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2380 Tenth Line Road
City of Ottawa

Servicing and Stormwater Management Report

Prepared for: Claridge Homes

2380 Tenth Line Road

City of Ottawa

Servicing and Stormwater Management Report

Prepared By:

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Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario
K2M 1P6

October 16, 2025
Revised: April 17,2026
Revised: August 24, 2026
Revised: October 23, 2026

Novatech File: 125079
Ref: R-2025-96

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Engineers, Planners & Landscape Architects

October 23, 2026

City of Ottawa
Planning, Development and Building Services Department (PDBS)
110 Laurier Avenue West, 4th Floor
Ottawa ON, K1P 1J1

Attention: **John Sevigny C.E.T – A/Manager, Development Review East Branch**

Reference: **2380 Tenth Line Road**
Servicing and Stormwater Management Report
Our File No.: 125079

Please find enclosed the 'Servicing and Stormwater Management Report' for the above noted development located in the City of Ottawa. This report is submitted in support of the site plan application for the proposed development at 2380 Tenth Line Road.

Should you have any questions or require additional information, please contact the undersigned.

Yours truly,

NOVATECH



Greg MacDonald, P. Eng.
Director, Land Development and Public Sector Infrastructure

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1.0 INTRODUCTION

Novatech has been retained to prepare a Servicing and Stormwater Management Report for the proposed retirement home on the property municipally known as 2380 Tenth Line Road in Ward 19 – Orleans South Navan. The following report outlines how the proposed development will be serviced with sanitary, storm and water infrastructure. **Figure 1** Key Plan shows the site location.

1.1 Existing Conditions

The subject site is approximately **0.624 hectares (ha.)** in size and is located on the north side of Promenade Decoeur Drive in the Orleans South-Navan Ward (Ward 19) in the City of Ottawa. The Subject Site is in an area bounded by Tenth Line Road to the east, the 2370 Tenth Line Condo development to the North, David Lewis Private to the west, and Promenade Decoeur Drive to the south.

A low-rise subdivision abuts the Subject Site to the north and west. Tenth Line Road, and low-rise dwellings featuring a mix of townhouses and single-family dwellings and open space are situated to the east and northeast of the site. Decoeur Drive, and low-rise dwellings with a mix of townhouses and single-family dwellings are situated to the south. The Notre-Place Catholic Elementary School is situated west of the site. **Figure 2** shows the existing site conditions.

The subject site is within the East Urban community and is subject to the design criteria within the following report:

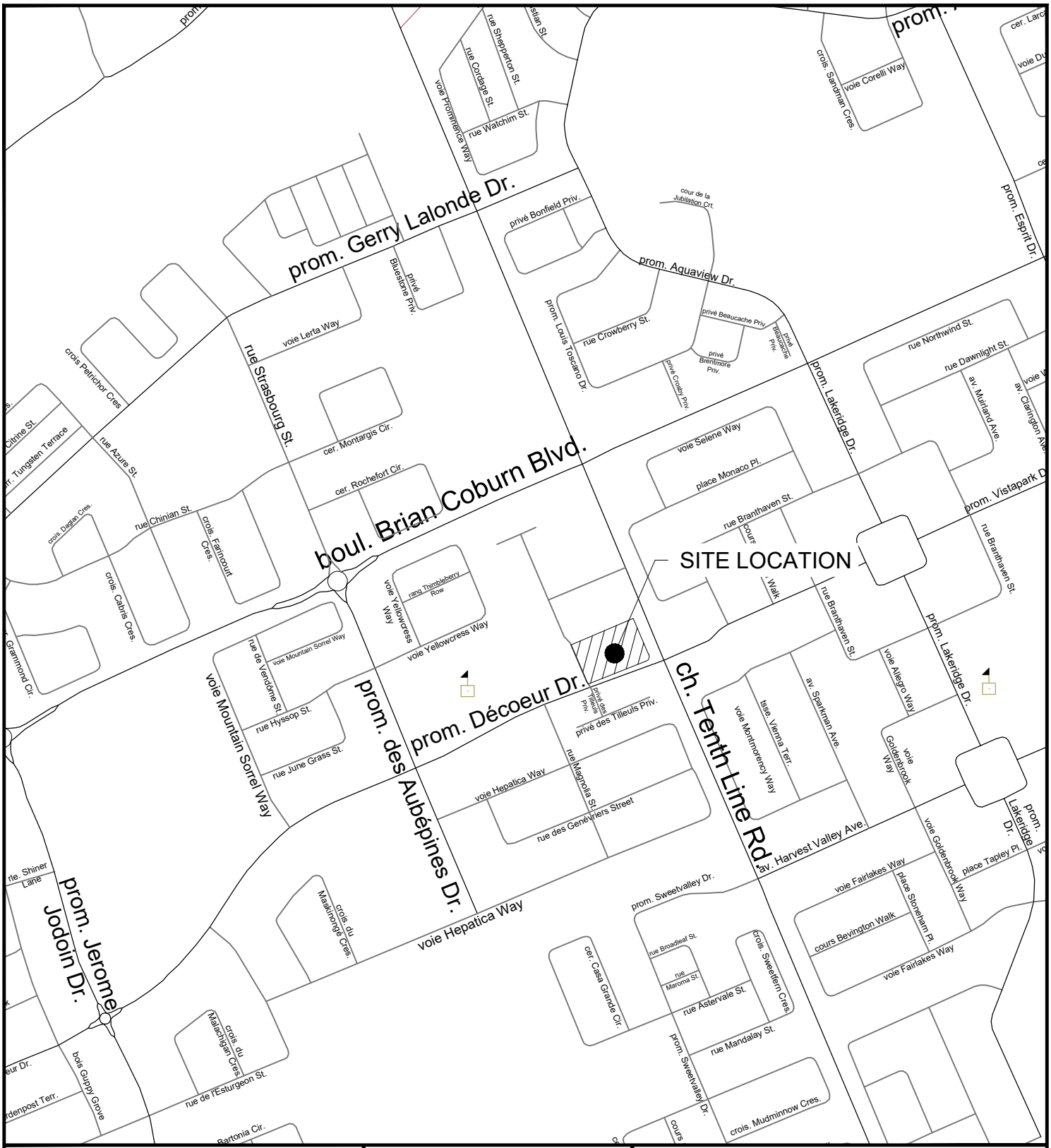
- 'East Urban Community (Neighborhood 5) Avalon West – Stage 3 Site Servicing and Stormwater Management Report', Atrel Engineering Ltd., November 2014 (Revision 7), (Referenced as **Atrel Report**).

Within the above report the subject site was a portion of Block 123. Block 123 has since been severed into multiple parcels including the neighboring 2370 Tenthline road development. Design information pertaining to the neighboring Tenth Line Road development is available within the following report:

- '2370 Tenth Line - Site Servicing and Stormwater Management Report', Stantec Consulting Ltd., December 2, 2022 (Revision 2), (Referenced as **2370 Report**).

1.2 Proposed Development

It is proposed to develop the site with a six (6) storey Retirement Home complete with above ground parking and an underground parking structure. The building will have a footprint of **2101.72 m^2**, with a total of 141 dwelling units. Vehicular access to the site will be provided from Promenade Decoeur Drive while pedestrian access will be provided from both Promenade Decoeur Drive, and Tenth Line Rd. **Figure 3** shows the concept plan for the proposed development.



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CITY OF OTTAWA
2380 TENTH LINE RD

KEY PLAN

SCALE: N.T.S

DATE: SEP 2025 | JOB: 125079 | FIGURE: FIGURE 1

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LEGEND

SITE BOUNDARY

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CITY OF OTTAWA
2380 TENTH LINE

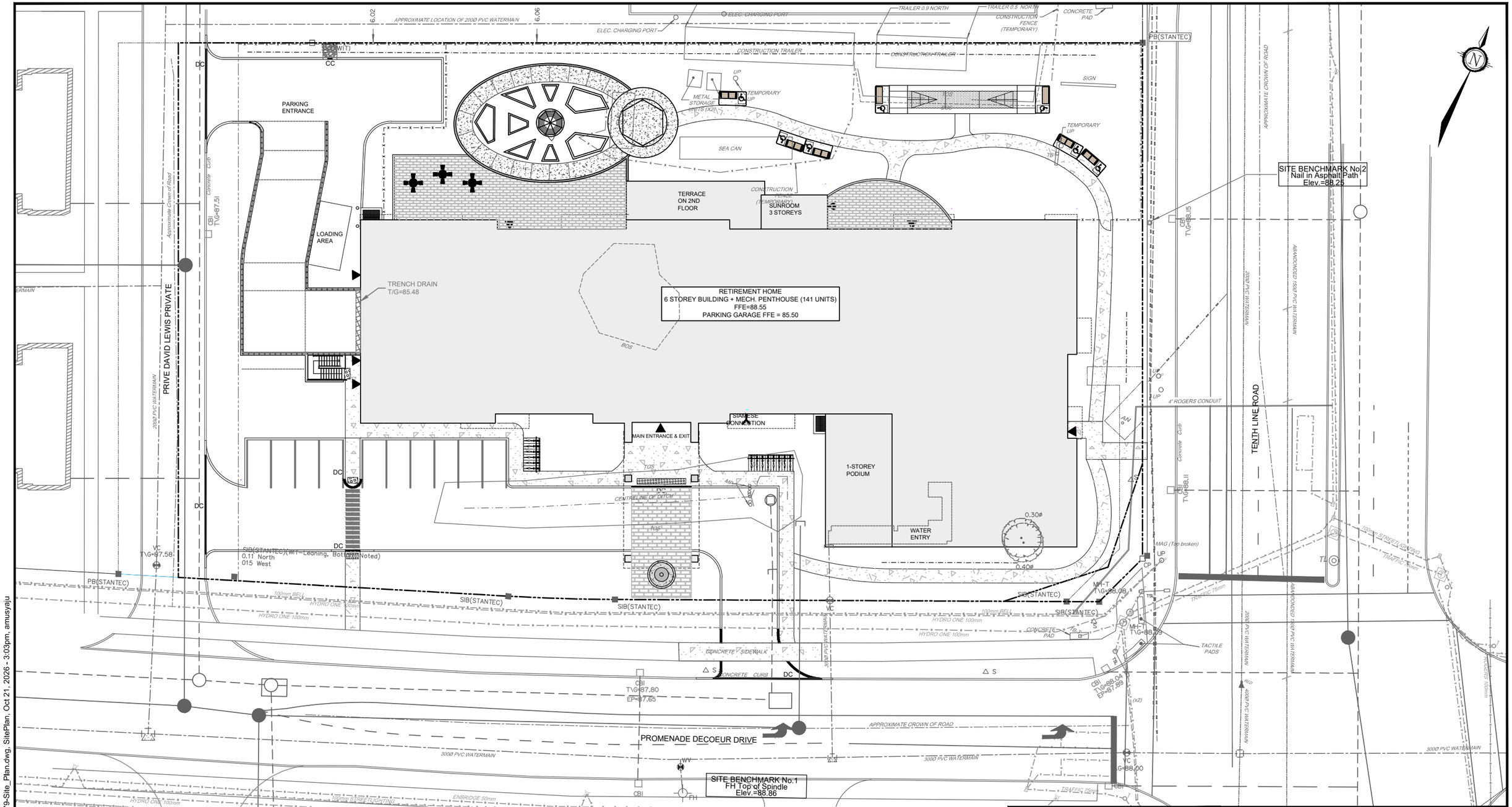
EXISTING CONDITIONS

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE OCT 2025 | JOB 125079 | FIGURE FIG-3

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LEGEND

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BUILDING HATCH

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CITY OF OTTAWA

2380 TENTH LINE RD

SITE PLAN

SCALE 1 : 400 (0, 4, 8, 12, 16)

DATE OCT 2026 | JOB 125079 | FIGURE FIGURE 3

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2.0 GEOTECHNICAL INVESTIGATION

A geotechnical investigation was completed for the subject site, and a report prepared entitled 'Geotechnical Investigation', Proposed Multi-Storey Building, 2380 Tenth Line Road, Ottawa Ontario prepared by Paterson Group Inc. dated May 23, 2025 (PG7518-1). The following is a summary of the findings of the report:

- Based on these observations, the long-term groundwater table can be expected to be at a depth of approximately 2.5 to 3.5 m below the existing ground surface. It should be noted that groundwater levels are subject to seasonal fluctuations. Therefore, the groundwater levels could vary at the time of construction.

- Topsoil, building debris, and deleterious fill, such as those containing organic materials, should be stripped from under any buildings, paved areas, pipe bedding and other settlement sensitive structures.

- A permissible grade raise restriction of 0.8 m is recommended for the subject site. If greater permissible grade raises are required, preloading with or without a surcharge, lightweight fill, and/or other measures should be investigated to reduce the risks of unacceptable long-term post construction total and differential settlements.

- The excavation side slopes above the groundwater level extending to a maximum depth of 3 m should be cut back at 1H:1V or flatter. The flatter slope is required for excavation below groundwater level. Excavations below the groundwater level should be cut back at a maximum slope of 1.5H:1V. The subsoil at this site is considered to be mainly a Type 2 and 3 soil according to the Occupational Health and Safety Act and Regulations for Construction Projects. Excavated soil should not be stockpiled directly at the top of excavations and heavy equipment should be kept away from the excavation sides. Slopes in excess of 3 m in height should be periodically inspected by the geotechnical consultant in order to detect if the slopes are exhibiting signs of distress.

- To reduce long-term lowering of the groundwater level at this site, clay seals should be provided in the service trenches. The seals should be at least 1.5 m long and should extend from trench wall to trench wall. Generally, the seals should extend from the frost line and fully penetrate the bedding, subbedding and cover material.

- A temporary Ministry of Environment, Conservation and Parks (MECP) permit to take water (PTTW) may be required if more than 400,000 L/day of ground and/or surface water are to be pumped during the construction phase. At least 4 to 5 months should be allowed for completion of the application and issuance of the permit by the MECP.

- For typical ground or surface water volumes being pumped during the construction phase, typically between 50,000 to 400,000 L/day, it is required to register on the Environmental Activity and Sector Registry (EASR). A minimum of two to four weeks should be allotted for completion of the EASR registration and the Water Taking and Discharge Plan to be prepared by a Qualified Person as stipulated under O.Reg. 63/16.

- The plasticity index of the silty clay deposit at the subject site does not exceed 40%. Therefore, the following tree planting setbacks are recommended for the silty clay deposit. Large trees (mature height over 14 m) can be planted within the silty clay areas provided a tree to foundation setback equal to the full mature height of the tree can be provided (e.g., in a park or other green space). Detailed tree planting recommendations in relation to the soil analysis are outlined within the Geotechnical report.

3.0 WATER SERVICING

The proposed development is located within the City of Ottawa's Zone 2E water distribution system. Existing City watermains are present within all municipal rights-of-way fronting the site. A 300 mm diameter PVC watermain is located within Promenade Decoeur Drive, while Tenth Line Road contains a 400 mm diameter PVC watermain that reduces to 200 mm in diameter. Additionally, a 200 mm diameter PVC watermain is situated within David Lewis Private adjacent to the site. A 300 mm diameter PVC service connection also extends from Promenade Decoeur Drive into the proposed development area.

3.1 Watermain Design Parameters

Water demands have been calculated using criteria from Section 4 of the City of Ottawa Water Distribution Guidelines, ISTB-2021-03, and the Ontario Building Code as follows:

Table 3.1: Watermain Design Parameters and Criteria

Domestic Demand	**Design Parameters**
Unit Population: Assisted Care Studio/1-Bed Apartments 2-bed Apartments	1.0 people/unit 1.4 people/unit 2.1 people/unit
Residential Average Day Demand	280 L/c/d
Assisted Care Average Day Demand	450 L/c/d
Maximum Day Demand (MXDY)	Residential: 2.5 x Basic Day (> 500 Persons) MOE Table 3-3 (<500 Persons) Commercial: 1.5 x Basic Day
Peak Hour Demand (PKHR)	Residential: 2.2 x Max Day (> 500 Persons) MOE Table 3-3 (<500 Persons) Commercial: 2.70 x Basic Day
Commercial	**Design Parameters**
Beauty Salon Water Closet Office Dinning Area	650 L/station/day 150L/fixture/day 75L/person/day 125 L/seat/day (1 seat/1.1m^2)

Fire Demand (FF) Design	Design Flows
Apartment Building Hydrant spacing	per FUS 2020 Within 45m of the building Siamese
System Pressure Criteria Design Parameters	**Criteria**
Maximum Pressure (BSDY) Condition	< 80 psi occupied areas
Minimum Pressure (PKHR) Condition	> 40 psi
Minimum Pressure (MXDY+FF) Condition	> 20 psi

3.2 Fire Demand

The required fire demand was calculated using the Fire Underwriters Survey 2020 (FUS) Guidelines and City of Ottawa ITSB-2014-02. Through correspondence with the Architect, it is understood that the proposed building is residential occupancy (Limited Combustible) and is composed of non-combustible construction. The building will have an adequately designed fire system as per NFPA 13, complete with a standard water supply, a fully supervised system and 100% sprinkler coverage. The building will have a footprint of **2101.72m^2**. Correspondence with the Architect is included in **Appendix A** for reference.

3.3 Water Demand

The water demand calculations, fire flow calculations and correspondence are provided in **Appendix A** for reference. A summary of the water demand and fire flows are provided in **Table 3.2**.

Table 3.2: Domestic Water Demand Summary

Population	Ave. Daily Demand (L/s)	Max. Daily Demand (L/s)	Peak Hour Demand (L/s)	Fire Flow (L/s)
177.60	1.41	4.48	7.08	83

As per **ITSB 2021-03** the proposed development demand is above **50m^3/day,** and contains more than 50 units, thus will need to be serviced with two (2) services separated by an isolation valve. Therefore, it is proposed to service by utilizing the existing 300mm diameter stub from Promenade Decoeur Drive, and a second new service will be installed adjacent the existing service complete with an isolation valve between the services. The existing 300mm service will be reduced to 200mm prior to entering the building.

Additionally, the required site fire flow will be provided by the existing City owned fire hydrants within the Promenade Decoeur Drive right-of-way. All existing hydrants within the vicinity of the development are blue top hydrants indicating a rating of Class AA. As per **ITSB 2018-02** the fire flow allowance from the existing hydrants was assumed to be as outlined in **Table 3.3**.

Table 3.3: Maximum Flow to be considered from a given hydrant.

Hydrant Class	Distance to building (m)	Contribution to Fire Flow	
		(L/min)	(L/s)
AA	≤75	5700	95
	>75and ≥150	3800	63.33
A	≤75	3800	63.33
	>75and ≥150	2850	47.50
B	≤75	1900	31.67
	>75and ≥150	1500	25.00
C	≤75	800	13.33
	>75and ≥150	800	13.33

With a calculated fire flow requirement of **83 L/s**, a single hydrant is sufficient to meet the required flow. There are currently two existing Class AA hydrants along Promenade Decoeur Drive: one located within **75 m** of the proposed building and another approximately **77.9 m** away, together capable of providing a combined flow of **158.33 L/s**, as outlined in **Table 3.2**. One of the hydrants, located on the opposite side of the road, is within **45 m** of the proposed Siamese connection. Refer to **Appendix A** for the Hydrant Coverage figure which depicts the existing hydrants and distances to the proposed building.

3.4 Water Analysis

The above water demand information was submitted to the City for boundary conditions from the City's water model. These boundary conditions were used for analyzing the performance of the proposed and existing watermain systems for three theoretical conditions:

1) High Pressure check under Average Day conditions
2) Peak Hour demand
3) Maximum Day + Fire Flow demand.

Refer to **Table 3.4** for a summary of the proposed boundary conditions and hydraulic analysis.

Table 3.4: Water Boundary Conditions and Hydraulic Analysis Summary

Criteria	Head (m)	Pressure[1] (psi)	Pressure Requirements (psi)
Connection (300mm dia. Promenade Decoeur Drive)			
Max HGL (Average Day)	130.2	59.2	< 80psi
Min HGL (Peak Hour)	126.9	54.5	> 40psi
Max Day + Fire Flow (1300L/min)	126.9	54.5	> 20psi

[1]Pressure based on a Finished Floor elevation of 88.55m

Based on the above system pressures the existing City infrastructure has capacity to service the proposed development. Booster pumps will be utilized by the internal mechanical system to ensure adequate pressures to the upper floors, as required. Refer to **Appendix A** for detailed water demand calculations and City of Ottawa boundary conditions.

4.0 SANITARY SERVICING

Existing City sanitary sewers are located within all municipal rights-of-way fronting the site. A 250mm diameter sanitary main is located within Promenade Decoeur Drive, terminating at existing maintenance hole (MH) 3102, while Tenth Line Road contains a 600 mm diameter sanitary main. Additionally, a 250 mm diameter sanitary main is situated within David Lewis Private adjacent to the site. A 250 mm diameter service connection also extends from existing MH 3102 in Promenade Decoeur Drive into the proposed development area.

To provide sanitary servicing for the proposed development, a new 1,200 mm diameter maintenance hole will be installed at the property line connecting to the existing 250mm service stub. From this new maintenance hole, a 250 mm diameter PVC service connection will extend to the building to convey sanitary flows to the municipal system.

4.1 Sanitary Design Parameters

Sanitary flows for the proposed development were calculated using criteria from Section 4 of the City of Ottawa Sewer Design Guidelines, ITSB-2018-01, and the Ontario Building Code as follows:

Table 4.1: Sanitary Sewer Design Parameters

Design Component	Design Parameter
Unit Population: Assisted Care Studio/ 1-Bed Apartment 2-bed Apartment	1.0 person/unit 1.4 person/unit 2.1 person/unit
Residential Flow Rate	280 L/cap/day
Assisted Care Average Day Demand	450 L/cap/day
Residential Peaking Factor	Harmon Equation (min=2.0, max=4.0) Harmon Correction Factor = 0.8m (Design)
Commercial Flows: Beauty Salon Water Closet Office Dinning Area	650 L/station/day 150L/fixture/day 75L/person/day 125 L/seat/day (1 seat/1.1m^2)
Extraneous Flow Rate	Design = 0.33 L/s/ha
Minimum Pipe Size	200mm (Res)
Minimum Velocity[1]	0.6 m/s
Maximum Velocity	3.0 m/s
Minimum Pipe Cover	2.0 m (Unless frost protection provided)

[1]A minimum gradient of 0.65% is required for any initial sewer run with less than 10 residential connections.

4.2 Proposed Development Flows

The proposed development will have a combination of residential and assisted care units. The residential units will be composed of twenty-four (24) studio, fifty-one (51) one (1) bed, and six (6) two (2) bed apartments for a total of 81 units and a population of 118 persons. The assisted care units will be composed of fifty (50) studio, and ten (10) one (1) bed units for a total of 60 units and a population of 60 persons. The proposed residential flow for the site was determined to be **2.45L/s.** There will also be communal amenities on the ground floor including a dining area, salon, and an administrative office area. Additionally, there will be water closets for Guests and staff. The anticipated commercial flow from the development is **0.72L/s**. The extraneous flows for the 0**.625ha** development was calculated to be **0.21L/s**. Thus, the peak sanitary flow including infiltration for the development is **3.38 L/s.** Detailed sanitary flow calculations are provided in **Appendix B** for reference.

4.3 Anticipated Site Flows

As noted previously, the detailed design of the East Urban Community was completed by Atrel with details provided within the **Atrel Report.** The East Community design assumed that 2370 Tenth Line and 2380 Tenth Line were one parcel **4.79 ha** in area with a commercial occupancy. The assumed flows were **50000L/day** with a peaking factor of **1.5**, and an extraneous flow of **0.28 L/s/ha.** The above resulted in a flow allotment of **5.50L/s** for the combined parcel. Therefore, the flow allotment for the proposed **0.624ha** development is **0.72L/s.**

4.4 Downstream Capacity

The Avalon West – Stage 3 sanitary collection system is directed to the Tenth Line Road Pumping Station at 2428 Tenth Line Road. As noted above, the proposed flows are higher than anticipated during the overall design. As such the capacity of the downstream system was reviewed to ensure that there is adequate capacity for the proposed development. The proposed development will result in an increase of **2.66L/s**.

It should also be noted that the neighboring 2370 Tenth Line also exceeded the allotment for the property. As noted in the **2370 Report**, 2370 Tenth Line had a property area of **3.19 ha**, and a design flow of **7.5L/s**. Based on the **Atrel Report** allotment values the site had an allotment of **3.66L/s**, for an exceedance of **3.84L/s.**

Thus, the total increase in flows to the downstream system from 2370 and 2380 Tenth Line is **6.5L/s**.

The flows from the site are conveyed through the system to the pumping station at 2428 Tenth Line Road. In the downstream system the pipe run from 3275-3276 in Hepacia Crescent had the least available capacity with a design flow of **100.31L/s**, and a capacity of **149.48 L/s**, for a utilization of **67.1%.** The increase in flow will result in a utilization of approximately **71%.**

It should be noted that the analysis in the **Atrel Report** was performed utilizing a sanitary flow of **350 L/cap/Day** which is significantly higher than the present **280l/cap/day** design flow, and thus the numbers above are conservative.

The slight increase in utilization will have a negligible impact on the downstream system. Based on the above analysis, the downstream system has capacity for the proposed development. Refer to **Appendix B** for report excerpts.

5.0 STORM SERVICING

Existing City storm sewers are located within all municipal rights-of-way fronting the proposed site. A 1,200 mm diameter storm sewer is situated within the Promenade Decoeur Drive right-of-way, terminating at existing maintenance hole (MH) 3574, while an 825 mm diameter storm sewer is located within the David Lewis Private right-of-way. The Tenth Line Road right-of-way also contains storm sewers ranging in diameter from 375 mm to 525 mm. Additionally, a 1,200 mm diameter service extends from existing MH 3574 in Promenade Decoeur Drive into the proposed development area.

The proposed development will be serviced using the existing 1,200 mm storm service. From this service, a private storm system will be constructed consisting of an independent controlled catch basin system along the northwestern and northeastern site boundary, a second independent controlled catch basin system complete with a 1,350 mm pipe and a 250 mm diameter building connection to convey roof drainage flows, and a 250 mm diameter building connection to convey uncontrolled foundation drainage and garage ramp flows. Refer to the General Plan of Services drawing **(125079-GP)** for detailed servicing information.

The design criteria used in sizing the storm sewers are summarized below in **Table 5.1.**

Table 5.1: Storm Sewer Design Parameters

Parameter	Design Criteria
Local Roads	2 Year Return Period
Storm Sewer Design	Rational Method
IDF Rainfall Data	Ottawa Sewer Design Guidelines
Initial Time of Concentration (Tc)	10 min
Minimum Velocity	0.8 m/s
Maximum Velocity	3.0 m/s
Minimum Diameter	250 mm

Refer to **Appendix C** for detailed storm drainage area plans and storm sewer design sheets.

6.0 STORM DRAINAGE AND STORMWATER MANAGEMENT

The stormwater management strategy for the site is based on the established criteria from the City of Ottawa, and the **Atrel Report**.

6.1 Design Criteria

Through correspondence with the City of Ottawa, the **Atrel Report** and our knowledge of development requirements in the area, the following criteria have been adopted to control post-development stormwater discharge from the site:

- Control proposed development flows, up to and including the 100-year storm event, to an allowable release rate **of 220L/s/ha;**
- Provide source controls which are in conformity with the City of Ottawa requirements, where possible;
- Limit ponding to 0.15 m for all rooftop storage areas and 0.35 m for all parking storage areas; and
- Provide guidelines to ensure that site preparation and construction is in accordance with the current Best Management Practices for Erosion and Sediment Control.

The approach to the stormwater management design is to determine the allowable release rate for the site, calculate the uncontrolled flow, and ensure that the remaining flow, in combination with the uncontrolled flow, does not exceed the allowable release rate. All proposed development runoff in excess of the allowable release rate, will be attenuated on-site prior to being released into the storm sewers Promenade Decoeur Drive.

6.2 Quantity Control

The proposed site is contained within the tributary area of the Avalon West (N5) SWM Facility. The flows from the site will be conveyed through the storm sewers of the rights-of-way, prior to discharging to the existing pond and ultimately the McKinnon Creek. The inflow rate into the minor system of the neighboring subdivisions was limited to **220 L/s/ha**, and a time of concentration of 10 minutes.

The proposed site has a total area of **0.624 ha**. The **0.037 ha** portion of the site within the right-of-way easement for David Lewis Private is captured within the neighboring 2370 storm system. As such allowable release rate for the remaining **0.587 ha** was calculated to be **129.1 L/s** based on the above criteria. It is proposed to control the post-development flows to the allowable release rate through the use of ICD's within proposed catch basin and maintenance hole structures as described in the following sections.

6.2.1 Design Storms

The design storms are based on City of Ottawa IDF curve equations provided within the City of Ottawa sewer design Guidelines. Design storms were used for the 2, 5, 100, and 100+20%-year return periods (i.e. storm events) as listed below.

$$\text{100-year +20 \% Intensity} = (1735.688 / (\text{Time in min} + 6.014)^{0.820})*1.20$$
$$\text{100-year Intensity} = 1735.688 / (\text{Time in min} + 6.014)^{0.820}$$
$$\text{5-year Intensity} = 998.071 / (\text{Time in min} + 6.053)^{0.814}$$
$$\text{2-year Intensity} = 732.951 / (\text{Time in min} + 6.199)^{0.810}$$

6.2.2 Catchment Areas

Post-development catchments were analyzed utilizing the rational method based on the proposed site plan and grading as shown on **Drawing 125079-SWM** within **Appendix C**.

The site has been divided into Seven (7) drainage areas for the post development condition. The drainage areas are as follows:

Area A-01:

- Stormwater from the proposed parking garage ramp will be collected by a proposed area drain and trench drain. The flows will be directed to the proposed free flowing building service at STMMH 101 by the internal mechanical system. The flows will remain uncontrolled and will drain by gravity to the existing sewer system within Promenade Decoeur Drive.

Area A-02:

- Stormwater from the proposed swale system located to the rear and along the east side of the building will be collected by landscape drains and catch basins. These flows will be controlled by a proposed inlet control device (ICD) within catchbasin manhole 102. The flows will then discharge by gravity to the existing sewer system within Promenade Decoeur Drive.

Area A-03 & A-04:

- Stormwater from the above ground parking area will be collected by proposed catchbasins, and conveyed to the 1350mm pipe between STMMH 106 and STMMH 105. The flows will be controlled by a proposed ICD within STMMH 105 and then drain by gravity to the existing sewer system within Promenade Decoeur Drive.

Area R-00:

- Stormwater from the building roof will be captured by roof drains and conveyed to the storm service connecting to STMMH 105 by the internal mechanical system. Flow attenuation will be provided by the proposed ICD within STMMH 105 with storage provided within the 1350mm pipe between STMMH 106 and STMMH 106.
- The roof will be provided complete with overflow scuppers provided for emergencies limiting potential ponding to 150mm above the roof insulation. Further details will be provided once a mechanical consultant is retained for the subject development.

Area D-01:

- The drainage along the west edge of the above ground parking area will flow uncontrolled to the David Lewis Private right-of-way, where it will be captured by the existing storm system.

Area D-02

- The drainage from the landscaped area and back of curb along the south property line will sheet flow uncontrolled to the Promenade Decoeur Drive right-of-way, where it will be captured by the existing storm system.

6.2.3 Rational Method Calculations

The stormwater flows for the subject site were calculated utilizing the rational method. The rational method utilizes the rainfall IFC curves and weighted runoff coefficients based on the proposed surface types. The minimum time of concentration to be utilized with the rational method is 10min as the results become erroneous at lower values. The equation is as follows:

$$Q=2.78 \times C \times I \times A$$

Where:
C= The runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the catchment drainage area

The runoff coefficients for various surface types are as follows:

Table 6.1: Runoff Coefficients

Surface Types	Runoff Coefficient
Building Roof	0.90
Asphalt Parking	0.90
Grass	0.20

Table **6.2 below** summarizes the flow, storage required, and storage provided for each of the site catchment areas.

Table 6.2: Stormwater Management Summary

Area ID	Area (ha)	1:5 Year Weighted Cw	1:100 Year Weighted Cw	Control Device		Outlet Location	2 Year Storm Event			5 Year Storm Event			100 Year Storm Event			
							Release (L/s)	Head (m)	Req'd Vol (cu.m)	Release (L/s)	Head (m)	Req'd Vol (cu.m)	Release (L/s)	Head (m)	Req'd Vol (cu.m)	Max. Vol. Provided (cu.m.)
D-01	0.004	0.40	0.46	N/A		David Lewis Private	0.40	N/A	N/A	0.50	N/A	N/A	1.00	N/A	N/A	N/A
D-02	0.005	0.49	0.56	N/A		Promenade Decoeur Drive	0.50	N/A	N/A	0.70	N/A	N/A	1.40	N/A	N/A	N/A
A-01	0.025	0.90	1.00	N/A		Promenade Decoeur Drive	4.70	N/A	N/A	6.40	N/A	N/A	12.20	N/A	N/A	N/A
A-02	0.222	0.50	0.58	Plate Oriface	127	Promenade Decoeur Drive	23.90	N/A	N/A	32.42	N/A	N/A	49.50	1.994	23.43	28.96
R00, A-03, A-04	0.330	0.81	0.91	Plate Oriface	152	Promenade Decoeur Drive	33.50	0.448	26.46	41.00	0.683	38.267	62.00	1.533	83.07	100.35
Post-Development Flow							**63.0**	**-**		**81.0**	**-**		**126.1**	**-**		
Total Allowable Release Rate							**129.1**			**129.1**			**129.1**			

As summarized in the above table, the post-development flows will be controlled to **126.1 L/s,** approximately **3.0 L/s** lower than the pre-development condition of the site. The flows will be controlled by proposed ICDs within CBMH 102, and STMMH 105. All other flows from the site are proposed to be free flowing. All flows conveyed by others, or the internal mechanical system, shall adhere to the values in the above table.

Refer to **Appendix C** for Rational Method calculations and Drawing **125079-SWM**-Stormwater Management Plan.

6.3 Quality Control

As noted above the subject site is tributary to the Avalon West (N5) SWM Facility. The existing facility was designed to provide an Enhanced Level of Protection (80% total suspended solids removal) per MECP guidelines. As such no onsite quality control measures are required for the proposed site. Excerpts from the **Atrel Report** are included in **Appendix C** for reference.

6.4 Major Overland Flow Route

A major overland flow route will be provided for storms greater than the 100-year storm event. Stormwater will be directed to the surrounding rights-of-way, and the rear yard swale of the adjoining subdivision. The major overland system is shown on the Grading Plan (drawing 125079-GR).

7.0 EROSION AND SEDIMENT CONTROL

Temporary erosion and sediment control measures will be implemented on-site during construction in accordance with the Best Management Practices for Erosion and Sediment Control. This includes the following temporary measures:

- Filter socks (catchbasin inserts) will be placed in existing and proposed catchbasins and catchbasin manholes, and will remain in place until vegetation has been established and construction is completed;
- Silt fencing will be placed along the surrounding construction limits;
- Mud mats will be installed at the site entrances;
- Strawbale or rock check dams will be installed in swales and ditches;
- The contractor will be required to perform regular street sweeping and cleaning as required, to suppress dust and to provide safe and clean roadways adjacent to the construction site;

Erosion and sediment control measures should be inspected daily and after every rain event to determine maintenance, repair or replacement requirements. Sediments or granulars that enter site sewers shall be removed immediately by the contractor. These measures will be implemented prior to the commencement of construction and maintained in good order until vegetation has been established. Refer to the Erosion and Sediment Control Plan (drawing 125079-ESC) for additional information.

8.0 CONCLUSIONS AND RECOMMENDATIONS

Watermain

The analysis of the existing and proposed watermain network confirms the following:

- The existing 300 mm diameter service, together with the proposed 200 mm diameter water service connections to the existing 300 mm watermain within Promenade Decoeur Drive, will provide adequate servicing for the proposed development.
- There are adequate pressures in the existing watermain infrastructure to meet the required domestic demands for the development.
- There is adequate flow to service the proposed fire protections system.

Sanitary Servicing

The analysis of the proposed sanitary system confirms the following:

- It is proposed to service the development with a new 250 mm sanitary service, connecting to the proposed manhole and discharging into the existing 250 mm sanitary service, which outlets to the municipal sewer network within the Promenade Decoeur Drive.
- It is anticipated there is adequate capacity within the existing sanitary infrastructure to service.

Stormwater Management

The following provides a summary of the storm sewer and stormwater management system:

- The proposed storm sewer system is to connect to the storm sewers within in the Promenade Decoeur Drive right-of-way.
- Stormwater control is to be provided by parking lot storage.
- Storm flows will be attenuated through the implementation of inlet control devices.
- As per existing conditions major overland flow routes have been provided to the surrounding rights-of-way.

Erosion and Sediment control

- Erosion and sediment control measures (i.e. filter fabric, catch basin inserts, silt fences, etc.) will be implemented prior to construction and are to remain in place until vegetation is established.

9.0 CLOSURE

The preceding report is respectfully submitted for review and approval. Please contact the undersigned should you have questions or require additional information.

NOVATECH

Prepared by:



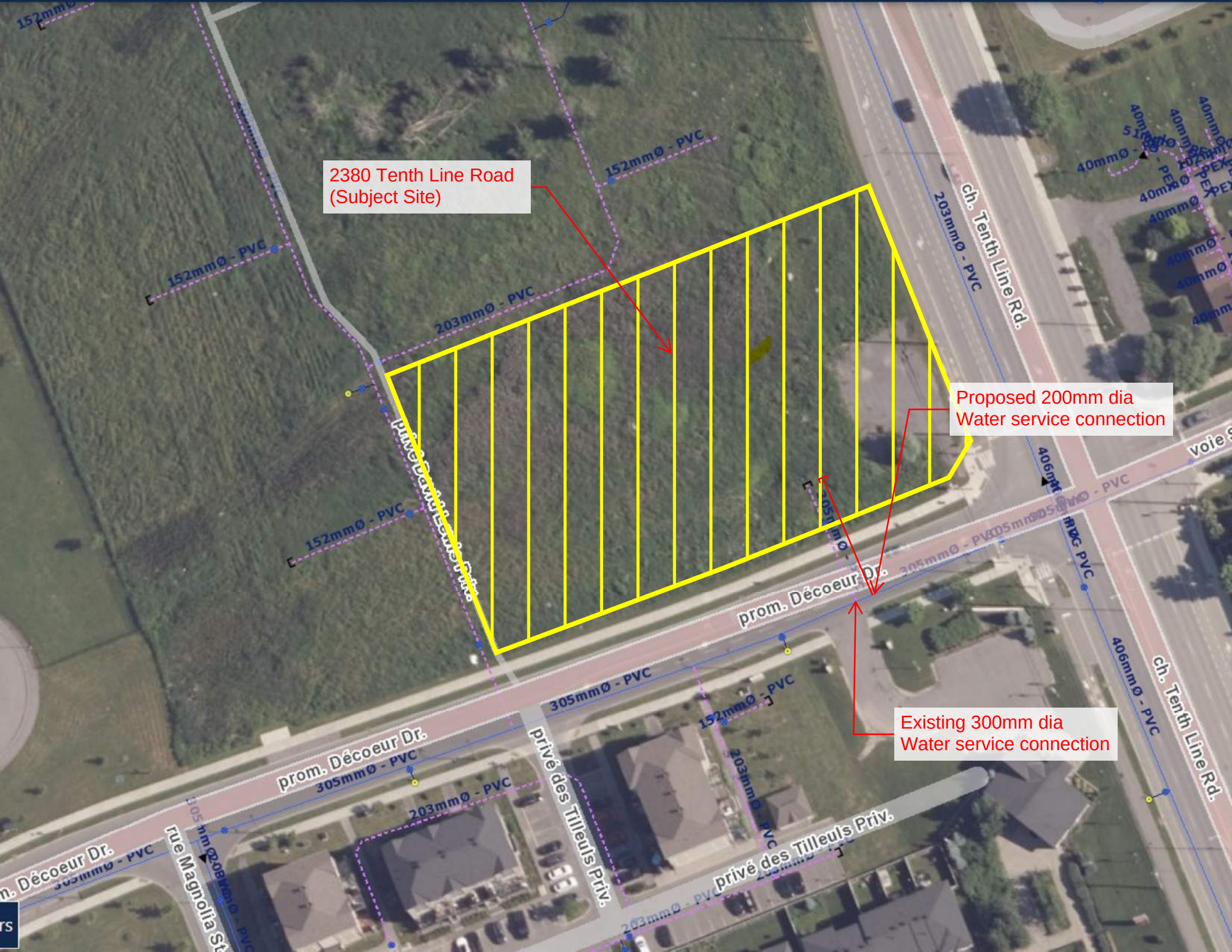
Anthony Mestwarp, P.Eng
Project Manager
Land Development Engineering

Reviewed by:



Greg MacDonald, P.Eng
Director, Land Development and Public Sector Infrastructure

Appendix A
Water Servicing


2380 Tenth Line Road
(Subject Site)
Proposed 200mm dia
Water service connection
Existing 300mm dia
Water service connection
ch. Tenth Line Rd.
prom. Décoeur Dr.
privé des Tilleuls Priv.
rue Magnolia St.
305mmØ - PVC
203mmØ - PVC
152mmØ - PVC
406mmØ - PVC
40mmØ - PEX

Water Demand Design Sheet

NOVATECH
Engineers, Planners & Landscape Architects

Boundary Condition Request

Novatech Project #: 125079
Project Name: 2380 Tenth Line
Date: 9/30/2025
Input By: Anjush Musyaju, EIT
Reviewed By: Anthony Mestwarp, P.Eng
Drawing Reference: A100-Site Plan

Legend: Input by User | No Input Required | Calculated Cells →

Reference: Ottawa Design Guidelines - Water Distribution (2010 and TBs)
MOE Design Guidelines for Drinking-Water Systems (2008)
Fire Underwriter's Survey Guideline (2020)
Ontario Building Code, Part 3 (2012)

Small System = YES

	# of Dwellings	# of fixtures/ stations/ offices	Area (m^2)	Pop. Equiv.	Average Day Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)
Residential Input							
Apartments (2-BR)	6			12.60	0.04	0.20	0.30
Apartments (1-BR)	51			71.40	0.23	1.13	1.71
Apartments (Studio)	24			33.60	0.11	0.53	0.81
Assisted care Input							
Apartments (1-BR)	11			11.00	0.06	0.28	0.42
Apartments (Studio)	49			49.00	0.26	1.25	1.89
Industrial / Commercial / Institutional (ICI) Input							
Beauty Salon		3.00			0.02	0.03	0.06
Water Closet		11.00			0.46	0.69	1.24
Office		5.00			0.004	0.01	0.01
Dinning Area			179.29	162.99	0.24	0.35	0.64
Other Area					0.00	0.00	0.00
Totals	**141**		**179.29**	**177.60**	**1.41**	**4.48**	**7.08**

* It is assumed that the dinning area does not add to the building population and is mostly utilized by the tenants

Summary

i. Type of Development and Units:	6 Storey Retirement home building	
ii. Site Address:	2380 Tenth Line Road, Ottawa	
iii. Proposed Water Service Connection Location(s):	200 mm service connection to tie into the existing 300 mm diameter watermain on Decoeur Drive, along with the existing 300 mm diameter	
iv. Average Day Flow Demand:	1.41	L/s
v. Peak Hour Flow Demand:	7.08	L/s
vi. Maximum Day Flow Demand:	4.48	L/s
vii. Required Fire Flow #1:	5000	L/min
viii. Required Fire Flow #2:		L/min
ix. Required Fire Flow #3:		L/min

Water Demand Design Sheet

NOVATECH
Engineers, Planners & Landscape Architects

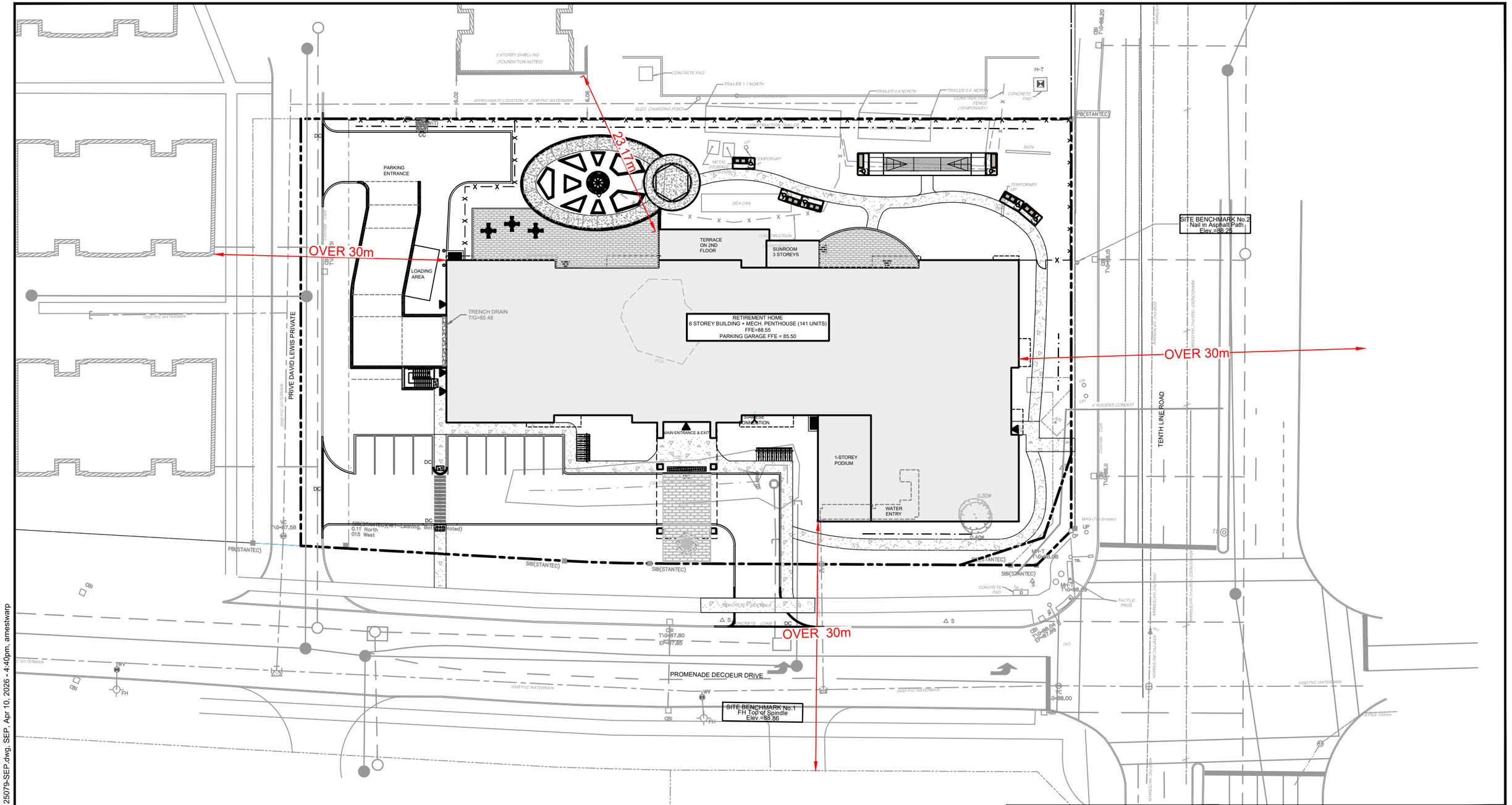
Design Parameters

	Residential				Assisted		Dinning Area
Unit Type	**Apts (2-BR)**		**Apts (1-BR)**	**Apts (Studio)**	**Apts (1-BR)**	**Apts (Studio)**	
Population Equiv.	2.1		1.4	1.4	1	**1**	
Dailly Demand	L/per person/day				L/per person/day		
Average Demand	280				450		
Basic Demand	280				450		

Residential Peaking Factors		**Max Day (x Avg Day)**	**Peak Hour (x Avg Day)**
	Pop.		
Small System (If Applicable)	0	9.50	14.30
	30	9.50	14.30
	150	4.90	7.40
Modified	300	3.60	*5.50*
	450	3.00	*5.50*
	500	2.90	*5.50*
Large System (Default)	> 500	2.50	5.50

Institutional / Commercial / Industrial							
Industrial		**Commercial**	**Institutional**	**Beauty Salon**	**Water Closet**	**Office**	**Dinning Area**
Light	**Heavy**						**1.1m^2/person**
L/gross ha/day				L/station/day	L/fixture/hr	L/person/day	L/seat/day
35,000	55,000	28,000	28,000	650	150	75	125
10,000	17,000	17,000	17,000				

ICI Peaking Factors	**Max Day (x Avg Day)**	**Peak Hour (x Avg Day)**
	1.50	2.70



LEGEND

PROPERTY LINE

19.28 EXPOSURE DISTANCES

NOVATECH
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Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

CITY OF OTTAWA
2380 TENTH LINE

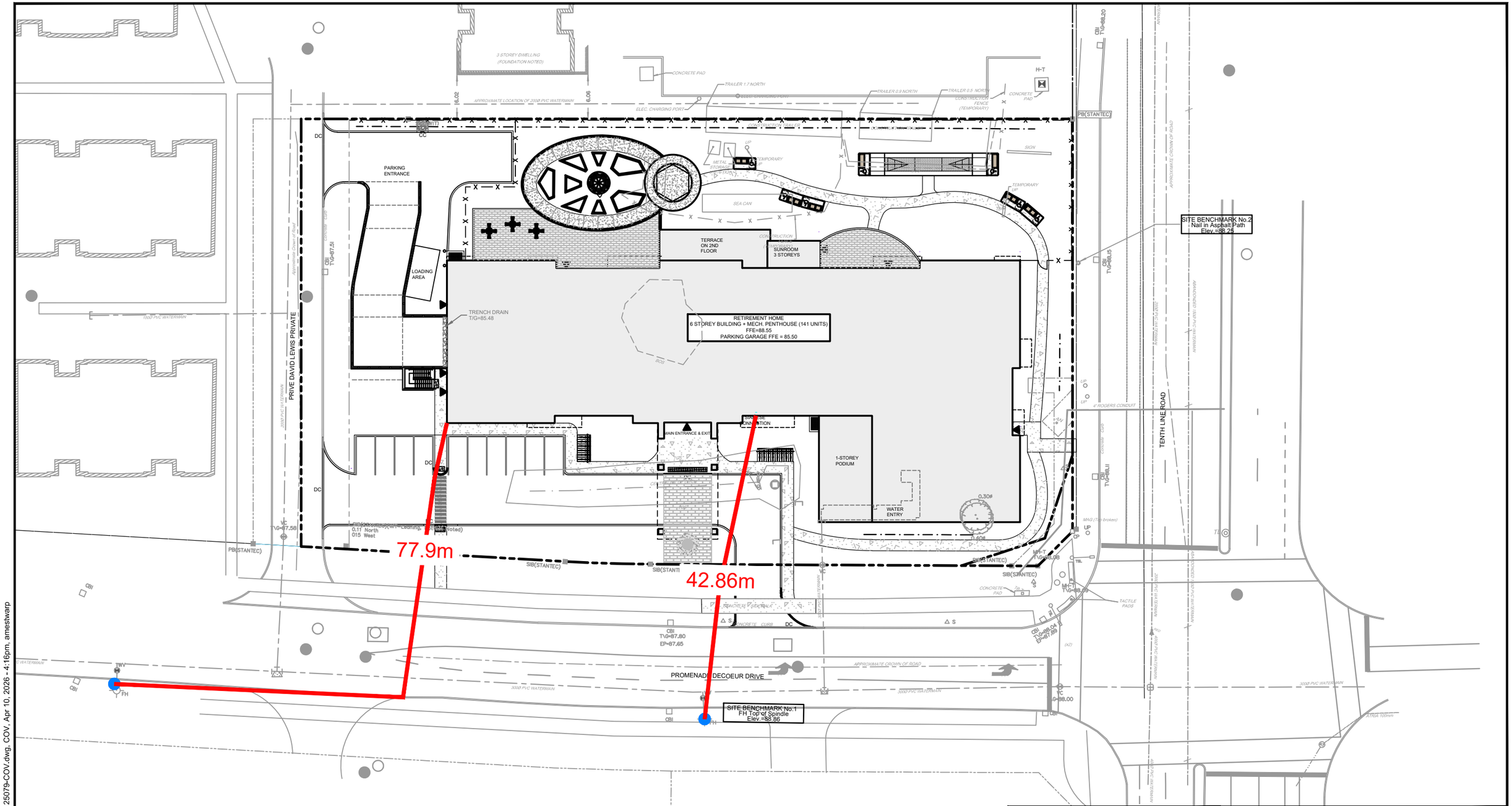
FUS SEPARATION

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE OCT 2026 | JOB 125079 | FIGURE SEP

SHT11X17.DWG - 279mmX432mm

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LEGEND

- PROPERTY LINE
- PROPOSED SIAMESE CONNECTION
- EXISTING CLASS AA HYDRANT
- PROPOSED HYDRANT
- DISTANCE FROM HYDRANT TO SIAMESE CONNECTION/ BUILDING ENTRANCE
- PROPOSED ENTRANCE

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Website www.novatech-eng.com

CITY OF OTTAWA
2380 TENTH LINE

FUS COVERAGE

SCALE 1 : 500 (0, 5m, 10m, 20m)
DATE OCT 2026
JOB 125079
FIGURE COV

SHT11X17.DWG - 279mmX432mm

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FUS - Fire Flow Calculations

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 125079
Project Name: 2380 Tenth Line Road
Date: 8/22/2025
Input By: Anjush Musyaju, EIT
Reviewed By: Anthony Mestwarp, P.Eng
Drawing Reference: 125079-COV

Legend: Input by User
No Input Required
Reference: Fire Underwriter's Survey Guideline (2020)
Formula Method

Building Description: Multi-Storey Tower
Type II - Non-combustible construction

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Type V - Wood frame		1.5	0.8	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction	Yes	0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	2102			
		Number of Floors/Storeys	6			
		Protected Openings (1 hr) if C<1.0	Yes			
		Area of structure considered (m^2)			**3,153**	
	F	**Base fire flow without reductions**				**10,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**		**FUS Table 3**	**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**8,500**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**		**FUS Table 4**	**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	**-4,250**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	Yes	-10%	-10%	
				Cumulative Sub-Total	**-50%**	
		Area of Sprinklered Coverage (m^2)	12612	100%		
				Cumulative Total	**-50%**	
5	**Exposure Surcharge**		**FUS Table 5**		**Surcharge**	
	(3)	North Side	20.1 - 30 m		10%	**850**
		East Side	>30m		0%	
		South Side	>30m		0%	
		West Side	>30m		0%	
				Cumulative Total	**10%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**5,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**83**
				or	USGPM	1,321

From: Carly Rouault <crouault@neuf.ca>
Sent: Thursday, August 21, 2025 5:56 PM
To: Anthony Mestwarp <a.mestwarp@novatech-eng.com>
Cc: Pascal Vendette <pascal@neuf.ca>; Amina Aliyu <aaliyu@neuf.ca>; Owen MacLeod <omacleod@neuf.ca>
Subject: RE: 2380 Tenth Line - 125079

Hi Anthony,

I think this should answer all your questions. See highlighted items below.

Thanks,

CARLY ROUAULT, OAQ

Architecte. Architect

T 514 847 1117 #333 F 514 847 2287

630, boul. René-Lévesque O. 32e étage, Montréal (QC) H3B 1S6

NEUF ARCHITECTES INC. Confidentialité + Transmission

Montréal. Ottawa. Toronto

De : Anthony Mestwarp
Envoyé : 21 août 2025 14:47
À : Carly Rouault
Cc : Pascal Vendette ; Amina Aliyu ; Owen MacLeod
Objet : RE: 2380 Tenth Line - 125079

Hi Carly,

Can you confirm the following for the fire demand calculations for the proposed building at 2380 Tenth line:

1. Building construction

Type V - Wood frame
Type IV - Mass Timber
Type III - Ordinary construction
Type II - Non-combustible construction
Type I - Fire resistive construction (2 hrs)

2. If there are 1hr protected openings between floors

FRR ratings and construction type to follow requirements of 3.2.2.55A

3.2.2.55A. Group C, Retirement Home, Any Height, Any Area, Sprinklered

(1) Except as permitted by Articles 3.2.2.55B. to 3.2.2.55E., a *retirement home* shall conform to Sentence (2).

(2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
(a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* shall be *sprinklered* throughout,
(b) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 2 h,
(c) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
(d) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3. Details on the proposed sprinkler system

Adequately Designed System (NFPA 13)
Standard Water Supply
Fully Supervised System

Mechanical to confirm – should be a standard system.

4. If any areas of the proposed building will be without sprinkler protection.

None

5. The proposed building floor area per floor if the floor area varies.

Building area (OBC) is : 2099m2

Gross floor area by floor is per the screen shot below. Note that the gross construction are is a bit larger than the OBC gross area as it includes the thickness of the exterior walls.

GROSS CONTRUCTION AREA		
LEVEL	AREA (m2)	AREA (ft2)
00-BASEMENT	2100 m²	22607 ft²
01-GROUND FLOOR	2102 m²	22623 ft²
02-2nd FLOOR	1947 m²	20955 ft²
03-3rd FLOOR	1947 m²	20956 ft²
04-4th FLOOR	1872 m²	20151 ft²
05-5th FLOOR	1872 m²	20151 ft²
06-6th FLOOR	1872 m²	20149 ft²
	13712 m²	147590 ft²

NOTES:
GROSS CONSTRUCTION AREA INCLUDES ALL AREA INSIDE THE OUTSIDE FACE OF EXTERIOR WALLS WITH NO DEDUCTIONS.
UNIT AREAS INCLUDE ALL AREA FROM THE OUTSIDE FACE OF EXTERIOR WALLS TO THE MIDPOINT OF DEMISING WALLS.

AREAS ARE SUBJECT TO CHANGE THROUGH THE DESIGN PROCESS.

Thanks,

Anthony Mestwarp, P.Eng., Project Manager | Land Development Engineering

NOVATECH

Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext. 216
The information contained in this email message is confidential and is for exclusive use of the addressee.

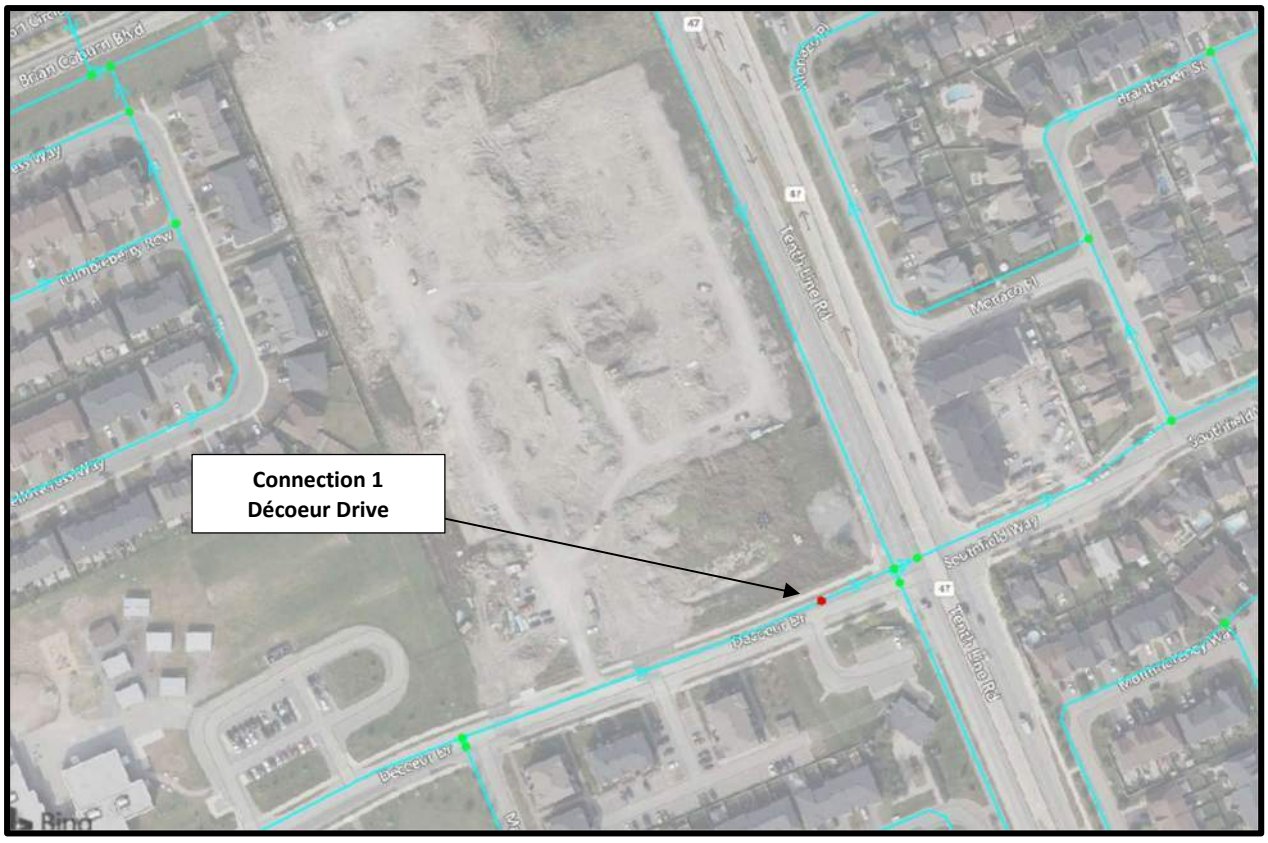
**Electronic documents, when supplied, are supplemental. The print (or pdf) versions of the documents govern. Requested electronic documents remain the property of Novatech (on behalf of the Owner) and shall only be used for the purpose for which they were originally intended

Boundary Conditions
2380 Tenth Line Road

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	85	1.41
Maximum Daily Demand	269	4.48
Peak Hour	425	7.08
Fire Flow Demand #1	5,000	83.33

Location



Results

Connection 1 – Décoeur Drive

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.2	60.0
Peak Hour	126.9	55.3
Max Day plus Fire Flow #1	126.9	55.3

[1] Ground Elevation = 88.0 m

Notes

1. The IWSD has recently updated their water modelling software. Any significant difference between previously received BC results and newly received BC results could be attributed to this update.
2. According to the OWDG Tech Bulleting ISTB-2021-03 Section 4.3.1.:
    - Industrial, commercial, institutional service areas with a basic day demand greater than 50 m^3/day (0.58 L/s) and residential areas serving 50 or more dwellings shall be connected with a minimum of two watermains, separated by an isolation valve, to avoid the creation of a vulnerable service area. Individual residential facilities with a basic day demand greater than 50 m3/day shall be connected with a minimum of two water services, separated by an isolation valve, to avoid the creation of a vulnerable service area.

Disclaimer

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

PROJECT #: 125079
PROJECT NAME: 2380 Tenth Line
LOCATION: City of Ottawa

NOVATECH
Engineers, Planners & Landscape Architects

DATE: October 9, 2025

CALCULATED WATER DEMNADS:

Water Demands

Average Day (Maximum HGL)=	1.41	L/s
Maximum Day =	4.48	L/s
Peak Hour (Minimum HGL) =	7.08	L/s
Fire Flow (FUS) =	83.33	L/s

City of Ottawa Boundary Conditions:

Average Day (Maximum HGL)=	130.2	m
Peak Hour (Minimum HGL) =	126.9	m
Max Day + Fire =	126.9	m

Watermain Analysis

Finished Floor Elevation = 88.55 m

High Pressure Test = Max. HGL -Finished Floor Elevation x 1.42197 PSI/m < 80 PSI

High Pressure = 59.2 PSI

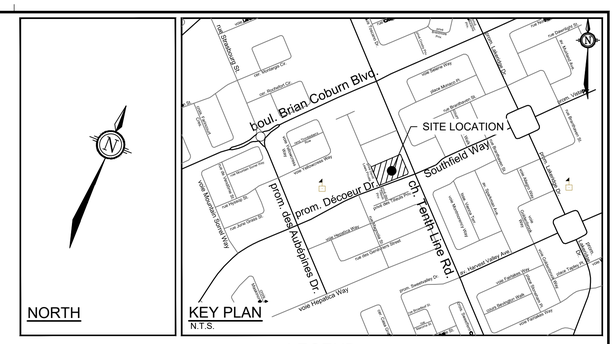
Low Pressure Test = Min. HGL - Finished Floor Elevation x 1.42197 PSI/m > 40 PSI

Low Pressure = 54.5 PSI

Max Day + Fire Test = Max Day + Fire Flow - Finished Floor Elevation x 1.42197 PSI/m > 20 PSI

Max Day + Fire (Connection #1) = 54.5 PSI

Appendix B
Sanitary Servicing



LEGEND

- SITE PROPERTY LINE
- MISC LEGAL LINE (EASEMENT, PROPERTY LINES) REFER TO LEGAL PLAN FOR DETAILS
- PROPOSED TACTILE WALKING SURFACE INDICATOR (TWSI)
- PROPOSED CURB
- DC — PROPOSED DEPRESSED CURB
- SWALE c/w SUBDRAIN AND DIRECTION OF FLOW
- FIRE DEPARTMENT SIAMESE CONNECTION
- PROPOSED BUILDING ENTRANCE
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED CATCHBASIN
- PROPOSED AREA DRAIN
- PROPOSED LANDSCAPE DRAIN (ELBOW/TEE)
- PROPOSED BIKE RACKS
- PROPOSED CROSSWALK PAINTING
- PROPOSED LINE PAINTING
- PROPOSED SANITARY MANHOLE
- 101 — PROPOSED SANITARY SEWER AND FLOW DIRECTION
- SANITARY DRAINAGE AREA BOUNDARY
- AREA — AREA IN HECTARES
- 110-108 — MANHOLE TO MANHOLE
- 24 51 — POPULATION EQUIVALENT
- EXISTING VALVE & VALVE BOX
- EXISTING VALVE & LEAD
- STM MH — EXISTING STORM MANHOLE
- CB 1 — EXISTING CATCHBASIN
- EXISTING DITCH CENTERLINE
- SAN MH — EXISTING SANITARY MANHOLE & SEWER

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

NOT FOR CONSTRUCTION

No.	REVISION	DATE	BY
3.	REVISED PER CITY COMMENT	OCT 23/2026	ARM
2.	REVISED PER CITY SUPPORTABILITY COMMENT	APRIL 17/2026	ARM
1.	ISSUED FOR SPA	OCT 16/2025	ARM

SCALE 1:300

1:300
0 3 6 9 12

DESIGN ARM/AM
CHECKED ARM
DRAWN MF/AM
CHECKED ARM
APPROVED GJM

FOR REVIEW ONLY

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
2380 TENTH LINE

DRAWING NAME
SANITARY PLAN

PROJECT No. 125079
REV REV#3
DRAWING No. 125079-SAN

PLANA1.DWG - BWhite(ISO A1)

M:\2025\125079\CAD\Civil\125079-SAN.dwg, SAN, Oct 21, 2026 - 2:46pm, ammasyaliu

SANITARY SEWER DESIGN SHEET

vatech Project #: 125079
Project Name: 2380 Tenth Line
Date: 8/11/2025
Revised 3/11/2026
Input By: Anjush Musyaju, EIT
Reviewed By: Anthony Mestwarp, P.Eng
wing Reference: 125079-SAN

Legend: Design Input by User
As-Built Input by User
Cumulative Cell
Calculated Design Cell Output

Reference: City of Ottawa - Sewer Design Guidelines (
MOE - Design Guidelines for Sewage Work

Location				Demand																						Design Capacity							
				Design Flow Flow															Industrial / Commercial / Institutional (ICI) Flow								Extraneous Flow Area Method		Total Design Flow	Proposed Sewer Pipe Sizing / Design							
				Residential						Assisted Care					Total Flows																				
Street	Area ID	From MH	To MH	Studio	1-Bed	2-Bed	Population (in 1000's)	Cumulative Population (in 1000's)	Average Pop. Flow Q(q) (L/s)	Studio	1-Bed	Population (in 1000's)	Cumulative Population (in 1000's)	Average Pop. Flow Q(q) (L/s)	Design Peaking Factor M	Peak Design Pop. Flow Q(p) (L/s)	Res. Drainage Area (ha.)	Cumulative Res. Drainage Area (ha.)	Beauty salon (station)	Water Closet (Fixture)	Office (person)	Dining Area (m^2)	Average Commercial Flow (L/s)	Cumulative Commercial Flow L/s	Commercial Peaking Factor	Peak Commercial Design Flow	Cumulative Extraneous Drainage Area (ha.)	Design Extraneous Flow Q(e) (L/s)	Total Peak Design Flow Q(D) (L/s)	Pipe Length (m)	Pipe Size (mm) and Material	Pipe ID Actual (m)	Roughness n	Design Grade So (%)	Capacity Qfull (L/s)	Full Flow Velocity (m/s)	Q(D) / Qfull
Street One	A1	Building	301	24	51	6	0.118	0.118	0.38	49	11	0.060	0.060	0.31	3.53	2.45	0.625	0.625	3.00	11.00	5.00	179.20	0.72	0.72	1.00	0.72	0.625	0.21	3.38	18.4	250 PVC	0.254	0.013	1.00	62.0	1.22	5.4%
Street One		301	Existing				0.000	0.118	0.38			0.000	0.060	0.31	3.53	2.45	0.000	0.625	0.000	0.000	0.000	0.000	0.00	0.72	1.000	0.72	0.625	0.21	3.38	14.6	250 PVC	0.254	0.013	0.22	29.1	0.57	11.6%
Totals				**24**	**51**	**6**	**0.118**	**0.118**	**0.38**	**49**	**11**	**0.060**	**0.060**	**0.31**	3.53	**2.45**	**0.625**	**0.625**								**0.721**	**0.625**	**0.21**	**3.38**	**33.0**						

Demand Equation / Parameters

1. **Q(D) =** Q(p) + Q(ici) + Q(e)
2. **Q(p) =** (P x q x M x K / 86,400)
3. **q =** 280 L/per person/day (Residential design)
   450 L/per person/day (Assisted Care design)
4. **M = Harmon Formula (maximum of 4.0)**
5. **K =** 0.8 (design)
6. **Park flow is considered equivalent to a single unit / ha**
   Park Demand = 4 single unit equivalent / park ha (~ 3,600 L/ha/day)
7. **Q(ici) =** ICI Area x ICI Flow x ICI Peak
8. **Q(e) =** 0.33 L/s/ha (design)

Definitions

Q(D) = Peak Design Flow (L/s)
Q(p) = Peak Design Population Flow (L/s)
Q(q) = Average Population Flow (L/s)

P = Residential Population =
q = Average Capita Flow
M = Harmon Formula
K = Harmon Correction Factor
Q(ici) = Industrial / Commercial / Institutional Flow (L/s)
Q(e) = Extraneous Flow (L/s)

Institutional / Commercial / Industrial
Design =
ICI Peak *
Design =

Residential

Studio	1-Bed	2-Bed
1.4	1.4	2.1

Assisted care

Studio	1-Bed
1	1

Commercial

Beauty salon	650	L/Station/day
Water Closet	150	L/Fixture/hr
Office	75	L/person/day
Dining Area	125	L/seat/day (1.1person/m^2)

1.0	1.5

* ICI Peak = 1.0 Default, 1.5 if ICI in contributing area is >20% (design only)

Capacity Equation

Q full = $1000*(1/n)*A_p*R^{2/3}*So^{0.5}$

Definitions

Q full = Capacity (L/s)
n = Manning coefficient of roughness (0.013)
A_p = Pipe flow area (m^2)
R = Hydraulic Radius of wetted area (dia./4 for full pipes)
So = Pipe slope/gradient

Atrel Report Excerpts

2380/ 2370 Tenth Line Road

SANITARY SEWER COMPUTATION FORM

DATE: **November, 2014**
DESIGNED BY: AGS
CHECKED BY: JMD

PROJECT: Neighbourhood 5 - Avalon West - STAGE 3
CLIENT: Minto Communities Inc.
PROJECT #: 131004
BY: ATREL ENGINEERING LTD

q= 350 l/cap.day
i= 0.28 l/ha.s
PVC/CONC N= 0.013
OTHER N= 0.024

Table 21
Townhouse= 2.7 person/unit
Back to Back= 2.1 person/unit
Single Dwellings= 3.4 person/unit

STREET NAMES	LOCATION FROM (Up)		TO (Down)		RESIDENTIAL INDIVIDUAL AREA (ha.)	INDIVIDUAL POP.	CUMULATIVE AREA (ha.)	CUMULATIVE POP.	PEAKING FACTOR M	FLOW Q(p) (L/S)	COMMERCIAL , INSTITUTIONAL INDIVIDUAL AREA (ha.)	INDIVIDUAL POP.	CUMULATIVE AREA (ha.)	CUMULATIVE POP.	PEAKING FACTOR M	FLOW Q(p) (L/S)	**PEAK DES. Q(d) (L/S)**	SEWER DATA TYPE PIPE	DIA. (N0M) (mm)	DIA. (ACT) (MM)	SLOPE (%)	LENGTH (M)	CAP. (L/S)	Remaining Capacity (%)	VEL. (M/S)	UpStream Obv. (M)	UpStream Inv. (M)	DwnStream Obv. (M)	DwnStream Inv. (M)
Commercial	MH	100	MH	3102							4.79	685	4.79	685	1.50	4.16	5.50	PVC	250	251.5	0.24	22.5	29.59	81%	0.60	82.89	82.64	82.84	82.59
Site Plan No.1	MH	3101	MH	3102	0.18	17.0	0.18	17	4.00	0.28							0.33	PVC	200	201.2	2.00	45.0	47.11	99%	1.48	84.19	83.99	83.29	83.09
Décoeur Drive	MH	3102	MH	3103	0.26		0.44	17	4.00	0.28			4.79	685	1.50	4.16	5.90	PVC	250	251.5	0.24	57.0	29.59	80%	0.60	82.78	82.53	82.64	82.39
Décoeur Drive	MH	3103	MH	3104	0.23		0.67	17	4.00	0.28			4.79	685	1.50	4.16	5.97	PVC	250	251.5	0.24	85.0	29.59	80%	0.60	82.64	82.39	82.44	82.19
School	MH	101	MH	3104							2.44	350	2.44	350	1.50	2.13	2.81	PVC	250	251.5	0.24	23.5	29.59	91%	0.60	82.73	82.48	82.67	82.42
Magnolia Street	MH	3104	MH	3107	0.08		0.75	17	4.00	0.28			7.23	1035	1.50	6.29	8.80	PVC	250	251.5	0.24	50.5	29.59	70%	0.60	82.38	82.13	82.26	82.01
Site Plan No.1	MH	3105	MH	3106	0.26	26.0	0.26	26.0	4.00	0.42							0.49	PVC	200	201.17	0.90	59.0	31.60	98%	0.99	85.19	84.99	84.66	84.46
Site Plan No.1	MH	3106	MH	3107	0.29	30.0	0.55	56.0	4.00	0.91							1.06	PVC	200	201.17	2.00	70.0	47.11	98%	1.48	84.06	83.86	82.66	82.46
Magnolia Street	MH	3107	MH	3115	0.08		1.38	73.0	4.00	1.18			7.23	1035	1.50	6.29	9.88	PVC	300	299.21	0.19	48.5	41.86	76%	0.60	82.16	81.86	82.07	81.77
Hepatica Crescent	MH	3110	MH	3112	0.28	11.0	0.28	11.0	4.00	0.18							0.26	PVC	200	201.17	1.60	31.5	42.14	99%	1.33	85.11	84.91	84.61	84.41
Park	MH	3111	MH	3112	1.19		1.19										0.33	PVC	200	201.17	0.32	14.0	18.93	98%	0.60	84.12	83.92	84.07	83.87
Hepatica Crescent	MH	3112	MH	3115	0.32	14.0	1.79	25.0	4.00	0.41							0.91	PVC	200	201.17	2.00	97.0	47.11	98%	1.48	84.01	83.81	82.07	81.87
Hepatica Crescent	MH	3113	MH	3114	0.54	50.0	0.54	50.0	4.00	0.81							0.96	PVC	200	201.17	0.65	80.0	26.86	96%	0.84	85.25	85.05	84.73	84.53
Hepatica Crescent	MH	3114	MH	3115	0.52	47.0	1.06	97.0	4.00	1.57							1.87	PVC	200	201.17	1.80	86.5	44.69	96%	1.41	84.13	83.93	82.57	82.37
Magnolia Street	MH	3115	MH	3124	0.49	34.0	4.72	229.0	4.00	3.71			7.23	1035	1.50	6.29	13.35	PVC	300	299.21	0.19	79.0	41.86	68%	0.60	82.07	81.77	81.92	81.62
Genévriers Street	MH	3116	MH	3117	0.33	21.0	0.33	21.0	4.00	0.34							0.43	PVC	200	201.17	0.65	59.0	26.86	98%	0.84	84.90	84.70	84.52	84.32
Genévriers Street	MH	3117	MH	3118	0.18	51.0	0.51	72.0	4.00	1.17							1.31	PVC	200	201.17	0.65	12.0	26.86	95%	0.84	84.49	84.29	84.41	84.21
Genévriers Street	MH	3118	MH	3119	0.65	58.0	1.16	130.0	4.00	2.11							2.43	PVC	200	201.17	1.50	77.5	40.80	94%	1.28	84.38	84.18	83.22	83.02
Genévriers Street	MH	3119	MH	3124	0.15	7.0	1.31	137.0	4.00	2.22							2.59	PVC	200	201.17	1.50	52.5	40.80	94%	1.28	82.62	82.42	81.83	81.63
Hepatica Crescent	MH	3113	MH	3120	0.05	3.0	0.05	3.0	4.00	0.05							0.06	PVC	200	201.17	0.65	10.0	26.86	100%	0.84	85.23	85.03	85.16	84.96
Hepatica Crescent	MH	3120	MH	3122	0.28	17.0	0.33	20.0	4.00	0.32							0.42	PVC	200	201.17	2.10	71.5	48.27	99%	1.52	85.13	84.93	83.63	83.43
Hepatica Crescent	MH	3121	MH	3122	0.27	21.0	0.27	21.0	4.00	0.34							0.42	PVC	200	201.17	0.88	69.0	31.25	99%	0.98	84.78	84.58	84.17	83.97
Genévriers Street	MH	3122	MH	3123	0.40	28.0	1.00	69.0	4.00	1.12							1.40	PVC	200	201.17	0.75	86.5	28.85	95%	0.91	83.57	83.37	82.92	82.72
Genévriers Street	MH	3123	MH	3124	0.48	34.0	1.48	103.0	4.00	1.67							2.08	PVC	200	201.17	0.75	88.5	28.85	93%	0.91	82.71	82.51	82.05	81.85
Magnolia Street	MH	3124	MH	3273	0.49	41.0	8.00	510.0	3.97	8.20			7.23	1035	1.50	6.29	18.75	PVC	300	299.21	0.19	79.0	41.86	55%	0.60	81.55	81.25	81.40	81.10
Site Plan No.2	MH	3129	MH	3130	0.79	84.0	0.79	84.0	4.00	1.36							1.58	PVC	200	201.17	0.32	91.5	18.93	92%	0.60	84.32	84.12	84.02	83.82
Site Plan No.2	MH	3130	MH	3131			0.79	84.0	4.00	1.36							1.58	PVC	200	201.17	0.32	120.0	18.93	92%	0.60	84.02	83.82	83.63	83.43
Des Aubépines Drive	MH	3131	MH	3140	0.22		1.01	84.0	4.00	1.36							1.64	PVC	250	251.46	0.24	51.0	29.59	94%	0.60	83.62	83.37	83.50	83.25
Commercial	MH	106	MH	3133														PVC	250	251.5	0.24	9.0	29.59	100%	0.60	84.15	83.90	84.13	83.88
Street No.12	MH	3132	MH	3133	0.08		0.08										0.02	PVC	200	201.17	0.65	41.5	26.86	100%	0.84	84.41	84.21	84.14	83.94
Street No.8	MH	3133	MH	3134	0.48	57.0	0.56	57.0	4.00	0.92							1.08	PVC	250	251.46	0.24	85.5	29.59	96%	0.60	84.13	83.88	83.92	83.67
Street No.8	MH	3134	MH	3139A	0.51	63.0	1.07	120.0	4.00	1.94							2.24	PVC	250	251.46	0.24	83.5	29.59	92%	0.60	83.92	83.67	83.72	83.47

LICENSED PROFESSIONAL ENGINEER
A. G. Y. SAUVE
100142393
Nov. 20, 2014
PROVINCE OF ONTARIO

SANITARY SEWER COMPUTATION FORM

Table 21

PROJECT: Neighbourhood 5 - Avalon West - STAGE 3 | q= 350 l/cap.day | Townhouse= 2.7 person/unit
DATE: **November, 2014** | CLIENT: Minto Communities Inc. | i= 0.28 l/ha.s | Back to Back= 2.1 person/unit
DESIGNED BY: AGS | PROJECT #: 131004 | PVC/CONC N= 0.013 | Single Dwellings= 3.4 person/unit
CHECKED BY: JMD | BY: ATREL ENGINEERING LTD | OTHER N= 0.024

STREET NAMES	LOCATION FROM (Up)		TO (Down)		RESIDENTIAL INDIVIDUAL AREA (ha.)	INDIVIDUAL POP.	CUMULATIVE AREA (ha.)	CUMULATIVE POP.	PEAKING FACTOR M	FLOW Q(p) (L/S)	COMMERCIAL , INSTITUTIONAL INDIVIDUAL AREA (ha.)	INDIVIDUAL POP.	CUMULATIVE AREA (ha.)	CUMULATIVE POP.	PEAKING FACTOR M	FLOW Q(p) (L/S)	**PEAK DES. Q(d) (L/S)**	SEWER DATA TYPE PIPE	DIA. (N0M) (mm)	(ACT) (MM)	SLOPE (%)	LENGTH (M)	CAP. (L/S)	Remaining Capacity (%)	VEL. (M/S)	UpStream Obv. (M)	UpStream Inv. (M)	DwnStream Obv. (M)	DwnStream Inv. (M)
Street No.12	MH	3132	MH	3135														PVC	200	201.17	0.65	9.5	26.86	100%	0.84	84.55	84.35	84.49	84.29
Street No.12	MH	3135	MH	3136	0.54	63.0	0.54	63.0	4.00	1.02							1.17	PVC	200	201.17	0.32	76.0	18.93	94%	0.60	84.46	84.26	84.21	84.01
Street No.12	MH	3136	MH	3137	0.53	60.0	1.07	123.0	4.00	1.99							2.29	PVC	200	201.17	0.32	79.0	18.93	88%	0.60	84.21	84.01	83.95	83.75
Street No.12	MH	3137	MH	3138	0.15	9.0	1.22	132.0	4.00	2.14							2.48	PVC	200	201.17	0.32	10.5	18.93	87%	0.60	83.92	83.72	83.89	83.69
Street No.12	MH	3138	MH	3139A	0.19	14.0	1.41	146.0	4.00	2.37							2.76	PVC	200	201.17	0.32	41.0	18.93	85%	0.60	83.86	83.66	83.73	83.53
Street No.8	MH	3139A	MH	3139B	0.20	9.0	2.68	275	4.00	4.46							5.21	PVC	250	251.5	0.24	36.5	29.59	82%	0.60	83.72	83.47	83.63	83.38
Street No.8	MH	3139B	MH	3140			2.68	275	4.00	4.46							5.21	PVC	250	251.5	0.24	17.0	29.59	82%	0.60	83.60	83.35	83.56	83.31
Des Aubépines Drive	MH	3140	MH	3141	0.54	27.0	4.23	386.0	4.00	6.25							7.44	PVC	250	251.46	0.24	117.5	29.59	75%	0.60	83.50	83.25	83.22	82.97
Des Aubépines Drive	MH	3141	MH	3142	0.83	36.0	5.06	422.0	4.00	6.84							8.25	PVC	250	251.46	0.24	120.0	29.59	72%	0.60	83.22	82.97	82.93	82.68
Des Aubépines Drive	MH	3142	MH	3143	0.54	28.0	5.60	450.0	4.00	7.29							8.85	PVC	250	251.46	0.24	101.0	29.59	70%	0.60	82.93	82.68	82.69	82.44
Des Aubépines Drive	MH	3143	MH	3271	0.86	55.0	6.46	505.0	3.97	8.13							9.93	PVC	250	251.46	0.24	119.5	29.59	66%	0.60	82.69	82.44	82.40	82.15
Street No.11	MH	3270	MH	3271	45.26	3308.0	45.26	3308.0	3.41	45.64	12.78	1828.0	12.78	1828	1.50	11.11	73.00	CONC	450	457.20	0.11	120.0	98.65	26%	0.60	81.81	81.36	81.68	81.23
Hepatica Crescent	MH	3271	MH	3272	0.69	45.0	52.41	3858.0	3.35	52.31			12.78	1828	1.50	11.11	81.67	CONC	525	533.40	0.11	99.5	148.80	45%	0.67	81.53	81.00	81.42	80.89
Hepatica Crescent	MH	3272	MH	3273	0.83	58.0	53.24	3916.0	3.34	53.01			12.78	1828	1.50	11.11	82.60	CONC	525	533.40	0.11	120.0	149.48	45%	0.67	81.42	80.89	81.29	80.76
Hepatica Crescent	MH	3273	MH	3274	0.49	31.0	61.73	4457.0	3.29	59.42			20.01	2863	1.50	17.40	99.70	CONC	525	533.40	0.11	79.0	149.48	33%	0.67	81.29	80.76	81.20	80.67
Hepatica Crescent	MH	3274	MH	3275	0.60	38.0	62.33	4495.0	3.29	59.86			20.01	2863	1.50	17.40	100.31	CONC	525	533.40	0.11	89.0	149.48	33%	0.67	81.20	80.67	81.10	80.57
Hepatica Crescent	MH	3275	MH	3276			62.33	4495.0	3.29	59.86			20.01	2863	1.50	17.40	100.31	CONC	525	533.40	0.11	8.5	149.48	33%	0.67	81.10	80.57	81.09	80.56
Hepatica Crescent	MH	3276	MH	15166			62.33	4495.0	3.29	59.86			20.01	2863	1.50	17.40	100.31	CONC	675	685.80	0.12	34.5	303.78	67%	0.82	81.09	80.41	81.05	80.37

Proposed Stage 3 Sanitary Sewers
Future Stages Sanitary Sewers



EXISTING BRIAN COBURN BLVD

FUTURE BRIAN COBURN BLVD WIDENING

ELEV.=88.00

EX. 300mmø WM

DES AUBEPINES DRIVE

STREET NO.4

STREET NO.20

DÉCOEUR DRIVE

MAGNOLIA STREET

TENTH LINE ROAD

STREET NO. 2

TH-XX

BLK-01 BLK-02 BLK-03 BLK-04

2.0m CONCRETE SIDEWALK

250mmø SAN

400mmø SAN

SAN MH 329 SAN MH 330 SAN MH 340 SAN MH 341 SAN MH 342 SAN MH 304 SAN MH 303 SAN MH 302 SAN MH 307

EX.SAN MH T/G=88.14 INV.N=78.80

EX.SAN MH T/G=87.66 INV.N=78.73 S=78.73

STUB 101 250mmø SAN

STUB 100 250mmø SAN

9.0m-200mmø @0.32% SAN

0.79ha.	40 | 84
0.14ha.	0 | 0
0.22ha.	0 | 0
0.20ha.	3 | 9
0.51ha.	23 | 63
0.48ha.	21 | 57
0.08ha.	0 | 0
1.56ha.	109 | 229
0.19ha.	5 | 14
0.08ha.	2 | 6
0.24ha.	5.4 | 15
0.33ha.	10 | 27
0.54ha.	10 | 27
0.15ha.	3 | 9
0.53ha.	22 | 60
0.54ha.	23 | 63
0.28ha.	7.6 | 21
0.34ha.	10 | 27
0.83ha.	13 | 36
0.32ha.	4.4 | 12
2.77ha.	Peq.=396
2.45ha.	Peq.=350
4.78ha.	Peq.=683
0.48ha.	0 | 0
0.23ha.	0 | 0
0.26ha.	0 | 0
1.19ha.	Peq.=0
0.08ha.	0 | 0
0.29ha.	14 | 30
0.26ha.	12 | 26
0.18ha.	8 | 47

LEGEND

- 0.63ha. / 10 | 40 — SANITARY DRAINAGE SUB AREA / POPULATION EQUIVALENT / NUMBER OF UNITS IN SUB AREA
- DRAINAGE AREA BOUNDARY
- PROPOSED SANITARY SEWER
- EXISTING SANITARY SEWER
- OUTSIDE PROPOSED DEVELOPMENT
- SITE PLAN APPROVAL

REVIEWED BY DEVELOPMENT REVIEW BRANCH
Signed Will Cuming
Date NOV 24 2014
Plan Number 16796

THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	REVISION △-APPLIES WHEN DRAWING MODIFIED	DATE	BY
1	AS PER CITY COMMENTS	JULY 25/14	JMD
2	AS PER CITY COMMENTS	AUG 12/14	JMD
3	AS PER CITY COMMENTS	SEPT 10/14	JMD
4	ISSUED FOR TENDER	SEPT 12/14	JMD
5	ISSUED FOR CONSTRUCTION	SEPT 16/14	JMD
6	ISSUED FOR CONSTRUCTION	OCT 9/14	JMD
7	AS PER CITY COMMENTS	OCT 31/14	JMD
8	AS PER CITY COMMENTS	NOV 6/14	JMD
9	AS PER CITY COMMENTS	NOV 18/14	JMD
10	AS PER CITY COMMENTS	NOV 20/14	JMD

SCALE 1:750 (8m 0 24m)

DESIGN AGS
CHECKED JMD
DRAWN PNC
CHECKED AGS
APPROVED JMD

LICENSED PROFESSIONAL ENGINEER A. G. Y. SAUVÉ 100142393 Nov. 20, 2014 PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER J. M. DÉCOEUR Nov. 20, 2014 PROVINCE OF ONTARIO

ATREL Engineering Ltd.
Engineers - Ingénieurs
380 LAURIER ST., ROCKLAND, ONTARIO K4K 1G2
TEL.: (613) 446-7423 FAX: (613) 446-7425

CITY OF OTTAWA
EAST URBAN COMMUNITY
AVALON WEST STAGE 3

MINTO COMMUNITIES INC.

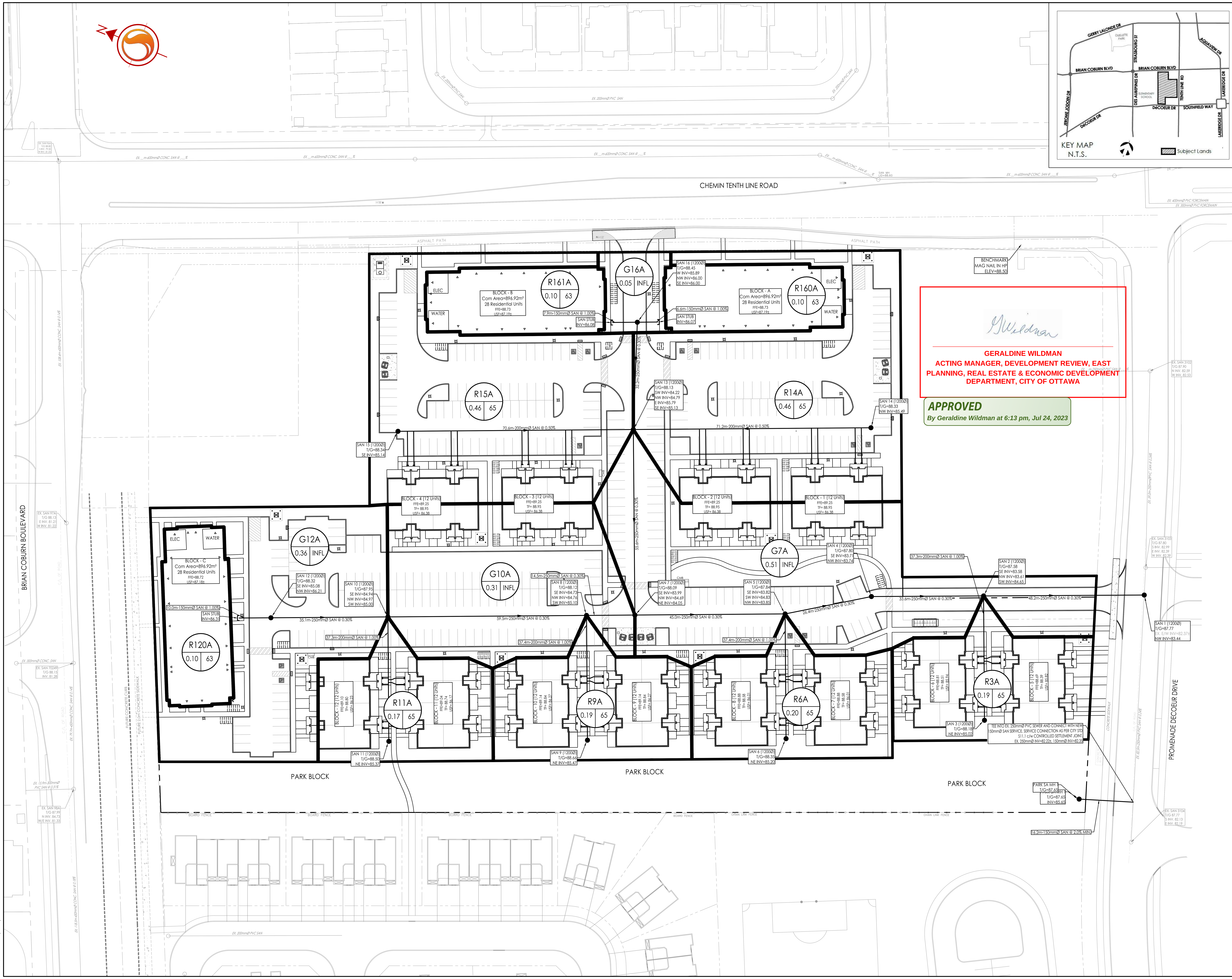
PLAN
SANITARY DRAINAGE AREA PLAN

CLIENT No. 148
PROJECT No. 131004
DATE NOVEMBER 2013
DRAWING No. 131004-SAN2

D07-16-09-0018 - Phase 7

16796

2370 Report Excerpts



V:\01-604\active\160401710\design\drawing\160401710 DB.dwg
2023/05/31 3:39 PM By: Sharp, Mike

ORIGINAL SHEET - ARCH D

Stantec

Stantec Consulting Ltd.
400 - 1331 Clyde Avenue
Ottawa ON
Tel. 613.722.4420
www.stantec.com

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Legend

- R100A — SANITARY DRAINAGE AREA ID#
- 50 — POPULATION COUNT
- 0.31 — SANITARY DRAINAGE AREA ha.
- G100A — SANITARY DRAINAGE AREA ID#
- INFL — INFILTRATION RATE OF 0.33 L/s/Ha APPLIED
- 0.11 — SANITARY DRAINAGE AREA ha.
- SANITARY DRAINAGE AREA
- PROPOSED SANITARY MH AND SEWER
- EXISTING SANITARY MH AND SEWER

Notes

5	ISSUED FOR CONSTRUCTION	MJS	KS	23.05.31
4	REVISED AS PER SITE PLAN	MJS	KS	23.03.28
3	REVISED AS PER CITY COMMENTS/SITE PLAN	MJS	KS	23.02.27
2	REVISED AS PER NEW SITE PLAN	MJS	DT	22.12.05
1	REVISED AS PER SITE PLAN	MJS	DT	22.09.27
0	ISSUED FOR SPA	MJS	DT	21.12.13
Revision		By	Appd.	YY.MM.DD

File Name: 160401710DB	MJS	DT	MJS	21.11.22
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

Client/Project

MATTAMY HOMES LTD.

ORLEANS DECOEUR RESIDENTIAL DEVELOPMENT
2370 TENTH LINE ROAD
OTTAWA, ON, CANADA

Title

SANITARY DRAINAGE AREA PLAN

Project No. 160401710

Scale 1:500 (0 5 15 25m)

Drawing No. SA-1

Sheet 7 of 7

Revision 5

PLAN No. 18668

D07-12-21-0224

Stantec

SUBDIVISION:
ORLEANS DECOEUR RESIDENTIAL DEVELOPMENT

DATE: 2022-09-23
REVISION: 2
DESIGNED BY: MJS
CHECKED BY: MW

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

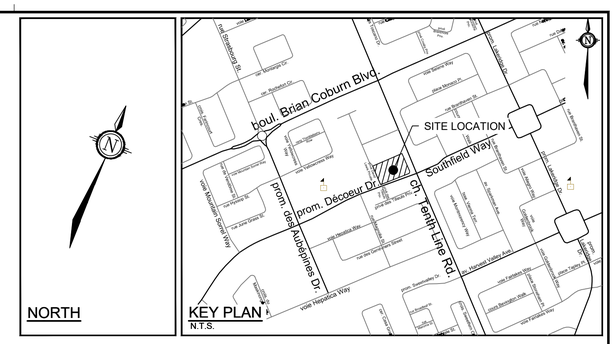
FILE NUMBER: 160401710

DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	280 l/p/day	MINIMUM VELOCITY	0.60 m/s
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	28,000 l/ha/day	MAXIMUM VELOCITY	3.00 m/s
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000 l/ha/day	MANNINGS n	0.013
PEAKING FACTOR (ICI >20%):	1.5	INDUSTRIAL (LIGHT)	35,000 l/ha/day	BEDDING CLASS	B
PERSONS / 1 BED+DEN & 2 BED	2.1	INSTITUTIONAL	28,000 l/ha/day	MINIMUM COVER	2.50 m
PERSONS / TOWNHOME	2.7	INFILTRATION	0.33 l/s/Ha	HARMON CORRECTION FACTOR	0.8
PERSONS / 2 BED+DEN	3.1				

LOCATION			RESIDENTIAL AREA AND POPULATION									COMMERCIAL		INDUSTRIAL (L)		INDUSTRIAL (H)		INSTITUTIONAL		GREEN / UNUSED		C+I+I	INFILTRATION			TOTAL	PIPE							
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA (ha)	1 BED+DEN & 2 BED APT	UNITS TOWN	2 BED+DEN APT	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	FLOW (l/s)	LENGTH (m)	DIA (mm)	MATERIAL	CLASS	SLOPE (%)	CAP. (FULL) (l/s)	CAP. V PEAK FLOW (%)	VEL. (FULL) (m/s)
R120A	120	12	0.10	24	0	4	63	0.10	63	3.63	0.7	0.09	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.19	0.19	0.1	0.8	10.9	150	PVC	DR 28	1.00	15.3	**5.53%**	0.86
G12A	12	10	0.00	0	0	0	0	0.10	63	3.63	0.7	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.36	0.0	0.36	0.56	0.2	1.0	35.1	250	PVC	SDR 35	0.30	33.2	**2.87%**	0.67
R11A	11	10	0.17	0	24	0	65	0.17	65	3.63	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.17	0.17	0.1	0.8	37.3	200	PVC	SDR 35	1.00	33.4	**2.45%**	1.05
G10A	10	8	0.00	0	0	0	0	0.28	128	3.57	1.5	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.67	0.0	0.31	1.03	0.3	1.8	59.5	250	PVC	SDR 35	0.30	33.2	**5.56%**	0.67
R9A	9	8	0.19	0	24	0	65	0.19	65	3.63	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.19	0.19	0.1	0.8	37.4	200	PVC	SDR 35	1.00	33.4	**2.47%**	1.05
	8	7	0.00	0	0	0	0	0.47	192	3.52	2.2	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.0	0.00	1.23	0.4	2.6	14.5	250	PVC	SDR 35	0.30	33.2	**7.92%**	0.67
R15A	15	13	0.46	0	24	0	65	0.46	65	3.63	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.46	0.46	0.2	0.9	69.6	200	PVC	SDR 35	0.50	23.6	**3.87%**	0.74
R14A	14	13	0.46	0	24	0	65	0.46	65	3.63	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.46	0.46	0.2	0.9	70.7	200	PVC	SDR 35	0.50	23.6	**3.87%**	0.74
R161A	161	16	0.10	24	0	4	63	0.10	63	3.63	0.7	0.09	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.19	0.19	0.1	0.8	8.9	150	PVC	DR 28	1.00	15.3	**5.54%**	0.86
R160A	160	16	0.10	24	0	4	63	0.10	63	3.63	0.7	0.09	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.19	0.19	0.1	0.8	7.6	150	PVC	DR 28	1.00	15.3	**5.53%**	0.86
G16A	16	13	0.00	0	0	0	0	0.21	126	3.57	1.5	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.1	0.04	0.43	0.1	1.7	32.2	250	PVC	SDR 35	0.30	33.2	**5.07%**	0.67
	13	7	0.00	0	0	0	0	1.13	255	3.49	2.9	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.1	0.00	1.36	0.4	3.4	55.6	250	PVC	SDR 35	0.30	33.4	**10.16%**	0.67
G7A	7	5	0.00	0	0	0	0	1.60	448	3.40	4.9	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.51	1.22	0.1	0.51	3.09	1.0	6.0	45.0	250	PVC	SDR 35	0.30	33.2	**18.18%**	0.67
R6A	6	5	0.20	0	24	0	65	0.20	65	3.63	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.20	0.20	0.1	0.8	37.4	200	PVC	SDR 35	1.00	33.4	**2.47%**	1.05
	5	4	0.00	0	0	0	0	1.79	512	3.37	5.6	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.22	0.1	0.00	3.29	1.1	6.8	26.4	250	PVC	SDR 35	0.30	33.2	**20.41%**	0.67
	4	2	0.00	0	0	0	0	1.79	512	3.37	5.6	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.22	0.1	0.00	3.29	1.1	6.8	33.6	250	PVC	SDR 35	0.30	33.2	**20.41%**	0.67
R3A	3	2	0.19	0	24	0	65	0.19	65	3.63	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.19	0.19	0.1	0.8	37.3	200	PVC	SDR 35	1.00	33.4	**2.47%**	1.05
	2	1	0.00	0	0	0	0	1.99	577	3.35	6.3	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.22	0.1	0.00	3.48	1.1	7.5	48.2	250	PVC	SDR 35	0.30	33.2	**22.63%**	0.67
																												250						

Appendix C
Storm Servicing



LEGEND

- PROPERTY LINE
- MISC LEGAL LINE (EASEMENT, PROPERTY LINES) REFER TO LEGAL PLAN FOR DETAILS
- PROPOSED SIDEWALK
- PROPOSED RETAINING WALL C/W RAILING
- PROPOSED CURB
- DC — PROPOSED DEPRESSED CURB
- SWALE c/w SUBDRAIN AND DIRECTION OF FLOW
- TERRACING 3:1 SLOPE MAX (UNLESS OTHERWISE INDICATED)
- STORM SEWER DRAINAGE AREA BOUNDARY
- 0.085 / A-16 / 0.78 — DRAINAGE AREA (ha) / DRAINAGE AREA ID / RUNOFF COEFFICIENT
- PROPOSED STORM SEWER AND MANHOLE
- PROPOSED STORMWATER MANAGEMENT PIPE
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED CATCHBASIN
- PROPOSED LANDSCAPE DRAIN
- PROPOSED ROOF DRAINS
- STM MH — EXISTING STORM MANHOLE & SEWER
- CB 1 — EXISTING CATCHBASIN
- EXISTING DITCH CENTRELINE

FLOWS FROM THE ROW-EASEMENT WERE ACCOUNTED FOR WITHIN THE 2370 TENTH LINE DESIGN

PRIVE DAVID LEWIS PRIVATE

PROMENADE DECOEUR DRIVE

TENTH LINE ROAD

RETIREMENT HOME
6 STOREY BUILDING + MECH. PENTHOUSE (141 UNITS)
FFE=88.55
PARKING GARAGE FFE = 85.50

1-STOREY PODIUM

TERRACE ON 2ND FLOOR

SUNROOM 3 STOREYS

PARKING ENTRANCE

LOADING AREA

MAIN ENTRANCE & EXIT

WATER ENTRY

SEA CAN

TRENCH DRAIN T/G=85.48

0.222 / A-02 / 0.50

0.025 / A-01 / 0.90

0.004 / D-01 / 0.40

0.082 / A-03 / 0.65

0.221 / R-00 / 0.90

0.028 / A-04 / 0.58

0.005 / D-02 / 0.49

LD 204 — LD 203 — 19.4m-250mmØ PERF STM @ 0.50% — CB 1 — 26.3m-250mmØ PERF STM @ 0.60% — CB 2 — 36.7m-250mmØ PERF STM @ 0.50% — CBMH 104

28.9m-250mmØ STM @ 0.50%

LD 202

4.9m-250mmØ STM @ 0.50%

3.6m-250mmØ STM @ 0.50%

4.6m-250mmØ STM @ 0.50%

13.2m-250mmØ STM @ 0.50%

LD 201

CBMH 102

26.6m-250mmØ STM @ 0.50%

STMMH 103

9.3m-250mmØ STM @ 2.00%

10.2m-250mmØ STM @ 2.00%

STMMH 101

STMMH 105

STMMH 106

49.3m-1350mmØ STM @ 0.10%

CB 3 — CB 4 — CB 5 — CB 6

SITE BENCHMARK No.2
Nail in Asphalt Path
Elev.=88.25

SITE BENCHMARK No.1
FH Top of Spindle
Elev.=88.86

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	REVISION	DATE	BY
4.	REVISED PER CITY COMMENTS	OCT 23/2026	ARM
3.	REVISED PER CITY COMMENTS	AUG 14/2026	ARM
2.	REVISED PER CITY SUPPORTABILITY COMMENT	APRIL 17/2026	ARM
1.	ISSUED FOR SPA	OCT 16/2025	ARM

SCALE: 1:300 (1:300, 0 3 6 9 12)

DESIGN: ARM/AM
CHECKED: ARM
DRAWN: MF/AM
CHECKED: ARM
APPROVED: GJM

FOR REVIEW ONLY

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
2380 TENTH LINE

DRAWING NAME
STORM WATER MANAGEMENT

PROJECT No. 125079
REV REV#4
DRAWING No. 125079-SWM

M:\2025\125079\CAD\Civil\125079-SWM.dwg, PLANS-A1, Oct 21, 2026 - 2:54pm, amuayqiu

PLANA1.DWG - 914mmx594mm

Novatech Project #: 125079
Project Name: 2380 Tenth Line
Date: 8/17/2026
Input By: Anjush Musyaju, EIT
Reviewed By: Anthony Mestwarp. P.Eng
Drawing Reference: 125079-SWM

Storm Tributary Area Coefficents

Area ID	Area (ha)	Imperivous Area (ha)	Proposed Pervious Area (ha)	Coefficent
		0.9	0.2	
D-01	0.004	0.001	0.003	0.40
D-02	0.005	0.002	0.003	0.49
A-01	0.025	0.025	0.000	0.90
A-02	0.222	0.096	0.126	0.50
A-03	0.082	0.053	0.029	0.65
A-04	0.028	0.015	0.012	0.58
R-00	0.221	0.221	0.000	0.90
	0.587	**1.313**	**0.173**	**2.07**

STORM SEWER DESIGN SHEET

Novatech Project #: 125079
Project Name: 2380 Tenth Line
Date: 9/4/2025
Revised: 4/9/2026
Revised: 8/17/2026
Input By: Anjush Musyaju, EIT
Reviewed By: Anthony Mestwarp. P.Eng
Drawing Reference: 125079-SWM

Storm Design Event = 2 Year

Legend:
- Design Input by User
- As-Built Input by User
- Cumulative Cell
- Calculated Design Cell Output
- Calculated Uncontrolled Peak Flow Cell Output
- Design Input Restricted Peak Flow Cell

Reference: City of Ottawa - Sewer Design Guidelines (2012 and TBs)
MOE - Design Guidelines for Sewage Works (2008)

Location				Flow									Design Capacity							
													Proposed Sewer Pipe Sizing / Design							
Street	Area ID	From MH	To MH	Hardscape Area 0.9	Pervious Area 0.2	Area A (ha.)	Runoff Coefficient C	Indivi. 2.78 AC	Accum. 2.78 AC	Time of Conc. Tc (min.)	Rain Intensity I (mm/hr)	Total Uncontrolled Peak Flow Q (L/s)	Pipe Length (m)	Pipe Size (mm) and Material	Pipe ID Actual (m)	Roughness n	Design Grade So (%)	Capacity Qfull (L/s)	Full Flow Velocity (m/s)	Time of Flow (min.)	Q / Qfull
Street One	A-01	Building	101	0.02	0	0.02	0.90	0.06	0.06	10.00	76.81	4.7	10.2	250 PVC	0.254	0.013	2.00	87.7	1.73	0.10	5.4%
Street One	A-03, A-04, R-00	105	101	0.29	0.04	0.33	0.81	0.75	0.75	10.00	76.81	57.3	5.1	250 PVC	0.254	0.013	1.00	62.0	1.22	0.07	92.4%
Street One	A-02	102	101-EX	0.10	0.13	0.22	0.50	0.31	0.31	10.00	76.81	23.9	26.6	250 PVC	0.254	0.013	0.50	43.9	0.87	0.51	54.5%
Street One		101	EXISTING					0.00	1.12	10.51	74.89	83.8	19.8	1200 CONC	1.2192	0.013	0.21	1863.9	1.60	0.21	4.5%
Totals						**0.58**		**1.12**					**61.7**							

Demand Equation / Parameters

1. Q = 2.78 ACI

Definitions

Q = Peak flow in litres per second (L/s)
A = Area in hectares (ha)
C = Weighted runoff coefficient (increased by 25% for 100-year)
I = Rainfall intensity in millimeters per hour (mm/hr)

Rainfall intensity is based on City of Ottawa IDF data presented in the City of Ottawa - Sewer Design Guidelines

Capacity Equation

Q full = $1000*(1/n)*A_p*R^{2/3}*So^{0.5}$

Definitions

Q full = Capacity (L/s)
n = Manning coefficient of roughness (0.013)
A_p = Pipe flow area (m^2)
R = Hydraulic Radius of wetted area (dia./4 for full pipes)
So = Pipe slope/gradient

PROJECT #: 125079
PROJECT NAME: 2380 Tenth Line
LOCATION: City of Ottawa

NOVATECH
Engineers, Planners & Landscape Architects

Date Prepared: October 2, 2025

TABLE 1A: Existing Conditions

Drainage Area	Area (HA)	"C"
Block 1	0.59	0.20
Total	0.59	0.20

Site Constraints	220	L/s/ha

* Stormwater Management Report for Cassette Subdivision', 2275 Mer-Bleue Road, City of Ottawa, May 2022, Updated July 2022, JFSA Ref. No.: 231-22, Prepard by JFSA

TABLE 1B: Allowable Flows

Outlet Options	**Area (ha)**	**Q_{ALLOW} (L/s)**
Promenade Decoeur Drive	0.587	**129.1**

TABLE 2A: Post-Development Runoff Coefficient "C" - D-01

Area	Surface	Ha	"C"	C_{avg}	*C_{100}
Total	Hard	0.001	0.90	0.40	0.46
0.004	Soft	0.003	0.20		

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

* Runoff Coefficient increases by 25% up to a maximum value of 1.00 for the 100-Year event

TABLE 2B: Post-Development D-01 Flows

Outlet Options	Area (ha)	C_{avg}	Tc (min)	$Q_{2\ Year}$ (L/s)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
David Lewis Private	0.004	0.40	10	**0.4**	**0.5**	**1.0**

Time of Concentration	Tc=	10	min
Intensity (2 Year Event)	I_2=	76.81	mm/hr
Intensity (5 Year Event)	I_5=	104.19	mm/hr
Intensity (100 Year Event)	I_{100}=	178.56	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014) $^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$
2 year Intensity = 732.951 / (Time in min + 6.199) $^{0.810}$

Equations:
Flow Equation
Q = 2.78 x C x I x A
Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

TABLE 3A: Post-Development Runoff Coefficient "C" - D-02

Area	Surface	Ha	"C"	C_{avg}	$*C_{100}$
Total	Hard	0.002	0.90	0.49	0.56
0.005	Soft	0.003	0.20		

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

* Runoff Coefficient increases by 25% up to a maximum value of 1.00 for the 100-Year event

TABLE 3B: Post-Development D-02 Flows

Outlet Options	Area (ha)	C_{avg}	Tc (min)	$Q_{2\ Year}$ (L/s)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
Promenade Decoeur Drive	0.005	0.49	10	**0.5**	**0.7**	**1.4**

Time of Concentration	Tc=	10	min
Intensity (2 Year Event)	I_2=	76.81	mm/hr
Intensity (5 Year Event)	I_5=	104.19	mm/hr
Intensity (100 Year Event)	I_{100}=	178.56	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014) $^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$
2 year Intensity = 732.951 / (Time in min + 6.199) $^{0.810}$

Equations:
Flow Equation
Q = 2.78 x C x I x A
Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

TABLE 4A: Post-Development Runoff Coefficient "C" - A-01

Area	Surface	Ha	"C"	C_{avg}	*C_{100}
Total	Hard	0.025	0.90	0.90	1.00
0.025	Soft	0.000	0.20		

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

* Runoff Coefficient increases by 25% up to a maximum value of 1.00 for the 100-Year event

TABLE 4B: Post-Development A-01 Flows

Outlet Options	Area (ha)	C_{avg}	Tc (min)	$Q_{2\ Year}$ (L/s)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
Promenade Decoeur Drive	0.025	0.90	10	**4.7**	**6.4**	**12.2**

Time of Concentration	Tc=	10	min
Intensity (2 Year Event)	I_2=	76.81	mm/hr
Intensity (5 Year Event)	I_5=	104.19	mm/hr
Intensity (100 Year Event)	I_{100}=	178.56	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014) $^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$
2 year Intensity = 732.951 / (Time in min + 6.199) $^{0.810}$

Equations:
Flow Equation
Q = 2.78 x C x I x A
Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

TABLE 5A: Post-Development Runoff Coefficient "C" - A-02

			5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" + 25%	$*C_{avg}$
Total	Hard	0.096	0.90	0.50	1.00	0.58
0.222	Roof	0.000	0.90		1.00	
	Soft	0.126	0.20		0.25	

TABLE 5B: 2 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-02

0.222 =Area (ha)
0.50 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)*	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
2 YEAR	0	167.22	52.03	16.2	35.88	0.00
	5	103.57	32.23	16.2	16.08	4.82
	10	**76.81**	**23.90**	**16.2**	**7.75**	**4.65**
	15	61.77	19.22	16.2	3.07	2.76
	20	52.03	16.19	16.2	0.04	0.05

TABLE 5C: 5 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-02

0.222 =Area (ha)
0.50 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)*	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
5 YEAR	0	230.48	71.71	18.800	52.91	0.00
	5	141.18	43.93	18.800	25.13	7.54
	10	**104.19**	**32.42**	**18.800**	**13.62**	**8.17**
	15	83.56	26.00	18.800	7.20	6.48
	20	70.25	21.86	18.800	3.06	3.67

TABLE 5D: 100 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-02

0.222 =Area (ha)
0.58 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)*	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
100 YEAR	5	242.70	86.26	24.75	61.51	18.45
	10	178.56	63.46	24.75	38.71	23.23
	15	**142.89**	**50.79**	**24.75**	**26.04**	**23.43**
	20	119.95	42.63	24.75	17.88	21.46
	25	103.85	36.91	24.75	12.16	18.24

TABLE 5E: 100 YEAR + 20% EVENT QUANTITY STORAGE REQUIREMENT - A-02

0.222 =Area (ha)
0.58 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)*	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
100 YEAR + 20	5	291.24	103.51	29.3	74.26	22.28
	10	214.27	76.15	29.3	46.90	28.14
	15	**171.47**	**60.94**	**29.3**	**31.69**	**28.52**
	20	143.94	51.16	29.3	21.91	26.29
	25	124.62	44.29	29.3	15.04	22.56

Equations:

Flow Equation

$Q = 2.78 \times C \times I \times A$

Where:

C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

Runoff Coefficient Equation

$C_5 = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

$C_{100} = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{Tot}$

* Allowable run-off is 50% of the actual flow to calculate the required volume as per city of Ottawa Guidelines for underground storage

TABLE 5F: Catchbasin - A-02

Structures	Size Dia.(mm)	Area (m^2)	T/G	Inv OUT
LD 204	300	0.07	87.83	86.57
LD 203	300	0.07	87.7	86.52
CB 1	610X610	0.37	87.88	86.41
CB 2	610X610	0.37	87.88	86.25
CBMH 104	1200	1.13	87.90	85.80
LD 202	300	0.07	88.05	86.85
LD 201	300	0.07	88.05	86.8
STMMH 103	1200	1.13	88.26	85.47
CBMH 102	1200	1.13	87.97	**84.96**

TABLE 5F: Pipe - A-02

Structures	Dia.(mm)	Area (m^2)	Upstream inv	Down stream invert	Length (m)*	Volume (m^3)
CBMH 104 - STMMH 103	250	0.05	85.80	85.53	53.99	2.65
STMMH 103 - CBMH 102	250	0.05	85.47	85.43	6.70	0.33
LD 202 - MAIN	250	0.05	86.80	86.76	3.75	0.18
LD 201-STMMH 103	250	0.05	86.80	86.77	2.25	0.11
* Length is edge of structure to edge of structure						**3.27**

TABLE 5G: Underground Storage (Perforated Pipe) - A-02

MH to MH (U/S to D/S)	Pipe Data			Trench Dimensions				Storage Volumes (m^3)		
	Up Stream Invert (m)	*Downstream Invert* (m)	Pipe Dia. (mm)	Length (m)	Height* (m)	Width (m)	Porosity	Perf. Pipe	Stone**	TOTAL
LD 204-LD 203	86.57	86.53	250	8.6	0.55	0.85	0.3	0.42	1.1	1.5
LD 203 - CB 1	86.52	86.42	250	18.95	0.55	0.85	0.3	0.93	2.4	3.3
CB 1 - CB 2	86.41	86.26	250	25.69	0.55	0.85	0.3	1.26	3.2	4.5
CB07 – CB06	86.25	86.07	250	35.795	0.55	0.85	0.3	1.76	4.5	6.3
Total Length (North) =		**69.1**				**Total Storage (North) =**		**4.4**	**11.2**	**15.5**

*Height of trench does not include 0.15m of clearstone below the subdrain.
** Based on 30% porosity in the clear stone

TABLE 5H: Storage Provided -A-02

Area A-05: Above Ground Ponding			
Elevation (m)	LD 203 Ponding Depth (m)	LD 203 Area* (m^2)	Storage Volume (m^3)
87.7	0.000	0.360	0.00
87.75	0.050	0.922	0.03
87.8	0.100	3.507	0.14
87.85	0.150	7.079	0.41
87.88	0.180	7.079	0.62

TABLE 5I: Storage Provided - A-02

Storage Table														
Elevation (m)	System Depth (m)	CBMH 102 Volume (m^3)	STMMH 103 Volume (m^3)	LD 201 Volume (m^3)	LD 202 Volume (m^3)	CBMH 104 Volume (m^3)	CB 1 Volume (m^3)	CB 2 Volume (m^3)	LD 203 Volume (m^3)	LD 204 Volume (m^3)	Pipe Volume (m^3)	Underground Volume (m^3)*	Ponding Volume (m^3)	**Total Volume (m^3)**
84.960	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	**0.00**
86.050	1.09	1.233	0.656	0.000	0.000	0.283	0.000	0.000	0.00	0.00	3.27	5.45	0.00	**5.45**
87.120	2.16	2.443	1.866	0.023	0.019	1.493	0.264	0.324	0.04	0.04	18.82	25.33	0.00	**25.33**
87.270	2.31	2.613	2.036	0.033	0.030	1.663	0.320	0.380	0.05	0.05	-	26.00	0.00	**26.00**
87.420	2.46	2.782	2.205	0.044	0.040	1.832	0.376	0.435	0.06	0.06	-	26.66	0.00	**26.66**
87.570	2.61	2.952	2.375	0.054	0.051	2.002	0.432	0.491	0.07	0.07	-	27.32	0.00	**27.32**
87.700	2.74	3.099	2.522	0.064	0.060	2.149	0.480	0.540	0.08	0.08	-	27.90	0.00	**27.90**
87.750	2.79	3.155	2.579	0.067	0.064	2.205	0.499	0.558	0.09	0.08	-	28.12	0.00	**28.12**
87.800	2.84	3.212	2.635	0.071	0.067	2.262	0.517	0.577	-	0.09	-	28.33	0.03	**28.37**
87.830	2.87	3.246	2.669	0.073	0.069	2.296	0.528	0.588	-	0.09	-	28.47	0.14	**28.61**
87.850	2.89	3.269	2.692	0.074	0.071	2.318	0.536	0.595		-		28.55	0.41	**28.96**

TABLE 5J: Orifice Sizing information - A-02

Control Device								
Plate Oriface	*127*							
Design Event	**Uncontrolled Flow (L/s)**	**Controlled Flow (L/S)**	**Head (m)**	**Elev (m)**	**Outlet dia. (mm)**	**Volume (m^3)**	**Area (m^2)**	**Equivelent Dia. (mm)**
1:2 Year	23.90	32.3	0.87	85.89	250	4.65	0.0126	127.0
1:5 Year	32.42	37.6	1.17	86.20	250.00	8.17	0.0126	127.0
1:100 Year	63.46	49.5	1.99	87.02	250.00	23.43	0.0128	127.0
1:100 + 20 Year	76.15	58.5	2.80	87.82	250.00	28.52	0.0127	127.0

The design Head is calculated based on the centre of the orifice at the bottom of the pipe
Where the equivelent controlled flow excceds the uncontrolled flow with a 10 minute time of concentration the storm event is uncontrolled by the ICD

Orifice Control Sizing
$Q = 0.62 \times A \times (2gh) \times 0.5$
Q is the release rate in m^3/s
A is the orifice area in m^2
g is the acceleration due to gravity, 9.81 m/s^2
h is the head of water above the orifice centre in m
d is the diameter of the orifice in m

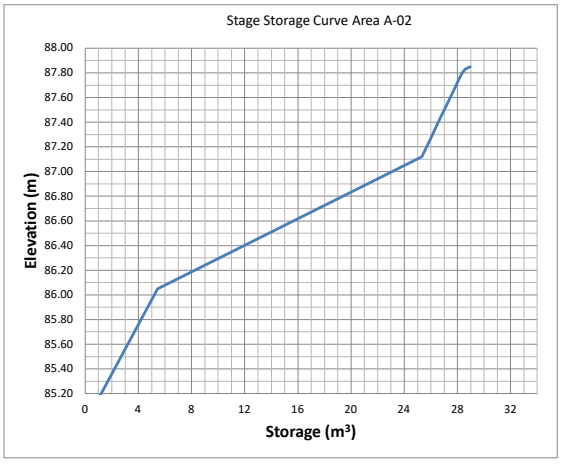


TABLE 6A: Post-Development Runoff Coefficient "C" - A-03, A-04, R-0(

			5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" + 25%	$*C_{avg}$
Total	Hard	0.068	0.90	0.81	1.00	0.91
0.330	Roof	0.221	0.90		1.00	
	Soft	0.041	0.20		0.25	

TABLE 6B: 2 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-03, A-04, R-0(

0.330 =Area (ha)
0.81 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)*	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
2 YEAR	10	76.81	57.28	16.75	40.53	24.32
	15	61.77	46.06	16.75	29.31	26.38
	20	**52.03**	**38.80**	**16.75**	**22.05**	**26.46**
	25	45.17	33.68	16.75	16.93	25.40
	30	40.04	29.86	16.75	13.11	23.60

TABLE 6C: 5 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-03, A-04, R-0(

0.330 =Area (ha)
0.81 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)*	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
5 YEAR	10	104.19	77.70	20.50	57.20	34.32
	15	83.56	62.31	20.50	41.81	37.63
	20	**70.25**	**52.39**	**20.50**	**31.89**	**38.27**
	25	60.90	45.41	20.50	24.91	37.37
	30	53.93	40.22	20.50	19.72	35.49

TABLE 6D: 100 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-03, A-04, R-0(

0.330 =Area (ha)
0.91 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)*	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
100 YEAR	15	142.89	118.86	31.00	87.86	79.07
	20	119.95	99.77	31.00	68.77	82.53
	25	**103.85**	**86.38**	**31.00**	**55.38**	**83.07**
	30	91.87	76.41	31.00	45.41	81.75
	35	82.58	68.69	31.00	37.69	79.14

TABLE 6E: 100 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-03, A-04, R-0(

0.330 =Area (ha)
0.91 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)*	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
100 YEAR + 20	10	214.27	178.23	39.6	138.63	83.18
	15	171.47	142.63	39.6	103.03	92.72
	20	**143.94**	**119.73**	**39.6**	**80.13**	**96.15**
	25	124.62	103.65	39.6	64.05	96.08
	30	110.24	91.70	39.6	52.10	93.77

Equations:

Flow Equation

$Q = 2.78 \times C \times I \times A$

Where:

C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

Runoff Coefficient Equation

$C_5 = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

$C_{100} = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{Tot}$

* Allowable run-off is 50% of the actual flow to calculate the required volume as per city of Ottawa Guidelines for underground storage

TABLE 6F: Catchbasin - A-03, A-04, R-00

Structures	Size Dia.(mm)	Area (m^2)	T/G	Inv OUT
STMMH106	2400	4.52	87.82	85.22
STMMH105	2400	4.52	88.17	85.16
CB3	610X610	0.37	87.95	86.45
CB4	610X610	0.37	87.77	86.27
CB5	610X610	0.37	87.75	86.25
CB6	610X610	0.37	87.98	86.48

TABLE 6G: Pipe - A-03, A-04, R-00

Structures	Dia.(mm)	Area (m^2)	Upstream inv	Down stream invert	Length* (m)	Volume
CBMH106-CBMH105	1372	1.48	85.22	85.17	46.90	69.34
CB3-LEAD	250	0.05	86.45	85.94	11.20	0.55
CB4-LEAD	200	0.03	86.27	86.21	2.80	0.09
CB5-LEAD	200	0.03	86.25	86.19	2.80	0.09
CB6-STMMH105	200	0.03	86.60	86.57	5.00	0.16

* Length is edge of structure to edge of structure

TABLE 6H: Storage Provided - A-03, A-04, R-00

Area A-05: Above Ground Ponding					
Elevation (m)	CB4 Ponding Depth (m)	CB4 Area* (m^2)	CB5 Ponding Depth (m)	CB5 Area* (m^2)	Storage Volume (m^3)
87.75	0.000	0.000	0.000	0.360	0.00
87.77	0.000	0.360	0.020	2.878	0.03
87.8	0.030	5.883	0.050	8.862	0.30
87.82	0.050	11.836	0.070	14.623	0.71
87.85	0.080	24.448	0.100	27.189	1.89
87.88	0.110	42.243	0.130	40.188	3.90

TABLE 6I: Storage Provided - A-03, A-04, R-00

Storage Table											
Elevation (m)	System Depth (m)	STMMH106 Volume (m^3)	STMMH105 Volume (m^3)	CB3 Volume (m^3)	CB4 Volume (m^3)	CB5 Volume (m^3)	CB6 Volume (m^3)	Pipe Volume (m^3)	Underground Volume (m^3)*	Ponding Volume (m^3)	**Total Volume (m^3)**
85.160	0.00	0.00	0.00	0.00	-	-	-	0.00	0.00	0.00	**0.00**
86.700	1.54	0.00	6.97	0.09	0.16	0.17	0.08	70.22	77.69	0.00	**77.69**
86.800	1.64	7.15	7.42	0.13	0.20	0.20	0.12	-	85.44	0.00	**85.44**
86.950	1.79	7.83	8.10	0.19	0.25	0.26	0.17	-	87.02	0.00	**87.02**
87.100	1.94	8.50	8.78	0.24	0.31	0.32	0.23	-	88.60	0.00	**88.60**
87.250	2.09	9.18	9.45	0.30	0.36	0.37	0.29	-	90.18	0.00	**90.18**
87.400	2.24	9.86	10.13	0.35	0.42	0.43	0.34	-	91.76	0.00	**91.76**
87.550	2.39	10.54	10.81	0.41	0.48	0.48	0.40	-	93.34	0.00	**93.34**
87.700	2.54	11.22	11.49	0.47	0.53	0.54	0.45	-	94.92	0.00	**94.92**
87.750	2.59	11.45	11.72	0.48	0.55	0.56	0.47	-	95.45	0.00	**95.45**
87.770	2.61	11.54	11.81	0.49	0.56	-	0.48	-	95.65	0.03	**95.68**
87.800	2.64	11.67	11.94	0.50	-	-	0.49	-	95.94	0.30	**96.25**
87.820	2.66	11.76	12.03	0.51	-	-	0.50	-	96.14	0.71	**96.85**
87.850	2.69	-	12.17	0.52	-	-	0.51	-	96.30	1.89	**98.18**
87.880	2.72	-	12.30	0.53	-	-	0.52	-	96.46	3.90	**100.35**

TABLE 6J: Orifice Sizing information - A-03, A-04, R-00

Control Device							
Plate Orifice	*152*						
Design Event	**Flow (L/S)**	**Head (m)**	**Elev (m)**	**Outlet dia. (mm)**	**Volume (m^3)**	**Area (m^2)**	**Equivelent Dia. (mm)**
1:2 Year	33.50	0.45	85.68	250	26.46	0.0182	152.0
1:5 Year	41.00	0.68	85.92	250.00	38.27	0.0181	152.0
1:100 Year	62.00	1.53	86.77	250.00	83.07	0.0182	152.0
1:100 + 20 Year	79.20	2.56	87.79	250.00	96.15	0.0180	152.0

The design Head is calculated based on the centre of the orifice at the bottom of the pipe

Orifice Control Sizing

Q = 0.62 x A x (2gh) x 0.5
Q is the release rate in m^3/s
A is the orifice area in m^2
g is the acceleration due to gravity, 9.81 m/s^2
h is the head of water above the orifice centre in m
d is the diameter of the orifice in m

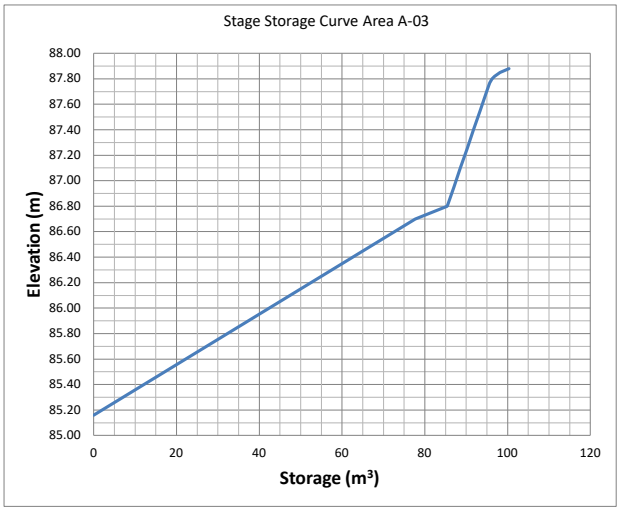


Table 9: Post-Development Stormwater Management Summary

Area ID	Area (ha)	1:5 Year Weighted Cw	1:100 Year Weighted Cw	Control Device		Outlet Location	2 Year Storm Event			5 Year Storm Event			100 Year Storm Event			
							Release (L/s)	Head (m)	Req'd Vol (cu.m)	Release (L/s)	Head (m)	Req'd Vol (cu.m)	Release (L/s)	Head (m)	Req'd Vol (cu.m)	Max. Vol. Provided (cu.m.)
D-01	0.004	0.40	0.46	N/A		David Lewis Private	0.40	N/A	N/A	0.50	N/A	N/A	1.00	N/A	N/A	N/A
D-02	0.005	0.49	0.56	N/A		Promenade Decoeur Drive	0.50	N/A	N/A	0.70	N/A	N/A	1.40	N/A	N/A	N/A
A-01	0.025	0.90	1.00	N/A		Promenade Decoeur Drive	4.70	N/A	N/A	6.40	N/A	N/A	12.20	N/A	N/A	N/A
A-02	0.222	0.50	0.58	Plate Oriface	127	Promenade Decoeur Drive	23.90	N/A	N/A	32.42	N/A	N/A	49.50	1.994	23.43	28.96
R00, A-03, A-04	0.330	0.81	0.91	Plate Oriface	152	Promenade Decoeur Drive	33.50	0.448	26.46	41.00	0.683	38.267	62.00	1.533	83.07	100.35
Post-Development Flow							**63.0**	**-**		**81.0**	**-**		**126.1**	**-**		
Total Allowable Release Rate							**129.1**			**129.1**			**129.1**			

Atrel Report Excerpts

ii) The storm sewer on Des Aubépines Drive (referred as the Eastern Trunk as per IBI Group Report) is already constructed and is designed to carry the flow from this proposed development. The trunk information was extracted from IBI's As-Built Drawings of Neighbourhood 5, Phase 1, dated December 17th, 2009.

iii) There is an existing 28.0m – 675mmø sanitary concrete stub west of existing San MH 15166 located on Tenth Line Rd near the pumping station.

iv) It is proposed to connect directly on these services as they have been designed accordingly. The watermain, storm and sanitary sewer design of Avalon West Stage 3 were done in conjunction with IBI's reports titled "Mer Bleue Community Design Plan Infrastructure Servicing Study report dated April 2006" and "Avalon West (Neighbourhood 5), Stormwater Management Facility Design, Revision 5" dated October 2013.

1.4 Storm Sewer

The "Mer Bleue Community Design Plan Infrastructure Servicing Study" and "Avalon West (Neighbourhood 5), Stormwater Management Facility Design Report" prepared by IBI Group recommends that the storm water of Avalon West Stage 3 be conveyed to the future Storm Water Management (SWM) Basin located south of Neigbourhood 5. The Avalon West Stage 3 development falls within the Eastern Trunk watershed, which conveys its runoff to a SWM pond. This SWM facility (designed by others) will control both the quantity and quality of the storm water from Avalon West Stage 3. The attenuated flow will then discharge via a storm sewer, which will outlet into the McKinnon Creek located south of the proposed pond. According to IBI Group's memo"Update to Avalon West Stormwater Management Facility Design Report: Proposed Mattamy Bisson Lands" dated November 3, 2014 the pond level for the 100yr will be 84.65 m once the Mattamy Bisson lands are developed.

1.4.1 Design Constraints

The main storm drainage design constraints can be summarized as follows:

a) Minor System

1) Storm sewer will be designed using the Rational formula for the 5 year storm using an inlet time of 10 minutes for roads.
2) All residential inlets will be equipped with flow restrictors. The term "inlet" means "a single catch basin" or "a group of interconnected catchbasins" connected by a single lead into the minor system. The inflow rate into the minor system shall be 220 L/s/ha, as per IBI's report.
3) Catch basin densities and capacities for commercial development should be assessed on a site specific basis to limit the inflow into the minor system to a maximum of 220 L/s/ha, as per IBI's report.
4) Green space areas shall be restricted to 220L/s/ha, as per IBI's report.
5) The arterial roads area shall be restricted to a 1:10 year storm and a 10 minute inlet time which represents 238 l/s/ha according to IBI's report.

6) The hydraulic grade line shall be computed and the maximum permitted hydraulic grade line elevation is to be 0.30m below the underside of footing.
7) Dynamic modelling shall be provided for all submerged outlets.

b) Major System

1) Grading design is to be based on split lot drainage.
2) The commercial developments and green space shall be designed to provide an on-site storage to retain the 100 year storm event.
3) On site detention storage of 124 m^3/ha for Townhouses, 108 m^3/ha for single family units and 168 m^3/ha for stacked homes may be provided in the following areas:
   i) Road low points (Sawtoothing design)
   ii) Parking Areas on private sites

c) Street and Rear Yard Emergency Overflow

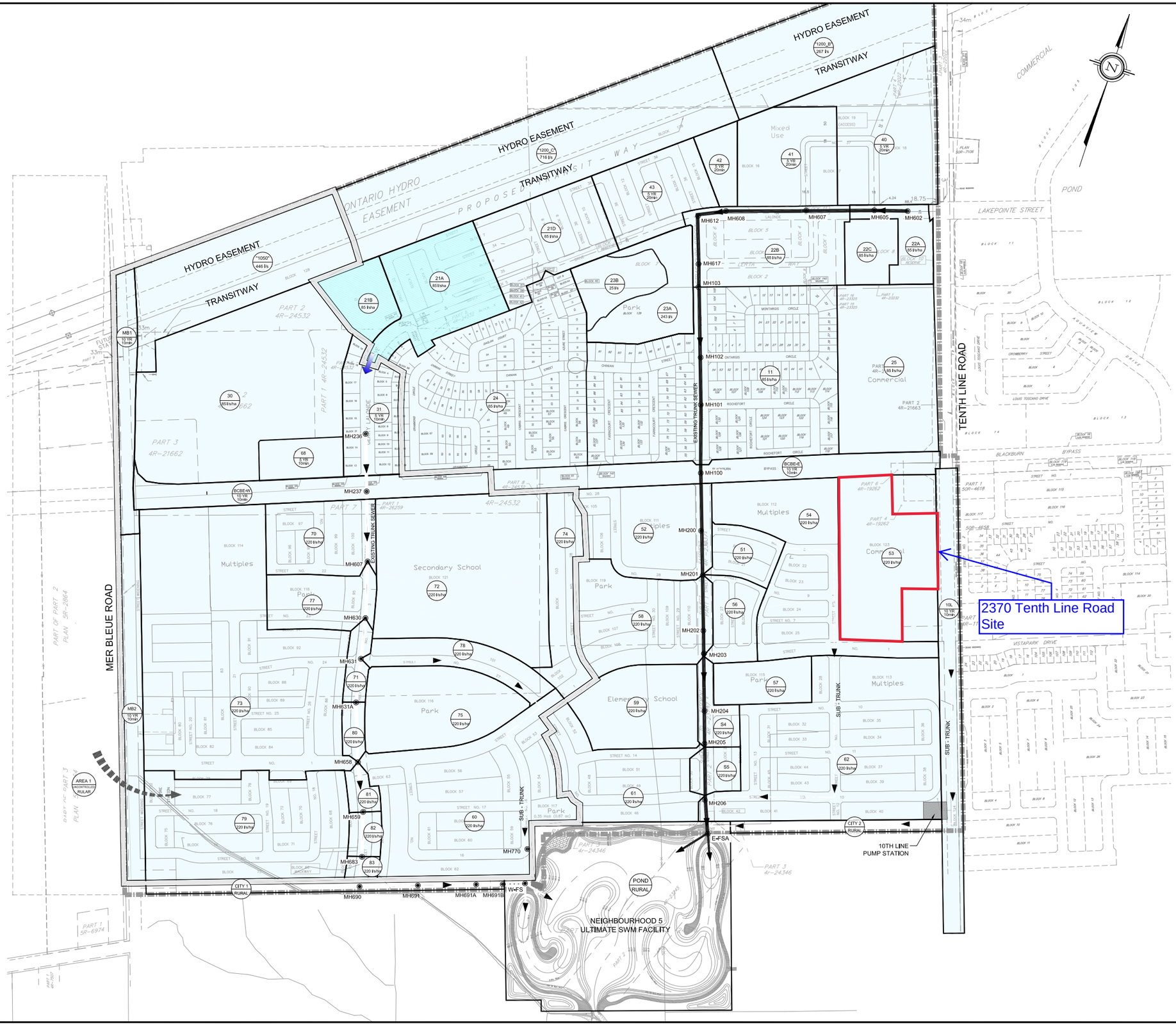
1) On street routing to emergency storage area must be provided and illustrated on the grade control plan. This routing must incorporate a maximum 0.30m flow depth on street under either static or dynamic conditions. An overall positive slope of 0.10% will be required across consecutive high points for routing purposes.
2) A maximum ponding depth of 0.30m will be allowed in the rear yards.
3) A ponding area plan that includes an identification number, the area, the depth, the volume and an elevation will be required.

d) Water Quality

An Enhanced Level of Protection (80 % removal of Total Suspended Solids) will be achieved in the ultimate stormwater management wet pond, as per IBI's reports. The Best Management Practices should also be implemented within the subdivision design and during construction.

e) Geotechnical Constraints

The geotechnical investigation conducted for Neighbourhood 5 – Avalon West indicates that the low lying lands are prone to an excessive soil consolidation, and can only be developed with grade raise restriction or by using non-standard techniques, such as structural slabs.



LEGEND:

- NEIGHBOURHOOD 5 BOUNDARY LINE
- EXISTING EASTERN TRUNK SEWER
- EXISTING WESTERN TRUNK SEWER
- FUTURE WESTERN TRUNK SEWER
- DRAINAGE BOUNDARIES
- WESTERN TRUNK DRAINAGE BOUNDARY
- SUB - TRUNK
- 70 — 5 YR 10ha/s — AREA ID / LEVEL OF SERVICE
- AREA CONTRIBUTED MAJOR FLOW TO WESTERN TRUNK (MINOR TO EASTERN TRUNK)
- MAJOR FLOW
- MH607 — TRUNK STORM SEWER MANHOLE

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6			
5	REVISED AS PER CITY COMMENTS	P.S.	13/10/25
4	REVISED AS PER CITY COMMENTS	P.S.	13/09/19
3	REVISED AS PER CITY COMMENTS	P.S.	13/04/08
2	REVISED AS PER CITY COMMENTS	P.S.	12/08/14
1	ISSUED TO CITY	P.S.	12/05/30

IBI GROUP
333 Preston Street
Tower 1, Suite 400
Ottawa, Ontario
Canada K1S 5N4
Tel (613)225-1311
FAX (613)225-9868

Project Title
AVALON WEST (N5)
STORMWATER MANAGEMENT FACILITY DESIGN

Drawing Title
DRAINAGE AREA LEVEL OF SERVICE

Scale
1:3000

Design	Date
R.B.	FEB. 2012
Drawn	Checked
S.V.	P.S.
Project No.	Drawing No.
30113	FIGURE 3

J:\30113-Avalon\DWG\5.0 Drawings\Sheet\Current\Autocad\Rev5-1\Figures\Figure 3(N5_09-17-2013).dwg Layout Name - Figure 3 Plot Style: AIA STANDARD_COLOR.ctb(CTB) Plot Scale: 1:1 Plotted At: 10/25/2013 3:06 PM Plotted By: SUMON VIANO Last Saved By: Sheila Last Saved At:

STORM SEWER COMPUTATION FORM

DESIGNED BY: AGS
CHECKED BY: JMD

Neighbourhood 5 - Avalon West - STAGE 3
Minto Communities Inc.
131004
ATREL ENGINEERING LTD
November 2014

STORM FREQUENCY : 5 YEAR
RATIONAL METHOD Q= 2.78 AIR
PVC/CONC N= 0.013
CSP N= 0.024
CORR N= 0.021

Table 1

STREET NAMES	LOCATION FROM (Up)		TO (Down)		AREA (ha.) RUNOFF COEFFICIENT 0.20	0.27	0.29	0.30	0.36	0.39	0.45	0.48	0.50	0.55	0.60	0.62	0.65	0.70	0.75	0.80	0.85	0.70	0.70	0.76
Future Site Plan	MH	Stub1	MH	602																				0.70
Bluestone Private	MH	601	MH	602														0.64						
G.Lalonde Drive	MH	602	MH	605											0.34									
Bluestone Private	MH	603	MH	605													0.28	0.61						
Future Site Plan	MH	Stub2	MH	605		4.94																		3.65
G.Lalonde Drive	MH	605	MH	607											0.19									
Future Site Plan	MH	Stub3	MH	607																				1.33
G.Lalonde Drive	MH	607	MH	608													0.25							
Future Street	MH	Stub4	MH	608												0.74								1.50
G.Lalonde Drive	MH	608	MH	612													0.56							
Petrichor Crescent	MH	650	MH	651										0.27	0.17									
Petrichor Crescent	MH	651	MH	652														0.35						
G.Lalonde Drive	MH	652	MH	654									0.18											
Petrichor Crescent	MH	653	MH	654														0.58						
G.Lalonde Drive	MH	654	MH	655									0.19											
G.Lalonde Drive	MH	655	MH	612																				
Petrichor Crescent	MH	656	MH	658										0.27	0.20									
Transit Way/Hydro	MH	657	MH	658			9.47																	
Petrichor Crescent	MH	658	MH	612										0.18				0.38						
Strasbourg Street	MH	612	MH	617													0.25							
Lerta Crescent	MH	613	MH	614							0.20						0.31							
Lerta Crescent	MH	614	MH	615							0.21													
Lerta Crescent	MH	615	MH	616							0.28						0.37							
Lerta Crescent	MH	616	MH	617							0.59						0.40							
Strasbourg Street	MH	617	MH	1103													0.07							
Strasbourg Street	MH	1103	MH	1102				1.89			0.51													
G.Lalonde Drive	MH	234	MH	233													0.37							
G.Lalonde Drive	MH	233	MH	211													0.18							
G. Lalonde Drive	MH	624	MH	211										0.14				0.27						
Trigoria Crescent	MH	680	MH	681													0.27							
Future Site Plan	MH	690	MH	681										0.18							0.32			
Trigoria Crescent	MH	681	MH	682																				
Future Site Plan	MH	691	MH	692													0.06			0.32				
Future Site Plan	MH	692	MH	682																0.21				
Trigoria Crescent	MH	682	MH	211														0.22						
Chinian Street	MH	211	MH	210						0.55			0.16											
Chinian Street	MH	210	MH	209																				
Chinian Street	MH	209	MH	208											0.33									
Chinian Street	MH	208	MH	207						0.37														
Chinian Street	MH	207	MH	206																				
Petrichor Crescent	MH	629	MH	630										0.32				0.63						
G. Lalonde Drive	MH	630	MH	635				1.25					0.15											
G. Lalonde Drive	MH	633	MH	634										0.16				0.31						
G. Lalonde Drive	MH	634	MH	635														0.25						
Trigoria Crescent	MH	660	MH	661															0.52					
Trigoria Crescent	MH	661	MH	662															0.29					
Trigoria Crescent	MH	662	MH	663																				
Trigoria Crescent	MH	663	MH	667																				
Citrine Street	MH	665	MH	666														0.50						
Citrine Street	MH	666	MH	667														0.25						
Trigoria Crescent	MH	667	MH	673														0.27						
Nacarat Street	MH	670	MH	671										0.27				0.13						
Tungsten Terrace	MH	671	MH	672											0.20									
Tungsten Terrace	MH	672	MH	673											0.35									
Trigoria Crescent	MH	673	MH	635																				

STREET NAMES	FROM (Up)	TO (Down)	RATIONAL METHOD INDIV. 2.78AR	ACCUM. 2.78AR	5 YEAR TIME CONC. (MIN)	RAINF. INTENS. (MM/HR)	FLOW (L/S)	Commercial & green space area Restr Flow (L/S)	Cum Flow (L/S)	**ACTUAL PIPE FLOW (L/S)**	PIPE TYPE	DIA. (N0M) (mm)	(ACT)	SEWER DATA SLOPE (%)	LENGTH (M)	CAP. (L/S)	Remaining Capacity (%)	VEL. (M/S)	TIME OF FLOW (MIN)	UpStream Obv. (M)	UpStream Inv. (M)	Forced drop (M)	Inv to Inv (M)	DwStream Obv. (M)	DwStream Inv. (M)	**UpStream Hgl at UP-MH (M)**	Hgl Out UP-MH (M)	Down MH Hgl (M)	SURG AT UP MH (M)	UpStream USF ELEV (M)	HGL FREEBOARD (M)	Comment
Future Site Plan	Stub1	602			15.00	83.56		103.91	103.91	103.91	CONC	450	457.2	0.20	9.0	133.02	22%	0.81	0.19	86.05	85.60	0.54	no	86.03	85.58	86.05	86.05	86.04		n/a	n/a	n/a
Bluestone Private	601	602	1.25	1.25	15.00	83.56	104.07			104.07	CONC	525	533.4	1.03	112.0	455.34	77%	2.04	0.92	86.62	86.10	-0.02	no	85.47	84.95	86.62	86.62	86.04		87.50	0.88	OK
G.Lalonde Drive	602	605	0.57	1.81	15.92	80.71	146.29		103.91	250.20	CONC	600	609.6	0.20	82.5	286.47	13%	0.98	1.40	85.49	84.89	-0.59	no	85.32	84.72	86.04	86.04	85.91	0.55	87.50	1.46	OK
Bluestone Private	603	605	1.69	1.69	15.00	83.56	141.47			141.47	CONC	525	533.4	1.20	112.5	491.48	71%	2.20	0.85	86.49	85.97	-0.77	no	85.14	84.62	86.49	86.49	85.91		87.38	0.89	OK
Future Site Plan	Stub2	605			15.00	83.56		813.80	813.80	813.80	CONC	975	990.6	0.16	9.0	935.18	13%	1.21	0.12	85.94	84.97	0.02	no	85.93	84.96	85.94	85.94	85.93		n/a	n/a	n/a
G.Lalonde Drive	605	607	0.32	3.82	17.32	76.75	293.38		917.71	1211.09	CONC	1350	1371.6	0.10	80.0	1760.81	31%	1.19	1.12	85.91	84.56		no	85.83	84.48	85.91	85.91	85.83		86.78	0.87	OK
Future Site Plan	Stub3	607			15.00	83.56		197.43	197.43	197.43	CONC	600	609.6	0.15	9.0	248.09	20%	0.85	0.18	85.84	85.24		no	85.83	85.23	85.84	85.84	85.83		n/a	n/a	n/a
G.Lalonde Drive	607	608	0.45	4.27	18.44	73.88	315.78		1115.14	1430.92	CONC	1350	1371.6	0.10	103.0	1760.81	19%	1.19	1.44	85.83	84.48		no	85.73	84.38	85.83	85.83	85.76		86.74	0.91	OK
Future Street	Stub4	608	1.28	1.28	15.00	83.56	106.58	222.66	222.66	329.24	CONC	750	762.0	0.15	9.0	449.81	27%	0.99	0.15	85.74	84.99		no	85.73	84.98	85.77	85.77	85.76	0.03	n/a	n/a	n/a
G.Lalonde Drive	608	612	1.01	6.56	19.88	70.52	462.73		1337.80	1800.52	CONC	1350	1371.6	0.12	94.0	1928.87	7%	1.31	1.20	85.73	84.38	0.05	no	85.62	84.27	85.76	85.76	85.66	0.03	86.70	0.94	OK
Petrichor Crescent	650	651	0.70	0.70	10.00	104.19	72.56			72.56	PVC	375	366.4	0.26	39.5	84.05	14%	0.80	0.83	86.16	85.79		no	86.06	85.69	86.17	86.17	86.09	0.01	n/a	n/a	n/a
Petrichor Crescent	651	652	0.68	1.38	10.83	100.02	137.78			137.78	CONC	525	533.4	0.16	111.0	179.46	23%	0.80	2.30	86.06	85.54		no	85.88	85.36	86.09	86.06	85.88		86.71	0.65	OK
G.Lalonde Drive	652	654	0.25	1.63	13.13	90.13	146.70			146.70	CONC	525	533.4	0.16	51.5	179.46	18%	0.80	1.07	85.82	85.30		no	85.74	85.22	85.86	85.83	85.77	0.01	n/a	n/a	n/a
Petrichor Crescent	653	654	1.13	1.13	10.00	104.19	117.60			117.60	CONC	525	533.4	0.20	118.5	200.65	41%	0.90	2.20	85.98	85.46		no	85.74	85.22	85.98	85.98	85.77		86.63	0.65	OK
G.Lalonde Drive	654	655	0.26	3.02	14.20	86.24	260.49			260.49	CONC	675	685.8	0.15	54.0	339.63	23%	0.92	0.98	85.74	85.07		no	85.66	84.99	85.77	85.74	85.66		n/a	n/a	n/a
G.Lalonde Drive	655	612		3.02	15.18	82.99	250.67			250.67	CONC	1200	1219.2	0.15	19.0	1575.26	84%	1.35	0.23	85.66	84.46	0.06	no	85.63	84.43	85.66	85.66	85.66		n/a	n/a	n/a
Petrichor Crescent	656	658	0.75	0.75	10.00	104.19	77.77			77.77	PVC	375	366.4	0.35	37.5	97.52	20%	0.92	0.68	85.87	85.50		no	85.74	85.37	85.87	85.87	85.77		n/a	n/a	n/a
Transit Way/Hydro	657	658			10.00	104.19		716.00	716.00	716.00	CONC	1200	1219.2	0.15	9.0	1575.26	55%	1.35	0.11	85.75	84.55		no	85.74	84.54	85.77	85.77	85.77	0.02	n/a	n/a	n/a
Petrichor Crescent	658	612	1.01	1.76	10.68	100.75	177.43		716.00	893.43	CONC	1200	1219.2	0.15	115.0	1575.26	43%	1.35	1.42	85.74	84.54		no	85.57	84.37	85.77	85.74	85.66		86.63	0.89	OK
Strasbourg Street	612	617	0.45	11.79	21.08	67.97	801.71		2053.79	2855.50	CONC	1800	1828.8	0.10	83.5	3792.13	25%	1.44	0.96	85.57	83.77		no	85.49	83.69	85.66	85.57	85.49		86.68	1.11	OK
Lerta Crescent	613	614	0.81	0.81	15.00	83.56	67.71			67.71	PVC	375	366.4	0.35	61.0	97.52	31%	0.92	1.10	86.18	85.81		no	85.97	85.60	86.18	86.18	85.98		86.78	0.60	OK
Lerta Crescent	614	615	0.26	1.07	16.10	80.17	86.03			86.03	CONC	450	457.2	0.26	9.5	151.66	43%	0.92	0.17	85.97	85.52		no	85.95	85.50	85.98	85.97	85.96		86.89	0.92	OK
Lerta Crescent	615	616	1.02	2.09	16.27	79.66	166.64			166.64	CONC	525	533.4	0.30	83.5	245.74	32%	1.10	1.27	85.95	85.43		no	85.70	85.18	85.96	85.95	85.70		86.67	0.72	OK
Lerta Crescent	616	617	1.46	3.55	17.54	76.17	270.62			270.62	CONC	675	685.8	0.76	106.5	764.49	65%	2.07	0.86	85.70	85.03	-0.60	no	84.89	84.22	85.70	85.70	85.49		86.55	0.85	OK
Strasbourg Street	617	1103	0.13	15.47	22.04	66.07	1022.39		2053.79	3076.18	CONC	1800	1828.8	0.10	42.0	3792.13	19%	1.44	0.48	85.49	83.69		no	85.45	83.65	85.49	85.49	85.45		n/a	n/a	n/a
Strasbourg Street	1103	1102	2.21	17.69	22.53	65.15	1152.41		2053.79	3206.21	CONC	1800	1828.8	0.10	121.8	3792.13	15%	1.44	1.41	85.45	83.65	0.01	no	85.33	83.53	85.45	85.45	85.36		n/a	n/a	n/a
G.Lalonde Drive	234	233	0.67	0.67	10.00	104.19	69.66			69.66	PVC	375	366.4	0.40	48.7	104.25	33%	0.99	0.82	86.36	85.98	-0.04	no	86.17	85.79	86.36	86.36	86.24		86.99	0.63	OK
G.Lalonde Drive	233	211	0.33	0.99	10.82	100.05	99.43			99.43	CONC	450	457.2	0.26	31.0	151.66	34%	0.92	0.56	86.21	85.76	0.23	1	86.13	85.68	86.24	86.24	86.21	0.03	86.75	0.51	OK
G. Lalonde Drive	624	211	0.74	0.74	10.00	104.19	77.05			77.05	CONC	450	457.2	0.35	77.5	175.96	56%	1.07	1.21	86.40	85.95	-0.08	X	86.13	85.68	86.40	86.40	86.21		86.93	0.53	OK
Trigoria Crescent	680	681	0.49	0.49	10.00	104.19	50.83			50.83	CONC	600	609.6	0.26	25.0	326.62	84%	1.12	0.37	86.42	85.82		no	86.35	85.75	86.42	86.42	86.38		86.85	0.43	OK
Future Site Plan	690	681	1.03	1.03	10.00	104.19	107.46			107.46	CONC	450	457.2	0.20	112.0	133.02	19%	0.81	2.30	86.57	86.12		no	86.35	85.90	86.57	86.57	86.38		87.75	1.18	OK
Trigoria Crescent	681	682		1.52	12.30	93.42	141.93			141.93	CONC	600	609.6	0.26	41.0	326.62	57%	1.12	0.61	86.35	85.75		no	86.24	85.64	86.38	86.36	86.34	0.01	86.85	0.49	OK
Future Site Plan	691	692	0.82	0.82	10.00	104.19	85.45			85.45	CONC	525	533.4	0.16	50.0	179.46	52%	0.80	1.04	86.42	85.90		no	86.34	85.82	86.42	86.42	86.38		87.67	1.25	OK
Future Site Plan	692	682	0.47	1.29	11.04	99.01	127.44			127.44	CONC	525	533.4	0.16	44.5	179.46	29%	0.80	0.92	86.31	85.79		no	86.24	85.72	86.38	86.38	86.34	0.07	87.52	1.14	OK
Trigoria Crescent	682	211	0.43	3.23	12.91	90.96	294.21			294.21	CONC	600	609.6	0.26	44.0	326.62	10%	1.12	0.66	86.24	85.64	-0.08	no	86.13	85.53	86.34	86.30	86.21	0.06	86.80	0.50	OK
Chinian Street	211	210	0.82	5.79	13.57	88.48	512.00			512.00	CONC	825	838.2	0.10	55.4	473.55	-8%	0.86	1.08	86.21	85.39	0.03	no	86.15	85.33	86.21	86.21	86.15		n/a	n/a	n/a
Chinian Street	210	209		5.79	14.65	84.72	490.24			490.24	CONC	825	838.2	0.10	23.9	473.55	-4%	0.86	0.46	86.12	85.30	0.03	no	86.10	85.28	86.15	86.13	86.10	0.01	88.72	2.59	OK
					16.19							975																				
Chinian Street	209	208	0.55	6.67	16.19	79.91	533.25			533.25	CONC	975	990.6	0.11	37.8	775.41	31%	1.01	0.63	86.07	85.10	-0.01	no	86.03	85.06	86.08	86.07	86.03		88.64	2.57	OK
Chinian Street	208	207	0.40	7.07	16.81	78.13	552.71			552.71	CONC	975	990.6	0.10	30.1	739.33	25%	0.96	0.52	86.01	85.04		no	85.98	85.01	86.02	86.01	85.98		88.47	2.46	OK
Chinian Street	207	206		7.07	17.34	76.70	542.60			542.60	CONC	975	990.6	0.10	20.6	739.33	27%	0.96	0.36	85.95	84.98	0.01	no	85.93	84.96	85.95	85.95	85.93		88.70	2.75	OK
					13.21							1350																				
Petrichor Crescent	629	630	1.72	1.72	10.00	104.19	178.71			178.71	CONC	525	533.4	0.20	118.5	200.65	11%	0.90	2.20	86.23	85.71		no	85.99	85.47	86.23	86.23	86.02		86.71	0.48	OK
G. Lalonde Drive	630	635	1.25	2.97	12.20	93.85	278.38			278.38	CONC	750	762.0	0.15	78.0	449.81	38%	0.99	1.32	85.99	85.24		no	85.87	85.12	86.02	85.99	85.95		n/a	n/a	n/a
G. Lalonde Drive	633	634	0.85	0.85	10.00	104.19	88.34			88.34	CONC	450	457.2	0.20	91.0	133.02	34%	0.81	1.87	86.19	85.74		no	86.01	85.56	86.19	86.19	86.01		86.98	0.79	OK
G. Lalonde Drive	634	635	0.49	1.33	11.87	95.25	127.10			127.10	CONC	675	685.8	0.18	75.5	372.05	66%	1.01	1.25	86.01	85.34		no	85.87	85.20	86.01	86.01	85.95		87.08	1.07	OK
Trigoria Crescent	660	661	1.08	1.08	10.00	104.19	112.96			112.96	CONC	450	457.2	0.20	110.0	133.02	15%	0.81	2.26	86.46	86.01		no	86.24	85.79	86.46	86.46	86.24		87.47	1.01	OK
Trigoria Crescent	661	662	0.60	1.69	12.26	93.59	158.06			158.06	CONC	525	533.4	0.16	63.0	179.46	12%	0.80	1.31	86.24	85.72		no	86.14	85.62	86.24	86.24	86.15		87.56	1.32	OK
Trigoria Crescent	662	663		1.69	13.57	88.48	149.43			149.43	CONC	525	533.4	0.16	11.0	179.46	17%	0.80	0.23	86.11	85.59		no	86.09	85.57	86.15	86.14	86.13	0.03	86.91	0.77	OK
Trigoria Crescent	663	667		1.69	13.80	87.65	148.03			148.03	CONC	525	533.4	0.16	39.0	179.46	18%	0.80	0.81	86.06	85.54		no	86.00	85.48	86.13	86.12	86.08	0.06	86.91	0.79	OK
Citrine Street	665	666	0.97	0.97	10.00	104.19	101.38			101.38	CONC	450	457.2	0.20	89.0	133.02	24%	0.81	1.83	86.30	85.85		no	86.12	85.67	86.30	86.30	86.15		87.38	1.08	OK
Citrine Street	666	667	0.49	1.46	11.83	95.42	139.27			139.27	CONC	525	533.4	0.16	72.5	179.46	22%	0.80	1.50	86.12	85.60		no	86.00	85.48	86.15	86.15	86.08	0.03	87.43	1.28	OK
Trigoria Crescent	667	673	0.53	3.67	14.61	84.85	311.72			311.72	CONC	675	685.8	0.20	47.0	392.18	21%	1.06	0.74	86.00	85.33		no	85.91	85.24	86.08	86.07	86.01	0.07	86.84	0.77	OK
Nacarat Street	670	671	0.67	0.67	10.00	104.19	69.37			69.37	PVC	375	366.4	0.26	83.5	84.05	17%	0.80	1.75	86.43	86.06		no	86.21	85.84	86.43	86.43	86.24		86.83	0.40	OK
Tungsten Terrace	671	672	0.33	1.00	11.75	95.79	95.73			95.73	CONC	450	457.2	0.20	56.0	133.02	28%	0.81	1.15	86.21	85.76		no	86.10	85.65	86.24	86.21	86.13		87.44	1.23	OK
Tungsten Terrace	672	673	0.58	1.58	12.90	91.03	144.12			144.12	CONC	525	533.4	0.16	120.0	179.46	20%	0.80	2.49	86.10	85.58		no	85.91	85.39	86.13	86.13	86.01	0.03	87.38	1.25	OK
Trigoria Crescent	673	635		5.26	15.39	82.32	432.75			432.75	CONC	825	838.2	0.15	23.5	579.98	25%	1.05	0.37	85.91	85.09		no	85.87	85.05	86.01	85.97	85.95	0.06	86.84	0.87	OK



STORM SEWER COMPUTATION FORM

DESIGNED BY: AGS
CHECKED BY: JMD

Neighbourhood 5 - Avalon West - STAGE 3
Minto Communities Inc.
131004
ATREL ENGINEERING LTD
November 2014

STORM FREQUENCY : 5 YEAR
RATIONAL METHOD Q= 2.78 AIR
PVC/CONC N= 0.013
CSP N= 0.024
CORR N= 0.021

Table 1

STREET NAMES	LOCATION FROM (Up)		TO (Down)		AREA (ha.) RUNOFF COEFFICIENT 0.20	0.27	0.29	0.30	0.36	0.39	0.45	0.48	0.50	0.55	0.60	0.62	0.65	0.70	0.75	0.80	0.85	0.70	0.70	0.76	RATIONAL METHOD INDIV. 2.78AR	ACCUM. 2.78AR	5 YEAR TIME CONC. (MIN)	RAINF. INTENS. (MM/HR)	FLOW (L/S)	Commercial & green space area Restr Flow (L/S)	Cum Flow (L/S)	ACTUAL PIPE FLOW (L/S)	PIPE TYPE	DIA. (N0M) (mm)	(ACT)	SLOPE (%)	LENGTH (M)	SEWER DATA CAP. (L/S)	Remaining Capacity (%)	VEL. (M/S)	TIME OF FLOW (MIN)	UpStream Obv. (M)	UpStream Inv. (M)	Forced drop (M)	Inv to	DwStream Obv. (M)	DwStream Inv. (M)	UpStream Hgl at UP-MH (M)	UpStream Hgl Out UP-MH (M)	Down MH Hgl (M)	SURG AT UP MH (M)	USF ELEV (M)	UpStream HGL FREEBOARD (M)	Comment
Chinian Street	MH	635	MH	216								0.60													0.80	10.36	15.76	81.18	840.89			840.89	CONC	975	990.6	0.13	87.7	842.96	0%	1.09	1.34	85.87	84.90		no	85.76	84.79	85.95	85.89	85.78	0.02	n/a	n/a	n/a
Azure Street	MH	216	MH	202								0.37													0.49	10.85	17.10	77.34	839.29			839.29	CONC	975	990.6	0.10	86.9	739.33	-14%	0.96	1.51	85.76	84.79		no	85.67	84.70	85.78	85.78	85.67	0.02	88.37	2.59	OK
Chinian Street	MH	202	MH	201																						24.02	20.26	69.67	1673.13			1673.13	CONC	1350	1371.6	0.10	37.7	1760.81	5%	1.19	0.53	85.67	84.32	0.03	no	85.63	84.28	85.67	85.67	85.63		88.52	2.85	OK
Chinian Street	MH	201	MH	1112							0.26	0.27													0.69	24.70	20.79	68.56	1693.47			1693.47	CONC	1350	1371.6	0.10	35.8	1760.81	4%	1.19	0.50	85.60	84.25	0.04	no	85.56	84.21	85.63	85.63	85.60	0.03	88.14	2.51	OK
Chinan Street	MH	1113	MH	1112							0.04				0.65										1.13	1.13	16.65	78.58	89.13			89.13	CONC	450	457.2	0.20	75.7	133.02	33%	0.81	1.56	85.67	85.22		no	85.52	85.07	85.67	85.67	85.60		88.30	2.63	OK
Chinian Street	MH	1112	MH	1111D							0.30														0.38	26.21	21.29	67.54	1770.23			1770.23	CONC	1350	1371.6	0.10	56.6	1760.81	-1%	1.19	0.79	85.52	84.17		no	85.46	84.11	85.60	85.60	85.54	0.08	88.30	2.70	OK
Chinian Street	MH	1111D	MH	1111							0.29														0.36	26.57	22.08	65.98	1753.28			1753.28	CONC	1350	1371.6	0.10	23.8	1760.81	0%	1.19	0.33	85.43	84.08		no	85.41	84.06	85.54	85.51	85.49	0.08	n/a	n/a	n/a
Chinian Street	MH	1111	MH	1111E							0.25														0.31	28.85	22.42	65.36	1885.35			1885.35	CONC	1350	1371.6	0.11	48.4	1846.76	-2%	1.25	0.65	85.41	84.06		no	85.36	84.01	85.49	85.49	85.43	0.08	n/a	n/a	n/a
Chinian Street	MH	1111E	MH	1102							0.33														0.41	29.26	23.06	64.17	1877.51			1877.51	CONC	1350	1371.6	0.11	30.8	1846.76	-2%	1.25	0.41	85.36	84.01	0.01	no	85.33	83.98	85.43	85.40	85.36	0.04	n/a	n/a	n/a
Montagris Circle	MH	1104	MH	1102							2.95														3.69	3.69	18.64	73.40	270.88			270.88	CONC	600	609.6	0.20	85.8	286.47	5%	0.98	1.46	85.52	84.92	0.03	no	85.35	84.75	85.60	85.52	85.36		n/a	n/a	n/a
Strasbourg Street	MH	1102	MH	1101							0.22				0.32										0.81	51.45	23.93	62.66	3223.63		2053.79	5277.43	CONC	2100	2133.6	0.10	76.5	5720.16	8%	1.60	0.80	85.32	83.22		no	85.24	83.14	85.36	85.36	85.29	0.04	87.79	2.43	OK
Rochefort Circle	MH	1117	MH	1101											2.97										4.95	4.95	18.61	73.45	363.87			363.87	CONC	675	685.8	0.20	85.8	392.18	7%	1.06	1.35	85.44	84.77	0.03	no	85.27	84.60	85.44	85.44	85.29		87.79	2.35	OK
Strasbourg Street	MH	1101	MH	50543									0.60												0.83	57.23	24.73	61.33	3510.18		2053.79	5563.98	CONC	2100	2133.6	0.11	118.1	5999.35	7%	1.68	1.17	85.24	83.14		no	85.11	83.01	85.29	85.29	85.18	0.05	87.79	2.50	OK
Brian Coburn Blvd.	MH	199	MH	50543															4.74		1.61				10.54	10.54	18.10	74.72	787.68	383.18	383.18	1170.86	CONC	1050	1066.8	0.20	120.0	1274.02	8%	1.43	1.40	85.35	84.30		no	85.11	84.06	85.38	85.38	85.18	0.03	n/a	n/a	n/a
Brian Coburn Blvd.	MH	196	MH	50543																	1.34						15.28	82.67		318.92	318.92	318.92	CONC	600	609.6	0.30	120.0	350.85	9%	1.20	1.66	85.49	84.89	0.02	no	85.13	84.53	85.49	85.49	85.18		n/a	n/a	n/a
Des Aubépines Drive	MH	50543	MH	50544											0.30										0.50	68.28	25.90	59.49	4061.77		2755.89	6817.66	CONC	2250	2286.0	0.10	96.9	6875.59	1%	1.68	0.96	85.11	82.86		no	85.01	82.76	85.18	85.18	85.09	0.07	85.89	0.71	OK
Site Plan No.2	MH	3511	MH	3512															0.28						0.62	0.62	10.00	104.19	64.88			64.88	CONC	525	533.4	0.16	99.0	179.46	64%	0.80	2.05	85.78	85.26		no	85.62	85.10	85.78	85.78	85.62		n/a	n/a	n/a
Site Plan No.2	MH	3512	MH	3513															0.24						0.53	1.16	12.05	94.46	109.24			109.24	CONC	525	533.4	0.16	99.0	179.46	39%	0.80	2.05	85.62	85.10		no	85.46	84.94	85.62	85.62	85.46		n/a	n/a	n/a
Street No.4	MH	3513	MH	3515											0.12										0.20	1.36	14.11	86.55	117.42			117.42	CONC	525	533.4	0.20	52.5	200.65	41%	0.90	0.97	85.40	84.88		no	85.29	84.77	85.42	85.40	85.31		n/a	n/a	n/a
Street No.4	MH	3514	MH	3515														0.14							0.27	0.27	10.00	104.19	28.39			28.39	PVC	300	299.2	0.34	44.5	55.99	49%	0.80	0.93	85.44	85.14		no	85.29	84.99	85.44	85.44	85.31		n/a	n/a	n/a
Street No.4	MH	3515	MH	3516									0.10					0.48							1.07	2.70	15.08	83.29	225.06			225.06	CONC	750	762.0	0.10	85.5	367.27	39%	0.81	1.77	85.29	84.54		no	85.20	84.45	85.31	85.29	85.20		86.28	0.99	OK
Street No.4	MH	3516	MH	3521									0.12					0.31							0.77	3.47	16.85	78.01	270.87			270.87	CONC	825	838.2	0.10	86.5	473.55	43%	0.86	1.68	85.20	84.38		no	85.11	84.29	85.20	85.20	85.12		86.06	0.86	OK
Street No.4	MH	3514	MH	3517																							10.00	104.19					PVC	375	366.4	0.26	10.0	84.05	100%	0.80	0.21	85.51	85.14		no	85.48	85.11	85.51	85.51	85.48		86.35	0.84	OK
Street No.4	MH	3517	MH	3518									0.17					0.39							1.00	1.00	10.21	103.10	102.61			102.61	CONC	525	533.4	0.20	78.0	198.12	48%	0.89	1.47	85.48	84.96		no	85.33	84.81	85.48	85.48	85.33		86.38	0.90	OK
Street No.4	MH	3518	MH	3519									0.14					0.38							0.93	1.93	11.68	96.10	185.41			185.41	CONC	675	685.8	0.15	78.5	339.63	45%	0.92	1.42	85.33	84.66		no	85.21	84.54	85.33	85.33	85.21		86.22	0.89	OK
Street No.4	MH	3519	MH	3520									0.15												0.21	2.14	13.10	90.25	192.94			192.94	CONC	675	685.8	0.15	10.5	339.63	43%	0.92	0.19	85.18	84.51		no	85.16	84.49	85.19	85.18	85.17		86.05	0.87	OK
Street No.4	MH	3520	MH	3521									0.06					0.13							0.34	2.47	13.29	89.53	221.52			221.52	CONC	750	762.0	0.11	44.0	385.20	42%	0.84	0.87	85.16	84.41		no	85.11	84.36	85.17	85.16	85.12		86.14	0.98	OK
Street No.4	MH	3521	MH	3522									0.05												0.07	6.02	18.53	73.65	443.07			443.07	CONC	975	990.6	0.13	36.5	842.96	47%	1.09	0.56	85.11	84.14		no	85.06	84.09	85.12	85.12	85.11	0.01	85.91	0.79	OK
Street No.4	MH	3522	MH	50544																						6.02	19.09	72.32	435.07			435.07	CONC	975	990.6	0.13	18.5	842.96	48%	1.09	0.28	85.03	84.06		no	85.01	84.04	85.11	85.10	85.09	0.07	85.94	0.84	OK
Multiple Block	MH	500	MH	50544															1.56						3.25	3.25	19.37 13.10	90.26	293.58			293.58	CONC	750	762.0	0.20	11.5	519.40	43%	1.14	0.17	85.03	84.28		no	85.01	84.26	85.10	85.10	85.09	0.07	86.00	0.90	OK
Des Aubépines Drive	MH	50544	MH	53620														0.16							0.31	77.86	26.87	58.07	4521.12		2755.89	7277.02	CONC	2250	2286.0	0.10	74.5	6875.59	-6%	1.68	0.74	85.01	82.76		no	84.94	82.69	85.09	85.09	85.01	0.08	85.94	0.85	OK
Des Aubépines Drive	MH	53620	MH	53621									0.31					0.34							1.09	78.95	27.61	57.03	4502.46		2755.89	7258.35	CONC	2250	2286.0	0.12	69.5	7373.25	2%	1.80	0.64	84.94	82.69		no	84.86	82.61	85.01	85.01	84.93	0.07	85.88	0.87	OK
Des Aubépines Drive	MH	53621	MH	53622														0.42							0.82	79.77	28.25	56.15	4478.88		2755.89	7234.77	CONC	2250	2286.0	0.13	74.0	7809.17	7%	1.90	0.65	84.86	82.61		no	84.76	82.51	84.93	84.93	84.85	0.07	85.73	0.80	OK
Décoeur Drive	MH	3550	MH	53622									0.18		0.44		5.46								10.85	10.85	18.54	73.64	799.02			799.02	CONC	1350	1371.6	0.10	75.0	1760.81	55%	1.19	1.05	84.84	83.49		no	84.76	83.41	84.87	84.87	84.85	0.03	85.80	0.93	OK
Des Aubépines Drive	MH	53622	MH	53644														0.37							0.72	91.34	28.90 29.69	55.31	5051.83		2755.89	7807.72	CONC	2550	2590.8	0.11	88.0	9836.90	21%	1.87	0.79	84.76	82.21		no	84.67	82.12	84.85	84.85	84.79	0.09	85.60	0.75	OK
Elementary School	MH	504	MH	53644															2.77						5.78	5.78	13.52	88.66	512.05			512.05	CONC	975	990.6	0.20	12.5	1045.56	51%	1.36	0.15	84.70	83.73		no	84.67	83.70	84.81	84.80	84.79	0.10	85.67	0.87	OK
Des Aubépines Drive	MH	53644	MH	53645														0.28							0.54	97.66	29.69	54.31	5303.75		2755.89	8059.64	CONC	2550	2590.8	0.11	83.7	9836.90	18%	1.87	0.75	84.67	82.12		no	84.58	82.03	84.79	84.79	84.73	0.12	85.43	0.64	OK
Street No. 9	MH	3553	MH	53645														0.58							1.13	1.13	13.37	89.22	100.70			100.70	CONC	675	685.8	0.11	14.5	296.09	66%	0.80	0.30	84.60	83.93		no	84.58	83.91	84.73	84.73	84.73	0.13	85.25	0.52	OK
Des Aubépines Drive	MH	53645	MH	53646														0.41							0.80	99.58	30.43	53.41	5318.75		2755.89	8074.65	CONC	2550	2590.8	0.11	74.5	9836.90	18%	1.87	0.67	84.58	82.03		no	84.50	81.95	84.73	84.73	84.68	0.15	85.28	0.55	OK
Street No.5	MH	3567	MH	53646	0.35										1.73			1.36							5.49	5.49	15.15	83.08	455.80			455.80	CONC	975	990.6	0.11	118.0	775.41	41%	1.01	1.95	84.63	83.66		no	84.50	83.53	84.72	84.72	84.68	0.09	85.65	0.93	OK
Neighbourhood Park	MH	505	MH	3571	1.19																				0.66	0.66	10.00	104.19	68.94			68.94	PVC	375	366.4	0.26	18.0	84.05	18%	0.80	0.38	85.36	84.99		no	85.31	84.94	85.37	85.37	85.34	0.01	n/a	n/a	n/a
Décoeur Drive	MH	3571	MH	3572											0.25										0.42	1.08	10.38	102.25	110.29			110.29	CONC	450	457.2	0.20	74.0	133.02	17%	0.81	1.52	85.31	84.86		no	85.16	84.71	85.34	85.31	85.18		n/a	n/a	n/a
Décoeur Drive	MH	3572	MH	3576											0.18										0.30	1.38	11.90 12.56	95.13	131.17			131.17	CONC	525	533.4	0.16	32.0	179.46	27%	0.80	0.66	85.16	84.64		no	85.11	84.59	85.18	85.18	85.15	0.02	n/a	n/a	n/a
School	MH	501	MH	3576															2.44						5.09	5.09	13.93	87.17	443.47			443.47	CONC	900	914.4	0.20	19.0	844.60	47%	1.29	0.25	85.15	84.25		no	85.11	84.21	85.16	85.16	85.15	0.01	86.22	1.06	OK
Commercial	MH	503	MH	3574															4.78						9.97	9.97	15.05	83.40	831.71			831.71	CONC	1200	1219.2	0.20	17.0	1818.95	54%	1.56	0.18	85.35	84.15		no	85.32	84.12	85.35	85.35	85.32		86.48	1.13	OK
Site Plan No.1	MH	3573	MH	3574																	0.12				0.27	0.27	10.00	104.19	27.81			27.81	PVC	300	299.2	1.00	45.0	96.02	71%	1.37	0.55	85.71	85.41		no	85.26	84.96	85.71	85.71	85.30		87.14	1.43	OK
Décoeur Drive	MH	3574	MH	3575											0.26										0.43	10.67	15.23	82.82	883.95			883.95	CONC	1200	1219.2	0.11	56.5	1348.97	34%	1.16	0.81	85.26	84.06		no	85.20	84.00	85.30	85.26	85.20		86.87	1.61	OK
Décoeur Drive	MH	3575	MH	3576											0.34										0.57	11.24	16.04	80.33	902.93			902.93	CONC	1200	1219.2	0.11	85.0	1348.97	33%	1.16	1.23	85.20	84.00		no	85.11	83.91	85.20	85.20	85.15		86.88	1.68	OK
Magnolia Street	MH	3576	MH	3579														0.09							0.18	17.88	17.27	76.87	1374.56			1374.56	CONC	1500	1524.0	0.11	51.5	2445.85	44%	1.34	0.64	85.11	83.61		no	85.05	83.55	85.15	85.11	85.05		n/a	n/a	n/a
Site Plan No.1	MH	3577	MH	3578															0.23						0.51	0.51	10.00	104.19	53.30			53.30	PVC	375	366.4	0.26	59.5	84.05	37%	0.80	1.24	85.56	85.19		no	85.41	85.04	85.56	85.56	85.41		87.00	1.44	OK
Site Plan No.1	MH	3578	MH	3579															0.13						0.29	0.80	11.24	98.05	78.50			78.50	CONC	450	457.2	0.20	71.5	131.34	40%	0.80	1.49	85.41	84.96	0.22	no	85.27	84.82	85.41	85.41	85.27		86.88	1.47	OK
Magnolia Street	MH	3579	MH	3585									0.13					0.18							0.53	19.21	17.91	75.20	1444.84			1444.84	CONC	1650	1676.4	0.10	48.0	3006.86	52%	1.36	0.59	85.05	83.40		no	85.00	83.35	85.05	85.05	85.00		n/a	n/a	n/a
Hepatica Crescent	MH	3581	MH	3582											0.31			0.24							0.91	0.91	10.00	104.19	94.57			94.57	CONC	525	533.4	0.16	82.5	179.46	47%	0.80	1.71	85.26	84.74		no	85.13	84.61	85.26	85.26	85.13		85.88	0.62	OK
Hepatica Crescent	MH	3582	MH	3585														0.22							0.40	1.31	11.71	95.94	125.22			125.22	CONC	600	609.6	0.13	95.5	232.73	46%	0.80	2.00	85.13	84.53		no	85.00	84.40	85.13	85.13	85.00		85.77	0.64	OK
Hepatica Crescent	MH	3583	MH	3584									0.17					0.41							1.03	1.03	10.00	104.19	107.75			107.75	CONC	525	533.4	0.16	83.0	179.46	40%	0.80	1.72	85.41	84.89		no	85.28	84.76	85.41	85.41	85.28		85.88	0.47	OK
Hepatica Crescent	MH	3584	MH	3585														0.24							0.47	1.50	11.72	95.90	143.97			143.97	CONC	600	609.6	0.15	88.0	248.09	42%	0.85	1.73	85.28	84.68	0.15	no	85.15	84.55	85.28	85.28	85.15		85.92	0.64	OK

2322, 2370 Tenth Line Road, 885 Decoeur Drive

LICENSED PROFESSIONAL ENGINEER
A. G. Y. SAUVE
100142393
Nov. 29 2014
PROVINCE OF ONTARIO

STORM SEWER COMPUTATION FORM

DESIGNED BY: AGS
CHECKED BY: JMD

Neighbourhood 5 - Avalon West - STAGE 3
Minto Communities Inc.
131004
ATREL ENGINEERING LTD
November 2014

STORM FREQUENCY : 5 YEAR
RATIONAL METHOD Q= 2.78 AIR
PVC/CONC N= 0.013
CSP N= 0.024
CORR N= 0.021

Table 1

STREET NAMES	LOCATION FROM (Up)		TO (Down)		AREA (ha.) RUNOFF COEFFICIENT 0.20	0.27	0.29	0.30	0.36	0.39	0.45	0.48	0.50	0.55	0.60	0.62	0.65	0.70	0.75	0.80	0.85	0.70	0.70	0.76
Magnolia Street	MH	3585	MH	3594										0.14				0.37						
Genévriers Street	MH	3586	MH	3587										0.42				0.22						
Genévriers Street	MH	3587	MH	3588																				
Genévriers Street	MH	3588	MH	3589														0.40						
Genévriers Street	MH	3589	MH	3594																				
Hepatica Crescent	MH	3583	MH	3590																				
Hepatica Crescent	MH	3590	MH	3592														0.04						
Hepatica Crescent	MH	3591	MH	3592														0.18						
Genévriers Street	MH	3592	MH	3593										0.29				0.40						
Genévriers Street	MH	3593	MH	3594										0.12				0.24						
Magnolia Street	MH	3594	MH	3597										0.16				0.28						
Hepatica Crescent	MH	3595	MH	3596										0.37				0.31						
Hepatica Crescent	MH	3596	MH	3597										0.29				0.23						
Hepatica Crescent	MH	3597	MH	3598										0.73				0.56						
Hepatica Crescent	MH	3598	MH	53646										0.48				0.32						
Des Aubépines Drive	MH	53646	MH	HEADWALL																				

STREET NAMES	FROM	TO	RATIONAL METHOD INDIV. 2.78AR	ACCUM. 2.78AR	5 YEAR TIME CONC. (MIN)	RAINF. INTENS. (MM/HR)	FLOW (L/S)	Commercial & green space area Restr Flow (L/S)	Cum Flow (L/S)	**ACTUAL PIPE FLOW (L/S)**	PIPE TYPE	DIA. (N0M) (mm)	(ACT)	SEWER DATA SLOPE (%)	LENGTH (M)	CAP. (L/S)	Remaining Capacity (%)	VEL. (M/S)	TIME OF FLOW (MIN)
Magnolia Street	3585	3594	0.93	22.95	18.50	73.73	1692.38			1692.38	CONC	1650	1676.4	0.10	79.0	3006.86	44%	1.36	0.97
Genévriers Street	3586	3587	1.07	1.07	10.00	104.19	111.51			111.51	CONC	525	533.4	0.16	59.0	179.46	38%	0.80	1.22
Genévriers Street	3587	3588		1.07	11.22	98.14	105.04			105.04	CONC	525	533.4	0.16	11.5	179.46	41%	0.80	0.24
Genévriers Street	3588	3589	0.78	1.85	11.46	97.05	179.42			179.42	CONC	675	685.8	0.11	77.5	294.79	39%	0.80	1.62
Genévriers Street	3589	3594		1.85	13.08	90.32	166.97			166.97	CONC	750	762.0	0.11	48.0	390.41	57%	0.86	0.93
Hepatica Crescent	3583	3590			10.00	104.19					PVC	300	299.2	0.34	10.5	55.99	100%	0.80	0.22
Hepatica Crescent	3590	3592	0.08	0.08	10.22	103.05	8.02			8.02	PVC	300	299.2	0.34	71.5	55.99	86%	0.80	1.50
Hepatica Crescent	3591	3592	0.35	0.35	10.00	104.19	36.50			36.50	PVC	375	366.4	0.26	69.0	84.05	57%	0.80	1.44
Genévriers Street	3592	3593	1.22	1.65	11.72	95.92	158.26			158.26	CONC	675	685.8	0.11	90.0	294.79	46%	0.80	1.88
Genévriers Street	3593	3594	0.65	2.30	13.60	88.39	203.34			203.34	CONC	750	762.0	0.10	90.0	367.27	45%	0.81	1.86
Magnolia Street	3594	3597	0.79	27.89	19.46	71.45	1992.91			1992.91	CONC	1800	1828.8	0.10	84.0	3792.13	47%	1.44	0.97
Hepatica Crescent	3595	3596	1.17	1.17	10.00	104.19	121.80			121.80	CONC	525	533.4	0.16	71.0	179.46	32%	0.80	1.47
Hepatica Crescent	3596	3597	0.89	2.06	11.47	97.01	199.84			199.84	CONC	675	685.8	0.12	80.5	303.78	34%	0.82	1.63
Hepatica Crescent	3597	3598	2.21	32.16	20.43	69.31	2228.89			2228.89	CONC	1800	1828.8	0.13	118.0	4323.69	48%	1.65	1.19
Hepatica Crescent	3598	53646	1.36	33.51	21.63	66.87	2241.15			2241.15	CONC	1800	1828.8	0.13	101.5	4323.69	48%	1.65	1.03
Des Aubépines Drive	53646	HEADWALL		138.58	31.10	52.63	7293.72		2755.89	10049.61	CONC	2700	2743.2	0.10	38.5	11180.46	10%	1.89	0.34
					31.44														

STREET NAMES	FROM	TO	UpStream Obv. (M)	Inv. (M)	Forced drop (M)	Inv to Inv (M)	DwStream Obv. (M)	Inv. (M)	**UpStream Hgl at UP-MH (M)**	Hgl Out UP-MH (M)	Down MH Hgl (M)	SURG AT UP MH (M)	UpStream USF ELEV (M)	HGL FREEBOARD (M)	Comment
Magnolia Street	3585	3594	85.00	83.35		no	84.92	83.27	85.00	85.00	84.92		85.63	0.63	OK
Genévriers Street	3586	3587	85.20	84.68		no	85.11	84.59	85.20	85.20	85.11		85.60	0.40	OK
Genévriers Street	3587	3588	85.08	84.56		no	85.06	84.54	85.08	85.08	85.06		85.79	0.71	OK
Genévriers Street	3588	3589	85.06	84.39		no	84.97	84.30	85.06	85.06	84.97		85.59	0.53	OK
Genévriers Street	3589	3594	84.97	84.22		no	84.92	84.17	84.97	84.97	84.92		85.71	0.74	OK
Hepatica Crescent	3583	3590	85.52	85.22		no	85.48	85.18	85.52	85.52	85.48		86.08	0.56	OK
Hepatica Crescent	3590	3592	85.45	85.15		no	85.21	84.91	85.45	85.45	85.22		85.96	0.51	OK
Hepatica Crescent	3591	3592	85.39	85.02		no	85.21	84.84	85.39	85.39	85.22		85.86	0.47	OK
Genévriers Street	3592	3593	85.21	84.54		no	85.11	84.44	85.22	85.21	85.11		85.84	0.63	OK
Genévriers Street	3593	3594	85.11	84.36	0.10	no	85.02	84.27	85.11	85.11	85.02		85.75	0.64	OK
Magnolia Street	3594	3597	84.92	83.12		no	84.84	83.04	84.92	84.92	84.84		85.64	0.72	OK
Hepatica Crescent	3595	3596	85.14	84.62		no	85.03	84.51	85.14	85.14	85.03		85.59	0.45	OK
Hepatica Crescent	3596	3597	85.03	84.36	0.15	no	84.93	84.26	85.03	85.03	84.93		85.54	0.51	OK
Hepatica Crescent	3597	3598	84.78	82.98		no	84.63	82.83	84.82	84.78	84.72		85.35	0.57	OK
Hepatica Crescent	3598	53646	84.63	82.83		no	84.50	82.70	84.72	84.72	84.68	0.09	85.20	0.48	OK
Des Aubépines Drive	53646	HEADWALL	84.50	81.80		no	84.46	81.76	84.68	84.68	84.65	0.18	n/a	n/a	n/a

Existing Storm Sewers
Existing Eastern Trunk
Stage 2 Storm Sewers
Proposed Stage 3 Storm Sewers
Future Stages Storm Sewers



STORM SEWER COMPUTATION FORM

DESIGNED BY: AGS
CHECKED BY: JMD

PROJECT: **Neighbourhood 5 - Avalon West - STAGE 3**
CLIENT: Minto Communities Inc.
PROJECT #: 131004
BY: ATREL ENGINEERING LTD
DATE: November 2014

RESTRICTED FLOW : Various L/S/Ha.
RATIONAL METHOD Q= 2.78 AIR
PVC/CONC N= 0.013
CSP N= 0.024
CORR N= 0.021

Table 2

STREET NAMES	LOCATION FROM (Up)		TO (Down)		AREA (ha.) RUNOFF COEFFICIENT 0.20	0.27	0.29	0.30	0.36	0.39	0.45	0.48	0.50	0.55	0.60	0.62	0.65	0.70	0.75	0.80	0.85	0.70	0.70	0.76	Indiv Various L/s/ha	Cumul L/s/ha	FLOW (L/S)	Commercial & green space area Restr Flow (L/S)	Cum Flow (L/S)	Above ground (2) Local F.R. (L/S)	Qty	Restricted Flow (L/S)	Cum Restricted Flow (L/S)	ACTUAL PIPE FLOW (L/S)	PIPE TYPE	DIA (N0M) (mm)	(ACT)	SLOPE (%)	LENGTH (M)	SEWER DATA CAP. (L/S)	Remaining Capacity (%)	VEL. (M/S)	TIME OF FLOW (MIN)	UpStream Obv. (M)	UpStream Inv. (M)	Forced drop (M)	Inv to Inv (M)	DwStream Obv. (M)	DwStream Inv. (M)	UpStream Hgl at UP-MH (M)	Hgl Out UP-MH (M)	Down MH Hgl (M)	SURG AT UP MH (M)	USF ELEV (M)	UpStream HGL FREEBOARD (M)	Comment
Future Site Plan	MH	Stub1	MH	602																			0.70				103.91	103.91	13.40	7.75	103.91	103.91	103.91	CONC	450	457.2	0.20	9.0	133.02	22%	0.81	0.19	86.05	85.60	0.54	no	86.03	85.58	86.05	86.05	86.03		n/a	n/a	n/a
Bluestone Private	MH	601	MH	602														0.64							54.40	54.40	54.40			13.40	3.74	50.12	50.12	50.12	CONC	525	533.4	1.03	112.0	455.34	89%	2.04	0.92	86.62	86.10	-0.02	no	85.47	84.95	86.62	86.62	86.00		87.50	0.88	OK
G.Lalonde Drive	MH	602	MH	605											0.34										28.90	83.30	83.30		103.91	13.40	2.96	39.66	193.69	193.69	CONC	600	609.6	0.20	82.5	286.47	32%	0.98	1.40	85.49	84.89	-0.59	no	85.32	84.72	86.00	86.00	85.92	0.51	87.50	1.50	OK
Bluestone Private	MH	603	MH	605													0.28	0.61							75.65	75.65	75.65			13.40	5.81	77.85	77.85	77.85	CONC	525	533.4	1.20	112.5	491.48	84%	2.20	0.85	86.49	85.97	-0.77	no	85.14	84.62	86.49	86.49	85.92		87.38	0.89	OK
Future Site Plan	MH	Stub2	MH	605		4.94																	3.65					813.80	813.80	13.40	60.73	813.80	813.80	813.80	CONC	975	990.6	0.16	9.0	935.18	13%	1.21	0.12	85.94	84.97	0.02	no	85.93	84.96	85.94	85.94	85.93		n/a	n/a	n/a
G.Lalonde Drive	MH	605	MH	607											0.19										16.15	175.10	175.10		917.71	13.40	1.48	19.83	1105.18	1105.18	CONC	1350	1371.6	0.10	80.0	1760.81	37%	1.19	1.12	85.91	84.56		no	85.83	84.48	85.92	85.92	85.89	0.01	86.78	0.86	OK
Future Site Plan	MH	Stub3	MH	607																			1.33					197.43	197.43	13.40	14.73	197.43	197.43	197.43	CONC	600	609.6	0.15	9.0	248.09	20%	0.85	0.18	85.84	85.24		no	85.83	85.23	85.90	85.90	85.89	0.06	n/a	n/a	n/a
G.Lalonde Drive	MH	607	MH	608													0.25								21.25	196.35	196.35		1115.14	13.40	2.00	26.80	1329.40	1329.40	CONC	1350	1371.6	0.10	103.0	1760.81	25%	1.19	1.44	85.83	84.48		no	85.73	84.38	85.89	85.89	85.83	0.06	86.74	0.85	OK
Future Street	MH	Stub4	MH	608												0.74							1.50	62.90	62.90	62.90	222.66	222.66	13.40	23.30	312.26	312.26	312.26	CONC	750	762.0	0.15	9.0	449.81	31%	0.99	0.15	85.74	84.99		no	85.73	84.98	85.84	85.84	85.83	0.10	n/a	n/a	n/a
G.Lalonde Drive	MH	608	MH	612													0.56								47.60	306.85	306.85		1337.80	13.40	3.48	46.63	1688.29	1688.29	CONC	1350	1371.6	0.12	94.0	1928.87	12%	1.31	1.20	85.73	84.38	0.05	no	85.62	84.27	85.83	85.83	85.74	0.10	86.70	0.87	OK
Petrichor Crescent	MH	650	MH	651										0.27	0.17										37.40	37.40	37.40			13.40	4.44	59.50	59.50	59.50	PVC	375	366.4	0.26	39.5	84.05	29%	0.80	0.83	86.16	85.79		no	86.06	85.69	86.16	86.16	86.08		n/a	n/a	n/a
Petrichor Crescent	MH	651	MH	652														0.35							29.75	67.15	67.15			13.40	3.28	44.00	103.50	103.50	CONC	525	533.4	0.16	111.0	179.46	42%	0.80	2.30	86.06	85.54		no	85.88	85.36	86.08	86.06	85.89		86.71	0.65	OK
G.Lalonde Drive	MH	652	MH	654									0.18												15.30	82.45	82.45			13.40	2.31	31.00	134.50	134.50	CONC	525	533.4	0.16	51.5	179.46	25%	0.80	1.07	85.82	85.30		no	85.74	85.22	85.89	85.87	85.82	0.05	n/a	n/a	n/a
Petrichor Crescent	MH	653	MH	654														0.58							49.30	49.30	49.30			13.40	6.57	88.00	88.00	88.00	CONC	525	533.4	0.20	118.5	200.65	56%	0.90	2.20	85.98	85.46		no	85.74	85.22	85.98	85.98	85.82		86.63	0.65	OK
G.Lalonde Drive	MH	654	MH	655									0.19												16.15	147.90	147.90			13.40	2.31	31.00	253.50	253.50	CONC	675	685.8	0.15	54.0	339.63	25%	0.92	0.98	85.74	85.07		no	85.66	84.99	85.82	85.79	85.74	0.05	n/a	n/a	n/a
G.Lalonde Drive	MH	655	MH	612																						147.90	147.90			13.40			253.50	253.50	CONC	1200	1219.2	0.15	19.0	1575.26	84%	1.35	0.23	85.66	84.46	0.06	no	85.63	84.43	85.74	85.74	85.74	0.08	n/a	n/a	n/a
Petrichor Crescent	MH	656	MH	658										0.27	0.20										39.95	39.95	39.95			13.40	4.44	59.50	59.50	59.50	PVC	375	366.4	0.35	37.5	97.52	39%	0.92	0.68	85.87	85.50		no	85.74	85.37	85.87	85.87	85.82		n/a	n/a	n/a
Transit Way/Hydro	MH	657	MH	658			9.47																					716.00	716.00	13.40	53.43	716.00	716.00	716.00	CONC	1200	1219.2	0.15	9.0	1575.26	55%	1.35	0.11	85.75	84.55		no	85.74	84.54	85.82	85.82	85.82	0.07	n/a	n/a	n/a
Petrichor Crescent	MH	658	MH	612										0.18				0.38							47.60	87.55	87.55		716.00	13.40	4.44	59.50	835.00	835.00	CONC	1200	1219.2	0.15	115.0	1575.26	47%	1.35	1.42	85.74	84.54		no	85.57	84.37	85.82	85.79	85.74	0.05	86.63	0.84	OK
Strasbourg Street	MH	612	MH	617													0.25								21.25	563.55	563.55		2053.79	13.40	2.00	26.80	2803.59	2803.59	CONC	1800	1828.8	0.10	83.5	3792.13	26%	1.44	0.96	85.57	83.77		no	85.49	83.69	85.74	85.66	85.61	0.09	86.68	1.02	OK
Lerta Crescent	MH	613	MH	614							0.20						0.31								43.35	43.35	43.35			13.40	3.00	40.20	40.20	40.20	PVC	375	366.4	0.35	61.0	97.52	59%	0.92	1.10	86.18	85.81		no	85.97	85.60	86.18	86.18	85.97		86.78	0.60	OK
Lerta Crescent	MH	614	MH	615							0.21														17.85	61.20	61.20			13.40	1.00	13.40	53.60	53.60	CONC	450	457.2	0.26	9.5	151.66	65%	0.92	0.17	85.97	85.52		no	85.95	85.50	85.97	85.95	85.92		86.89	0.92	OK
Lerta Crescent	MH	615	MH	616							0.28						0.37								55.25	116.45	116.45			13.40	3.48	46.63	100.23	100.23	CONC	525	533.4	0.30	83.5	245.74	59%	1.10	1.27	85.95	85.43		no	85.70	85.18	85.95	85.95	85.70		86.67	0.72	OK
Lerta Crescent	MH	616	MH	617							0.59						0.40								84.15	200.60	200.60			13.40	6.00	80.40	180.63	180.63	CONC	675	685.8	0.76	106.5	764.49	76%	2.07	0.86	85.70	85.03	-0.60	no	84.89	84.22	85.70	85.70	85.61		86.55	0.85	OK
Strasbourg Street	MH	617	MH	1103													0.07								5.95	770.10	770.10		2053.79	13.40			2984.22	2984.22	CONC	1800	1828.8	0.10	42.0	3792.13	21%	1.44	0.48	85.49	83.69		no	85.45	83.65	85.61	85.61	85.58	0.12	n/a	n/a	n/a
Strasbourg Street	MH	1103	MH	1102				1.89			0.51														204.00	974.10	974.10		2053.79	13.40	21.37	286.34	3270.57	3270.57	CONC	1800	1828.8	0.10	121.8	3792.13	14%	1.44	1.41	85.45	83.65	0.01	no	85.33	83.53	85.58	85.58	85.49	0.13	n/a	n/a	n/a
G.Lalonde Drive	MH	234	MH	233													0.37								31.45	31.45	31.45			13.40	2.00	26.80	26.80	26.80	PVC	375	366.4	0.40	48.7	104.25	74%	0.99	0.82	86.36	85.98	-0.04	no	86.17	85.79	86.36	86.36	86.22		86.99	0.63	OK
G.Lalonde Drive	MH	233	MH	211													0.18								15.30	46.75	46.75			13.40	1.00	13.40	40.20	40.20	CONC	450	457.2	0.26	31.0	151.66	73%	0.92	0.56	86.21	85.76	0.23	1	86.13	85.68	86.22	86.22	86.21	0.02	86.75	0.53	OK
G. Lalonde Drive	MH	624	MH	211										0.14				0.27							34.85	34.85	34.85			13.40	3.47	46.50	46.50	46.50	CONC	450	457.2	0.35	77.5	175.96	74%	1.07	1.21	86.40	85.95	-0.08	X	86.13	85.68	86.40	86.40	86.21		86.93	0.53	OK
Trigoria Crescent	MH	680	MH	681													0.27								22.95	22.95	22.95			13.40	1.16	15.50	15.50	15.50	CONC	600	609.6	0.26	25.0	326.62	95%	1.12	0.37	86.42	85.82		no	86.35	85.75	86.42	86.42	86.35		86.85	0.43	OK
Future Site Plan	MH	690	MH	681										0.18							0.32				42.50	42.50	42.50			13.40	3.17	42.50	42.50	42.50	CONC	450	457.2	0.20	112.0	133.02	68%	0.81	2.30	86.57	86.12		no	86.35	85.90	86.57	86.57	86.35		87.75	1.18	OK
Trigoria Crescent	MH	681	MH	682																						65.45	65.45			13.40			58.00	58.00	CONC	600	609.6	0.26	41.0	326.62	82%	1.12	0.61	86.35	85.75		no	86.24	85.64	86.35	86.35	86.25		86.85	0.50	OK
Future Site Plan	MH	691	MH	692													0.06				0.32				32.30	32.30	32.30			13.40	2.41	32.30	32.30	32.30	CONC	525	533.4	0.16	50.0	179.46	82%	0.80	1.04	86.42	85.90		no	86.34	85.82	86.42	86.42	86.34		87.67	1.25	OK
Future Site Plan	MH	692	MH	682																	0.21				17.85	50.15	50.15			13.40	1.33	17.85	50.15	50.15	CONC	525	533.4	0.16	44.5	179.46	72%	0.80	0.92	86.31	85.79		no	86.24	85.72	86.31	86.31	86.25		87.52	1.21	OK
Trigoria Crescent	MH	682	MH	211														0.22							18.70	134.30	134.30			13.40	1.16	15.50	123.65	123.65	CONC	600	609.6	0.26	44.0	326.62	62%	1.12	0.66	86.24	85.64	-0.08	no	86.13	85.53	86.25	86.24	86.21		86.80	0.56	OK
Chinian Street	MH	211	MH	210						0.55			0.16					0.60							60.35	276.25	276.25			13.40	1.00	13.40	223.75	223.75	CONC	825	838.2	0.10	55.4	473.55	53%	0.86	1.08	86.21	85.39	0.03	no	86.15	85.33	86.21	86.21	86.15		n/a	n/a	n/a
Chinian Street	MH	210	MH	209																						276.25	276.25			13.40			223.75	223.75	CONC	825	838.2	0.10	23.9	473.55	53%	0.86	0.46	86.12	85.30	0.03	no	86.10	85.28	86.12	86.12	86.10		88.72	2.60	OK
Chinian Street	MH	209	MH	208											0.33										28.05	330.65	330.65			13.40	2.09	28.05	278.15	278.15	CONC	975	990.6	0.11	37.8	775.41	64%	1.01	0.63	86.07	85.10	-0.01	no	86.03	85.06	86.07	86.07	86.03		88.64	2.57	OK
Chinian Street	MH	208	MH	207						0.37															31.45	362.10	362.10			13.40	2.35	31.45	309.60	309.60	CONC	975	990.6	0.10	30.1	739.33	58%	0.96	0.52	86.01	85.04		no	85.98	85.01	86.01	86.01	85.98		88.47	2.46	OK
Chinian Street	MH	207	MH	206																						362.10	362.10			13.40			309.60	309.60	CONC	975	990.6	0.10	20.6	739.33	58%	0.96	0.36	85.95	84.98	0.01	no	85.93	84.96	85.95	85.95	85.93		88.70	2.75	OK
Petrichor Crescent	MH	629	MH	630										0.32				0.63							80.75	80.75	80.75			13.40	6.27	84.00	84.00	84.00	CONC	1350 525	533.4	0.20	118.5	200.65	58%	0.90	2.20	86.23	85.71		no	85.99	85.47	86.23	86.23	86.00		86.71	0.48	OK
G. Lalonde Drive	MH	630	MH	635			1.25						0.15												119.00	199.75	199.75			13.40	3.02	40.50	124.50	124.50	CONC	750	762.0	0.15	78.0	449.81	72%	0.99	1.32	85.99	85.24		no	85.87	85.12	86.00	85.99	85.89		n/a	n/a	n/a
G. Lalonde Drive	MH	633	MH	634										0.16				0.31							39.95	39.95	39.95			13.40	3.47	46.50	46.50	46.50	CONC	450	457.2	0.20	91.0	133.02	65%	0.81	1.87	86.19	85.74		no	86.01	85.56	86.19	86.19	86.01		86.98	0.79	OK
G. Lalonde Drive	MH	634	MH	635														0.25							21.25	61.20	61.20			13.40	1.64	22.00	68.50	68.50	CONC	675	685.8	0.18	75.5	372.05	82%	1.01	1.25	86.01	85.34		no	85.87	85.20	86.01	86.01	85.89		87.08	1.07	OK
Trigoria Crescent	MH	660	MH	661															0.52						44.20	44.20	44.20			13.40	3.47	46.50	46.50	46.50	CONC	450	457.2	0.20	110.0	133.02	65%	0.81	2.26	86.46	86.01		no	86.24	85.79	86.46	86.46	86.24		87.47	1.01	OK
Trigoria Crescent	MH	661	MH	662															0.29						24.65	68.85	68.85			13.40	1.64	22.00	68.50	68.50	CONC	525	533.4	0.16	63.0	179.46	62%	0.80	1.31	86.24	85.72		no	86.14	85.62	86.24	86.24	86.14		87.56	1.32	OK
Trigoria Crescent	MH	662	MH	663																						68.85	68.85			13.40			68.50	68.50	CONC	525	533.4	0.16	11.0	179.46	62%	0.80	0.23	86.11	85.59		no	86.09	85.57	86.11	86.11	86.09		86.91	0.80	OK
Trigoria Crescent	MH	663	MH	667																						68.85	68.85			13.40			68.50	68.50	CONC	525	533.4	0.16	39.0	179.46	62%	0.80	0.81	86.06	85.54		no	86.00	85.48	86.06	86.06	86.00		86.91	0.85	OK
Citrine Street	MH	665	MH	666														0.50							42.50	42.50	42.50			13.40	2.80	37.50	37.50	37.50	CONC	450	457.2	0.20	89.0	133.02	72%	0.81	1.83	86.30	85.85		no	86.12	85.67	86.30	86.30	86.12		87.38	1.08	OK
Citrine Street	MH	666	MH	667														0.25							21.25	63.75	63.75			13.40	1.16	15.50	53.00	53.00	CONC	525	533.4	0.16	72.5	179.46	70%	0.80	1.50	86.12	85.60		no	86.00	85.48	86.12	86.12	86.00		87.43	1.31	OK
Trigoria Crescent	MH	667	MH	673														0.27							22.95	155.55	155.55			13.40	1.64	22.00	143.50	143.50	CONC	675	685.8	0.20	47.0	392.18	63%	1.06	0.74	86.00	85.33		no	85.91	85.24	86.00	86.00	85.92		86.84	0.84	OK
Nacarat Street	MH	670	MH	671										0.27				0.13							34.00	34.00	34.00			13.40	2.31	31.00	31.00	31.00	PVC	375	366.4	0.26	83.5	84.05	63%	0.80	1.75	86.43	86.06		no	86.21	85.84	86.43	86.43	86.22		86.83	0.40	OK
Tungsten Terrace	MH	671	MH	672											0.20										17.00	51.00	51.00			13.40	1.16	15.50	46.50	46.50	CONC	450	457.2	0.20	56.0	133.02	65%	0.81	1.15	86.21	85.76		no	86.10	85.65	86.22	86.21	86.10		87.44	1.23	OK
Tungsten Terrace	MH	672	MH	673											0.35										29.75	80.75	80.75			13.40	2.31	31.00	77.50	77.50	CONC	525	533.4	0.16	120.0	179.46	57%	0.80	2.49	86.10	85.58		no	85.91	85.39	86.10	86.10	85.92		87.38	1.28	OK
Trigoria Crescent	MH	673	MH	635																						236.30	236.30			13.40			221.00	221.00	CONC	825	838.2	0.15	23.5	579.98	62%	1.05	0.37	85.91	85.09		no	85.87	85.05	85.92	85.91	85.89		86.84	0.93	OK



STORM SEWER COMPUTATION FORM

DESIGNED BY: AGS
CHECKED BY: JMD

PROJECT: **Neighbourhood 5 - Avalon West - STAGE 3**
CLIENT: Minto Communities Inc.
PROJECT #: 131004
BY: ATREL ENGINEERING LTD
DATE: November 2014

RESTRICTED FLOW : Various L/S/Ha.
RATIONAL METHOD Q= 2.78 AIR
PVC/CONC N= 0.013
CSP N= 0.024
CORR N= 0.021

Table 2

STREET NAMES	LOCATION FROM (Up)		TO (Down)		AREA (ha.) RUNOFF COEFFICIENT 0.20	0.27	0.29	0.30	0.36	0.39	0.45	0.48	0.50	0.55	0.60	0.62	0.65	0.70	0.75	0.80	0.85	0.70	0.70	0.76	Indiv Various L/s/ha	Cumul L/s/ha	FLOW (L/S)	Commercial & green space area Restr Flow (L/S)	Cum Flow (L/S)	Above ground (2) Local F.R. (L/S)	Qty	Restricted Flow (L/S)	Cum Restricted Flow (L/S)	ACTUAL PIPE FLOW (L/S)	PIPE TYPE	DIA (N0M) (mm)	(ACT)	SLOPE (%)	LENGTH (M)	SEWER DATA CAP. (L/S)	Remaining Capacity (%)	VEL. (M/S)	TIME OF FLOW (MIN)	UpStream Obv. (M)	UpStream Inv. (M)	Forced drop (M)	Inv to Inv (M)	DwStream Obv. (M)	DwStream Inv. (M)	**UpStream Hgl at UP-MH (M)**	Hgl Out UP-MH (M)	Down MH Hgl (M)	SURG AT UP MH (M)	USF ELEV (M)	HGL FREEBOARD (M)	Comment
Chinian Street	MH	635	MH	216								0.60													51.00	548.25	548.25			13.40	3.81	51.00	465.00	465.00	CONC	975	990.6	0.13	87.7	842.96	45%	1.09	1.34	85.87	84.90		no	85.76	84.79	85.89	85.87	85.76		n/a	n/a	n/a
Azure Street	MH	216	MH	202								0.37													31.45	579.70	579.70			13.40	2.35	31.45	496.45	496.45	CONC	975	990.6	0.10	86.9	739.33	33%	0.96	1.51	85.76	84.79		no	85.67	84.70	85.76	85.67		88.37	2.61	OK
Chinian Street	MH	202	MH	201																						1290.30	1290.30			13.40			1154.55	1154.55	CONC	1350	1371.6	0.10	37.7	1760.81	34%	1.19	0.53	85.67	84.32	0.03	no	85.63	84.28	85.67	85.67	85.64		88.52	2.85	OK
Chinian Street	MH	201	MH	1112							0.26	0.27													45.05	1335.35	1335.35			13.40	3.36	45.05	1199.60	1199.60	CONC	1350	1371.6	0.10	35.8	1760.81	32%	1.19	0.50	85.60	84.25	0.04	no	85.56	84.21	85.64	85.64	85.62	0.04	88.14	2.50	OK
Chinan Street	MH	1113	MH	1112							0.04				0.65										58.65	58.65	58.65			13.40	4.38	58.65	58.65	58.65	CONC	450	457.2	0.20	75.7	133.02	56%	0.81	1.56	85.67	85.22		no	85.52	85.07	85.67	85.67	85.62		88.30	2.63	OK
Chinian Street	MH	1112	MH	1111D							0.30														25.50	1419.50	1419.50			13.40	1.90	25.50	1283.75	1283.75	CONC	1350	1371.6	0.10	56.6	1760.81	27%	1.19	0.79	85.52	84.17		no	85.46	84.11	85.62	85.62	85.59	0.10	88.30	2.68	OK
Chinian Street	MH	1111D	MH	1111							0.29														24.65	1444.15	1444.15			13.40	1.84	24.65	1308.40	1308.40	CONC	1350	1371.6	0.10	23.8	1760.81	26%	1.19	0.33	85.43	84.08		no	85.41	84.06	85.59	85.57	85.56	0.14	n/a	n/a	n/a
Chinian Street	MH	1111	MH	1111E							0.25														21.25	1570.80	1570.80			13.40	1.59	21.25	1435.05	1435.05	CONC	1350	1371.6	0.11	48.4	1846.76	22%	1.25	0.65	85.41	84.06		no	85.36	84.01	85.56	85.56	85.53	0.15	n/a	n/a	n/a
Chinian Street	MH	1111E	MH	1102							0.33														28.05	1598.85	1598.85			13.40	2.09	28.05	1463.10	1463.10	CONC	1350	1371.6	0.11	30.8	1846.76	21%	1.25	0.41	85.36	84.01	0.01	no	85.33	83.98	85.53	85.51	85.49	0.15	n/a	n/a	n/a
Montagris Circle	MH	1104	MH	1102							2.95														250.75	250.75	250.75			13.40	18.71	250.75	250.75	250.75	CONC	600	609.6	0.20	85.8	286.47	12%	0.98	1.46	85.52	84.92	0.03	no	85.35	84.75	85.67	85.62	85.49	0.10	n/a	n/a	n/a
Strasbourg Street	MH	1102	MH	1101							0.22				0.32										45.90	2869.60	2869.60		2053.79	13.40	3.43	45.90	5030.32	5030.32	CONC	2100	2133.6	0.10	76.5	5720.16	12%	1.60	0.80	85.32	83.22		no	85.24	83.14	85.49	85.49	85.43	0.17	87.79	2.30	OK
Rochefort Circle	MH	1117	MH	1101											2.97										252.45	252.45	252.45			13.40	18.84	252.45	252.45	252.45	CONC	675	685.8	0.20	85.8	392.18	36%	1.06	1.35	85.44	84.77	0.03	no	85.27	84.60	85.50	85.50	85.43	0.06	87.79	2.29	OK
Strasbourg Street	MH	1101	MH	50543									0.60												51.00	3173.05	3173.05		2053.79	13.40	3.81	51.00	5333.77	5333.77	CONC	2100	2133.6	0.11	118.1	5999.35	11%	1.68	1.17	85.24	83.14		no	85.11	83.01	85.43	85.43	85.33	0.19	87.79	2.36	OK
Brian Coburn Blvd.	MH	199	MH	50543																4.74		1.61			402.90	402.90	402.90	383.18	383.18	13.40	58.66	786.08	786.08	786.08	CONC	1050	1066.8	0.20	120.0	1274.02	38%	1.43	1.40	85.35	84.30		no	85.11	84.06	85.42	85.42	85.33	0.07	n/a	n/a	n/a
Brian Coburn Blvd.	MH	196	MH	50543																		1.34						318.92	318.92	13.40	23.80	318.92	318.92	318.92	CONC	600	609.6	0.30	120.0	350.85	9%	1.20	1.66	85.49	84.89	0.02	no	85.13	84.53	85.63	85.63	85.33	0.14	n/a	n/a	n/a
Des Aubépines Drive	MH	50543	MH	50544											0.30										66.00	3641.95	3641.95		2755.89	13.40	3.59	48.16	6486.93	6486.93	CONC	2250	2286.0	0.10	96.9	6875.59	6%	1.68	0.96	85.11	82.86		no	85.01	82.76	85.33	85.33	85.24	0.22	85.89	0.56	OK
Site Plan No.2	MH	3511	MH	3512																0.28					61.60	61.60	61.60			13.40	4.60	61.60	61.60	61.60	CONC	525	533.4	0.16	99.0	179.46	66%	0.80	2.05	85.78	85.26		no	85.62	85.10	85.78	85.62			n/a	n/a	n/a
Site Plan No.2	MH	3512	MH	3513																0.24					52.80	114.40	114.40			13.40	3.94	52.80	114.40	114.40	CONC	525	533.4	0.16	99.0	179.46	36%	0.80	2.05	85.62	85.10		no	85.46	84.94	85.62	85.62	85.53		n/a	n/a	n/a
Street No.4	MH	3513	MH	3515											0.12										26.40	140.80	140.80			13.40	1.97	26.40	140.80	140.80	CONC	525	533.4	0.20	52.5	200.65	30%	0.90	0.97	85.40	84.88		no	85.29	84.77	85.53	85.51	85.46	0.11	n/a	n/a	n/a
Street No.4	MH	3514	MH	3515														0.14							30.80	30.80	30.80			13.40	2.30	30.80	30.80	30.80	PVC	300	299.2	0.34	44.5	55.99	45%	0.80	0.93	85.44	85.14		no	85.29	84.99	85.51	85.51	85.46	0.07	n/a	n/a	n/a
Street No.4	MH	3515	MH	3516									0.10					0.48							127.60	299.20	299.20			13.40	9.52	127.60	299.20	299.20	CONC	750	762.0	0.10	85.5	367.27	19%	0.81	1.77	85.29	84.54		no	85.20	84.45	85.46	85.43	85.37	0.14	86.28	0.85	OK
Street No.4	MH	3516	MH	3521									0.12					0.31							94.60	393.80	393.80			13.40	7.06	94.60	393.80	393.80	CONC	825	838.2	0.10	86.5	473.55	17%	0.86	1.68	85.20	84.38		no	85.11	84.29	85.37	85.31	85.17		86.06	0.69	OK
Street No.4	MH	3514	MH	3517																										13.40					PVC	375	366.4	0.26	10.0	84.05	100%	0.80	0.21	85.51	85.14		no	85.48	85.11	85.51	85.51	85.49		86.35	0.84	OK
Street No.4	MH	3517	MH	3518									0.17					0.39							123.20	123.20	123.20			13.40	9.19	123.20	123.20	123.20	CONC	525	533.4	0.20	78.0	198.12	38%	0.89	1.47	85.48	84.96		no	85.33	84.81	85.49	85.43	0.01	86.38	0.89	OK
Street No.4	MH	3518	MH	3519									0.14					0.38							114.40	237.60	237.60			13.40	8.54	114.40	237.60	237.60	CONC	675	685.8	0.15	78.5	339.63	30%	0.92	1.42	85.33	84.66		no	85.21	84.54	85.43	85.43	85.37	0.10	86.22	0.79	OK
Street No.4	MH	3519	MH	3520									0.15												33.00	270.60	270.60			13.40	2.46	33.00	270.60	270.60	CONC	675	685.8	0.15	10.5	339.63	20%	0.92	0.19	85.18	84.51		no	85.16	84.49	85.37	85.36	85.35	0.18	86.05	0.69	OK
Street No.4	MH	3520	MH	3521									0.06					0.13							41.80	312.40	312.40			13.40	3.12	41.80	312.40	312.40	CONC	750	762.0	0.11	44.0	385.20	19%	0.84	0.87	85.16	84.41		no	85.11	84.36	85.35	85.34	85.31	0.18	86.14	0.80	OK
Street No.4	MH	3521	MH	3522									0.05												11.00	717.20	717.20			13.40	0.82	11.00	717.20	717.20	CONC	975	990.6	0.13	36.5	842.96	15%	1.09	0.56	85.11	84.14		no	85.06	84.09	85.31	85.28	85.20		85.91	0.60	OK
Street No.4	MH	3522	MH	50544																						717.20	717.20			13.40			717.20	717.20	CONC	975	990.6	0.13	18.5	842.96	15%	1.09	0.28	85.03	84.06		no	85.01	84.04	85.28	85.26	85.24	0.23	85.94	0.68	OK
Multiple Block	MH	500	MH	50544															1.56						343.20	343.20	343.20			13.40	25.61	343.20	343.20	343.20	CONC	750	762.0	0.20	11.5	519.40	34%	1.14	0.17	85.03	84.28		no	85.01	84.26	85.25	85.25	85.24	0.22	86.00	0.75	OK
Des Aubépines Drive	MH	50544	MH	53620														0.16							35.20	4737.55	4737.55		2755.89	13.40	2.59	34.72	7582.05	7582.05	CONC	2250	2286.0	0.10	74.5	6875.59	-10%	1.68	0.74	85.01	82.76		no	84.94	82.69	85.24	85.24	85.15	0.23	85.94	0.70	OK
Des Aubépines Drive	MH	53620	MH	53621									0.31					0.34							143.00	4880.55	4880.55		2755.89	13.40	6.49	86.96	7669.01	7669.01	CONC	2250	2286.0	0.12	69.5	7373.25	-4%	1.80	0.64	84.94	82.69		no	84.86	82.61	85.15	85.15	85.06	0.21	85.88	0.73	OK
Des Aubépines Drive	MH	53621	MH	53622														0.42							92.40	4972.95	4972.95		2755.89	13.40	6.77	90.72	7759.73	7759.73	CONC	2250	2286.0	0.13	74.0	7809.17	1%	1.90	0.65	84.86	82.61		no	84.76	82.51	85.06	85.06	84.97	0.20	85.73	0.67	OK
Décoeur Drive	MH	3550	MH	53622									0.18		0.44		5.46								1337.60	1337.60	1337.60			13.40	100.65	1348.76	1348.76	1348.76	CONC	1350	1371.6	0.10	75.0	1760.81	23%	1.19	1.05	84.84	83.49		no	84.76	83.41	85.01	85.01	84.97	0.17	85.80	0.79	OK
Des Aubépines Drive	MH	53622	MH	53644														0.37							81.40	6391.95	6391.95		2755.89	13.40	6.19	82.88	9191.36	9191.36	CONC	2550	2590.8	0.11	88.0	9836.90	7%	1.87	0.79	84.76	82.21		no	84.67	82.12	84.97	84.97	84.89	0.21	85.60	0.63	OK
Elementary School	MH	504	MH	53644															2.77						609.40	609.40	609.40			13.40	45.48	609.40	609.40	609.40	CONC	975	990.6	0.20	12.5	1045.56	42%	1.36	0.15	84.70	83.73		no	84.67	83.70	84.91	84.90	84.89	0.20	85.67	0.77	OK
Des Aubépines Drive	MH	53644	MH	53645														0.28							61.60	7062.95	7062.95		2755.89	13.40	5.97	80.00	9880.76	9880.76	CONC	2550	2590.8	0.11	83.7	9836.90	0%	1.87	0.75	84.67	82.12		no	84.58	82.03	84.89	84.89	84.80	0.22	85.43	0.54	OK
Street No. 9	MH	3553	MH	53645														0.58							127.60	127.60	127.60			13.40	10.03	134.36	134.36	134.36	CONC	675	685.8	0.11	14.5	296.09	55%	0.80	0.30	84.60	83.93		no	84.58	83.91	84.80	84.80	84.80	0.20	85.25	0.45	OK
Des Aubépines Drive	MH	53645	MH	53646														0.41							90.20	7280.75	7280.75		2755.89	13.40	9.55	128.00	10143.12	10143.12	CONC	2550	2590.8	0.11	74.5	9836.90	-3%	1.87	0.67	84.58	82.03		no	84.50	81.95	84.80	84.80	84.72	0.22	85.28	0.48	OK
Street No.5	MH	3567	MH	53646	0.35									1.73				1.36							756.80	756.80	756.80			13.40	56.51	757.28	757.28	757.28	CONC	975	990.6	0.11	118.0	775.41	2%	1.01	1.95	84.63	83.66		no	84.50	83.53	84.84	84.84	84.72	0.21	85.65	0.81	OK
Neighbourhood Park	MH	505	MH	3571	1.19																				261.80	261.80	261.80			13.40	4.01	53.76	53.76	53.76	PVC	375	366.4	0.26	18.0	84.05	36%	0.80	0.38	85.36	84.99		no	85.31	84.94	85.38	85.38	85.36	0.02	n/a	n/a	n/a
Décoeur Drive	MH	3571	MH	3572											0.25										55.00	316.80	316.80			13.40	3.09	41.44	95.20	95.20	CONC	450	457.2	0.20	74.0	133.02	28%	0.81	1.52	85.31	84.86		no	85.16	84.71	85.36	85.34	85.26	0.03	n/a	n/a	n/a
Décoeur Drive	MH	3572	MH	3576											0.18										39.60	356.40	356.40			13.40	2.31	31.00	126.20	126.20	CONC	525	533.4	0.16	32.0	179.46	30%	0.80	0.66	85.16	84.64		no	85.11	84.59	85.26	85.26	85.23	0.10	n/a	n/a	n/a
School	MH	501	MH	3576															2.44						536.80	536.80	536.80			13.40	40.06	536.80	536.80	536.80	CONC	900	914.4	0.20	19.0	844.60	36%	1.29	0.25	85.15	84.25		no	85.11	84.21	85.25	85.25	85.23	0.10	86.22	0.97	OK
Commercial	MH	503	MH	3574															4.78						1052.26	1052.26	1052.26			13.40	78.53	1052.26	1052.26	1052.26	CONC	1200	1219.2	0.20	17.0	1818.95	42%	1.56	0.18	85.35	84.15		no	85.32	84.12	85.41	85.41	85.40	0.06	86.48	1.07	OK
Site Plan No.1	MH	3573	MH	3574																0.12					26.40	26.40	26.40			13.40	2.17	29.12	29.12	29.12	PVC	300	299.2	1.00	45.0	96.02	70%	1.37	0.55	85.71	85.41		no	85.26	84.96	85.71	85.71	85.40		87.14	1.43	OK
Décoeur Drive	MH	3574	MH	3575											0.26										57.20	1135.86	1135.86			13.40	3.09	41.44	1122.82	1122.82	CONC	1200	1219.2	0.11	56.5	1348.97	17%	1.16	0.81	85.26	84.06		no	85.20	84.00	85.40	85.34	85.30	0.08	86.87	1.53	OK
Décoeur Drive	MH	3575	MH	3576											0.34										74.80	1210.66	1210.66			13.40	2.90	38.80	1161.62	1161.62	CONC	1200	1219.2	0.11	85.0	1348.97	14%	1.16	1.23	85.20	84.00		no	85.11	83.91	85.30	85.30	85.23	0.10	86.88	1.58	OK
Magnolia Street	MH	3576	MH	3579														0.09							19.80	2123.66	2123.66			13.40	2.31	31.00	1855.62	1855.62	CONC	1500	1524.0	0.11	51.5	2445.85	24%	1.34	0.64	85.11	83.61		no	85.05	83.55	85.23	85.16	85.13	0.05	n/a	n/a	n/a
Site Plan No.1	MH	3577	MH	3578																0.23					50.60	50.60	50.60			13.40	4.26	57.12	57.12	57.12	PVC	375	366.4	0.26	59.5	84.05	32%	0.80	1.24	85.56	85.19		no	85.41	85.04	85.56	85.56	85.41		87.00	1.44	OK
Site Plan No.1	MH	3578	MH	3579																0.13					28.60	79.20	79.20			13.40	2.42	32.48	89.60	89.60	CONC	450	457.2	0.20	71.5	131.34	32%	0.80	1.49	85.41	84.96	0.22	no	85.27	84.82	85.41	85.41	85.27		86.88	1.47	OK
Magnolia Street	MH	3579	MH	3585									0.13					0.18							68.20	2271.06	2271.06			13.40	4.01	53.76	1998.98	1998.98	CONC	1650	1676.4	0.10	48.0	3006.86	34%	1.36	0.59	85.05	83.40		no	85.00	83.35	85.13	85.13	85.11	0.08	n/a	n/a	n/a
Hepatica Crescent	MH	3581	MH	3582										0.31			0.24								121.00	121.00	121.00			13.40	6.77	90.72	90.72	90.72	CONC	525	533.4	0.16	82.5	179.46	49%	0.80	1.71	85.26	84.74		no	85.13	84.61	85.26	85.26	85.17		85.88	0.62	OK
Hepatica Crescent	MH	3582	MH	3585													0.22								48.40	169.40	169.40			13.40	4.78	64.00	154.72	154.72	CONC	600	609.6	0.13	95.5	232.73	34%	0.80	2.00	85.13	84.53		no	85.00	84.40	85.17	85.17	85.11	0.04	85.77	0.60	OK
Hepatica Crescent	MH	3583	MH	3584									0.17					0.41							127.60	127.60	127.60			13.40	7.86	105.28	105.28	105.28	CONC	525	533.4	0.16	83.0	179.46	41%	0.80	1.72	85.41	84.89		no	85.28	84.76	85.41	85.41	85.28		85.88	0.47	OK
Hepatica Crescent	MH	3584	MH	3585														0.24							52.80	180.40	180.40			13.40	3.68	49.28	154.56	154.56	CONC	600	609.6	0.15	88.0	248.09	38%	0.85	1.73	85.28	84.68	0.15	no	85.15	84.55	85.28	85.28	85.15		85.92	0.64	OK

2322, 2370 Tenth Line Road, 885 Decoeur Drive

LICENSED PROFESSIONAL ENGINEER
A. G. Y. SAUVE
100142393
Nov. 29, 2014
PROVINCE OF ONTARIO

STORM SEWER COMPUTATION FORM

DESIGNED BY: AGS
CHECKED BY: JMD

PROJECT: **Neighbourhood 5 - Avalon West - STAGE 3**
CLIENT: Minto Communities Inc.
PROJECT #: 131004
BY: ATREL ENGINEERING LTD
DATE: November 2014

RESTRICTED FLOW : Various L/S/Ha.
RATIONAL METHOD Q= 2.78 AIR
PVC/CONC N= 0.013
CSP N= 0.024
CORR N= 0.021

Table 2

STREET NAMES	LOCATION FROM (Up)		TO (Down)		AREA (ha.) RUNOFF COEFFICIENT 0.20	0.27	0.29	0.30	0.36	0.39	0.45	0.48	0.50	0.55	0.60	0.62	0.65	0.70	0.75	0.80	0.85	0.70	0.70	0.76
Magnolia Street	MH	3585	MH	3594										0.14				0.37						
Genévriers Street	MH	3586	MH	3587										0.42				0.22						
Genévriers Street	MH	3587	MH	3588																				
Genévriers Street	MH	3588	MH	3589														0.40						
Genévriers Street	MH	3589	MH	3594																				
Hepatica Crescent	MH	3583	MH	3590																				
Hepatica Crescent	MH	3590	MH	3592														0.04						
Hepatica Crescent	MH	3591	MH	3592														0.18						
Genévriers Street	MH	3592	MH	3593										0.29				0.40						
Genévriers Street	MH	3593	MH	3594										0.12				0.24						
Magnolia Street	MH	3594	MH	3597										0.16				0.28						
Hepatica Crescent	MH	3595	MH	3596										0.37				0.31						
Hepatica Crescent	MH	3596	MH	3597										0.29				0.23						
Hepatica Crescent	MH	3597	MH	3598										0.73				0.56						
Hepatica Crescent	MH	3598	MH	53646										0.48				0.32						
Des Aubépines Drive	MH	53646	MH	HEADWALL																				

STREET NAMES	FROM (Up)	TO (Down)	Indiv Various L/s/ha	Cumul L/s/ha	FLOW (L/S)	Commercial & green space area Restr Flow (L/S)	Cum Flow (L/S)	(2) Local F.R. (L/S)	Above ground Qty	Restricted Flow (L/S)	Cum Restricted Flow (L/S)	**ACTUAL PIPE FLOW (L/S)**	PIPE TYPE	DIA. (N0M) (mm)	(ACT)	SEWER DATA SLOPE (%)	LENGTH (M)	CAP. (L/S)	Remaining Capacity (%)	VEL. (M/S)	TIME OF FLOW (MIN)
Magnolia Street	3585	3594	112.20	2733.06	2733.06			13.40	8.68	116.28	2424.54	2424.54	CONC	1650	1676.4	0.10	79.0	3006.86	19%	1.36	0.97
Genévriers Street	3586	3587	140.80	140.80	140.80			13.40	9.46	126.72	126.72	126.72	CONC	525	533.4	0.16	59.0	179.46	29%	0.80	1.22
Genévriers Street	3587	3588		140.80	140.80			13.40			126.72	126.72	CONC	525	533.4	0.16	11.5	179.46	29%	0.80	0.24
Genévriers Street	3588	3589	88.00	228.80	228.80			13.40	6.10	81.76	208.48	208.48	CONC	675	685.8	0.11	77.5	294.79	29%	0.80	1.62
Genévriers Street	3589	3594		228.80	228.80			13.40			208.48	208.48	CONC	750	762.0	0.11	48.0	390.41	47%	0.86	0.93
Hepatica Crescent	3583	3590						13.40					PVC	300	299.2	0.34	10.5	55.99	100%	0.80	0.22
Hepatica Crescent	3590	3592	8.80	8.80	8.80			13.40					PVC	300	299.2	0.34	71.5	55.99	100%	0.80	1.50
Hepatica Crescent	3591	3592	39.60	39.60	39.60			13.40	2.76	36.96	36.96	36.96	PVC	375	366.4	0.26	69.0	84.05	56%	0.80	1.44
Genévriers Street	3592	3593	151.80	200.20	200.20			13.40	9.95	133.28	170.24	170.24	CONC	675	685.8	0.11	90.0	294.79	42%	0.80	1.88
Genévriers Street	3593	3594	79.20	279.40	279.40			13.40	5.10	68.32	238.56	238.56	CONC	750	762.0	0.10	90.0	367.27	35%	0.81	1.86
Magnolia Street	3594	3597	96.80	3338.06	3338.06			13.40	8.26	110.64	2982.22	2982.22	CONC	1800	1828.8	0.10	84.0	3792.13	21%	1.44	0.97
Hepatica Crescent	3595	3596	149.60	149.60	149.60			13.40	9.03	120.96	120.96	120.96	CONC	525	533.4	0.16	71.0	179.46	33%	0.80	1.47
Hepatica Crescent	3596	3597	114.40	264.00	264.00			13.40	8.12	108.80	229.76	229.76	CONC	675	685.8	0.12	80.5	303.78	24%	0.82	1.63
Hepatica Crescent	3597	3598	283.80	3885.86	3885.86			13.40	20.21	270.88	3482.86	3482.86	CONC	1800	1828.8	0.13	118.0	4323.69	19%	1.65	1.19
Hepatica Crescent	3598	53646	176.00	4061.86	4061.86			13.40	12.60	168.80	3651.66	3651.66	CONC	1800	1828.8	0.13	101.5	4323.69	16%	1.65	1.03
Des Aubépines Drive	53646	HEADWALL		12099.41	12099.41		2755.89	13.40			14552.06	14552.06	CONC	2700	2743.2	0.10	38.5	11180.46	-30%	1.89	0.34

STREET NAMES	FROM (Up)	TO (Down)	UpStream Obv. (M)	UpStream Inv. (M)	Forced drop (M)	Inv to Inv (M)	DwStream Obv. (M)	DwStream Inv. (M)	**UpStream Hgl at UP-MH (M)**	Hgl Out UP-MH (M)	Down MH Hgl (M)	SURG AT UP MH (M)	UpStream USF ELEV (M)	HGL FREEBOARD (M)	Comment
Magnolia Street	3585	3594	85.00	83.35		no	84.92	83.27	85.11	85.11	85.06	0.11	85.63	0.52	OK
Genévriers Street	3586	3587	85.20	84.68		no	85.11	84.59	85.20	85.20	85.15		85.60	0.40	OK
Genévriers Street	3587	3588	85.08	84.56		no	85.06	84.54	85.15	85.14	85.13	0.06	85.79	0.65	OK
Genévriers Street	3588	3589	85.06	84.39		no	84.97	84.30	85.13	85.12	85.08	0.06	85.59	0.47	OK
Genévriers Street	3589	3594	84.97	84.22		no	84.92	84.17	85.08	85.08	85.06	0.11	85.71	0.63	OK
Hepatica Crescent	3583	3590	85.52	85.22		no	85.48	85.18	85.52	85.52	85.48		86.08	0.56	OK
Hepatica Crescent	3590	3592	85.45	85.15		no	85.21	84.91	85.45	85.45	85.22		85.96	0.51	OK
Hepatica Crescent	3591	3592	85.39	85.02		no	85.21	84.84	85.39	85.39	85.22		85.86	0.47	OK
Genévriers Street	3592	3593	85.21	84.54		no	85.11	84.44	85.22	85.21	85.11		85.84	0.63	OK
Genévriers Street	3593	3594	85.11	84.36	0.10	no	85.02	84.27	85.11	85.11	85.06		85.75	0.64	OK
Magnolia Street	3594	3597	84.92	83.12		no	84.84	83.04	85.06	85.06	85.01	0.14	85.64	0.58	OK
Hepatica Crescent	3595	3596	85.14	84.62		no	85.03	84.51	85.14	85.14	85.07		85.59	0.45	OK
Hepatica Crescent	3596	3597	85.03	84.36	0.15	no	84.93	84.26	85.07	85.07	85.01	0.04	85.54	0.47	OK
Hepatica Crescent	3597	3598	84.78	82.98		no	84.63	82.83	85.01	84.91	84.81	0.13	85.35	0.44	OK
Hepatica Crescent	3598	53646	84.63	82.83		no	84.50	82.70	84.81	84.81	84.72	0.18	85.20	0.39	OK
Des Aubépines Drive	53646	HEADWALL	84.50	81.80		no	84.46	81.76	84.72	84.72	84.65	0.22	n/a	n/a	n/a

Existing Storm Sewers
Existing Eastern Trunk
Stage 2 Storm Sewers
Proposed Stage 3 Storm Sewers
Future Stages Storm Sewers



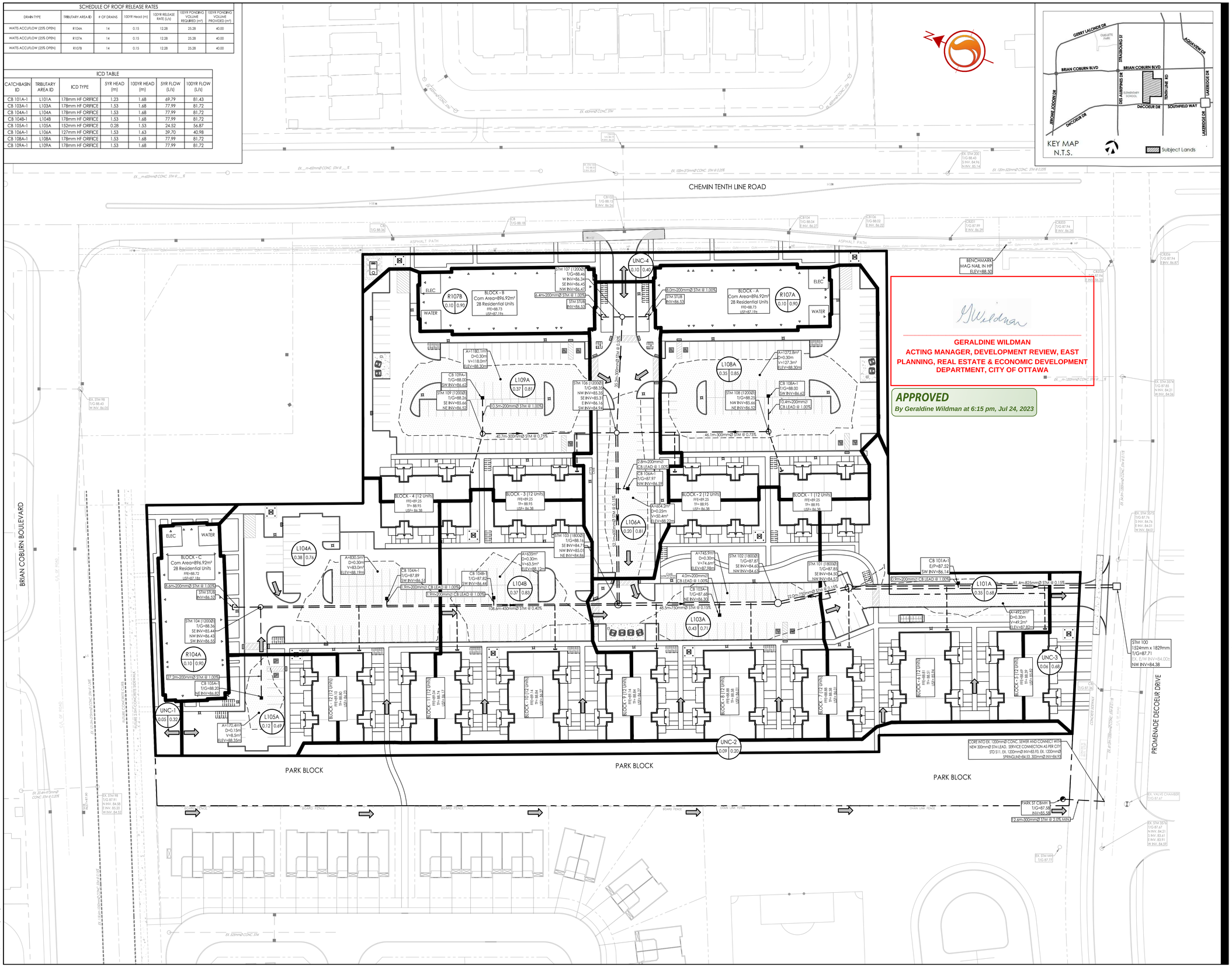
2370 Report Excerpts

SCHEDULE OF ROOF RELEASE RATES

DRAIN TYPE	TRIBUTARY AREA ID	# OF DRAINS	100YR Head (m)	100YR RELEASE RATE (L/s)	100YR PONDING VOLUME REQUIRED (m³)	100YR PONDING VOLUME PROVIDED (m³)
WATTS ACCUFLOW (25% OPEN)	R104A	14	0.15	12.28	25.28	40.00
WATTS ACCUFLOW (25% OPEN)	R107A	14	0.15	12.28	25.28	40.00
WATTS ACCUFLOW (25% OPEN)	R107B	14	0.15	12.28	25.28	40.00

ICD TABLE

CATCHBASIN ID	TRIBUTARY AREA ID	ICD TYPE	5YR HEAD (m)	100YR HEAD (m)	5YR FLOW (L/s)	100YR FLOW (L/s)
CB 101A-1	L101A	178mm HF ORIFICE	1.23	1.68	69.79	81.43
CB 103A-1	L103A	178mm HF ORIFICE	1.53	1.68	77.99	81.72
CB 104A-1	L104A	178mm HF ORIFICE	1.53	1.68	77.99	81.72
CB 104B-1	L104B	178mm HF ORIFICE	1.53	1.68	77.99	81.72
CB 105A-1	L105A	152mm HF ORIFICE	0.28	1.53	24.52	56.87
CB 106A-1	L106A	127mm HF ORIFICE	1.53	1.63	39.70	40.98
CB 108A-1	L108A	178mm HF ORIFICE	1.53	1.68	77.99	81.72
CB 109A-1	L109A	178mm HF ORIFICE	1.53	1.68	77.99	81.72



GERALDINE WILDMAN
ACTING MANAGER, DEVELOPMENT REVIEW, EAST
PLANNING, REAL ESTATE & ECONOMIC DEVELOPMENT
DEPARTMENT, CITY OF OTTAWA

APPROVED
By Geraldine Wildman at 6:15 pm, Jul 24, 2023

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Legend

- L101A / 1.00 / 0.85 — AREA ID; RUNOFF COEFFICIENT; STORM DRAINAGE AREA ha.
- STORM DRAINAGE BOUNDARY
- DIRECTION OF OVERLAND FLOW
- DIRECTION OF EMERGENCY OVERLAND FLOW
- PROPOSED STORM MH AND SEWER
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED CATCHBASIN
- PROPOSED WATTS FD-530 (OR EQUIVALENT) TO BE CONNECTED TO INTERNAL STORM SEWER PLUMBING.
- EXISTING STORM MH AND SEWER
- EXISTING CATCHBASIN
- THERMAL INSULATION ON STORM SEWER WHERE COVER IS LESS THAN 1.5m. THERMAL INSULATION ON WATERMAIN WHERE COVER IS LESS THAN 2.4m AS PER W22.
- MAXIMUM STATIC PONDING LIMITS

Notes

Revision	By	Appd.	YY.MM.DD
5 ISSUED FOR CONSTRUCTION	MJS	KS	23.05.31
4 REVISED AS PER SITE PLAN	MJS	KS	23.03.28
3 REVISED AS PER CITY COMMENTS/SITE PLAN	MJS	KS	23.02.27
2 REVISED AS PER NEW SITE PLAN	MJS	DT	22.12.05
1 REVISED AS PER SITE PLAN	MJS	DT	22.09.27
0 ISSUED FOR SPA	MJS	DT	21.12.13

File Name: 160401710D8	Dwn.	Chkd.	Dsgn.	YY.MM.DD
	MJS	DT	MJS	21.11.22

Permit-Seal

Client/Project
MATTAMY HOMES LTD.

ORLEANS DECOEUR RESIDENTIAL DEVELOPMENT
2370 TENTH LINE ROAD
OTTAWA, ON, CANADA

Title
STORM DRAINAGE AREA PLAN

Project No.	Scale	Sheet	Revision
160401710	1:500 (0 5 15 25m)	6 of 7	5
Drawing No.			
SD-1			PLAN No. 18668

D07-12-21-0224

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2023/05/31 3:39 PM By: Sharp, Mike

ORIGINAL SHEET - ARCH D

Stantec

	DECOEUR
DATE:	2022-11-22
REVISION:	2
DESIGNED BY:	MJS
CHECKED BY:	DT
FILE NUMBER:	160401710

STORM SEWER DESIGN SHEET
(City of Ottawa)

DESIGN PARAMETERS

$I = a / (t+b)^c$ (As per City of Ottawa Guidelines, 2012)

	1:2 yr	1:5 yr	1:10 yr	1:100 yr				
a =	732.951	998.071	1174.184	1735.688	MANNING'S n =	0.013	BEDDING CLASS =	B
b =	6.199	6.053	6.014	6.014	MINIMUM COVER:	2.00	m	
c =	0.810	0.814	0.816	0.820	TIME OF ENTRY	10	min	

LOCATION			DRAINAGE AREA																						PIPE SELECTION									
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA (2-YEAR) (ha)	AREA (5-YEAR) (ha)	AREA (10-YEAR) (ha)	AREA (100-YEAR) (ha)	AREA (ROOF) (ha)	C (2-YEAR) (-)	C (5-YEAR) (-)	C (10-YEAR) (-)	C (100-YEAR) (-)	A x C (2-YEAR) (ha)	ACCUM AxC (2YR) (ha)	A x C (5-YEAR) (ha)	ACCUM. AxC (5YR) (ha)	A x C (10-YEAR) (ha)	ACCUM. AxC (10YR) (ha)	A x C (100-YEAR) (ha)	ACCUM. AxC (100YR) (ha)	T of C (min)	$I_{2\text{-YEAR}}$ (mm/h)	$I_{5\text{-YEAR}}$ (mm/h)	$I_{10\text{-YEAR}}$ (mm/h)	$I_{100\text{-YEAR}}$ (mm/h)	$Q_{CONTROL}$ (L/s)	ACCUM. $Q_{CONTROL}$ (L/s)	Q_{ACT} (CIA/360) (L/s)	LENGTH (m)	PIPE WIDTH OR DIAMETE (mm)	PIPE HEIGHT (mm)	PIPE SHAPE (-)	MATERIAL (-)	CLASS (-)	SLOPE %	Q_{CAP} (FULL) (L/s)	% FULL (-)	VEL. (FULL) (m/s)	TIME OF FLOW (min)
R104A	BLDG C	104	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	12.3	12.3	12.3	9.4	200	200	CIRCULAR	PVC	-	1.00	33.3	**36.87%**	1.05	0.19
																				10.19															
L105A	105A-1	104	0.12	0.00	0.00	0.00	0.00	0.69	0.00	0.00	0.00	0.083	0.083	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	17.8	27.2	200	200	CIRCULAR	PVC	-	1.00	33.3	**53.35%**	1.05	0.50
																				10.50															
L104A, L104B	104	103	0.76	0.00	0.00	0.00	0.00	0.79	0.00	0.00	0.00	0.603	0.686	0.000	0.000	0.000	0.000	0.000	0.000	10.50	74.95	101.64	119.14	174.14	0.0	12.3	155.1	108.6	450	450	CIRCULAR	CONCRETE	-	0.40	188.1	**82.45%**	1.15	1.59
																				12.08															
	109A-1	109	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	0.0	10.5	200	200	CIRCULAR	PVC	-	1.00	33.3	**0.00%**	1.05	0.00
L109A	109	106	0.38	0.00	0.00	0.00	0.00	0.81	0.00	0.00	0.00	0.306	0.306	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	65.2	40.7	300	300	CIRCULAR	PVC	-	0.75	83.3	**78.30%**	1.18	0.59
																				10.59															
	108A-1	108	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	0.0	10.4	200	200	CIRCULAR	PVC	-	1.00	33.3	**0.00%**	1.05	0.00
L108A	108	106	0.36	0.00	0.00	0.00	0.00	0.85	0.00	0.00	0.00	0.302	0.302	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	64.4	46.1	300	300	CIRCULAR	PVC	-	0.75	83.3	**77.33%**	1.18	0.67
																				10.67															
	BLDG A	107	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	12.3	12.3	12.3	9.0	200	200	CIRCULAR	PVC	-	1.00	33.3	**36.87%**	1.05	0.19
																				10.19															
	BLDG B	107	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	12.3	12.3	12.3	7.4	200	200	CIRCULAR	PVC	-	1.00	33.3	**36.87%**	1.05	0.15
																				10.15															
R107B, R107A	107	106	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.19	76.10	103.23	121.00	176.88	0.0	24.6	24.6	35.2	300	300	CIRCULAR	PVC	-	0.50	68.0	**36.12%**	0.97	0.78
																				10.97															
L106A	106	103	0.20	0.00	0.00	0.00	0.00	0.81	0.00	0.00	0.00	0.166	0.773	0.000	0.000	0.000	0.000	0.000	0.000	10.97	73.28	99.35	116.44	170.18	0.0	24.6	181.9	52.1	600	600	CIRCULAR	CONCRETE	-	0.15	248.1	**73.33%**	0.85	1.06
																				12.03															
L103A	103	102	0.43	0.00	0.00	0.00	0.00	0.71	0.00	0.00	0.00	0.306	1.765	0.000	0.000	0.000	0.000	0.000	0.000	12.08	69.64	94.34	110.54	161.52	0.0	36.8	378.3	48.5	750	750	CIRCULAR	CONCRETE	-	0.15	449.8	**84.11%**	0.99	0.82
	102	101	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	1.765	0.000	0.000	0.000	0.000	0.000	0.000	12.90	67.21	91.01	106.62	155.77	0.0	36.8	366.4	22.0	750	750	CIRCULAR	CONCRETE	-	0.15	449.8	**81.46%**	0.99	0.37
L101A	101	100	0.35	0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.00	0.241	2.006	0.000	0.000	0.000	0.000	0.000	0.000	13.28	66.16	89.57	104.93	153.28	0.0	36.8	405.5	81.4	825	825	CIRCULAR	CONCRETE	-	0.15	580.0	**69.92%**	1.05	1.36
																				14.64															
																													825	825								