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39 Years

Proposed Residential Development
73, 79 & 83 STE-CÉCILE STREET
Servicing and Stormwater Management Report

73, 79 & 83 STE-CÉCILE STREET
PROPOSED 3-STOREY RESIDENTIAL DEVELOPMENT

OTTAWA, ONTARIO

SERVICING AND STORMWATER MANAGEMENT REPORT

Prepared by:

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

December 16, 2022

Ref: R-2022-198
Novatech File: 122167

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Engineers, Planners & Landscape Architects

December 16, 2022

City of Ottawa
Planning and Growth Management Department
4th Floor
110 Laurier Avenue West
Ottawa, Ontario
K1P 1J1

Attention: Colette Gorni

Dear Ms. Gorni

Re: Servicing and Stormwater Management Report
Proposed 3-Storey Residential Development
73, 79 & 83 Ste-Cécile Street, Ottawa, ON
Novatech File No.: 122167

Please find enclosed the 'Servicing and Stormwater Management Report' dated December 16, 2022 for the above noted project. This report is submitted in support of a Zoning By-law Amendment and Site Plan Control Applications.

If you have any questions, please contact the undersigned.

Yours truly,

NOVATECH

Matthew Hrehoriak, P.Eng.
Project Manager, Land Development Engineering

cc: Mohammed Fawzi (City of Ottawa)
Murray Chown (Novatech)
Dean & Dennis Michaud (Henry Investments)

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1.0. INTRODUCTION

Novatech has been retained to prepare a Servicing and Stormwater Management Report for the property located at 73, 79 & 83 Ste-Cécile Street within the City of Ottawa. This report will support the Zoning By-Law Amendment and Site Plan Application for the subject development. ***Figure 1*** is a Key Plan showing the site location.

2.0. EXISTING DEVELOPMENT

The existing three properties combine for a total site area of approximately 0.11 hectares in size. There is currently a single-detached residential dwelling on each of the three lots. The legal description of the property is identified as Lots 85, 86 and 87, Registered Plan M-27, City of Ottawa. The property is bound by Marquette Avenue to the North, Ste-Cécile Street to the South and adjacent residential dwellings to the east and west. The topography of the site slopes towards Ste-Cécile Street (North to South). ***Figure 2*** shows the existing site conditions.

3.0. PROPOSED DEVELOPMENT

It is proposed to develop a 3-storey apartment building that includes surface parking at the rear of the building. The apartment will have a total of 30 units consisting of 18 one-bedroom and 12 two-bedroom units. The ground floor has two levels, the lower ground floor level is the main at grade entrance to the building which includes a lobby, bike room and garbage room. The upper ground floor level consists of one-bedroom and two-bedroom apartment units. The basement floor will also have two different levels, the main basement level will have apartment units and the sub-basement level is the mechanical room. The proposed development will have pedestrian and vehicular access from Ste-Cécile Street at ground level. ***Figure 3*** shows the proposed development.

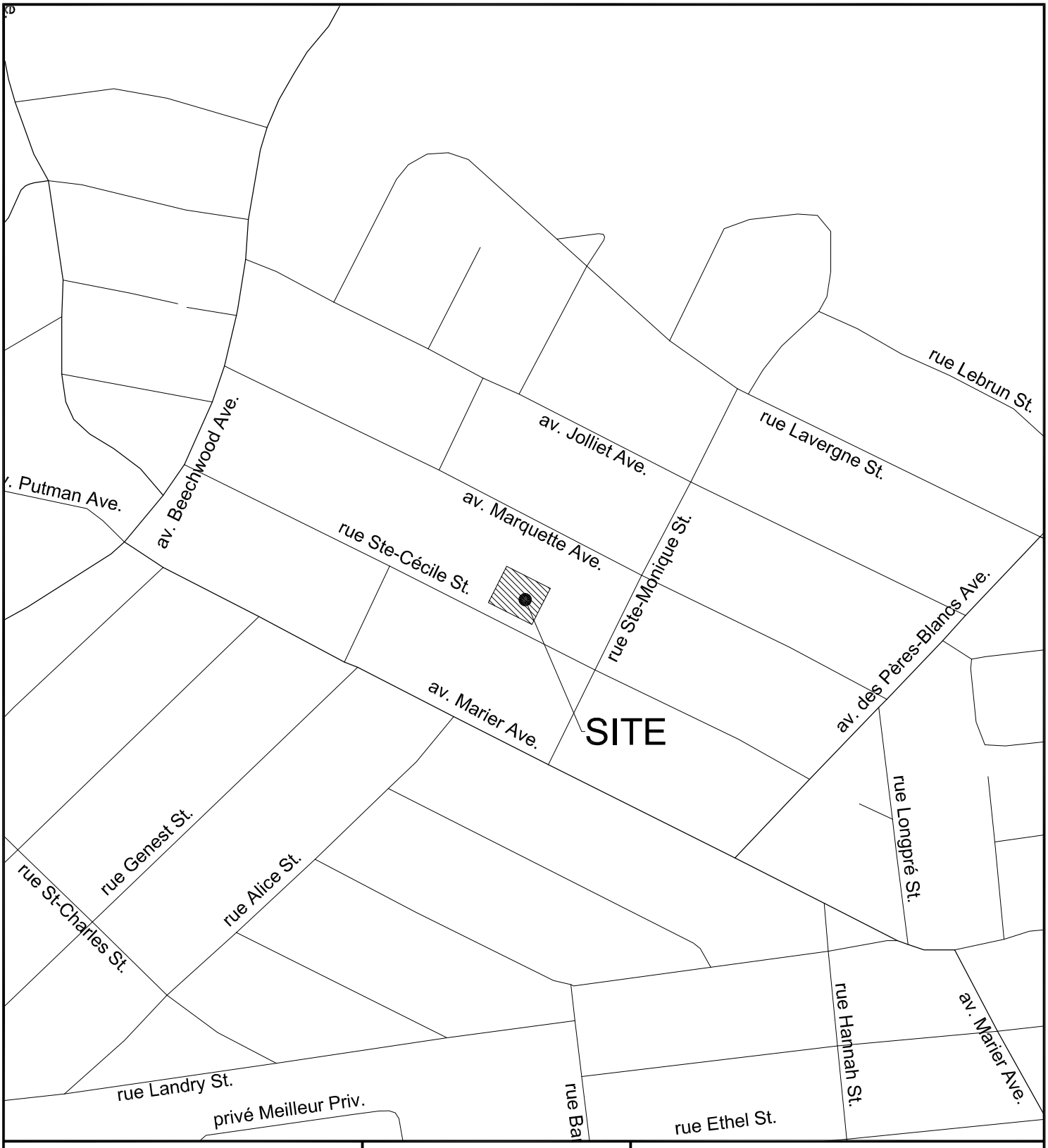
4.0. PRE-CONSULTATION INFORMATION

A pre-consultation meeting was held with the City of Ottawa on September 23, 2022, at which time the client was advised of the general submission requirements. Refer to **Appendix A** for a copy of the correspondence from the City of Ottawa.

The subject site is located within the jurisdiction of the Rideau Valley Conservation Authority (RVCA). Since the receiving downstream storm sewer outlet (Ottawa River) is approximately 2.6 kilometers, quality control is not expected for the subject site.

5.0. WATER SERVICING

There is an existing 200mm diameter PVC watermain located in the Ste-Cécile Street right-of-way which will provide service for the proposed development. The proposed 3-storey apartment building will be serviced by a new 100mm diameter water service with a connection to the existing 200mm diameter watermain in Ste-Cécile Street. The proposed water service will be sized to provide the required domestic water demand only, fire protection will be provided by the existing hydrants in the Ste-Cécile Street right-of-way. A shut-off valve will be provided on the proposed service at the property line and a water meter and remote water meter will be provided. Refer to the General Plan of Services **(122167-GP)** for further details.



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Website www.novatech-eng.com

73-83 STE. CECILE STREET

KEY PLAN

SCALE: N.T.S

DATE: NOV 2022 | JOB: 122167 | FIGURE: 1

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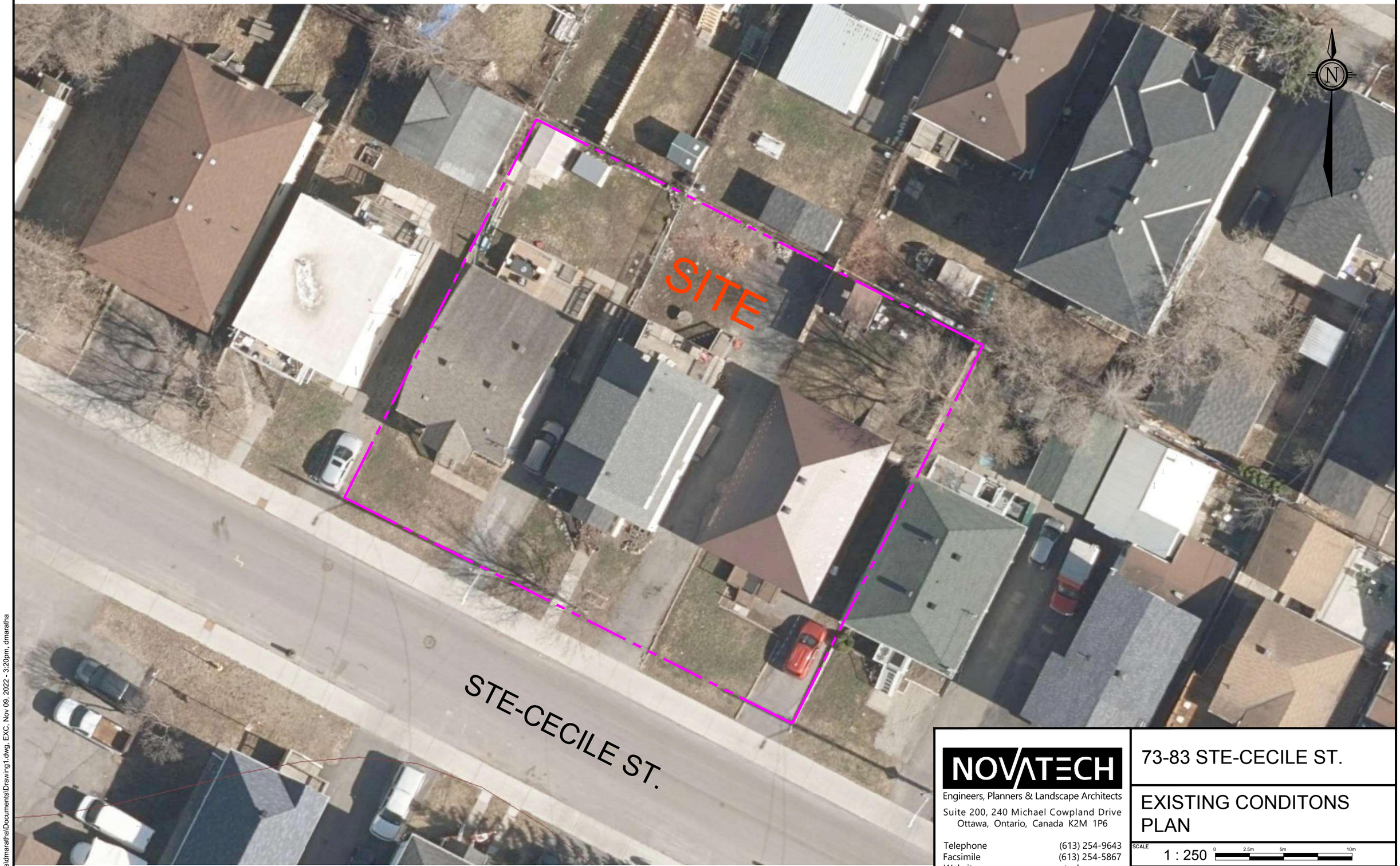

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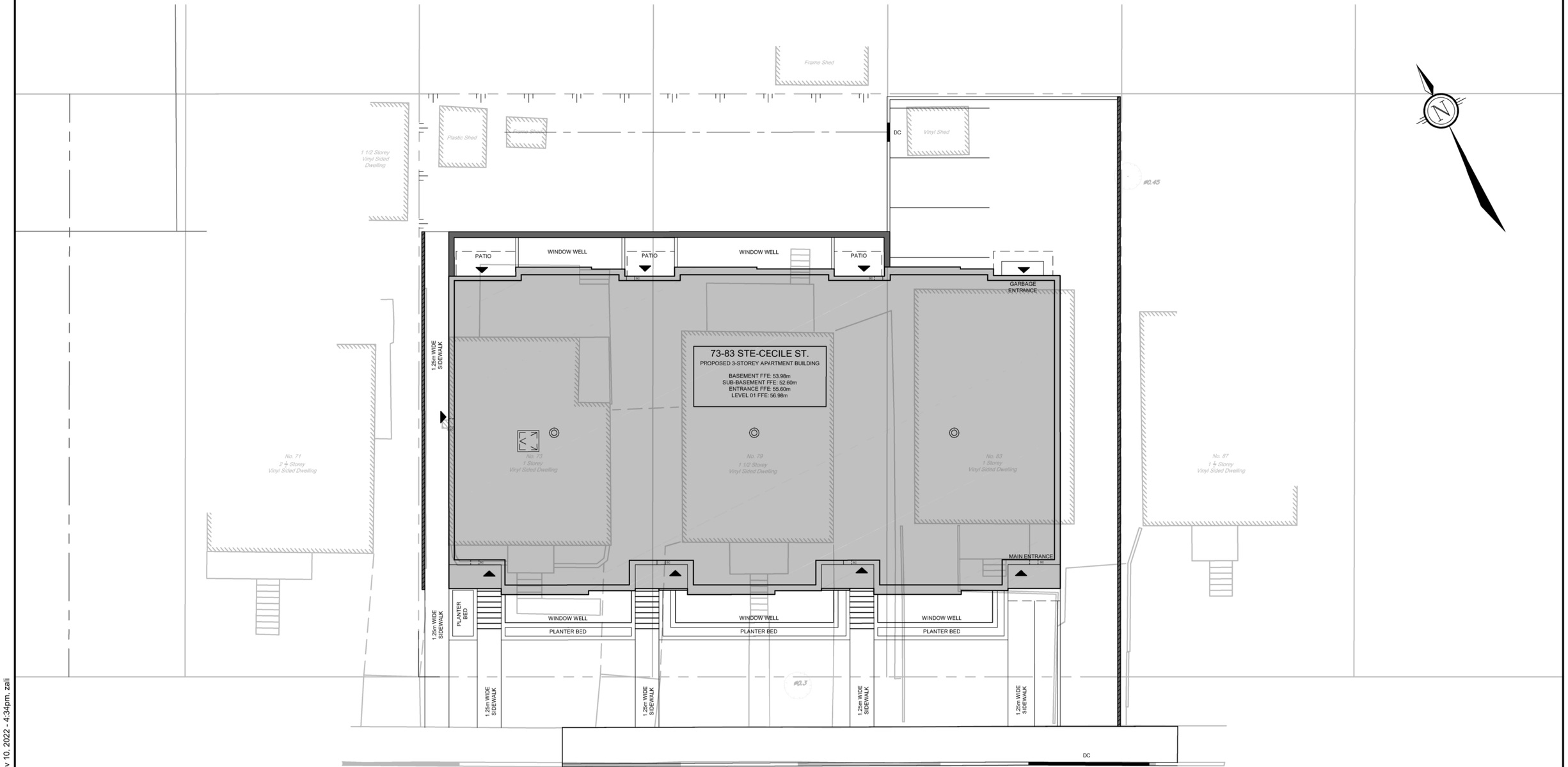
73-83 STE-CECILE ST.

EXISTING CONDITONS PLAN

SCALE 1 : 250 (0, 2.5m, 5m, 10m)

DATE NOV 2022 | JOB 122167 | FIGURE 2



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73-83 STE-CECILE ST.

PROPOSED SITE PLAN

SCALE 1 : 200 (0 2 4 6 8)

DATE NOV 2022 | JOB 122167 | FIGURE 3

Water demand and fire flow calculations have been prepared based on the current development plan. The water demands were calculated using criteria from Section 4 of the City of Ottawa Design Guidelines for Water Distribution Systems and were based on a population of 50 people. The required fire flow was calculated using the 2020 Fire Underwriters Survey method. Detailed water demand and fire flow calculations are provided in **Appendix C** for reference. A summary of the water demand and fire flows are provided in **Table 5.1** below.

Table 5.1 Water Demand Summary

Use	Ave. Daily Demand (L/s)	Max. Daily Demand (L/s)	Peak Hour Demand (L/s)	Fire Flow (L/s)
Residential	0.16	0.41	0.89	250

This water demand information was submitted to the City of Ottawa for boundary conditions provided from the City's water model. The boundary conditions will determine whether the existing watermain infrastructure in Ste-Cécile Street has capacity for the proposed development. The boundary conditions are provided in **Table 5.2** below.

Table 5.2 Water Boundary Conditions

Criteria	Head (m)
Connection Ste-Cécile Street	
Minimum HGL	109.4
Maximum HGL	118.4
Max Day + Fire Flow HGL (250L/s)	91.7

These boundary conditions were used to analyze the performance of the watermain for three theoretical conditions: 1) High Pressure check under Average Day conditions 2) Peak Hour demand 3) Maximum Day + Fire Flow demand. A summary of the results from the hydraulic water analysis are provided in **Table 5.3** below.

Table 5.3 Water Analysis Results Summary

Condition	Demand (L/s)	Min/Max Allowable Operating Pressures (psi)	Limits of Design Operating Pressures (psi)
High Pressure	0.16	80psi (Max)	89.3
Max Day + Fire Flow	250.41	20psi (Min)	51.3
Peak Hour	0.89	40psi (Min)	76.5

Based on the proceeding analysis it can be concluded that the watermain will provide adequate flow and pressures for the fire flow + maximum day demand and peak hour demand. The existing fire hydrants along Ste-Cécile Street will provide fire protection for the proposed development. Pressure reduction valves will be required as the High-Pressure Condition exceeds the allowable operating pressure. Refer to **Appendix C** for hydraulic calculations and City of Ottawa boundary conditions.

6.0. SANITARY SERVICING

There is an existing 375mm diameter PVC sanitary sewer located in the Ste-Cécile Street right-of-way which will service the proposed development. The existing 375mm diameter sanitary sewer flows to the west along Ste-Cécile Street where it connects into a 900mm diameter concrete sanitary trunk sewer at Genesis Street.

The proposed 3-storey apartment building will be serviced by a new 150mm diameter sanitary service with a connection to the existing 375mm diameter sewer in Ste-Cécile Street. Refer to the General Plan of Services **(122167-GP)** for further details. Sanitary flows for the proposed development were calculated based on the following criteria from Section 4 of the City of Ottawa Sewer Design Guidelines:

Residential Use

- Residential 1-Bedroom Units: 1.4 people per unit
- Residential 2-Bedroom Units: 2.1 people per unit
- Average Daily Residential Sewage Flow: 280 L/person/day
- Residential Peaking Factor = 3.2 (Harmon Equation)
- Infiltration Allowance: 0.33 L/s/ha x 0.112 ha site = 0.04 L/s

The peak sanitary flow was calculated to be 0.56L/s based on a total population 50 people from a total of 30 units. Detailed sanitary flow calculations are provided in **Appendix D** for reference.

The proposed 150mm dia. sanitary service at a slope of 2.0% has a full flow conveyance capacity of 21.5 L/s and will therefore, have enough capacity to convey the theoretical sanitary flows from the proposed development.

7.0. STORM SERVICING & STORMWATER MANAGEMENT

7.1. Storm Servicing

There is an existing 450mm diameter storm sewer in Ste-Cécile Street which is the storm sewer outlet for the proposed development. The proposed 3-storey apartment including the surface parking and landscaped area will be serviced by a new 200mm diameter storm sewer that connects to the existing 450mm dia. storm sewer in Ste-Cécile Street. Refer to the General Plan of Services **(122167-GP)** for further details.

The proposed storm sewers have been sized to convey the uncontrolled 5-year storm event using the Rational Method. The design criteria used in sizing the storm sewers is summarized in Table 7.1.

Table 7.1: Storm Sewer Design Parameters

Parameter	Design Criteria
Private Roads	5 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	200 mm

A storm sewer drainage area plan and design sheet for the proposed storm sewer system is provided in **Appendix E** for reference.

7.2. Stormwater management Objectives

The stormwater management criteria and objectives for the site are as follows:

- Maximize the use of on-site storage on the building roof and on the surface in the rear landscape and paved parking area behind the building.
- Control the post-development flows from the site to the maximum allowable release rate specified by the City of Ottawa. Control post-development flows from the site for storms up to and including the 100-year design event.
- Ensure no surface ponding in the parking area during the 2-year storm event.
- Minimize the impact on the existing storm sewer in Ste-Cécile Street by reducing the post-development storm flows from the site, when compared to current conditions.
- Provide guidelines to ensure that the site preparation and construction is in accordance with the current Best Management Practices for Erosion and Sediment Control.

7.3. Pre-development Conditions and Allowable Release Rate

The uncontrolled pre-development flows from the 0.112 ha site were calculated using the Rational Method to be 16.5 L/s during the 5-year storm event and 32.3 L/s during the 100-year storm event. Refer to **Appendix E** for detailed calculations.

As specified by the City of Ottawa, the maximum allowable release rate for the development is based on a 10-minute rainfall intensity, a 5-year return period (City of Ottawa IDF Curves) and a runoff coefficient no greater than C=0.50. The allowable release rate was calculated using the Ration Method to be 16.2 L/s.

T_c = 10 min C =0.50
I_{5yr} = 104.2 mm/hr A = 0.112 ha

Q_{allow} = 2.78 CIA
= 2.78 (0.50) (104.2) (0.112)
= 16.2 L/s

7.4. Post-development Conditions

As part of the stormwater management (SWM) strategy, stormwater runoff from the building roof will be attenuated using control flow roof drains, while storm flows from the rear landscape area and parking lot area will be attenuated using an inlet control device (ICD). Runoff from the remaining areas directly fronting onto Ste-Cécile Street will sheet drain uncontrolled directly towards the street. The window wells and basement patios will drain to the foundation drainage system. The foundation drainage system will outlet to the storm service via a sump pit and pump. The storm service connection is to be protected by a backflow preventor. The approach for the stormwater management design is to meet the City of Ottawa requirements.

The following sections outline the stormwater management strategy for each area of the proposed site, and provide post-development peak flow results. The site has been divided into 2 controlled and 1 uncontrolled drainage areas and are as follows:

Areas A-1: Uncontrolled Site Runoff

The landscaped area and driveway directly fronting onto Ste-Cécile Street will sheet drain uncontrolled to the catch basins in Ste-Cécile Street. The window wells and basement patios areas will drain uncontrolled to the storm service. The uncontrolled post-development flows from sub-catchment area A-1 were calculated using the Rational Method to be 5.0 L/s and 9.7 L/s during the 5 and 100-year design events respectively. Refer to **Appendix E** for detailed calculations.

Area A-2: Controlled Flow from the Building Roof

The post-development flow from this sub-catchment area will be attenuated using three (3) Watts adjustable 'Accutrol' control flow roof drains (model number RD-100-A-ADJ) prior to being directed to the proposed on-site storm sewer system.

A summary of the post-development design flows and storage requirements from this sub-catchment area are provided in **Table 7.2** below.

Table 7.2: Roof Flow and Storage Summary

Roof Drain ID & Drainage Area (ha)	Number of Roof Drains	Watts Roof Drain Model ID (Weir Opening)	Controlled Flow (L/s)		Approximate Ponding Depth (m)		Storage Volume Required (m^3)		Maximum Storage Provided (m^3)
			5-Yr	100-Yr	5-Yr	100-Yr	5-Yr	100-Yr	
Total Roof (0.054 ha)	**3**	RD-100-A-ADJ (1/4 Open)	**2.1**	**2.7**	**0.08**	**0.14**	**9.2**	**20.4**	**22.7**

Refer to **Appendix E** for detailed SWM calculations and to **Appendix F** for roof drain manufacturer information. As indicated in the table above, the building roof will provide sufficient storage for both the 5 and 100-year design events.

Area A-3: Controlled Site Runoff

The maximum flow allotted to this sub-catchment area, during the 100-year design event, was calculated to be 3.8 L/s (16.2 – (9.7 + 2.7)). This value represents the maximum allowable release rate minus the sum of the flows from the other sub-catchment areas. The 100-year

peak design flow has been set at 3.7 L/s, based on the storage available, and will be attenuated by an inlet control device (ICD) installed in the outlet pipe of CB 1.

The Modified Rational Method was used to determine the required storage volumes for the 2-year, 5-year and 100-year design events. As required by the City of Ottawa, due to the presence of underground storage, the storage volume calculations were completed using an assumed average release rate, equal to (or less than) 1/2 of the peak design flow. It is noted that this approach is considered conservative and is likely to overestimate the required storage volume and ponding elevations. The approximate ponding elevations calculated for the 2-year, 5-year and 100-year design storms were estimated based on these required storage volumes. The site has been designed to ensure that no stormwater will pond on the private paved surfaces (i.e. driveway or rear parking lot) during the 2-year storm event.

A summary of the post-development peak flows and storage requirements for this sub-catchment area are provided in **Table 7.3** below.

Table 7.3: Controlled Surface Flow and Storage Summary

Design Event	Sub-Catchment Area A-3					
	ICD Type	Allotted Peak Design Flow (L/s)	Less Than ½ Peak Design Flow (L/s)	Ponding Elevation (m)*	Storage Vol. Required (m^3)*	Maximum Storage Available (m^3)
2-Year	Tempest LMF 60	3.7 L/s	1.75 L/s	55.12 m	1.1 m^3	30.0 m^3
5-Year			1.80 L/s	55.15 m	2.0 m^3	
100-Year			1.85 L/s	55.22 m	5.7 m^3	

*Storage volumes and ponding elevations are based on the Less than ½ Peak Design Flow values

Refer to **Appendix E** for SWM calculations and **Appendix F** for ICD information. As indicated in the table above, this sub-catchment area will provide sufficient storage for the 2-year, 5-year and 100-year design events. Furthermore, no stormwater will pond on the private paved surfaces (i.e. drive aisles or parking lots) during the 2-year storm event.

Window wells and basement patios will drain to the foundation drainage system, and the foundation drainage system will be pumped to the proposed 200mm diameter storm sewer. As specified by the City of Ottawa Sewer Design Guidelines (Section 5.4.7), the peak flow from foundation drains can be estimated to be 0.45 L/s/home. Average home size is approximately 1800 sq. ft. (167 sq. m.), thus based on the proposed building footprint of 535 sq. m. the flow from the foundation drains will be approximately (0.45/167) *535=1.45 L/s, plus the uncontrolled 100-year flows from the window wells and basement patios (approximately 2.8 L/s). The pump should be sized appropriately to drain an approximate flow of 4.3 L/s.

Stormwater Flow Summary

A summary of the pre- and post-development flows are provided in **Table 7.4** below.

Table 7.4: Stormwater Management Flow Summary

Design Event	Pre-Development Conditions		Post-Development Conditions				
	Uncontrolled Flow (L/s)	Maximum Allowable Storm Flow (L/s)	A-1 Flow (L/s)	A-2 Flow (L/s)	A-3 Flow (L/s)	Total Flow (L/s)	Reduction in Flow (L/s or %)*
2-Yr	12.2	16.2	3.7	1.9	3.5	9.1	3.1 or 25%
5-Yr	16.5		5.0	2.1	3.6	10.7	5.8 or 35%
100-Yr	32.3		9.7	2.7	3.7	16.1	16.2 or 50%

*Reduced flow compared to uncontrolled pre-development conditions

As indicated in the table above, both the 5-year and 100-year post-development flows from the site will be less than the maximum allowable storm flow of 16.2 L/s. This also represents a reduction in total site flow rate, when compared to the pre-development condition.

8.0. EROSION AND SEDIMENT CONTROL MEASURES

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

- Filter bags will be placed under the grates of nearby catchbasins, manholes and will remain in place until vegetation has been established and construction is completed.
- Silt fencing will be placed per OPSS 577 and OPSD 219.110 along the surrounding construction limits.
- A mud mat will be installed at the site entrance off Ste-Cécile Street.
- Street sweeping, and cleaning will be performed, as required, to suppress dust and to provide safe and clean roadways adjacent to the construction site.
- On-site dewatering is to be directed to a sediment trap and/or gravel splash pad and discharged safely to an approved outlet as directed by the engineer.

The erosion and sediment control measures will be required prior to construction and will remain in place during all phases of construction. Regular inspection and maintenance of the erosion control measures will be undertaken. Refer to the Erosion and Sediment Control Plan **(122167-ESC).**

9.0. CONCLUSIONS AND RECOMMENDATIONS

The conclusions of this report are as follows:

- Water servicing will be provided by a single 100mm diameter service connection to the existing 200mm diameter watermain infrastructure within Ste-Cécile Street. Fire protection can be provided from the existing fire hydrants.
- The proposed building will be serviced by a single 150mm diameter sanitary sewer which will connect to the existing 375mm diameter sanitary sewer in Ste-Cécile Street. The sanitary flows from the building will be pumped to the proposed sanitary service and the existing sanitary sewer has adequate capacity for the proposed development.
- The proposed building will be serviced by 200mm diameter storm service which will connect to the existing 450mm diameter storm sewer in Ste-Cécile Street. Quantity control of stormwater will be provided by flow-controlled roof drains to attenuate flows and surface storage with an inlet control device. The allowable release rate for the site is 16.2 L/s and the post-development stormwater release rates are 10.7 L/s and 16.1 L/s for the 5-year and 100-year events respectively.
- Quality control of stormwater is not expected for development.
- An overland flow route will be provided to Ste-Cécile Street.
- Erosion and sediment control measures will be required during construction.

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

NOVATECH

Prepared by:

Devang Maratha, EIT.
Engineering Intern
Land Development Engineering

Reviewed by:

Matthew Hrehoriak, P.Eng.
Project Manager
Land Development Engineering

APPENDIX A
Correspondence

Pre-Application Consultation Meeting Notes

Property Address: 73-83 Ste-Cécile Street
PC2022-0229
September 23, 2022

Attendees: Colette Gorni, Planner (File Lead) – City of Ottawa
Mohammed Fawzi, Infrastructure Project Manager – City of Ottawa
Amber Chen, Planning Co-op Student – City of Ottawa
Ryan Koolwine, Architect – Project 1 Architects
Dean Michaud – Henry Investments
Denis Michaud – Henry Investments
Murray Chown, Planner – Novatech
Simran Soor, Planner – Novatech
Chris Greenshields – Vanier Community Association
Benjamin Gianni – Vanier Community Association

Regrets: Hayley Murray, Planning Forester – City of Ottawa
Mark Richardson, Planning Forester – City of Ottawa
Matthew Hayley, Environmental Planner – City of Ottawa
Mary Ellen Wood, Parks Planner – City of Ottawa
Wally Dubyk, Transportation Project Manager – City of Ottawa
Selma Hassan, Urban Design Planner – City of Ottawa
Eric Lalande, RVCA Planner – Rideau Valley Conservation Authority

Subject: 73-83 Ste-Cécile Street

Meeting notes:

Overview of the Proposal (Applicant)

1. The subject site is composed of three properties, 73-83 Ste-Cécile Street, which are currently occupied by single-detached dwellings. The applicant is proposing to demolish the existing homes and construct a 4-storey low-rise apartment building with 35 dwellings units (mix of 1- and 2-bedroom units).

2. A total of nine vehicular parking spaces are proposed on site. The vehicular parking spaces are located towards the rear of the property and are below grade but are not within interior to the building (i.e., parking pit, not underground parking garage). The parking area is accessible from Ste-Cécile Street via a depressed ramp.

3. Applicant anticipates that a major rezoning will be required to permit the proposed development, as it likely does not meet the intention of the R4UA zone. It is anticipated that a R4UD zone would be requested.

Planning (Colette Gorni)

1. Staff have concerns with the size of the proposed building. Consider eliminating a storey and/or explore different building typologies (e.g., two smaller buildings rather than one large building).

2. Staff have concerns with the proposed parking pit. All parking should be located within the building footprint. Consider reconfiguring the parking so that it occupies the basement level of the proposed building.

3. Staff have concerns with the proposed building height. Given the context of the neighbourhood, and subject site's location within the interior of the neighbourhood, staff are of the opinion that the current height limit of 11 metres should be maintained. Further rationale will need to be provided at the time of formal application if additional height is being sought.

4. Please note that the following minimum soft landscaping requirements apply to the site:

    a. 30% of the lot area must be provided as landscaped area for a lot containing an apartment dwelling (Section 161(8)).

    b. 50% of the rear yard (Section 161(15)(b)).

    c. 40% of the front yard (Table 161).

5. Staff have concerns that the proposed development does not meet the intention of the current R4UA zone, which is intended to be the least intensive of the new urban R4 zones and permits low-rise apartment buildings with a maximum of eight units. Although it is technically possible to achieve the required relief through a minor rezoning, staff are of the opinion that a Major Rezoning would be more appropriate in this context.

6. Internal bicycle storage room is appreciated and encouraged; however, please consider also providing some outdoor bicycle parking in close proximity to entrances for visitors. Outdoor bicycle parking should be covered and visible from the street, if possible.

7. Consider opportunities for further landscaping and tree planning throughout the site.

8. Please note that Ottawa City Council passed the High Development Performance Development Standard (HPDS) on April 13, 2022. An overview of the purpose and objectives of HPDS has been provided for your reference.

9. Required Applications:

    a. A "Site Plan Control – Complex" application is required to permit the proposed development. More information on the Site Plan Control process can be found here.

b. A “Zoning By-law Amendment (Major)” is required to permit the proposed development. More information on the Zoning By-law Amendment process can be found here.

Urban Design (Selma Hassan)

1. Zoning – Urban Design has multiple concerns with this proposal as it goes beyond the permissions in R4UA zoning in numerous cases. These concerns include the following:

    a. Lot size – The frontage and lot area are both larger than permitted by zoning.

    b. Building height – The overall building height is not shown on the drawings. Given the 4 ½ floors above grade, it would appear that the height will be at least 13.5m+. This is well beyond the 11m permitted in the zoning.

    c. Total units - The zoning permits a maximum of 8 apartment units. At 35 units, the proposal is more than 4x greater than zoning permits

    d. Parking – The proposal only requires parking as it is proposing a unit count well beyond what is required by zoning. If it met the zoning permissions for unit count, no parking would be required. As proposed the proposal only provides 9 of the 14 required spaces.

    e. Balconies and porches – The zoning by-law requires a balcony or porch for each unit that faces the street and these are required to have minimum area of $2m^2$. The drawings show balconies for the upper units. The applicant is requested to provide the dimensions of these balconies and to indicate how the zoning requirement is being met for the below grade units that face the street.

    f. Landscape requirements – The Zoning by-law requires 30% of the total lot to be landscaped and 40% of the front yard to have soft landscaping. It is unclear if these percentages are being met. The applicant is asked to provide a drawing which demonstrates that the provisions of the by-law have been met.

    While we are supportive of apartment uses, this proposal does not appear to meet the intent of the by-law for smaller scale, compatible infill.

2. A Design Brief is required. A Terms of Reference for the Brief is attached; all elements highlighted in yellow must be addressed in the Design Brief.

3. The below grade parking pit in the rear yard is not supported at all. Any parking that is included in the submission is to be located under the footprint of the building. The

building is 17m wide and the parking area is 16.4m wide, so parking will fit under the footprint of the building.

4. Drop the building so that the first floor is at grade. This eliminates the need for exterior stairs to units, drops the overall height, and creates a better relationship to the street.

5. Eliminate the basement units. This removes the need for window wells, permits all parking to be below grade, and reduces the total unit count.

6. Remove the 4th floor. With #4, this brings the building height within what it permitted by zoning and also helps reduce the total unit count.

7. Tree planting is required. The landscape plan should show 4 tree in the front yard and 3-4 in the rear yard.

It is strongly suggested that the applicants explore multiple alternative designs, that fit within the parameters of the zoning, and that the applicant return with these alternatives for a second pre-consultation meeting.

Engineering (Mohammed Fawzi)

1. Available Infrastructure:

    a. Ste. Cécile Street:

        i. Sanitary: 375mm PVC (Install 2017)

        ii. Storm: 450mm Conc (Install 2017)

        iii. Water: 203mm PVC (Install 2017)

2. Water Boundary Conditions:

    a. Will be provided at request of consultant. Requests must include the location of the service and the expected loads required by the proposed development. Please provide the following and submit Fire Flow Calculation Sheet per FUS method with the request:

        i. Location of service
        ii. Type of development and amount of required fire flow (per FUS method – include FUS calculation sheet with request)
        iii. Average Daily Demand (l/s)
        iv. Maximum Hourly Demand (l/s)
        v. Maximum Daily Demand (l/s)
        vi. Water Supply Redundancy – Fire Flow:

vii. Applicant to ensure that a second service with an inline valve chamber be provided where the average daily demand exceeds 50 m^3 / day (0.5787 l/s per day)

b. Water services larger than 19 mm require a Water Data Card. Please complete card and submit.

3. Stormwater Management (Quantity Control):

   a. Coefficient (C) of runoff determined **as per existing conditions** but in no case more than 0.5.

   b. TC = To be calculated, minimum 10 minutes

   c. Any storm events greater than 5 year, up to 100 year, and including 100-year storm event must be detained on site.

   d. Foundation drains are to be independently connected to sewer main unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention.

   e. Roof drains are to be connected downstream of any incorporated ICD within the SWM system.

4. Stormwater Management (Quality Control):

   a. Rideau Valley Conservation Authority to provide Quality Controls.

5. Noise Study:

   a. Noise study required – due to proximity to existing Collector Road (Marier Avenue).

6. Phase I and Phase II ESA:

   a. Phase I ESA is required; Phase II ESA may be required depending on the results of the Phase I ESA. Phase I ESA must include an EcoLog ERIS Report.
   b. Phase I ESA and Phase II ESAs must conform to clause 4.8.4 of the Official Plan that requires that development applications conform to Ontario Regulation 153/04.

7. Required Studies:

   a. Stormwater Management Report
   b. Site Servicing Study
   c. Geotechnical Study
   d. Phase I ESA

e. Phase II ESA (depends on outcome of Phase I)
f. Noise Study

8. Required Plans:

    a. Site Servicing Plan
    b. Grade Control and Drainage Plan
    c. Erosion and Sediment Control Plan (Can be combined with Grading Plan)
    d. Existing Conditions and Removals Plan
    e. Pre and Post Development Drainage Plans
    f. Roof Drainage Plan

9. Snow Storage:

    a. Any portion of the subject property which is intended to be used for permanent or temporary snow storage shall be as shown on the approved site plan and grading plan. Snow storage shall not interfere with approved grading and drainage patterns or servicing. Snow storage areas shall be setback from the property lines, foundations, fencing or landscaping a minimum of 1.5m. Snow storage areas shall not occupy driveways, aisles, required parking spaces or any portion of a road allowance. If snow is to be removed from the site please indicate this on the plan(s).

10. Exterior Site Lighting:

    a. Any proposed light fixtures (both pole-mounted and wall mounted) must be part of the approved Site Plan. All external light fixtures must meet the criteria for Full Cut-off Classification as recognized by the Illuminating Engineering Society of North America (IESNA or IES), and must result in minimal light spillage onto adjacent properties (as a guideline, 0.5 fc is normally the maximum allowable spillage). In order to satisfy these criteria, the please provide the City with a Site Lighting Plan, and Certification (Statement) Letter from an acceptable professional engineer stating that the design is compliant.

11. The Servicing Study Guidelines for Development Applications are available at the following address: https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans#servicing-study-guidelines-development-applications

12. Servicing and site works shall be in accordance with the following documents:
    - ⇨ Ottawa Sewer Design Guidelines (October 2012)
    - ⇨ Ottawa Design Guidelines – Water Distribution (2010)
    - ⇨ Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)

- ⇨ City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
- ⇨ City of Ottawa Environmental Noise Control Guidelines (January 2016)
- ⇨ City of Ottawa Park and Pathway Development Manual (2012)
- ⇨ City of Ottawa Accessibility Design Standards (2012)
- ⇨ Ottawa Standard Tender Documents (latest version)
- ⇨ Ontario Provincial Standards for Roads & Public Works (2013)

13. Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-2424 x.44455).
14. Any proposed work in utility easements requires written consent of easement owner.
15. Please note that these comments are considered preliminary based on the information available to date and therefore maybe amended as additional details become available and presented to the City. It is the responsibility of the applicant to verify the above information. The applicant may contact me for follow-up questions related to engineering/infrastructure prior to submission of an application if necessary.

Transportation (Wally Dubyk)

1. Ste Cecil Street is classified as a Local Road. There are no additional protected ROW limits identified in the OP.
2. The Screening Form has indicated that no TIA Triggers have been met. This development would not generate sufficient traffic. The consultant is to address how they plan to enable and encourage travel by sustainable modes (i.e. to make walking, cycling, transit, carpooling and telework more convenient, accessible, safe and comfortable). Please complete the City of Ottawa's *TDM Measures Checklist*.
3. The Site Plan drawing should depict the street features and hydro poles.
4. The purchaser, tenant or sub-lessee acknowledges the unit being rented/sold is not provided with any on-site parking and should a tenant/purchaser have a vehicle for which they wish to have parking that alternative and lawful arrangements will need to be made to accommodate their parking need at an alternative location. The Purchaser/Tenant also acknowledges that the availability and regulations governing on-street parking vary; that access to on-street parking, including through residential on-street parking permits issued by the City cannot be guaranteed now or in the future; and

that a purchaser, tenant or sub-lessee intending to rely on on-street parking for their vehicle or vehicles does so at their own risk.

5. Ensure that potential tenants who are not assigned a parking space are aware that on street parking is not a viable option for tenants.

6. Permanent structures such as curbing, stairs, retaining walls, and underground parking foundation also bicycle parking racks are not to extend into the City's right-of-way limits.

7. The Owner acknowledges and agrees that all private accesses to Roads shall comply with the City's Private Approach By-Law being By-Law No. 2003-447 as amended https://ottawa.ca/en/living-ottawa/laws-licences-and-permits/laws/law-z/private-approach-law-no-2003-447 or as approved through the Site Plan control process.

8. The closure of an existing private approach shall reinstate the sidewalk, shoulder, curb and boulevard to City standards.

9. The concrete sidewalk should be 2.0 metres in width and be continuous and depressed through the proposed access.

10. No private approach shall be constructed within 0.3 metres of any adjacent property measured at the highway line, and at the curb line or roadway edge.

11. The proponent is to provide an access grade that does not exceed 2% within the private property for a minimum distance of 6.0 metres from the **ROW limits**. This is a critical safe distance to allow a driver to stop at the top of the ramp and have a good sight angle of pedestrians. If ramp exceeds 6% grade, a subsurface melting element will be required.

12. The Owner shall be required to enter into maintenance and liability agreement for all pavers, plant and landscaping material placed in the City right-of-way and the Owner shall assume all maintenance and replacement responsibilities in perpetuity.
13. Bicycle parking spaces are required as per Section 111 of the Ottawa Comprehensive Zoning By-law. Bicycle parking spaces should be located in safe, secure places near main entrances and preferably protected from the weather.

Environment (Matthew Hayley)

1. No triggers for an Environmental Impact Study since there are no natural heritage features on or adjacent to the site.

2. Street trees need to be provided as part of the design and the existing trees on-site retained if feasible. TCR will be required, Foresters can provide more detail.

Forestry (Hayley Murray)

Project Comments

1. Retention of the Norway Maple in front of house no. 79 is preferred if possible

2. All trees whose CRZ extends into the development site must be included in the TCR. This means privately as well as boundary and adjacently owned trees. Refer to line 5 in the TCR requirements.

TCR Requirements

1. A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City

    a. An approved TCR is a requirement of Site Plan approval.

    b. The TCR may be combined with the LP provided all information is supplied

2. Any removal of privately-owned trees 10cm or larger in diameter, or city-owned trees of any diameter requires a tree permit issued under the Tree Protection Bylaw (Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.

3. The Planning Forester from Planning and Growth Management as well as foresters from Forestry Services will review the submitted TCR

    a. If tree removal is required, both municipal and privately-owned trees will be addressed in a single permit issued through the Planning Forester

    b. Compensation may be required for city owned trees – if so, it will need to be paid prior to the release of the tree permit

4. The TCR must contain 2 separate plans:

    a. Plan/Map 1 - show existing conditions with tree cover information

    b. Plan/Map 2 - show proposed development with tree cover information

    c. Please ensure retained trees are shown on the landscape plan

5. The TCR must list all trees on site, as well as off-site trees if the CRZ extends into the developed area, by species, diameter and health condition

    a. Please identify trees by ownership – private onsite, private on adjoining site, city owned, boundary (trees on a property line)

6. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained

7. All retained trees must be shown, and all retained trees within the area impacted by the development process must be protected as per City guidelines available at Tree Protection Specification or by searching Ottawa.ca

    a. The location of tree protection fencing must be shown on the plan

8. The City encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.

9. For more information on the process or help with tree retention options, contact Hayley Murray hayley.murray@ottawa.ca or on City of Ottawa

Landscape Plan Tree Planting Requirements

(For additional information on the following please contact tracy.smith@Ottawa.ca)

10. Minimum Setbacks:

    a. Maintain 1.5m from sidewalk or MUP/cycle track or water service laterals.

    b. Maintain 2.5m from curb

    c. Coniferous species require a minimum 4.5m setback from curb, sidewalk or MUP/cycle track/pathway.

    d. Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing, except where otherwise approved in naturalization / afforestation areas. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.

11. Tree Specifications:

    a. Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.

    b. Maximize the use of large deciduous species wherever possible to maximize future canopy coverage

    c. Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and include watering and warranty as described in the specification (can be provided by Forestry Services).

    d. Plant native trees whenever possible

    e. No root barriers, dead-man anchor systems, or planters are permitted.

    f. No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

12. Hard Surface Planting:

    a. Curb style planter is highly recommended

    b. No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.

    c. Trees are to be planted at grade

13. Soil Volume:

    a. Please document on the LP that adequate soil volumes can be met:

Tree Type/Size	Single Tree Soil Volume (m3)	Multiple Tree Soil Volume (m3/tree)
Ornamental	15	9
Columnar	15	9
Small	20	12
Medium	25	15
Large	30	18
Conifer	25	15

    b. Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines

14. Tree Canopy Cover

    a. The landscape plan shall show how the proposed tree planting will replace and increase canopy cover on the site over time, to support the City's 40% urban forest canopy cover target.

    b. At a site level, efforts shall be made to provide as much canopy cover as possible, through tree planting and tree retention, with an aim of 40% canopy cover at 40 years, as appropriate.

    c. Indicate on the plan the projected future canopy cover at 40 years for the site.

<u>Parks (Mary Ellen Wood)</u>

1. For the proposed 4-storey low-rise apartment building with 35 units at 73-83 Ste-Cecile Street the Owner shall pay cash-in-lieu of parkland in accordance with the Parkland Dedication By-law of the City of Ottawa, as well as the fee for appraisal services. The monies are to be paid at time of execution of the Site Plan Agreement.

2. Through any future site plan application for dwelling units within an apartment dwelling, low-rise (as defined by the Zoning By-law) the parkland dedication will be calculated at the following rate:

    a. Cash-in-lieu parkland: 1 hectare per 500 dwelling units. The required conveyance shall not exceed an amount equivalent to 10% of the gross land area.

3. Subject property (application form) indicated a Lot area of 1,116m2. Appling the above calculation the required parkland dedication equates to 111.6m2.

4. Confirmation of Lot area is required by certified survey.

5. Please note, these park comments are preliminary and will be finalized (and subject to change) upon receipt of the development application. Additionally, if the proposed land use changes, then the parkland dedication requirement will be re-evaluated accordingly.

6. Please note that Parks and Facilities Planning has recently undertaken a legislated replacement of the Parkland Dedication By-law, with the new by-law approved by City Council on August 31, 2022. To ensure you are aware of parkland dedication requirements for your proposed development, we encourage you to familiarize yourself with the staff report and recommended by-law that were approved by Council on August 31, 2022.

City Surveyor (Bill Harper)

1. The determination of property boundaries, minimum setbacks and other regulatory constraints are a critical component of development. An Ontario Land Surveyor (O.L.S.) needs to be consulted at the outset of a project to ensure properties are properly defined and can be used as the geospatial framework for the development.
    a. Topographic details may also be required for a project and should be either carried out by the O.L.S. that has provided the Legal Survey or done in consultation with the O.L.S. to ensure that the project is integrated to the appropriate control network.

Questions regarding the above requirements can be directed to the City's Surveyor, Bill Harper, at Bill.Harper@ottawa.ca

Waste Services (Andre Laplante)

1. New multi-unit residential development, defined as containing six (6) or more units, intending to receive City waste collection services will be required, as of June 1, 2022, to participate in the City's Green Bin program in accordance with Council's approval of the multi-residential waste diversion strategy. The development must include adequate facilities for the proper storage of allocated garbage, recycling, and green bin containers and such facilities built in accordance with the approved site design. Questions regarding this change and requirements can be directed to Andre.Laplante@ottawa.ca.

Conservation Authority (RVCA)

1. The RVCA has no objections or concerns with the project. Based on the site design, the RVCA has no Stormwater Quality control requirements.

Vanier Community Association (Chris Greenshields, Benjamin Gianni)

1. VCA generally likes the architecture of the building but believe that the subject site is not the right location for a building this size. The proposed level of density/massing would be more appropriate closer to Optimiste Park or a higher order road such as Marier Avenue.

Submission requirements and fees

- Refer to the attached list of submission requirements for plans and studies to be submitted at the time of a formal application.
- Additional information regarding fees related to planning applications can be found here.
- Plans are to be standard A1 size (594 mm x 841 mm) or Arch D size (609.6 mm x 914.4 mm) sheets, dimensioned in metric and utilizing an appropriate Metric scale (1:200, 1:250, 1:300, 1:400 or 1:500).
- All PDF submitted documents are to be unlocked and flattened.

Next steps

- You are encouraged to reach out to the Ward Councillor, Councillor Mathieu Fleury, at Mathieu.Fleury@ottawa.ca to discuss the proposed development. You may also consider reaching out to community groups and neighbours surrounding the site.

APPENDIX B
Development Servicing Study Checklist

73-83 STE CECILE STREET
CITY OF OTTAWA
DEVELOPMENT SERVICING STUDY CHECKLIST

4.1 General Content	**Addressed (Y/N/NA)**	**Comments**
Executive Summary (for larger reports only).	N/A	
Date and revision number of the report.	Y	
Location map and plan showing municipal address, boundary, and layout of proposed development.	Y	Refer to Report Figures
Plan showing the site and location of all existing services.	Y	Refer to Grading and Servicing Plans
Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	Y	Refer to Site Plan
Summary of Pre-consultation Meetings with City and other approval agencies.	Y	
Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.	N/A	
Statement of objectives and servicing criteria.	Y	Report Sections: 5.0 Water Servicing , 6.0 Sanitary Servicing, 7.0 Storm Servicing
Identification of existing and proposed infrastructure available in the immediate area.	Y	
Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	N/A	
Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighboring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	Y	Refer to Grading Plan and Storm Drainage Area Plan

73-83 STE CECILE STREET
CITY OF OTTAWA
DEVELOPMENT SERVICING STUDY CHECKLIST

4.1 General Content	**Addressed (Y/N/NA)**	**Comments**
Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A	
Proposed phasing of the development, if applicable.	N/A	
Reference to geotechnical studies and recommendations concerning servicing.	N	
All preliminary and formal site plan submissions should have the following information:		
Metric scale	Y	
North arrow (including construction	Y	
Key plan	Y	
Name and contact information of applicant and property owner	Y	
Property limits including bearings and dimensions	Y	
Existing and proposed structures and parking areas	Y	
Easements, road widening and rights-of-	Y	
Adjacent street names	Y	

73-83 STE CECILE STREET
CITY OF OTTAWA
DEVELOPMENT SERVICING STUDY CHECKLIST

4.2 Water	**Addressed (Y/N/NA)**	**Comments**
Confirm consistency with Master Servicing Study, if available.	N/A	
Availability of public infrastructure to service proposed development.	Y	Report Sections: 5.0 Water Servicing , 6.0 Sanitary Servicing, 7.0 Storm Servicing
Identification of system constraints.	N/A	
Identify boundary conditions.	Y	Provided by City of Ottawa
Confirmation of adequate domestic supply and pressure.	Y	Refer to Appendix C
Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	Y	Refer to Appendix C
Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	Y	Refer to Appendix C
Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design.	N/A	
Address reliability requirements such as appropriate location of shut-off valves.	Y	Refer to Appendix C
Check on the necessity of a pressure zone boundary modification.	N/A	
Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range.	Y	Report Section 5.0 Water Servicing & Appendix C
Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	Y	Report Section 5.0 Water Servicing
Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	N/A	
Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Y	Report Section 5.0 Water Servicing & Appendix C
Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	N/A	

73-83 STE CECILE STREET
CITY OF OTTAWA
DEVELOPMENT SERVICING STUDY CHECKLIST

4.3 Wastewater	Addressed (Y/N/NA)	**Comments**
Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed	Y	Report Section 6.0 Sanitary Servicing
Confirm consistency with Master Servicing Study and/or justifications for deviations.	N/A	
Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	N/A	
Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Y	Report Section 6.0 Sanitary Servicing
Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)	y	Refer to Appendix D
Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	N/A	
Description of proposed sewer network including sewers, pumping stations, and forcemains.	Y	Report Section 6.0 Sanitary Servicing & Appendix D
Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	N/A	
Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	N/A	
Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A	
Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	N/A	
Special considerations such as contamination, corrosive environment etc.	N/A	

73-83 STE CECILE STREET
CITY OF OTTAWA
DEVELOPMENT SERVICING STUDY CHECKLIST

4.4 Stormwater	Addressed (Y/N/NA)	Comments
Description of drainage outlets and downstream constraints including legality of outlet (i.e. municipal drain, right-of-way, watercourse, or private property).	Y	Report Section 7.0 Storm Servicing Stormwater Management
Analysis of the available capacity in existing public infrastructure.	N	Stormwater release rates less than or equal to city allowable release rate criteria
A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns and proposed drainage patterns.	Y	Refer to Storm Drainage Area Plan
Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.	Y	Report Section 7.0 Storm Servicing Stormwater Management
Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Y	Report Section 7.0 Storm Servicing & Stormwater Management
Description of stormwater management concept with facility locations and descriptions with references and supporting information.	Y	Report Section 7.0 Storm Servicing Stormwater Management
Set-back from private sewage disposal systems.	N/A	
Watercourse and hazard lands setbacks.	N/A	
Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	N/A	
Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	N/A	
Storage requirements (complete with calcs) and conveyance capacity for 5 yr and 100 yr events.	Y	Refer to Appendix E
Identification of watercourse within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	N/A	
Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Y	Refer to Appendix E
Any proposed diversion of drainage catchment areas from one outlet to another.	N/A	
Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and SWM	N/A	
If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	N/A	

73-83 STE CECILE STREET
CITY OF OTTAWA
DEVELOPMENT SERVICING STUDY CHECKLIST

4.4 Stormwater	Addressed (Y/N/NA)	Comments
Identification of potential impacts to receiving watercourses.	N/A	
Identification of municipal drains and related approval requirements.	N/A	
Description of how the conveyance and storage capacity will be achieved for the development.	Y	Report Section 7.0 Storm Servicing Stormwater Management
100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	Y	Refer to Storm Drainage Area Plan
Inclusion of hydraulic analysis including HGL elevations.	N/A	
Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Y	Report Section 8.0 Erosion and Sediment Control
Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	N/A	
Identification of fill constrains related to floodplain and geotechnical investigation.	N/A	

4.5 Approval and Permit Requirements	Addressed (Y/N/NA)	Comments
Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.	N/A	
Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	N/A	
Changes to Municipal Drains.	N/A	
Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	N/A	

4.6 Conclusion	Addressed (Y/N/NA)	Comments
Clearly stated conclusions and recommendations.	Y	Report Section 9.0 Conclusions and Recommendations
Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.	N/A	T.B.D.
All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario.	Y	

APPENDIX C
Watermain Servicing Information

73-83 STE. CECILE STREET

	Unit Type	Unit Type	Total	Residential Demand (L/s)		
	1-Bed Room Apartment	2-Bed Room Apartment		Avg. Day	Max. Day	Peak Hour
No. Units	18	12	30	0.16	0.41	0.89
Unit Population	25	25	50			

Design Parameters:

- 1-Bed Apartment = 1.4 persons/unit
- 2-Bed Apartment = 2.1 persons/unit

Section 4.0 Ottawa Sewer Design Guidelines

- Average Domestic Flow	280	L/person/day

Peaking Factors (Table 4.2)

Max. Daily Demand:

- Residential	2.5	x Avg. Day

Peak Hourly Demand:

- Residential	2.2	x Max. Day

FUS - Fire Flow Calculations

As per 2020 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 122167
Project Name: 73,79 & 83 Ste. Cecile Street
Date: 11/14/2022
Input By: Zarak Ali
Reviewed By: Matthew Hrehoriak

Legend: Input by User; No Information or Input Required

Building Description: 3-storey, 30-unit Apartment
Type V - Wood frame

Step			Input		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	Yes	1.5	1.5	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	519			
		Number of Floors/Storeys	3			
		Area of structure considered (m^2)			**1,557**	
	F	**Base fire flow without reductions**				**13,000**
		F = 220 C (A)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**			**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**11,050**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction (100% sprinkler coverage of building used)**			**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	No	-30%		**0**
		Standard Water Supply	No	-10%		
		Fully Supervised System	No	-10%		
				Cumulative Total	**0%**	
5	**Exposure Surcharge (cumulative %, Maximum Exposure Adjsutement Charge Used)**				**Surcharge**	
	(3)	North Side	2Hr Fire Wall		10%	**4,420**
		East Side	2Hr Fire Wall		10%	
		South Side	20.1 - 30 m		10%	
		West Side	2Hr Fire Wall		10%	
				Cumulative Total	**40%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**15,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**250**
				or	USGPM	3,963
7	**Storage Volume**	Required Duration of Fire Flow (hours)			Hours	3
		Required Volume of Fire Flow (m^3)			m^3	2700

CALCULATED WATER DEMNADS:

PROPOSED DEVELOPMENT (3 STOREY BUILDING)

AVERAGE DAY =	0.16	L/s
MAXIMUM DAY =	0.41	L/s
PEAK HOUR =	0.89	L/s
MAX DAY + FIRE =	250.41	L/s

CITY OF OTTAWA BOUNDARY CONDITIONS:

BOUNDAY CONDITIONS BASED ON CONNECTION TO 203mm DIA. WATERMAIN ON STE CECILE STREET.

MINIMUM HGL =	109.4	m
MAXIMUM HGL =	118.4	m
MAX DAY + FIRE =	91.7	m

WATERMAIN ANALYSIS:

24-30 PRETORIA AVE WATERMAIN CONNECTIONS

FINSIHED FLOOR GROUND ELEVATION = 55.60 m

HIGH PRESSURE TEST = MAX HGL - AVG GROUND ELEV x 1.42197 PSI/m < 80 PSI

HIGH PRESSURE = 89.3 PSI

LOW PRESSURE TEST = MIN HGL - AVG GROUND ELEV x 1.42197 PSI/m > 40 PSI

LOW PRESSURE = 76.5 PSI

MAX DAY + FIRE TEST = MAX DAY + FIRE - AVG GROUND ELEV x 1.42197 PSI/m > 20 PSI

LOW PRESSURE = 51.3 PSI

APPENDIX D
Sanitary Calculations

PROJECT #: 122167
PROJECT NAME: 73-83 STE. CECILE STREET
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: NOVEMBER 2022

73-83 STE. CECILE STREET

LOCATION			RESIDENTIAL								INFILTRATION			Total Flow (l/s)	PIPE					
AREA	FROM	TO	Unit Type		Unit Type		TOTAL				Total Area (ha)	Accum. Area (ha)	Infilt. Flow (l/s)		Size (mm)	Slope (%)	Length (m)	Capacity (l/s)	Full Flow Vel. (m/s)	Q/Q_{full} (%)
			1 Bed Units	Pop.	2 Bed Units	Pop.	Pop.	Accum. Pop.	Peak Factor	Peak Flow (l/s)										
	BLDG	EX MH	18	25	12	25	50	50	3.2	0.52	0.112	0.112	0.04	0.56	150	2.00	11.8	21.5	1.22	2.6%
Existing Sewer Capacity															375	0.37		106.6	0.97	

Design Parameters:

- 1 Bed Apartment = 1.4 persons/unit
- 2 Bed Apartment = 2.1 persons/unit

Section 4.0 Ottawa Sewer Design Guidelines

- Average Domestic Flow	280	L/person/day
- Extraneous Flows	0.33	l/s/ha
Residential Peaking Factor	Harmon Equation	

APPENDIX E
Storm Sewer Design & Stormwater Management Calculations

73-83 STE CECILE STREET
CITY OF OTTAWA
Project No.: 122167

STORM SEWER DESIGN SHEET
78-83 STE CECILE STREET
FLOW RATES BASED ON RATIONAL METHOD

NOVATECH
Engineers, Planners & Landscape Architects

LOCATION			AREA (ha)					FLOW							TOTAL FLOW	SEWER DATA								
AREA ID	From Manhole	To Manhole	Total Area (ha)	C = 0.20	C = 0.90	C	AC (ha)	Indiv 2.78 AC	Accum 2.78 AC	Time of Concentration	Rainfall Intensity 2 Year (mm/hr)	Rainfall Intensity 5 Year (mm/hr)	Rainfall Intensity 10 Year (mm/hr)	Peak Flow (L/s)	Total Peak Flow, Q (L/s)	Dia. (m) Actual	Dia. (mm)	Type	Slope (%)	Length (m)	Capacity (L/s)	Velocity (m/s)	Flow Time (min)	Ratio Q/Q full
(1:5 YEAR STORM EVENT)																								
							0.00	0.000	0.000	10.00														
A-3	CB 1	STMMH 01	0.033	0.018	0.015	0.52	0.02	0.048	0.048	10.00		104.19		5.0	5.0	0.203	200	PVC	0.50	20.6	24.2	0.75	0.46	21%
							0.00	0.000	0.000	10.00														
							0.00	0.000	0.000	10.00														
A-2	BUILDING SERVICE		0.054	0.000	0.054	0.90	0.05	0.135	0.135	10.00		104.19		14.1	14.1	0.152	150	PVC	2.00	0.5	22.4	1.23	0.01	63%
							0.00	0.000	0.000	10.00														
							0.00	0.000	0.000	10.46														
	STMMH 01	EX STMMH					0.00	0.000	0.183	10.46		101.82		18.6	18.6	0.203	200	PVC	0.50	34.3	24.2	0.75	0.77	77%
							0.00	0.000	0.000	10.46														

Q = 2.78 AIC, where
Q = Peak Flow in Litres per Second (L/s)
A = Area in hectares (ha)
I = Rainfall Intensity (mm/hr), 5 year storm
C = Runoff Coefficient

Consultant:	**Novatech**
Date:	November 23, 2022
Design By:	DMM / ZA
	Dwg. Reference: 122167-SWM / **Checked By:** MJH

LEGEND

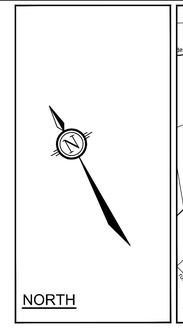
- PRE-DEVELOPMENT DRAINAGE AREA LIMITS
- POST-DEVELOPMENT DRAINAGE AREA LIMITS
- 1:2 YR / 1:5 YR / 1:100 YR — APPROXIMATE PONDING LIMITS
- A-4 / 0.198 / 0.88 — AREA ID / DRAINAGE AREA (ha) / 1:5 YEAR WEIGHTED RUNOFF COEFICIENT
- STMMH 01 — PROPOSED STORM MANHOLE
- CB 1 — PROPOSED CATCHBASIN
- PROPOSED STORM SEWER AND FLOW DIRECTION
- ICD — PROPOSED INLET CONTROL DEVICE
- EMERGENCY OVERLAND FLOW ROUTE
- PROPOSED BUILDING ENTRANCE / EXIT
- MH-ST — EXISTING STORM MH & SEWER
- CB — EXISTING CATCHBASIN C/W CATCHBASIN LEAD
- MAXIMUM 3:1 SIDESLOPE

ROOF DRAIN TABLE: AREA A-2 (ROOF DRAINS 1 to 2)						
AREA ID *	ROOF DRAIN No. (WATTS MODEL)	ROOF DRAIN OPENING SETTING	1:5 YEAR RELEASE RATE	APPROX. 5 YR PONDING DEPTH	1:100 YEAR RELEASE RATE	APPROX. 100 YR PONDING DEPTH
A-2	RD 1 (RD-100-A-ADJ)	1/4 EXPOSED	0.71 L/s	8 cm	0.91 L/s	14 cm
A-2	RD 2 (RD-100-A-ADJ)	1/4 EXPOSED	0.71 L/s	8 cm	0.91 L/s	14 cm
A-2	RD 3 (RD-100-A-ADJ)	1/4 EXPOSED	0.71 L/s	8 cm	0.91 L/s	14 cm

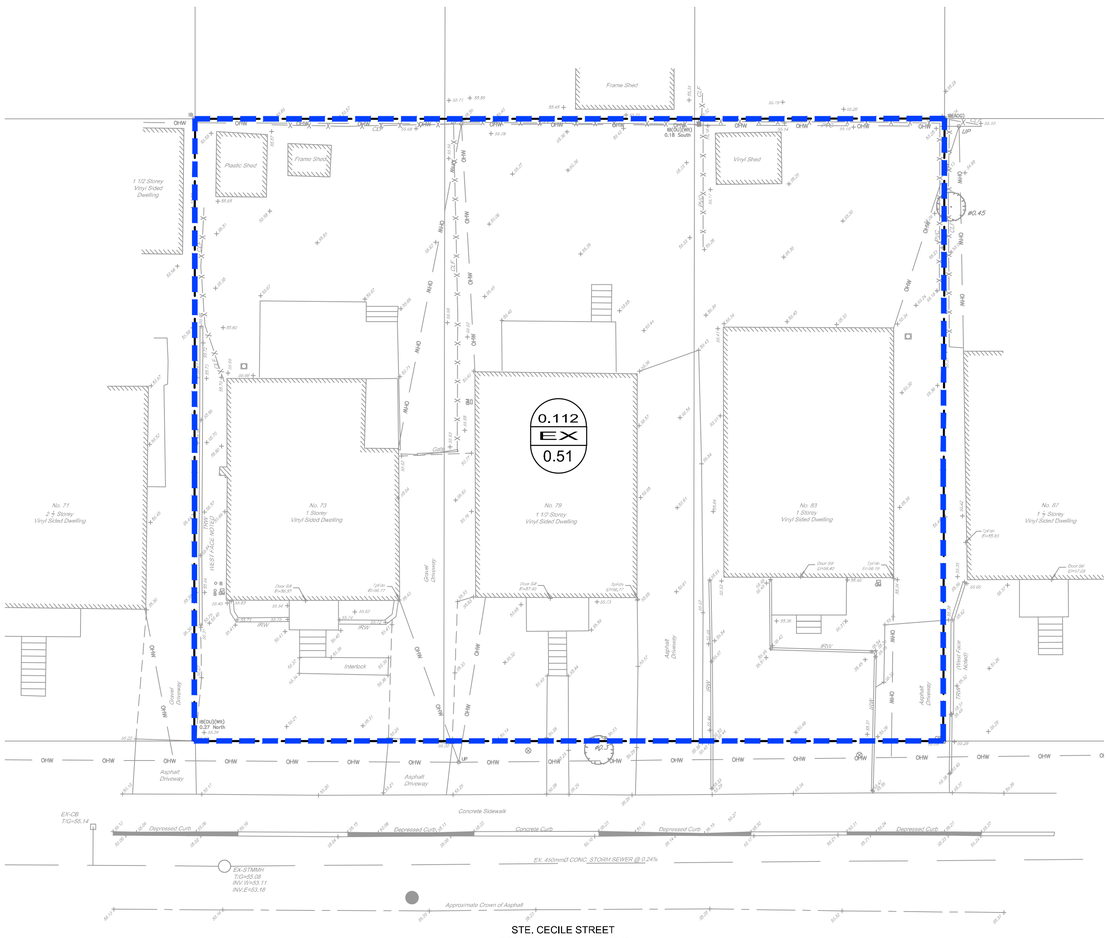
* REFER TO THE 'DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT' (R-2022-198) PREPARED BY NOVATECH FOR DRAINAGE AREA IDENTIFIERS AND STORMWATER MANAGEMENT DETAILS.

**ALL CONTROLLED FLOW ROOF DRAINS FOR THE PROPOSED BUILDING TO BE WATTS 'ADJUSTABLE ACCUTROL' ROOF DRAINS.

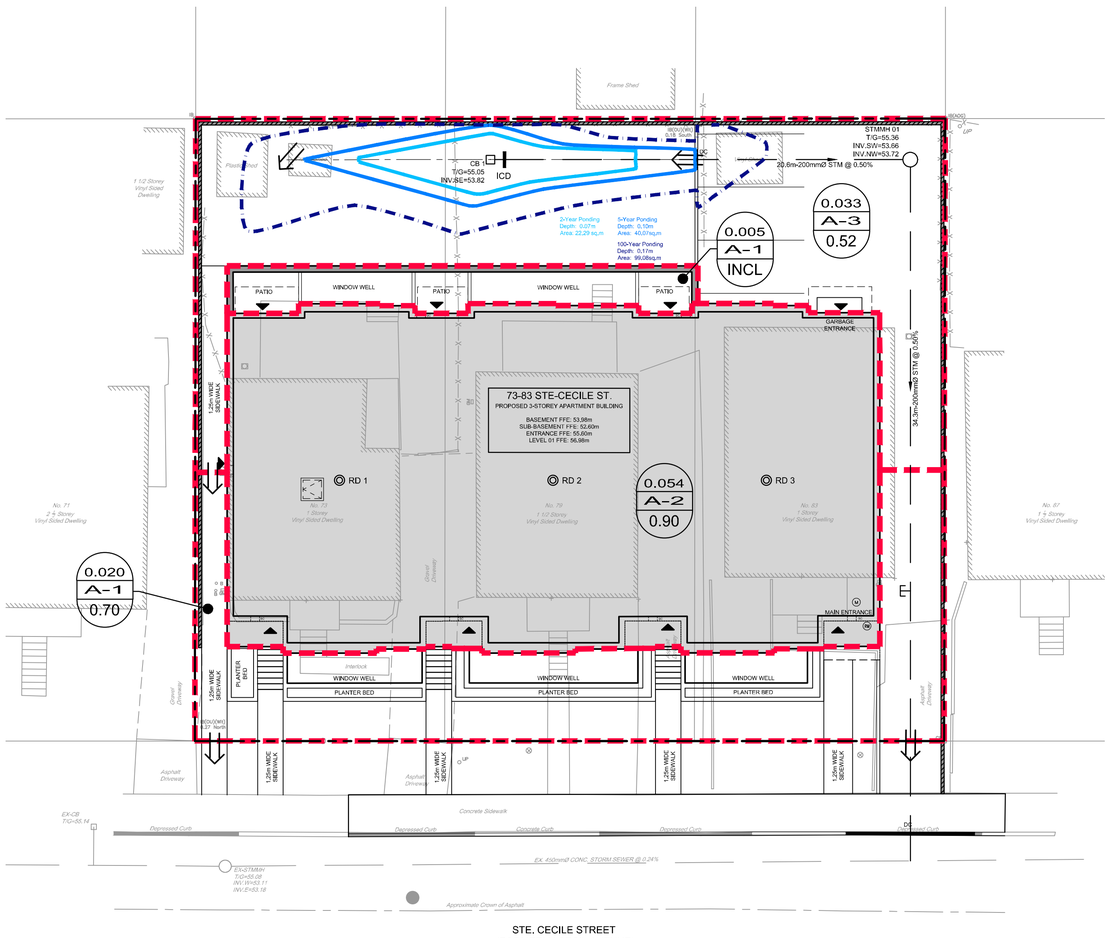
INLET CONTROL DEVICE - DATA TABLE								
STRUCTURE ID	ICD TYPE	DIAMETER OF OUTLET PIPE (mm)	DESIGN FLOW (L/s)			DESIGN HEAD (m)		
			2-YEAR	5-YEAR	100-YEAR	2-YEAR	5-YEAR	100-YEAR
CB 1	TEMPEST LMF 60	200	3.5	3.6	3.7	1.20	1.23	1.30



PRE-DEVELOPMENT DRAINAGE AREA PLAN



POST-DEVELOPMENT DRAINAGE AREA PLAN



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
1.	ISSUED FOR SITE PLAN APPLICATION	DEC 16/22	MJH

SCALE: 1:150 (1:150 0 2 4 6)

DESIGN: DMM/ZA
CHECKED: MJH
DRAWN: DMM/ZA
CHECKED: MJH
APPROVED: JLS

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER — M.J. HREHORIAK — 100211256 — DEC 16/22 — PROVINCE OF ONTARIO

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
73-83 CECILE STREET

DRAWING NAME
STORM DRAINAGE AREA PLAN

PROJECT No. 122167
REV REV # 1
DRAWING No. 122167-SWM

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PLANNED DWG - Do Not Modify

PROJECT #: 122167
PROJECT NAME: 73-83 STE. CECILE STREET
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: NOVEMBER 2022

TABLE 1A: Pre-Development Runoff Coefficient "C" - PRE

Area	Surface	Ha	"C"	C_{avg}	$*C_{100}$
Total	Hard	0.049	0.90	0.51	0.58
0.112	Soft	0.063	0.20		

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

TABLE 1B: Pre-Development Flows

Outlet Options	Area (ha)	C_{avg}	Tc (min)	$Q_{2\ Year}$ (L/s)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
Ste. Cecile Street	0.112	0.51	10	**12.2**	**16.5**	**32.3**

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

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

PROJECT #: 122167
PROJECT NAME: 73-83 STE. CECILE STREET
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: NOVEMBER 2022

TABLE 2A: Allowable Runoff Coefficient "C"

Area	"C"
Total	0.50
0.112	

TABLE 2B: Allowable Flows

Outlet Options	Area (ha)	"C"	Tc (min)	$Q_{5\ Year}$ (L/s)
Ste. Cecile Street	0.112	0.50	10	**16.2**

Time of Concentration Tc= 10 min

Intensity (5 Year Event) I_5= 104.19 mm/hr

5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$

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" - A-1

Area	Surface	Ha	"C"	C_{avg}	$*C_{100}$
Total	Hard	0.018	0.90	0.70	0.78
0.025	Soft	0.007	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 A-1 Flows

Outlet Options	Area (ha)	C_{avg}	Tc (min)	$Q_{2\ Year}$ (L/s)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
Ste. Cecile Street	0.025	0.70	10	**3.7**	**5.0**	**9.7**

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

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-2

			5 Year Event		100 Year Event	
Area	0.4	Ha	"C"	C_{avg}	"C" + 25%	*C_{avg}
Total	Hard	0.000	0.90		1.00	
0.054	Roof	0.054	0.90	0.90	1.00	1.00
	Soft	0.000	0.20		0.25	

TABLE 4B: 2 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-2

0.054 =Area (ha)
0.90 = 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	20	52.03	6.96	1.9	5.07	6.09
	25	45.17	6.05	1.9	4.16	6.23
	30	40.04	**5.36**	**1.9**	**3.47**	**6.25**
	35	36.06	4.83	1.9	2.94	6.17
	40	32.86	4.40	1.9	2.51	6.02

TABLE 4C: 5 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-2

0.054 =Area (ha)
0.90 = 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	25	60.90	8.15	2.1	6.02	9.03
	30	53.93	7.22	2.1	5.09	9.16
	35	**48.52**	**6.49**	**2.1**	**4.37**	**9.17**
	40	44.18	5.91	2.1	3.79	9.08
	45	40.63	5.44	2.1	3.31	8.94

TABLE 4D: 100 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-2

0.0535 =Area (ha)
1.00 = 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	35	82.58	12.28	2.7	9.56	20.08
	40	75.15	11.18	2.7	8.46	20.29
	45	**69.05**	**10.27**	**2.7**	**7.55**	**20.38**
	50	63.95	9.51	2.7	6.79	20.37
	55	59.62	8.87	2.7	6.15	20.29

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

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

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

Table 4E: Roof Drain Flows

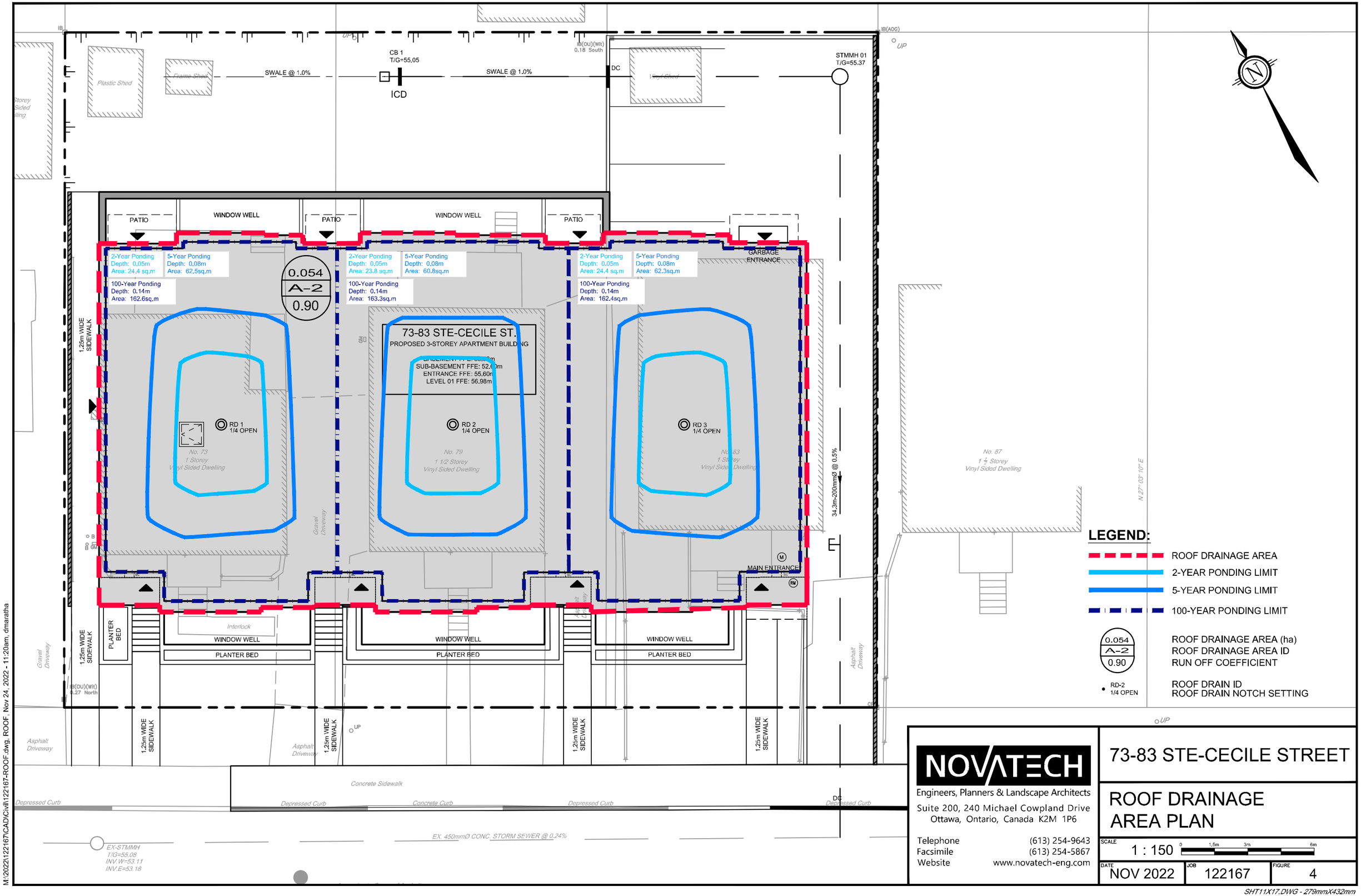
Roof Drains		
Roof Area	535	m^2
Qty	3	
Type	Accutrol RD-100-A-ADJ	
Setting	1/4 Open	
Design Head	0.05-0.15	m
Design Flow 1" of head	0.32	L/s (ea)
Design Flow 2" of head	0.63	L/s (ea)
Design Flow 3" of head	0.71	L/s (ea)
Design Flow 4" of head	0.79	L/s (ea)
Design Flow 5" of head	0.87	L/s (ea)
Design Flow 6" of head	0.95	L/s (ea)

Table 4F: Total Roof Storage

Storm Event	Roof Drain ID	**Avg Area Per Roof Drain (m^2)	Avg Ponding Depth Per Roof Drain (m)	*Total Volume (m^3)	Total Volume (m^3) Required
2 Year	RD-1	163	0.051	2.75	-
	RD-2	163	0.051	2.77	-
	RD-3	162	0.051	2.75	-
			Total	**8.27**	**6.25**
5 Year	RD-1	163	0.076	4.13	-
	RD-2	163	0.076	4.15	-
	RD-3	162	0.076	4.12	-
			Total	**12.40**	**9.17**
100 Year	RD-1	163	0.140	7.57	-
	RD-2	163	0.140	7.60	-
	RD-3	162	0.140	7.56	-
			Total	**22.74**	**20.38**

*Note: Ponding volumes calculated using cone equation:

$$V = \frac{Area\ X\ Depth}{3}$$



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Website www.novatech-eng.com

73-83 STE-CECILE STREET

ROOF DRAINAGE AREA PLAN

SCALE 1 : 150 (0, 1.5m, 3m, 6m)

DATE NOV 2022 | JOB 122167 | FIGURE 4

SHT11X17.DWG - 279mmX432mm

TABLE 5A: Post-Development Runoff Coefficient "C" - A-3

			5 Year Event		100 Year Event	
Area	0.4	Ha	"C"	C_{avg}	"C" + 25%	*C_{avg}
Total	Hard	0.015	0.90		1.00	
0.033	Roof	0.000	0.90	0.52	1.00	0.59
	Soft	0.018	0.20		0.25	

TABLE 5B: 2 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-3

0.033 =Area (ha)
0.52 = 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	7.96	1.8	6.21	0.00
	5	103.57	4.93	1.8	3.18	0.95
	10	76.81	**3.66**	**1.8**	**1.91**	**1.14**
	15	61.77	2.94	1.8	1.19	1.07
	20	52.03	2.48	1.8	0.73	0.87

TABLE 5C: 5 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-3

0.033 =Area (ha)
0.52 = 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	5	141.18	6.72	1.8	4.92	1.48
	10	104.19	4.96	1.8	3.16	1.90
	15	**83.56**	**3.98**	**1.8**	**2.18**	**1.96**
	20	70.25	3.34	1.8	1.54	1.85
	25	60.90	2.90	1.8	1.10	1.65

TABLE 5D: 100 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-3

0.03298 =Area (ha)
0.59 = 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	7.76	1.9	5.91	5.32
	20	119.95	6.51	1.9	4.66	5.59
	25	**103.85**	**5.64**	**1.9**	**3.79**	**5.68**
	30	91.87	4.99	1.9	3.14	5.65
	35	82.58	4.48	1.9	2.63	5.53

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

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

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

TABLE 5E: Structure information

Structures	Size Dia.(mm)	Area (m^2)	T/G	Inv IN	Inv OUT
CB 1	600	0.37	55.05	N/A	53.82

TABLE 5F: Storage Provided - A-3

Area A-3 Storage Table				Total Storage	
Elevation (m)	System Depth (m)	CB 1 Volume (m^3)	Underground Volume (m^3)*	CB 01 Ponding Volume (m^3)	**Total Volume (m^3)**
53.820	0.00	-	0.00		**0.00**
55.050	1.23	0.46	0.46		**0.46**
55.100	1.28	-	0.46	0.3	**0.76**
55.150	1.33	-	0.46	1.43	**1.89**
55.200	1.38		0.46	3.86	**4.32**
55.250	1.43		0.46	8.18	**8.64**
55.300	1.48		0.46	14.83	**15.29**
55.380	1.56		0.46	29.59	**30.05**

TABLE 5G: Orfice Sizing information Area - A-3 Structure - CB 1

Control Device *TEMPEST*		LMF 60			
Design Event	**Flow (L/S)**	**Head (m)**	**Elev (m)**	**Outlet dia. (mm)**	**Required Volume (m^3)**
1:2 Year	3.5	1.20	55.12	200.00	1.14
1:5 Year	3.6	1.23	55.15	200.00	1.96
1:100 Year	3.7	1.30	55.22	200.00	5.68

*NOTE: Design head taken from the center of the outlet pipe

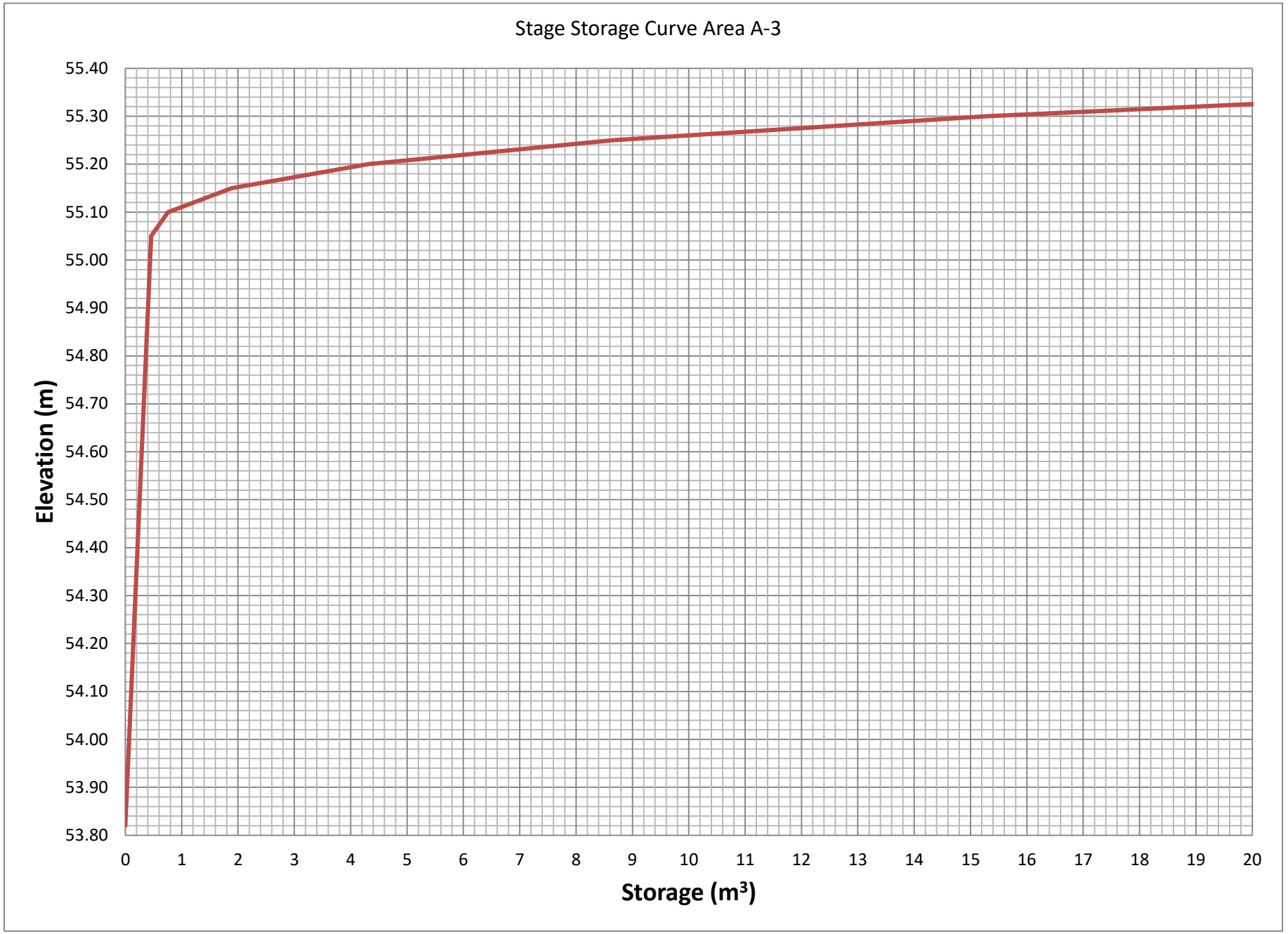

Stage Storage Curve Area A-3
Elevation (m)
55.40
55.30
55.20
55.10
55.00
54.90
54.80
54.70
54.60
54.50
54.40
54.30
54.20
54.10
54.00
53.90
53.80
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
Storage (m³)

Table 6: Post-Development Stormwater Mangement Summary

Area ID	Area (ha)	1:5 Year Weighted Cw	Oulet Location	Orifice	2 Year Storm Event				5 Year Storm Event				100 Year Storm Event			
					Release (L/s)	Head (m)	Req'd Vol (cu.m)	Vol. Provided	Release (L/s)	Head (m)	Req'd Vol (cu.m)	Vol. Provided	Release (L/s)	Head (m)	Req'd Vol (cu.m)	Max. Vol. Provided
A-1	0.025	0.70	Ste. Cecile St	N/A	3.7	N/A	N/A	N/A	5.0	N/A	N/A	N/A	9.7	N/A	N/A	N/A
A-2	0.054	0.90	Ste. Cecile St	RD-100-A-ADJ	1.9	0.05	6.2	8.3	2.1	0.08	9.2	12.4	2.7	0.14	20.4	22.7
A-3	0.033	0.52	Ste. Cecile St	LMF 60	3.5	1.20	1.1	1.9	3.6	1.23	2.0	8.6	3.7	1.30	5.7	30.1
Total Post Developemt Release Rate					**9.1**				**10.7**				**16.1**			
Target Allowable Release Rate					**16.2**				**16.2**				**16.2**			
Total Pre-Development Release Rate					**12.2**				**16.5**				**32.3**			

APPENDIX F
Roof Drain & ICD Information

WATTS® DRAINAGE

Adjustable Accutrol Weir

Tag: RD-100-A-ADJ

Adjustable Flow Control for Roof Drains

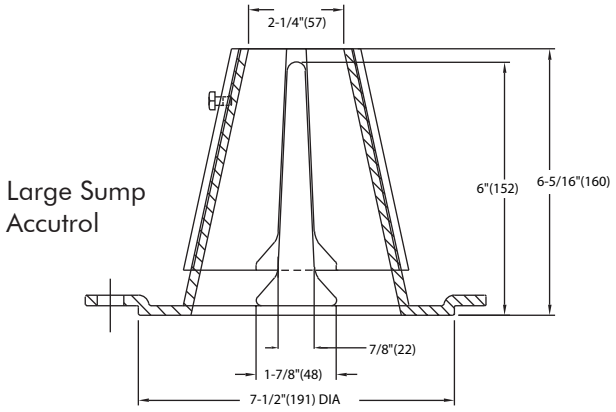
ADJUSTABLE ACCUTROL(for Large Sump Roof Drains only)

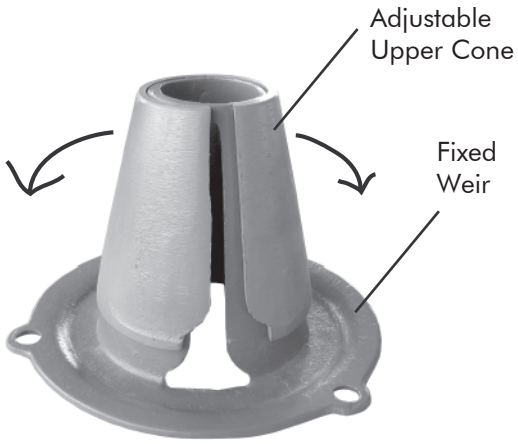
For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the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

EXAMPLE:

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

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





1/2 Weir Opening Exposed Shown Above

TABLE 1. Adjustable Accutrol Flow Rate Settings

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

Job Name _____ Contractor _____

Job Location _____ Contractor's P.O. No. _____

Engineer _____ Representative _____

WATTS® DRAINAGE
CANADA: 5435 North Service Road, Burlington, ON, L7L 5H7 TEL: 905-332-6718 TOLL-FREE: 1-888-208-8927 Website: www.wattsdrainage.ca
CANADA

Volume III: TEMPEST INLET CONTROL DEVICES

Municipal Technical Manual Series

SECOND EDITION

LMF (Low to Medium Flow) ICD

HF (High Flow) ICD

MHF (Medium to High Flow) ICD

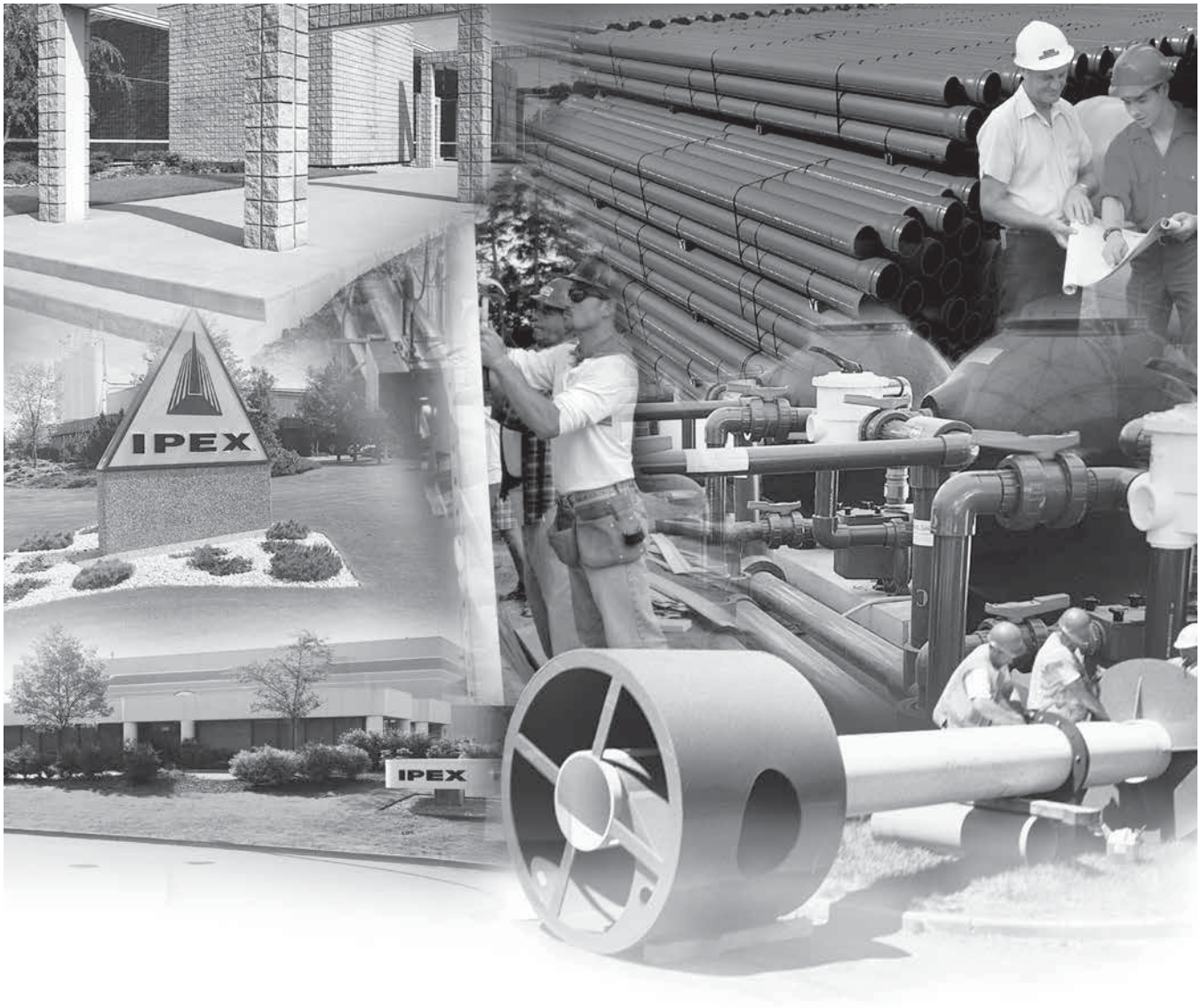
IPEX
by aliaxis

IPEX Tempest™ Inlet Control Devices

Municipal Technical Manual Series

Vol. I, 2nd Edition

For information contact: IPEX, Marketing,
1425 North Service Road East, Oakville, Ontario, Canada, L6H 1A7



ABOUT IPEX

At IPEX, we have been manufacturing non-metallic pipe and fittings since 1951. We formulate our own compounds and maintain strict quality control during production. Our products are made available for customers thanks to a network of regional stocking locations throughout North America. We offer a wide variety of systems including complete lines of piping, fittings, valves and custom-fabricated items.

More importantly, we are committed to meeting our customers' needs. As a leader in the plastic piping industry, IPEX continually develops new products, modernizes manufacturing facilities and acquires innovative process technology. In addition, our staff take pride in their work, making available to customers their extensive thermoplastic knowledge and field experience. IPEX personnel are committed to improving the safety, reliability and performance of thermoplastic materials. We are involved in several standards committees and are members of and/or comply with the organizations listed on this page.

For specific details about any IPEX product, contact our customer service department.

CONTENTS

PRODUCT INFORMATION: TEMPEST LOW, MEDIUM FLOW (LMF) ICD

Purpose

To control the amount of storm water runoff entering a sewer system by allowing a specified flow volume out of a catch basin or manhole at a specified head. This approach conserves pipe capacity so that catch basins downstream do not become uncontrollably surcharged, which can lead to basement floods, flash floods and combined sewer overflows.

Product Description

Our LMF ICD is designed to accommodate catch basins or manholes with sewer outlet pipes 6" in diameter and larger. Any storm sewer larger than 12" may require custom modification. However, IPEX can custom build a TEMPEST device to accommodate virtually any storm sewer size.

Available in 14 preset flow curves, the LMF ICD has the ability to provide flow rates: 2lps – 17lps (31gpm – 270gpm)

Product Function

The LMF ICD vortex flow action allows the LMF ICD to provide a narrower flow curve using a larger orifice than a conventional orifice plate ICD, making it less likely to clog. When comparing flows at the same head level, the LMF ICD has the ability to restrict more flow than a conventional ICD during a rain event, preserving greater sewer capacity.

Product Construction

Constructed from durable PVC, the LMF ICD is light weight 8.9 Kg (19.7 lbs).

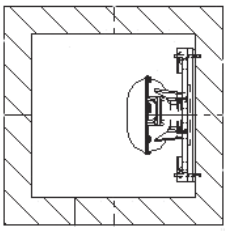
Product Applications

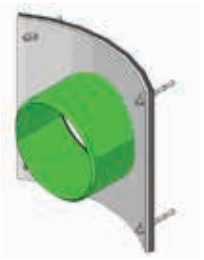
Will accommodate both square and round applications:

Square Application

Round Application

Universal Mounting Plate





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Spigot CB Wall Plate

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Universal Mounting Plate Hub Adapter

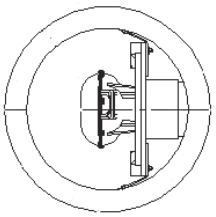


Chart 1: LMF 14 Preset Flow Curves

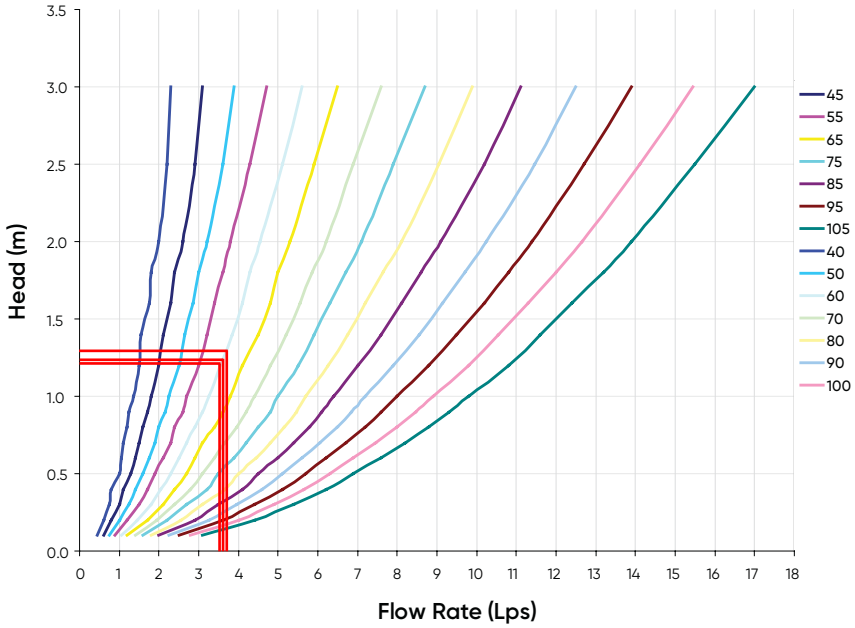
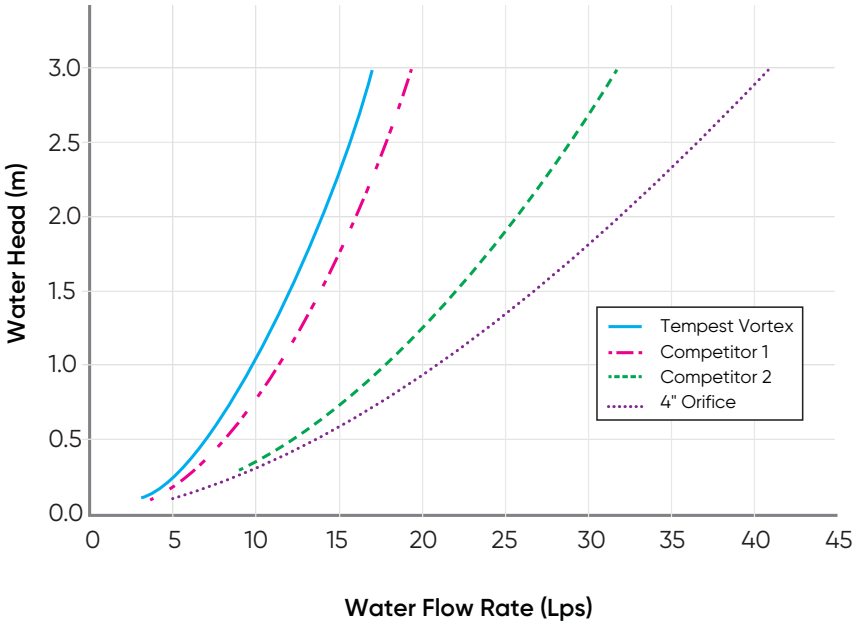


Chart 2: LMF Flow vs. ICD Alternatives



PRODUCT INSTALLATION

Instructions to assemble a TEMPEST LMF ICD into a Square Catch Basin:

STEPS:

1. Materials and tooling verification:
   - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level, and marker.
   - Material: (4) concrete anchor 3/8 x 3-1/2, (4) washers, (4) nuts, universal mounting plate, ICD device.
2. Use the mounting wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8" concrete bit to make the four holes at a minimum of 1-1/2" depth up to 2-1/2". Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Thread the nuts on the top of the anchors to protect the threads when you hit the anchors with the hammer. Remove the nuts from the ends of the anchors.
5. Install the universal mounting plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the wall mounting plate and the catch basin wall.
6. From the ground above using a reach bar, lower the ICD device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the universal mounting plate and has created a seal.

⚠ WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut down the pipe flush to the catch basin wall.
- Call your IPEX representative for more information or if you have any questions about our products.

Instructions to assemble a TEMPEST LMF ICD into a Round Catch Basin:

STEPS:

1. Materials and tooling verification.
   - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level and marker.
   - Material: (4) concrete anchor 3/8 x 3-1/2, (4) washers and (4) nuts, spigot CB wall plate, universal mounting plate hub adapter, ICD device.
2. Use the spigot catch basin wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8" concrete bit to make the four holes at a depth between 1-1/2" to 2-1/2". Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Thread the nuts on the top of the anchors to protect the threads when you hit the anchors with the hammer. Remove the nuts from the ends of the anchors.
5. Install the CB spigot wall plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the spigot wall plate and the catch basin wall.
6. Apply solvent cement on the hub of the universal mounting plate, hub adapter and the spigot of the CB wall plate, then slide the hub over the spigot. Make sure the universal mounting plate is at the horizontal and its hub is completely inserted onto the spigot. Normally, the corners of the universal mounting plate hub adapter should touch the catch basin wall.
7. From ground above using a reach bar, lower the ICD device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the mounting plate and has created a seal.

⚠ WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut back the pipe flush to the catch basin wall.
- The solvent cement which is used in this installation is to be approved for PVC.
- The solvent cement should not be used below 0°C (32°F) or in a high humidity environment. Refer to the IPEX solvent cement guide to confirm the required curing time or visit the IPEX Online Solvent Cement Training Course available at ipexna.com.
- Call your IPEX representative for more information or if you have any questions about our products.

NOTE: Do not use or test the products in this manual with compressed air or other gases including air-over-water-boosters

SALES AND CUSTOMER SERVICE

IPEX Inc.
Toll Free: (866) 473-9462
ipexna.com

About the IPEX Group of Companies

As leading suppliers of thermoplastic piping systems, the IPEX Group of Companies provides our customers with some of the largest and most comprehensive product lines. All IPEX products are backed by more than 50 years of experience. With state-of-the-art manufacturing facilities and distribution centers across North America, we have established a reputation for product innovation, quality, end-user focus and performance.

Markets served by IPEX group products are:

- Electrical systems
- Telecommunications and utility piping systems
- PVC, CPVC, PP, ABS, PEX, FR-PVDF and PE pipe and fittings (1/4" to 48")
- Industrial process piping systems
- Municipal pressure and gravity piping systems
- Plumbing and mechanical piping systems
- PE Electrofusion systems for gas and water
- Industrial, plumbing and electrical cements
- Irrigation systems

Products manufactured by IPEX Inc.
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APPENDIX G
Engineering Drawings