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Proposed Residential Development 15 Larch Street

Development Servicing and Stormwater Management Report

**PROPOSED RESIDENTIAL DEVELOPMENT
15 LARCH STREET**

**DEVELOPMENT SERVICING AND
STORMWATER MANAGEMENT REPORT**

Prepared by:

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Novatech File No. 120251

October 27, 2023

15-19 Larch St. Inc.
359 Kent Street, Suite 503
Ottawa, Ontario,
K2P 0R6

Attention: Mr. Roberto Campagna

Dear Sir:

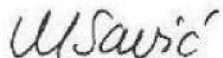
**Re: Development Servicing and Stormwater Management Report
Proposed Residential Development
15 Larch Street, Ottawa, Ontario
Novatech File No.: 120251**

Enclosed is a copy of the revised 'Development Servicing and Stormwater Management Report' for the proposed 3-storey residential development located at 15 Larch Street, in the City of Ottawa. This report addresses the approach to site servicing and stormwater management and is submitted in support of Zoning By-Law Amendment and Site Plan Control applications.

Please contact the undersigned, should you have any questions or require additional information.

Yours truly,

NOVATECH



Miroslav Savic, P. Eng.
Senior Project Manager

cc: Shawn Wessel (City of Ottawa)
Hugo Latrielle (Hobin)

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1.0 INTRODUCTION

The new 3-storey residential building is being proposed by 15-19 Larch St. Inc. and Novatech has been retained to complete the site servicing and stormwater management design for this project. This report addresses the approach to servicing and stormwater management and is being submitted in support of the Zoning By-Law Amendment (ZBLA) and Site Plan Control (SPC) applications.

1.1 Site Description and Location

The subject site is approximately 0.092 hectares in size and currently consists of two existing residential buildings with surface parking along the frontage with Larch Street and a legal boundary that extends to the south side of the Larch Street right-of-way. The subject site is bordered by a vegetated rear laneway, existing residential properties to the north and east, Larch Street to the south and a partially vacant government parcel to the west. The legal description of the subject site is designated as Part of Block 122, Registered Plan No. 13, Lots 35 and 36 and Part of Lot 34, Registered Plan No. 82974, City of Ottawa.

Figure 1 – Aerial Plan provides an aerial view of the site.



1.2 Pre-Consultation Information

A pre-consultation meeting was held with the City of Ottawa on April 20, 2021, at which time the client was advised of the general submission requirements. Refer to **Appendix A** for a summary of the correspondence related to the proposed development.

Based on a review of **O. Reg. 525/98: Approval Exemptions**, a Ministry of the Environment, Conservation and Parks (MECP) Environmental Compliance Approval (ECA) is anticipated to be required because the storm flows from this site are being directed into a combined sewer in Larch Street. A pre-consultation meeting has not been held with the MECP.

The subject site is located within the jurisdiction of the Rideau Valley Conservation Authority (RVCA). Based on discussions with the RVCA, stormwater quality control will not be required for this development as the storm sewer flows are being directed into the existing municipal combined sewer system in Larch Street.

1.3 Proposed Development

The proposed development will consist of a new 3-storey residential building with entrances to and from the basement level as well as a sub-basement level mechanical space. The new building will occupy the existing residential properties of 15, 17 and 19 Larch Street. The proposed residential dwelling will be serviced by extending new laterals to the municipal combined sewer adjacent to the site. The site will require the extension of the existing 150mm dia. municipal watermain in Larch Street with a new section of 200mm dia. watermain approximately 40m from the existing stub to the front of the site at the west end of Larch Street and a new fire hydrant near the west end of the street. Barrier-free access to the proposed building will be provided off Larch Street while a loading spot will be provided at the rear of the property, adjacent to the existing rear laneway parcel.

1.4 Reference Material

The following reports and studies were reviewed as part of the design process:

¹ The Geotechnical Investigation Report (Ref. No. PG6071-1, Revision 1), prepared by Paterson Group Inc. on February 11, 2022.

2.0 SITE SERVICING

The objective of the site servicing design is to provide proper sewage outlets, a suitable domestic water supply and to ensure that appropriate fire protection is provided for the proposed development. As discussed with the City of Ottawa, the total allowable flow from the subject site being directed to the existing municipal combined sewer in Larch Street will include:

- Peak sanitary sewage flows
- Ground water flows (Less than 10,000 L/day per the geotechnical correspondence)
- Peak stormwater flows

The total flow from the site (summarized in **Section 2.3.4** of the Report) is being provided to the City of Ottawa for their review in confirming that the existing municipal combined sewer system has adequate capacity to accommodate the proposed development.

The servicing criteria, the expected sewage flows, and the water demands are to conform to the City of Ottawa municipal design guidelines for sewer and water distribution systems. Refer to the subsequent sections of the report for further details.

The City of Ottawa Servicing Study Guidelines for Development Applications requires that a Development Servicing Study Checklist be included to confirm that each applicable item is deemed complete and ready for review by City of Ottawa Infrastructure Approvals. A completed checklist is enclosed in **Appendix B** of the report.

2.1 Sanitary Sewage

The proposed residential development will be serviced by a new 200mm dia. sanitary sewer connected to the existing 450mm dia. combined sewer in Larch Street.

The City of Ottawa design criteria were used to calculate the theoretical sanitary flows for the proposed development. The following design criteria were taken from Section 4 – ‘Sanitary Sewer Systems’ and Appendix 4-A - ‘Daily Sewage Flow for Various Types of Establishments’ of the City of Ottawa Sewer Design Guidelines:

Residential Use

- Residential Units (Bachelor or 1-Bedroom): 1.4 people per unit
- Residential Units (2-Bedroom): 2.1 people per unit
- Average Daily Residential Sewage Flow: 280 L/person/day (ISTB-2018-01)
- Residential Peaking Factor = 3.46 (Harmon Equation)
- Infiltration Allowance: 0.33 L/s/ha x 0.09 ha site = 0.03 L/s

Table 1 identifies the theoretical sanitary flows for the proposed residential development based on the above design criteria.

Table 1: Theoretical Post-Development Sanitary Flows

Residential Use	Unit Count	Design Population	Average Flow (L/s)	Peaking Factor	Peak Flow (L/s)	Total Flow (L/s)
New Building (serviced by a new lateral)						
Bachelor	3	5	0.02*	3.46	0.07*	0.07
1-Bedroom	11	15	0.05*	3.46	0.18*	0.18
2-Bedroom	12	25	0.07*	3.46	0.25*	0.25
Infiltration Allowance	-	-	-	-	-	0.03
Total	26	45	0.14	-	-	0.53

*Represents rounded values. Refer to detailed calculations in Appendix D.

As indicated in the table above, the peak sanitary flow to the combined sewer in Larch Street was calculated to be approximately 0.5 L/s. Refer to **Appendix C** for a copy of the theoretical sanitary flow calculations.

A 200mm dia. sanitary gravity sewer at a minimum slope of 1.0% has a full flow conveyance capacity of 34.2 L/s and will have enough capacity to convey the theoretical sanitary flows for the proposed development.

2.2 Water for Domestic Use and Firefighting

The proposed residential development will be serviced by a new 100mm dia. water service connected to the new 200mm dia. PVC watermain extension in Larch Street. The water service has been sized to provide the required domestic water demand and fire flow in coordination with

the mechanical engineer. A shut-off valve will be provided on the proposed water service near the property line on the south side of the building. The water meter will be located within the water entry room, with a remote meter also on the exterior face of the building.

The City of Ottawa design criteria were used to calculate the theoretical water demands for the proposed development. The following design criteria were taken from Section 4 – ‘Water Distribution Systems’ of the Ottawa Design Guidelines – Water Distribution:

- Residential Units (Bachelor or 1 Bedroom): 1.4 people per unit
- Residential Units (2 Bedroom): 2.1 people per unit
- Average Daily Residential Water Demand: 280 L/person/day (ISTB-2021-03)
- Maximum Day Demand Peaking Factor = 2.5 x Avg. Day Demand (City Water Table 4.2)
- Peak Hour Demand Peaking Factor = 2.2 x Max. Day Demand (City Water Table 4.2)

Table 2 identifies the theoretical domestic water demands for the proposed residential development based on the above design criteria.

Table 2: Theoretical Water Demand for the Proposed Development

Residential Use	Unit Count	Design Population	Average Day Demand (L/s)	Max. Day Demand (L/s)	Peak Hour Demand (L/s)
Bachelor	3	5	0.02*	0.04*	0.09*
1-Bedroom	11	15	0.05*	0.12*	0.27*
2-Bedroom	12	25	0.08*	0.20*	0.45*
Total	26	45	0.15*	0.36*	0.81*

*Represents rounded values. Refer to detailed calculations in Appendix D.

The following design criteria were taken from Section 4.2.2 – ‘Watermain Pressure and Demand Objectives’ of the City of Ottawa Design Guidelines for Water Distribution:

- Normal operating pressures are to range between 345 kPa (50 psi) and 552 kPa (80 psi) under Max Day demands
- Minimum system pressures are to be 276 kPa (40 psi) under Peak Hour demands
- Minimum system pressures are to be 140 kPa (20 psi) under Max Day + Fire Flow demands

The anticipated domestic water demands, and fire flow requirements were provided to the City of Ottawa. These values were used to generate the municipal watermain network boundary conditions. **Table 2.1** below summarizes the watermain boundary conditions and the results of the hydraulic analysis related to the domestic demands.

Table 2.1: Hydraulic Boundary Condition Provided by the City

Municipal Watermain Boundary Condition	HGL	Domestic Demand (L/s)	Normal Operating Pressure Range (psi)	Design Pressure (psi)*
Minimum HGL (Peak Hour Demand)	107.2 m	0.80	40 psi (min.)	71.0
Maximum HGL (Max Day Demand)	115.3 m	0.36	50-80 psi	82.5

*Based on Larch Street watermain elevation of 57.3m at the service connection location.

Since the check of high pressures indicates that the design pressure will be over 80 psi, a pressure reducing valve (PRV) will be required to be installed immediately downstream of the isolation valve in the building as per the Ontario Building Code (OBC).

2.2.1 Water Supply for Firefighting

The proposed building will not be sprinklered, however, it is located approximately 56m from the nearest existing municipal fire hydrant on the south side of the Larch Street right-of-way. A new fire hydrant will also be installed on the south side of Larch Street R.O.W. approximately 18m from the proposed development to service the west end of the street.

The Fire Underwriters Survey (FUS) was used to estimate fire flow requirements for the proposed building. Based on information provided by the architect, the residential building will not be sprinklered and will be constructed using combustible materials, however there will be a fire separation within the building (a 2-hour rated fire wall) that was used in the calculations.

Table 2.2 summarizes the fire flow requirements for the proposed building, based on the FUS calculations.

Table 2.2: Fire Flow Requirements for the Proposed Development

Residential Building Use	Fire Flow Demand USGPM (L/s)
Building West Fire Separation	2,378 USGPM (150 L/s)
Building East Fire Separation	3,435 USGPM (217 L/s)

Refer to **Appendix D** for a copy of the preliminary FUS fire flow calculations and watermain boundary conditions correspondence from the City of Ottawa.

A multi-hydrant approach to firefighting is anticipated to be required. There will be two (2) Class AA, blue bonnet municipal hydrants within 75m of the proposed development (approximately 56m from the south-east corner of the proposed building and the new fire hydrant 18m from the proposed building) as well as an existing Class AA, blue bonnet municipal hydrant within 150m of the proposed development in the east boulevard of Preston Street (approximately 117m from the south-east corner of the proposed building at Willow Street). Based on *Table 1 Maximum*

flow to be considered from a given hydrant in Appendix I of Technical Bulletin ISTB-2018-02, the combined flows from the three hydrants are summarized below in **Table 2.4**.

Table 2.3: Combined Hydrant Flow Summary

Proposed Development	Fire Flow Demand (L/s)	Fire Hydrant(s) within 75m (~ 95 L/s each)	Fire Hydrant(s) within 150m (~ 63 L/s each)	Combined Available Fire Flow (L/s)
Residential Building	217	2	1	253

The combined maximum flow from these hydrants will exceed the Max Day + Fire Flow requirement (13,000 L/min) of the proposed development. The existing municipal watermain network should therefore have adequate fire water supply for the proposed development. Refer to **Appendix D** for a sketch showing the existing fire hydrant locations, City ID numbers and the dimensions confirming the appropriate site coverage for fire-fighting purposes.

The existing municipal watermain network should therefore have adequate water supply for the proposed development and will provide adequate system pressures for both 'Max Day + Fire Flow' and 'Peak Hour' conditions, within the normal operating pressure ranges.

2.3 Storm Drainage and Stormwater Management

The south-west portion of the existing site (0.007 ha), is to be maintained as the existing portion of the western limit of the Larch Street municipal right-of-way, will be excluded from the SWM calculations, as there is no opportunity to control the runoff from this area with the municipal R.O.W. On-site stormwater management will however be required for the remaining portion of the site to be developed (0.085 ha). Stormwater runoff from a small drainage swale along the western property line and the front of the site will sheet drain uncontrolled towards Larch Street as it does under current conditions.

The proposed storm outlet for the site to be developed is the existing 450mm dia. concrete combined sewer in Larch Street, which in turn flows into a combined sewer in Preston Street. Since the post-development storm flows are being directly connected to a combined sewer, they will need to be controlled prior to being released from the site. The total allowable site flow will be a combination of the peak sanitary flows, anticipated groundwater flows and the allocated stormwater flow components, as specified by the City of Ottawa.

The proposed storm drainage and stormwater management design for the site is discussed in the following sections of the report.

2.3.1 Stormwater Management Criteria and Objectives

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

- Provide best measures to attempt to control the post-development flows from the site to a target release rate (i.e.: allowable 2-year release rate specified by the City of Ottawa minus the peak sanitary and ground water flow components). Control post-development flows from the portion of the site being developed (i.e.: the proposed building and site

areas), excluding the south-west portion of the property to remain at the end of the municipal R.O.W., for storms up to and including the 100-year design event.

- Minimize the impact on the existing combined sewer system in Larch Street by reducing the post-development storm flows from the site, when compared to current conditions.
- Provide guidelines to ensure that site preparation and construction is in accordance with the current Best Management Practices for Erosion and Sediment Control.

2.3.2 Pre-Development Conditions and Allowable Release Rate

The uncontrolled pre-development flows from the 0.085 ha portion of the site to be developed were calculated using the Rational Method to be 13.6 L/s during the 1:5-year design event and 26.4 L/s during the 1:100-year design event. Refer to **Appendix E** for detailed calculations. There are currently no water quantity or water quality control measures being provided on site.

As specified by the City of Ottawa, the target allowable release rate from the site (including the sanitary and groundwater flow components) was calculated using the Rational Method, to be approximately 7.3 L/s, based on a 10-minute rainfall intensity, using a 2-year return period (City of Ottawa IDF Curves) and a runoff coefficient of 0.40.

$$\begin{aligned}
 T_c &= 10 \text{ min} & C &= 0.40 \\
 I_{5yr} &= 76.81 \text{ mm/hr} & A &= 0.085 \text{ ha} \\
 \\
 Q_{allow} &= 2.78 \text{ CIA} \\
 &= 2.78 \times 0.40 \times 76.81 \times 0.085 \\
 &= 7.3 \text{ L/s}
 \end{aligned}$$

As stated above, the total site allowable flow to the combined sewer system in Larch Street will be a combination of the peak sanitary flow, anticipated groundwater flow and the allocated stormwater flow components.

- The peak sanitary flow from **Table 1** above was calculated to be 0.5 L/s.
- The anticipated groundwater corresponds to a maximum flow rate of approximately 0.1 L/s (based on the geotechnical estimate of less than 10,000 L/day/building).
- The remaining site flow allocated for stormwater management is therefore 6.7 L/s. (7.3 L/s – (0.5 L/s peak sanitary flow + 0.1 L/s groundwater flow))

2.3.3 Post-Development Conditions

The proposed site will be serviced by connecting to the existing 450mm dia. combined sewer in Larch Street. Stormwater runoff from the new building roof will be controlled prior to being discharged into the building service downstream of the proposed ICD for the remainder of the controlled site flows. Post-development flows from the weeping tile system as well as the uncontrolled deck drains within the sunken rear patios will be pumped to the building storm service to protect the building and sunken patios from any potential sewer backups. Runoff from a small portion of the side yard along the west property line and the front yard will sheet drain uncontrolled towards existing catchbasins within the municipal right-of-way. Refer to plan 120251-SWM for the relevant drainage areas, area I.D.'s and runoff coefficients.

2.3.3.1 Areas A-1: Uncontrolled Direct Runoff - West

The runoff from this small sub-catchment area will flow overland towards the roadway catch basins in Larch Street via a new drainage swale along the west property line. The uncontrolled post-development flows from sub-catchment area A-1 were calculated using the Rational Method to be approximately 0.3 L/s during the 5-year design event and 0.7 L/s during the 100-year design event. Refer to **Appendix E** for detailed calculations.

2.3.3.2 Areas A-2: Uncontrolled Direct Runoff - East

The runoff from this small sub-catchment area will flow overland towards the roadway catch basins in Larch Street. The uncontrolled post-development flows from sub-catchment area A-2 were calculated using the Rational Method to be approximately 0.1 L/s during the 5-year design event and 0.3 L/s during the 100-year design event. Refer to **Appendix E** for detailed calculations.

2.3.3.3 Area A-3: Controlled Site Flows

Runoff from sub-catchment A-3 will be captured by the on-site storm sewer system + landscape drains and attenuated by an ICD installed in the outlet pipe of STM MH 02 prior to being released into the Larch Street municipal combined sewer. Adequate storage will be required for all storms up-to and including the 100-year storm event. There will be no surface ponding during any storm events up to and including the 100-year design event.

Table 2.4 summarizes the post-development design flow from this sub-catchment area as well as the type of ICD, the anticipated water storage elevations in the system, storage volumes required and storage volume provided for the 2-year, 5-year and the 100-year design events.

Table 2.4: Stormwater Flows, ICD & Surface Storage

Design Event	Controlled Site Flows from Area A-3					
	ICD Type	Peak Flow	Water Storage Elevation	Average Flow (50% Qpeak)	Storage Volume Required	Max Storage Provided
2-Year	Tempest Vortex ICD LMF-Model 50	1.0 L/s	0cm ponding (57.28 m)	0.5 L/s	2.0 m ³	10.5 m ³
5-Year		1.3 L/s	0cm ponding (57.44 m)	0.7 L/s	2.8 m ³	
100-Year		1.8 L/s	0cm ponding (57.75 m)	0.9 L/s	6.2 m ³	
100-Year (+20%)		1.8 L/s	0cm ponding (58.28 m)	0.9 L/s	7.9 m ³	

Refer to **Appendix E** for detailed SWM calculations and to **Appendix F** for ICD information.

2.3.3.4 Area R-1: Controlled Building Roof Flows + Uncontrolled Deck Drains

The post-development flow from this sub-catchment area will be attenuated by Five (5) individual Watts adjustable 'Accutrol' control flow roof drains (model number RD-100-A-ADJ) prior to being directed to the proposed storm service, by-passing the internal mechanical pumps.

Table 2.5 summarizes the post-development design flows from this sub-catchment area as well as the type of roof drains, the maximum anticipated ponding depths, storage volumes required, and storage volumes provided for both the 5-year and the 100-year design events.

Table 2.5: Design Flow and Roof Drain Table

Roof Drain ID & Drainage Area (ha)	Number of Roof Drains	Watts Roof Drain Model ID (Weir Opening)	Controlled Flow per Drain (L/s)		Approximate Ponding Depth Above Drains (m)		Storage Volume Required (m ³)		Max. Storage Available (m ³)
			5-Yr	100-Yr	5-Yr	100-Yr	5-Yr	100-Yr	
RD-1.1 (0.011 ha)	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.11	0.14	2.1	4.9	5.2
RD-1.2 (0.009 ha)	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.10	0.14	1.6	3.9	4.6
RD-2.1 (0.011 ha)	1	RD-100-A-ADJ (1/4 Exposed)	0.87	0.95	0.12	0.14	1.5	3.5	4.7
RD-2.2 (0.008 ha)	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.10	0.13	1.3	3.2	4.1
RD-2.3 (0.008 ha)	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.10	0.13	1.3	3.2	4.1
Total Roof (0.047 ha)	5	-	2.15	2.23	-	-	7.8	18.7	22.7

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

Deck drains from a 0.003 ha area will be conveyed to an internal sump prior to being pumped to the building service via the internal mechanical plumbing system. A separate weeping tile system will also be pumped to the building service. Flows from the controlled flow building roof drains will be conveyed by gravity to the building service, downstream of the backflow preventer (per the mechanical plumbing design). Post-development flows from this portion of the uncontrolled sunken patios were calculated using the Rational Method to be approx. 0.6 L/s during the 2-year, 0.8 L/s during the 5-year and 1.6 L/s during the 100-year design events. Refer to **Appendix E** for detailed calculations.

2.3.3.5 Stormwater Flow Summary

Table 2.6 provides a summary of the total post-development flows from the site to be developed and compares them to the uncontrolled pre-development flows and allocated for the stormwater component.

Table 2.6: Stormwater Flows Comparison Table

Design Event	Pre-Development Conditions		Post-Development Conditions					
	Uncontrolled Flow (L/s)	Allocated Release Rate (L/s)	A-1 Flow (L/s)	A-2 Flow (L/s)	A-3 Flow (L/s)	R-1 Flow (L/s)	Deck Drain Flow (L/s)	Total Stormwater Flow (L/s)
2-Yr	10.0	7.3	0.3	0.1	1.0	2.1	0.6	4.1
5-Yr	13.6		0.3	0.1	1.3	2.2	0.8	4.7
100-Yr	26.4		0.7	0.3	1.8	2.2	1.6	6.6

A 200mm dia. storm service at a minimum slope of 1.0% has a full flow conveyance capacity of 34.2 L/s and will have enough capacity to convey the theoretical storm flows for the proposed development.

2.3.4 Summary of Total Flow to Municipal Combined Sewer

As stated above, the target site allowable flow to the combined sewer system in Larch Street will be a combination of the peak sanitary flow, anticipated groundwater flow and the allocated stormwater flow components.

Table 2.7 provides a summary of the total post-development flows from the site to be developed and compares them to the uncontrolled pre-development flows and the target allowable release rate specified by the City of Ottawa.

Table 2.7: Site Flows Summary and Comparison Table

Design Event	Pre-Development Conditions		Post-Development Conditions				
	Uncontrolled Storm Flow (L/s)	Allowable Release Rate (L/s)	Sanitary Flow (L/s)	Ground Water Flow (L/s)	Storm Flow (L/s)	Total Flow (L/s)	Reduction in Flow (L/s or %)*
2-Yr	10.0	7.3	0.5	0.1	4.1	4.7	5.3 or 53%
5-Yr	13.6				4.7	5.3	8.3 or 61%
100-Yr	26.4				6.6	7.2	19.2 or 73%

* Reduced flow compared to uncontrolled pre-development stormwater runoff conditions (excluding pre-development sanitary and ground water flow components).

The total flow from the site to be developed is being provided to the City of Ottawa for their review in confirming that the municipal combined sewer system has adequate capacity to accommodate the proposed development.

2.3.5 Stormwater Quality Control

The subject site is located within the jurisdiction of the Rideau Valley Conservation Authority (RVCA). Based on discussions with the City of Ottawa and the RVCA, stormwater quality control will not be required for this development as the subject site is located within a combined sewershed. Refer to **Appendix A** for a copy of the correspondence received from the RVCA.

3.0 SITE GRADING

The existing site generally slopes from west to east, with elevations varying from approximately 60.6m at the northwest and 60.5m at the southwest property corners down to approximately 58.9m at the northeast property corner and approximately 58.8m at the southeast property corner of the rear vegetated area for the municipal rear laneway and along the existing right-of way for Larch Street respectively. The finished floor elevation (FFE) of the proposed residential building will be set at an elevation of 59.18m to tie into the existing laneway elevations and the perimeter sidewalk elevations along Larch Street. The building will be partially buried or 'bunkered-in' to the western elevations of the property resulting in lower-level patios that will be partially below grade as shown on the architectural building sections. Refer to the enclosed Grading and Erosion & Sediment Control Plan (120251-GR) for details.

4.0 GEOTECHNICAL INVESTIGATIONS

A Geotechnical Investigation Report has been prepared by Paterson Group for the proposed project. Refer to the Geotechnical Report¹ for subsurface conditions, construction recommendations and geotechnical inspection requirements.

5.0 EROSION AND SEDIMENT CONTROL

To mitigate erosion and to prevent sediment from entering the municipal sewer system, temporary erosion and sediment control measures will be implemented on-site during construction in accordance with the Best Management Practices for Erosion and Sediment Control. This includes the following temporary measures:

- Filter bags and/or Filter socks will be placed under the grates or at the curb inlet openings of nearby catchbasin structures 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 construction entrance.
- 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 temporary erosion and sediment control measures will be implemented 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.

6.0 CONCLUSION

This report has been prepared in support of Zoning By-Law Amendment and Site Plan Control applications for the proposed residential development located at 15 Larch Street.

The conclusions are as follows:

- The proposed 3-storey residential building will be serviced by extending new laterals to the municipal combined sewer in Larch Street.
- The existing 150mm dia. watermain in Larch Street will be extended with a new 200mm dia. municipal watermain to service the proposed development.
- The building will include fire separations and will be located within range of three existing municipal fire hydrants for fire-fighting purposes.
- The site flows from sub-catchment areas A-1 & A-2 will be uncontrolled to the adjacent municipal right-of-way. The flows from sub-catchment areas A-3 and R-1 will be controlled on-site prior to being discharged into the municipal combined sewer system in Larch Street.
- The total post-development flow for the portion of the site being developed will be controlled to a maximum release rate of 4.7 L/s during the 5-year and 7.2 L/s during the 100-year storm events, both of which are less than the allowable release rate of 7.3 L/s specified by the city. Furthermore, the total site runoff to the combined sewer represents a significant reduction when compared to the pre-development storm flows of 26.4 L/s.
- Regular inspection and maintenance of the building services, roof drains as well as the external SWM storage system and ICD is recommended to ensure that the storm drainage system is clean and operational.
- Temporary erosion and sediment control measures are to be provided during construction.

It is recommended that the proposed site servicing and stormwater management design be approved for implementation.

NOVATECH

Prepared by:



Chris Visser
Project Coordinator

Reviewed by:



Miroslav Savic, P. Eng.
Senior Project Manager

APPENDIX A
Correspondence

Steve Matthews

From: Jeffrey Kelly
Sent: Wednesday, June 9, 2021 1:56 PM
To: Lee Sheets; Ryan James; Jennifer Luong
Cc: Murray Chown
Subject: FW: 15 Larch Street (Novatech Project # 120251) - Pre-con follow-up email
Attachments: Larch, 15_Design Brief.pdf; 15 Larch Infrastructure Pre-Con notes.docx; Pre-con Meeting Minute 15 Larch.pdf; 15 Larch St Plans and Studies List April 2021.pdf

Good Afternoon,

Please find the staff comments and meeting minutes from our pre-consultation meeting for 15 Larch Street.

Apologies for the delay in getting this information out to you for review.

We have tentatively scheduled a follow up meeting with the client for next week and will keep you informed once a date and time are confirmed.

Thank you,

Jeff

Jeffrey Kelly, MCIP, RPP, Project Planner

NOVATECH Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 | Fax: 613.254.5867

The information contained in this email message is confidential and is for exclusive use of the addressee.

From: Baldwin, Kimberley <Kimberley.Baldwin@ottawa.ca>
Sent: Tuesday, June 1, 2021 3:26 PM
To: Murray Chown <m.Chown@novatech-eng.com>; Jeffrey Kelly <j.kelly@novatech-eng.com>
Cc: Moise, Christopher <christopher.moise@ottawa.ca>; Wessel, Shawn <shawn.wessel@ottawa.ca>; Dubyk, Wally <Wally.Dubyk@ottawa.ca>; Barry Hobin <bjhobin@hobinarc.com>; Hugo Latreille <hlatreille@hobinarc.com>; Roberto Campagna <roberto@rocahomes.ca>
Subject: 15 Larch Street - Pre-con follow-up email

Good afternoon Murray and Jeff,

Please refer to the below and attached notes regarding the Pre-Application Consultation (pre-con) Meeting held on April 20, 2021 for the property at 15 Larch Street. Apologies for the delay in sending this out.

Proposal: To demolish 2-storey dwelling as well as a metal shop and construct a 27-unit, low-rise apartment building. Three visitor parking spaces are proposed on the privately-owned lands at the end of Larch Street. The proposal requires applications for Site Plan Control (Complex) and Zoning By-law Amendment (Minor).

Below and attached are staff's preliminary comments based on the information available at the time of pre-con meeting:

Development Review Application Required (File Lead- Kimberley Baldwin)

- [Site Plan Control](#) – Complex (Manager Approval, Public Consultation)

- [Zoning By-law Amendment](#) (Minor)
 - Note: to amend performance standards – to permit 27-units (max 12 units), front yard and rear yard setbacks and relief for the proposed location of the rear yard accessory structure
- Note: Prior to application submission, confirm submission process and if hard copies are required. Procedures are subject to change due to current pandemic procedures.
- Attached is the required Plans & Study List for application submission. This is based on a concurrent submission of the applications.

Planning - Kimberley Baldwin

- [Official Plan](#) – Mixed-Use Centre Designation – Policies in Section 3.6.2
 - Other policies apply, such as 2.5.1 and 4.11. Reference relevant policies within Planning Rationale
 - Note: Consult the [New Official Plan](#) currently under review. Policy framework may be subject to change prior to application submission. Depending on timing, any application submitted prior to the New OP coming into effect shall have regard to the policy direction.
- [Corso-Italia Secondary Plan](#) ** NEW Council-Approved
 - Mixed-use neighbourhood designation (refer to Preston Side Streets policies)
- [Zoning](#): Residential Fourth Density Zone, Subzone UB [R4UB]
 - Area Z for parking
- Review the [waste management guidelines](#) for residential use collection.
- See further comments in the attached minutes.

Urban Design - Christopher Moise

- A Design Brief is a required submittal for all Site Plan/Re-zoning applications. Please see the attached Design Brief Terms of Reference provided.
- Review by the Urban Design Review Panel is not required
- Additional comments in attached minutes.

Engineering - Shawn Wessel

- See comments in the attached minutes, and the attached 'Infrastructure Notes' document.
- MECP ECA required – combined sewer
- Noise Study required – due to proximity to Preston and 417
- Feel free to contact Shawn Wessel at shawn.wessel@ottawa.ca for additional comments

Transportation - Wally Dubyk

- Wally Dubyk confirmed that a full TIA report will not be required. Please submit the TDM checklist for this proposed development
- Transportation staff are reviewing the proposed parking spaces at the end of Larch Street. We will provide comments once a review has been completed.
- Additional comments in attached minutes

Forestry – Mark Richardson

- Review the new [Tree Protection By-law](#)
- See detailed comments in the attached minutes.

Dalhousie Community Association

Eric Darwin

- Concern with the stub end of the street and impact on cycling mobility
- Why is there a fence between the properties?
- Treatment along the west side of the building and entrances to
- Is handicap parking required?
- Would like to see trees planted in the front yard
- Stairwell in the centre of the building is intriguing and would likely encourage stairwell use.

- Would much rather see triplexes rather than a larger block of building. Proposal is not in accordance with the 25 foot lots common in the area

David Seaborn

- To the east of the strip of land, there's land owned by 22 Larch Street
- Mass of building appears too big
- Proposal does not meet 4.1.3 of secondary plan
- Fourplexes would be a better fit for the rhythm of the neighbourhood
- All the other buildings are setback further
- Are balconies permitted at the back?
- Glad to see the 2 bedroom units and would also like to see family sized units

Other

- You are encouraged to contact the Ward Councilor, Catherine McKenney and to continue communication with the Dalhousie Community Association, and to speak with neighbours, about the proposal.

Please refer to the links to "[Guide to preparing studies and plans](#)" and [fees](#) for further information. Additional information is available related to [building permits](#), [development charges](#), and the [Accessibility Design Standards](#). Be aware that other fees and permits may be required, outside of the development review process. You may obtain background drawings by contacting informationcentre@ottawa.ca.

These pre-con comments are valid for one year. If you submit a development application(s) after this time, you may be required to meet for another pre-consultation meeting and/or the submission requirements may change. You are encouraged to contact us for a follow-up meeting if the plan/concept will be further refined.

Please do not hesitate to contact me if you have any questions.

Regards,

Kimberley Baldwin, MCIP, RPP

Planner II | Urbaniste II

Development Review, Central Services | Examen des projets d'aménagement, Services centrale

Planning, Infrastructure and Economic Development Department | Services de planification, d'infrastructure et de développement économique

City of Ottawa | Ville d'Ottawa

110 Laurier Avenue West. Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1

613.580.2424 ext./poste 23032

Due to the current COVID-19 pandemic I am working remotely. Please contact me through email for day to day matters.

This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

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APPLICANT'S STUDY AND PLAN IDENTIFICATION LIST

Legend: **S** indicates that the study or plan is required with application submission.
A indicates that the study or plan may be required to satisfy a condition of approval/draft approval.

For information and guidance on preparing required studies and plans refer to:

<http://ottawa.ca/en/development-application-review-process-0/guide-preparing-studies-and-plans>

S/A	Number of copies	ENGINEERING		S/A	Number of copies
S	10	1. Site Servicing Plan	2. Site Servicing Report	S	5
S	10	3. Grading and Drainage Area Plan	4. Geotechnical Study / Slope Stability Study	S	5
	2	5. Composite Utility Plan	6. Groundwater Impact Study		6
	5	7. Servicing Options Report	8. Wellhead Protection Study		
	15	9. Transportation Impact Study	10. Erosion and Sediment Control Plan	S	10
S	5	11. Storm water Management Report	12. Hydro geological and Terrain Analysis		8
	3	13. Hydraulic Water main Analysis	14. Noise / Vibration Study	S	8
	35/50/55	15. Roadway Modification Design Plan	16. Confederation Line Proximity Study		9

S/A	Number of copies	PLANNING / DESIGN / SURVEY		S/A	Number of copies
	10	17. Draft Plan of Subdivision	18. Plan Showing Layout of Parking Garage		2
	30	19. Draft Plan of Condominium	20. Planning Rationale	S	8
S	35/55	21. Site Plan	22. Minimum Distance Separation (MDS) Include in Planning Rationale – if required		8
	10	23. Concept Plan Showing Proposed Land Uses and Landscaping	24. Agrology and Soil Capability Study		5
	3	25. Concept Plan Showing Ultimate Use of Land	26. Cultural Heritage Impact Statement		3
S	20	27. Landscape Plan	28. Archaeological Resource Assessment Please see accompanying notes – Phase 1 checklist is required		8
S	2	29. Survey Plan	30. Shadow Analysis		3
S	3	31. Architectural Building Elevation Drawings (dimensioned)	32. Design Brief (includes the Design Review Panel Submission Requirements)	S	8

S/A	Number of copies	ENVIRONMENTAL		S/A	Number of copies
S	5	33. Phase 1 Environmental Site Assessment	34. Impact Assessment of Adjacent Waste Disposal/Former Landfill Site		6
S	5	35. Phase 2 Environmental Site Assessment (depends on the outcome of Phase 1)	36. Assessment of Landform Features		7
	4	37. Record of Site Condition	38. Mineral Resource Impact Assessment		4
S	20	39. Tree Conservation Report	40. Environmental Impact Statement / Impact Assessment of Endangered Species		8
	4	41. Mine Hazard Study / Abandoned Pit or Quarry Study	42. Integrated Environmental Review (Draft, as part of Planning Rationale)		8

S/A	Number of copies	ADDITIONAL REQUIREMENTS		S/A	Number of copies
A		Exterior Site Lighting Certificate	Electronic copy of all required plans and studies	S	1
		MOE ECA			

Meeting Date: April 20, 2021

Application Type: *Site Plan Control, Complex and Zoning By-law Amendment, Minor*

File Lead (Assigned Planner): Kimberley Baldwin

Infrastructure Approvals Project Manager: Shawn Wessel

Site Address (Municipal Address): 15 Larch Street

*Preliminary Assessment: 1 2 3 4 5

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

It is important to note that the need for additional studies and plans may result during application review. If following the submission of your application, it is determined that material that is not identified in this checklist is required to achieve complete application status, in accordance with the Planning Act and Official Plan requirements, the Planning, Infrastructure and Economic Development Department will notify you of outstanding material required within the required 30 day period. Mandatory pre-application consultation will not shorten the City's standard processing timelines, or guarantee that an application will be approved. It is intended to help educate and inform the applicant about submission requirements as well as municipal processes, policies, and key issues in advance of submitting a formal

Description:

A Design Brief is the core submission document that illustrates how the development is designed to work with its existing and planned context, to improve its surroundings and also demonstrate how the proposal supports the overall goals of the Official Plan, relevant secondary plans, Council approved plans and design guidelines. The purpose of the Terms of Reference is to assist the applicant to organize and substantiate the design justification in support of the proposed development and to assist staff and the public in the review of the proposal.

Authority to Request a Design Brief:

The *Planning Act* gives municipalities the authority to require that a Design Brief be prepared. Under Sections 22(4), (5) and Section 41(4) of the *Planning Act*, a Council has the authority to request such other information or material that the authority needs in order to evaluate and make a decision on an application. Section 5.2.6 of the Official Plan sets out the general requirement for a Design Brief.

Preparation:

The Design Brief should be signed by an urban designer, licenced architect, landscape architect, or a full member of the Canadian Institute of Planners.

When Required:

A Design Brief is required for the following planning application:

- Site Plan Control

A Scoped Design Brief* is required when the following planning applications are applied for and not accompanied by a Site Plan Control application:

- Official Plan Amendment
- Zoning Bylaw Amendment (exception: a change in use which does not result in an increase in height or massing)

The requirement and scope of a Design Brief will be determined at the formal pre-application consultation meeting. Should an application be required to go to the [Urban Design Review Panel \(UDRP\)](#), the Design Brief may be submitted as part of the submission materials to the panel.

Contents for Design Brief Submissions:

A Design Brief will contain and/or address the points identified during the pre-consultation meeting. Failure to address the critical elements identified in the pre-consultation meeting may result in the application being considered incomplete.

* A *Scoped Design Brief* is composed of:

- Section 1 should be combined into the *Planning Rationale* submission, and
- Section 2 items will be confirmed in the *pre-application consultation meeting*.

SECTION 1

The Application Submission:

Not Required

Required

State the: type of application, legal description, municipal address, purpose of the application and provide an overall vision statement and goals for the proposal.

Response to City Documents:

Not Required

Required

State the Official Plan land use designation for the subject property and demonstrate how the proposal conforms to the Official Plan as it relates to the design of the subject site. Reference specific policy numbers from the Official Plan to show consistency. Justify areas of non-compliance and explain why there is non-compliance.

State the applicable plans which apply to the subject proposal: community design plan, secondary plan, concept plan and design guideline. Reference the relevant design related policies within the applicable Plans/Guidelines and provide a comprehensive analysis as to how the proposed development incorporates the objectives or why it does not incorporate the objectives.

Context Plan:

Not Required

Required

Provide a contextual analysis that discusses/illustrates abutting properties, key destinations and linkages within a 100 m radius (a larger radius may be requested for larger/more complex projects), such as transit stations; transportation networks for cars, cyclists, and pedestrians; focal points/nodes; gateways; parks/open spaces; topography; views towards the site; the urban pattern (streets, blocks); future and current proposals (if applicable), public art, heritage resources, etc.

Photographs to illustrate existing site conditions and surrounding contexts. Include a map pinpointing (with numbers) where each photo is taken and correspond these numbers with the site photos. Arrows illustrating the direction the photo is taken is also useful.

SECTION 2

The Design Proposal:

The purpose of the Design Proposal is to show the building elevations, exterior details, transitions in form, treatment of the public realm and compatibility with adjacent buildings, using 3-D models, illustrations, diagrams, plans, and cross sections. Referencing Official Plan, Section 5.2.1; as determined at time of pre-application consultation meeting, submissions will need to address the following in the form of labelled graphics and written explanation:

Massing and Scale

Not Required Required

- | | | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <i>Images which show:</i> |
| <input type="checkbox"/> | <input type="checkbox"/> | <u>Building massing</u> – from: <ul style="list-style-type: none"> • at least two sides set within it current context (showing the entire height and width of the building) OR • all four sides set within it current context (showing the entire height and width of the building). |
| <input type="checkbox"/> | <input type="checkbox"/> | <u>Views</u> – of the entire block, from: <ul style="list-style-type: none"> • at least two perspectives to show how the proposed building is set within its current context OR • all four perspectives to show how the proposed building is set within its current context. |
| <input type="checkbox"/> | <input type="checkbox"/> | <u>Building transition</u> – to adjacent uses, with labelled explanation of the transition measures used. |
| <input type="checkbox"/> | <input type="checkbox"/> | <u>Grading</u> – if grades are an issue. |
| <input type="checkbox"/> | <input type="checkbox"/> | <u>Alternative building massing</u> – additional imagery and site layouts considered and provide justification for the ultimate proposal sought. |

Public Realm

Not Required Required

- | | | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <i>Labelled graphics and a written explanation which show:</i> |
| <input type="checkbox"/> | <input type="checkbox"/> | <u>Streetscape</u> – cross sections which illustrate the street design and right of way (referencing the City's design manuals). |
| <input type="checkbox"/> | <input type="checkbox"/> | <u>Relationship to the public realm</u> – illustrating how the first few storeys of the proposed development responds to and relates to the existing context (e.g. through a podium plan and first floor plan). This is to include detailed explanation on: <ul style="list-style-type: none"> • Architectural responses • Landscaping details • Public art features (in accordance with Official Plan, Section 4.11) • For developments in Design Priority Areas, detail the building and site features, (in accordance with Official Plan, Section 4.11) which will enhance the public realm. Provide explanation for features which are not provided. |

Building Design

Not Required

Required

Labelled graphics (e.g. building elevations and floor plans) and a written explanation which document the proposed exterior architectural details and design in accordance with Official Plan, Section 5.2.1).

For high-rise development applications, detail the building design and massing and scale elements and how they relate to the proposed high-rise development (in accordance with Official Plan, Section 5.2.1).

Sustainability

Not Required

Required

Any sustainable design features to be incorporated, such as green roofs or walls, sun traps, reflective or permeable surfaces.

Heritage

Not Required

Required

How the building relates to the historic details, materials, site and setting of any existing historic resources on or adjacent to the subject property (if applicable).

Additional Contents:

Some proponents may be requested to provide submission material which complements the Design Brief. These additional requirements could be incorporated into the Design Brief submission for ease of review. These will be identified at the time of pre-consultation meeting:

- Site Plan
- Landscape Plan
- Plan showing existing and proposed servicing
- Shadow Analysis
- Wind Analysis

Submission Requirements

- Six hard copies and one digital copy

Pre-Application Consultation Meeting Notes

Property Address: 15 Larch Street

File No: PC2021-0127

Date: April 20, 2021, Via Microsoft Teams

Attendees:

City of Ottawa: Kimberley Baldwin (File Lead – Planner), Christopher Moise (Urban Design), Shawn Wessel (Project Manager – Infrastructure), Wally Dubyk (Transportation)

Applicant Team: Murray Chown (Novatech - Planner), Jeffrey Kelly (Novatech – Planner), Barry Hobin (Architect – Hobin Architecture), Hugo Latreille (Hobin Architecture), Roberto Campagna (Roca Homes – Owner Representative)

Dalhousie Community Association: Eric Darwin and David Seaborn

Meeting notes:

Opening & attendee introduction

- Introduction of meeting attendees
- **Overview of proposal:**
 - To demolish 2-storey dwelling as well as a metal shop and construct a 27-unit, low-rise apartment building
 - 45% of units will be two-bedroom units, as required by the zoning bylaw
 - Building façade to be broken up into three sections to create visual interest and mimic the rhythm of built forms along the street.
 - No on-site parking. 3 visitor parking spaces proposed in the ROW. Right-of-way at the end of Larch Street is in private ownership
 - Garbage and bike storage handled in a small one storey accessory building at the back of the site abutting a rear laneway.
 - The front and rear of the proposal will be landscaped with soft landscaping.
 - Zoning amendments required:
 - To permit 27 residential units, whereas the bylaw a maximum of 12 units.
 - Relief also requested for the proposed front yard and rear yard setbacks
 - Proposed rear yard accessory structure also requires relief

Preliminary comments and questions from staff and agencies, including follow-up actions:

- **Planning** (Kimberley Baldwin)
 - Corso-Italia Secondary Plan **NEW Council-approved
 - Mixed-use neighbourhood designation (refer to Preston Side Streets policies)
 - Max 4 storeys on north side of Larch St.
 - Plan calls for tree planting along Larch Street.
 - Concern with the visitor parking proposed at the end of Larch Street as it does not align with the priority on pedestrian and cycling connectivity in the Plan

- The City may consider acquisition of that portion of privately-owned properties that currently encumber the western passage of existing, east-west lanes to the new lanes presented in the Plan (with the intention to support pedestrian and cycling as the primary mode of travel to and from this neighbourhood. (Policy 4.1.3.6)
 - Larch Street shall remain a dead-end to motor vehicles (Policy 5.2.28)
 - Surface parking lots abutting public street are prohibited (Policy 5.5.11)
 - vision for an active transportation links to the O-train station to run north-south along the western side of this property.
 - Zoning Bylaw
 - Residential Fourth Density Zone, Subzone UB [R4UB]
 - Several new zoning regulations about front façade articulation, landscaping in front and rear yards, and waste management. Please review and confirm compliance in your planning rationale
 - Area Z for parking
 - no resident parking required (proximity to major transit)
 - visitor parking – no parking required for the first 12 units, then visitor parking required at a rate of 0.1 spaces per unit.
 - Mature Neighbourhood Overlay (Streetscape Character Analysis Required)
 - General planning comments
 - For a building of this scale, consider internalizing the waste management and bicycle storage.
 - Recommend providing more bicycle parking at this cycling-friendly location (one per unit), ideally in a secure location within the building.
 - How does the proposed rear yard relate to the neighbouring properties?
 - Cash-in-lieu of parkland will be required for the net increase in units
 - Please advise if you wish to discuss the possible land acquisition of land at the end of Larch and I will coordinate a meeting with the City’s Real Estate division
- **Urban Design** (Christopher Moise)
 - This proposal runs along one of the City's Design Priority Areas, however, this proposal does not meet the threshold for attendance to the UDRP;
 - We would like to see an illustration of the front yard setback relative to the other properties along the street if front yard averaging is proposed;
 - We would like to see the details of the required rear yard setback to understand the proposed relief;
 - We wonder if the material treatment of the building might be better mirrored on the site;
 - We would like to see the opportunities for tree planting in the front and rear yards;
 - We recommend garbage access to the rear yard be confirmed not to be 2.2m wide;

- We recommend that additional protected bike storage be provided. The rear yard may already be reduced for green space and amenity so we recommend this storage be internalized in the building.
 - A Design Brief is a required submittal for all Site Plan/Re-zoning applications. Please see the scoped Design Brief Terms of Reference provided.
- **Engineering** (Shawn Wessel)
 - Detailed comments will be attached as a separate document in the pre-con follow-up email, including plan and study requirements.
 - A 50 mm dia. CO (Copper) Water service (c. 2008) is available on Larch, connected to a 150 mm dia. PVC WM at East end of street.
 - A 450 mm dia. Conc. Combined Sewer (c. 2008) is available, which drains to Preston Street and onto to Spruce Street conveying effluent to the Interceptor Sewer.
 - MECP ECA will be required
 - Noise study required due to proximity to Preston and HWY 417
- **Transportation** (Wally Dubyk)
 - Proposed Visitor Parking Spaces
 - There is an existing gate at the end of Larch Street. The posted sign reads “Private Property No Parking, Unauthorized Vehicles Will Be Ticketed And Towed At Owner Risk And Expense”. Also, there is a narrow strip of Property Parcel PIN: 041070067 identified as 22 Larch Street in front of the proposed visitor parking area.
 - We have circulated the proposed plan internally to various transportation staff for preliminary comment on the proposed parking spaces from a traffic-safety perspective. We will share their response(s) once received.
 - A Screening Form is to be submitted to determine if a transportation study is required. Consultants should fill in the form in Appendix ‘B’. Click on the website: www.ottawa.ca/TIA. Submission of TDM checklists is encouraged even if a TIA study report is not considered to be required. Please keep in mind that on street parking is not a viable option for tenants. Ensure that potential tenants are aware that there is no provision for parking.
 - Permanent structures such as curbing, stairs, retaining walls and bicycle parking racks are not to extend into the City’s right-of-way limits.
 - The closure of an existing private approach shall reinstate the sidewalk, shoulder, curb and boulevard to City standards.
 - 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.
- **City Surveyor**
 - 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.
 - 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

Forestry (Mark Richardson)

TCR requirements:

- Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City
 - an approved TCR is a requirement of Site Plan approval.
- As of January 1 2021, any removal of privately or publicly (City) owned trees 10cm or larger in 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.
- The Planning Forester from Planning and Growth Management as well as foresters from Forestry Services will review the submitted TCR
 - If tree removal is required, both municipal and privately-owned trees will be addressed in a single permit issued through the Planning Forester
 - Compensation may be required for city owned trees – if so, it will need to be paid prior to the release of the tree permit
- the TCR must list all trees on site by species, diameter and health condition
- the TCR must list all trees on adjacent sites if they have a critical root zone that extends onto the development site
- If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained
- 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
 - securities may be required for retained trees
 - the location of tree protection fencing must be shown on a plan
 - show the critical root zone of the retained trees
 - if excavation will occur within the critical root zone, please show the limits of excavation
- 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.
- For more information on the process or help with tree retention options, contact Mark Richardson mark.richardson@ottawa.ca or on [City of Ottawa](#)

LP tree planting requirements:

For additional information on the following please contact Tracy.Smith@Ottawa.ca

Minimum Setbacks

- Maintain 1.5m from sidewalk or MUP/cycle track.
- Maintain 2.5m from curb
- Coniferous species require a minimum 4.5m setback from curb, sidewalk or MUP/cycle track/pathway.
- Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing.

- Adhere to Ottawa Hydro’s planting guidelines (species and setbacks) when planting around overhead primary conductors.

Tree specifications

- Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
- Maximize the use of large deciduous species wherever possible to maximize future canopy coverage
- 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).
- Plant native trees whenever possible
- No root barriers, dead-man anchor systems, or planters are permitted.
- No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

Hard surface planting

- Curb style planter is highly recommended
- No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
- Trees are to be planted at grade

Soil Volume

- Please ensure adequate soil volumes are 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

Please note that these soil volumes are not applicable in cases with Sensitive Marine Clay.

Sensitive Marine Clay

- Please follow the City’s 2017 Tree Planting in Sensitive Marine Clay guidelines

Dalhousie Community Association Comments

Eric Darwin

- Concern with the stub end of the street and impact on cycling mobility
- Why is there a fence between the properties?
- Treatment along the west side of the building and entrances to

- Is handicap parking required?
- Would like to see trees planted in the front yard
- Stairwell in the centre of the building is intriguing and would likely encourage stairwell use.
- Would much rather see triplexes rather than a larger block of building. Proposal is not in accordance with the 25 foot lots common in the area

David Seaborn

- To the east of the strip of land, there's land owned by 22 Larch Street
- Mass of building appears too big
- Proposal does not meet 4.1.3 of secondary plan
- Fourplexes would be a better fit for the rhythm of the neighbourhood
- All the other buildings are setback further
- Are balconies permitted at the back?
- Glad to see the 2 bedroom units and would also like to see family sized units

Next steps

- City Staff encourage the applicant to discuss the proposal with Councillor, community groups and neighbours
- City staff to send follow-up email confirming submission requirements

Application Submission Information

Development Application(s) Required:

Site Plan Control, Complex, Managed Approval with Public Consultation Application

Minor Zoning By-law Amendment Application

For information on Site Plan Control Thresholds under the Site Plan Control By-law, please visit: https://documents.ottawa.ca/sites/documents/files/siteplan_thresholds_en.pdf

For information on Applications, including fees, please visit: <https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/fees-and-funding-programs/development-application-fees>

The application processing timeline generally depends on the quality of the submission. For more information on standard processing timelines, please visit: <https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/development-application-forms#site-plan-control>

[Prior to submitting a formal application, it is recommended that you pre-consult with the Ward Councillor.](#)

Application Submission Requirements

For information on the preparation of Studies and Plans and the City's Planning and Engineering requirements, please visit: <https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans>

Please provide electronic copy (PDF) of all plans and studies required.

Note that many of the plans and studies collected with this application must be signed, sealed and dated by a qualified engineer, architect, surveyor, planner or designated specialist.

Pre-Consul Meeting Notes to the File Lead - Kim Baldwin

April 20, 2021

Re: 15 Larch Street

Ward 14 - Somerset, Councillor Catherine McKenney

4 Storey Residential Apt. Building with 27 units – No parking proposed

Infrastructure:

A 50 mm dia. CO (Copper) Water service (c. 2008) is available on Larch, connected to a 150 mm dia. PVC WM at East end of street.

A 450 mm dia. Conc. Combined Sewer (c. 2008) is available, which drains to Preston Street and onto to Spruce Street conveying effluent to the Interceptor Sewer.

The following apply to this site and any development within a combined sewer area:

- Total allowable release rate will be 2-year pre-development rate.
- Coefficient (C) of runoff will need to be determined **as per existing conditions** but in no case more than 0.4
- TC can be calculated and should be not be less than 10 minutes, since IDF curves become unrealistic at less than 10 min.
- Any storm events greater than 2 year, up to 100 year, and including 100-year storm event must be detained on site.
- Two separate sewer laterals (one for sanitary and other for storm) will be required.

1. An MECP ECA will be required.

Please have applicant provide one copy of the following for our review:

MECP ECA Application Form - TOR or Direct Submission tied to SPC

~~Fees – Certified Cheque made out to “City of Ottawa” for TOR – or for DS “Ministry of Finance”~~

Proof of Applicant’s Identification (if no Certificate of Incorporation)

Certificate of Incorporation (if Applicable)

NAICS Code (If Applicable)

Plan & Profile

Grading and Servicing Plans

Survey Plan

Pipe Data Form

Draft ECA (City of Ottawa Expanded Works Form)

Source Protection Policy Screening & Significant Threat Report

Sewer Drainage Area Plan

SWM Report

Services Report

Geotechnical Report & any other supportive documentation

Correspondence: City of Ottawa including ROW, Water Resources Dept., ISD etc., MNR, Conservation Authority & MECP.

Please note that once the review has been completed and the Sr. Engineer is satisfied and ready to sign off on the application, after the PM recommendations ~~3 final bound copies including 3 CD Rom disks will be required to accompany the applications with MECP and for City of Ottawa records.~~

Please note a change in process, as per MECP, whereas payment will be arranged between Applicant and MECP for DS applications.

As previously done, applicant to supply all information for our review.

Submission to MECP will be in form of WeTransfer file, created by applicant and emailed to City - including all listed above as well as City provided Sr. Eng. sign-off document and Source Protection Screening. We will be happy to clarify any confusion generated from these instructions.

CD/USB drives with digital files will not be required at this time.

Applicant may request TOR application as the MECP has recently updated their procedures. PM will investigate internally and with MECP to see if this application qualifies.

Footer of ECA Application should have reference #: 8551E (2019/05)

Please also note:

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

Roof drains are to be connected downstream of any incorporated ICD within the SWM system. Provide Roof plan showing roof drain and scupper locations, flow rates, drain type and weir opening if controlled. Provide Manufacturer Specifications on drains and also provide 5- and 100-year ponding limits on plan.

Boundary Conditions will be provided at request of consultant after providing Average Daily Demands, Peak Hour Demands & Max Day + Fire Flow Demands

Existing buildings require a CCTV inspection and report to ensure existing services to be re-used are in good working order and meet current minimum size requirements. Located services to be placed on site servicing plans.



CCTV Scan
Guideline.pdf

If window wells are proposed, they are to be indirectly connected to the footing drains. A detail of window well with indirect connection is required, as is a note at window well location speaking to indirect connection.

Proposed Sunken Patios:

Due to combined sewer area and possibility of surcharge of waste effluent, City DR will be looking for applicant to demonstrate that the lower dwelling units are protected from flooding and sewage back-up and/or blockage of foundation drain connections. The City recognizes that sunken patios are prone to flooding.

In addition, please see Sewer Design Guideline Tech Bulletins and specifically 2016-01, 2018-04 and 2019-2 in regard to HGL and stress test 100-year + 20%. Protection of lowest openings and drainage of sunken patios, as well as protection from sewer and/or foundation drain surcharge, is critical.

Patio drains are to be indirectly connected to foundation drain. We recommend pumping foundation drain for additional protection. Alternatively, patio drains may be connected to a trench drain (soakaway pit), where trench drain can be located a min. 4 m distance from the foundation wall. See MECP SWM Planning and Design Manual (2003) – Soakaway Pits

Other:

Environmental Noise Study is required due to within 100m proximity of Preston Street and within 500 m of Hwy #417.

Stationary Noise Study – consultant to speak to this in their report as per City NCG and NPC 300 Guidelines. May be required after Mechanical Design completed and prior to building permit issuance.

Water Supply Redundancy – Fire Flow:

Applicant to ensure that a second service with an inline valve chamber be provided where the average daily demand exceeds 50 m³ / day (0.5787 l/s per day)
FUS Fire Flow Criteria to be used unless a low-rise building, where OBC requirements may be applicable.



W12.pdf

Trees:

Please note that a new Tree By-law is now in effect. Please also note that we are currently in a no tree removal window until August 16, 2021.



General Bulletin_New
Tree Protection Bylaw

A gas pressure regulating station may be required depending on HVAC needs (typically for 12+ units). Be sure to include this on the Grading, Site Servicing, SWM and Landscape plans. This is to ensure that there are no barriers for overland flow routes (SWM) or conflicts with any proposed grading or landscape features with installed structures and has nothing to do with supply and demand of any product.



Gas Pressure
Regulating Station.pdf

Regarding Quantity Estimates:

Please note that external Garbage and/or bicycle storage structures are to be added to QE under Landscaping as it is subject to securities.

In addition, sump pumps for Sanitary and Storm laterals and/or cisterns are to be added to QE under Hard items as it is subject to securities, even though it is internal and is spoken to under SWM and Site Servicing Report and Plan.

Source Protection Policy Screening (SPPS):

SPPS will be provided to applicant by City Risk Mgmt. Officer within Asset Mgmt. Dept.
PM – Send Request to Tessa Di Iorio tessa.diiorio@ottawa.ca

Applicant to contact Rideau Valley Conservation Authority (RVCA) for possible restrictions due to quality control. Provide correspondence in Report.

Where servicing involves three or more service trenches, either a full road width or full lane width 40 mm asphalt overlay will be required, as per amended Road Activity By-Law 2003-445

and City Standard Detail Drawing R10. The amount of overlay will depend on condition of roadway and width of roadway(s).

Excavation of bedrock:

Pre-Construction (Piling/Hoe Ramming or close proximity to City Assets) and/or Pre-Blasting (if applicable) Survey required for any buildings/dwellings in proximity of 75m of site and circulation of notice of vibration/noise to residents within 150 m of site. Conditions for Pre-Construction/ Pre-Blast Survey & Use of Explosives will be applied to agreements. Refer to City's Standard S.P. No. F-1201 entitled *Use of Explosives*, as amended.

Where underground storage (UG) and surface ponding are being considered:

Show all ponding for 5- and 100-year events

Above and below ground storage is permitted although uses $\frac{1}{2}$ Peak Flow Rate or is modeled. Please confirm that this has been accounted for and/or revise.

Rationale:

The Modified Rational Method for storage computation in the Sewer Design Guidelines was originally intended to be used for above ground storage (i.e. parking lot) where the change in head over the orifice varied from 1.5 m to 1.2 m (assuming a 1.2 m deep CB and a max ponding depth of 0.3 m). This change in head was small and hence the release rate fluctuated little, therefore there was no need to use an average release rate.

When underground storage is used, the release rate fluctuates from a maximum peak flow based on maximum head down to a release rate of zero. This difference is large and has a significant impact on storage requirements. We therefore require that an average release rate be used to estimate the required volume. Alternatively, the consultant may choose to use a submersible pump in the design to ensure a constant release rate.

In the event that there is a disagreement from the designer regarding the required storage, The City will require that the designer demonstrate their rationale utilizing dynamic modelling, that will then be reviewed by City modellers in the Water Resources Group.

Note that the above will be added to upcoming revised Sewer Design Guidelines to account for underground storage, which is now widely used.

Further to above, what will be the actual underground storage provided during the major (100 year) and minor (2 year) storm events?

Please provide information on UG storage pipe. Provide required cover over pipe and details, chart of storage values, capacity etc. How will this pipe be cleaned of sediment and debris?

Note - There must be at least 15cm of vertical clearance between the spill elevation and the ground elevation at the building envelope that is in proximity of the flow route or ponding area. The exception in this case would be at reverse sloped loading dock locations. At these locations, a minimum of 15cm of vertical clearance must be provided below loading dock openings. Ensure to provide discussion in report and ensure grading plan matches if applicable.

Provide information on type of underground storage system including product name and model, number of chambers, chamber configuration, confirm invert of chamber system, top of chamber system, required cover over system and details, interior bottom slope (for self-cleansing), chart of storage values, length, width and height, capacity, entry ports (maintenance) etc.

Provide a cross section of underground chamber system showing invert and obvert/top, major and minor HWLs, top of ground, system volume provided during major and minor events. UG storage to provide actual 2- and 100-year event storage requirements.

In regard to all proposed UG storage, ground water levels (and in particular HGW levels) will need to be reviewed to ensure that the proposed system does not become surcharged and thereby ineffective.

Modeling can be provided to ensure capacity for both storm and sanitary sewers for the proposed development by City's Water Distribution Dept. – Modeling Group, through PM and upon request.

For proposed depressed driveways or developments with private lanes, parking areas or with entrances etc. lower than roadway...



S18.pdf



S18.1.pdf

Rear yard on grade parking to be permeable pavement. Refer to City Standard Detail Drawings SC26 (maintenance/temp parking areas), SC27 or permeable asphalt materials. No gravel or stone dust parking areas permitted.

Severance:

If severance is planned, this needs to be addressed in servicing to satisfy severance requirements. Where a large parcel with multiple buildings is planned, City will require an ultimate servicing plan so as to appropriately understand how severance requirements are being met.

Note:

“Provided Info to applicant”:

Please be advised that it is the responsibility of the applicant and their representatives/consultants to verify information provided by the City of Ottawa. Please contact City View and Release Info Centre at Ext. 44455

Environmental Source Information:

Due to more sensitive use, a Record of Site Condition (RSC) is required. Ensure Phase I, and if applicable, Phase II ESA’s speak to required RSC.

City of Ottawa - Historical Land Use Inventory (HLUI) - Required

Rationale:

The HLUI database is currently undergoing an update. The updated HLUI will include additional sources beyond those included in the current database, making the inclusion of this record search even more important.

Although a municipal historic land use database is not specifically listed as required environmental record in O. Reg 153/04, Schedule D, Part II states the following:

The following are the specific objectives of a records review:

1. To obtain and review records that relate to the Phase I (One) property and to the current and past uses of and activities at or affecting the Phase I (One) property in order to determine if an area of potential environmental concern exists and to interpret any area of potential environmental concern.
2. To obtain and review records that relate to properties in the Phase I (One) study area other than the Phase I (One) property, in order to determine if an area of potential environmental concern exists and to interpret any area of potential environmental concern.

It is therefore reasonable to request that the HLUI search be included in the Phase I ESA to meet the above objectives.

Please submit.

All existing reports and plans will need to be revised if older than 2 years and must reflect current City Standards, Guidelines, By-laws and Policies.

Please refer to City of Ottawa website portal for **“Guide to preparing Studies and Plans”** at <https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans>.

New:

Specific information has been incorporated into both the [Guide to Preparing Studies and Plans](#) for a site plan. The guide outlines the requirement for a statement to be provided on the plan about where the property boundaries have been derived from.

Added to the general information for servicing and grading plans is a note that an O.L.S. should be engaged when reporting on or relating information to property boundaries or existing conditions. The importance of engaging an O.L.S. for development projects is emphasized.

Please ensure you are using the current guidelines, bylaws and standards including materials of construction, disinfection and all relevant reference to OPSS/D and AWWA guidelines - all current and as amended, such as:

[City of Ottawa Sewer Design Guidelines \(CoOSDG\)](#) complete with ISTDB 2012-01, 2014-01, 2016-01, 2018-01 & 2019-02 technical bulletin updates as well as current Sewer, Landscape & Road Standard Detail Drawings as well as Material Specifications (MS Docs).
Sewer Connection (2003-513) & Sewer Use (2003-514) By-Laws.

[City of Ottawa Water Distribution Design Guidelines \(CoOWDDG\)](#) complete with ISTDB 2010-02, 2014-02 & 2018-02 technical bulletin updates as well as current Watermain/ Services Material Specifications (MS Docs) as well as Water and Road Standard Detail Drawings.
FUS Fire Flow standards
Water (2018-167) By-Law

Ensure to include version date and add “**(as amended)**” when referencing all standards, detail drawings, by-Laws and guidelines.

Fourth (4th) Review Charge:

Please be advised that additional charges for each review, after the 3rd review, will be applicable to each file. There will be no exceptions.

Construction approach – Please contact the Right-of-Ways Permit Office TMconstruction@ottawa.ca early in the OPA/Zoning or SPC process to determine the ability to construct site and copy Kim Baldwin on this request.

Contact me by e-mail shawn.wessel@ottawa.ca if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'S. Wessel', is positioned below the word 'Sincerely,'.

Shawn Wessel, A.Sc.T., rcji
Project Manager
Development Review, Central Branch

Steve Matthews

From: Glen McDonald <glen.mcdonald@rvca.ca>
Sent: Tuesday, January 4, 2022 4:03 PM
To: Miro Savic
Cc: Murray Chown; Steve Matthews; Jamie Batchelor
Subject: RE: 15 Larch Street - RVCA Pre-Consultation

Miro,

Our records confirm that stormwater from this site is currently directed to a combined sewer in Larch Street. As such, RVCA does not have specific requirements for swm for this site. However, wherever possible, landscaping and grading should be used to promote infiltration and reduce runoff from the site.

Glen

Glen McDonald MCIP RPP
Director of Planning and Watershed Science
glen.mcdonald@rvca.ca ext. 1133



3889 Rideau Valley Drive
PO Box 599, Manotick ON K4M 1A5
T 613-692-3571 | 1-800-267-3504 F 613-692-0831 | www.rvca.ca

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From: Miro Savic <m.savic@novatech-eng.com>
Sent: Tuesday, January 4, 2022 3:29 PM
To: Glen McDonald <glen.mcdonald@rvca.ca>
Cc: Murray Chown <m.Chown@novatech-eng.com>; Steve Matthews <S.Matthews@novatech-eng.com>; Jamie Batchelor <jamie.batchelor@rvca.ca>
Subject: RE: 15 Larch Street - RVCA Pre-Consultation

Hello Glen,

Can you please review email below and provide response in Jamie's absence.

Thank you,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering

NOVATECH Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265 | Fax: 613.254.5867

The information contained in this email message is confidential and is for exclusive use of the addressee.

From: Miro Savic

Sent: Tuesday, January 4, 2022 3:18 PM

To: Jamie Batchelor <jamie.batchelor@rvca.ca>

Cc: Murray Chown <m.Chown@novatech-eng.com>; Steve Matthews <S.Matthews@novatech-eng.com>

Subject: 15 Larch Street - RVCA Pre-Consultation

Hello Jamie,

We are working on servicing and stormwater management design for a proposed development located at 15 Larch Street in the City of Ottawa. The development is a 4-storey residential building with associated landscaped areas. One visitor parking spot will be provided at the back of the property. Refer to the attached preliminary site plan for details.

The storm drainage from the site will be directed to the existing 450mm diameter combined sewer in Larch Street. The stormwater quantity control will be provided by controlling the post development flows from the site up to and including 100-year design event to a target 2-year release rate specified by the City of Ottawa.

Please confirm that the stormwater quality control is not required for the proposed development.



Regards,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering

NOVATECH Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265 | Fax: 613.254.5867

The information contained in this email message is confidential and is for exclusive use of the addressee.

Steve Matthews

From: Maha Saleh <MSaleh@patersongroup.ca>
Sent: Friday, January 28, 2022 2:24 PM
To: Steve Matthews
Cc: Domenic Idone; hlatreille@hobinarc.com; Barry Hobin; Jeffrey Kelly; Miro Savic; Murray Chown; Ryan James; David Gilbert; Mark D'Arcy
Subject: PG6071 - 15 Larch - Preliminary Geotechnical Recommendations

Hello Steve,

Apologies for the delay. We completed last minute Atterberg limits testing to provide tree planting recommendations and I was waiting for the results.

Please find below, highlighted in red, preliminary recommendations for the items you requested earlier.

- Pavement structure recommendation for asphalt access lane – **will be included in our report**
- Pavement structure recommendation for permeable paver parking spot (anything over and above the standard spec you might recommend for this specific site) – **will be included in our report**
- Approximate existing on-site groundwater table elevation - **Water was encountered at a depth of 5 to 6m below ground surface on January 17, 2022 (approximately at geodetic elevation 54.00m)**
- Anticipated groundwater flows (L/day for the building weeping tile system that will be tributary to the municipal combined sewer) **it is anticipated that volumes up to approximately 10,000 L/day will be handled by the building's weeping tile system.**
- A recommendation as to whether or not the native soils are conducive to infiltration from permeable pavement for the surface parking and/or possible rainwater garden infiltration (less than 1.5m depth) - **Based on the nature of the material encountered within the top 1.5m, during the geotechnical investigation, it is anticipated that the subsurface soil within the majority of the site are not conducive to infiltration. However, soils within the southeast corner may have a higher infiltration rate than the remainder of the site.**

The report is undergoing a final round of reviews and will be issued shortly.

Let me know if you have any other questions or comments.

Regards,

Maha Saleh, M.A.Sc, Provisional P.Eng.

Project Manager - Geotechnical Department

patersongroup
solution oriented engineering
over 60 years serving our clients

154 Colonnade Road South
Ottawa, Ontario, K2E 7J5
Tel: (613) 226-7381
Cell: (613) 219-9688

From: Steve Matthews <S.Matthews@novatech-eng.com>
Sent: January 28, 2022 10:55 AM
To: Mark D'Arcy <mdarcy@patersongroup.ca>; Maha Saleh <MSaleh@patersongroup.ca>
Cc: Domenic Idone <didone@osmco.ca>; hlatreille@hobinarc.com; Barry Hobin <bjhobin@hobinarc.com>; Jeffrey Kelly <j.kelly@novatech-eng.com>; Miro Savic <m.savic@novatech-eng.com>; Murray Chown <m.Chown@novatech-

eng.com>; Ryan James <r.james@novatech-eng.com>

Subject: RE: Larch - Follow-Up: Geotechnical Coordination for Civil Items

Hi Maha and Mark,

Please advise on an approximate timeline for when we might expect to receive the Geotechnical Investigation Report and/or the answers to the questions provided earlier this month (see email below). We are approaching our target submission date and we still require the Geotech information to complete the civil design for submission to the city.

Thanks,
Steve

Stephen Matthews, B.A.(Env), Senior Design Technologist

NOVATECH Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 223 | Fax: 613.254.5867

The information contained in this email message is confidential and is for exclusive use of the addressee.

From: Steve Matthews

Sent: Friday, January 7, 2022 11:40 AM

To: Maha Saleh <msaleh@Patersongroup.ca>; 'Mark D'Arcy' <mdarcy@patersongroup.ca>

Cc: Domenic Idone <didone@osmco.ca>; hlatreille@hobinarc.com; Barry Hobin <bjhobin@hobinarc.com>; Jeffrey Kelly <j.kelly@novatech-eng.com>; Miro Savic <m.savic@novatech-eng.com>; Murray Chown <m.Chown@novatech-eng.com>

Subject: RE: Larch - Coordination Meeting Follow-Up: Geotechnical Coordination for Civil Items

Hi Maha and Mark,

It was nice to meet you and thank you for the guidance provided in the Larch Street coordination meeting this morning.

Here are the geotechnical items we would like to have in order to advance the civil and landscape designs at this stage of the project:

- Pavement structure recommendation for asphalt access lane – **will be included in our report**
- Pavement structure recommendation for permeable paver parking spot (anything over and above the standard spec you might recommend for this specific site) – **will be included in our report**
- Approximate existing on-site groundwater table elevation - **Water was encountered at a depth of 5 to 6m below ground surface on January 17, 2022 (approximately at geodetic elevation 54.00m)**
- Anticipated groundwater flows (L/day for the building weeping tile system that will be tributary to the municipal combined sewer) **it is anticipated that volumes up to approximately 10,000 L/day will be handled by the building's weeping tile system.**
- A recommendation as to whether or not the native soils are conducive to infiltration from permeable pavement for the surface parking and/or possible rainwater garden infiltration (less than 1.5m depth) - **Based on the brown silty encountered during the geotechnical investigation, it is anticipated that the subsurface soil are not conducive to infiltration.**

I have attached the City standard for permeable pavers that we will be specifying on the drawing and maybe the architect or structural can provide additional info if you need anything more regarding the building weeping tile system. Take care, be safe out there and have a great weekend.

Regards,
Steve

APPENDIX B
Development Servicing Study Checklist

Servicing study guidelines for development applications

4. Development Servicing Study Checklist

The following section describes the checklist of the required content of servicing studies. It is expected that the proponent will address each one of the following items for the study to be deemed complete and ready for review by City of Ottawa Infrastructure Approvals staff.

The level of required detail in the Servicing Study will increase depending on the type of application. For example, for Official Plan amendments and re-zoning applications, the main issues will be to determine the capacity requirements for the proposed change in land use and confirm this against the existing capacity constraint, and to define the solutions, phasing of works and the financing of works to address the capacity constraint. For subdivisions and site plans, the above will be required with additional detailed information supporting the servicing within the development boundary.

4.1 General Content

- Executive Summary (for larger reports only).
- Date and revision number of the report.
- Location map and plan showing municipal address, boundary, and layout of proposed development.
- Plan showing the site and location of all existing services.
- 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.
- Summary of Pre-consultation Meetings with City and other approval agencies.
- Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defensible design criteria.
- Statement of objectives and servicing criteria.
- Identification of existing and proposed infrastructure available in the immediate area.
- 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).
- Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.
- 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.
- Proposed phasing of the development, if applicable.

- Reference to geotechnical studies and recommendations concerning servicing.

- All preliminary and formal site plan submissions should have the following information:
 - Metric scale

 - North arrow (including construction North)

 - Key plan

 - Name and contact information of applicant and property owner

 - Property limits including bearings and dimensions

 - Existing and proposed structures and parking areas

 - Easements, road widening and rights-of-way

 - Adjacent street names

4.2 Development Servicing Report: Water

- Confirm consistency with Master Servicing Study, if available
- Availability of public infrastructure to service proposed development
- Identification of system constraints
- Identify boundary conditions
- Confirmation of adequate domestic supply and pressure
- 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.
- 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.
- Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design
- Address reliability requirements such as appropriate location of shut-off valves
- Check on the necessity of a pressure zone boundary modification.
- 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

- 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.
- Description of off-site required feeder mains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.
- Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.
- Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.

4.3 Development Servicing Report: Wastewater

- Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).
- Confirm consistency with Master Servicing Study and/or justifications for deviations.
- 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.
- Description of existing sanitary sewer available for discharge of wastewater from proposed development.
- 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)
- Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.
- Description of proposed sewer network including sewers, pumping stations, and forcemains.
- 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).
- Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.
- Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.
- Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.
- Special considerations such as contamination, corrosive environment etc.

4.4 Development Servicing Report: Stormwater Checklist

- Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)
- Analysis of available capacity in existing public infrastructure.
- A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.
- 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.
- Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.
- Description of the stormwater management concept with facility locations and descriptions with references and supporting information.
- Set-back from private sewage disposal systems.
- Watercourse and hazard lands setbacks.
- Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.
- Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.
- Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).
- Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.
- 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.
- Any proposed diversion of drainage catchment areas from one outlet to another.
- Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.
- 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.
- Identification of potential impacts to receiving watercourses
- Identification of municipal drains and related approval requirements.
- Descriptions of how the conveyance and storage capacity will be achieved for the development.
- 100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.

- Inclusion of hydraulic analysis including hydraulic grade line elevations.
- Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.
- 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.
- Identification of fill constraints related to floodplain and geotechnical investigation.

4.5 Approval and Permit Requirements: Checklist

The Servicing Study shall provide a list of applicable permits and regulatory approvals necessary for the proposed development as well as the relevant issues affecting each approval. The approval and permitting shall include but not be limited to the following:

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

4.6 Conclusion Checklist

- Clearly stated 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.
- All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario

APPENDIX C

Theoretical Sanitary Flow Calculations

15 LARCH STREET SANITARY FLOWS

Number of Bachelor Units	3
Persons per Bachelor Unit	1.4
Number of 1 Bedroom Units	12
Persons per 1-bdr Unit	1.4
Number of 2 Bedroom Units	11
Persons per 1-bdr Unit	2.1
Total Population	45
Average Daily Flow	280 L/c/day
Peak Factor (Harmon Formula)	3.46
Peak Sanitary Flow	0.50 L/s
Site Area	0.09 ha
Infiltration Allowance	0.33 L/s/ha
Peak Extraneous Flows	0.03 L/s
Total Peak Sanitary Flow	0.53 L/s

APPENDIX D

Water Demands, FUS Calculations, Boundary Conditions

15 LARCH STREET

WATER DEMAND

Number of Bachelor Units	3
Persons per Bachelor Unit	1.4
Number of 1 Bedroom Units	12
Persons per 1-bdr Unit	1.4
Number of 2 Bedroom Units	11
Persons per 2-bdr Unit	2.1
Total Population	45
Average Day Demand	280 L/c/day
Average Day Demand	0.15 L/s
Maximum Day Demand (2.5 x avg. day)	0.36 L/s
Peak Hour Demand (2.2 x avg. day)	0.80 L/s

BOUNDARY CONDITIONS

Maximum HGL =	115.3 m
Minimum HGL =	107.2 m

PRESSURE TESTS

Larch Street Watermain Elevation 57.3 m

High Pressure Test = Max HGL - Avg Ground Elev x 1.42197 PSI/m < 80 PSI
High Pressure Check = **82.5 PSI**

Low Pressure Test = Min HGL - Avg Ground Elev x 1.42197 PSI/m > 40 PSI
Low Pressure Check = **71.0 PSI**

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines



Engineers, Planners & Landscape Architects

Novatech Project #: 120251
 Project Name: 15 Larch Street
 Date: 12/10/2021
 Input By: S.Matthews
 Reviewed By: M.Savic

Legend

Input by User
 No Information or Input Required

Building Description: 4 Storey Apartment - West Fire Separation
 Wood frame

Step	Input		Value Used	Total Fire Flow (L/min)		
Base Fire Flow						
1	Construction Material		Multiplier	1.5		
	Coefficient related to type of construction C	Wood frame	Yes		1.5	
		Ordinary construction			1	
		Non-combustible construction			0.8	
		Modified Fire resistive construction (2 hrs)			0.6	
Fire resistive construction (> 3 hrs)			0.6			
2	Floor Area			9,000		
	A	Building Footprint (m ²)	202		808	
		Number of Floors/Storeys	4			
		Area of structure considered (m ²)				
F	Base fire flow without reductions					
Reductions or Surcharges						
3	Occupancy hazard reduction or surcharge		Reduction/Surcharge	6,750		
	(1)	Non-combustible	Yes		-25%	
		Limited combustible			-15%	
		Combustible			0%	
		Free burning			15%	
Rapid burning			25%			
4	Sprinkler Reduction		Reduction	0		
	(2)	Adequately Designed System (NFPA 13)			-30%	
		Standard Water Supply			-10%	
		Fully Supervised System			-10%	
Cumulative Total			0%			
5	Exposure Surcharge (cumulative %)		Surcharge	2,363		
	(3)	North Side	10.1 - 20 m		15%	
		East Side	2Hr Fire Wall		10%	
		South Side	20.1 - 30 m		10%	
		West Side	> 45.1m		0%	
Cumulative Total			35%			
Results						
6	(1) + (2) + (3)	Total Required Fire Flow, rounded to nearest 1000L/min		L/min	9,000	
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	150
				or	USGPM	2,378
7	Storage Volume	Required Duration of Fire Flow (hours)		Hours	2	
		Required Volume of Fire Flow (m ³)		m³	1080	

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines



Engineers, Planners & Landscape Architects

Novatech Project #: 120251
 Project Name: 15 Larch Street
 Date: 12/10/2021
 Input By: S.Matthews
 Reviewed By: M.Savic

Legend

Input by User
 No Information or Input Required

Building Description: 4 Storey Apartment - East Fire Separation
 Wood frame

Step	Input		Value Used	Total Fire Flow (L/min)		
Base Fire Flow						
1	Construction Material		Multiplier	1.5		
	Coefficient related to type of construction C	Wood frame	Yes		1.5	
		Ordinary construction			1	
		Non-combustible construction			0.8	
		Modified Fire resistive construction (2 hrs)			0.6	
Fire resistive construction (> 3 hrs)			0.6			
2	Floor Area			11,000		
	A	Building Footprint (m ²)	269		1,076	
		Number of Floors/Storeys	4			
		Area of structure considered (m ²)				
	F	Base fire flow without reductions				
F = 220 C (A)^{0.5}						
Reductions or Surcharges						
3	Occupancy hazard reduction or surcharge		Reduction/Surcharge	8,250		
	(1)	Non-combustible	Yes		-25%	
		Limited combustible			-15%	
		Combustible			0%	
		Free burning			15%	
Rapid burning			25%			
4	Sprinkler Reduction		Reduction	0		
	(2)	Adequately Designed System (NFPA 13)			-30%	
		Standard Water Supply			-10%	
		Fully Supervised System			-10%	
Cumulative Total			0%			
5	Exposure Surcharge (cumulative %)		Surcharge	4,538		
	(3)	North Side	10.1 - 20 m		15%	
		East Side	3.1 - 10 m		20%	
		South Side	20.1 - 30 m		10%	
		West Side	2Hr Fire Wall		10%	
Cumulative Total			55%			
Results						
6	(1) + (2) + (3)	Total Required Fire Flow, rounded to nearest 1000L/min		L/min	13,000	
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	217
				or	USGPM	3,435
7	Storage Volume	Required Duration of Fire Flow (hours)		Hours	2.5	
		Required Volume of Fire Flow (m ³)		m ³	1950	

Steve Matthews

From: Miro Savic
Sent: Monday, January 17, 2022 3:14 PM
To: Wessel, Shawn
Cc: Steve Matthews; Murray Chown
Subject: RE: 15 Larch Street Boundary Conditions Request
Attachments: WM Boundary Conditions Request Sketch.pdf

Hello Shawn,

As discussed at the meeting, there are three municipal hydrants within 150m from the site: 366029H307, 366029H356 & 366029H016. Please see to the attached sketch that was provided with the boundary conditions request. The required fire flow can be met with a multi hydrant approach using these three hydrants.

Regards,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering

NOVATECH Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265 | Fax: 613.254.5867

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From: Wessel, Shawn <shawn.wessel@ottawa.ca>
Sent: Thursday, January 13, 2022 2:05 PM
To: Miro Savic <m.savic@novatech-eng.com>
Cc: Steve Matthews <S.Matthews@novatech-eng.com>; Murray Chown <m.Chown@novatech-eng.com>
Subject: RE: 15 Larch Street Boundary Conditions Request

Good afternoon Miro

Sorry to took a while, Matt Steele was on holidays and wanted to look at this a bit closer before sending me comments, due to the size of the existing WM, being 50mm, and the proposal of the 150mm WM upgrade as well as a development planned within the lands to the West.

Please find the conditions below and attached.

The following are boundary conditions, HGL, for hydraulic analysis at 15 Larch Street (zone 1W) assumed to be connected to the proposed extended 152 mm watermain on Larch Street (see attached PDF for location).

Minimum HGL: 107.2 m

Maximum HGL: 115.3 m

The required fire flow cannot be met with a multi-hydrant analysis using hydrant 366029H037 & 366029H356.

These are for current conditions and are based on computer model simulation.

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

The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation.

It has been recommended by Water Resources Dept. that the 50mm WM be upgraded to 200 mm to match mains in the planned development to the West. I have contacted both of the applicable City File Leads to discuss this further.

If you require additional information or clarification, please do not hesitate to contact me anytime.

Thank you

Regards,

Shawn Wessel, A.Sc.T.,rcji
Project Manager - Infrastructure Approvals
Gestionnaire de projet – Approbation des demandes d’infrastructures

Development Review Central Branch | Direction de l’examen des projets d’aménagement, Centrale
Planning, Real Estate and Economic Development Department | Direction générale de la planification des biens immobiliers et du développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Ave. W. | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1
(613) 580 2424 Ext. | Poste 33017
Int. Mail Code | Code de Courrier Interne 01-14
shawn.wessel@ottawa.ca

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*****Please also note that, while my work hours may be affected by the current situation and am working from home, I still have access to email, video conferencing and telephone. Feel free to schedule video conferences and/or telephone calls, as necessary.*****

From: Miro Savic <m.savic@novatech-eng.com>
Sent: January 13, 2022 1:53 PM
To: Wessel, Shawn <shawn.wessel@ottawa.ca>
Cc: Steve Matthews <S.Matthews@novatech-eng.com>; Murray Chown <m.chown@novatech-eng.com>
Subject: RE: 15 Larch Street Boundary Conditions Request

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I was wondering if you have heard anything back from Water Resources.

Thank you,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering

NOVATECH Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265 | Fax: 613.254.5867

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From: Wessel, Shawn <shawn.wessel@ottawa.ca>

Sent: Wednesday, January 5, 2022 1:32 PM

To: Miro Savic <m.savic@novatech-eng.com>

Cc: Steve Matthews <S.Matthews@novatech-eng.com>; Murray Chown <m.Chown@novatech-eng.com>

Subject: RE: 15 Larch Street Boundary Conditions Request

Thank you for your email Miro.

I had sent the request to Water Resources and will follow up with them.

If you require additional information or clarification, please do not hesitate to contact me anytime.

Thank you

Regards,

Shawn Wessel, A.Sc.T.,rcji

Project Manager - Infrastructure Approvals

Gestionnaire de projet – Approbation des demandes d'infrastructures

Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale
Planning, Infrastructure and Economic Development Department | Direction générale de la planification
de l'infrastructure et du développement économique

City of Ottawa | Ville d'Ottawa

110 Laurier Ave. W. | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1

(613) 580 2424 Ext. | Poste 33017

Int. Mail Code | Code de Courrier Interne 01-14

shawn.wessel@ottawa.ca

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*****Please also note that, while my work hours may be affected by the current situation and am working from home, I still have access to email, video conferencing and telephone. Feel free to schedule video conferences and/or telephone calls, as necessary.*****

From: Miro Savic <m.savic@novatech-eng.com>
Sent: January 05, 2022 9:50 AM
To: Wessel, Shawn <shawn.wessel@ottawa.ca>
Cc: Steve Matthews <S.Matthews@novatech-eng.com>; Murray Chown <m.chown@novatech-eng.com>
Subject: RE: 15 Larch Street Boundary Conditions Request

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Would you be able to confirm when we can expect to receive boundary conditions.

Thank you,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering

NOVATECH Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265 | Fax: 613.254.5867

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From: Miro Savic
Sent: Friday, December 17, 2021 12:44 PM
To: Wessel, Shawn <shawn.wessel@ottawa.ca>
Cc: Steve Matthews <S.Matthews@novatech-eng.com>; Murray Chown <m.Chown@novatech-eng.com>
Subject: 15 Larch Street Boundary Conditions Request

Hello Shawn,

I'm writing to request water boundary conditions for the proposed residential development located at 15 Larch Street.

The proposed building is a 4-storey wood frame construction. A 2-hour fire wall is being proposed to divide the building into 2 separate fire areas. See the attached sheets showing the calcs for both fire separation areas (West area @ 150 L/s and East area @ 217 L/s).

The domestic water demands for the proposed building are calculated as follows:

- Average Day Demand: 0.18 L/s
- Maximum Day Demand: 0.46 L/s
- Peak Hour Demand: 1.00 L/s

There are three existing municipal hydrants within range of the site and the attached sketch shows Hydrant ID numbers as well as the approximate distances to the proposed building.

It is anticipated that the existing 50mm diameter watermain located in front of the property will need to be replaced with a larger diameter pipe in order to provide sufficient flow and pressure to the proposed building.

Please let me know if you have any questions or require more information to provide the boundary conditions for the project.

Regards,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering

NOVATECH Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265 | Fax: 613.254.5867

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Steve Matthews

From: Miro Savic
Sent: Friday, December 17, 2021 12:44 PM
To: Wessel, Shawn
Cc: Steve Matthews; Murray Chown
Subject: 15 Larch Street Boundary Conditions Request
Attachments: 120251-FUS-EastFireSeparation.pdf; 120251-FUS-WestFireSeparation.pdf; WM Boundary Conditions Request Sketch.pdf

Hello Shawn,

I'm writing to request water boundary conditions for the proposed residential development located at 15 Larch Street.

The proposed building is a 4-storey wood frame construction. A 2-hour fire wall is being proposed to divide the building into 2 separate fire areas. See the attached sheets showing the calcs for both fire separation areas (West area @ 150 L/s and East area @ 217 L/s).

The domestic water demands for the proposed building are calculated as follows:

- Average Day Demand: 0.18 L/s
- Maximum Day Demand: 0.46 L/s
- Peak Hour Demand: 1.00 L/s

There are three existing municipal hydrants within range of the site and the attached sketch shows Hydrant ID numbers as well as the approximate distances to the proposed building.

It is anticipated that the existing 50mm diameter watermain located in front of the property will need to be replaced with a larger diameter pipe in order to provide sufficient flow and pressure to the proposed building.

Please let me know if you have any questions or require more information to provide the boundary conditions for the project.

Regards,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering

NOVATECH Engineers, Planners & Landscape Architects

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**Watermain Boundary
Conditions Request
15 Larch Street**

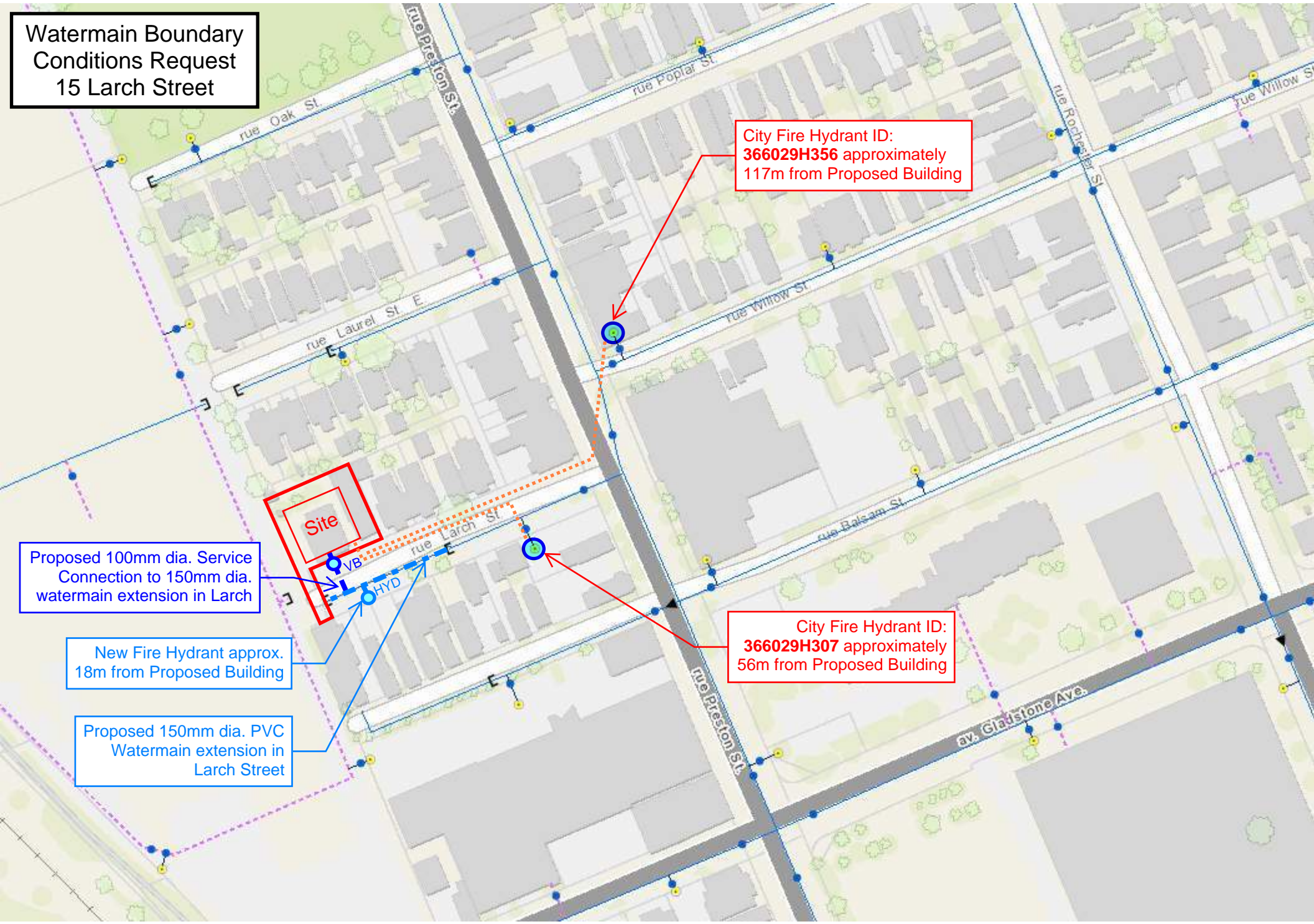
City Fire Hydrant ID:
366029H356 approximately
117m from Proposed Building

Proposed 100mm dia. Service
Connection to 150mm dia.
watermain extension in Larch

City Fire Hydrant ID:
366029H307 approximately
56m from Proposed Building

New Fire Hydrant approx.
18m from Proposed Building

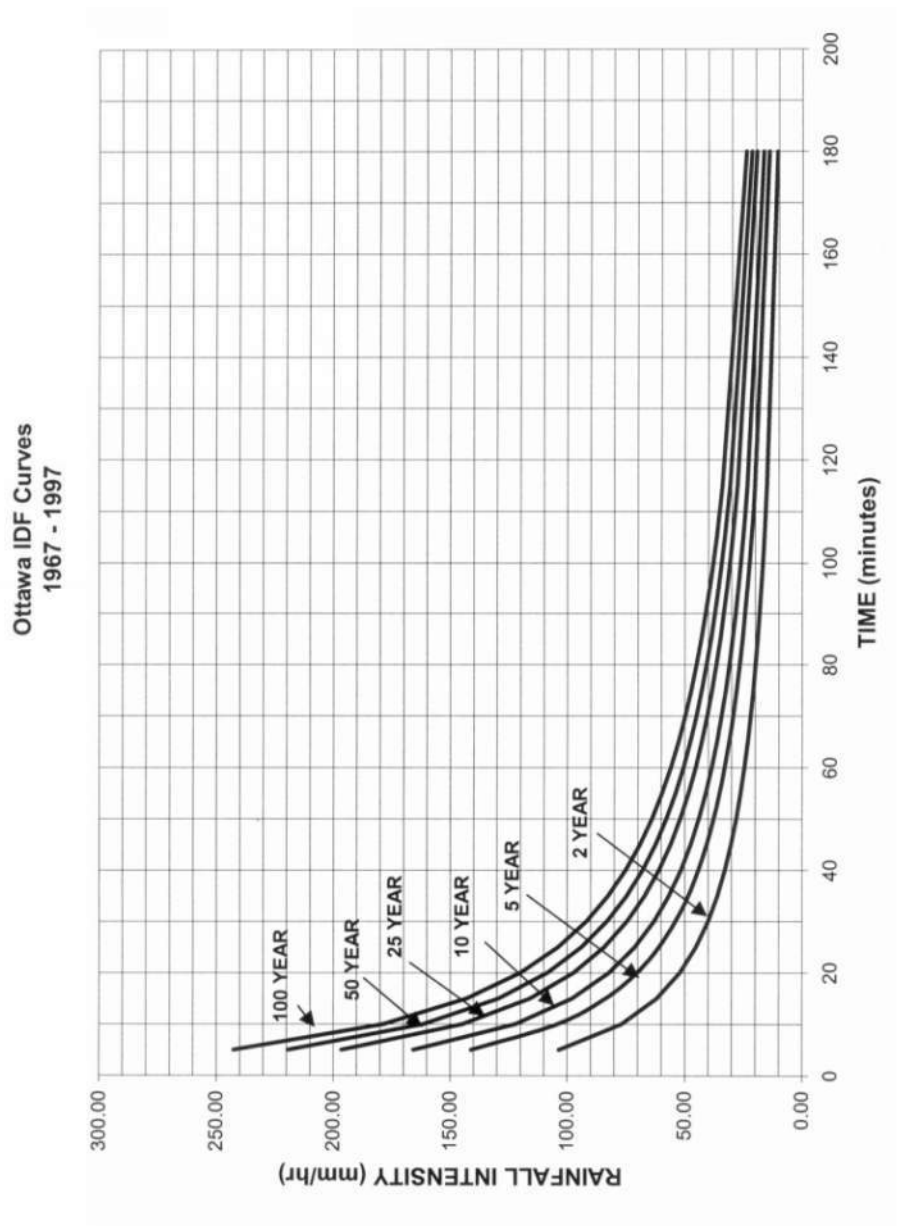
Proposed 150mm dia. PVC
Watermain extension in
Larch Street



APPENDIX E
IDF Curves and SWM Calculations

APPENDIX 5-A

OTTAWA INTENSITY DURATION FREQUENCY (IDF) CURVE



Proposed Residential Development 15 Larch Street

Pre - Development Site Flows											
Description	Area (ha)	$A_{impervious}$ (ha) C=0.9	A_{gravel} (ha) C=0.6	$A_{pervious}$ (ha) C=0.2	Weighted C_{w5}	Weighted C_{w100}	1:2 Year Flow (L/s)	1:5 Year Flow (L/s)	1:100 Year Flow (L/s)	Allowable C_w	Allowable Flow
											2-year (L/s)
Portion of Site to be Re-Developed	0.085	0.042	0.000	0.043	0.55	0.62	10.0	13.6	26.4	0.40	7.3

Total Allowable to Combined Sewer
 $T_c = 10mins$

Post - Development Site Flows																	
Area	Description	Area (ha)	A_{imp} (ha) C=0.9	A_{perv} (ha) C=0.2	C_5	C_{100}	Uncontrolled Flow (L/s)			Controlled Flow (L/s)			Storage Required (m ³)			Storage	
							2-year	5-year	100-year	2-year	5-year	100-year	2-year	5-year	100-year	Provided (m ³)	
A-1	Uncontrolled Runoff to Larch - West	0.006	0.0000	0.0060	0.20	0.25	0.3	0.3	0.7	-	-	-	-	-	-	-	
A-2	Uncontrolled Runoff to Larch - East	0.002	0.0000	0.0022	0.20	0.25	0.1	0.1	0.3	-	-	-	-	-	-	-	
A-3	Controlled Site Flows	0.027	0.013	0.014	0.54	0.61	-	-	-	1.0	1.3	1.8	2.0	2.8	6.2	10.5	
R-1	Controlled Flow Roof Drains	0.050	0.050	0.000	0.90	1.00	0.6	0.8	1.6	2.1	2.2	2.2	5.0	7.8	18.8	22.7	
Totals :		0.085	-	-	-	-	1.0	1.3	2.6	3.1	3.4	4.0	7.0	10.6	25.0	33.2	
							Total Stormwater Flows :			4.1	4.7	6.6	Stormwater Flows				
												0.5	Sanitary Flows				
												0.1	Groundwater Flows				
												7.2	Total Flow to Combined Sewer in Larch Street				

$T_c = 10mins$

Proposed Residential Development Novatech Project No. 120251 REQUIRED STORAGE - 1:2 YEAR EVENT Allowable Flow to Larch Combined Sewer				
OTTAWA IDF CURVE				
Area =	0.085	ha	Qallow =	7.3 L/s
C =	0.40		Vol(max) =	0.0 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	103.57	9.85	2.54	0.76
10	76.81	7.30	0.00	0.00
15	61.77	5.87	-1.43	-1.29
20	52.03	4.95	-2.36	-2.83
25	45.17	4.29	-3.01	-4.51
30	40.04	3.81	-3.49	-6.29
35	36.06	3.43	-3.87	-8.13
40	32.86	3.12	-4.18	-10.03
45	30.24	2.87	-4.43	-11.95
50	28.04	2.67	-4.64	-13.91
55	26.17	2.49	-4.81	-15.88
60	24.56	2.33	-4.97	-17.88
65	23.15	2.20	-5.10	-19.89
70	21.91	2.08	-5.22	-21.92
75	20.81	1.98	-5.32	-23.95
80	19.83	1.89	-5.42	-26.00
85	18.94	1.80	-5.50	-28.05
90	18.14	1.72	-5.58	-30.11

Proposed Residential Development				
Novatech Project No. 120251				
REQUIRED STORAGE - 1:5 YEAR EVENT				
AREA A-1 Uncontrolled Runoff to Larch - West				
OTTAWA IDF CURVE				
Area =	0.006	ha	Qallow =	0.3 L/s
C =	0.20		Vol(max) =	0.0 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	141.18	0.47	0.12	0.04
10	104.19	0.35	0.00	0.00
15	83.56	0.28	-0.07	-0.06
20	70.25	0.23	-0.11	-0.14
25	60.90	0.20	-0.14	-0.22
30	53.93	0.18	-0.17	-0.30
35	48.52	0.16	-0.19	-0.39
40	44.18	0.15	-0.20	-0.48
45	40.63	0.14	-0.21	-0.57
50	37.65	0.13	-0.22	-0.66
55	35.12	0.12	-0.23	-0.76
60	32.94	0.11	-0.24	-0.85
65	31.04	0.10	-0.24	-0.95
70	29.37	0.10	-0.25	-1.05
75	27.89	0.09	-0.25	-1.14
80	26.56	0.09	-0.26	-1.24
85	25.37	0.08	-0.26	-1.34
90	24.29	0.08	-0.27	-1.44

Proposed Residential Development				
Novatech Project No. 120251				
REQUIRED STORAGE - 1:100 YEAR EVENT				
AREA A-1 Uncontrolled Runoff to Larch - West				
OTTAWA IDF CURVE				
Area =	0.006	ha	Qallow =	0.7 L/s
C =	0.25		Vol(max) =	0.0 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	242.70	1.01	0.27	0.08
10	178.56	0.74	0.00	0.00
15	142.89	0.59	-0.15	-0.13
20	119.95	0.50	-0.24	-0.29
25	103.85	0.43	-0.31	-0.47
30	91.87	0.38	-0.36	-0.65
35	82.58	0.34	-0.40	-0.84
40	75.15	0.31	-0.43	-1.03
45	69.05	0.29	-0.46	-1.23
50	63.95	0.27	-0.48	-1.43
55	59.62	0.25	-0.50	-1.63
60	55.89	0.23	-0.51	-1.84
65	52.65	0.22	-0.52	-2.04
70	49.79	0.21	-0.54	-2.25
75	47.26	0.20	-0.55	-2.46
80	44.99	0.19	-0.56	-2.67
85	42.95	0.18	-0.56	-2.88
90	41.11	0.17	-0.57	-3.09

Proposed Residential Development				
Novatech Project No. 120251				
REQUIRED STORAGE - 1:5 YEAR EVENT				
AREA A-1 Uncontrolled Runoff to Larch - West				
OTTAWA IDF CURVE				
Area =	0.002	ha	Qallow =	0.1 L/s
C =	0.20		Vol(max) =	0.0 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	141.18	0.17	0.05	0.01
10	104.19	0.13	0.00	0.00
15	83.56	0.10	-0.03	-0.02
20	70.25	0.09	-0.04	-0.05
25	60.90	0.07	-0.05	-0.08
30	53.93	0.07	-0.06	-0.11
35	48.52	0.06	-0.07	-0.14
40	44.18	0.05	-0.07	-0.18
45	40.63	0.05	-0.08	-0.21
50	37.65	0.05	-0.08	-0.24
55	35.12	0.04	-0.08	-0.28
60	32.94	0.04	-0.09	-0.31
65	31.04	0.04	-0.09	-0.35
70	29.37	0.04	-0.09	-0.38
75	27.89	0.03	-0.09	-0.42
80	26.56	0.03	-0.09	-0.46
85	25.37	0.03	-0.10	-0.49
90	24.29	0.03	-0.10	-0.53

Proposed Residential Development				
Novatech Project No. 120251				
REQUIRED STORAGE - 1:100 YEAR EVENT				
AREA A-1 Uncontrolled Runoff to Larch - West				
OTTAWA IDF CURVE				
Area =	0.002	ha	Qallow =	0.3 L/s
C =	0.25		Vol(max) =	0.0 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	242.70	0.37	0.10	0.03
10	178.56	0.27	0.00	0.00
15	142.89	0.22	-0.05	-0.05
20	119.95	0.18	-0.09	-0.11
25	103.85	0.16	-0.11	-0.17
30	91.87	0.14	-0.13	-0.24
35	82.58	0.13	-0.15	-0.31
40	75.15	0.11	-0.16	-0.38
45	69.05	0.11	-0.17	-0.45
50	63.95	0.10	-0.18	-0.53
55	59.62	0.09	-0.18	-0.60
60	55.89	0.09	-0.19	-0.68
65	52.65	0.08	-0.19	-0.75
70	49.79	0.08	-0.20	-0.83
75	47.26	0.07	-0.20	-0.90
80	44.99	0.07	-0.20	-0.98
85	42.95	0.07	-0.21	-1.06
90	41.11	0.06	-0.21	-1.13

Proposed Residential Development Storage Calculations Using Average
Novatech Project No. 120251 Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:2 YEAR EVENT

AREA A-3 Controlled Site Flows + Underground Storage

OTTAWA IDF CURVE
 Area = 0.027 ha
 C = 0.54
 Qpeak = 1.0 L/s
 Qavg = 0.5 L/s
 Vol(max) = 2.0 m3
 (Vol calculated for Qallow-avg)

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.20	3.70	1.11
10	76.81	3.12	2.62	1.57
15	61.77	2.51	2.01	1.80
20	52.03	2.11	1.61	1.93
25	45.17	1.83	1.33	2.00
30	40.04	1.62	1.12	2.02
35	36.06	1.46	0.96	2.02
40	32.86	1.33	0.83	2.00
45	30.24	1.23	0.73	1.96
50	28.04	1.14	0.64	1.91
55	26.17	1.06	0.56	1.85
60	24.56	1.00	0.50	1.79
65	23.15	0.94	0.44	1.71
70	21.91	0.89	0.39	1.63
75	20.81	0.84	0.34	1.55
90	18.14	0.74	0.24	1.27
105	16.13	0.65	0.15	0.97
120	14.56	0.59	0.09	0.65
135	13.30	0.54	0.04	0.32
150	12.25	0.50	0.00	-0.03

Proposed Residential Development Storage Calculations Using Average
Novatech Project No. 120251 Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:5 YEAR EVENT

AREA A-3 Controlled Site Flows + Underground Storage

OTTAWA IDF CURVE
 Area = 0.027 ha
 C = 0.54
 Qpeak = 1.3 L/s
 Qavg = 0.7 L/s
 Vol(max) = 2.8 m3
 (Vol calculated for Qallow-avg)

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.73	5.08	1.52
10	104.19	4.23	3.58	2.15
15	83.56	3.39	2.74	2.47
20	70.25	2.85	2.20	2.64
25	60.90	2.47	1.82	2.73
30	53.93	2.19	1.54	2.77
35	48.52	1.97	1.32	2.77
40	44.18	1.79	1.14	2.74
45	40.63	1.65	1.00	2.69
50	37.65	1.53	0.88	2.63
55	35.12	1.42	0.77	2.56
60	32.94	1.34	0.69	2.47
65	31.04	1.26	0.61	2.38
70	29.37	1.19	0.54	2.27
75	27.89	1.13	0.48	2.17
90	24.29	0.99	0.34	1.81
105	21.58	0.88	0.23	1.42
120	19.47	0.79	0.14	1.01
135	17.76	0.72	0.07	0.57
150	16.36	0.66	0.01	0.12

Proposed Residential Development Storage Calculations Using Average
Novatech Project No. 120251 Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:100 YEAR EVENT

AREA A-3 Controlled Site Flows + Underground Storage

OTTAWA IDF CURVE
 Area = 0.027 ha
 C = 0.61
 Qpeak = 1.8 L/s
 Qavg = 0.9 L/s
 Vol(max) = 6.2 m3
 (Vol calculated for Qallow-avg)

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	11.20	10.30	3.09
10	178.56	8.24	7.34	4.40
15	142.89	6.59	5.69	5.12
20	119.95	5.54	4.64	5.56
25	103.85	4.79	3.89	5.84
30	91.87	4.24	3.34	6.01
35	82.58	3.81	2.91	6.11
40	75.15	3.47	2.57	6.16
45	69.05	3.19	2.29	6.17
50	63.95	2.95	2.05	6.15
55	59.62	2.75	1.85	6.11
60	55.89	2.58	1.68	6.05
65	52.65	2.43	1.53	5.97
70	49.79	2.30	1.40	5.87
75	47.26	2.18	1.28	5.76
90	41.11	1.90	1.00	5.38
105	36.50	1.68	0.78	4.94
120	32.89	1.52	0.62	4.45
135	30.00	1.38	0.48	3.92
150	27.61	1.27	0.37	3.37

Proposed Residential Development Storage Calculations Using Average
Novatech Project No. 120251 Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:100 YR + 20% IDF Increase

AREA A-3 Controlled Site Flows + Underground Storage

OTTAWA IDF CURVE
 Area = 0.027 ha
 C = 0.61
 Qpeak = 1.8 L/s
 Qavg = 0.9 L/s
 Vol(max) = 7.9 m3
 (Vol calculated for Qallow-avg)

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	13.44	12.54	3.76
10	214.27	9.89	8.99	5.39
15	171.47	7.91	7.01	6.31
20	143.94	6.64	5.74	6.89
25	124.62	5.75	4.85	7.28
30	110.24	5.09	4.19	7.54
35	99.09	4.57	3.67	7.71
40	90.17	4.16	3.26	7.83
45	82.86	3.82	2.92	7.89
50	76.74	3.54	2.64	7.92
55	71.55	3.30	2.40	7.93
60	67.07	3.10	2.20	7.90
65	63.18	2.92	2.02	7.86
70	59.75	2.76	1.86	7.80
75	56.71	2.62	1.72	7.73
90	49.33	2.28	1.38	7.43
105	43.80	2.02	1.12	7.06
120	39.47	1.82	0.92	6.64
135	36.00	1.66	0.76	6.17
150	33.13	1.53	0.63	5.66

Structures	Size (mm)	Area (m ²)	T/G	Inv IN	Inv OUT
STM MH 01	1219	1.17	58.96	57.09	56.99
CBMH 01	1219	1.17	58.90	57.11	57.10
CBMH 02	1219	1.17	58.80	-	57.15

Area A-3: Storage Table

Elevation (m)	System Depth (m)	Underground Storage			Surface Storage						Total Storage			
		STM MH 01 Volume (m ³)	CBMH 01 Volume (m ³)	CBMH 02 Volume (m ³)	Combined Volume (m ³)	STM MH 01 Area (m ²)	STM MH 01 Volume (m ³)	CBMH 01 Area (m ²)	CBMH 01 Volume (m ³)	CBMH 02 Area (m ²)	CBMH 02 Volume (m ³)	Ponding Volume (m ³)	Total Volume (m ³)	
56.99	0.00	-	-	-	-	-	-	-	-	-	-	0	-	
57.14	0.15	0.18	0.05	-	0.22	-	-	-	-	-	-	0.2	0.05	
57.28	0.29	0.34	0.21	0.15	0.70	-	-	-	-	-	-	0.2	0.19	
57.43	0.44	0.51	0.39	0.33	1.23	-	-	-	-	-	-	0.2	0.34	
57.73	0.74	0.66	0.74	0.68	2.08	-	-	-	-	-	-	0.2	0.64	
58.33	1.34	1.56	1.44	1.38	4.34	-	-	-	-	-	-	0.2	1.24	
58.68	1.69	1.97	1.84	1.79	6.57	-	-	-	-	-	-	0.2	1.59	
58.83	1.84	2.15	2.02	1.96	7.13	-	-	-	0.0	0.0	0.0	0.2	1.74	
58.85	1.86	2.17	2.04	1.96	7.24	-	-	-	4.25	0.04	0.0	0.2	1.76	
58.93	1.94	2.26	2.14	2.04	6.44	0.00	0.00	0.00	0.00	0.04	0.0	0.2	1.84	
58.98	1.99	2.32	2.20	2.14	6.66	0.00	0.00	10.25	0.26	0.00	0.04	0.3	10.5	1.89

Tempest Vortex LMF Model 50 ICD

1:100 Yr
 Flow (L/s) = 1.8
 Head (m) = 0.66
 Elevation (m) = 57.75
 Outlet Pipe Dia.(mm) = 203
 Volume (m3) = 6.2

1:5 Yr
 Flow (L/s) = 1.3
 Head (m) = 0.35
 Elevation (m) = 57.44
 Outlet Pipe Dia.(mm) = 203
 Volume (m3) = 2.8

1:2 Yr
 Flow (L/s) = 1.0
 Head (m) = 0.19
 Elevation (m) = 57.28
 Outlet Pipe Dia.(mm) = 203
 Volume (m3) = 2.0

Orifice Size - 1:100 yr Flow Check
 $Q=0.62 \times A \times \sqrt{2gh} \times 0.5$

1:100 yr Flow Check
 Q (m³/s) = 0.0018
 g (m/s²) = 9.81
 h (m) = 0.66
 A (m²) = 0.000807706
 D (m) = 0.032068731
 D (mm) = 32

1:5 yr Flow Check
 $Q=0.62 \times A \times \sqrt{2gh} \times 0.5$

1:5 yr Flow Check
 Q (m³/s) = 0.0013
 g (m/s²) = 9.81
 h (m) = 0.35
 A (m²) = 0.00080
 D (m) = 0.032
 D (mm) = 32

1:2 yr Flow Check
 $Q=0.62 \times A \times \sqrt{2gh} \times 0.5$

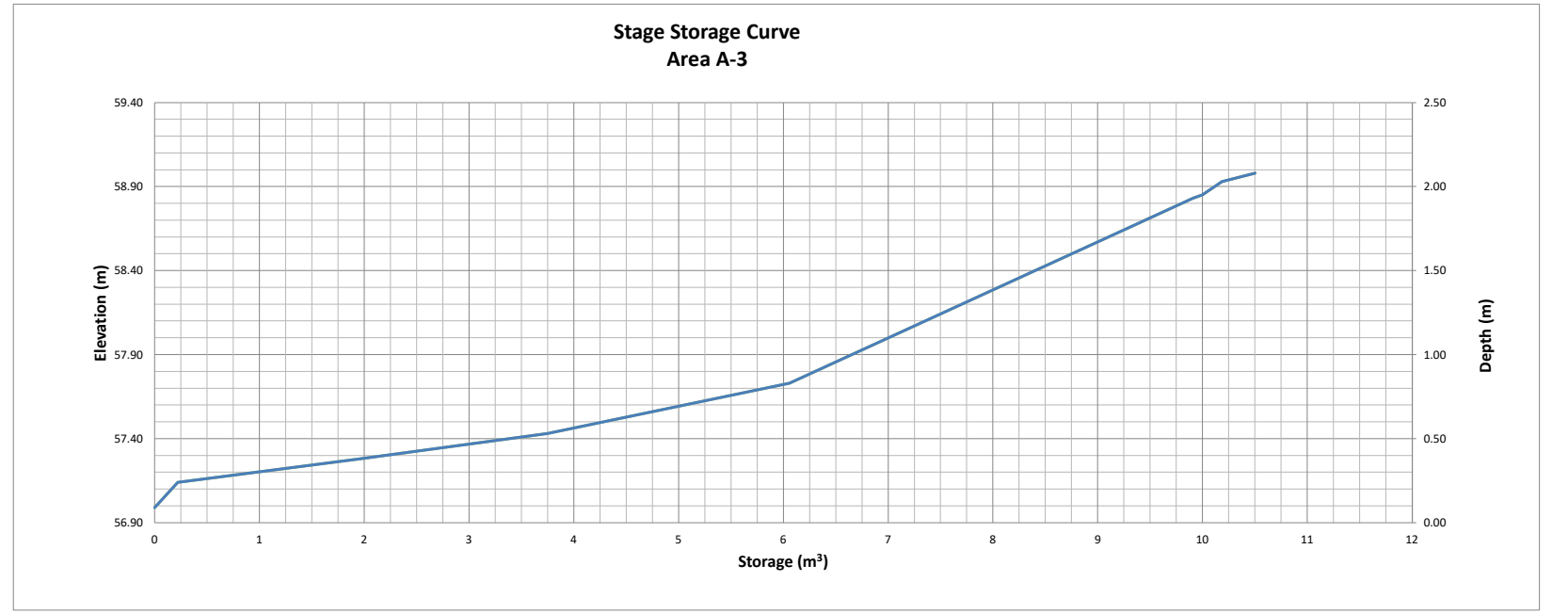
1:2 yr Flow Check
 Q (m³/s) = 0.0010
 g (m/s²) = 9.81
 h (m) = 0.19
 A (m²) = 0.00080
 D (m) = 0.032
 D (mm) = 32

PI = 3.141592654
 pipe I.D.= 457 (pvc pipe)
 U/G Storage Pipe Volume
 End Area 0.164 (m²)
 Total Length 23.1 (m)
 Pipe Volume 3.8 (m³)

U/G Pipe Size	450mm dia.	450mm dia.
Pipe Segment	STMMH 01 - CBMH 01	CBMH 01 - CBMH 02
Centre-Centre Length	4.0	21.5
Inside Structure	1.2	1.2
U/G Storage Length	2.8	20.3

Maximum Ponding Depths (cm)

1:100 Yr	-105
1:5 Yr	-136
1:2 Yr	-152



Proposed Residential Development					
Novatech Project No. 120251					
REQUIRED STORAGE - 1:2 YEAR EVENT					
AREA R-1 Controlled Roof Drain #1.1					
OTTAWA IDF CURVE					
Area =	0.011	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	1.4	m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	103.57	2.80	2.48	0.74	
10	76.81	2.08	1.76	1.05	
15	61.77	1.67	1.35	1.21	
20	52.03	1.41	1.09	1.30	
25	45.17	1.22	0.90	1.35	
30	40.04	1.08	0.76	1.37	
35	36.06	0.97	0.65	1.37	
40	32.86	0.89	0.57	1.36	
45	30.24	0.82	0.50	1.34	
50	28.04	0.76	0.44	1.31	
55	26.17	0.71	0.39	1.28	
60	24.56	0.66	0.34	1.24	
65	23.15	0.63	0.31	1.19	
70	21.91	0.59	0.27	1.14	
75	20.81	0.56	0.24	1.09	
90	18.14	0.49	0.17	0.92	
105	16.13	0.44	0.12	0.73	
120	14.56	0.39	0.07	0.53	

Proposed Residential Development					
Novatech Project No. 120251					
REQUIRED STORAGE - 1:5 YEAR EVENT					
AREA R-1 Controlled Roof Drain #1.1					
OTTAWA IDF CURVE					
Area =	0.011	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.1	m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	141.18	3.81	3.49	1.05	
10	104.19	2.82	2.50	1.50	
15	83.56	2.26	1.94	1.74	
20	70.25	1.90	1.58	1.89	
25	60.90	1.65	1.33	1.99	
30	53.93	1.46	1.14	2.05	
35	48.52	1.31	0.99	2.08	
40	44.18	1.19	0.87	2.10	
45	40.63	1.10	0.78	2.10	
50	37.65	1.02	0.70	2.09	
55	35.12	0.95	0.63	2.08	
60	32.94	0.89	0.57	2.05	
65	31.04	0.84	0.52	2.02	
70	29.37	0.79	0.47	1.99	
75	27.89	0.75	0.43	1.95	
90	24.29	0.66	0.34	1.82	
105	21.58	0.58	0.26	1.66	
120	19.47	0.53	0.21	1.48	

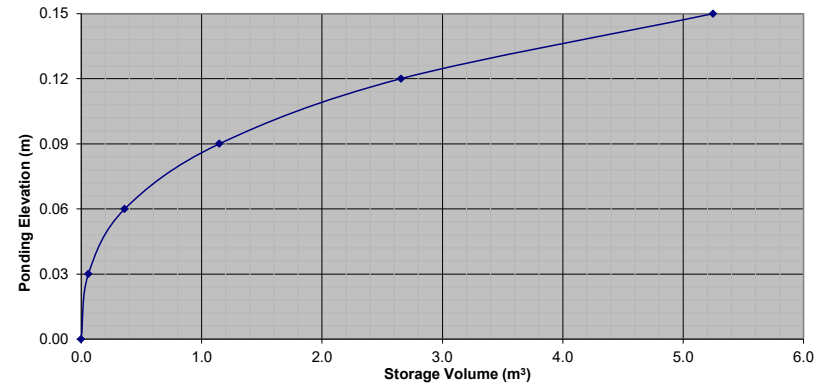
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed					
Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m ³)	
				Required	Provided
1:2 Year	0.32	0.32	9	1.4	2.7
1:5 Year	0.32	0.32	11	2.1	5.2
1:100 Year	0.32	0.32	14	4.9	5.2

Roof Drain Storage Table for Area RD 1.1		
Elevation	Area RD 1.1	Total Volume
m	m ²	m ³
0.00	0	0
0.03	4.03	0.1
0.06	16.1	0.4
0.09	36.22	1.1
0.12	64.4	2.7
0.15	108.37	5.2

Proposed Residential Development					
Novatech Project No. 120251					
REQUIRED STORAGE - 1:100 YEAR EVENT					
AREA R-1 Controlled Roof Drain #1.1					
OTTAWA IDF CURVE					
Area =	0.011	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	4.9	m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	242.70	7.29	6.97	2.09	
10	178.56	5.36	5.04	3.02	
15	142.89	4.29	3.97	3.57	
20	119.95	3.60	3.28	3.94	
25	103.85	3.12	2.80	4.20	
30	91.87	2.76	2.44	4.39	
35	82.58	2.48	2.16	4.53	
40	75.15	2.26	1.94	4.65	
45	69.05	2.07	1.75	4.73	
50	63.95	1.92	1.60	4.80	
55	59.62	1.79	1.47	4.85	
60	55.89	1.68	1.36	4.89	
65	52.65	1.58	1.26	4.92	
70	49.79	1.49	1.17	4.93	
75	47.26	1.42	1.10	4.94	
90	41.11	1.23	0.91	4.94	
105	36.50	1.10	0.78	4.89	
120	32.89	0.99	0.67	4.81	

Proposed Residential Development					
Novatech Project No. 120251					
REQUIRED STORAGE - 1:100 YEAR + 20%					
AREA R-1 Controlled Roof Drain #1.1					
OTTAWA IDF CURVE					
Area =	0.011	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	6.3	m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	291.24	8.74	8.42	2.53	
10	214.27	6.43	6.11	3.67	
15	171.47	5.15	4.83	4.35	
20	143.94	4.32	4.00	4.80	
25	124.62	3.74	3.42	5.13	
30	110.24	3.31	2.99	5.38	
35	99.09	2.98	2.66	5.58	
40	90.17	2.71	2.39	5.73	
45	82.86	2.49	2.17	5.85	
50	76.74	2.30	1.98	5.95	
55	71.55	2.15	1.83	6.03	
60	67.07	2.01	1.69	6.10	
65	63.18	1.90	1.58	6.15	
70	59.75	1.79	1.47	6.19	
75	56.71	1.70	1.38	6.22	
90	49.33	1.48	1.16	6.27	
105	43.80	1.31	0.99	6.27	
120	39.47	1.19	0.87	6.23	

Stage Storage Curve: Area R-1
Controlled Roof Drain #1.1



Proposed Residential Development					
Novatech Project No. 120251					
REQUIRED STORAGE - 1:2 YEAR EVENT					
AREA R-1		Controlled Roof Drain #1.2			
OTTAWA IDF CURVE					
Area =	0.009	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	1.1	m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	103.57	2.36	2.04	0.61	
10	76.81	1.75	1.43	0.86	
15	61.77	1.41	1.09	0.98	
20	52.03	1.18	0.86	1.04	
25	45.17	1.03	0.71	1.06	
30	40.04	0.91	0.59	1.07	
35	36.06	0.82	0.50	1.05	
40	32.86	0.75	0.43	1.03	
45	30.24	0.69	0.37	0.99	
50	28.04	0.64	0.32	0.96	
55	26.17	0.60	0.28	0.91	
60	24.56	0.56	0.24	0.86	
65	23.15	0.53	0.21	0.81	
70	21.91	0.50	0.18	0.75	
75	20.81	0.47	0.15	0.69	
90	18.14	0.41	0.09	0.50	
105	16.13	0.37	0.05	0.30	
120	14.56	0.33	0.01	0.08	

Proposed Residential Development					
Novatech Project No. 120251					
REQUIRED STORAGE - 1:5 YEAR EVENT					
AREA R-1		Controlled Roof Drain #1.2			
OTTAWA IDF CURVE					
Area =	0.009	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	1.6	m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	141.18	3.21	2.89	0.87	
10	104.19	2.37	2.05	1.23	
15	83.56	1.90	1.58	1.42	
20	70.25	1.60	1.28	1.54	
25	60.90	1.39	1.07	1.60	
30	53.93	1.23	0.91	1.63	
35	48.52	1.10	0.78	1.65	
40	44.18	1.01	0.69	1.65	
45	40.63	0.93	0.61	1.63	
50	37.65	0.86	0.54	1.61	
55	35.12	0.80	0.48	1.58	
60	32.94	0.75	0.43	1.55	
65	31.04	0.71	0.39	1.51	
70	29.37	0.67	0.35	1.46	
75	27.89	0.63	0.31	1.42	
90	24.29	0.55	0.23	1.26	
105	21.58	0.49	0.17	1.08	
120	19.47	0.44	0.12	0.89	

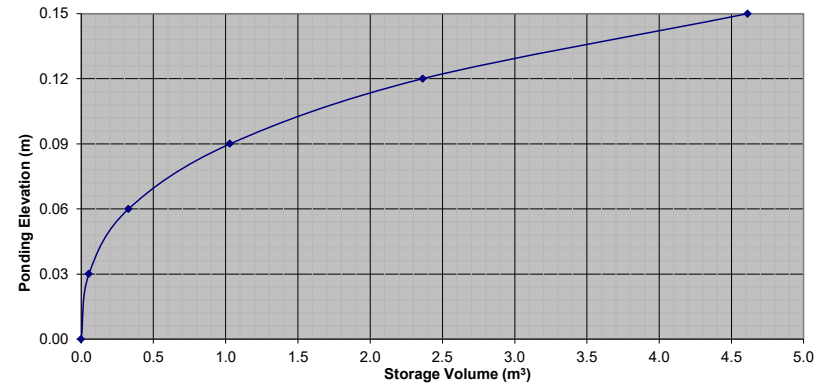
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed					
Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m ³)	
				Required	Provided
1:2 Year	0.32	0.32	9	1.1	2.4
1:5 Year	0.32	0.32	10	1.6	4.6
1:100 Year	0.32	0.32	14	3.9	4.6

Roof Drain Storage Table for Area RD 1.2		
Elevation	Area RD 1.2	Total Volume
m	m ²	m ³
0.00	0	0
0.03	3.56	0.1
0.06	14.79	0.3
0.09	32.01	1.0
0.12	56.9	2.4
0.15	92.98	4.6

Proposed Residential Development					
Novatech Project No. 120251					
REQUIRED STORAGE - 1:100 YEAR EVENT					
AREA R-1		Controlled Roof Drain #1.2			
OTTAWA IDF CURVE					
Area =	0.009	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	3.9	m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	242.70	6.14	5.82	1.75	
10	178.56	4.52	4.20	2.52	
15	142.89	3.61	3.29	2.97	
20	119.95	3.03	2.71	3.26	
25	103.85	2.63	2.31	3.46	
30	91.87	2.32	2.00	3.61	
35	82.58	2.09	1.77	3.72	
40	75.15	1.90	1.58	3.79	
45	69.05	1.75	1.43	3.85	
50	63.95	1.62	1.30	3.89	
55	59.62	1.51	1.19	3.92	
60	55.89	1.41	1.09	3.94	
65	52.65	1.33	1.01	3.95	
70	49.79	1.26	0.94	3.95	
75	47.26	1.20	0.88	3.94	
90	41.11	1.04	0.72	3.89	
105	36.50	0.92	0.60	3.80	
120	32.89	0.83	0.51	3.69	

Proposed Residential Development					
Novatech Project No. 120251					
REQUIRED STORAGE - 1:100 YEAR + 20%					
AREA R-1		Controlled Roof Drain #1.2			
OTTAWA IDF CURVE					
Area =	0.009	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	5.0	m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	291.24	7.37	7.05	2.11	
10	214.27	5.42	5.10	3.06	
15	171.47	4.34	4.02	3.62	
20	143.94	3.64	3.32	3.99	
25	124.62	3.15	2.83	4.25	
30	110.24	2.79	2.47	4.44	
35	99.09	2.51	2.19	4.59	
40	90.17	2.28	1.96	4.71	
45	82.86	2.10	1.78	4.80	
50	76.74	1.94	1.62	4.86	
55	71.55	1.81	1.49	4.92	
60	67.07	1.70	1.38	4.96	
65	63.18	1.60	1.28	4.99	
70	59.75	1.51	1.19	5.00	
75	56.71	1.43	1.11	5.02	
90	49.33	1.25	0.93	5.01	
105	43.80	1.11	0.79	4.96	
120	39.47	1.00	0.68	4.89	

Stage Storage Curve: Area R-1
Controlled Roof Drain #1.2



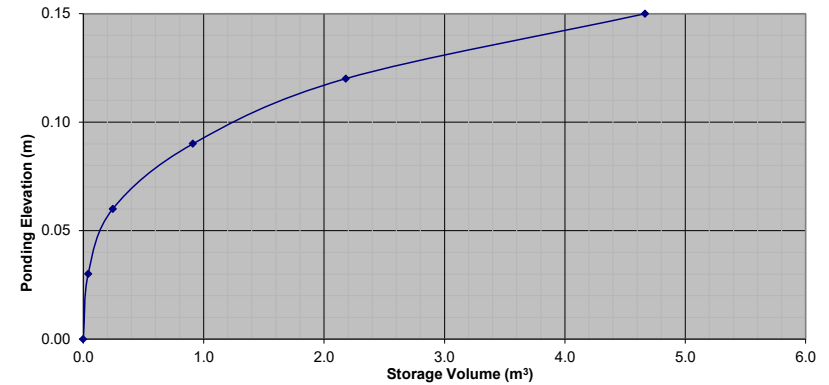
Proposed Residential Development					
Novatech Project No. 120251					
REQUIRED STORAGE - 1:2 YEAR EVENT					
AREA R-1 Controlled Roof Drain #2.1					
OTTAWA IDF CURVE					
Area =	0.011	ha	Qallow =	0.79	L/s
C =	0.90		Vol(max) =	0.9	m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	103.57	2.95	2.16	0.65	
10	76.81	2.19	1.40	0.84	
15	61.77	1.76	0.97	0.87	
20	52.03	1.48	0.69	0.83	
25	45.17	1.29	0.50	0.75	
30	40.04	1.14	0.35	0.63	
35	36.06	1.03	0.24	0.50	
40	32.86	0.94	0.15	0.35	
45	30.24	0.86	0.07	0.20	
50	28.04	0.80	0.01	0.03	
55	26.17	0.75	-0.04	-0.14	
60	24.56	0.70	-0.09	-0.32	
65	23.15	0.66	-0.13	-0.51	
70	21.91	0.63	-0.16	-0.69	
75	20.81	0.59	-0.20	-0.88	
90	18.14	0.52	-0.27	-1.47	
105	16.13	0.46	-0.33	-2.08	
120	14.56	0.42	-0.37	-2.70	

Proposed Residential Development					
Novatech Project No. 120251					
REQUIRED STORAGE - 1:5 YEAR EVENT					
AREA R-1 Controlled Roof Drain #2.1					
OTTAWA IDF CURVE					
Area =	0.011	ha	Qallow =	0.87	L/s
C =	0.90		Vol(max) =	1.5	m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	141.18	4.03	3.24	0.97	
10	104.19	2.97	2.18	1.31	
15	83.56	2.38	1.59	1.43	
20	70.25	2.00	1.21	1.46	
25	60.90	1.74	0.95	1.42	
30	53.93	1.54	0.75	1.35	
35	48.52	1.38	0.59	1.25	
40	44.18	1.26	0.47	1.13	
45	40.63	1.16	0.37	1.00	
50	37.65	1.07	0.28	0.85	
55	35.12	1.00	0.21	0.70	
60	32.94	0.94	0.15	0.54	
65	31.04	0.89	0.10	0.37	
70	29.37	0.84	0.05	0.20	
75	27.89	0.80	0.01	0.02	
90	24.29	0.69	-0.10	-0.53	
105	21.58	0.62	-0.17	-1.10	
120	19.47	0.56	-0.23	-1.69	

Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to 1/4 open					
Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m ³)	
				Required	Provided
1:2 Year	0.32	0.79	10	0.9	2.2
1:5 Year	0.32	0.87	12	1.5	4.7
1:100 Year	0.32	0.95	14	3.5	4.7

Roof Drain Storage Table for Area RD 2.1		
Elevation	Area RD 2.1	Total Volume
m	m ²	m ³
0.00	0	0
0.03	2.74	0.0
0.06	10.94	0.2
0.09	33.32	0.9
0.12	51.38	2.2
0.15	114.37	4.7

Stage Storage Curve: Area R-1
Controlled Roof Drain #2.1



Proposed Residential Development					
Novatech Project No. 120251					
REQUIRED STORAGE - 1:100 YEAR EVENT					
AREA R-1 Controlled Roof Drain #2.1					
OTTAWA IDF CURVE					
Area =	0.011	ha	Qallow =	0.95	L/s
C =	1.00		Vol(max) =	3.5	m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	242.70	7.69	6.74	2.02	
10	178.56	5.66	4.71	2.83	
15	142.89	4.53	3.58	3.22	
20	119.95	3.80	2.85	3.42	
25	103.85	3.29	2.34	3.51	
30	91.87	2.91	1.96	3.53	
35	82.58	2.62	1.67	3.50	
40	75.15	2.38	1.43	3.44	
45	69.05	2.19	1.24	3.34	
50	63.95	2.03	1.08	3.23	
55	59.62	1.89	0.94	3.10	
60	55.89	1.77	0.82	2.96	
65	52.65	1.67	0.72	2.80	
70	49.79	1.58	0.63	2.64	
75	47.26	1.50	0.55	2.46	
90	41.11	1.30	0.35	1.91	
105	36.50	1.16	0.21	1.30	
120	32.89	1.04	0.09	0.67	

Proposed Residential Development					
Novatech Project No. 120251					
REQUIRED STORAGE - 1:100 YEAR + 20%					
AREA R-1 Controlled Roof Drain #2.1					
OTTAWA IDF CURVE					
Area =	0.011	ha	Qallow =	0.79	L/s
C =	1.00		Vol(max) =	5.0	m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	291.24	9.23	8.44	2.53	
10	214.27	6.79	6.00	3.60	
15	171.47	5.43	4.64	4.18	
20	143.94	4.56	3.77	4.53	
25	124.62	3.95	3.16	4.74	
30	110.24	3.49	2.70	4.87	
35	99.09	3.14	2.35	4.94	
40	90.17	2.86	2.07	4.96	
45	82.86	2.63	1.84	4.96	
50	76.74	2.43	1.64	4.93	
55	71.55	2.27	1.48	4.88	
60	67.07	2.13	1.34	4.81	
65	63.18	2.00	1.21	4.73	
70	59.75	1.89	1.10	4.63	
75	56.71	1.80	1.01	4.53	
90	49.33	1.56	0.77	4.18	
105	43.80	1.39	0.60	3.77	
120	39.47	1.25	0.46	3.32	

Proposed Residential Development					
Novatech Project No. 120251					
REQUIRED STORAGE - 1:2 YEAR EVENT					
AREA R-1		Controlled Roof Drain #2.2			
OTTAWA IDF CURVE					
Area =	0.008	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	0.8	m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	103.57	2.02	1.70	0.51	
10	76.81	1.50	1.18	0.71	
15	61.77	1.20	0.88	0.80	
20	52.03	1.01	0.69	0.83	
25	45.17	0.88	0.56	0.84	
30	40.04	0.78	0.46	0.83	
35	36.06	0.70	0.38	0.80	
40	32.86	0.64	0.32	0.77	
45	30.24	0.59	0.27	0.73	
50	28.04	0.55	0.23	0.68	
55	26.17	0.51	0.19	0.63	
60	24.56	0.48	0.16	0.57	
65	23.15	0.45	0.13	0.51	
70	21.91	0.43	0.11	0.45	
75	20.81	0.41	0.09	0.39	
90	18.14	0.35	0.03	0.18	
105	16.13	0.31	-0.01	-0.03	
120	14.56	0.28	-0.04	-0.26	

Proposed Residential Development					
Novatech Project No. 120251					
REQUIRED STORAGE - 1:5 YEAR EVENT					
AREA R-1		Controlled Roof Drain #2.2			
OTTAWA IDF CURVE					
Area =	0.008	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	1.3	m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	141.18	2.75	2.43	0.73	
10	104.19	2.03	1.71	1.03	
15	83.56	1.63	1.31	1.18	
20	70.25	1.37	1.05	1.26	
25	60.90	1.19	0.87	1.30	
30	53.93	1.05	0.73	1.32	
35	48.52	0.95	0.63	1.31	
40	44.18	0.86	0.54	1.30	
45	40.63	0.79	0.47	1.27	
50	37.65	0.73	0.41	1.24	
55	35.12	0.68	0.36	1.20	
60	32.94	0.64	0.32	1.16	
65	31.04	0.61	0.29	1.11	
70	29.37	0.57	0.25	1.06	
75	27.89	0.54	0.22	1.01	
90	24.29	0.47	0.15	0.83	
105	21.58	0.42	0.10	0.63	
120	19.47	0.38	0.06	0.43	

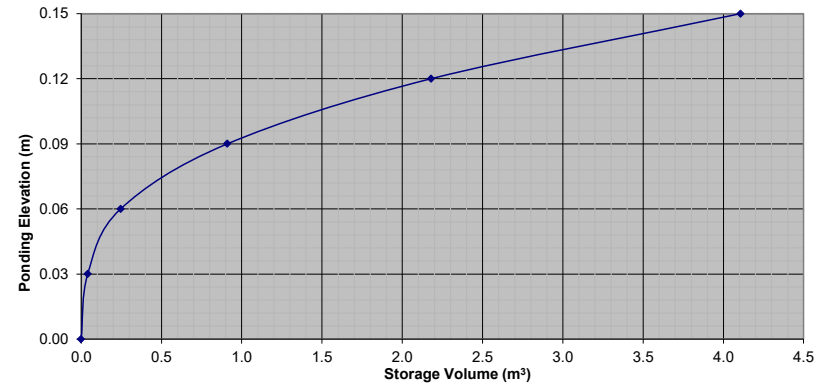
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed					
Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m ³)	
				Required	Provided
1:2 Year	0.32	0.32	9	0.8	2.2
1:5 Year	0.32	0.32	10	1.3	4.1
1:100 Year	0.32	0.32	13	3.2	4.1

Roof Drain Storage Table for Area RD 2.2		
Elevation	Area RD 2.2	Total Volume
m	m ²	m ³
0.00	0	0
0.03	2.74	0.0
0.06	10.94	0.2
0.09	33.32	0.9
0.12	51.38	2.2
0.15	77.06	4.1

Proposed Residential Development					
Novatech Project No. 120251					
REQUIRED STORAGE - 1:100 YEAR EVENT					
AREA R-1		Controlled Roof Drain #2.2			
OTTAWA IDF CURVE					
Area =	0.008	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	3.2	m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	242.70	5.26	4.94	1.48	
10	178.56	3.87	3.55	2.13	
15	142.89	3.09	2.77	2.50	
20	119.95	2.60	2.28	2.73	
25	103.85	2.25	1.93	2.89	
30	91.87	1.99	1.67	3.01	
35	82.58	1.79	1.47	3.08	
40	75.15	1.63	1.31	3.14	
45	69.05	1.50	1.18	3.17	
50	63.95	1.39	1.07	3.20	
55	59.62	1.29	0.97	3.21	
60	55.89	1.21	0.89	3.21	
65	52.65	1.14	0.82	3.20	
70	49.79	1.08	0.76	3.18	
75	47.26	1.02	0.70	3.17	
90	41.11	0.89	0.57	3.08	
105	36.50	0.79	0.47	2.96	
120	32.89	0.71	0.39	2.83	

Proposed Residential Development					
Novatech Project No. 120251					
REQUIRED STORAGE - 1:100 YEAR + 20%					
AREA R-1		Controlled Roof Drain #2.2			
OTTAWA IDF CURVE					
Area =	0.008	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	4.1	m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	291.24	6.31	5.99	1.80	
10	214.27	4.64	4.32	2.59	
15	171.47	3.71	3.39	3.05	
20	143.94	3.12	2.80	3.36	
25	124.62	2.70	2.38	3.57	
30	110.24	2.39	2.07	3.72	
35	99.09	2.15	1.83	3.83	
40	90.17	1.95	1.63	3.92	
45	82.86	1.79	1.47	3.98	
50	76.74	1.66	1.34	4.03	
55	71.55	1.55	1.23	4.06	
60	67.07	1.45	1.13	4.08	
65	63.18	1.37	1.05	4.09	
70	59.75	1.29	0.97	4.09	
75	56.71	1.23	0.91	4.09	
90	49.33	1.07	0.75	4.04	
105	43.80	0.95	0.63	3.96	
120	39.47	0.85	0.53	3.85	

Stage Storage Curve: Area R-1
Controlled Roof Drain #2.2



Proposed Residential Development					
Novatech Project No. 120251					
REQUIRED STORAGE - 1:2 YEAR EVENT					
AREA R-1		Controlled Roof Drain #2.3			
OTTAWA IDF CURVE					
Area =	0.008	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	0.8	m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	103.57	2.02	1.70	0.51	
10	76.81	1.50	1.18	0.71	
15	61.77	1.20	0.88	0.80	
20	52.03	1.01	0.69	0.83	
25	45.17	0.88	0.56	0.84	
30	40.04	0.78	0.46	0.83	
35	36.06	0.70	0.38	0.80	
40	32.86	0.64	0.32	0.77	
45	30.24	0.59	0.27	0.73	
50	28.04	0.55	0.23	0.68	
55	26.17	0.51	0.19	0.63	
60	24.56	0.48	0.16	0.57	
65	23.15	0.45	0.13	0.51	
70	21.91	0.43	0.11	0.45	
75	20.81	0.41	0.09	0.39	
90	18.14	0.35	0.03	0.18	
105	16.13	0.31	-0.01	-0.03	
120	14.56	0.28	-0.04	-0.26	

Proposed Residential Development					
Novatech Project No. 120251					
REQUIRED STORAGE - 1:5 YEAR EVENT					
AREA R-1		Controlled Roof Drain #2.3			
OTTAWA IDF CURVE					
Area =	0.008	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	1.3	m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	141.18	2.75	2.43	0.73	
10	104.19	2.03	1.71	1.03	
15	83.56	1.63	1.31	1.18	
20	70.25	1.37	1.05	1.26	
25	60.90	1.19	0.87	1.30	
30	53.93	1.05	0.73	1.32	
35	48.52	0.95	0.63	1.31	
40	44.18	0.86	0.54	1.30	
45	40.63	0.79	0.47	1.27	
50	37.65	0.73	0.41	1.24	
55	35.12	0.68	0.36	1.20	
60	32.94	0.64	0.32	1.16	
65	31.04	0.61	0.29	1.11	
70	29.37	0.57	0.25	1.06	
75	27.89	0.54	0.22	1.01	
90	24.29	0.47	0.15	0.83	
105	21.58	0.42	0.10	0.63	
120	19.47	0.38	0.06	0.43	

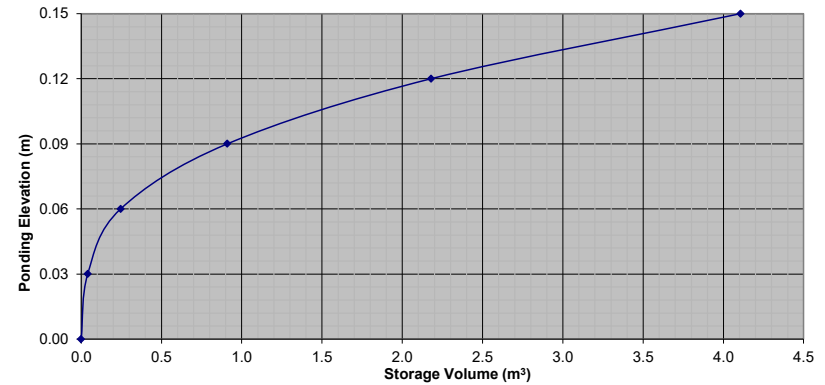
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed					
Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m ³)	
				Required	Provided
1:2 Year	0.32	0.32	9	0.8	2.2
1:5 Year	0.32	0.32	10	1.3	4.1
1:100 Year	0.32	0.32	13	3.2	4.1

Roof Drain Storage Table for Area RD 2.2		
Elevation	Area RD 2.2	Total Volume
m	m ²	m ³
0.00	0	0
0.03	2.74	0.0
0.06	10.94	0.2
0.09	33.32	0.9
0.12	51.38	2.2
0.15	77.06	4.1

Proposed Residential Development					
Novatech Project No. 120251					
REQUIRED STORAGE - 1:100 YEAR EVENT					
AREA R-1		Controlled Roof Drain #2.3			
OTTAWA IDF CURVE					
Area =	0.008	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	3.2	m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	242.70	5.26	4.94	1.48	
10	178.56	3.87	3.55	2.13	
15	142.89	3.09	2.77	2.50	
20	119.95	2.60	2.28	2.73	
25	103.85	2.25	1.93	2.89	
30	91.87	1.99	1.67	3.01	
35	82.58	1.79	1.47	3.08	
40	75.15	1.63	1.31	3.14	
45	69.05	1.50	1.18	3.17	
50	63.95	1.39	1.07	3.20	
55	59.62	1.29	0.97	3.21	
60	55.89	1.21	0.89	3.21	
65	52.65	1.14	0.82	3.20	
70	49.79	1.08	0.76	3.18	
75	47.26	1.02	0.70	3.17	
90	41.11	0.89	0.57	3.08	
105	36.50	0.79	0.47	2.96	
120	32.89	0.71	0.39	2.83	

Proposed Residential Development					
Novatech Project No. 120251					
REQUIRED STORAGE - 1:100 YEAR + 20%					
AREA R-1		Controlled Roof Drain #2.3			
OTTAWA IDF CURVE					
Area =	0.008	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	4.1	m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	291.24	6.31	5.99	1.80	
10	214.27	4.64	4.32	2.59	
15	171.47	3.71	3.39	3.05	
20	143.94	3.12	2.80	3.36	
25	124.62	2.70	2.38	3.57	
30	110.24	2.39	2.07	3.72	
35	99.09	2.15	1.83	3.83	
40	90.17	1.95	1.63	3.92	
45	82.86	1.79	1.47	3.98	
50	76.74	1.66	1.34	4.03	
55	71.55	1.55	1.23	4.06	
60	67.07	1.45	1.13	4.08	
65	63.18	1.37	1.05	4.09	
70	59.75	1.29	0.97	4.09	
75	56.71	1.23	0.91	4.09	
90	49.33	1.07	0.75	4.04	
105	43.80	0.95	0.63	3.96	
120	39.47	0.85	0.53	3.85	

Stage Storage Curve: Area R-1
Controlled Roof Drain #2.3



APPENDIX F

Inlet Control Device (ICD) Information

IPEX Tempest™ Inlet Control Devices

Municipal Technical Manual Series

Vol. I, 2nd Edition

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The information contained here within is based on current information and product design at the time of publication and is subject to change without notification. IPEX does not guarantee or warranty the accuracy, suitability for particular applications, or results to be obtained therefrom.

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:

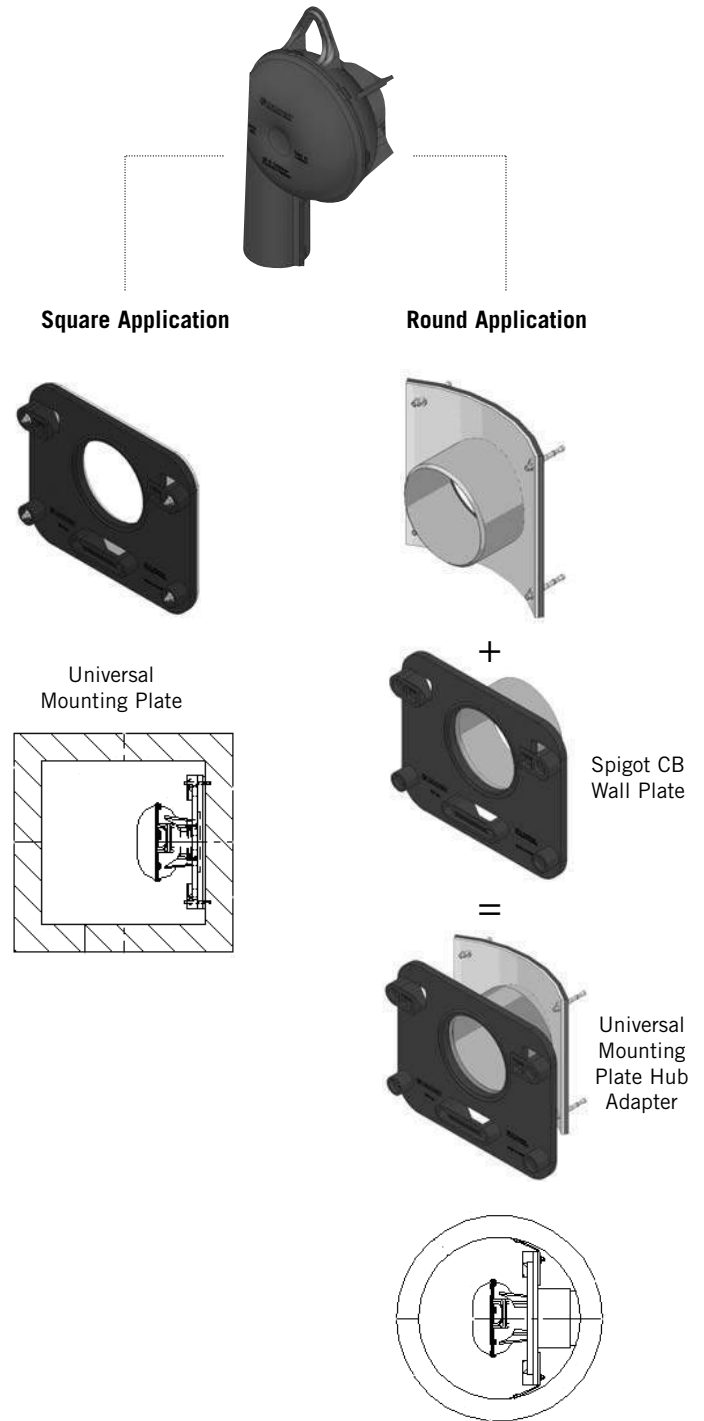


Chart 1: LMF 14 Preset Flow Curves

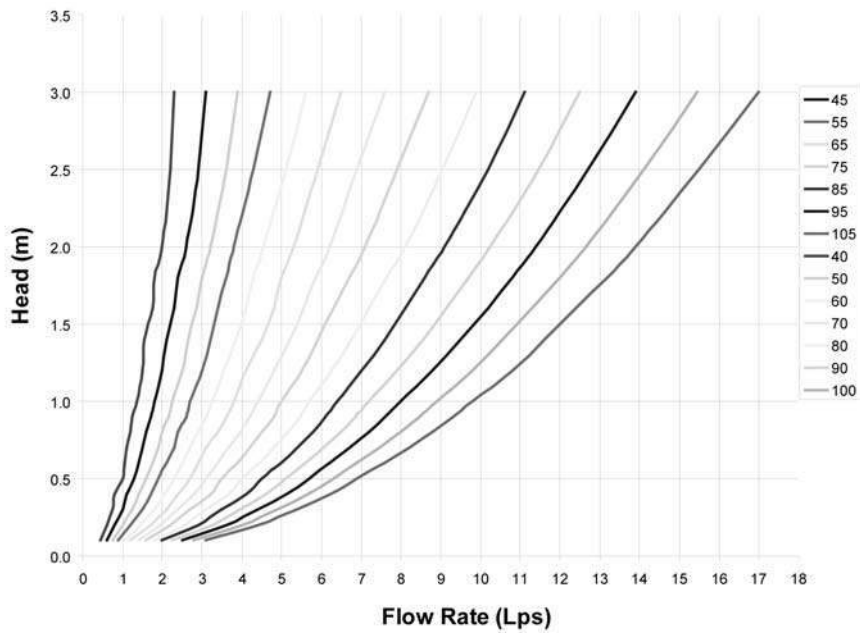
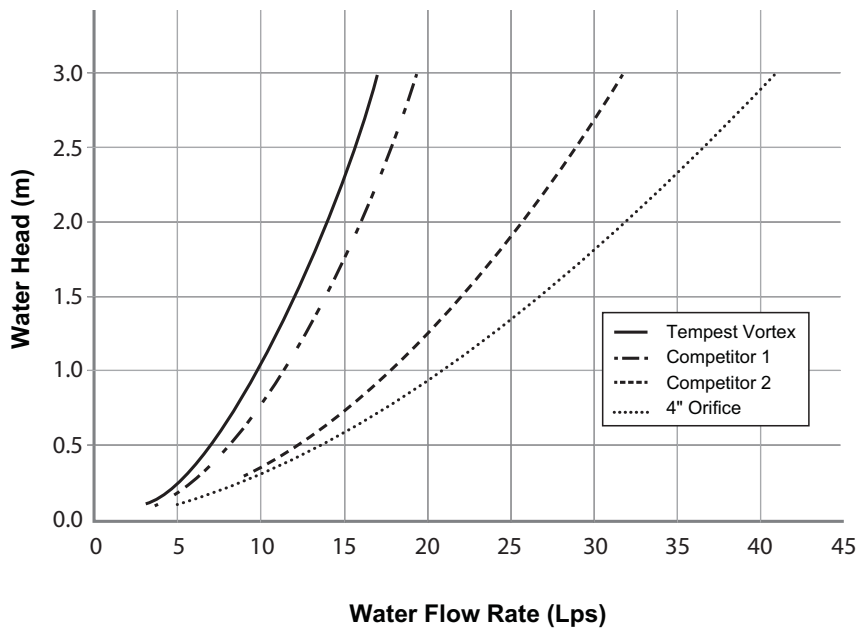


Chart 2: LMF Flow vs. ICD Alternatives



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 www.ipexinc.com.
- Call your IPEX representative for more information or if you have any questions about our products.

PRODUCT TECHNICAL SPECIFICATION

General

Inlet control devices (ICD's) are designed to provide flow control at a specified rate for a given water head level and also provide odour and floatable control. All ICD's will be IPEX Tempest or approved equal.

All devices shall be removable from a universal mounting plate. An operator from street level using only a T-bar with a hook will be able to retrieve the device while leaving the universal mounting plate secured to the catch basin wall face. The removal of the TEMPEST devices listed above must not require any unbolting or special manipulation or any special tools.

High Flow (HF) Sump devices will consist of a removable threaded cap which can be accessible from street level with out entry into the catchbasin (CB). The removal of the threaded cap shall not require any special tools other than the operator's hand.

ICD's shall have no moving parts.

Materials

ICD's are to be manufactured from Polyvinyl Chloride (PVC) or Polyurethane material, designed to be durable enough to withstand multiple freeze-thaw cycles and exposure to harsh elements.

The inner ring seal will be manufactured using a Buna or Nitrile material with hardness between Duro 50 and Duro 70.

The wall seal is to be comprised of a 3/8" thick Neoprene Closed Cell Sponge gasket which is attached to the back of the wall plate.

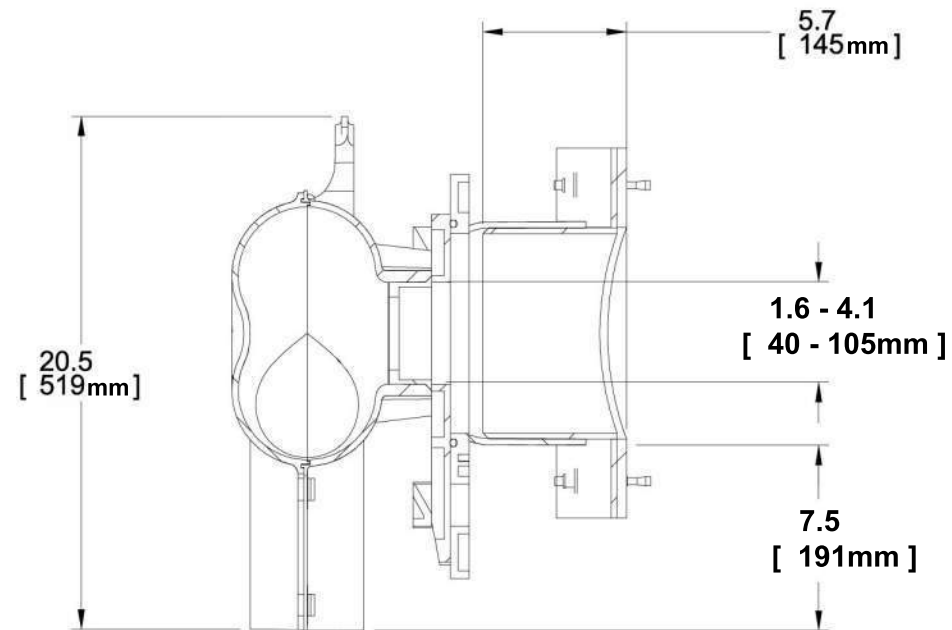
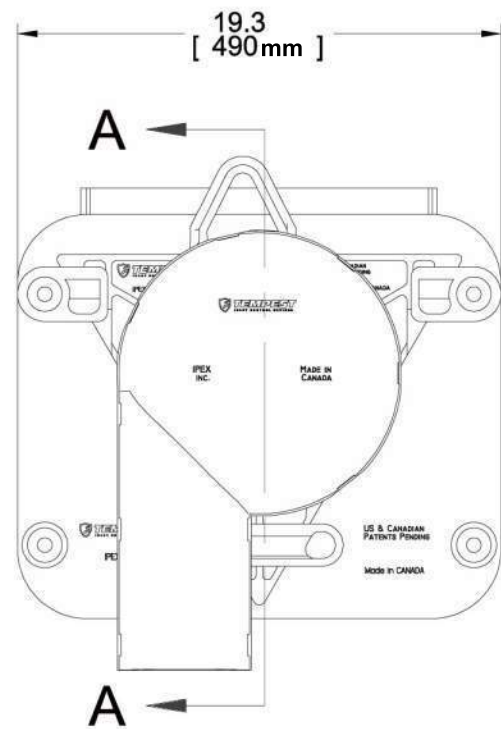
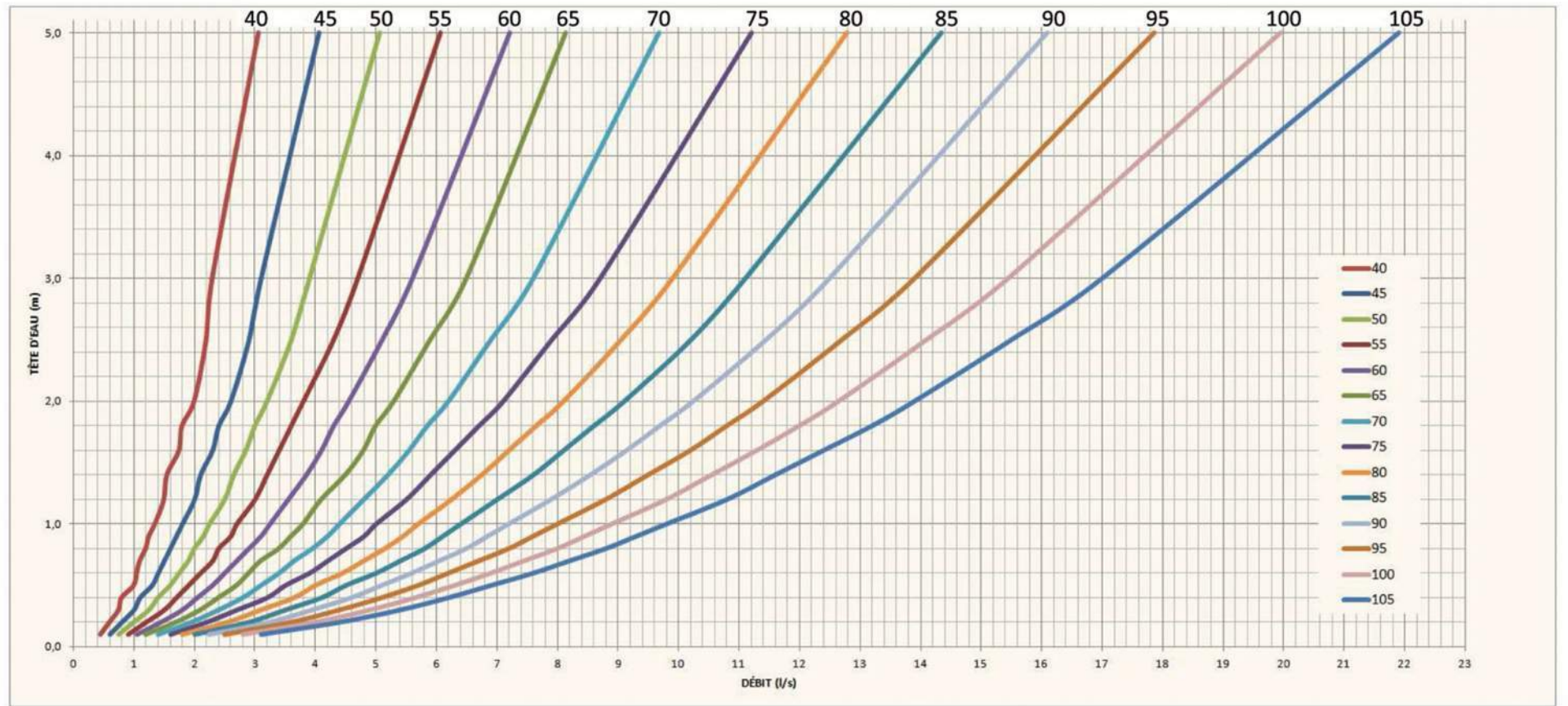
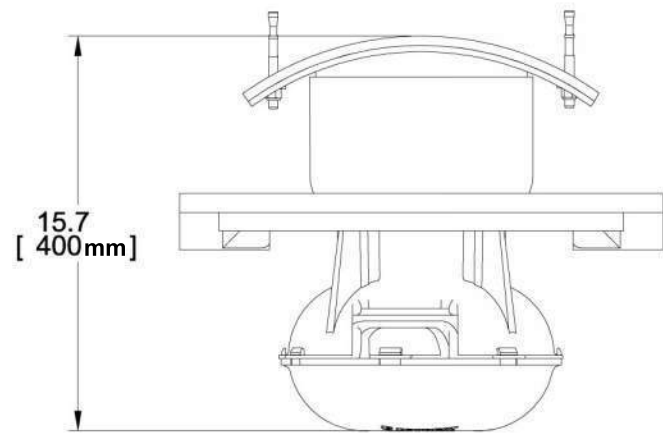
All hardware will be made from 304 stainless steel.

Dimensioning

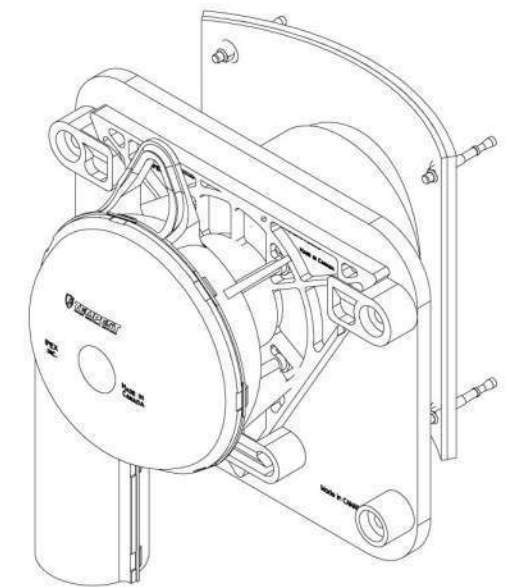
The Low Medium Flow (LMF), High Flow (HF) and the High Flow (HF) Sump shall allow for a minimum outlet pipe diameter of 200mm with a 600mm deep Catch Basin sump.

Installation

Contractor shall be responsible for securing, supporting and connecting the ICD's to the existing influent pipe and catchbasin/manhole structure as specified and designed by the Engineer.



SECTION A-A



APPENDIX G

Flow Control Roof Drain Information



Adjustable Accutrol Weir
 Tag: RD-100-A-ADJ

**Adjustable Flow Control
 for Roof Drains**

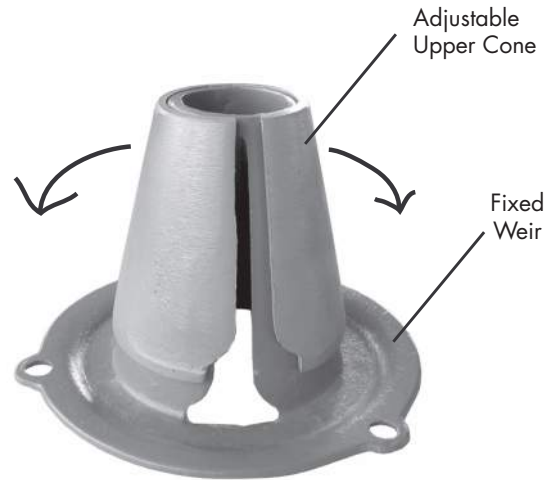
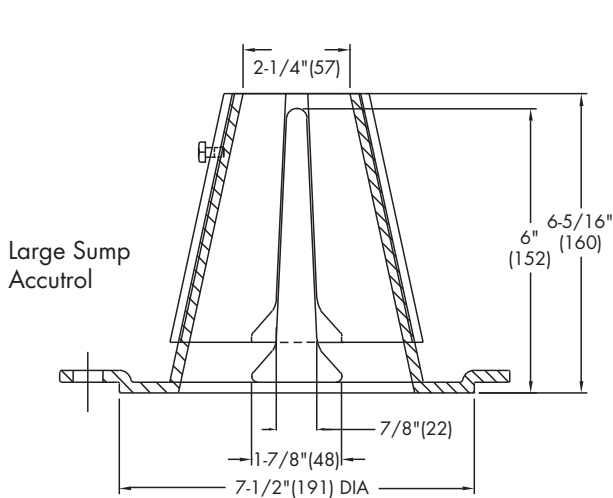
ADJUSTABLE ACCUTROL (for Large Sump Roof Drains only)

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

Job Name _____
 Job Location _____
 Engineer _____

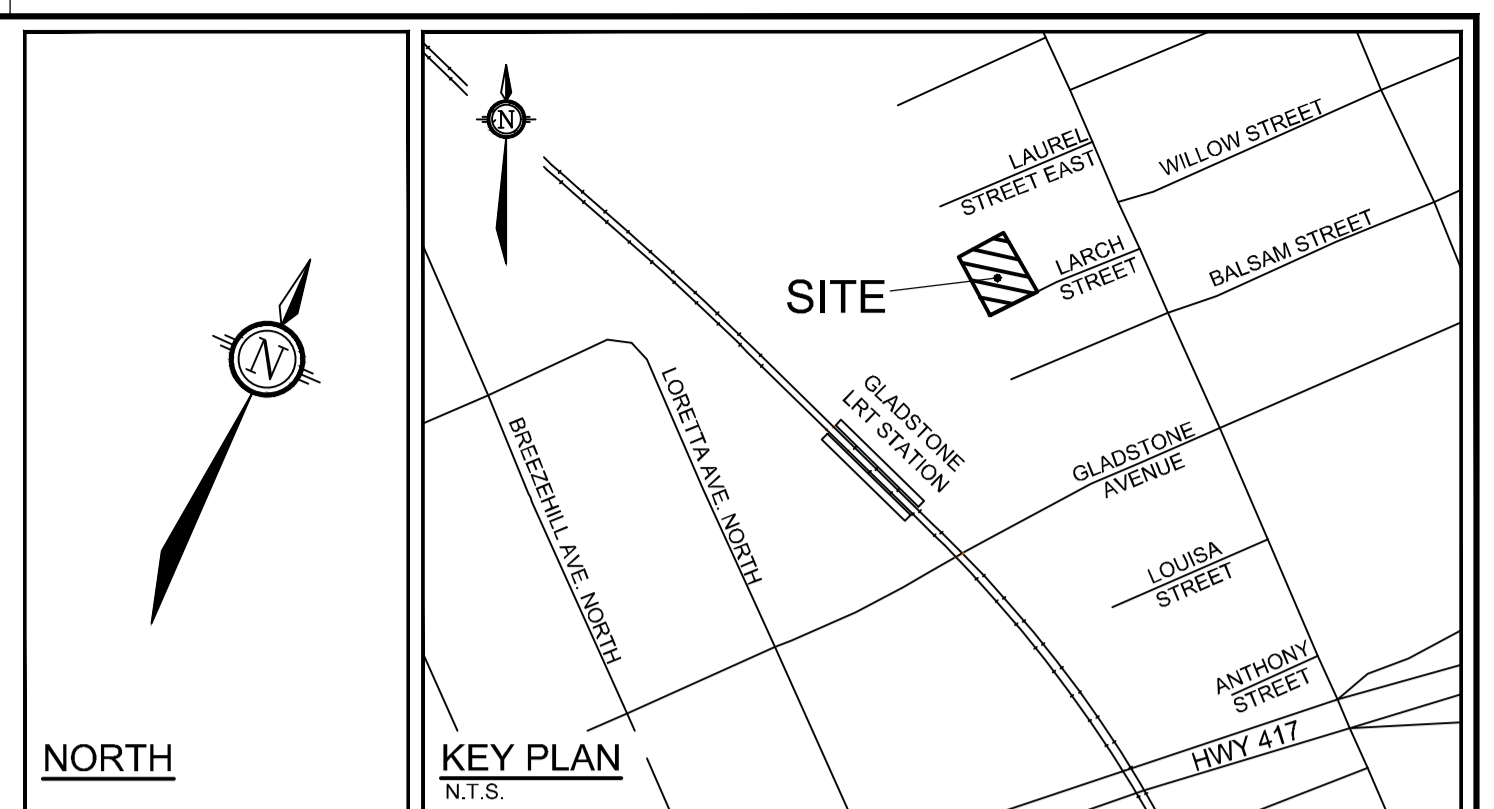
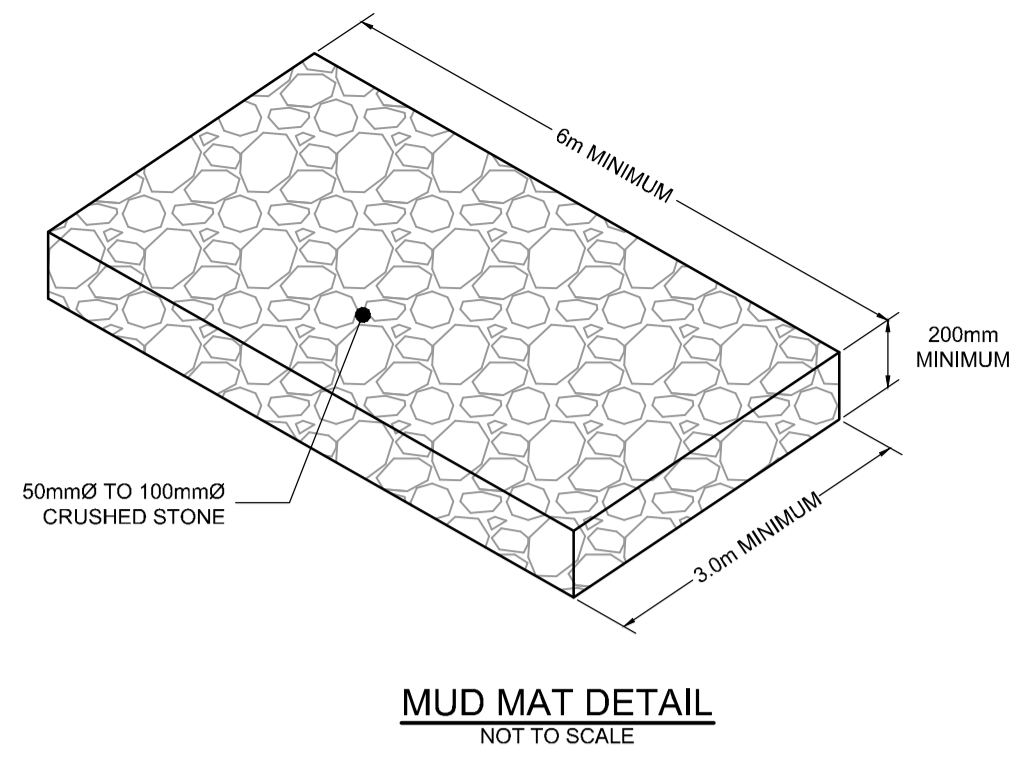
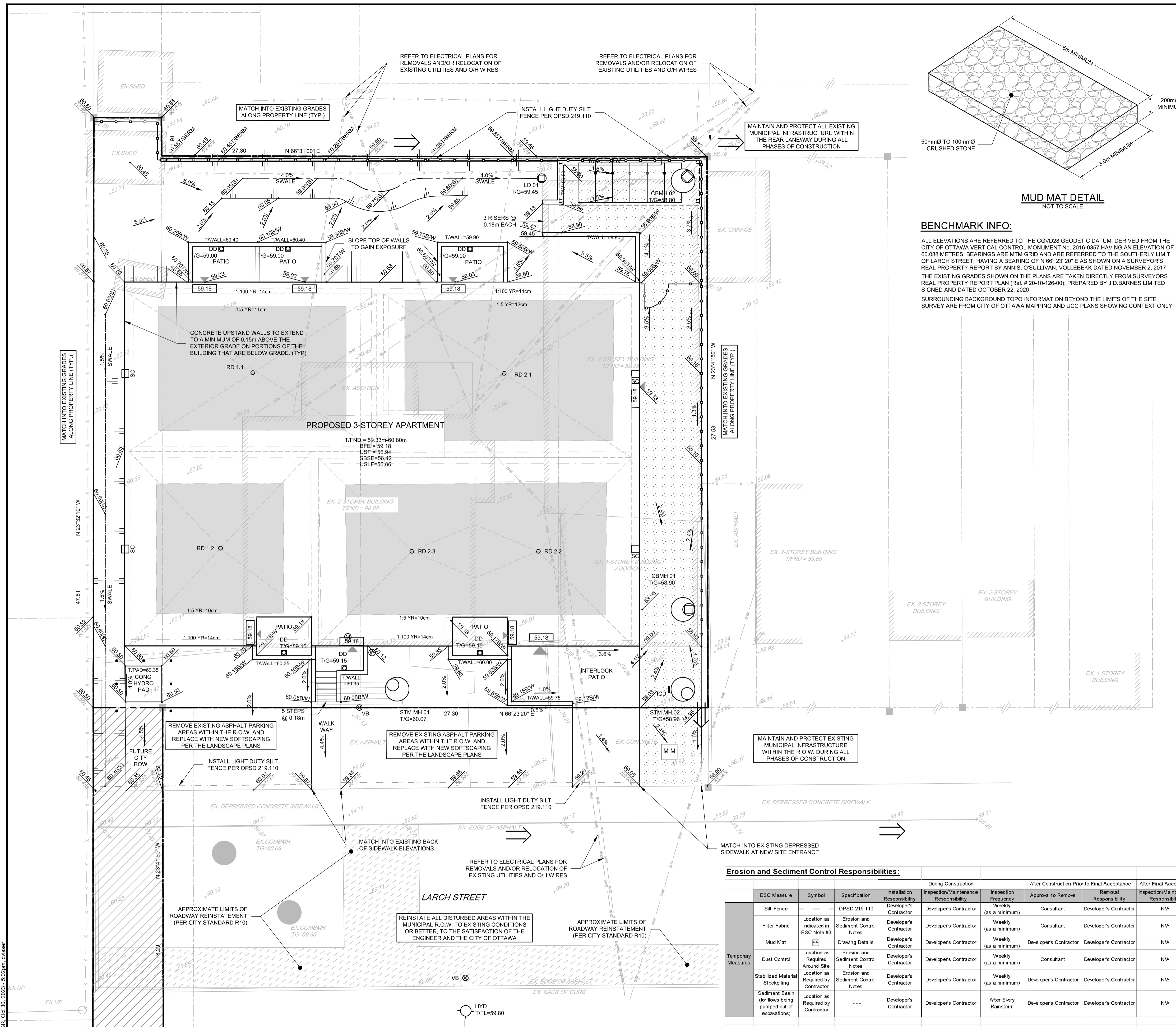
Contractor _____
 Contractor's P.O. No. _____
 Representative _____

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

USA: Tel: (800) 338-2581 • Fax: (828) 248-3929 • Watts.com
 Canada: Tel: (905) 332-4090 • Fax: (905) 332-7068 • Watts.ca
 Latin America: Tel: (52) 81-1001-8600 • Fax: (52) 81-8000-7091 • Watts.com



APPENDIX H
Engineering Drawings



BENCHMARK INFO:

ALL ELEVATIONS ARE REFERRED TO THE CGVD28 GEODETIC DATUM, DERIVED FROM THE CITY OF OTTAWA VERTICAL CONTROL MONUMENT No. 2016-0357 HAVING AN ELEVATION OF 60.088 METRES. BEARINGS ARE MTM GRID AND ARE REFERRED TO THE SOUTHERLY LIMIT OF LARCH STREET, HAVING A BEARING OF N 66° 23' 20" E AS SHOWN ON A SURVEYOR'S REAL PROPERTY REPORT BY ANNIS, O'SULLIVAN, VOLLEBEK DATED NOVEMBER 2, 2017 THE EXISTING GRADES SHOWN ON THE PLANS ARE TAKEN DIRECTLY FROM SURVEYORS REAL PROPERTY REPORT PLAN (Ref. # 20-10-126-00), PREPARED BY J.D. BARNES LIMITED SIGNED AND DATED OCTOBER 22, 2020. SURROUNDING BACKGROUND TOPO INFORMATION BEYOND THE LIMITS OF THE SITE SURVEY ARE FROM CITY OF OTTAWA MAPPING AND UCC PLANS SHOWING CONTEXT ONLY.

LEGEND

- PROPERTY LINE
 - PROPOSED ELEVATION
 - EXISTING ELEVATION
 - GRADE AND DIRECTION
 - PROPOSED ELEVATION
 - DIRECTION OF MAJOR SYSTEM OVERLAND FLOW
 - TOP OF FOUNDATION WALL ELEVATION
 - BASEMENT FLOOR ELEVATION
 - UNDERSIDE OF FOOTING ELEVATION
 - SUB-BASEMENT SLAB ELEVATION
 - UNDERSIDE OF LOW FOOTING ELEVATION
 - PROPOSED CONTROLLED FLOW ROOF DRAIN
 - PROPOSED ROOFTOP SCUPPER LOCATION
 - BUILDING ENTRANCE / EXIT
 - APPROXIMATE PONDING LIMITS
 - REMOVAL AND/OR ABANDONMENT
 - PROPOSED VALVE AND VALVE BOX
 - PROPOSED STORM MANHOLE
 - PROPOSED SANITARY MANHOLE
 - EXISTING EDGE OF PAVEMENT
 - EXISTING VALVE & VALVE BOX
 - EXISTING HYDRANT
 - EXISTING COMBINED MH
 - EXISTING CATCHBASIN
 - EXISTING UTILITY POLE
 - EXISTING FENCE
 - EXISTING OVERHEAD WIRES
- PAVEMENT STRUCTURES:**
- LIGHT-DUTY PERMEABLE PAVERS
 - LIGHT-DUTY ASPHALT PAVEMENT
 - HEAVY-DUTY ROADWAY RE-INSTATEMENT

GENERAL NOTES:

- COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
- DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
- OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
- BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR \$5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
- RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
- REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
- ALL ELEVATIONS ARE GEODETIC.
- REFER TO GEOTECHNICAL INVESTIGATION REPORT (NUMBER PG6071-1, REV.1), DATED FEBRUARY 11, 2022, PREPARED BY PATERSON GROUP INC. FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
- REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARD SURFACE AREAS AND DIMENSIONS.
- REFER TO DEVELOPMENT SERVING STUDY & STORMWATER MANAGEMENT REPORT(R-2022-001) PREPARED BY NOVATECH.
- SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).

GRADING NOTES:

- ALL TOPSOIL, ORGANIC OR DELETERIOUS MATERIAL MUST BE ENTIRELY REMOVED FROM BENEATH THE PROPOSED PAVED AREAS AS DIRECTED BY THE SITE ENGINEER OR GEOTECHNICAL ENGINEER.
- EXPOSED SUBGRADES IN PROPOSED PAVED AREAS SHOULD BE PROOF ROLLED WITH A LARGE STEEL DRUM ROLLER AND INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF GRANULARS.
- ANY SOFT AREAS EVIDENT FROM THE PROOF ROLLING SHOULD BE SUB-EXCAVATED AND REPLACED WITH SUITABLE MATERIAL THAT IS FROST COMPATIBLE WITH THE EXISTING SOILS AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
- THE GRANULAR BASE SHOULD BE COMPACTED TO AT LEAST 100% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE. ANY ADDITIONAL GRANULAR FILL USED BELOW THE PROPOSED PAVEMENT SHOULD BE COMPACTED TO AT LEAST 98% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE.
- MINIMUM OF 2% GRADE FOR ALL GRASS AREAS UNLESS OTHERWISE NOTED.
- MAXIMUM TERRACING GRADE TO BE 3:1 UNLESS OTHERWISE NOTED.
- ALL GRADES BY CURBS ARE EDGE OF PAVEMENT GRADES UNLESS OTHERWISE INDICATED.
- ALL CURBS SHALL BE BARRIER CURB (150mm) UNLESS OTHERWISE NOTED AND CONSTRUCTED AS PER CITY OF OTTAWA STANDARDS (SC1.1).
- REFER TO LANDSCAPE PLAN FOR PLANTING AND OTHER LANDSCAPE FEATURE DETAILS.
- CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GRADING PLAN INDICATING AS-BUILT ELEVATIONS OF ALL DESIGN GRADES SHOWN ON THIS PLAN.

EROSION AND SEDIMENT CONTROL NOTES:

- ALL EROSION AND SEDIMENT CONTROLS ARE TO BE INSTALLED TO THE SATISFACTION OF THE ENGINEER AND THE CITY OF OTTAWA. THEY ARE TO BE APPROPRIATE TO THE SITE CONDITIONS, PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.) AND DURING ALL PHASES OF SITE PREPARATION AND CONSTRUCTION. THESE PRACTICES ARE TO BE IMPLEMENTED IN ACCORDANCE WITH THE CURRENT BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL AND SHOULD INCLUDE AS A MINIMUM THOSE MEASURES INDICATED ON THE PLAN.
- TO PREVENT SURFACE EROSION FROM ENTERING ANY STORM SEWER SYSTEM DURING CONSTRUCTION, FILTER BAGS WILL BE PLACED UNDER GRATES OF NEARBY CATCHBASINS AND STRUCTURES. A LIGHT DUTY SILT FENCE BARRIER WILL ALSO BE INSTALLED AROUND THE CONSTRUCTION AREA (WHERE APPLICABLE). THESE CONTROL MEASURES WILL REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE.
- THE SEDIMENT CONTROL MEASURES SHALL ONLY BE REMOVED WHEN, IN THE OPINION OF THE ENGINEER, THE MEASURES ARE NO LONGER REQUIRED. NO CONTROL MEASURES MAY BE PERMANENTLY REMOVED WITHOUT PRIOR AUTHORIZATION FROM THE ENGINEER.
- THE CONTRACTOR SHALL IMMEDIATELY REPORT TO THE ENGINEER ANY ACCIDENTAL DISCHARGES OF SEDIMENT MATERIAL INTO ANY STORM SEWER SYSTEM. APPROPRIATE RESPONSE MEASURES, INCLUDING ANY REPAIRS TO EXISTING CONTROL MEASURES OR THE IMPLEMENTATION OF ADDITIONAL CONTROL MEASURES, SHALL BE CARRIED OUT BY THE CONTRACTOR WITHOUT DELAY.
- THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
- ROADWAYS ARE TO BE SWEEP AS REQUIRED OR AS DIRECTED BY THE ENGINEER AND/OR MUNICIPALITY.
- THE CONTRACTOR SHALL ENSURE PROPER DUST CONTROL IS PROVIDED WITH THE APPLICATION OF WATER (AND IF REQUIRED, CALCIUM CHLORIDE) DURING DRY PERIODS.

Erosion and Sediment Control Responsibilities:

ESC Measure	Symbol	Specification	During Construction		After Construction Prior to Final Acceptance		After Final Acceptance	
			Installation Responsibility	Inspection/Maintenance Frequency	Approval to Remove	Removal Responsibility	Inspection/Maintenance Frequency	Inspection/Maintenance Responsibility
Silt Fence	---	OPSD 219.110	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Consultant	Developer's Contractor	N/A
Filter Fabric	Location as indicated in ESC Note #3	Erosion and Sediment Control Notes	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Consultant	Developer's Contractor	N/A
Mud Mat	---	Drawing Details	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Developer's Contractor	Developer's Contractor	N/A
Dust Control	Location as Required Around Site	Erosion and Sediment Control Notes	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Consultant	Developer's Contractor	N/A
Stabilized Material Stockpiling	Location as Required by Contractor	Erosion and Sediment Control Notes	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Developer's Contractor	Developer's Contractor	N/A
Sediment Basin (for flows being pumped out of excavations)	Location as Required by Contractor	---	Developer's Contractor	Developer's Contractor	After Every Rainstorm	Developer's Contractor	Developer's Contractor	N/A

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMANS, 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.

OWNER INFORMATION
15-19 LARCH ST. INC.
359 KENT STREET, SUITE 503
OTTAWA, ONTARIO, K2P 0R6
ROBERTO CAMPAGNA
PHONE: (613) 851-7823
roberto@rochomes.ca

No.	REVISION	DATE	BY
4	REVISED PER NEW SITE PLAN	OCT 27/23	MS
3	REVISED PER ADDITIONAL CITY COMMENTS	MAR 27/23	MS
2	REVISED PER CITY COMMENTS	SEPT 2/22	MS
1	ISSUED FOR SITE PLAN APPROVAL	FEB 17/22	MS

SCALE

1:100

0 1 2 3 4

DESIGN

CHECKED SM

MS

DRAWN DWM / SM

CHECKED SM

APPROVED MS

FOR REVIEW ONLY

PROFESSIONAL ENGINEER

M. SAVIC

100102651

10/27/23

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NOVATECH

Engineers, Planners & Landscape Architects

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Ottawa, Ontario, Canada K2M 1P6

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Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
15 LARCH STREET

DRAWING NAME
GRADING, DRAINAGE AND SEDIMENT CONTROL PLAN

PROJECT No. 120251

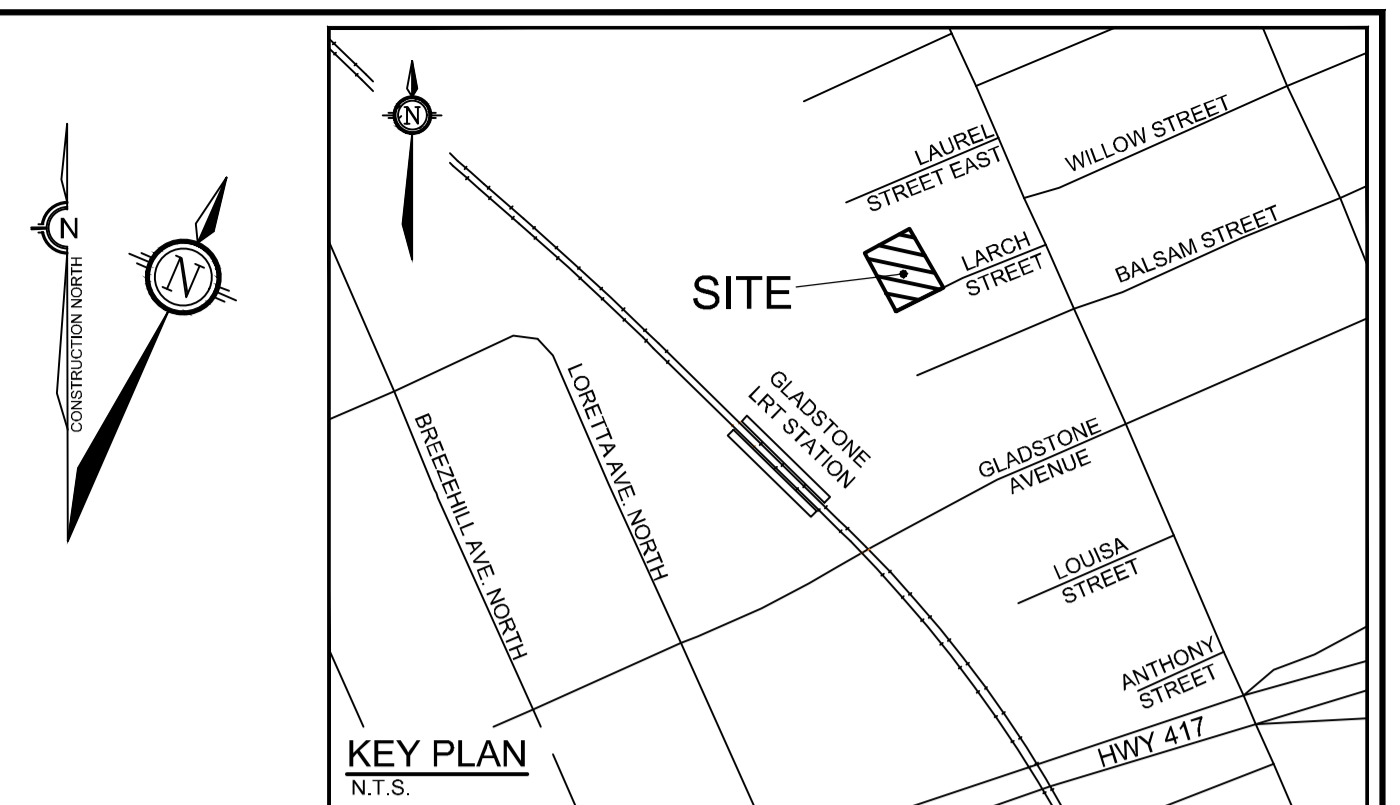
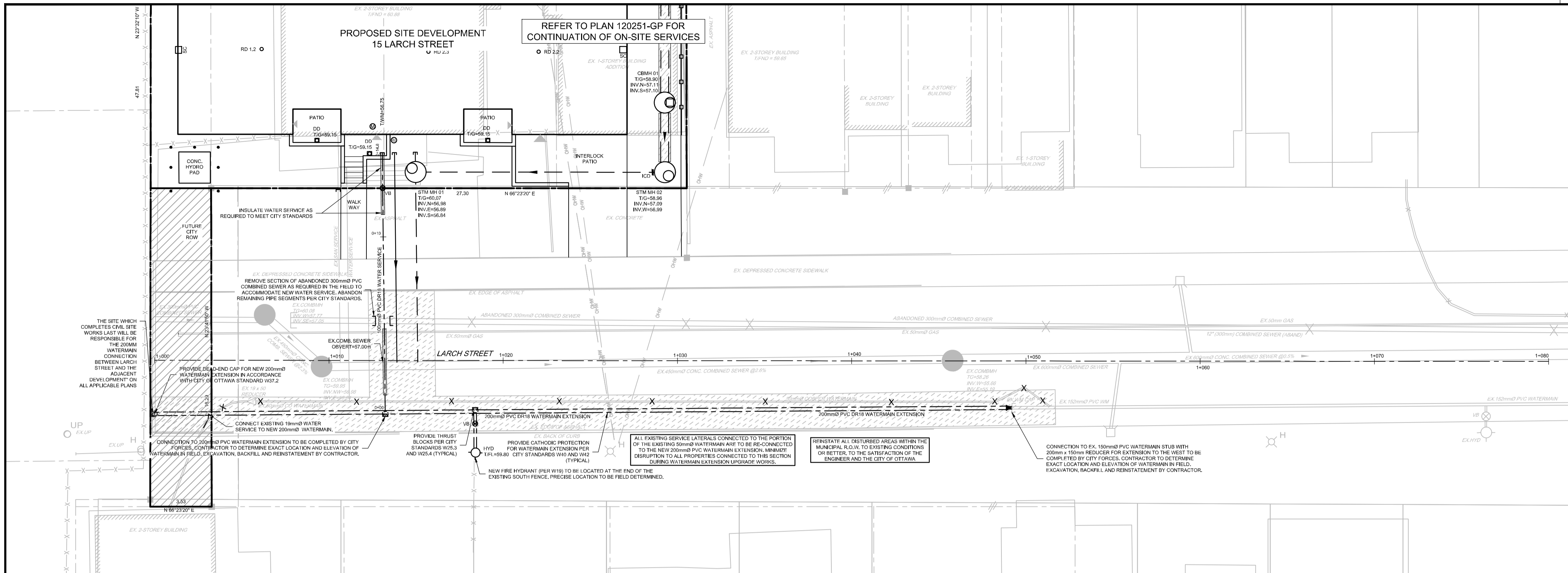
REV #4

DRAWING No. 120251-GR

PLAN #18698

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D07-12-22-0027



LEGEND

- 150mmØ --- PROPOSED WATERMAIN EXTENSION
- VB --- PROPOSED VALVE & VALVE BOX
- BEND --- PROPOSED BEND AND THRUSTBLOCK 11.25°, 22.5°, 45° or TEE
- C --- PROPOSED CAP
- MH-COMB --- EXISTING COMBINED MH & SEWER
- OHW --- EXISTING OVERHEAD WIRES
- EXISTING CONCRETE CURB
- EXISTING SANITARY MANHOLE & SEWER
- HYD --- EXISTING HYDRANT & VALVE
- EXISTING TREES / VEGETATION
- EX UP --- EXISTING UTILITY POLE
- EXISTING FENCE
- 150mmØ WM --- EXISTING WATERMAIN

LARCH STREET

BENCHMARK INFO:

ALL ELEVATIONS ARE REFERRED TO THE CGVD28 GEODETIC DATUM, DERIVED FROM THE CITY OF OTTAWA VERTICAL CONTROL MONUMENT No. 2016-0357 HAVING AN ELEVATION OF 60.088 METRES. BEARINGS ARE MTM GRID AND ARE REFERRED TO THE SOUTHERLY LIMIT OF LARCH STREET, HAVING A BEARING OF N 86° 23' 30" E AS SHOWN ON A SURVEYOR'S REAL PROPERTY REPORT BY ANNIS, O'SULLIVAN, VOLLEBEKK DATED NOVEMBER 2, 2017. THE EXISTING GRADES SHOWN ON THE PLANS ARE TAKEN DIRECTLY FROM SURVEYORS REAL PROPERTY REPORT PLAN (Ref. # 20-10-126-00), PREPARED BY J.D.BARNES LIMITED SIGNED AND DATED OCTOBER 22, 2020. SURROUNDING BACKGROUND TOPO INFORMATION BEYOND THE LIMITS OF THE SITE SURVEY ARE FROM CITY OF OTTAWA MAPPING AND UCC PLANS SHOWING CONTEXT ONLY.

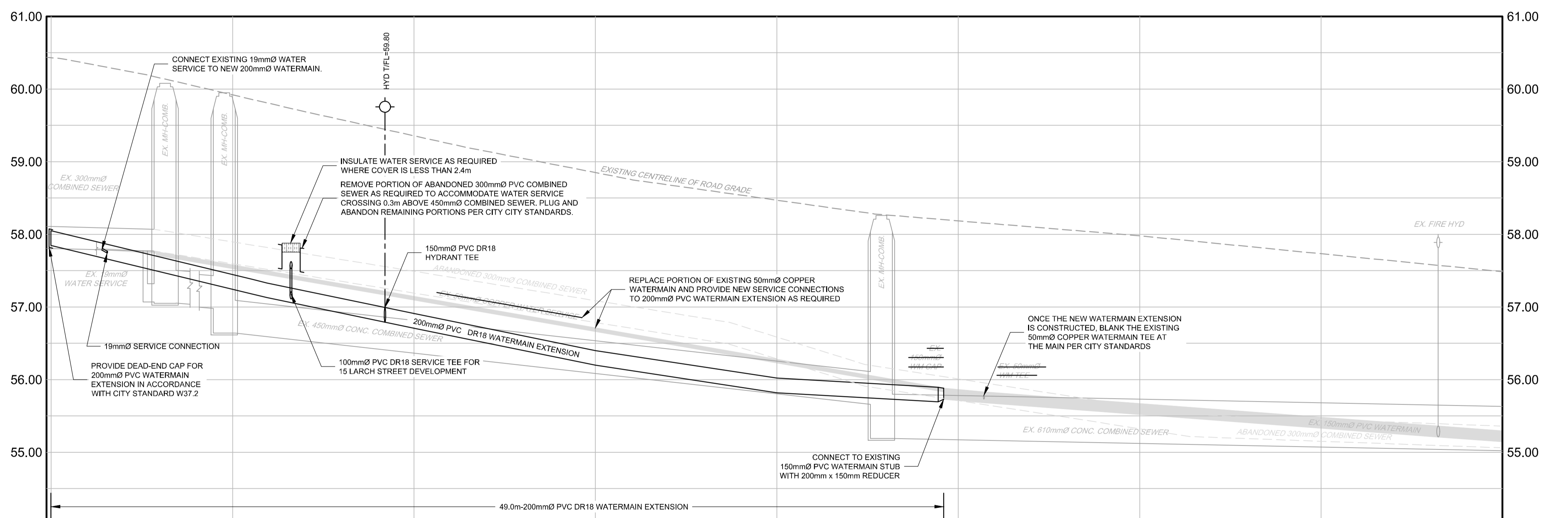
GENERAL NOTES:

- COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
- DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
- OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
- BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR \$5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
- RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF MUNICIPAL AUTHORITIES.
- REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
- ALL ELEVATIONS ARE GEODETIC.
- REFER TO GEOTECHNICAL INVESTIGATION REPORT (NUMBER PG607-1, REV. 1), DATED FEBRUARY 11, 2022, PREPARED BY PATERSON GROUP INC., FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
- REFER TO MECHANICAL PLAN FOR ROOF DRAIN INFORMATION.
- REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARD SURFACED AREAS AND DIMENSIONS.
- REFER TO THE 'DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT' (R-2022-001) PREPARED BY NOVATECH.
- SAW CUT AND KEYDRING ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE-IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).

WATERMAIN NOTES:

- SUPPLY AND CONSTRUCT ALL WATERMAIN AND APPURTENANCES IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARDS AND SPECIFICATIONS - ALL CURRENT VERSIONS AND 'AS AMENDED'.
- SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
WATERMAIN TRENCHING	W17	CITY OF OTTAWA
HYDRANT INSTALLATION	W19	CITY OF OTTAWA
THERMAL INSULATION IN SHALLOW TRENCHES	W22	CITY OF OTTAWA
THERMAL INSULATION BY OPEN STRUCTURES	W23	CITY OF OTTAWA
WATERMAIN CROSSING BELOW SEWERS	W25	CITY OF OTTAWA
WATERMAIN MATERIAL	PVC DR 18 (100mm AND LARGER)	CITY OF OTTAWA
- EXCAVATION, INSTALLATION, BACKFILL AND RESTORATION OF ALL WATERMANS BY THE CONTRACTOR. CONNECTIONS AND SHUT-OFFS AT THE MAIN AND CHLORINATION OF THE WATER SYSTEM SHALL BE PERFORMED BY CITY OFFICIALS. EXCAVATION, INSTALLATION OF SERVICE, BACKFILL AND RESTORATION BY THE CONTRACTOR.
- WATERMAIN SHALL BE MINIMUM 2.4m DEPTH BELOW GRADE UNLESS OTHERWISE INDICATED.
- PROVIDE MINIMUM 0.5m CLEARANCE BETWEEN OUTSIDE OF PIPES AT ALL CROSSINGS, UNLESS OTHERWISE INDICATED.



EXISTING GROUND ELEVATION	TOP OF WATERMAIN ELEVATION	COMBINED SEWER INVERTS	DESCRIPTION	CHAINAGE	EXISTING GROUND ELEVATION	TOP OF WATERMAIN ELEVATION	COMBINED SEWER INVERTS	DESCRIPTION	CHAINAGE
60.42	57.86	56.80	EX. 19mmØ SERVICE	1+000	59.40	56.91	56.64	EX. 300mmØ COMBINED SEWER	1+000
60.00	57.78	56.64	EX. 19mmØ WATER SERVICE	1+010	59.40	56.91	56.64	EX. 300mmØ COMBINED SEWER	1+010
59.00	57.71	56.64	EX. 19mmØ WATER SERVICE	1+020	59.40	56.91	56.64	EX. 300mmØ COMBINED SEWER	1+020
58.00	57.71	56.64	EX. 19mmØ WATER SERVICE	1+030	59.40	56.91	56.64	EX. 300mmØ COMBINED SEWER	1+030
57.00	57.71	56.64	EX. 19mmØ WATER SERVICE	1+040	59.40	56.91	56.64	EX. 300mmØ COMBINED SEWER	1+040
56.00	57.71	56.64	EX. 19mmØ WATER SERVICE	1+050	59.40	56.91	56.64	EX. 300mmØ COMBINED SEWER	1+050
55.00	57.71	56.64	EX. 19mmØ WATER SERVICE	1+060	59.40	56.91	56.64	EX. 300mmØ COMBINED SEWER	1+060

NOTE: THE POSITION OF ALL POLE LINES, CONDUITS, WATERMANS, 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.

OWNER INFORMATION
 15-19 LARCH ST. INC.
 359 KENT STREET, SUITE 503,
 OTTAWA, ONTARIO, K2P 0R6
 ROBERTO CAMPAGNA
 PHONE: (613) 851-7823
 roberto@rochomes.ca

SCALE

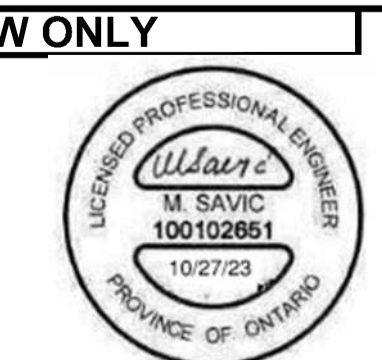
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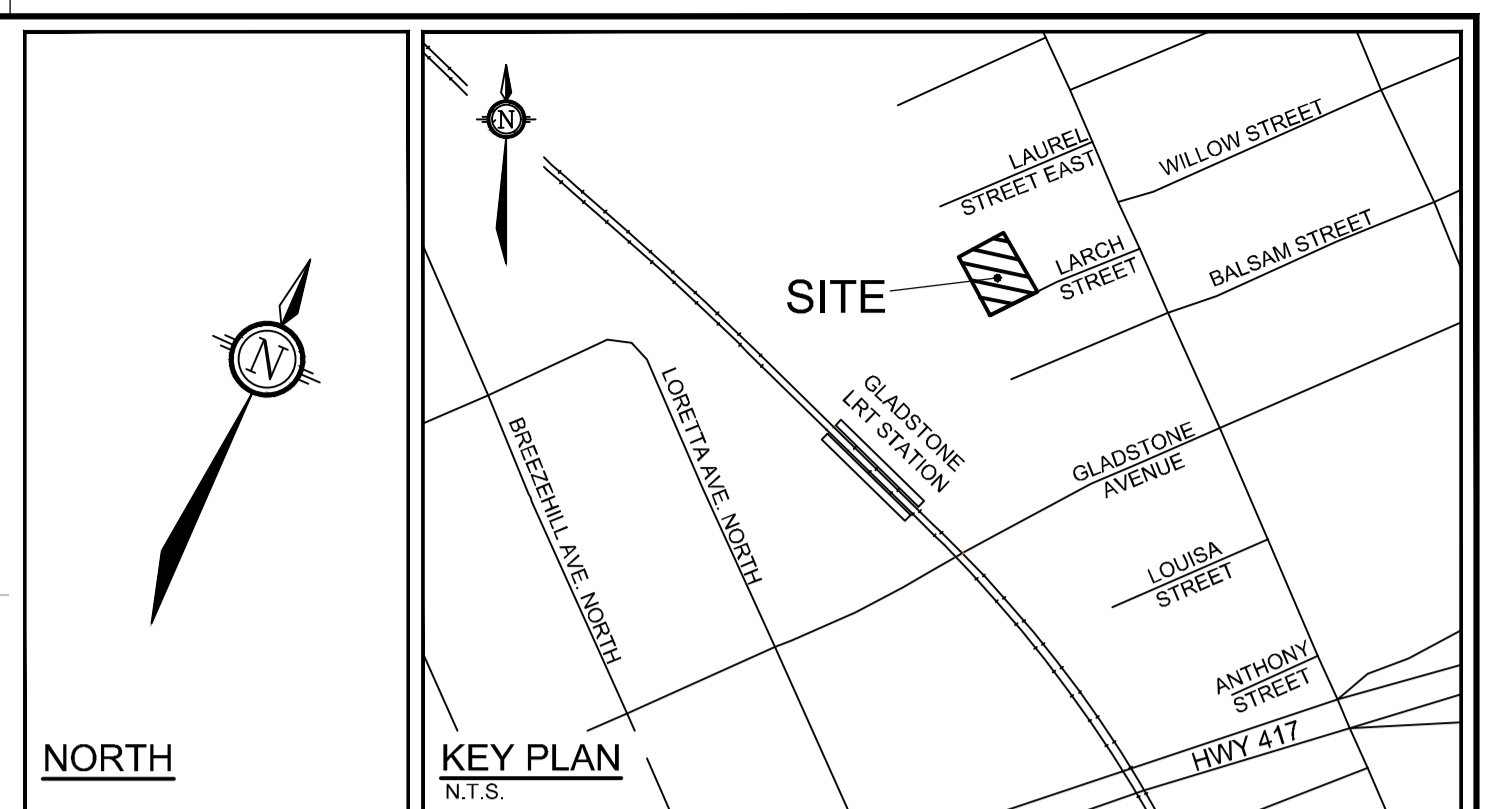
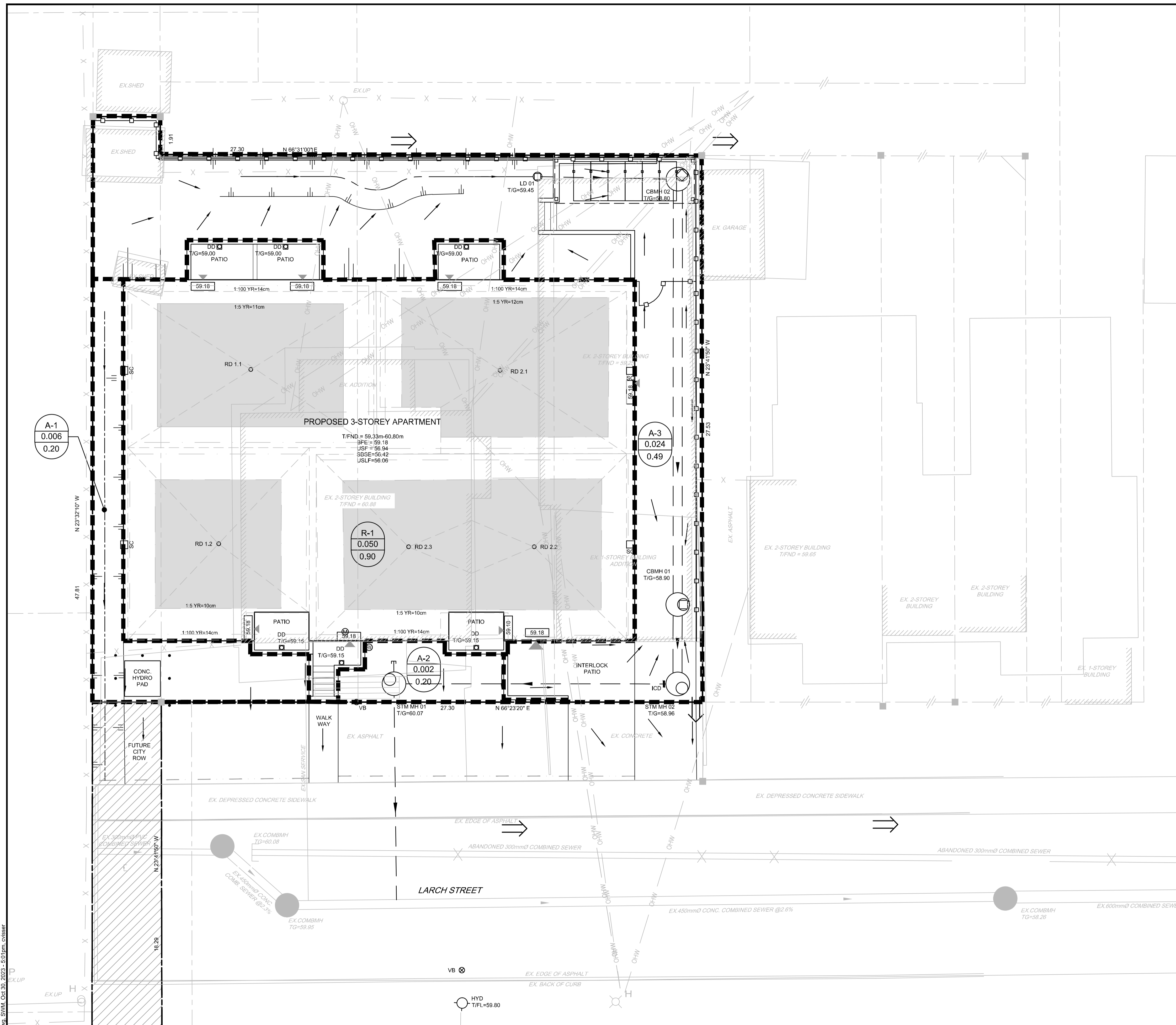
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APPROVED	MS



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LOCATION CITY OF OTTAWA 15 LARCH STREET	PROJECT No. 120251
DRAWING NAME WATERMAIN EXTENSION PLAN AND PROFILE (1+000 to 1+080 & LARCH STREET)	REV # 5 REV # 5
DRAWING No. 120251-PR1	PLAN #18698

D07-12-22-0027



LEGEND

- PROPOSED BARRIER CURB
- PROPOSED DEPRESSED CURB
- DRAINAGE AREA LIMITS
- APPROXIMATE PONDING LIMITS
- POST-DEVELOPMENT AREA ID
- POST-DEVELOPMENT DRAINAGE AREA (ha)
- 1.5 YEAR WEIGHTED RUNOFF COEFFICIENT
- TOP OF FOUNDATION WALL ELEVATION
- BASEMENT FLOOR ELEVATION
- UNDERSIDE OF FOOTING ELEVATION
- SUB-BASEMENT SLAB ELEVATION
- UNDERSIDE OF LOW FOOTING ELEVATION
- PROPOSED CONTROLLED FLOW ROOF DRAIN
- PROPOSED ROOFTOP SCUPPER LOCATION
- PROPOSED STORM SEWER AND FLOW DIRECTION
- EMERGENCY OVERLAND FLOW ROUTE
- PROPOSED BUILDING ENTRANCE / EXIT
- EXISTING STORM MH & SEWER
- EXISTING CATCHBASIN OR CATCHBASIN LEAD

BENCHMARK INFO:

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 - ALL ELEVATIONS ARE GEODETIC.
 - REFER TO GEOTECHNICAL INVESTIGATION REPORT (NUMBER PG6071-1, REV.1), DATED FEBRUARY 11, 2022, PREPARED BY PATERSON GROUP INC., FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
 - REFER TO ARCHITECTS AND LANDSCAPE ARCHITECTS DRAWINGS FOR BUILDING AND HARD SURFACE AREAS AND DIMENSIONS.
 - REFER TO DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT (R-2022-001) PREPARED BY NOVATECH.
 - SAW CUT AND KEY GRID ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
 - PROVIDE LINE/PARKING PAINTING.

ROOF DRAIN TABLE: AREA R-1 (ROOF DRAINS 1.1, 1.2 + 2.1, 2.2 & 2.3)

AREA ID	ROOF DRAIN No. (WATTS MODEL)	WEIR SETTING	1.5 YEAR RELEASE RATE	APPROX. 5 YR PONDING DEPTH	1:100 YEAR RELEASE RATE	APPROX. 100 YR PONDING DEPTH
R-1	RD 1.1 (RD-100-A-ADJ)	CLOSED	0.32 L/S	11 cm	0.32 L/S	14 cm
R-1	RD 1.2 (RD-100-A-ADJ)	CLOSED	0.32 L/S	10 cm	0.32 L/S	14 cm
R-1	RD 2.1 (RD-100-A-ADJ)	1/4 OPEN	0.87 L/S	12 cm	0.95 L/S	14 cm
R-1	RD 2.2 (RD-100-A-ADJ)	CLOSED	0.32 L/S	10 cm	0.32 L/S	13 cm
R-1	RD 2.3 (RD-100-A-ADJ)	CLOSED	0.32 L/S	10 cm	0.32 L/S	13 cm
TOTALS	-	-	2.15 L/s	-	2.23 L/s	-

* REFER TO THE 'DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT' (R-2022-001) PREPARED BY NOVATECH FOR DRAINAGE AREA IDENTIFIERS AND STORMWATER MANAGEMENT DETAILS.
 ** ALL CONTROLLED FLOW ROOF DRAINS FOR THE UPPER ROOF OF THE BUILDING ARE TO BE WATTS ACCUTROL ADJUSTABLE ROOF DRAINS WITH WEIR SETTINGS AS INDICATED IN THE TABLE ABOVE.

INLET CONTROL DEVICE DATA TABLE - AREA A-2

DESIGN EVENT	ICD TYPE (PLUG TYPE)	OUTLET STRUCTURE	DIAMETER OF OUTLET PIPE (mm)	PEAK DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m³)	AVAILABLE STORAGE
1:2 YR	IPEX TEMPEST	1200mm Ø STM MH 01	200mm Ø PVC	1.0	0.19	57.28	2.0	10.5 m³
1:5 YR	VORTEX LMF			1.3	0.35	57.44	2.8	
1:100 YR	MODEL 50			1.8	0.66	57.75	6.2	

PROPOSED SITE FLOWS & STORMWATER MANAGEMENT TABLE

DESIGN EVENT	PRE-DEVELOPMENT CONDITIONS		POST-DEVELOPMENT CONDITIONS					REDUCTION IN FLOW (L/s or %)**	
	SITE FLOWS (L/s)	ALLOWABLE RATE (L/s)	A-1 FLOW (L/s)	A-2 FLOW (L/s)	A-3 FLOW (L/s)	R-1 ROOF DRAINS (L/s)	R-1 DECK DRAINS (L/s)		TOTAL STM FLOWS (L/s)
1:2 YR	10.0	7.3	0.3	0.1	1.0	2.1	0.6*	4.1	5.9 or 59%
1:5 YR	13.6		0.3	0.1	1.3	2.1	0.8*	4.7	8.9 or 65%
1:100 YR	26.4		0.7	0.3	1.8	2.2	1.6*	6.6	19.8 or 75%

* UNCONTROLLED FLOW FROM SUNKEN REAR PATIO DRAINS (REFER TO MECHANICAL PLANS).
 ** DOES NOT INCLUDE POST-DEVELOPMENT SANITARY AND WEEPING TILE FLOWS.
 REDUCED FLOWS ARE COMPARED TO PRE-DEVELOPMENT UNCONTROLLED CONDITIONS.

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3	REVISED PER NEW SITE PLAN	OCT 27/23	MS
2	REVISED PER CITY COMMENTS	SEPT 2/22	MS
1	ISSUED FOR SITE PLAN APPROVAL	FEB 17/22	MS

SCALE

1:100

0 1 2 3 4

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DESIGN SM
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LOCATION
 CITY OF OTTAWA
 15 LARCH STREET

DRAWING NAME
 STORMWATER MANAGEMENT PLAN

PROJECT No. 120251
REV REV #3
DRAWING No. 120251-SWM
PLAN # 18698

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