MINIMUM REAR YARD:		
ABUTTING A STREET:	3 m	3 m
FROM A RESIDENTIAL ZONE:	7.5 m	7.5 m
FOR A RESIDENTIAL BUILDING:	7.5 m	7.5 m

PARKING RATES		
R9 - TOWNHOUSES:	1 p/main unit = 67	67 (GARAGES)
VISITOR:	0	67 DRIVE AISLES

BLOCK 14:		
R12 - APARTEMENTS	1.0 p/unit = 84	84 (UNDERGROUND)
VISITOR:	0.2 p/unit = 17	18 (UNDERGROUND)
N79 - RETAIL STORE:	3.4 p/100 m ² GFA = 30.6	32 (EXTERIOR)
		TOTAL: 134

BLOCK 15:		
R12 - APARTEMENTS	1.0 p/unit = 83	83 (UNDERGROUND)
VISITOR:	0.2 p/unit = 16.6	16 (UNDERGROUND)
N79 - RETAIL STORE:	3.4 p/100 m ² GFA = 30.6	32 (EXTERIOR)
		TOTAL: 131

BLOCK 17:		
R12 - APARTEMENTS	1.0 p/unit = 96	96 (UNDERGROUND)
VISITOR:	0.2 p/unit = 19.2	19 (15 EXT. + 4 UND.)
		TOTAL: 115

GROSS FLOOR AREA	
TOWNHOUSE A:	267 m ²
TOWNHOUSE B:	239 m ²
TOWNHOUSE C:	232 m ²
TOWNHOUSE C (CORNER UNIT):	236 m ²
TOWNHOUSE D:	225 m ²

TOTAL MODEL 01 (AB8888BA)	1,968 m ²
TOTAL MODEL 02 (AB8888BA)	1,729 m ²
TOTAL MODEL 03 (AB8888BA)	1,490 m ²
TOTAL MODEL 04 (C0C0C0C)	1,611 m ²
TOTAL MODEL 05 (C0C0C0C)	1,386 m ²

MIXED USE BUILDING (TOTAL OF 2 BUILDINGS):	TOTAL: 3,926 m ²
RESIDENTIAL:	3,027 m ²
COMMERCIAL:	899 m ²
RESIDENTIAL APARTMENT BUILDING (TOTAL OF 4 BUILDINGS):	TOTAL: 3,927 m ²
RESIDENTIAL:	3,927 m ²

NOTE

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



20 0 20 40m

1 2983, NAVAN ROAD - SITE PLAN
1:500

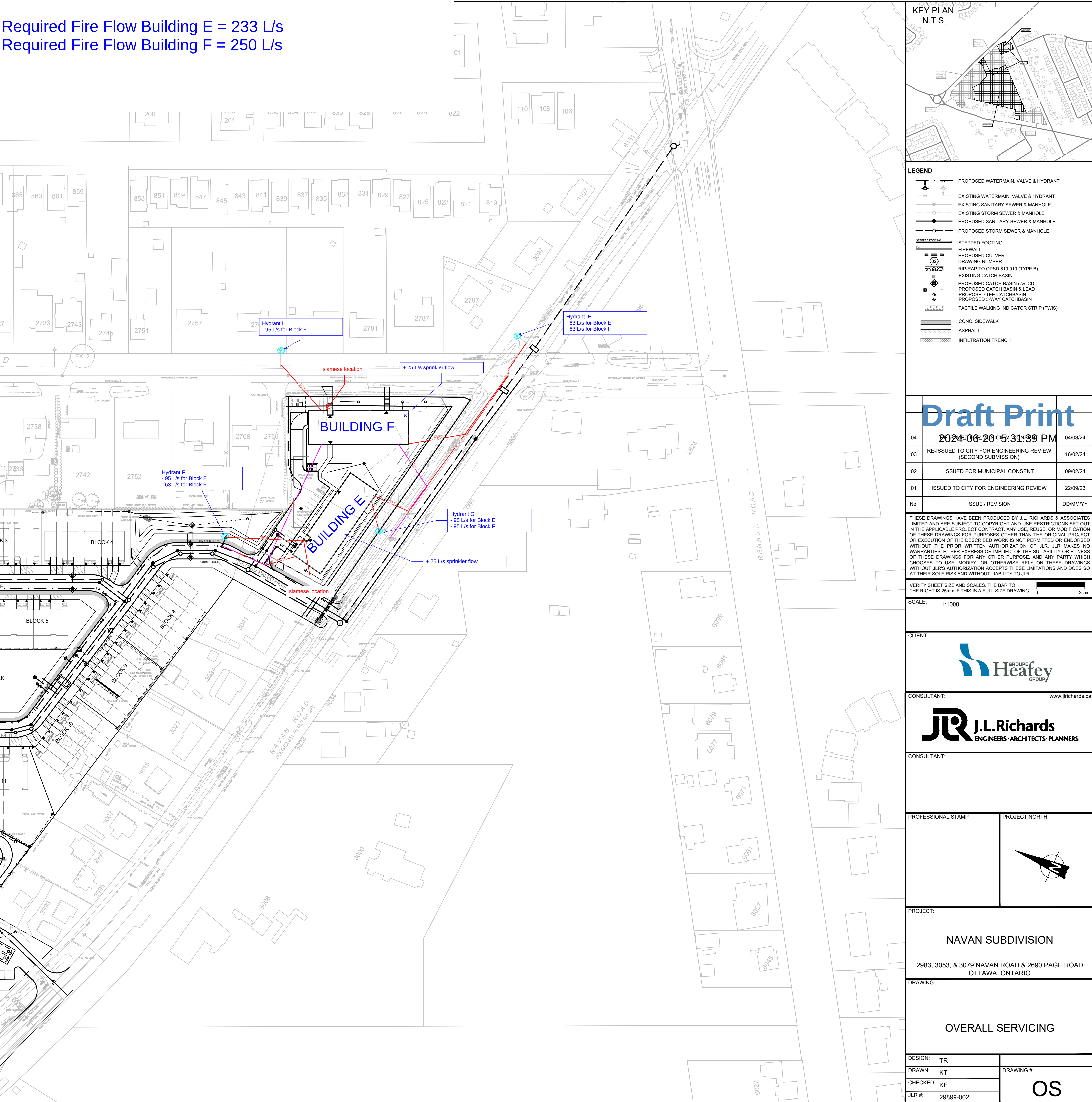
Table 1. Maximum flow to be considered from a given hydrant		
Hydrant Class	Distance to asset/structure/building (m) ^a	Contribution to required fire flow (L/min) ^b
AA	≤ 75	5,700
	> 75 and ≤ 150	3,800
A	≤ 75	3,800
	> 75 and ≤ 150	2,850
B	≤ 75	1,900
	> 75 and ≤ 150	1,500
C	≤ 75	800
	> 75 and ≤ 150	800

^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 17

Required Fire Flow Building E = 233 L/s
Required Fire Flow Building F = 250 L/s

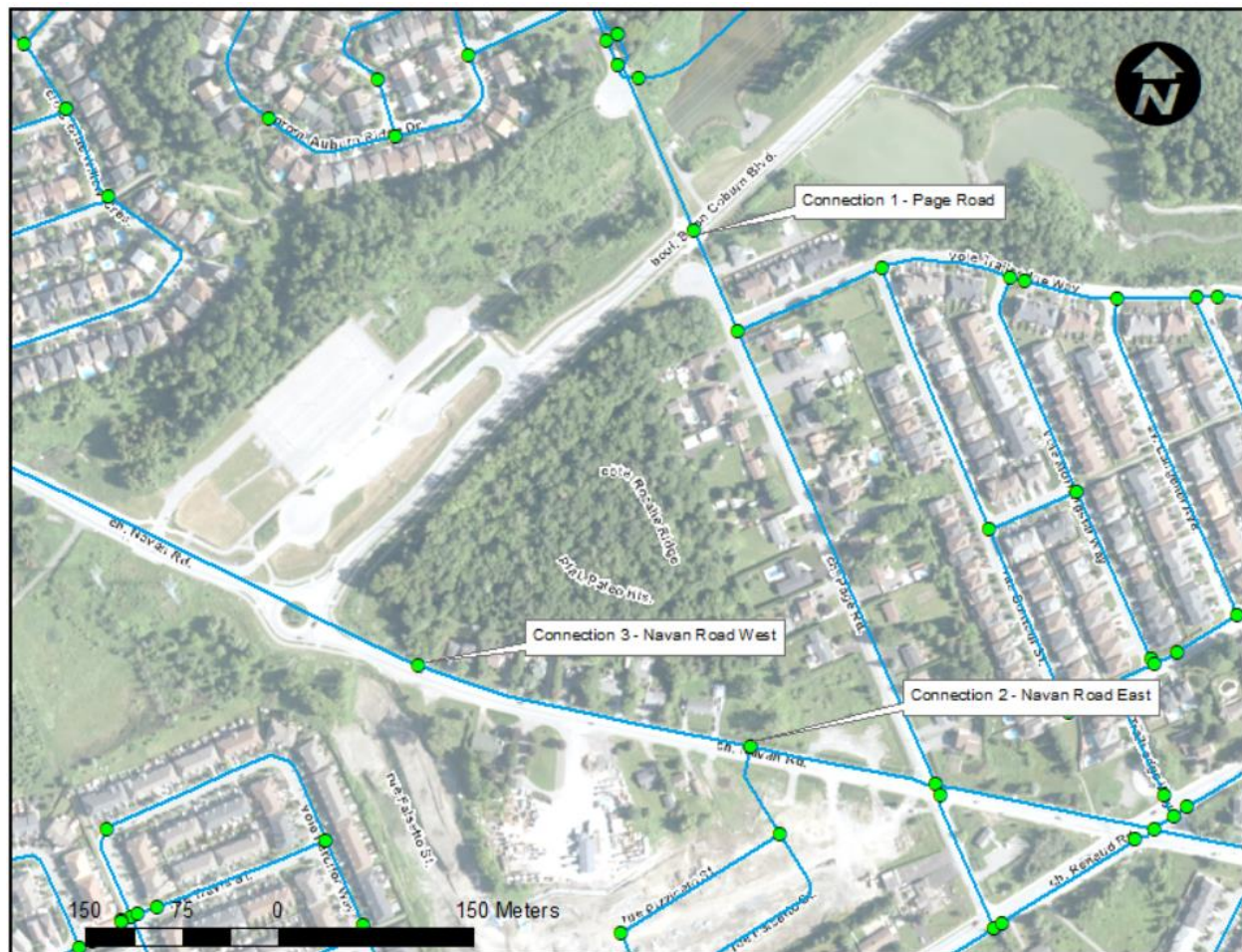


Boundary Conditions Navan Subdivision

Provided Information

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

Location



Results

Connection 1 - Page Road

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

¹ Ground Elevation = 85.7 m

Connection 2 - Navan Road East

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

¹ Ground Elevation = 80.5 m

Connection 3 - Navan Road West

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

¹ Ground Elevation = 81.9 m

Disclaimer

The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermain 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.

William Rugamba

From: Mahad Musse
Sent: July 15, 2024 1:21 PM
To: William Rugamba
Subject: FW: Navan Subdivision - Boundary Condition Request
Attachments: NavanSubdivision_Boundary Condition(4july2024).docx

Mahad Musse, B.Eng., EIT
Civil Engineering Graduate
Ottawa, ON
Work: [343-633-1501](tel:343-633-1501)

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@jrichards.ca>
Sent: August 15, 2023 9:26 AM
To: Polyak, Alex <alex.polyak@ottawa.ca>
Cc: Karla Ferrey <kferrey@jrichards.ca>; Raad Akrawi <rakrawi@groupeheafey.com>; Carmine Zayoun <carmine@zayoungroup.com>; Shahira Jalal <sjalal@jrichards.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



**J.L. Richards
& Associates Limited**
ENGINEERS • ARCHITECTS • PLANNERS



**BEST
MANAGED
COMPANIES**

Platinum
member

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

Hello Alex.

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

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

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

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

Average Day Demand: 6.44 L/s

Maximum Day Demand: 9.77 L/s

Peak Hour Demand: 16.50 L/s

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

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

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

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

Thanks,
Tatyana

,

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,

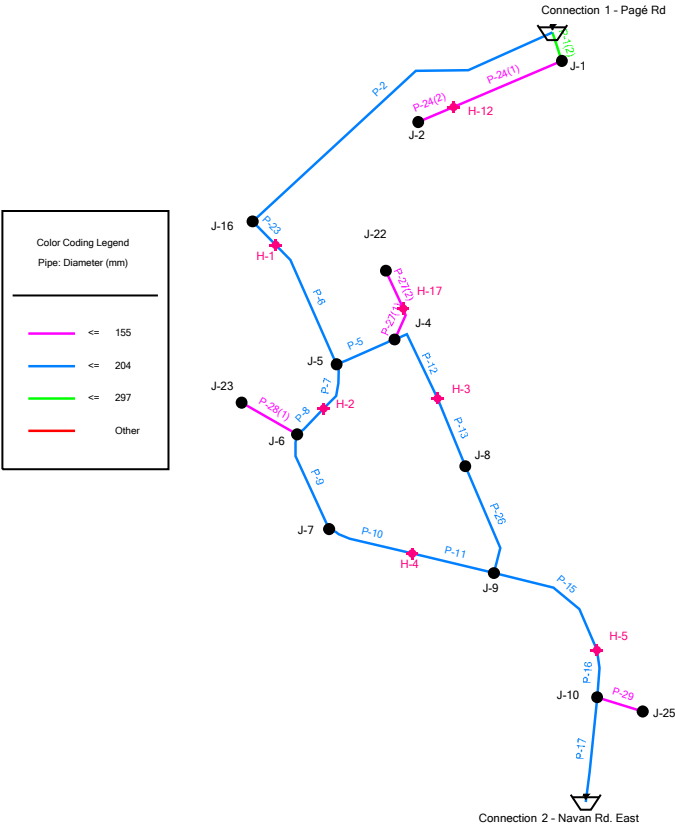
,

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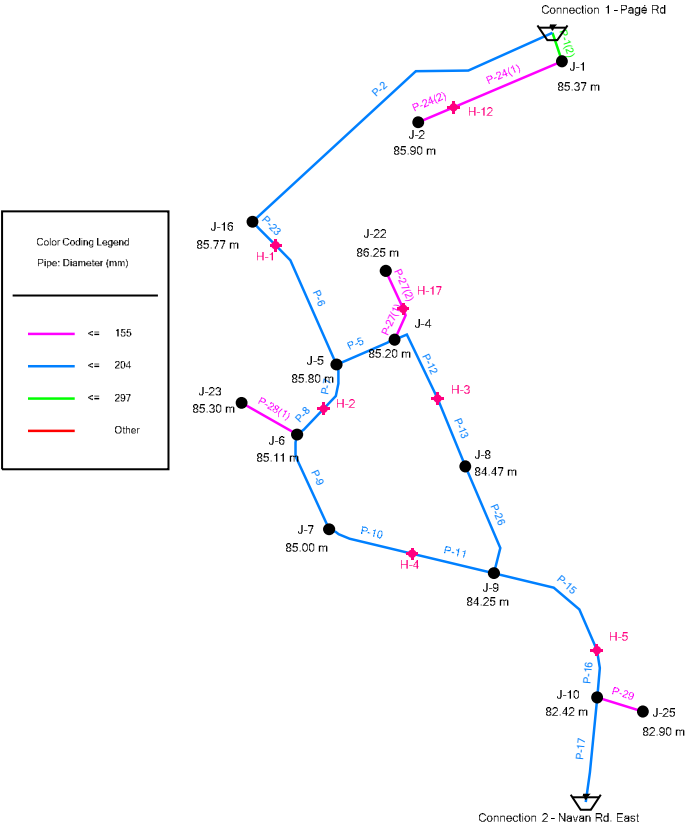
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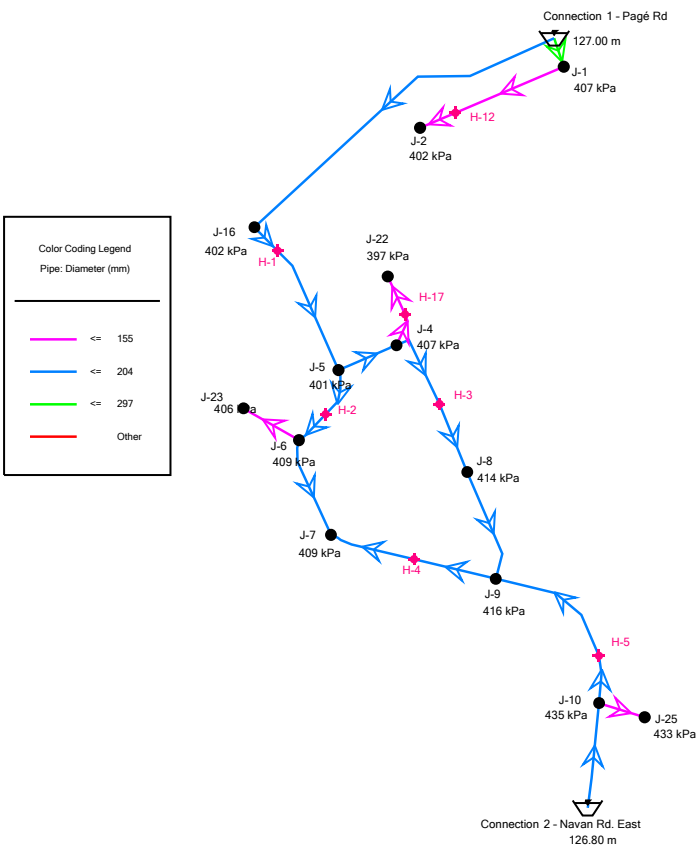
Mixed-Use Site Plan (Block 17)
Model Schematic



Mixed-Use Site Plan (Block 17)
Model Schematic
Elevation Model



Mixed-Use Site Plan (Block 17)
Peak Hour Demand



Mixed-Use Site Plan (Block 17)

Peak Hour Demand

Junction Table

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-22	86.25	2.78	126.77	397
J-5	85.80	0.00	126.79	401
J-16	85.77	0.00	126.85	402
J-2	85.90	0.58	127.00	402
J-23	85.30	2.74	126.77	406
J-4	85.20	0.00	126.78	407
J-1	85.37	0.00	127.00	407
J-6	85.03	0.00	126.78	409
J-7	85.00	4.63	126.77	409
J-8	84.47	1.90	126.78	414
J-9	84.25	1.31	126.78	416
J-25	82.55	2.94	126.78	433
J-10	82.35	0.00	126.78	435

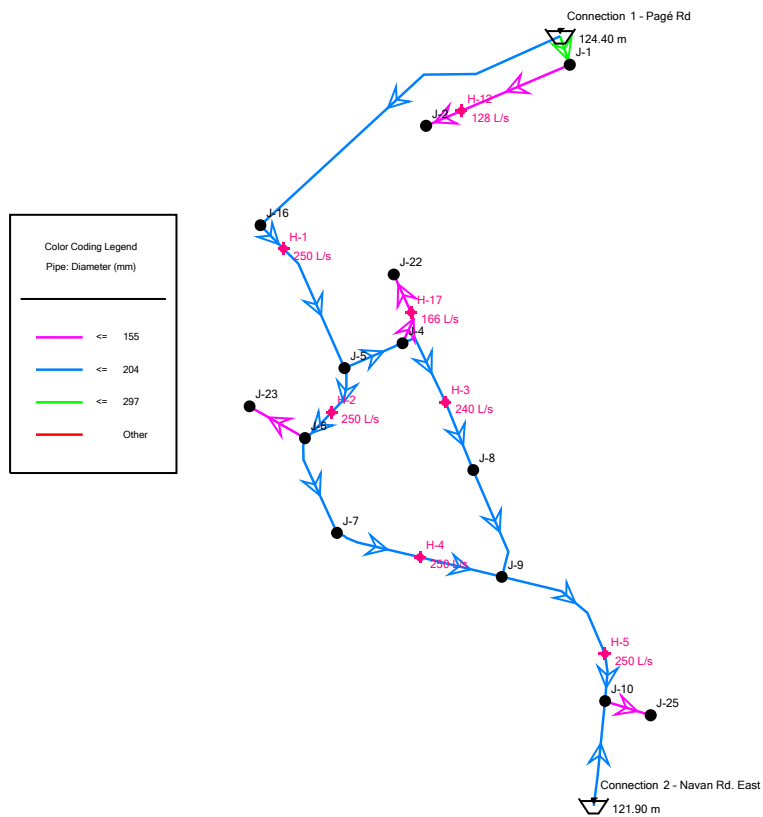
Mixed-Use Site Plan (Block 17)

Peak Hour Demand

Pipe Table

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)
P-1(2)	14	297	PVC	120.0	-0.58	0.01
P-2	175	204	PVC	110.0	10.24	0.31
P-5	31	204	PVC	110.0	-4.91	0.15
P-6	64	204	PVC	110.0	-10.24	0.31
P-7	24	204	PVC	110.0	5.33	0.16
P-8	18	204	PVC	110.0	5.33	0.16
P-9	49	204	PVC	110.0	2.59	0.08
P-10	41	204	PVC	110.0	-2.04	0.06
P-11	40	204	PVC	110.0	-2.04	0.06
P-12	40	204	PVC	110.0	2.13	0.07
P-13	35	204	PVC	110.0	2.13	0.07
P-15	67	204	PVC	110.0	-3.12	0.10
P-16	23	204	PVC	110.0	-3.12	0.10
P-17	50	204	PVC	110.0	-6.06	0.19
P-23	16	204	PVC	110.0	10.24	0.31
P-24(1)	56	155	PVC	100.0	0.58	0.03
P-24(2)	18	155	PVC	100.0	0.58	0.03
P-26	55	204	PVC	110.0	0.23	0.01
P-27(1)	16	155	PVC	100.0	2.78	0.15
P-27(2)	20	155	PVC	100.0	2.78	0.15
P-28(1)	30	155	PVC	100.0	2.74	0.15
P-29	23	155	PVC	100.0	2.94	0.16

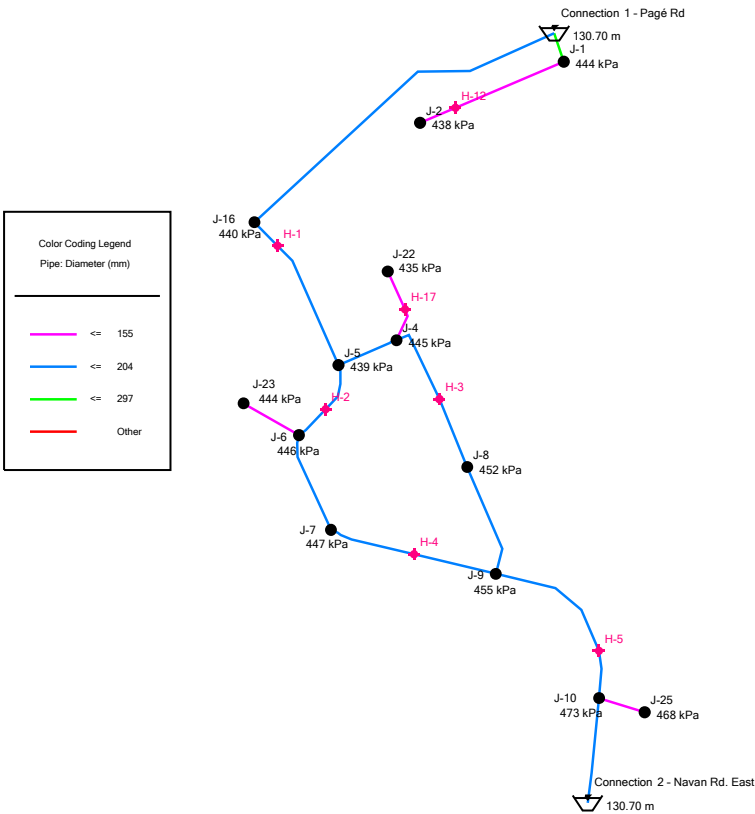
Mixed-Use Site Plan (Block 17) **Max Day + Fire Flow Requirement**



Mixed-Use Site Plan (Block 17)
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	162	184	J-16
H-2	True	250	250	140	140	147	J-23
H-3	True	240	240	140	140	165	J-22
H-4	True	250	250	140	143	154	J-7
H-5	True	250	250	140	252	256	J-22
H-12	True	128	128	140	140	147	J-2
H-17	True	166	166	140	143	140	J-22

Mixed-Use Site Plan (Block 17)
Maximum Pressure Analysis



Mixed-Use Site Plan (Block 17)

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-1	85.37	0	130.70	444
J-23	85.30	0	130.70	444
J-4	85.20	0	130.70	445
J-6	85.11	0	130.70	446
J-7	85.00	0	130.70	447
J-8	84.47	0	130.70	452
J-9	84.25	0	130.70	455
J-25	82.90	0	130.70	468
J-10	82.42	0	130.70	473

Mixed-Use Site Plan (Block 17)

Maximum Pressure Analysis

Pipe Table

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)
P-1(2)	14	297	PVC	120.0	0	0.00
P-2	175	204	PVC	110.0	0	0.00
P-5	31	204	PVC	110.0	0	0.00
P-6	64	204	PVC	110.0	0	0.00
P-7	24	204	PVC	110.0	0	0.00
P-8	18	204	PVC	110.0	0	0.00
P-9	49	204	PVC	110.0	0	0.00
P-10	41	204	PVC	110.0	0	0.00
P-11	40	204	PVC	110.0	0	0.00
P-12	40	204	PVC	110.0	0	0.00
P-13	35	204	PVC	110.0	0	0.00
P-15	67	204	PVC	110.0	0	0.00
P-16	23	204	PVC	110.0	0	0.00
P-17	50	204	PVC	110.0	0	0.00
P-23	16	204	PVC	110.0	0	0.00
P-24(1)	56	155	PVC	100.0	0	0.00
P-24(2)	18	155	PVC	100.0	0	0.00
P-26	55	204	PVC	110.0	0	0.00
P-27(1)	16	155	PVC	100.0	0	0.00
P-27(2)	20	155	PVC	100.0	0	0.00
P-28(1)	30	155	PVC	100.0	0	0.00
P-29	23	155	PVC	100.0	0	0.00

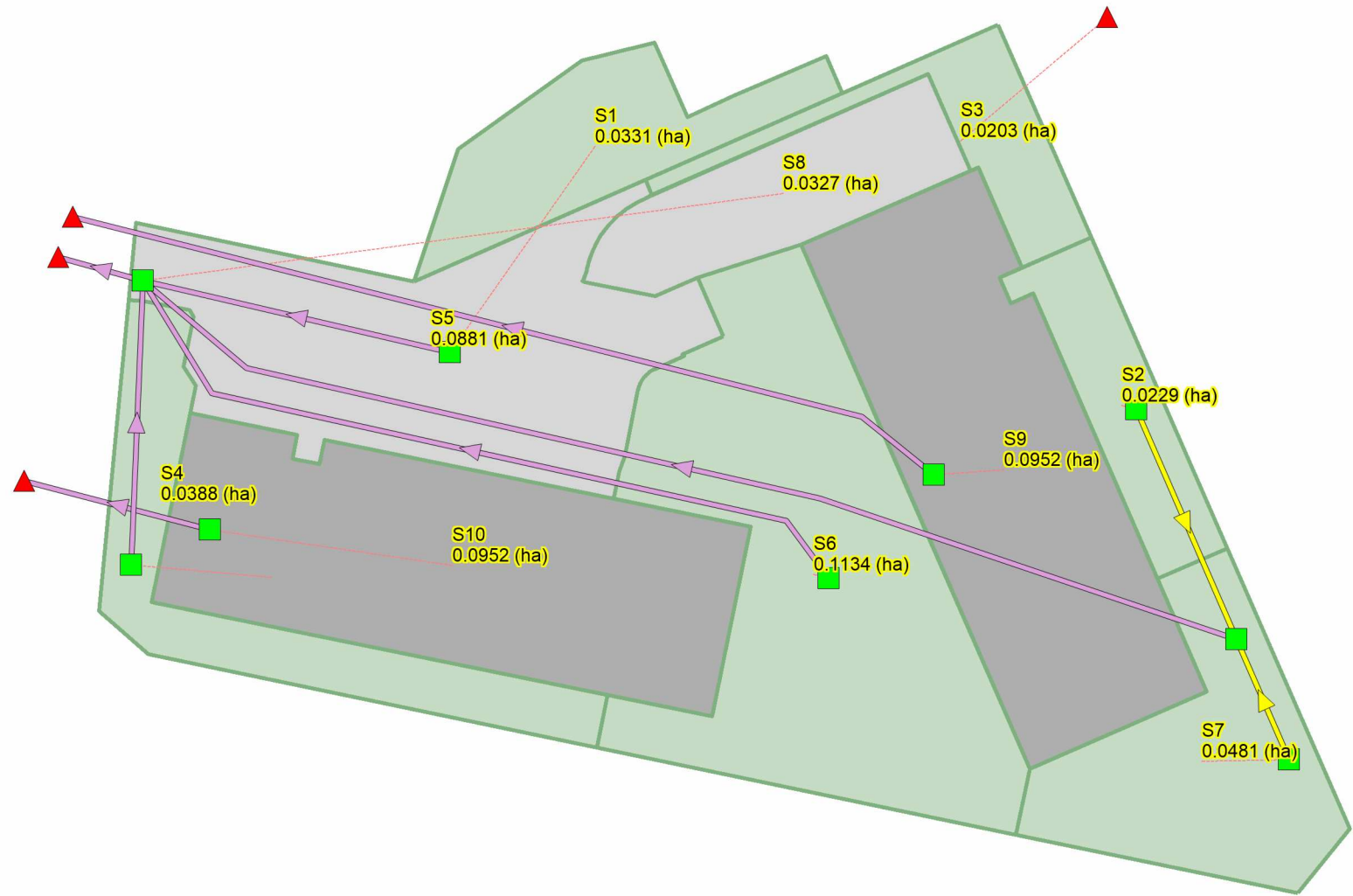
Appendix D

Stormwater Management

Notes on Peak Flow and Pipes Sizing

- (4) Allowable Release Rate from Site (45L/s) is equal to the sum of Cistern Flow (41L/s) and Root Drain Flow (4L/s)
- (5) Downstream Peak Flow is equal to allowable release rate for site (45 L/s) combined with the existing controlled flows from the subdivision (454 L/s)
- (6) Pipes are conservatively sized for 1.2 Year Peak Flow Rate
- (7) Actual Velocities based on actual peak flows from Note 5
- (8) Additional details from Existing Sewers can be found within East Orleans Ridge Subdivision Design Sheet.

REAR YARD CATCH BASIN TABLE														
Street Name	CB ID Number	T/G	Inlet					Outlet				Drop (m)	CATCH BASIN TYPE	ICD TYPE
			Pipe Dia. (mm)	Pipe Length (m)	Slope	Invert	Cover	Pipe Dia. (mm)	Pipe Length (m)	Invert	COVER (m)			
BLOCK 17	CB124	81.05	-	-	-	-		250	23.32	79.470	1.33		CATCH BASIN ELBOW PER CITY STANDARD S30	NO ICD
	CB122	80.80	-	-	-	-		250	12.24	79.350	1.20		CATCH BASIN ELBOW PER CITY STANDARD S30	NO ICD
	CB123	81.35	250	23.32	1.0%	79.237	1.86	250	3.49	79.168	1.93	0.06	600x600mm PRECAST CONCRETE PER OPSD 705.010 C/W FRAME AND COVER AS PER CITY OF OTTAWA S19	Vortex_ICD_70
			250	12.24	1.0%	79.228	1.87							
	CB125	82.00	-	-	-	-	-	-	200	1.90	80.200	1.60		600x600mm PRECAST CONCRETE PER OPSD 705.010 C/W FRAME AND COVER AS PER CITY OF OTTAWA S19



Legend

- ▲ Outfalls
- Storages
- Conduits
- Outlets
- Subcatchments
- Rear-Yard
- Parking Lot Area
- Ramp to Garage
- Building



10 m

PROJECT: NAVAN RESIDENTIAL SITE PLAN - BLOCK 17 Ottawa, ON			
DRAWING: Overall System Model Schematic			
 J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS	DESIGN:	ML	JLR NO.: 29899-002
	DRAWN:	ML	DRAWING NO.: Appendix D
	CHECKED:		

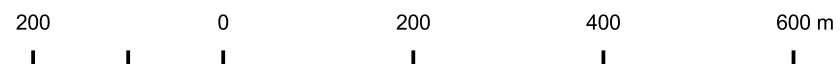
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Legend

Intersection

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



PROJECT:				NAVAN RESIDENTIAL AND COMMERCIAL BLOCK 17 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: Appendix D	
						CHECKED: ML			

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

[TITLE]				BLDG_E		Roof2		OF4		88.85		TABULAR/HEAD		O_Roof2															
;;Project Title/Notes				NO		BLDG_F		Roof1		OF3		88.85		TABULAR/HEAD		O_Roof1													
[OPTIONS]				NO		CB120		CB120		St_UnGrd		82.1		TABULAR/HEAD		ZURN_2150F-6NH													
;;Option				CMS		NO		CB121		CB121		St_UnGrd		82.28		TABULAR/HEAD		ZURN_2150F-6NH											
FLOW_UNITS				INFILTRATION		NO		CB123		CB123		St_UnGrd		79.168		TABULAR/HEAD		Vortex_ICD_70											
FLOW_ROUTING				DYNWAVE		NO		CB125		CB125		St_UnGrd		80.2		TABULAR/HEAD		Vortex_ICD_70											
LINK_OFFSETS				ELEVATION		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
MIN_SLOPE				0		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
ALLOW_PONDING				NO		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
SKIP_STEADY_STATE				NO		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
START_DATE				01/01/2000		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
START_TIME				00:00:00		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
REPORT_START_DATE				01/01/2000		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
REPORT_START_TIME				00:00:00		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
END_DATE				01/01/2000		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
END_TIME				03:00:00		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
SWEEP_START				1/1		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
SWEEP_END				12/31		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
DRY_DAYS				0		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
REPORT_STEP				00:01:00		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
WET_STEP				00:05:00		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
DRY_STEP				00:05:00		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
ROUTING_STEP				5		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
RULE_STEP				00:00:00		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
INERTIAL_DAMPING				PARTIAL		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
NORMAL_FLOW_LIMITED				BOTH		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
FORCE_MAIN_EQUATION				H-W		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
VARIABLE_STEP				0.75		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
LENGTHENING_STEP				0		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
MIN_SURFAREA				0		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
MAX_TRIALS				8		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
HEAD_TOLERANCE				0		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
SYS_FLOW_TOL				5		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
LAT_FLOW_TOL				5		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
MINIMUM_STEP				0.5		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
THREADS				12		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
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CONSTANT				0.0		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
DRY_ONLY				NO		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
[RAINGAGES]				Parameters		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd											
;;Name				Format		Interval SCF		Source		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd									
3CHI002				INTENSITY		0:10		1.0		TIMESERIES 3CHI002		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd							
3CHI100				INTENSITY		0:10		1.0		TIMESERIES 3CHI100		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd							
[SUBCATCHMENTS]				Parameters		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd									
;;Name				Rain Gage		Outlet		Area		%Imperv		Width		%Slope		CurbLen		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd	
SnowPack				Parameters		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd		O_St_UnGrd							
;;				Parameters		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd		O_St_UnGrd							
S1				3CHI002		CB120		0.0331		14.286		38.601		1.5		0		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd	
S10				3CHI002		Roof2		0.0952		100		18		1		0		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd	
S2				3CHI002		CB124		0.0229		12.231		38.94		2.1		0		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd	
S3				3CHI002		OF2		0.0203		10.528		26.019		2		0		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd	
S4				3CHI002		CB125		0.0388		9.35		163.644		1.5		0		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd	
S5				3CHI002		CB120		0.0881		79.259		79.845		2		0		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd	
S6				3CHI002		CB121		0.1134		20.006		105.724		2.1		0		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd	
S7				3CHI002		CB122		0.0481		3.822		44.221		3.3		0		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd	
S8				3CHI002		St_UnGrd		0.0327		95.747		11.978		5.2		0		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd	
S9				3CHI002		Roof1		0.0952		100		18		1		0		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd	
[SUBAREAS]				Parameters		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd		O_St_UnGrd							
;;Subcatchment				N-Imperv		N-Perv		S-Imperv		S-Perv		PctZero		RouteTo		PctRouted		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd	
S1				0.013		0.25		1.57		4.67		0		PERVIOUS		100		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd	
S10				0.013		0.25		1.57		4.67		0		OUTLET				OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd	
S2				0.013		0.25		1.57		4.67		0		PERVIOUS		100		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd	
S3				0.013		0.25		1.57		4.67		0		PERVIOUS		100		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd	
S4				0.013		0.25		1.57		4.67		0		PERVIOUS		100		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd	
S5				0.013		0.25		1.57		4.67		0		OUTLET				OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd	
S6				0.013		0.25		1.57		4.67		0		OUTLET				OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd	
S7				0.013		0.25		1.57		4.67		0		PERVIOUS		100		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd	
S8				0.013		0.25		1.57		4.67		0		PERVIOUS		100		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd	
S9				0.013		0.25		1.57		4.67		0		OUTLET				OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd	
[INFILTRATION]				Parameters		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd		O_St_UnGrd							
;;Subcatchment				Param1		Param2		Param3		Param4		Param5		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd			
S1				76.2		13.2		4.14		7		0		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd			
S10				76.2		13.2		4.14		7		0		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd			
S2				76.2		13.2		4.14		7		0		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd			
S3				76.2		13.2		4.14		7		0		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd			
S4				76.2		13.2		4.14		7		0		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd			
S5				76.2		13.2		4.14		7		0		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd			
S6				76.2		13.2		4.14		7		0		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd			
S7				76.2		13.2		4.14		7		0		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd			
S8				76.2		13.2		4.14		7		0		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd			
S9				76.2		13.2		4.14		7		0		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd			
[OUTFALLS]				Parameters		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd		O_St_UnGrd							
;;Name				Elevation		Type		Stage Data		Gated		Route To		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd			
MH505				78		NORMAL				NO				OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd			
OF2				0		FREE				NO				OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd			
OF3				78.88		NORMAL				NO				OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd			
OF4				78.88		NORMAL				NO				OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd			
[STORAGE]				Parameters		NO		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd		O_St_UnGrd							
;;Name				Elev.		MaxDepth		InitDepth		Shape		Curve Name/Params		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd			
SurDepth Fevap				Psi		Ksat		IMD						OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd			
CB120				82.1		0.3		0		TABULAR		CB120		0		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd			
0														OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd		O_St_UnGrd			
CB121				82.28		0.3		0		TABULAR		CB121		0		OL1		St_UnGrd		MH505		78		TABULAR/HEAD		O_St_UnGrd			
0														OL1															

[illegible]

Vortex_ICD_85	0.9	0.0061	InfiltratedInflow	01/01/2000	00:23:00	0.0009313222
Vortex_ICD_85	1	0.0064	InfiltratedInflow	01/01/2000	00:24:00	0.0009313222
Vortex_ICD_85	1.2	0.007	InfiltratedInflow	01/01/2000	00:25:00	0.0009313222
Vortex_ICD_85	1.4	0.0076	InfiltratedInflow	01/01/2000	00:26:00	0.0009313222
Vortex_ICD_85	1.6	0.0081	InfiltratedInflow	01/01/2000	00:27:00	0.0009313222
Vortex_ICD_85	1.8	0.0086	InfiltratedInflow	01/01/2000	00:28:00	0.0009313222
Vortex_ICD_85	2	0.0091	InfiltratedInflow	01/01/2000	00:29:00	0.0009313222
Vortex_ICD_85	2.5	0.0101	InfiltratedInflow	01/01/2000	00:30:00	0.001253858
Vortex_ICD_85	3	0.0111	InfiltratedInflow	01/01/2000	00:31:00	0.001253858
;Tempest Rating Curve for Vortex ICD 90, No grate allowance						
Vortex_ICD_90	Rating	0				
Vortex_ICD_90	0.1	0.0022	InfiltratedInflow	01/01/2000	00:32:00	0.001253858
Vortex_ICD_90	0.2	0.0032	InfiltratedInflow	01/01/2000	00:33:00	0.001253858
Vortex_ICD_90	0.3	0.0039	InfiltratedInflow	01/01/2000	00:34:00	0.001253858
Vortex_ICD_90	0.4	0.0045	InfiltratedInflow	01/01/2000	00:35:00	0.001253858
Vortex_ICD_90	0.5	0.0051	InfiltratedInflow	01/01/2000	00:36:00	0.001253858
Vortex_ICD_90	0.6	0.0055	InfiltratedInflow	01/01/2000	00:37:00	0.001253858
Vortex_ICD_90	0.7	0.006	InfiltratedInflow	01/01/2000	00:38:00	0.001253858
Vortex_ICD_90	0.8	0.0064	InfiltratedInflow	01/01/2000	00:39:00	0.001972508
Vortex_ICD_90	0.9	0.0068	InfiltratedInflow	01/01/2000	00:40:00	0.001972508
Vortex_ICD_90	1	0.0072	InfiltratedInflow	01/01/2000	00:41:00	0.001972508
Vortex_ICD_90	1.2	0.0079	InfiltratedInflow	01/01/2000	00:42:00	0.001972508
Vortex_ICD_90	1.4	0.0085	InfiltratedInflow	01/01/2000	00:43:00	0.001972508
Vortex_ICD_90	1.6	0.0091	InfiltratedInflow	01/01/2000	00:44:00	0.001972508
Vortex_ICD_90	1.8	0.0096	InfiltratedInflow	01/01/2000	00:45:00	0.001972508
Vortex_ICD_90	2	0.0102	InfiltratedInflow	01/01/2000	00:46:00	0.001972508
Vortex_ICD_90	2.5	0.0114	InfiltratedInflow	01/01/2000	00:47:00	0.001972508
Vortex_ICD_90	3	0.0125	InfiltratedInflow	01/01/2000	00:48:00	0.001972508
;Tempest Rating Curve for Vortex ICD 95, No grate allowance						
Vortex_ICD_95	Rating	0				
Vortex_ICD_95	0.1	0.0026	InfiltratedInflow	01/01/2000	00:53:00	0.005031055
Vortex_ICD_95	0.2	0.0036	InfiltratedInflow	01/01/2000	00:54:00	0.005031055
Vortex_ICD_95	0.3	0.0044	InfiltratedInflow	01/01/2000	00:55:00	0.005031055
Vortex_ICD_95	0.4	0.0051	InfiltratedInflow	01/01/2000	00:56:00	0.005031055
Vortex_ICD_95	0.5	0.0057	InfiltratedInflow	01/01/2000	00:57:00	0.005031055
Vortex_ICD_95	0.6	0.0062	InfiltratedInflow	01/01/2000	00:58:00	0.005031055
Vortex_ICD_95	0.7	0.0067	InfiltratedInflow	01/01/2000	00:59:00	0.005031055
Vortex_ICD_95	0.8	0.0071	InfiltratedInflow	01/01/2000	01:00:00	0.01861666
Vortex_ICD_95	0.9	0.0076	InfiltratedInflow	01/01/2000	01:01:00	0.01861666
Vortex_ICD_95	1	0.008	InfiltratedInflow	01/01/2000	01:02:00	0.01861666
Vortex_ICD_95	1.2	0.0087	InfiltratedInflow	01/01/2000	01:03:00	0.01861666
Vortex_ICD_95	1.4	0.0094	InfiltratedInflow	01/01/2000	01:04:00	0.01861666
Vortex_ICD_95	1.6	0.0101	InfiltratedInflow	01/01/2000	01:05:00	0.00937117
Vortex_ICD_95	1.8	0.0107	InfiltratedInflow	01/01/2000	01:06:00	0.00937117
Vortex_ICD_95	2	0.0113	InfiltratedInflow	01/01/2000	01:07:00	0.00937117
Vortex_ICD_95	2.5	0.0126	InfiltratedInflow	01/01/2000	01:08:00	0.00937117
Vortex_ICD_95	3	0.0138	InfiltratedInflow	01/01/2000	01:09:00	0.00937117
;From Zurn Manual RD178						
ZURN_2150F-6NH	Rating	0				
ZURN_2150F-6NH	0.0127	0.00503838308477861	InfiltratedInflow	01/01/2000	01:14:00	0.006358188
ZURN_2150F-6NH	0.0257	0.0132420013231177	InfiltratedInflow	01/01/2000	01:15:00	0.006358188
ZURN_2150F-6NH	0.0384	0.0234992054543888	InfiltratedInflow	01/01/2000	01:16:00	0.006358188
ZURN_2150F-6NH	0.0508	0.0357128365761305	InfiltratedInflow	01/01/2000	01:17:00	0.006358188
ZURN_2150F-6NH	0.0765	0.0425019726111045	InfiltratedInflow	01/01/2000	01:18:00	0.006358188
ZURN_2150F-6NH	0.1024	0.0433196215564931	InfiltratedInflow	01/01/2000	01:19:00	0.006358188
CB120	Storage	0	0.36			
CB120		0.3	340.08			
CB121	Storage	0	0.36			
CB121		0.3	292.57			
CB122	Storage	0	0.073			
CB122		1.45	0.073			
CB122		1.7	70.87			
CB123	Storage	0	0.36			
CB123		2.182	0.36			
CB124	Storage	0	0.073			
CB124		1.58	0.073			
CB124		1.78	34.68			
CB125	Storage	0	0.36			
CB125		1.8	0.36			
CB125		2	37.3			
[TIMESERIES]						
;Name						
;Date						
;Time						
;Value						
;Rainfall (mm/hr)						
3CHI002	01/01/2000	00:00:00	2.491			
3CHI002	01/01/2000	00:10:00	2.966			
3CHI002	01/01/2000	00:20:00	3.696			
3CHI002	01/01/2000	00:30:00	4.976			
3CHI002	01/01/2000	00:40:00	7.828			
3CHI002	01/01/2000	00:50:00	9.966			
3CHI002	01/01/2000	01:00:00	76.805			
3CHI002	01/01/2000	01:10:00	22.777			
3CHI002	01/01/2000	01:20:00	11.852			
3CHI002	01/01/2000	01:30:00	8.025			
3CHI002	01/01/2000	01:40:00	6.096			
3CHI002	01/01/2000	01:50:00	4.938			
3CHI002	01/01/2000	02:00:00	4.165			
3CHI002	01/01/2000	02:10:00	3.613			
3CHI002	01/01/2000	02:20:00	3.197			
3CHI002	01/01/2000	02:30:00	2.873			
3CHI002	01/01/2000	02:40:00	2.613			
3CHI002	01/01/2000	02:50:00	2.4			
3CHI002	01/01/2000	03:00:00	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 S6						
multiplied by their areas.						
InfiltratedInflow	01/01/2000	00:01:00	0.0006276849			
InfiltratedInflow	01/01/2000	00:02:00	0.0006276849			
InfiltratedInflow	01/01/2000	00:03:00	0.0006276849			
InfiltratedInflow	01/01/2000	00:04:00	0.0006276849			
InfiltratedInflow	01/01/2000	00:05:00	0.0006276849			
InfiltratedInflow	01/01/2000	00:06:00	0.0006276849			
InfiltratedInflow	01/01/2000	00:07:00	0.0006276849			
InfiltratedInflow	01/01/2000	00:08:00	0.0006276849			
InfiltratedInflow	01/01/2000	00:09:00	0.0006276849			
InfiltratedInflow	01/01/2000	00:10:00	0.0007473759			
InfiltratedInflow	01/01/2000	00:11:00	0.0007473759			
InfiltratedInflow	01/01/2000	00:12:00	0.0007473759			
InfiltratedInflow	01/01/2000	00:13:00	0.0007473759			
InfiltratedInflow	01/01/2000	00:14:00	0.0007473759			
InfiltratedInflow	01/01/2000	00:15:00	0.0007473759			
InfiltratedInflow	01/01/2000	00:16:00	0.0007473759			
InfiltratedInflow	01/01/2000	00:17:00	0.0007473759			
InfiltratedInflow	01/01/2000	00:18:00	0.0007473759			
InfiltratedInflow	01/01/2000	00:19:00	0.0007473759			
InfiltratedInflow	01/01/2000	00:20:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:21:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:22:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:23:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:24:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:25:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:26:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:27:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:28:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:29:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:30:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:31:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:32:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:33:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:34:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:35:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:36:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:37:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:38:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:39:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:40:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:41:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:42:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:43:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:44:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:45:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:46:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:47:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:48:00	0.0009313222			
InfiltratedInflow	01/01/2000	00:49:00	0.0009313222			
InfiltratedInflow	01/01/2000					

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

March 2025

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InfiltratedInflow 01/01/2000 02:52:00 0.0006047546
InfiltratedInflow 01/01/2000 02:53:00 0.0006047546
InfiltratedInflow 01/01/2000 02:54:00 0.0006047546
InfiltratedInflow 01/01/2000 02:55:00 0.0006047546
InfiltratedInflow 01/01/2000 02:56:00 0.0006047546
InfiltratedInflow 01/01/2000 02:57:00 0.0006047546
InfiltratedInflow 01/01/2000 02:58:00 0.0006047546
InfiltratedInflow 01/01/2000 02:59:00 0.0006047546
InfiltratedInflow 01/01/2000 03:00:00 0.0006047546

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

[TAGS]
Node St_UnGrd Underground_Storage

[MAP]
DIMENSIONS 381503.2836 5032790.42705 381639.0324 5032880.16395
UNITS Meters

[COORDINATES]
;;Node X-Coord Y-Coord
-----
MH505 381512.619 5032853.746
OP2 381610.244 5032876.085
OP3 381513.952 5032875.477
OP4 381509.454 5032832.912
CB120 381549.093 5032844.875
CB121 381584.314 5032823.865
CB122 381627.208 5032806.966
CB123 381622.312 5032818.188
CB124 381612.986 5032839.563
CB125 381519.372 5032825.114
Roof1 381594.1 5032833.494
Roof2 381526.761 5032828.396
St_UnGrd 381520.468 5032851.542

[VERTICES]
;;Link X-Coord Y-Coord
-----
BLDG_F 381587.375 5032838.9
CB121 381580.382 5032829.221
CB121 381526.869 5032841
CB123 381583.496 5032831.297
CB123 381530.098 5032843.407

[POLYGONS]
;;Subcatchment X-Coord Y-Coord
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S1 381585.63 5032868.962
S1 381545.732 5032851.464
S1 381549.859 5032863.759
S1 381561.383 5032872.018
S1 381568.12 5032873.68
S1 381571.213 5032866.739
S1 381575.491 5032868.703
S1 381584.113 5032872.421
S1 381585.63 5032868.962
S10 381577.07 5032838.633
S10 381573.49 5032810.992
S10 381521.312 5032821.582
S10 381524.892 5032839.223
S10 381534.873 5032837.198
S10 381534.419 5032834.958
S10 381536.967 5032834.441
S10 381537.422 5032836.68
S10 381577.07 5032828.633
S2 381600.237 5032851.815
S2 381608.78 5032855.542
S2 381621.447 5032826.603
S2 381614.961 5032823.791
S2 381603.372 5032850.345
S2 381601.278 5032849.431
S2 381600.237 5032851.815
S2 381600.122 5032875.319
S3 381608.78 5032855.542
S3 381602.332 5032852.729
S3 381598.259 5032862.063
S3 381597.544 5032861.752
S3 381593.609 5032870.772
S3 381567.855 5032859.534
S3 381567.277 5032860.913
S3 381600.122 5032870.319
S4 381524.892 5032839.223
S4 381521.312 5032821.582
S4 381563.78 5032812.963
S4 381562.788 5032809.079
S4 381521.032 5032816.77
S4 381516.421 5032820.775
S4 381519.182 5032849.734
S4 381520.586 5032849.638
S4 381524.866 5032848.769
S4 381525.228 5032848.183
S4 381524.284 5032843.53
S4 381525.411 5032841.771
S4 381524.892 5032839.223
S5 381545.732 5032851.464
S5 381567.277 5032860.913
S5 381567.855 5032859.534
S5 381567.897 5032859.438
S5 381567.158 5032859.115
S5 381566.874 5032858.986
S5 381566.594 5032858.846
S5 381566.319 5032858.697
S5 381566.05 5032858.539
S5 381565.786 5032858.372
S5 381565.528 5032858.196
S5 381565.276 5032858.012
S5 381565.03 5032857.819
S5 381564.792 5032857.617
S5 381564.56 5032857.408
S5 381564.335 5032857.191
S5 381564.118 5032856.966
S5 381563.908 5032856.735
S5 381563.707 5032856.504
S5 381563.514 5032856.25
S5 381563.329 5032855.999
S5 381563.153 5032855.747
S5 381562.986 5032855.477
S5 381562.827 5032855.207
S5 381562.681 5032854.937
S5 381562.543 5032854.662
S5 381562.415 5032854.382
S5 381562.296 5032854.099
S5 381562.186 5032853.811
S5 381562.087 5032853.52
S5 381561.997 5032853.226
S5 381561.917 5032852.929
S5 381561.846 5032852.63
S5 381561.812 5032852.481
S5 381561.773 5032852.334
S5 381561.729 5032852.188
S5 381561.68 5032852.043
S5 381561.627 5032851.9
S5 381561.569 5032851.759
S5 381561.507 5032851.62
S5 381561.441 5032851.483
S5 381561.615 5032851.396
S5 381568.16 5032850.064
S5 381572.167 5032851.809
S5 381574.562 5032846.312
S5 381570.746 5032844.646
S5 381570.904 5032844.497
S5 381568.214 5032843.324

```

	Volume	Volume
Flow Routing Continuity	hectare-m	10 ⁶ ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.010	0.097
Groundwater Inflow	0.000	0.000
EDI Inflow	0.000	0.000
External Inflow	0.003	0.029
External Outflow	0.010	0.101
Seeding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Filtration Loss	0.000	0.000
Final Storage Volume	0.000	0.000
Final Evaporation Loss	0.003	0.025

Continuity Error (%) 0.000

Time-Step Critical Elements
None

Highest Flow Instability Indexes
All links are stable.

Most Frequent Nonconverging Nodes
Convergence obtained at all time steps.

Routing Time Step Summary
Minimum Time Step : 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 Runoff Subcatchment mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Total Runoff Precip Coeff mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm
S1			31.88	0.00	0.00	29.87	4.34	2.03
2.03	0.00	0.00	0.064	0.00	0.00	0.00	30.03	0.00
S10			31.88	0.00	0.00	0.00	30.03	0.00
30.03	0.03	0.02	0.942	0.00	0.00	29.96	3.71	2.11
S2			31.88	0.00	0.00	30.42	3.20	1.56
2.11	0.00	0.00	0.066	0.00	0.00	30.21	2.84	2.22
S3			31.88	0.00	0.00	6.53	24.02	0.16
1.56	0.00	0.00	0.049	0.00	0.00	25.37	6.07	0.22
S4			31.88	0.00	0.00	31.40	1.16	0.59
2.22	0.00	0.00	0.070	0.00	0.00	2.02	29.00	28.00
S5			31.88	0.00	0.00	30.03	0.00	0.00
24.19	0.02	0.02	0.759	0.00	0.00	0.00	0.00	0.00
S6			31.88	0.00	0.00	0.00	0.00	0.00
6.29	0.01	0.01	0.197	0.00	0.00	0.00	0.00	0.00
S7			31.88	0.00	0.00	0.00	0.00	0.00
0.59	0.00	0.00	0.019	0.00	0.00	0.00	0.00	0.00
S8			31.88	0.00	0.00	0.00	0.00	0.00
28.00	0.01	0.01	0.878	0.00	0.00	0.00	0.00	0.00
S9			31.88	0.00	0.00	0.00	0.00	0.00
30.03	0.03	0.02	0.942	0.00	0.00	0.00	0.00	0.00

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
MH505	OUTFALL	0.00	0.00	78.00	0 00:00	0.00
OF2	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
OF3	OUTFALL	0.00	0.00	78.88	0 00:00	0.00
OF4	OUTFALL	0.00	0.00	78.88	0 00:00	0.00
CB120	STORAGE	0.00	0.03	82.13	0 01:10	0.03
CB121	STORAGE	0.00	0.01	82.29	0 01:10	0.01
CB122	STORAGE	0.00	0.02	79.37	0 01:10	0.02
CB123	STORAGE	0.01	0.09	79.26	0 01:12	0.09
CB124	STORAGE	0.00	0.02	79.49	0 01:10	0.02
CB125	STORAGE	0.01	0.14	80.34	0 01:11	0.13
Roof1	STORAGE	0.01	0.03	88.88	0 01:44	0.03
Roof2	STORAGE	0.01	0.03	88.88	0 01:44	0.03
St_UnGrd	STORAGE	0.00	0.02	78.02	0 01:11	0.02

Node Inflow Summary

Flow Balance	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
MH505	OUTFALL	0.000	0.036	0 01:08	0	0.0685
0.000						
OF2	OUTFALL	0.000	0.000	0 01:10	0.000316	0.000316
0.000						
OF3	OUTFALL	0.000	0.002	0 00:54	0	0.016
0.000						
OF4	OUTFALL	0.000	0.002	0 00:54	0	0.016
0.000						
CB120	STORAGE	0.016	0.016	0 01:10	0.0219	0.0219
0.001						
CB121	STORAGE	0.006	0.006	0 01:10	0.00711	0.00711
0.001						
CB122	STORAGE	0.001	0.001	0 01:10	0.000285	0.000285
0.843						
CB123	STORAGE	0.000	0.001	0 01:10	0	0.000765
0.009						
CB124	STORAGE	0.001	0.001	0 01:10	0.000483	0.000483
0.099						
CB125	STORAGE	0.002	0.002	0 01:10	0.000861	0.000861
0.003						
Roof1	STORAGE	0.020	0.020	0 01:10	0.0285	0.0285
0.000						
Roof2	STORAGE	0.020	0.020	0 01:10	0.0285	0.0285
0.000						
St_UnGrd	STORAGE	0.015	0.038	0 01:10	0.0379	0.0685
0.000						

Node Surcharge Summary

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Maximum Outflow Storage Unit CMS	Average Volume 1000 m³	Avg Pcmt Full	Evap Loss	Exfil Loss	Maximum Volume 1000 m³	Max Pcmt Full	Time of Max Occurrence days hr:min
CB120	0.000	0.1	0.0	0.0	0.000	1.0	0 01:10
0.016							
CB121	0.000	0.0	0.0	0.0	0.000	0.2	0 01:10
0.005							
CB122	0.000	0.0	0.0	0.0	0.000	0.0	0 01:10
0.001							
CB123	0.000	0.3	0.0	0.0	0.000	4.0	0 01:12
0.001							
CB124	0.000	0.0	0.0	0.0	0.000	0.0	0 01:10
0.001							
CB125	0.000	0.1	0.0	0.0	0.000	1.1	0 01:11
0.002							
Roof1	0.009	10.0	0.0	0.0	0.017	17.5	0 01:44
0.002							
Roof2	0.009	10.0	0.0	0.0	0.017	17.5	0 01:44
0.002							
St_UnGrd	0.000	0.2	0.0	0.0	0.001	1.5	0 01:11
0.036							

Outfall Loading Summary

Outfall Node	Flow Freq Pcmt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
MH505	99.35	0.006	0.036	0.068
OF2	11.80	0.000	0.000	0.000
OF3	81.21	0.002	0.002	0.016
OF4	81.21	0.002	0.002	0.016
System	68.39	0.010	0.040	0.101

Link Flow Summary

Link	Type	Maximum Flow CMS	Time of Max Occurrence days hr:min	Maximum Veloc m/sec	Max/Full Flow	Max/Full Depth
C1	CONDUIT	0.001	0 01:10	0.42	0.01	0.08
C2	CONDUIT	0.001	0 01:10	0.38	0.01	0.09
BLDG_F	DUMMY	0.002	0 00:54			
BLDG_F	DUMMY	0.002	0 00:54			
CB120	DUMMY	0.016	0 01:10			
CB121	DUMMY	0.005	0 01:10			
CB123	DUMMY	0.001	0 01:12			
CB125	DUMMY	0.002	0 01:11			
OL1	DUMMY	0.036	0 01:08			

Flow Classification Summary

Conduit	Adjusted /Actual Length	Up Dry	Down Dry	Sub Crit	Time in Flow Class Sup Crit	Up Crit	Down Crit	Norm Crit	Inlet Ctrl
C1	1.00	0.36	0.00	0.00	0.00	0.00	0.64	0.00	0.00
C2	1.00	0.36	0.00	0.00	0.02	0.00	0.61	0.02	0.00

Conduit Surcharge Summary

No conduits were surcharged.

Analysis begun on: Thu Mar 13 10:56:45 2025
Analysis ended on: Thu Mar 13 10:56:45 2025
Total elapsed time: < 1 sec

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	03:00:00						
SWEEP_START	01/01						
SWEEP_END	12/31						
DRY_DAYS	0						
REPORT_STEP	00:00:05						
WET_STEP	00:02:00						
DRY_STEP	00:02:00						
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			
;;							
3CHI100	INTENSITY	0:10	1.0	TIMESERIES 3CHI100			
[SUBCATCHMENTS]							
;;Name	Rain Gage	Outlet	Area	%Imperv	Width	%Slope	CurbLen
;;							
S1	3CHI100	CB120	0.0331	14.286	38.601	1.5	0
S10	3CHI100	Roof2	0.0952	100	18	1	0
S2	3CHI100	CB124	0.0229	12.231	38.94	2.1	0
S3	3CHI100	OF2	0.0203	10.528	26.019	2	0
S4	3CHI100	CB125	0.0388	9.35	163.644	1.5	0
S5	3CHI100	CB120	0.0881	79.259	79.845	2	0
S6	3CHI100	CB121	0.1134	20.006	105.724	2.1	0
S7	3CHI100	CB122	0.0481	3.822	44.221	3.3	0
S8	3CHI100	St_UnGrd	0.0327	95.747	11.978	5.2	0
S9	3CHI100	Roof1	0.0952	100	18	1	0
[SUBAREAS]							
;;Subcatchment	N-Imperv	N-Perv	S-Imperv	S-Perv	PctZero	RouteTo	PctRouted
;;							
S1	0.013	0.25	1.57	4.67	0	PERVIOUS	100
S10	0.013	0.25	1.57	4.67	0	OUTLET	100
S2	0.013	0.25	1.57	4.67	0	PERVIOUS	100
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	100
S6	0.013	0.25	1.57	4.67	0	OUTLET	100
S7	0.013	0.25	1.57	4.67	0	PERVIOUS	100
S8	0.013	0.25	1.57	4.67	0	PERVIOUS	100
S9	0.013	0.25	1.57	4.67	0	OUTLET	100
[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		
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		
;;							
MH505	78	NORMAL	NO				
OF2	0	FREE	NO				
OF3	78.88	NORMAL	NO				
OF4	78.88	NORMAL	NO				
[STORAGE]							
;;Name	Elev.	MaxDepth	InitDepth	Shape	Curve Name/Params		
SurDepth Evap	Psi	Ksat	IMD				
;;							
CB120	82.1	0.3	0	TABULAR	CB120		
0							
CB121	82.28	0.3	0	TABULAR	CB121		
0							
CB122	79.35	1.7	0	TABULAR	CB122		
0							
CB123	79.168	2.182	0	TABULAR	CB123		
0							
CB124	79.47	1.78	0	TABULAR	CB124		
0							
CB125	80.2	2	0	TABULAR	CB125		
0							
Roof1	88.85	0.15	0	FUNCTIONAL	0 0 635 0		
0							
Roof2	88.85	0.15	0	FUNCTIONAL	0 0 635 0		
0							
St_UnGrd	78	1	0	FUNCTIONAL	0 0 57 0		
0							
[CONDUITS]							
;;Name	From Node	To Node	Length	Roughness	InOffset	OutOffset	
InitFlow	MaxFlow						
;;							
C1		CB124	CB123	23.322	0.013	79.47 79.24	
0	0.04						
C2		CB122	CB123	12.244	0.013	79.35 79.228	
0	0.04						
[OUTLETS]							

;;Name	From Node	To Node	Offset	Type	QTable/Qcoeff
Qexpon	Gated				
;;					
BLDG_E	Roof2	OF4	88.85	TABULAR/HEAD	O_Roof2
NO					
BLDG_F	Roof1	OF3	88.85	TABULAR/HEAD	O_Roof1
NO					
CB120	CB120	St_UnGrd	82.1	TABULAR/HEAD	ZURN_Z150F-6NH
NO					
CB121	CB121	St_UnGrd	82.28	TABULAR/HEAD	ZURN_Z150F-6NH
NO					
CB123	CB123	St_UnGrd	79.168	TABULAR/HEAD	Vortex_ICD_70
NO					
CB125	CB125	St_UnGrd	80.2	TABULAR/HEAD	Vortex_ICD_70
NO					
OL1	St_UnGrd	MH505	78	TABULAR/HEAD	O_St_UnGrd
NO					
[XSECTIONS]					
;;Link	Shape	Geom1	Geom2	Geom3	Geom4
Culvert					Barrels
;;					
C1	CIRCULAR	0.25	0	0	1
C2	CIRCULAR	0.25	0	0	1
[LOSSES]					
;;Link	Kentry	Kexit	Kavg	Flap Gate	Seepage
;;					
[INFLOWS]					
;;Node	Constituent	Time Series	Type	Mfactor	Sfactor
;;					Baseline Pattern
;;					
St_UnGrd	FLOW	InfiltratedInflow	FLOW	1.0	1 0
[CURVES]					
;;Name	Type	X-Value	Y-Value		
;;					
CBMH Inlet Capture Curve based on the OSDG Appendix 7-A					
CBMH	Rating	0	0		
CBMH	0.122	0.06			
CBMH	0.183	0.073			
CBMH	0.2	0.076			
CBMH	0.243	0.084			
CBMH	0.305	0.094			
DI_GRATE_A_OPSD403.01	Rating	0.02	0.00762		
DI_GRATE_A_OPSD403.01		0.04	0.01524		
DI_GRATE_A_OPSD403.01		0.08	0.0381		
DI_GRATE_A_OPSD403.01		0.12	0.06858		
DI_GRATE_A_OPSD403.01		0.2	0.1524		
DI_GRATE_A_OPSD403.01		0.26	0.23622		
DI_GRATE_A_OPSD403.01		0.36	0.4572		
DI_GRATE_A_OPSD403.01		0.46	0.6858		
DI_GRATE_C_OPSD403.01	Rating	0.02	0.01465		
DI_GRATE_C_OPSD403.01		0.04	0.0293		
DI_GRATE_C_OPSD403.01		0.08	0.07325		
DI_GRATE_C_OPSD403.01		0.12	0.13185		
DI_GRATE_C_OPSD403.01		0.2	0.293		
DI_GRATE_C_OPSD403.01		0.26	0.45415		
DI_GRATE_C_OPSD403.01		0.36	0.879		
DI_GRATE_C_OPSD403.01		0.46	1.3185		
Les Produits MURPHCO Ltée	Rating	0	0		
Les Produits MURPHCO Ltée		0.0127	4E-05		
Les Produits MURPHCO Ltée		0.0254	0.00019		
Les Produits MURPHCO Ltée		0.0381	0.00032		
Les Produits MURPHCO Ltée		0.0508	0.00051		
Les Produits MURPHCO Ltée		0.0635	0.00064		
Les Produits MURPHCO Ltée		0.0762	0.00083		
Les Produits MURPHCO Ltée		0.0889	0.00093		
Les Produits MURPHCO Ltée		0.1016	0.00101		
Les Produits MURPHCO Ltée		0.1143	0.00111		
Les Produits MURPHCO Ltée		0.127	0.0012		
Les Produits MURPHCO Ltée		0.1397	0.00128		
Les Produits MURPHCO Ltée		0.1524	0.00135		
;Reversed Flow from rear yard manhole_Lid to the Street					
Manhole_Lid	Rating	0	0		
Manhole_Lid		0.11	0		
Manhole_Lid		0.2	0.187		
Manhole_Lid		0.3	0.395		
Manhole_Lid		0.4	0.602		
Manhole_Lid		0.5	0.81		
Manhole_Lid		0.6	1.018		
Manhole_Lid		0.7	1.225		
Manhole_Lid		0.8	1.433		
Manhole_Lid		0.9	1.641		
Manhole_Lid		1	1.848		
;Tempest Rating Curve for MHF IPEX TYPE A, No grate allowance					
MHF_IPEX_TYPE_A	Rating	0	0		
MHF_IPEX_TYPE_A		0.1	0.0057		
MHF_IPEX_TYPE_A		0.2	0.0081		
MHF_IPEX_TYPE_A		0.3	0.0099		
MHF_IPEX_TYPE_A		0.4	0.0114		
MHF_IPEX_TYPE_A		0.5	0.0128		
MHF_IPEX_TYPE_A		0.6	0.014		
MHF_IPEX_TYPE_A		0.7	0.0151		
MHF_IPEX_TYPE_A		0.8	0.0162		
MHF_IPEX_TYPE_A		0.9	0.0172		
MHF_IPEX_TYPE_A		1	0.0181		
MHF_IPEX_TYPE_A		1.2	0.0198		
MHF_IPEX_TYPE_A		1.4	0.0214		
MHF_IPEX_TYPE_A		1.6	0.0229		
MHF_IPEX_TYPE_A		1.8	0.0243		
MHF_IPEX_TYPE_A		2	0.0256		
MHF_IPEX_TYPE_A		2.5	0.0286		
MHF_IPEX_TYPE_A		3	0.0313		
;Tempest Rating Curve for MHF IPEX TYPE B, No grate allowance					
MHF_IPEX_TYPE_B	Rating	0	0		
MHF_IPEX_TYPE_B		0.1	0.0081		
MHF_IPEX_TYPE_B		0.2	0.0115		
MHF_IPEX_TYPE_B		0.3	0.0141		
MHF_IPEX_TYPE_B		0.4	0.0162		
MHF_IPEX_TYPE_B		0.5	0.0182		
MHF_IPEX_TYPE_B		0.6	0.0199		
MHF_IPEX_TYPE_B		0.7	0.0215		
MHF_IPEX_TYPE_B		0.8	0.023		
MHF_IPEX_TYPE_B		0.9	0.0244		
MHF_IPEX_TYPE_B		1	0.0257		
MHF_IPEX_TYPE_B		1.2	0.0281		
MHF_IPEX_TYPE_B		1.4	0.0304		
MHF_IPEX_TYPE_B		1.6	0.0325		
MHF_IPEX_TYPE_B		1.8	0.0344		
MHF_IPEX_TYPE_B		2	0.0363		
MHF_IPEX_TYPE_B		2.5	0.0406		
MHF_IPEX_TYPE_B		3	0.0445		
;Tempest Rating Curve for MHF IPEX TYPE C, No grate allowance					
MHF_IPEX_TYPE_C	Rating	0	0		
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	Vortex_ICD_45	1.4	0.0021
MHF_IPEX_TYPE_C	0.8	0.0299	Vortex_ICD_45	1.6	0.0023
MHF_IPEX_TYPE_C	0.9	0.0317	Vortex_ICD_45	1.8	0.0024
MHF_IPEX_TYPE_C	1	0.0335	Vortex_ICD_45	2	0.0026
MHF_IPEX_TYPE_C	1.2	0.0366	Vortex_ICD_45	2.5	0.0029
MHF_IPEX_TYPE_C	1.4	0.0396	Vortex_ICD_45	3	0.0031
MHF_IPEX_TYPE_C	1.6	0.0423			
MHF_IPEX_TYPE_C	1.8	0.0449	;Tempest Rating Curve for Vortex ICD 50, No grate allowance		
MHF_IPEX_TYPE_C	2	0.0473	Vortex_ICD_50	Rating	0
MHF_IPEX_TYPE_C	2.5	0.0529	Vortex_ICD_50	0.1	0.0007
MHF_IPEX_TYPE_C	3	0.0579	Vortex_ICD_50	0.2	0.001
			Vortex_ICD_50	0.3	0.0012
;Tempest Rating Curve for MHF IPEX TYPE D, No grate allowance			Vortex_ICD_50	0.4	0.0014
MHF_IPEX_TYPE_D	Rating	0	Vortex_ICD_50	0.5	0.0016
MHF_IPEX_TYPE_D	0.1	0.0154	Vortex_ICD_50	0.6	0.0018
MHF_IPEX_TYPE_D	0.2	0.0217	Vortex_ICD_50	0.7	0.0019
MHF_IPEX_TYPE_D	0.3	0.0266	Vortex_ICD_50	0.8	0.002
MHF_IPEX_TYPE_D	0.4	0.0307	Vortex_ICD_50	0.9	0.0021
MHF_IPEX_TYPE_D	0.5	0.0343	Vortex_ICD_50	1	0.0023
MHF_IPEX_TYPE_D	0.6	0.0376	Vortex_ICD_50	1.2	0.0025
MHF_IPEX_TYPE_D	0.7	0.0406	Vortex_ICD_50	1.4	0.0027
MHF_IPEX_TYPE_D	0.8	0.0434	Vortex_ICD_50	1.6	0.0029
MHF_IPEX_TYPE_D	0.9	0.0461	Vortex_ICD_50	1.8	0.003
MHF_IPEX_TYPE_D	1	0.0485	Vortex_ICD_50	2	0.0032
MHF_IPEX_TYPE_D	1.2	0.0532	Vortex_ICD_50	2.5	0.0036
MHF_IPEX_TYPE_D	1.4	0.0574	Vortex_ICD_50	3	0.0039
MHF_IPEX_TYPE_D	1.6	0.0614			
MHF_IPEX_TYPE_D	1.8	0.0651	;Tempest Rating Curve for Vortex ICD 55, No grate allowance		
MHF_IPEX_TYPE_D	2	0.0687	Vortex_ICD_55	Rating	0
MHF_IPEX_TYPE_D	2.5	0.0768	Vortex_ICD_55	0.1	0.0009
MHF_IPEX_TYPE_D	3	0.0841	Vortex_ICD_55	0.2	0.0012
			Vortex_ICD_55	0.3	0.0015
;Tempest Rating Curve for MHF IPEX TYPE E, No grate allowance			Vortex_ICD_55	0.4	0.0017
MHF_IPEX_TYPE_E	Rating	0	Vortex_ICD_55	0.5	0.0019
MHF_IPEX_TYPE_E	0.1	0.0205	Vortex_ICD_55	0.6	0.0021
MHF_IPEX_TYPE_E	0.2	0.0289	Vortex_ICD_55	0.7	0.0023
MHF_IPEX_TYPE_E	0.3	0.0355	Vortex_ICD_55	0.8	0.0024
MHF_IPEX_TYPE_E	0.4	0.0409	Vortex_ICD_55	0.9	0.0026
MHF_IPEX_TYPE_E	0.5	0.0458	Vortex_ICD_55	1	0.0027
MHF_IPEX_TYPE_E	0.6	0.0501	Vortex_ICD_55	1.2	0.003
MHF_IPEX_TYPE_E	0.7	0.0542	Vortex_ICD_55	1.4	0.0032
MHF_IPEX_TYPE_E	0.8	0.0579	Vortex_ICD_55	1.6	0.0034
MHF_IPEX_TYPE_E	0.9	0.0614	Vortex_ICD_55	1.8	0.0036
MHF_IPEX_TYPE_E	1	0.0647	Vortex_ICD_55	2	0.0038
MHF_IPEX_TYPE_E	1.2	0.0709	Vortex_ICD_55	2.5	0.0043
MHF_IPEX_TYPE_E	1.4	0.0766	Vortex_ICD_55	3	0.0047
MHF_IPEX_TYPE_E	1.6	0.0819			
MHF_IPEX_TYPE_E	1.8	0.0868	;Tempest Rating Curve for Vortex ICD 60, No grate allowance		
MHF_IPEX_TYPE_E	2	0.0915	Vortex_ICD_60	Rating	0
MHF_IPEX_TYPE_E	2.5	0.1023	Vortex_ICD_60	0.1	0.0011
MHF_IPEX_TYPE_E	3	0.1121	Vortex_ICD_60	0.2	0.0015
			Vortex_ICD_60	0.3	0.0018
O_Roof1	Rating	0	Vortex_ICD_60	0.4	0.0021
O_Roof1	0.001	0.002	Vortex_ICD_60	0.5	0.0021
O_Roof1	0.15	0.002	Vortex_ICD_60	0.6	0.0025
			Vortex_ICD_60	0.7	0.0027
O_Roof2	Rating	0	Vortex_ICD_60	0.8	0.0029
O_Roof2	0.001	0.002	Vortex_ICD_60	0.9	0.0031
O_Roof2	0.15	0.002	Vortex_ICD_60	1	0.0032
			Vortex_ICD_60	1.2	0.0036
O_St_L1	Rating	0	Vortex_ICD_60	1.4	0.0038
O_St_L1	0.001	0.003	Vortex_ICD_60	1.6	0.0041
O_St_L1	0.35	0.003	Vortex_ICD_60	1.8	0.0043
			Vortex_ICD_60	2	0.0046
O_St_L2	Rating	0	Vortex_ICD_60	2.5	0.0051
O_St_L2	0.001	0.002	Vortex_ICD_60	3	0.0056
O_St_L2	0.35	0.002			
			;Tempest Rating Curve for Vortex ICD 65, No grate allowance		
O_St_L3	Rating	0	Vortex_ICD_65	Rating	0
O_St_L3	0.001	0.0137	Vortex_ICD_65	0.1	0.0012
O_St_L3	0.35	0.0137	Vortex_ICD_65	0.2	0.0016
			Vortex_ICD_65	0.3	0.002
O_St_UnGrd	Rating	0	Vortex_ICD_65	0.4	0.0023
O_St_UnGrd	0.01	0.036	Vortex_ICD_65	0.5	0.0025
O_St_UnGrd	1	0.036	Vortex_ICD_65	0.6	0.0028
			Vortex_ICD_65	0.7	0.003
;Tempest Rating Curve for Vortex ICD 100, No grate allowance			Vortex_ICD_65	0.8	0.0032
Vortex_ICD_100	Rating	0	Vortex_ICD_65	0.9	0.0034
Vortex_ICD_100	0.1	0.0028	Vortex_ICD_65	1	0.0036
Vortex_ICD_100	0.2	0.004	Vortex_ICD_65	1.2	0.004
Vortex_ICD_100	0.3	0.0049	Vortex_ICD_65	1.4	0.0043
Vortex_ICD_100	0.4	0.0056	Vortex_ICD_65	1.6	0.0046
Vortex_ICD_100	0.5	0.0063	Vortex_ICD_65	1.8	0.0049
Vortex_ICD_100	0.6	0.0069	Vortex_ICD_65	2	0.0051
Vortex_ICD_100	0.7	0.0075	Vortex_ICD_65	2.5	0.0057
Vortex_ICD_100	0.8	0.008	Vortex_ICD_65	3	0.0063
Vortex_ICD_100	0.9	0.0085			
Vortex_ICD_100	1	0.0089	;Tempest Rating Curve for Vortex ICD 70, No grate allowance		
Vortex_ICD_100	1.2	0.0098	Vortex_ICD_70	Rating	0
Vortex_ICD_100	1.4	0.0106	Vortex_ICD_70	0.1	0.0013
Vortex_ICD_100	1.6	0.0113	Vortex_ICD_70	0.2	0.0019
Vortex_ICD_100	1.8	0.012	Vortex_ICD_70	0.3	0.0023
Vortex_ICD_100	2	0.0126	Vortex_ICD_70	0.4	0.0027
Vortex_ICD_100	2.5	0.0141	Vortex_ICD_70	0.5	0.003
Vortex_ICD_100	3	0.0155	Vortex_ICD_70	0.6	0.0033
			Vortex_ICD_70	0.7	0.0036
;Tempest Rating Curve for Vortex ICD 105, No grate allowance			Vortex_ICD_70	0.8	0.0038
Vortex_ICD_105	Rating	0	Vortex_ICD_70	0.9	0.0041
Vortex_ICD_105	0.1	0.0031	Vortex_ICD_70	1	0.0043
Vortex_ICD_105	0.2	0.0044	Vortex_ICD_70	1.2	0.0047
Vortex_ICD_105	0.3	0.0054	Vortex_ICD_70	1.4	0.0051
Vortex_ICD_105	0.4	0.0062	Vortex_ICD_70	1.6	0.0055
Vortex_ICD_105	0.5	0.0069	Vortex_ICD_70	1.8	0.0058
Vortex_ICD_105	0.6	0.0076	Vortex_ICD_70	2	0.0061
Vortex_ICD_105	0.7	0.0082	Vortex_ICD_70	2.5	0.0068
Vortex_ICD_105	0.8	0.0088	Vortex_ICD_70	3	0.0075
Vortex_ICD_105	0.9	0.0093			
Vortex_ICD_105	1	0.0098	;Tempest Rating Curve for Vortex ICD 75, No grate allowance		
Vortex_ICD_105	1.2	0.0107	Vortex_ICD_75	Rating	0
Vortex_ICD_105	1.4	0.0116	Vortex_ICD_75	0.1	0.0016
Vortex_ICD_105	1.6	0.0124	Vortex_ICD_75	0.2	0.0022
Vortex_ICD_105	1.8	0.0131	Vortex_ICD_75	0.3	0.0027
Vortex_ICD_105	2	0.0139	Vortex_ICD_75	0.4	0.0032
Vortex_ICD_105	2.5	0.0155	Vortex_ICD_75	0.5	0.0035
Vortex_ICD_105	3	0.017	Vortex_ICD_75	0.6	0.0039
			Vortex_ICD_75	0.7	0.0042
;Tempest Rating Curve for Vortex ICD 40, No grate allowance			Vortex_ICD_75	0.8	0.0045
Vortex_ICD_40	Rating	0	Vortex_ICD_75	0.9	0.0048
Vortex_ICD_40	0.1	0.0004	Vortex_ICD_75	1	0.005
Vortex_ICD_40	0.2	0.0006	Vortex_ICD_75	1.2	0.0055
Vortex_ICD_40	0.3	0.0007	Vortex_ICD_75	1.4	0.0059
Vortex_ICD_40	0.4	0.0009	Vortex_ICD_75	1.6	0.0063
Vortex_ICD_40	0.5	0.001	Vortex_ICD_75	1.8	0.0067
Vortex_ICD_40	0.6	0.001	Vortex_ICD_75	2	0.0071
Vortex_ICD_40	0.7	0.0011	Vortex_ICD_75	2.5	0.0079
Vortex_ICD_40	0.8	0.0012	Vortex_ICD_75	3	0.0087
Vortex_ICD_40	0.9	0.0013			
Vortex_ICD_40	1	0.0014	;Tempest Rating Curve for Vortex ICD 80, No grate allowance		
Vortex_ICD_40	1.2	0.0015	Vortex_ICD_80	Rating	0
Vortex_ICD_40	1.4	0.0016	Vortex_ICD_80	0.1	0.0018
Vortex_ICD_40	1.6	0.0017	Vortex_ICD_80	0.2	0.0021
Vortex_ICD_40	1.8	0.0018	Vortex_ICD_80	0.3	0.0031
Vortex_ICD_40	2	0.0019	Vortex_ICD_80	0.4	0.0036
Vortex_ICD_40	2.5	0.0022	Vortex_ICD_80	0.5	0.004
Vortex_ICD_40	3	0.0024	Vortex_ICD_80	0.6	0.0044
			Vortex_ICD_80	0.7	0.0048
;Tempest Rating Curve for Vortex ICD 45, No grate allowance			Vortex_ICD_80	0.8	0.0051
Vortex_ICD_45	Rating	0	Vortex_ICD_80	0.9	0.0054
Vortex_ICD_45	0.1	0.0006	Vortex_ICD_80	1	0.0057
Vortex_ICD_45	0.2	0.0008	Vortex_ICD_80	1.2	0.0063
Vortex_ICD_45	0.3	0.001	Vortex_ICD_80	1.4	0.0068
Vortex_ICD_45	0.4	0.0011	Vortex_ICD_80	1.6	0.0072
Vortex_ICD_45	0.5	0.0013	Vortex_ICD_80	1.8	0.0077
Vortex_ICD_45	0.6	0.0014	Vortex_ICD_80	2	0.0081
Vortex_ICD_45	0.7	0.0015	Vortex_ICD_80	2.5	0.009
Vortex_ICD_45	0.8	0.0016	Vortex_ICD_80	3	0.0099
Vortex_ICD_45	0.9	0.0017			
Vortex_ICD_45	1	0.0018	;Tempest Rating Curve for Vortex ICD 85, No grate allowance		
Vortex_ICD_45	1.2	0.002	Vortex_ICD_85	Rating	0

Vortex_ICD_85	0.1	0.002	OF4	381509.454	5032832.912
Vortex_ICD_85	0.2	0.0029	CB120	381549.093	5032844.875
Vortex_ICD_85	0.3	0.0035	CB121	381584.314	5032823.865
Vortex_ICD_85	0.4	0.0041	CB122	381627.208	5032806.966
Vortex_ICD_85	0.5	0.0045	CB123	381622.312	5032818.188
Vortex_ICD_85	0.6	0.005	CB124	381612.986	5032839.563
Vortex_ICD_85	0.7	0.0054	CB125	381519.372	5032825.114
Vortex_ICD_85	0.8	0.0057	Roof1	381594.1	5032833.494
Vortex_ICD_85	0.9	0.0061	Roof2	381526.761	5032828.396
Vortex_ICD_85	1	0.0064	St_UnGrd	381520.468	5032851.542
Vortex_ICD_85	1.2	0.007			
Vortex_ICD_85	1.4	0.0076	[VERTICES]		
Vortex_ICD_85	1.6	0.0081	;;Link	X-Coord	Y-Coord
Vortex_ICD_85	1.8	0.0086	;;		
Vortex_ICD_85	2	0.0091	BLDG_F	381587.375	5032838.9
Vortex_ICD_85	2.5	0.0101	CB121	381580.382	5032829.221
Vortex_ICD_85	3	0.0111	CB121	381526.869	5032841.1
			CB123	381583.496	5032831.297
			CB123	381530.098	5032843.407
;Tempest Rating Curve for Vortex ICD 90, No grate allowance					
Vortex_ICD_90	Rating	0	[POLYGONS]		
Vortex_ICD_90	0.1	0.0022	;;Subcatchment	X-Coord	Y-Coord
Vortex_ICD_90	0.2	0.0032	;;		
Vortex_ICD_90	0.3	0.0039	S1	381585.63	5032868.962
Vortex_ICD_90	0.4	0.0045	S1	381545.732	5032851.464
Vortex_ICD_90	0.5	0.0051	S1	381549.853	5032863.759
Vortex_ICD_90	0.6	0.0055	S1	381561.389	5032872.018
Vortex_ICD_90	0.7	0.006	S1	381568.12	5032873.68
Vortex_ICD_90	0.8	0.0064	S1	381571.213	5032866.739
Vortex_ICD_90	0.9	0.0068	S1	381575.491	5032868.703
Vortex_ICD_90	1	0.0072	S1	381584.113	5032872.421
Vortex_ICD_90	1.2	0.0079	S1	381585.63	5032868.962
Vortex_ICD_90	1.4	0.0085	S10	381577.07	5032828.633
Vortex_ICD_90	1.6	0.0091	S10	381573.49	5032810.992
Vortex_ICD_90	1.8	0.0096	S10	381521.312	5032821.582
Vortex_ICD_90	2	0.0102	S10	381524.892	5032839.223
Vortex_ICD_90	2.5	0.0114	S10	381534.873	5032837.198
Vortex_ICD_90	3	0.0125	S10	381534.419	5032834.958
			S10	381536.967	5032834.441
			S10	381537.422	5032836.68
;Tempest Rating Curve for Vortex ICD 95, No grate allowance					
Vortex_ICD_95	Rating	0	S10	381577.07	5032828.633
Vortex_ICD_95	0.1	0.0026	S2	381600.237	5032851.815
Vortex_ICD_95	0.2	0.0036	S2	381608.78	5032855.542
Vortex_ICD_95	0.3	0.0044	S2	381621.447	5032826.605
Vortex_ICD_95	0.4	0.0051	S2	381614.961	5032823.791
Vortex_ICD_95	0.5	0.0057	S2	381603.372	5032850.345
Vortex_ICD_95	0.6	0.0062	S2	381601.278	5032849.431
Vortex_ICD_95	0.7	0.0067	S2	381600.237	5032851.815
Vortex_ICD_95	0.8	0.0071	S3	381600.122	5032875.319
Vortex_ICD_95	0.9	0.0076	S3	381608.78	5032855.542
Vortex_ICD_95	1	0.008	S3	381602.332	5032852.729
Vortex_ICD_95	1.2	0.0087	S3	381598.259	5032862.063
Vortex_ICD_95	1.4	0.0094	S3	381597.544	5032861.752
Vortex_ICD_95	1.6	0.0101	S3	381593.609	5032870.772
Vortex_ICD_95	1.8	0.0107	S3	381567.855	5032859.534
Vortex_ICD_95	2	0.0113	S3	381567.277	5032860.913
Vortex_ICD_95	2.5	0.0126	S3	381600.122	5032875.319
Vortex_ICD_95	3	0.0138	S4	381524.892	5032839.223
			S4	381521.312	5032821.582
			S4	381563.78	5032812.963
			S4	381562.788	5032808.079
			S4	381521.032	5032816.77
			S4	381516.421	5032820.775
			S4	381519.182	5032849.734
			S4	381520.586	5032849.638
			S4	381524.866	5032848.769
			S4	381525.228	5032848.183
			S4	381524.284	5032843.53
			S4	381525.411	5032841.771
			S4	381524.892	5032839.223
			S5	381545.732	5032851.464
			S5	381567.277	5032860.913
			S5	381567.855	5032859.534
			S5	381567.897	5032859.438
			S5	381567.158	5032859.115
			S5	381566.874	5032858.986
			S5	381566.594	5032858.846
			S5	381566.319	5032858.697
			S5	381566.05	5032858.539
			S5	381565.786	5032858.372
			S5	381565.528	5032858.196
			S5	381565.276	5032858.012
			S5	381565.03	5032857.819
			S5	381564.792	5032857.617
			S5	381564.56	5032857.408
			S5	381564.335	5032857.191
			S5	381564.118	5032856.966
			S5	381563.908	5032856.735
			S5	381563.707	5032856.496
			S5	381563.514	5032856.25
			S5	381563.329	5032855.999
			S5	381563.153	5032855.741
			S5	381562.986	5032855.477
			S5	381562.827	5032855.207
			S5	381562.681	5032854.937
			S5	381562.543	5032854.662
			S5	381562.415	5032854.382
			S5	381562.296	5032854.099
			S5	381562.186	5032853.811
			S5	381562.087	5032853.52
			S5	381561.997	5032853.226
			S5	381561.917	5032852.929
			S5	381561.846	5032852.63
			S5	381561.812	5032852.481
			S5	381561.773	5032852.334
			S5	381561.729	5032852.188
			S5	381561.68	5032852.043
			S5	381561.627	5032851.9
			S5	381561.569	5032851.759
			S5	381561.507	5032851.62
			S5	381561.441	5032851.483
			S5	381561.615	5032851.396
			S5	381568.16	5032850.064
			S5	381572.167	5032851.809
			S5	381574.562	5032846.312
			S5	381570.746	5032844.646
			S5	381570.904	5032844.497
			S5	381568.214	5032843.324
			S5	381568.127	5032843.284
			S5	381568.041	5032843.241
			S5	381567.957	5032843.195
			S5	381567.874	5032843.147
			S5	381567.793	5032843.096
			S5	381567.714	5032843.041
			S5	381567.637	5032842.985
			S5	381567.561	5032842.925
			S5	381567.488	5032842.863
			S5	381567.417	5032842.799
			S5	381567.348	5032842.732
			S5	381567.282	5032842.663
			S5	381567.218	5032842.591
			S5	381567.156	5032842.518
			S5	381567.097	5032842.442
			S5	381567.041	5032842.365
			S5	381566.987	5032842.285
			S5	381566.936	5032842.204
			S5	381566.888	5032842.121
			S5	381566.843	5032842.036
			S5	381566.8	5032841.95
			S5	381566.761	5032841.863
			S5	381566.725	5032841.774
			S5	381566.692	5032841.684
			S5	381566.661	5032841.593
			S5	381566.634	5032841.501
			S5	381566.611	5032841.408
			S5	381566.59	5032841.314
			S5	381565.348	5032835.196
			S5	381564.854	5032833.766
			S5	381564.337	5032831.218
;Sum of Infiltrated flow from above the garage slab calculated from Infiltration graphs for S6 multiplied by their areas.					
InfiltratedInflow	01/01/2000 00:00:05	0.001345327			
InfiltratedInflow	01/01/2000 00:00:10	0.001345327			
InfiltratedInflow	01/01/2000 00:00:15	0.001345327			
InfiltratedInflow	01/01/2000 00:00:20	0.001345327			
InfiltratedInflow	01/01/2000 00:00:25	0.001345327			
InfiltratedInflow	01/01/2000 00:00:30	0.001345327			
InfiltratedInflow	01/01/2000 00:00:35	0.001345327			
InfiltratedInflow	01/01/2000 00:00:40	0.001345327			
InfiltratedInflow	01/01/2000 00:00:45	0.001345327			
InfiltratedInflow	01/01/2000 00:00:50	0.001345327			
InfiltratedInflow	01/01/2000 00:00:55	0.001345327			
.....					
Too many data points (2160 in total).					
[REPORT]					
;Reporting Options					
INPUT YES					
CONTROLS NO					
SUBCATCHMENTS ALL					
NODES ALL					
LINKS ALL					
[TAGS]					
Node	St_UnGrd	Underground_Storage			
[MAP]					
DIMENSIONS	381503.2836	5032790.42705	381639.0324	5032880.16395	
UNITS	Meters				
[COORDINATES]					
;;Node	X-Coord	Y-Coord			
;;					
MH505	381512.619	5032853.746			
OF2	381610.244	5032876.085			
OF3	381513.952	5032857.477			

S5	381546.649	5032834.808
S5	381537.422	5032836.68
S5	381536.967	5032834.441
S5	381534.419	5032834.958
S5	381534.873	5032837.198
S5	381524.892	5032839.223
S5	381525.411	5032841.771
S5	381524.284	5032843.53
S5	381525.228	5032848.183
S5	381524.866	5032848.769
S5	381520.586	5032849.638
S5	381519.182	5032849.734
S5	381519.868	5032856.933
S5	381545.732	5032851.464
S6	381574.562	5032846.312
S6	381572.167	5032851.809
S6	381581.761	5032854.864
S6	381590.946	5032833.812
S6	381603.052	5032806.066
S6	381601.782	5032799.963
S6	381562.788	5032808.079
S6	381563.78	5032812.963
S6	381573.49	5032810.992
S6	381577.07	5032828.633
S6	381564.337	5032831.218
S6	381564.854	5032833.766
S6	381565.348	5032835.196
S6	381566.59	5032841.314
S6	381566.611	5032841.408
S6	381566.635	5032841.501
S6	381566.662	5032841.593
S6	381566.692	5032841.684
S6	381566.725	5032841.774
S6	381566.761	5032841.862
S6	381566.801	5032841.95
S6	381566.843	5032842.036
S6	381566.888	5032842.121
S6	381566.937	5032842.203
S6	381566.988	5032842.285
S6	381567.041	5032842.364
S6	381567.098	5032842.442
S6	381567.157	5032842.517
S6	381567.218	5032842.591
S6	381567.282	5032842.662
S6	381567.349	5032842.732
S6	381567.417	5032842.798
S6	381567.488	5032842.863
S6	381567.562	5032842.925
S6	381567.637	5032842.984
S6	381567.714	5032843.041
S6	381567.793	5032843.095
S6	381567.874	5032843.147
S6	381567.957	5032843.195
S6	381568.041	5032843.241
S6	381568.127	5032843.284
S6	381568.214	5032843.324
S6	381570.904	5032844.497
S6	381570.746	5032844.646
S6	381574.562	5032846.312
S7	381627.999	5032794.506
S7	381601.782	5032799.963
S7	381603.052	5032806.066
S7	381619.55	5032813.264
S7	381614.961	5032823.791
S7	381621.447	5032826.605
S7	381632.862	5032800.531
S7	381627.999	5032794.506
S8	381597.544	5032861.751
S8	381581.761	5032854.863
S8	381572.167	5032851.809
S8	381568.16	5032850.064
S8	381561.615	5032851.396
S8	381561.441	5032851.483
S8	381561.507	5032851.62
S8	381561.569	5032851.759
S8	381561.627	5032851.9
S8	381561.68	5032852.043
S8	381561.729	5032852.188
S8	381561.773	5032852.334
S8	381561.812	5032852.481
S8	381561.846	5032852.63
S8	381561.917	5032852.929
S8	381561.997	5032853.226
S8	381562.087	5032853.52
S8	381562.186	5032853.811
S8	381562.296	5032854.099
S8	381562.415	5032854.382
S8	381562.543	5032854.662
S8	381562.681	5032854.937
S8	381562.827	5032855.207
S8	381562.986	5032855.477
S8	381563.153	5032855.741
S8	381563.329	5032855.999
S8	381563.514	5032856.25
S8	381563.707	5032856.496
S8	381563.908	5032856.735
S8	381564.118	5032856.966
S8	381564.335	5032857.191
S8	381564.56	5032857.408
S8	381564.792	5032857.617
S8	381565.03	5032857.819
S8	381565.276	5032858.012
S8	381565.528	5032858.196
S8	381565.786	5032858.372
S8	381566.05	5032858.539
S8	381566.319	5032858.697
S8	381566.594	5032858.846
S8	381566.874	5032858.986
S8	381567.158	5032859.115
S8	381567.897	5032859.438
S8	381567.855	5032859.534
S8	381593.609	5032870.772
S8	381597.544	5032861.751
S9	381581.761	5032854.865
S9	381598.259	5032862.063
S9	381602.332	5032852.729
S9	381600.237	5032851.815
S9	381601.278	5032849.431
S9	381603.372	5032850.345
S9	381619.55	5032813.264
S9	381603.052	5032806.066
S9	381581.761	5032854.865

;;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 ... 10						
Number of nodes 13						
Number of links 9						
Number of pollutants 0						
Number of land uses 0						

Raingage Summary						

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

Subcatchment Summary						

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet

S1	0.03	38.60	14.29	1.5000	3CHI100	CB120
S10	0.10	18.00	100.00	1.0000	3CHI100	Roof2
S2	0.02	38.94	12.23	2.1000	3CHI100	CB124
S3	0.02	26.02	10.53	2.0000	3CHI100	OF2
S4	0.04	163.64	9.35	1.5000	3CHI100	CB125
S5	0.09	79.85	79.26	2.0000	3CHI100	CB120
S6	0.11	105.72	20.01	2.1000	3CHI100	CB121
S7	0.05	44.22	3.82	3.3000	3CHI100	CB122
S8	0.03	11.98	95.75	5.2000	3CHI100	St_UnGrd
S9	0.10	18.00	100.00	1.0000	3CHI100	Roof1

Node Summary						

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow	
MH505	OUTFALL	78.00	0.00	0.0		
OF2	OUTFALL	0.00	0.00	0.0		
OF3	OUTFALL	78.88	0.00	0.0		
OF4	OUTFALL	78.88	0.00	0.0		
CB120	STORAGE	82.10	0.30	0.0		
CB121	STORAGE	82.28	0.30	0.0		
CB122	STORAGE	79.35	1.70	0.0		
CB123	STORAGE	79.17	2.18	0.0		
CB124	STORAGE	79.47	1.78	0.0		
CB125	STORAGE	80.20	2.00	0.0		
Roof1	STORAGE	88.85	0.15	0.0		
Roof2	STORAGE	88.85	0.15	0.0		
St_UnGrd	STORAGE	78.00	1.00	0.0	Yes	

Link Summary						

Name	From Node	To Node	Type	Length	%Slope	
Roughness						

C1	CB124	CB123	CONDUIT	23.3	0.9862	
0.130						
C2	CB122	CB123	CONDUIT	12.2	0.9965	
0.130						
BLDG_E	Roof2	OF4	OUTLET			
BLDG_F	Roof1	OF3	OUTLET			
CB120	CB120	St_UnGrd	OUTLET			
CB121	CB121	St_UnGrd	OUTLET			
CB123	CB123	St_UnGrd	OUTLET			
CB125	CB125	St_UnGrd	OUTLET			
OL1	St_UnGrd	MH505	OUTLET			

Cross Section Summary						

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels
C1	CIRCULAR	0.25	0.05	0.06	0.25	1
C2	CIRCULAR	0.25	0.05	0.06	0.25	1

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 03:00:00						
Antecedent Dry Days 0.0						
Report Time Step 00:00:05						
Wet Time Step 00:02:00						
Dry Time Step 00:02:00						
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	0.042	71.708				
Evaporation Loss	0.000	0.000				
Infiltration Loss	0.011	19.563				
Surface Runoff	0.030	51.134				
Final Storage	0.001	1.282				
Continuity Error (%)	-0.378					

Flow Routing Continuity						

	Volume	Volume				
	hectare-m	10^6 ltr				

Dry Weather Inflow	0.000	0.000				
Wet Weather Inflow	0.030	0.300				
Groundwater Inflow	0.000	0.000				
RDII Inflow	0.000	0.000				
External Inflow	0.004	0.040				
External Outflow	0.024	0.244				
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				

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

[illegible]

;Tempest Rating Curve for MHF IPEX TYPE D, No grate allowance				Vortex_ICD_50	0.4	0.0014
MHF_IPEX_TYPE_D	Rating	0	0	Vortex_ICD_50	0.5	0.0016
MHF_IPEX_TYPE_D		0.1	0.0154	Vortex_ICD_50	0.6	0.0018
MHF_IPEX_TYPE_D		0.2	0.0217	Vortex_ICD_50	0.7	0.0019
MHF_IPEX_TYPE_D		0.3	0.0266	Vortex_ICD_50	0.8	0.0021
MHF_IPEX_TYPE_D		0.4	0.0307	Vortex_ICD_50	0.9	0.0021
MHF_IPEX_TYPE_D		0.5	0.0343	Vortex_ICD_50	1	0.0023
MHF_IPEX_TYPE_D		0.6	0.0376	Vortex_ICD_50	1.2	0.0025
MHF_IPEX_TYPE_D		0.7	0.0406	Vortex_ICD_50	1.4	0.0027
MHF_IPEX_TYPE_D		0.8	0.0434	Vortex_ICD_50	1.6	0.0029
MHF_IPEX_TYPE_D		0.9	0.0461	Vortex_ICD_50	1.8	0.003
MHF_IPEX_TYPE_D		1	0.0485	Vortex_ICD_50	2	0.0032
MHF_IPEX_TYPE_D		1.2	0.0532	Vortex_ICD_50	2.5	0.0036
MHF_IPEX_TYPE_D		1.4	0.0574	Vortex_ICD_50	3	0.0039
MHF_IPEX_TYPE_D		1.6	0.0614	;Tempest Rating Curve for Vortex ICD 55, No grate allowance		
MHF_IPEX_TYPE_D		1.8	0.0651	Vortex_ICD_55	Rating	0
MHF_IPEX_TYPE_D		2	0.0687	Vortex_ICD_55	0.1	0.0009
MHF_IPEX_TYPE_D		2.5	0.0768	Vortex_ICD_55	0.2	0.0012
MHF_IPEX_TYPE_D		3	0.0841	Vortex_ICD_55	0.3	0.0015
;Tempest Rating Curve for MHF IPEX TYPE E, No grate allowance				Vortex_ICD_55	0.4	0.0017
MHF_IPEX_TYPE_E	Rating	0	0	Vortex_ICD_55	0.5	0.0019
MHF_IPEX_TYPE_E		0.1	0.0205	Vortex_ICD_55	0.6	0.0021
MHF_IPEX_TYPE_E		0.2	0.0289	Vortex_ICD_55	0.7	0.0023
MHF_IPEX_TYPE_E		0.3	0.0355	Vortex_ICD_55	0.8	0.0024
MHF_IPEX_TYPE_E		0.4	0.0409	Vortex_ICD_55	0.9	0.0026
MHF_IPEX_TYPE_E		0.5	0.0458	Vortex_ICD_55	1	0.0027
MHF_IPEX_TYPE_E		0.6	0.0501	Vortex_ICD_55	1.2	0.003
MHF_IPEX_TYPE_E		0.7	0.0542	Vortex_ICD_55	1.4	0.0032
MHF_IPEX_TYPE_E		0.8	0.0579	Vortex_ICD_55	1.6	0.0034
MHF_IPEX_TYPE_E		0.9	0.0614	Vortex_ICD_55	1.8	0.0036
MHF_IPEX_TYPE_E		1	0.0647	Vortex_ICD_55	2	0.0038
MHF_IPEX_TYPE_E		1.2	0.0709	Vortex_ICD_55	2.5	0.0043
MHF_IPEX_TYPE_E		1.4	0.0766	Vortex_ICD_55	3	0.0047
MHF_IPEX_TYPE_E		1.6	0.0819	;Tempest Rating Curve for Vortex ICD 60, No grate allowance		
MHF_IPEX_TYPE_E		1.8	0.0868	Vortex_ICD_60	Rating	0
MHF_IPEX_TYPE_E		2	0.0915	Vortex_ICD_60	0.1	0.0011
MHF_IPEX_TYPE_E		2.5	0.1023	Vortex_ICD_60	0.2	0.0015
MHF_IPEX_TYPE_E		3	0.1121	Vortex_ICD_60	0.3	0.0018
O_Roof1				Vortex_ICD_60	0.4	0.0021
O_Roof1	Rating	0	0	Vortex_ICD_60	0.5	0.0023
O_Roof1		0.001	0.002	Vortex_ICD_60	0.6	0.0025
O_Roof1		0.15	0.002	Vortex_ICD_60	0.7	0.0027
O_Roof2				Vortex_ICD_60	0.8	0.0029
O_Roof2	Rating	0	0	Vortex_ICD_60	0.9	0.0031
O_Roof2		0.001	0.002	Vortex_ICD_60	1	0.0032
O_Roof2		0.15	0.002	Vortex_ICD_60	1.2	0.0036
O_St_L1				Vortex_ICD_60	1.4	0.0038
O_St_L1	Rating	0	0	Vortex_ICD_60	1.6	0.0041
O_St_L1		0.001	0.003	Vortex_ICD_60	1.8	0.0043
O_St_L1		0.35	0.003	Vortex_ICD_60	2	0.0046
O_St_L2				Vortex_ICD_60	2.5	0.0051
O_St_L2	Rating	0	0	Vortex_ICD_60	3	0.0056
O_St_L2		0.001	0.002	;Tempest Rating Curve for Vortex ICD 65, No grate allowance		
O_St_L2		0.35	0.002	Vortex_ICD_65	Rating	0
O_St_L3				Vortex_ICD_65	0.1	0.0012
O_St_L3	Rating	0	0	Vortex_ICD_65	0.2	0.0016
O_St_L3		0.001	0.0137	Vortex_ICD_65	0.3	0.002
O_St_L3		0.35	0.0137	Vortex_ICD_65	0.4	0.0023
O_St_UnGrd				Vortex_ICD_65	0.5	0.0025
O_St_UnGrd	Rating	0	0	Vortex_ICD_65	0.6	0.0028
O_St_UnGrd		0.01	0.036	Vortex_ICD_65	0.7	0.003
O_St_UnGrd		1	0.036	Vortex_ICD_65	0.8	0.0032
;Tempest Rating Curve for Vortex ICD 100, No grate allowance				Vortex_ICD_65	0.9	0.0034
Vortex_ICD_100	Rating	0	0	Vortex_ICD_65	1	0.0036
Vortex_ICD_100		0.1	0.0028	Vortex_ICD_65	1.2	0.004
Vortex_ICD_100		0.2	0.004	Vortex_ICD_65	1.4	0.0043
Vortex_ICD_100		0.3	0.0049	Vortex_ICD_65	1.6	0.0046
Vortex_ICD_100		0.4	0.0056	Vortex_ICD_65	1.8	0.0049
Vortex_ICD_100		0.5	0.0063	Vortex_ICD_65	2	0.0051
Vortex_ICD_100		0.6	0.0069	Vortex_ICD_65	2.5	0.0057
Vortex_ICD_100		0.7	0.0075	Vortex_ICD_65	3	0.0063
Vortex_ICD_100		0.8	0.008	;Tempest Rating Curve for Vortex ICD 70, No grate allowance		
Vortex_ICD_100		0.9	0.0085	Vortex_ICD_70	Rating	0
Vortex_ICD_100		1	0.0089	Vortex_ICD_70	0.1	0.0013
Vortex_ICD_100		1.2	0.0098	Vortex_ICD_70	0.2	0.0019
Vortex_ICD_100		1.4	0.0106	Vortex_ICD_70	0.3	0.0023
Vortex_ICD_100		1.6	0.0113	Vortex_ICD_70	0.4	0.0027
Vortex_ICD_100		1.8	0.012	Vortex_ICD_70	0.5	0.003
Vortex_ICD_100		2	0.0126	Vortex_ICD_70	0.6	0.0033
Vortex_ICD_100		2.5	0.0141	Vortex_ICD_70	0.7	0.0036
Vortex_ICD_100		3	0.0155	Vortex_ICD_70	0.8	0.0038
;Tempest Rating Curve for Vortex ICD 105, No grate allowance				Vortex_ICD_70	0.9	0.0041
Vortex_ICD_105	Rating	0	0	Vortex_ICD_70	1	0.0043
Vortex_ICD_105		0.1	0.0031	Vortex_ICD_70	1.2	0.0047
Vortex_ICD_105		0.2	0.0044	Vortex_ICD_70	1.4	0.0051
Vortex_ICD_105		0.3	0.0054	Vortex_ICD_70	1.6	0.0054
Vortex_ICD_105		0.4	0.0062	Vortex_ICD_70	1.8	0.0058
Vortex_ICD_105		0.5	0.0069	Vortex_ICD_70	2	0.0061
Vortex_ICD_105		0.6	0.0076	Vortex_ICD_70	2.5	0.0068
Vortex_ICD_105		0.7	0.0082	Vortex_ICD_70	3	0.0075
Vortex_ICD_105		0.8	0.0088	;Tempest Rating Curve for Vortex ICD 75, No grate allowance		
Vortex_ICD_105		0.9	0.0093	Vortex_ICD_75	Rating	0
Vortex_ICD_105		1	0.0098	Vortex_ICD_75	0.1	0.0016
Vortex_ICD_105		1.2	0.0107	Vortex_ICD_75	0.2	0.0022
Vortex_ICD_105		1.4	0.0116	Vortex_ICD_75	0.3	0.0027
Vortex_ICD_105		1.6	0.0124	Vortex_ICD_75	0.4	0.0032
Vortex_ICD_105		1.8	0.0131	Vortex_ICD_75	0.5	0.0035
Vortex_ICD_105		2	0.0139	Vortex_ICD_75	0.6	0.0039
Vortex_ICD_105		2.5	0.0155	Vortex_ICD_75	0.7	0.0042
Vortex_ICD_105		3	0.017	Vortex_ICD_75	0.8	0.0045
;Tempest Rating Curve for Vortex ICD 40, No grate allowance				Vortex_ICD_75	0.9	0.0048
Vortex_ICD_40	Rating	0	0	Vortex_ICD_75	1	0.005
Vortex_ICD_40		0.1	0.0004	Vortex_ICD_75	1.2	0.0055
Vortex_ICD_40		0.2	0.0006	Vortex_ICD_75	1.4	0.0059
Vortex_ICD_40		0.3	0.0007	Vortex_ICD_75	1.6	0.0063
Vortex_ICD_40		0.4	0.0009	Vortex_ICD_75	1.8	0.0067
Vortex_ICD_40		0.5	0.001	Vortex_ICD_75	2	0.0071
Vortex_ICD_40		0.6	0.001	Vortex_ICD_75	2.5	0.0079
Vortex_ICD_40		0.7	0.0011	Vortex_ICD_75	3	0.0087
Vortex_ICD_40		0.8	0.0012	;Tempest Rating Curve for Vortex ICD 80, No grate allowance		
Vortex_ICD_40		0.9	0.0013	Vortex_ICD_80	Rating	0
Vortex_ICD_40		1	0.0014	Vortex_ICD_80	0.1	0.0018
Vortex_ICD_40		1.2	0.0015	Vortex_ICD_80	0.2	0.0026
Vortex_ICD_40		1.4	0.0016	Vortex_ICD_80	0.3	0.0031
Vortex_ICD_40		1.6	0.0017	Vortex_ICD_80	0.4	0.0036
Vortex_ICD_40		1.8	0.0018	Vortex_ICD_80	0.5	0.004
Vortex_ICD_40		2	0.0019	Vortex_ICD_80	0.6	0.0044
Vortex_ICD_40		2.5	0.0022	Vortex_ICD_80	0.7	0.0048
Vortex_ICD_40		3	0.0024	Vortex_ICD_80	0.8	0.0051
;Tempest Rating Curve for Vortex ICD 45, No grate allowance				Vortex_ICD_80	0.9	0.0054
Vortex_ICD_45	Rating	0	0	Vortex_ICD_80	1	0.0057
Vortex_ICD_45		0.1	0.0006	Vortex_ICD_80	1.2	0.0063
Vortex_ICD_45		0.2	0.0008	Vortex_ICD_80	1.4	0.0068
Vortex_ICD_45		0.3	0.001	Vortex_ICD_80	1.6	0.0072
Vortex_ICD_45		0.4	0.0011	Vortex_ICD_80	1.8	0.0077
Vortex_ICD_45		0.5	0.0013	Vortex_ICD_80	2	0.0081
Vortex_ICD_45		0.6	0.0014	Vortex_ICD_80	2.5	0.009
Vortex_ICD_45		0.7	0.0015	Vortex_ICD_80	3	0.0099
Vortex_ICD_45		0.8	0.0016	;Tempest Rating Curve for Vortex ICD 85, No grate allowance		
Vortex_ICD_45		0.9	0.0017	Vortex_ICD_85	Rating	0
Vortex_ICD_45		1	0.0018	Vortex_ICD_85	0.1	0.002
Vortex_ICD_45		1.2	0.002	Vortex_ICD_85	0.2	0.0029
Vortex_ICD_45		1.4	0.0021	Vortex_ICD_85	0.3	0.0035
Vortex_ICD_45		1.6	0.0023	Vortex_ICD_85	0.4	0.0041
Vortex_ICD_45		1.8	0.0024	Vortex_ICD_85	0.5	0.0045
Vortex_ICD_45		2	0.0026	Vortex_ICD_85	0.6	0.005
Vortex_ICD_45		2.5	0.0029	Vortex_ICD_85	0.7	0.0054
Vortex_ICD_45		3	0.0031	Vortex_ICD_85	0.8	0.0057
;Tempest Rating Curve for Vortex ICD 50, No grate allowance				Vortex_ICD_85	0.9	0.0061
Vortex_ICD_50	Rating	0	0	Vortex_ICD_85	1	0.0064
Vortex_ICD_50		0.1	0.0007	Vortex_ICD_85	1.2	0.007
Vortex_ICD_50		0.2	0.001	Vortex_ICD_85	1.4	0.0076
Vortex_ICD_50		0.3	0.0012			

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Vortex_ICD_85      1.6      0.0081      24SCS100      01/01/2000      17:15:00      2.3736
Vortex_ICD_85      1.8      0.0086      24SCS100      01/01/2000      17:30:00      2.3736
Vortex_ICD_85      2      0.0091      24SCS100      01/01/2000      17:45:00      2.3736
Vortex_ICD_85      2.5      0.0101      24SCS100      01/01/2000      18:00:00      1.548
Vortex_ICD_85      3      0.0111      24SCS100      01/01/2000      18:15:00      1.548
Vortex_ICD_85      3      0.0111      24SCS100      01/01/2000      18:30:00      1.548
Vortex_ICD_85      3      0.0111      24SCS100      01/01/2000      18:45:00      1.548
Vortex_ICD_90      0      0.0022      24SCS100      01/01/2000      19:00:00      1.2384
Vortex_ICD_90      0.1      0.0022      24SCS100      01/01/2000      19:15:00      1.2384
Vortex_ICD_90      0.2      0.0032      24SCS100      01/01/2000      19:30:00      1.2384
Vortex_ICD_90      0.3      0.0039      24SCS100      01/01/2000      19:45:00      1.2384
Vortex_ICD_90      0.4      0.0045      24SCS100      01/01/2000      20:00:00      1.7544
Vortex_ICD_90      0.5      0.0051      24SCS100      01/01/2000      20:15:00      1.7544
Vortex_ICD_90      0.6      0.0055      24SCS100      01/01/2000      20:30:00      1.7544
Vortex_ICD_90      0.7      0.006      24SCS100      01/01/2000      20:45:00      1.7544
Vortex_ICD_90      0.8      0.0064      24SCS100      01/01/2000      21:00:00      1.1352
Vortex_ICD_90      0.9      0.0068      24SCS100      01/01/2000      21:15:00      1.1352
Vortex_ICD_90      1      0.0072      24SCS100      01/01/2000      21:30:00      1.1352
Vortex_ICD_90      1.2      0.0079      24SCS100      01/01/2000      21:45:00      1.1352
Vortex_ICD_90      1.4      0.0085      24SCS100      01/01/2000      22:00:00      1.032
Vortex_ICD_90      1.6      0.0091      24SCS100      01/01/2000      22:15:00      1.032
Vortex_ICD_90      1.8      0.0096      24SCS100      01/01/2000      22:30:00      1.032
Vortex_ICD_90      2      0.0102      24SCS100      01/01/2000      22:45:00      1.032
Vortex_ICD_90      2.5      0.0114      24SCS100      01/01/2000      23:00:00      1.032
Vortex_ICD_90      3      0.0125      24SCS100      01/01/2000      23:15:00      1.032
Vortex_ICD_90      3      0.0125      24SCS100      01/01/2000      23:30:00      1.032
Vortex_ICD_90      3      0.0125      24SCS100      01/01/2000      23:45:00      1.032
Vortex_ICD_90      3      0.0125      24SCS100      01/02/2000      00:00:00      0
;Tempest Rating Curve for Vortex ICD 90, No grate allowance
Vortex_ICD_90      Rating      0      0
Vortex_ICD_95      0.1      0.0026      3CHI100      01/01/2000      00:00:00      5.339
Vortex_ICD_95      0.2      0.0036      3CHI100      01/01/2000      00:10:00      6.379
Vortex_ICD_95      0.3      0.0044      3CHI100      01/01/2000      00:20:00      7.977
Vortex_ICD_95      0.4      0.0051      3CHI100      01/01/2000      00:30:00      10.797
Vortex_ICD_95      0.5      0.0057      3CHI100      01/01/2000      00:40:00      17.136
Vortex_ICD_95      0.6      0.0062      3CHI100      01/01/2000      00:50:00      45.128
Vortex_ICD_95      0.7      0.0067      3CHI100      01/01/2000      01:00:00      178.107
Vortex_ICD_95      0.8      0.0071      3CHI100      01/01/2000      01:10:00      51.056
Vortex_ICD_95      0.9      0.0076      3CHI100      01/01/2000      01:20:00      26.163
Vortex_ICD_95      1      0.008      3CHI100      01/01/2000      01:30:00      17.571
Vortex_ICD_95      1.2      0.0087      3CHI100      01/01/2000      01:40:00      13.277
Vortex_ICD_95      1.4      0.0094      3CHI100      01/01/2000      01:50:00      10.712
Vortex_ICD_95      1.6      0.0101      3CHI100      01/01/2000      02:00:00      9.008
Vortex_ICD_95      1.8      0.0107      3CHI100      01/01/2000      02:10:00      7.793
Vortex_ICD_95      2      0.0113      3CHI100      01/01/2000      02:20:00      6.883
Vortex_ICD_95      2.5      0.0126      3CHI100      01/01/2000      02:30:00      6.174
Vortex_ICD_95      3      0.0138      3CHI100      01/01/2000      02:40:00      5.607
Vortex_ICD_95      3      0.0138      3CHI100      01/01/2000      02:50:00      4.142
Vortex_ICD_95      3      0.0138      3CHI100      01/01/2000      03:00:00      0
;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
;Sum of Infiltrated flow from above the garage slab calculated from Infiltration graphs for S6
InfiltratedInflow 01/01/2000 00:01:00 0.0003900667
InfiltratedInflow 01/01/2000 00:02:00 0.0003900667
InfiltratedInflow 01/01/2000 00:03:00 0.0003900667
InfiltratedInflow 01/01/2000 00:04:00 0.0003900667
InfiltratedInflow 01/01/2000 00:05:00 0.0003900667
InfiltratedInflow 01/01/2000 00:06:00 0.0003900667
InfiltratedInflow 01/01/2000 00:07:00 0.0003900667
InfiltratedInflow 01/01/2000 00:08:00 0.0003900667
InfiltratedInflow 01/01/2000 00:09:00 0.0003900667
InfiltratedInflow 01/01/2000 00:10:00 0.0003900667
InfiltratedInflow 01/01/2000 00:11:00 0.0003900667
.....
Too many data points (1440 in total).
[REPORT]
;Reporting Options
INPUT YES
CONTROLS NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL
[TAGS]
Subcatch S10 Building
Subcatch S5 Parking_Lot
Subcatch S8 Ramp
Subcatch S9 Building
Node St_UnGrd Underground_Storage
[MAP]
DIMENSIONS 381503.2836 5032790.42705 381639.0324 5032880.16395
UNITS Meters
[COORDINATES]
;Node X-Coord Y-Coord
MH505 381512.619 5032853.785
OF2 381610.244 5032876.046
OF3 381513.952 5032857.477
OF4 381509.454 5032882.912
CB120 381549.093 5032844.875
CB121 381584.314 5032823.865
CB122 381627.208 5032806.966
CB123 381622.312 5032818.188
CB124 381612.986 5032839.563
CB125 381519.372 5032825.114
Roof1 381594.1 5032833.494
Roof2 381526.761 5032828.396
St_UnGrd 381520.468 5032851.542
[VERTICES]
;Link X-Coord Y-Coord
BLDG_F 381587.375 5032838.9
CB121 381580.382 5032829.221
CB122 381526.869 5032828.396
CB123 381583.4
```


S4	381521.312	5032821.582	S6	381574.562	5032846.312
S4	381563.78	5032812.963	S7	381627.999	5032794.506
S4	381562.788	5032808.079	S7	381601.782	5032799.963
S4	381521.032	5032816.77	S7	381603.052	5032806.066
S4	381516.421	5032820.775	S7	381619.15	5032813.264
S4	381519.182	5032849.734	S7	381614.961	5032823.791
S4	381520.586	5032849.638	S7	381621.447	5032826.605
S4	381524.866	5032848.769	S7	381632.862	5032800.531
S4	381525.228	5032848.183	S7	381627.999	5032794.506
S4	381524.284	5032843.53	S8	381597.544	5032861.751
S4	381525.411	5032841.771	S8	381581.761	5032854.863
S4	381524.892	5032839.223	S8	381572.167	5032851.809
S5	381545.732	5032851.464	S8	381568.16	5032850.064
S5	381567.277	5032860.913	S8	381561.615	5032851.396
S5	381567.855	5032859.534	S8	381561.441	5032851.483
S5	381567.897	5032859.438	S8	381561.507	5032851.62
S5	381567.158	5032859.115	S8	381561.569	5032851.759
S5	381566.874	5032858.986	S8	381561.627	5032851.9
S5	381566.594	5032858.846	S8	381561.68	5032852.043
S5	381566.319	5032858.697	S8	381561.729	5032852.188
S5	381566.05	5032858.539	S8	381561.773	5032852.334
S5	381565.786	5032858.372	S8	381561.812	5032852.481
S5	381565.528	5032858.196	S8	381561.846	5032852.63
S5	381565.276	5032858.012	S8	381561.917	5032852.929
S5	381565.03	5032857.819	S8	381561.997	5032853.226
S5	381564.792	5032857.617	S8	381562.087	5032853.52
S5	381564.56	5032857.408	S8	381562.186	5032853.811
S5	381564.335	5032857.191	S8	381562.296	5032854.099
S5	381564.118	5032856.966	S8	381562.415	5032854.382
S5	381563.908	5032856.735	S8	381562.543	5032854.662
S5	381563.707	5032856.496	S8	381562.681	5032854.937
S5	381563.514	5032856.25	S8	381562.827	5032855.207
S5	381563.329	5032855.999	S8	381562.986	5032855.477
S5	381563.153	5032855.741	S8	381563.153	5032855.741
S5	381562.986	5032855.477	S8	381563.329	5032855.999
S5	381562.827	5032855.207	S8	381563.514	5032856.25
S5	381562.681	5032854.937	S8	381563.707	5032856.496
S5	381562.543	5032854.662	S8	381563.908	5032856.735
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S5	381562.186	5032853.811	S8	381564.56	5032857.408
S5	381562.087	5032853.52	S8	381564.792	5032857.617
S5	381561.997	5032853.226	S8	381565.03	5032857.819
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S5	381561.846	5032852.63	S8	381565.528	5032858.196
S5	381561.812	5032852.481	S8	381565.786	5032858.372
S5	381561.773	5032852.334	S8	381566.05	5032858.539
S5	381561.729	5032852.188	S8	381566.319	5032858.697
S5	381561.68	5032852.043	S8	381566.594	5032858.846
S5	381561.627	5032851.9	S8	381566.874	5032858.986
S5	381561.569	5032851.759	S8	381567.158	5032859.115
S5	381561.507	5032851.62	S8	381567.897	5032859.438
S5	381561.441	5032851.483	S8	381567.855	5032859.534
S5	381561.615	5032851.396	S8	381593.609	5032870.772
S5	381568.16	5032850.064	S8	381597.544	5032861.751
S5	381572.167	5032851.809	S9	381581.761	5032854.865
S5	381574.562	5032846.312	S9	381598.259	5032862.063
S5	381570.746	5032844.646	S9	381602.332	5032852.729
S5	381570.904	5032844.497	S9	381600.237	5032851.815
S5	381568.214	5032843.324	S9	381601.278	5032849.431
S5	381568.127	5032843.284	S9	381603.372	5032850.345
S5	381568.041	5032843.241	S9	381619.55	5032813.264
S5	381567.957	5032843.195	S9	381603.052	5032806.066
S5	381567.874	5032843.147	S9	381581.761	5032854.865
S5	381567.793	5032843.096			
S5	381567.714	5032843.041	;;Storage Node	X-Coord	Y-Coord
S5	381567.637	5032842.985	;;		
S5	381567.561	5032842.925			
S5	381567.488	5032842.863	[SYMBOLS]		
S5	381567.417	5032842.799	;;Gage	X-Coord	Y-Coord
S5	381567.348	5032842.732	;;		
S5	381567.282	5032842.663			
S5	381567.218	5032842.591			
S5	381567.156	5032842.518			
S5	381567.097	5032842.442			
S5	381567.041	5032842.365			
S5	381566.987	5032842.285			
S5	381566.936	5032842.204			
S5	381566.888	5032842.121			
S5	381566.843	5032842.036			
S5	381566.8	5032841.95			
S5	381566.761	5032841.863			
S5	381566.725	5032841.774			
S5	381566.692	5032841.684			
S5	381566.661	5032841.593			
S5	381566.634	5032841.501			
S5	381566.611	5032841.408			
S5	381566.59	5032841.314			
S5	381565.348	5032835.196			
S5	381564.854	5032833.766			
S5	381564.337	5032831.218			
S5	381546.649	5032834.808			
S5	381537.422	5032836.68			
S5	381536.967	5032834.441			
S5	381534.419	5032834.958			
S5	381534.873	5032837.198			
S5	381524.892	5032839.223			
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S5	381525.228	5032848.183			
S5	381524.866	5032848.769			
S5	381520.586	5032849.638			
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S5	381519.868	5032856.933			
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S6	381603.052	5032806.066			
S6	381601.782	5032799.963			
S6	381562.788	5032808.079			
S6	381563.78	5032812.963			
S6	381573.49	5032810.992			
S6	381577.07	5032828.633			
S6	381564.337	5032831.218			
S6	381564.854	5032833.766			
S6	381565.348	5032835.196			
S6	381566.59	5032841.314			
S6	381566.611	5032841.408			
S6	381566.635	5032841.501			
S6	381566.662	5032841.593			
S6	381566.692	5032841.684			
S6	381566.725	5032841.774			
S6	381566.761	5032841.862			
S6	381566.801	5032841.95			
S6	381566.843	5032842.036			
S6	381566.888	5032842.121			
S6	381566.937	5032842.203			
S6	381566.988	5032842.285			
S6	381567.041	5032842.364			
S6	381567.098	5032842.442			
S6	381567.157	5032842.517			
S6	381567.218	5032842.591			
S6	381567.282	5032842.662			
S6	381567.349	5032842.732			
S6	381567.417	5032842.798			
S6	381567.488	5032842.863			
S6	381567.562	5032842.925			
S6	381567.637	5032842.984			
S6	381567.714	5032843.041			
S6	381567.793	5032843.095			
S6	381567.874	5032843.147			
S6	381567.957	5032843.195			
S6	381568.041	5032843.241			
S6	381568.127	5032843.284			
S6	381568.214	5032843.324			
S6	381570.904	5032844.497			
S6	381570.746	5032844.646			

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)										Continuity Error (%) 0.008									
***** Element Count ***** Number of rain gages 2 Number of subcatchments ... 10 Number of nodes 13 Number of links 9 Number of pollutants 0 Number of land uses 0										***** Time-Step Critical Elements ***** None									
***** Rainingage Summary *****										***** Highest Flow Instability Indexes ***** All links are stable.									
***** Subcatchment Summary *****										***** Most Frequent Nonconverging Nodes ***** Convergence obtained at all time steps.									
***** Routing Time Step Summary *****										***** Subcatchment Runoff Summary *****									
***** Node Summary *****										***** Node Depth Summary *****									
***** Node Inflow Summary *****										***** Node Surcharge Summary *****									
No nodes were surcharged.																			

March 2025

```
Analysis begun on: Thu Mar 13 10:56:46 2025
Analysis ended on: Thu Mar 13 10:56:46 2025
Total elapsed time: < 1 sec
```

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	☐

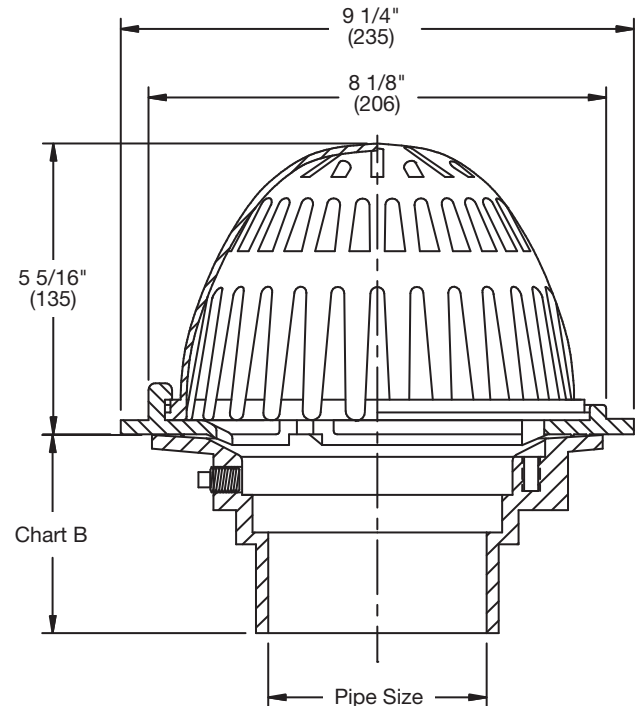


Chart B

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)

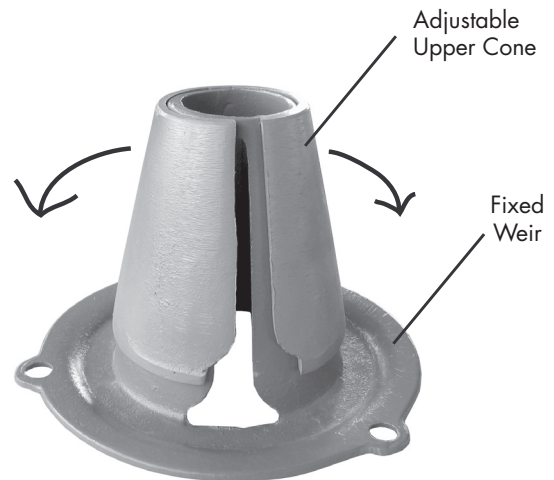
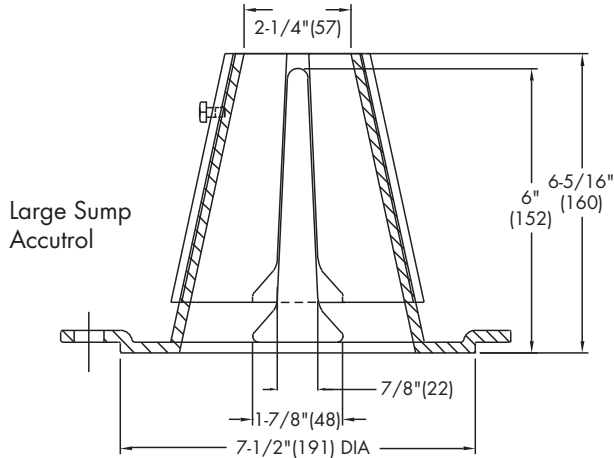
For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the 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.



1/2 Weir Opening Exposed Shown Above

TABLE 1. Adjustable Accutrol Flow Rate Settings

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

Job Name _____

Contractor _____

Job Location _____

Contractor's P.O. No. _____

Engineer _____

Representative _____

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

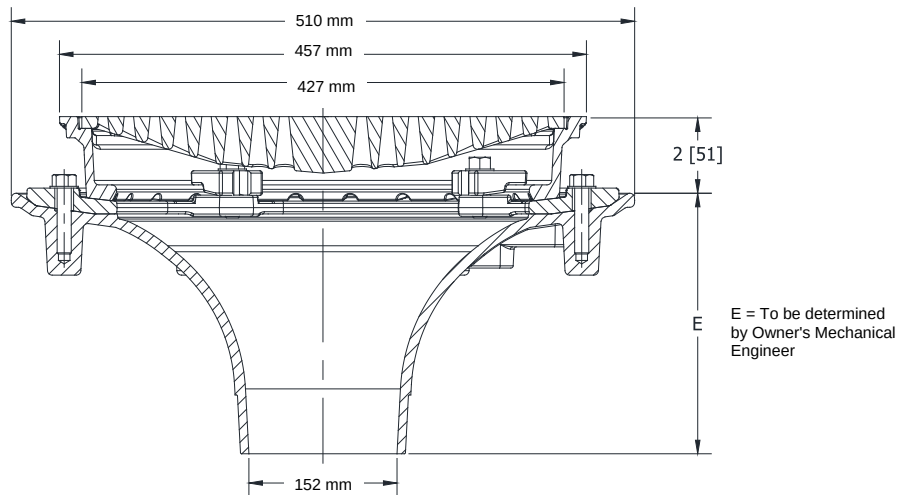
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A Watts Water Technologies Company

**Z150F****FLOFORCE™ HIGH PERFORMANCE PROMENADE DECK
DRAIN WITH ROTATABLE FRAME AND HEEL-PROOF GRATE****SPECIFICATION SHEET****TAG** _____

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



4 [102] No-Hub Illustrated

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

ENGINEERING SPECIFICATION: ZURN Z150F

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

OPTIONS (Check/specify appropriate options)**PIPE SIZE**(Specify size/type) **OUTLET****E BODY HT. DIM.**

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

PREFIXES

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

SUFFIXES

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

* Regularly furnished unless otherwise specified

⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov**⚠ ADVERTENCIA: Cáncer y daño reproductivo - www.P65Warnings.ca.gov****⚠ AVERTISSEMENT: Cancer et effets néfastes sur la reproduction - www.P65Warnings.ca.gov**

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

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. 29899-003 (NAVAN BLOCK 17)																																				
Street Name	Pipe Reach							Commercial/Institutional					Infiltration	Peak Design Flow L/s	Pipe Data								Upstream Geometry				Downstream Geometry					Self Cleansing Velocities				
	From	To	Multiples	Apartments	Cum. Pop.	Peaking Factor	Residential Flow (L/s)	Cum. Area (ha)	Peaking Factor	Inst. Flow (L/s)	Plug Flow (L/s)	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 (m/s)
EAST ORLEANS RIDGE SUBDIVISION	UPSTREAM	03	59	226	567	3.36	6.17	0.96	1.50	0.46	3.60	4.46	1.47	11.70	200	Circular	203.20	0.36%	20.39	0.63	22.7	6.69	57%	82.50	80.22	80.02	2.27	82.49	0.40	80.14	79.94	2.31	0.57	110.34	0.65	0.54
BLOCK 17	BLOCK 17	04		96	173	3.54	1.98	0.00	1.50	0.00	0.00	0.55	0.18	2.16	200	Circular	203.20	1.50%	41.91	1.29	11.6	39.74	5%	82.88	80.35	80.15	2.53	82.34	0.06	80.18	79.98	2.16	0.05	31.29	0.68	0.15
BLOCK 17	04	03			173	3.54	1.98	0.00	1.50	0.00	0.00	0.55	0.18	2.16	200	Circular	203.20	1.50%	41.91	1.29	21.5	39.74	5%	82.34	80.12	79.92	2.22	82.49	0.06	79.80	79.59	2.69	0.05	31.29	0.68	0.15
EAST ORLEANS RIDGE SUBDIVISION	03	02			740	3.30	7.92	0.96	1.50	0.46	3.60	5.08	1.68	13.66	200	Circular	203.20	0.33%	19.75	0.61	57.9	6.09	69%	82.49	79.74	79.53	2.72	81.83	0.07	79.54	79.34	2.29	0.69	124.16	0.66	0.61

Design Parameters		
Apartments Population	1.8	Cap/Unit
Multiples (Townhouse) Population	2.7	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 Average Flow	28000	L/gross ha/d
Manning Coefficient	0.013	unitless

Notes	
Existing	Details from Existing Sewers can be found within East Orleans Ridge Subdivision Design Sheet. This information was used to verify capacities in the existing sewers.

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

[CAUTION] This email originated from outside JLR. Do not click links or open attachments unless you recognize the sender and know the content is safe. Do not forward suspicious emails, if you are unsure, please send a separate message to Helpdesk.

Hi Mahad,

All items below confirmed

Regards

Sarith López
Project Manager

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



From: Mahad Musse <mmusse@jlrichards.ca>

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

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

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

Subject: Re-confirmation of Mechanical Items for Servicing Report

Hi Sarith/Chuck,

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

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

Thanks
Mahad



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

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