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522 Lower Byron Avenue Development Servicing and Stormwater Management Report



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**PROPOSED RESIDENTIAL DEVELOPMENT
522 LOWER BYRON AVENUE**

**DEVELOPMENT SERVICING AND
STORMWATER MANAGEMENT REPORT**

Prepared by:

NOVATECH

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July 7, 2022

Ref: R-2022-089
Novatech File No. 121097

July 7, 2022

SerCo Realty Group
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Attention: Loredana Porcari

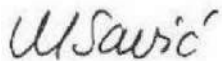
**Re: Development Servicing and Stormwater Management Report
Proposed 3-Storey Residential Development
522 Lower Byron Avenue, Ottawa, ON
Novatech File No: 121097**

Enclosed is a copy of the 'Development Servicing and Stormwater Management Report' for the proposed 3-storey residential development located at 522 Lower Byron Avenue, in the City of Ottawa. This report addresses the approach to site servicing and stormwater management and is submitted in support of a minor zoning by-law amendment and site plan control application.

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

Yours truly,

NOVATECH



Miroslav Savic, P. Eng.
Senior Project Manager

cc: John Wu (City of Ottawa)
Brandon Lawrence (S.J. Lawrence Architect Inc.)

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1.0 INTRODUCTION

The new 3-storey residential development is being proposed by Serco Realty Group and Novatech has been retained to complete the site servicing, grading and stormwater management designs for this project.

1.1 Purpose

This report addresses the approach to site servicing and stormwater management and is being submitted in support of a minor zoning by-law amendment and site plan control application.

1.2 Site Description and Location

The subject site is approximately 0.061 hectares in size and currently consists of a residential dwelling and a detached garage with site access off Lower Byron Avenue to the north. The subject site is located near the east end of the existing residential street of Lower Byron Avenue in the Westboro neighbourhood of Ottawa. Residential lots abut the property in all directions. The description of the subject site is designated as Lot 8 (South of Byron Avenue), Registered Plan 204, City of Ottawa.

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



1.3 Pre-Consultation Information

A pre-consultation meeting was held with the City of Ottawa on April 16th, 2021, at which time the client was advised of the general submission requirements. Further consultations were held with City staff via e-mail and virtual meetings and a summary of the correspondence is included in **Appendix A** of this report.

Based on a review of **O. Reg. 525/98: Approval Exemptions**, a Ministry of the Environment, Conservation and Parks (MECP) Environmental Compliance Approval (ECA) will not be required since the on-site stormwater management facilities will service a single lot that is not an industrial site and the storm flows from this site will discharge to the surface on-site.

The subject site is located within the jurisdiction of the Rideau Valley Conservation Authority (RVCA). Based on previous experience with the RVCA, surface parking lots and drive aisles typically require an 'Enhanced' Level of Protection (i.e.: 80% TSS removal), however, landscaped areas and roof tops are considered clean for the purposes of water quality and aquatic habitat protection. In this case, since there will be no surface parking for the residential development, on-site stormwater quality control will not be required.

1.4 Proposed Development

The proposed development will consist of a new 3-storey residential development replacing the pre-existing residential dwelling and detached garage. The proposed 3-storey development will be serviced by extending new on-site service laterals to the existing watermain and sanitary and sewer system in Lower Byron Avenue, while stormwater flows from the building will be controlled and discharged to the surface in by-pass swales that have been designed to convey the existing overland flows that reach the site from the upstream tributary areas to the south and east. Barrier-free access to the proposed building will be provided at various points around the site to allow for ease of movement for all residents. The existing driveway and garage along the east side of the building will be removed and replaced with pedestrian refuse access and rear yard amenity space and landscaping.

1.5 Reference Material

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

¹ The Geotechnical Investigation report (Report No.: PG5981-1), prepared by Paterson Group Inc. dated October 1st, 2021.

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. 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 this report.

2.1 Sanitary Sewage

The existing residential property outlets to the existing 225mm dia. municipal sewer in Lower Byron Avenue. The proposed residential apartment building will be serviced by connecting to the existing 225mm dia. concrete sewer with a new 'doghouse' maintenance hole. A new 200mm dia. sanitary lateral will be extended to the proposed building near the centre of the site.

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 Units (Studio / 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 calculated by the Harmon Equation
- Infiltration Allowance: 0.33 L/s/ha

The total calculated peak sanitary flow from the proposed building, including infiltration, is approximately 0.34 L/s. Refer to **Appendix C** for detailed calculations.

A 200mm dia. sanitary gravity service at a minimum slope of 3.0% has a full flow conveyance capacity of 48.4 L/s and will have enough capacity to convey the theoretical sanitary flows for the proposed residential building. Furthermore, the existing 225mm dia. municipal sanitary sewer is at an approximate slope of 1.0% with a full flow conveyance capacity of 46.8 L/s and the system should have sufficient capacity to convey the sanitary flows from the site.

2.2 Water

The subject site is located within the City of Ottawa 1W watermain pressure zone. The proposed development will be serviced by connecting to the existing 150mm dia. unlined cast iron municipal watermain in Lower Byron Avenue. The building will be non-sprinklered and serviced by a new 100mm dia. water service, sized to provide the required domestic water demand for the proposed building. A shut-off valve will be provided on the proposed water services at the property line in accordance with the City of Ottawa standards. The water meter will be located within the water entry room, with a remote meter on the exterior face of the building.

2.2.1 Domestic Water Demands and Watermain Analysis

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 (1 Bedroom Units): 1.4 people per unit
- Residential Units (2 Bedroom Units): 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 for Residents
- Peak Hour Demand Peaking Factor = 2.2 x Max. Day Demand for Residents

The domestic water demands for the proposed apartment building are summarized in **Table 2.1**. The detailed water demand calculations are provided in **Appendix D** of this report.

Table 2.1: Domestic Water Demands

Average Day Demand	Maximum Day Demand	Peak Hour Demand
0.09 L/s	0.23 L/s	0.50 L/s

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

Preliminary 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 at the service connection point. **Table 2.2** summarizes the watermain boundary conditions and the results of the hydraulic analysis.

Table 2.2: Hydraulic Boundary Conditions

Municipal Watermain Boundary Condition	Boundary Condition	Water Demand (L/s)	Min. / Max. Operating Pressure (psi)	Design Pressure (psi)*
Minimum HGL (Peak Hour Demand)	108.7m	0.50	40 psi (min.)	55.3
Maximum HGL (Avg Day Demand)	114.9 m	0.09	80 psi (max.)	64.1
Max Day + Fire Flow HGL	N/A	45 + 0.23	20 psi (min.)	32 L/s @ 20 psi (City Model Info)

* Based on an average ground elevation of 69.8m. Design pressure = (HGL – watermain elevation) x 1.42197 PSI/m

As indicated above, the existing municipal watermain should provide adequate system pressures to the proposed domestic water requirements, however, booster pump(s) may be required to provide adequate water pressure to the upper floors of the proposed building.

2.2.2 Water Supply for Fire-Fighting

The fire flow requirements have been calculated per the Ontario Building Code (OBC) as indicated in City of Ottawa Technical Bulletin ISTB-2021-03, based on information provided by the architect. The proposed 3-storey building will be non-sprinklered, however, it will have a building classification under OBC 3.2.2.44. Group C building; will be of non-combustible construction; and the K-value of 10 selected in the OBC calculations has been confirmed by the architect to be appropriate for this building design. The new building on-site will be located approximately 14m from the nearest existing municipal fire hydrant on the south side of the Lower Byron Avenue right-of-way and 114m from another municipal hydrant at the south-east corner of the intersection of Lower Byron Avenue and Roosevelt Avenue.

A multi-hydrant approach to firefighting will be required to supply adequate fire flow to the proposed development. There are currently two (2) Class AA (blue bonnet) hydrants within 150m of the proposed site. Based on the City of Ottawa Technical Bulletin ISTB-2018-02, Class AA (blue bonnet) hydrants within 75m should have a maximum capacity of 95 L/s while hydrants between 75m and 150m should have a maximum capacity of 63 L/s (at a pressure of 20 PSI), however, the City boundary conditions provided specifically for this site indicate that the available flow @ 20 PSI is 32 L/s **Table 2.3** summarizes the theoretical combined fire flow available from the nearby municipal fire hydrants and compares it to the fire flow demands based on the OBC calculations.

Table 2.3: Theoretical Fire Protection Summary Table

Building	(OBC) Fire Flow Demand (L/s)	Fire Hydrant(s) within 75m (~ 32 L/s each)	Fire Hydrant(s) within 150m (~ 32 L/s each)	Theoretical Combined Available Fire Flow (L/s)
Residential Building	45	1	1	64*

*Theoretical values exceed the (OBC) Fire Flow requirements and were therefore not confirmed by hydraulic analysis.

The combined maximum flow from the nearby municipal hydrants will exceed the Max Day + Fire Flow requirement of the proposed development. This multi-hydrant approach to firefighting is in accordance with the City of Ottawa Technical Bulletin ISTB-2018-02.

Based on the preliminary calculations, adequate water and system pressures will exist throughout the watermain network under the specified 'Max Day + Fire Flow' and 'Peak Hour' conditions. The fire flow requirements include both sprinkler system and hose allowances in accordance with the OBC and NFPA 13. The existing municipal watermain network should therefore have adequate fire water supply for the proposed development. Refer to **Appendix D** for a copy of the OBC fire flow calculations and correspondence from the City of Ottawa.

2.3 Storm Drainage and Stormwater Management

The current residential properties along Lower Byron Avenue all convey stormwater drainage from their existing properties as well as from an off-site area to the south and east overland to the existing municipal catchbasins at the west end of Lower Byron Avenue. The proposed residential apartment building will continue to convey off-site drainage uncontrolled to the catchbasins in Lower Byron while over-controlling the building roof flows from the site itself as much as possible, in order to mitigate the impacts of the development.

2.3.1 Stormwater Management Criteria and Objectives

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

- Maximize the use of on-site storage on the on the building roof to provided quantity control for the proposed building flows only.
- Convey existing tributary off-site flows from the elevated rear properties and provide adequate capacity to convey the 100-year flows within the proposed by-pass channels along the east and west property lines.

- Provide best measures to attempt to control the post-development flows from the site to a target 5-year release rate specified by the City of Ottawa. Control post-development flows from the site being developed up to and including the 100-year design event.
- Minimize the impact on the existing catchbasins in Lower Byron Avenue 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 subject site is approximately 0.061 ha in size and is comprised of a single residential dwelling and a detached garage. The existing property sheet drains uncontrolled to the Lower Byron Avenue roadway catchbasins and conveys overland flow from the rear of the property (identified as areas EX-1 and EX-2 on the Pre-development Stormwater Management Plan). There are currently no stormwater quantity or quality control measures on-site. There are also portions of the neighbouring rooftops and rear-yards that currently drain down the embankment from the south and through the subject site uncontrolled to Lower Byron Avenue (identified as areas OS-1 and OS-2). Off-site tributary flows will be conveyed overland through the subject site via drainage channels along the east and west property lines common to the neighbouring property, thus maintaining existing drainage patterns and not impeding storm flows from the adjacent properties.

The uncontrolled pre-development flows from the 0.061 ha site to be developed were calculated using the Rational Method to be 7.4 L/s during the 1:5-year design event and 14.6 L/s during the 1:100-year design event. Refer to **Appendix E** for detailed calculations.

As specified by the City of Ottawa, the target allowable release rate from the site was calculated using the Rational Method, to be approximately 7.4 L/s, based on a 10-min. rainfall intensity, using a 5-year return period (City of Ottawa IDF Curves) and an existing runoff coefficient of $C=0.42$. Since the building footprint covers approximately 50% of the total site area, and the uncontrolled site flows from just the perimeter direct runoff areas that cannot be controlled would exceed the theoretical allowable flows, then only the roof flows will be controlled. In this case, the maximum allowable release rate (for the roof area) would be calculated using the Rational Method, based on a 10-minute rainfall intensity, using a 5-year return period (City of Ottawa IDF Curves) and the existing site runoff coefficient of 0.42.

$$\begin{aligned}
 T_c &= 10 \text{ min} & C &= 0.42 \\
 I_{5yr} &= 104.2 \text{ mm/hr} & A &= 0.034 \text{ ha (post-development roof only)} \\
 Q_{\text{TargetAllow}} &= 2.78 \text{ CIA} \\
 &= 2.78 (0.42) (104.2) (0.034) \\
 &= 4.1 \text{ L/s}
 \end{aligned}$$

The proposed conveyance swales along the east and west property lines will need to be sized to adequately convey flows more than the 100-year design event for the tributary area that will continue to drain through the site from the embankment to the south. Refer to detailed calculations in **Appendix E** as well as the Pre-Development Stormwater Management Plan (121097-SWM 1) and the Post-Development Stormwater Management Plan (121097-SWM 2) for details and confirmation of flow capacities.

2.3.3 Post-Development Conditions

The proposed site will outlet to the surface drainage swale near the north-west corner of the site. As part of the stormwater management (SWM) strategy, stormwater runoff from the highest level of the proposed building roof will be attenuated using control flow roof drains prior to being discharged into the new building service via a mechanical pumping system. Refer to plan 121097-SWM 2 for drainage areas and details.

2.3.3.1 Area OS-1: Uncontrolled Flows from Off-Site Areas

The uncontrolled flow from sub-catchment area **OS-1** was calculated using the Rational Method to be approximately 31.5 L/s during the 5-year design event and 61.8 L/s during the 100-year design event. The proposed concrete conveyance channel along the east property line has been designed to adequately convey flows up to approximately 260 L/s at a 0.10m flow depth, which is significantly more capacity than the anticipated flows from the 100-year + 20% design event for the tributary area upstream of the new drainage channel of approximately 65 L/s. Refer to detailed calculations in **Appendix E** as well as the Pre-Development Stormwater Management Plan (121097-SWM 1) and the Post-Development Stormwater Management Plan (121097-SWM 2) for details and confirmation of flow capacities.

2.3.3.2 Area OS-2: Uncontrolled Flows from Off-Site Areas

The uncontrolled flow from sub-catchment area **OS-2** was calculated using the Rational Method to be approximately 7.6 L/s during the 5-year design event and 14.6 L/s during the 100-year design event. The proposed conveyance swales along the east and west property lines have been designed to adequately convey flows up to approximately 50 L/s at a 0.10m flow depth, which is significantly more capacity than the anticipated flows from the 100-year + 20% design event for the tributary area upstream of the new drainage channel of approximately 19 L/s. Refer to detailed calculations in **Appendix E** as well as the Pre-Development Stormwater Management Plan (121097-SWM 1) and the Post-Development Stormwater Management Plan (121097-SWM 2) for details and confirmation of flow capacities.

2.3.3.3 Area A-1: Uncontrolled Direct Runoff to Lower Byron Avenue

The combined uncontrolled post-development flow from sub-catchment areas **A-1.1**, **A-1.2** and **A-1.3** were calculated using the Rational Method to be approximately 3.8 L/s during the 5-year design event and 7.4 L/s during the 100-year design event. To mitigate flows from the hard surfaced post-development areas and the building roof will be directed to on-site grassed swales that outlet at the frontage of the property. Refer to **Appendix E** for SWM calculations.

2.3.3.4 Area R-1: Controlled Flow - Proposed Building Roof

The post-development flow from this sub-catchment area will be attenuated by four (4) individual Watts adjustable 'Accutrol' control flow roof drains (model number RD-100-A-ADJ) prior to being directed to the proposed storm service, outletting to the surface on-site.

Table 2.6 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 2.6: 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 (0.009 ha)	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.11	0.15	1.6	3.9	4.0
RD-2 (0.008 ha)	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.11	0.14	1.4	3.3	3.7
RD-3 (0.009 ha)	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.11	0.15	1.6	3.9	4.0
RD-3 (0.008 ha)	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.11	0.14	1.4	3.3	3.7
Total Roof (0.034 ha)	4	-	1.28	1.28	-	-	6.0	14.4	15.4

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

2.3.4 Stormwater Flow Summary

Table 3.0 provides a summary of the total post-development flows from the site and compares them to the uncontrolled pre-development flows and target release rate specified by the City.

Table 3.0: Stormwater Flow Comparison Table

Design Event	Pre-Development Conditions			Post-Development Conditions		
	Uncontrolled Flow (L/s)	Theoretical Allowable Flow (L/s)	Target Roof Allowable Flow (L/s)	A-1 (D.R.) Flow (L/s)	R-3 (Roof) Flow (L/s)	Total Flow (L/s)
5-Yr	7.4	7.4	4.1	3.8	1.3	5.1
100-Yr	14.6			7.4		8.7

During the 5-year post-development design event, flow from the controlled rooftop will be less than the target allowable roof flow of 4.1 L/s. During the 100-year design event, the total site flow will slightly exceed the desired release rate by approximately 1.3 L/s. This is mainly due to the fact that only a portion of the site flows cannot be attenuated due to existing drainage patterns in the rear-yards and the need to convey drainage from the rear of the property while protecting the residential buildings from any potential flooding. As indicated in the table above, the total post-development flows from the site represent a significant reduction in flows when compared to pre-development conditions.

2.4 Stormwater Quality Control

The subject site is located within the jurisdiction of the Rideau Valley Conservation Authority (RVCA) however, landscaped areas and residential building roof tops are considered clean for

the purposes of water quality and aquatic habitat protection. In this case, since there is no proposed on-site parking, stormwater quality control should not be required.

3.0 SITE GRADING

The area of the existing site to be developed is comprised of a single residential dwelling with steps down to the frontage along Lower Byron Avenue and a detached garage with a paved driveway along the east property line. The existing site generally slopes from south to north with elevations along the municipal R.O.W. at approximately 69.75m (north property line grades). There is a steep vegetated embankment along the south property line that has existing retaining wall segments along the slope to the rear residential properties. The rear embankment also slopes from south to north and the existing grades vary from approximately 77.00m down to 70.20m at the back of the existing house and garage. Due to the elevation of the rear yards being higher than the front yards, drainage swales will be required along the side yards to convey surface runoff from the neighbouring properties to the Lower Byron Avenue right-of-way.

The finished floor elevation (FFE) of the proposed residential apartment building will be set at an elevation of 70.80m in order to protect the building openings from any potential flooding. The grades along the east, west and south property lines will be maintained and matched into where the new grading design requires on-site adjustments. The grades along the north property line will generally be matched as well, however, there will be ramps required get up to the sunken foyer elevation of 70.30m and the other building entrances/exits (at 70.80m). In order to accommodate the proposed drainage swales to the Lower Byron Avenue right-of-way, an elevated walkway with an open grating will be constructed above the east drainage channel allowing refuse access to the rear garbage room. The west conveyance swale will require a small retaining wall adjacent to the building to allow for a 0.45m flat-bottom swale and still protect the building from water running against the foundation walls. A large structural retaining wall will also be required in the rear yard to accommodate the rear balconies. Refer to the enclosed Grading and Erosion & Sediment Control Plan (121097-GR) for details.

3.1 Emergency Overland Flow Route

In the case of a major rainfall event exceeding the design storms provided for, the stormwater located within the subject site will overflow towards the lower downstream sub-catchment areas and ultimately flow towards the Lower Byron Avenue right-of-way to the north. The floor elevation of the new building addition (70.80m) and the lowest building opening at the sunken foyer entrance (70.30m) will be a minimum of 0.30m above the major system overflow points. The emergency overland flow route spill elevation from the front yard is approximately 69.75m, as indicated on plan 121097-GR. There will be no on-site ponding during regular rainfall events, other than on the upper building roof. The lowest elevation against building envelope is approximately 70.10m, and as a result, no surface ponding will be able to reach the building envelope or any of the proposed building openings. The emergency overland flow route is shown on the enclosed Grading and Erosion & Sediment Control Plan.

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 storm 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 will be placed under the grates of nearby catchbasins, manholes and will remain in place until vegetation has been established and construction is completed.
- Silt fencing will be placed per OPSS 577 and OPSD 219.110 along the surrounding construction limits.
- A mud mat will be installed at the construction entrance for the site.
- 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 a minor zoning by-law amendment and site plan control application for the proposed residential development located at 522 Lower Byron Avenue in the City of Ottawa.

The conclusions are as follows:

- The proposed 3-storey residential apartment building will be serviced by extending new laterals to the existing municipal sanitary sewer and watermain in Lower Byron Ave. The site is currently serviced by multiple connections to the same municipal infrastructure.
- The building will be located within 14m and 114m of the existing municipal fire hydrants along the south side of Lower Byron Avenue.
- The site flows from sub-catchment area A-1 will continue to drain off-site uncontrolled to the municipal right-of-way in Lower Byron Avenue (including flows from OS-1 and OS-2), while flows from sub-catchment area R-1 will be controlled and conveyed to the surface.
- The total post-development site flows from the building rooftop will be controlled to a maximum release rate of 1.3 L/s during the 100-year storm event, which is less than the target allowable release rate of 4.1 L/s. Given the site conditions and minimal opportunities to control flows from the residential rear-yards, the desired release rate of 7.4 L/s cannot be achieved during the 100-year design event. The total site flows will however be controlled to a maximum release rate of 8.7 L/s, which represents a significant reduction when compared to the pre-development flow of 14.6 L/s.
- On-site stormwater quality control will not be required, as site runoff is deemed clean for the purpose of protecting surface water and aquatic habitat.

- Regular inspection and maintenance of the building services, roof drains as well as the on-site stormwater conveyance system 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:



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

Reviewed by:



Miroslav Savic, P. Eng.
Senior Project Manager

APPENDIX A
Correspondence

Steve Matthews

From: Murray Chown
Sent: Wednesday, July 21, 2021 2:35 PM
To: Rogers, Christopher; Miguelez, Alain
Cc: Gauthier, Steve; Sandercott, Robert; Anthony Chiarello; Loredana Porcari; Miro Savic; Serene Shahzadeh; Moerman, Tim; Herweyer, Don
Subject: RE: 522 Lower Byron - City Infrastructure

Chris:

Thanks for the update. We look forward to hearing from Development Review Services.

Murray Chown, MCIP, RPP, Director | Planning & Development

NOVATECH Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 239 | Fax: 613.254.5867

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From: Rogers, Christopher <Christopher.Rogers@ottawa.ca>
Sent: Wednesday, July 21, 2021 2:27 PM
To: Murray Chown <m.Chown@novatech-eng.com>; Miguelez, Alain <Alain.Miguelez@ottawa.ca>
Cc: Gauthier, Steve <Steve.Gauthier@ottawa.ca>; Sandercott, Robert <Robert.Sandercott@ottawa.ca>; Anthony Chiarello <a.chiarello@sercorealty.com>; Loredana Porcari <l.porcari@sercorealty.com>; Miro Savic <m.savic@novatech-eng.com>; Serene Shahzadeh <s.shahzadeh@novatech-eng.com>; Moerman, Tim <Tim.Moerman@ottawa.ca>; Herweyer, Don <Don.Herweyer@ottawa.ca>
Subject: RE: 522 Lower Byron - City Infrastructure

Hi Murray,

Staff have identified a less costly alternative. Follow-up on this will be through Development Review Services staff.

Regards,

Chris

From: Murray Chown <m.Chown@novatech-eng.com>
Sent: July 20, 2021 11:00 AM
To: Rogers, Christopher <Christopher.Rogers@ottawa.ca>; Miguelez, Alain <Alain.Miguelez@ottawa.ca>
Cc: Gauthier, Steve <Steve.Gauthier@ottawa.ca>; Sandercott, Robert <Robert.Sandercott@ottawa.ca>; Anthony Chiarello <a.chiarello@sercorealty.com>; Loredana Porcari <l.porcari@sercorealty.com>; Miro Savic <m.savic@novatech-eng.com>; Serene Shahzadeh <s.shahzadeh@novatech-eng.com>; Moerman, Tim <Tim.Moerman@ottawa.ca>; Herweyer, Don <Don.Herweyer@ottawa.ca>
Subject: RE: 522 Lower Byron - City Infrastructure

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Chris:

Thanks for the quick response. Looking forward to hearing how the internal discussion goes. Maybe we could set a time to "meet". I am open on Friday at 10:00 or noon.

Murray Chown, MCIP, RPP, Director | Planning & Development

NOVATECH Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 239 | Fax: 613.254.5867

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From: Rogers, Christopher <Christopher.Rogers@ottawa.ca>

Sent: Tuesday, July 20, 2021 10:55 AM

To: Murray Chown <m.Chown@novatech-eng.com>; Miguelez, Alain <Alain.Miguelez@ottawa.ca>

Cc: Gauthier, Steve <Steve.Gauthier@ottawa.ca>; Sandercott, Robert <Robert.Sandercott@ottawa.ca>; Anthony Chiarello <a.chiarello@sercorealty.com>; Loredana Porcari <l.porcari@sercorealty.com>; Miro Savic <m.savic@novatech-eng.com>; Serene Shahzadeh <s.shahzadeh@novatech-eng.com>; Moerman, Tim <Tim.Moerman@ottawa.ca>; Herweyer, Don <Don.Herweyer@ottawa.ca>

Subject: RE: 522 Lower Byron - City Infrastructure

Hi Murray,

Some options have been discussed and there is an internal meeting tomorrow to review. Hopefully will have something helpful to report later this week.

Chris

From: Murray Chown <m.Chown@novatech-eng.com>

Sent: July 20, 2021 8:12 AM

To: Rogers, Christopher <Christopher.Rogers@ottawa.ca>; Miguelez, Alain <Alain.Miguelez@ottawa.ca>

Cc: Gauthier, Steve <Steve.Gauthier@ottawa.ca>; Sandercott, Robert <Robert.Sandercott@ottawa.ca>; Anthony Chiarello <a.chiarello@sercorealty.com>; Loredana Porcari <l.porcari@sercorealty.com>; Miro Savic <m.savic@novatech-eng.com>; Serene Shahzadeh <s.shahzadeh@novatech-eng.com>; Moerman, Tim <Tim.Moerman@ottawa.ca>; Herweyer, Don <Don.Herweyer@ottawa.ca>

Subject: RE: 522 Lower Byron - City Infrastructure

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Any thoughts on how we can work with the city to extend a storm sewer on Lower Byron to facilitate the redevelopment and intensification anticipated by the Official Plan, and encouraged by the recently adopted zoning amendment for Westboro?

Murray Chown, MCIP, RPP, Director | Planning & Development

NOVATECH Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 239 | Fax: 613.254.5867

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From: Murray Chown

Sent: Wednesday, July 7, 2021 12:37 PM

To: Rogers, Christopher <Christopher.Rogers@ottawa.ca>; Miguelez, Alain <Alain.Miguelez@ottawa.ca>
Cc: Gauthier, Steve <Steve.Gauthier@ottawa.ca>; Sandercott, Robert <Robert.Sandercott@ottawa.ca>; Anthony Chiarello <a.chiarello@sercorealty.com>; Loredana Porcari <l.porcari@sercorealty.com>; Miro Savic <m.savic@novatech-eng.com>; Serene Shahzadeh <s.shahzadeh@novatech-eng.com>; Moerman, Tim <Tim.Moerman@ottawa.ca>; Herweyer, Don <Don.Herweyer@ottawa.ca>
Subject: RE: 522 Lower Byron - City Infrastructure

Chris:

Thanks for the update. Hoping we can work out an arrangement that benefits the city and the properties along Lower Byron.

Murray Chown, MCIP, RPP, Director | Planning & Development

NOVATECH Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 239 | Fax: 613.254.5867

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From: Rogers, Christopher <Christopher.Rogers@ottawa.ca>
Sent: Wednesday, July 7, 2021 11:42 AM
To: Murray Chown <m.Chown@novatech-eng.com>; Miguelez, Alain <Alain.Miguelez@ottawa.ca>
Cc: Gauthier, Steve <Steve.Gauthier@ottawa.ca>; Sandercott, Robert <Robert.Sandercott@ottawa.ca>; Anthony Chiarello <a.chiarello@sercorealty.com>; Loredana Porcari <l.porcari@sercorealty.com>; Miro Savic <m.savic@novatech-eng.com>; Serene Shahzadeh <s.shahzadeh@novatech-eng.com>; Moerman, Tim <Tim.Moerman@ottawa.ca>; Herweyer, Don <Don.Herweyer@ottawa.ca>
Subject: RE: 522 Lower Byron - City Infrastructure

Hi Murray,

Apologies for the delay in responding. I am still looking into this and will get back to you as soon as I can.

Regards,

Chris Rogers, M.A.Sc., P.Eng.

Program Manager, Infrastructure Planning

City of Ottawa

110 Laurier Avenue West

Ottawa, ON

613-580-2424 x27785

From: Murray Chown <m.Chown@novatech-eng.com>
Sent: June 30, 2021 9:57 AM
To: Miguelez, Alain <Alain.Miguelez@ottawa.ca>
Cc: Gauthier, Steve <Steve.Gauthier@ottawa.ca>; Sandercott, Robert <Robert.Sandercott@ottawa.ca>; Anthony Chiarello <a.chiarello@sercorealty.com>; Loredana Porcari <l.porcari@sercorealty.com>; Miro Savic <m.savic@novatech-eng.com>; Serene Shahzadeh <s.shahzadeh@novatech-eng.com>; Moerman, Tim <Tim.Moerman@ottawa.ca>; Herweyer, Don <Don.Herweyer@ottawa.ca>; Rogers, Christopher <Christopher.Rogers@ottawa.ca>
Subject: RE: 522 Lower Byron - City Infrastructure

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Chris: Any thoughts on how we can address this problem to everyone's benefit?

Murray Chown, MCIP, RPP, Director | Planning & Development

NOVATECH Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 239 | Fax: 613.254.5867

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From: Miguelez, Alain <Alain.Miguelez@ottawa.ca>

Sent: Wednesday, June 30, 2021 9:39 AM

To: Murray Chown <m.Chown@novatech-eng.com>

Cc: Gauthier, Steve <Steve.Gauthier@ottawa.ca>; Sandercott, Robert <Robert.Sandercott@ottawa.ca>; Anthony Chiarello <a.chiarello@sercorealty.com>; Loredana Porcari <l.porcari@sercorealty.com>; Miro Savic <m.savic@novatech-eng.com>; Serene Shahzadeh <s.shahzadeh@novatech-eng.com>; Moerman, Tim <Tim.Moerman@ottawa.ca>; Herweyer, Don <Don.Herweyer@ottawa.ca>; Rogers, Christopher <Christopher.Rogers@ottawa.ca>

Subject: Re: 522 Lower Byron - City Infrastructure

Hi Murray,

I have added Chris Rogers to the chain. I think the situation you are describing is the type of scenarios that the new IMP will seek to address in a more comprehensive manner, when it comes to identifying as many of these situations as possible and then preparing a long-range plan to address them. However, a discussion on funding options is a separate matter. I know of no City program that might be called upon at this time but, then again, this is not my area of expertise.

We support the project and we want to see it built. These are the challenges that the new OP, and its related master plans, are seeking to identify and resolve, which our current documents perhaps do not to the extent we need to support missing middle housing.

Best regards,

Alain Miguelez

Manager - Planning Policy and Resiliency

City of Ottawa

From: Murray Chown <m.Chown@novatech-eng.com>

Sent: June 30, 2021 08:59

To: Miguelez, Alain <Alain.Miguelez@ottawa.ca>

Cc: Gauthier, Steve <Steve.Gauthier@ottawa.ca>; Sandercott, Robert <Robert.Sandercott@ottawa.ca>; Anthony Chiarello <a.chiarello@sercorealty.com>; Loredana Porcari <l.porcari@sercorealty.com>; Miro Savic <m.savic@novatech-eng.com>; Serene Shahzadeh <s.shahzadeh@novatech-eng.com>; Moerman, Tim

<Tim.Moerman@ottawa.ca>; Herweyer, Don <Don.Herweyer@ottawa.ca>

Subject: RE: 522 Lower Byron - City Infrastructure

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I reached out to you because this predicament relates directly to the intensification target of the council adopted Growth Management Strategy. The R4 amendments were introduced in part to facilitate development of "missing middle" housing to help achieve higher levels of residential intensification. We can't get there if properties zoned R4 aren't fully serviced. I have added Tim and Don to the distribution list.

I doubt that providing the necessary infrastructure to meet the intensification target of the Growth Management Strategy is within the purview of the of the DR file lead (Steve Gauthier). If you or Steve can direct me to who I should be talking to, it would be very much appreciated. Should I be talking to Chris Rogers?

Thanks.

Murray Chown, MCIP, RPP, Director | Planning & Development

NOVATECH Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 239 | Fax: 613.254.5867

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From: Miguelez, Alain <Alain.Miguelez@ottawa.ca>

Sent: Tuesday, June 29, 2021 4:09 PM

To: Murray Chown <m.Chown@novatech-eng.com>

Cc: Gauthier, Steve <Steve.Gauthier@ottawa.ca>; Sandercott, Robert <Robert.Sandercott@ottawa.ca>; Anthony Chiarello <a.chiarello@sercorealty.com>; Loredana Porcari <l.porcari@sercorealty.com>; Miro Savic <m.savic@novatech-eng.com>; Serene Shahzadeh <s.shahzadeh@novatech-eng.com>

Subject: RE: 522 Lower Byron - City Infrastructure

Murray,

I am not your man in terms of discussing options for funding. I would suggest working with your DR file lead and team along with IS staff.

Thanks,
Alain

From: Murray Chown <m.Chown@novatech-eng.com>

Sent: June 28, 2021 12:36

To: Miguelez, Alain <Alain.Miguelez@ottawa.ca>

Cc: Gauthier, Steve <Steve.Gauthier@ottawa.ca>; Sandercott, Robert <Robert.Sandercott@ottawa.ca>; Anthony Chiarello <a.chiarello@sercorealty.com>; Loredana Porcari <l.porcari@sercorealty.com>; Miro Savic <m.savic@novatech-eng.com>; Serene Shahzadeh <s.shahzadeh@novatech-eng.com>

Subject: 522 Lower Byron - City Infrastructure

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We have run into a problem with a proposed redevelopment of the property located at 522 Lower Byron. This property was rezoned to an R4 subzone following completion of the Westboro Interim Control Study. The city has been applying the new R4 zones to locations where they want to encourage the development of low-rise apartment buildings to help fill the “gap” for the “missing middle” forms of housing. Lower Byron is an excellent location for this form of housing.

Following our pre-consultation meeting for a low-rise apartment dwelling at 522 Lower Byron, we were advised that *“The storm sewers will need to be extended to the property. Staff is not supportive of surface drainage on Lower Byron Avenue (this was further investigated following the pre-consultation meeting).”* The cost to extend a storm sewer from close to Roosevelt to the subject property is cost prohibitive for this project. We have estimated the cost to be in the order of \$130,000 to extend the storm sewer to service 522 Lower Byron.

If the city is going to encourage the redevelopment of the properties on Lower Byron, then steps need to be taken to upgrade the storm sewer on this street. The responsibility for this upgrade should not rest on the “first through the door”.

We would like to discuss options for funding for this work. Please let us know when it would be convenient to meet.

Murray Chown, MCIP, RPP, Director | Planning & Development

NOVATECH Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 239 | Fax: 613.254.5867

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,

Steve Matthews

From: Gauthier, Steve <Steve.Gauthier@ottawa.ca>
Sent: Wednesday, May 5, 2021 6:36 PM
To: Serene Shahzadeh; Murray Chown
Subject: 522 Lower Byron Ave - Pre-consultation follow-up and Submission List
Attachments: Submission List.pdf; Byron 522_UD Comments PRE1.pdf; Byron, 522_Design Brief.pdf

Hi Serene and Murray,

Please find attached the submission list along with the Urban Design comments, and the Terms of Reference for the Design Brief.

The salient points discussed at the meeting were:

- The proposal is for an 18-unit low-rise apartment building with no parking.
- Staff would be supportive of the relief from providing parking. This given the visitor requirement is only one(1) space, which would result in losing one(1) on-street parking space.
- Staff has concerns with the proposed reduced 6 m rear yard setback for the ground floor.
- Staff also has concerns with the proposed 5.2 m rear yard setback for the upper floors.
- Proper accessibility needs to be ensured internally and externally.
- Units restricted to only side windows are a concern.
- The storm sewers will need to be extended to the property. Staff is not supportive of surface drainage on Lower Byron Avenue (this was further investigated following the pre-consultation meeting).
- The community association would like to see soft landscaping and trees in the front yard.
- The community association asks for arrangements to be made to ensure that there is one(1) accessible on-street parking space in front of the proposed low-rise apartment building.

Regards,

Steve Gauthier RPP

Planner | Urbaniste

Development Review | Examen des projets d'aménagement

Planning Department | Service de l'urbanisme

City of Ottawa | Ville d'Ottawa

☎ 613.580.2424 ext./poste 27889

ottawa.ca/planning / ottawa.ca/urbanisme

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,

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	
<input type="checkbox"/>	<input type="checkbox"/>	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	
<input type="checkbox"/>	<input type="checkbox"/>	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.

<input type="checkbox"/>	<input type="checkbox"/>	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 polices 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	
<input type="checkbox"/>	<input type="checkbox"/>	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.

<input type="checkbox"/>	<input type="checkbox"/>	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"/> | <input type="checkbox"/>

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

Public Realm

Not Required Required

- | | | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <p><i>Labelled graphics and a written explanation which show:</i>
<u>Streetscape</u> – cross sections which illustrate the street design and right of way (referencing the City's design manuals).</p> |
| <input type="checkbox"/> | <input type="checkbox"/> | <p><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:</p> <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

522 Byron – City of Ottawa Planner: Steve Gauthier Urban Design Comments - Pre-consultation

Christopher Moise OAA MRAIC
Architect | Urban Designer
City of Ottawa

Comments

- We appreciate the multiple entrances facing the street to help relate the proposal with its context and especially the entrance accessible at grade. We also note that the materiality and design in general appear well developed, however, we have the following questions/ comments regarding the proposal;
 - **Accessibility:** The building appears to accessible, however the only accessible unit has stairs from the front and no access to the interior of the building?
 - We question the use of an amenity space on the roof that is not also accessible?
 - Access to the rear yard would also need to be accessible? And as a secondary exit it needs a clear path to the street;
 - Appreciate the internalization of the bike and garbage storage, however, those spaces are also not accessible from the inside of the building;
 - **Units with restricted access to light:** The bachelor units on all levels may be compromised with access to natural light if the neighbouring property is redeveloped in a similar way. We recommend that no units rely exclusively on the side yard for the only source of light. These units can be connected with units facing the front or rear yards and become additional bedrooms for proposed units;
 - **Window wells:** Consideration for how these will function and impact surrounding access, use of the rear yard and visual impact if guards are required. Please illustrate all related information on the site plan;
 - **Trees:** We recommend a landscape plan that illustrates opportunities for trees (alternatively this can be shown on the site plan);
 - **Reduction to the rear yard:** We recommend an illustration to support the reduction to the rear yard (ie site section) if it is proposed due to complicated existing grades;
- A Design Brief is a required submittal for all Site Plan/Re-zoning applications. Please see the scoped Design Brief Terms of Reference provided.

This is an exciting project in an area full of potential. We look forward to helping you achieve its goals with the highest level of design resolution. We are happy to assist and answer any questions regarding the above. Good luck.

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		1. Site Servicing Plan	2. Site Servicing Study	S	
S		3. Existing Conditions and Removals Plan	4. Pre-development Drainage Area Plan	S	
S		5. Post-development Drainage Plan	6. Roof Drainage Plan	S	
		7. Foundation Drainage System Details	8. Topographical Plan of Survey	S	
		9. Sight Lighting Plan	10. Photometric Plan		
S		11. Grade Control and Drainage Plan	12. Geotechnical Study	S	
		13. Composite Utility Plan	14. Groundwater Impact Study		
		15. Servicing Options Report	16. Wellhead Protection Study		
S		17. Transportation Impact Assessment Screening Form	18. Erosion and Sediment Control Plan / Brief	S	
S		19. Storm water Management Report	20. Hydro geological and Terrain Analysis		
		21. Hydraulic Water main Analysis	22. Noise / Vibration Study (If on-site stationary noise source)		
		23. Roadway Modification Design Plan	24. Confederation Line Proximity Study		

S/A	Number of copies	PLANNING / DESIGN / SURVEY		S/A	Number of copies
		25. Draft Plan of Subdivision	26. Plan Showing Layout of Parking Garage		
		27. Draft Plan of Condominium	28. Planning Rationale	S	
S		29. Site Plan	30. Minimum Distance Separation (MDS)		
		31. Concept Plan Showing Proposed Land Uses and Landscaping	32. Agrology and Soil Capability Study		
		33. Concept Plan Showing Ultimate Use of Land	34. Cultural Heritage Impact Statement		
S		35. Landscape Plan (showing existing trees)	36. Archaeological Resource Assessment Requirements: S (site plan) A (subdivision, condo)		
S		37. Survey Plan	38. Shadow Analysis		
S		39. Architectural Building Elevation Drawings (dimensioned)	40. Design Brief (includes the Design Review Panel Submission Requirements)	S	
		41. Wind Analysis			

S/A	Number of copies	ENVIRONMENTAL		S/A	Number of copies
S		42. Phase 1 Environmental Site Assessment	43. Impact Assessment of Adjacent Waste Disposal/Former Landfill Site		
A		44. Phase 2 Environmental Site Assessment (depends on the outcome of Phase 1)	45. Assessment of Landform Features		
		46. Record of Site Condition	47. Mineral Resource Impact Assessment		
		48. Tree Conservation Report	49. Environmental Impact Statement / Impact Assessment of Endangered Species		
		50. Mine Hazard Study / Abandoned Pit or Quarry Study			

S/A	Number of copies	ADDITIONAL REQUIREMENTS		S/A	Number of copies
		51.	52.		

Meeting Date: April 16, 2021

Application Type: Zoning By-law Amendment & Site Plan Control

File Lead (Assigned Planner): Steve Gauthier

Infrastructure Approvals Project Manager: John Wu

Site Address (Municipal Address): 522 Lower Byron Avenue

*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 and Growth Management 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 development application. This list is valid for one year following the meeting date. If the application is not submitted within this timeframe the applicant must again pre-consult with the Planning and Growth Management Department.

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
Sanitary Flow Calculations

522 LOWER BYRON AVENUE SANITARY FLOW

3-STOREY APARTMENT BUILDING

Number of 1 Bedroom/Studio Units	14
Persons per 1bdr Unit	1.4
Number of 2 Bedroom Units	4
Persons per 1bdr Unit	2.1
Total Population	28
Average Daily Flow	280 L/c/day
Peak Factor (Harmon Formula)	3.49
Peak Sanitary Flow	0.32 L/s
Site Area	0.06 ha
Infiltration Allowance	0.33 L/s/ha
Peak Extraneous Flow	0.02 L/s
Total Peak Sanitary Flow	0.34 L/s

APPENDIX D

Water Demands, OBC Fire Flow Calculations and Watermain Boundary Conditions

522 LOWER BYRON AVENUE

WATER ANALYSIS

WATER DEMANDS

Number of 1 Bedroom/Studio Units	14
Persons per 1bdr Unit	1.4
Number of 2 Bedroom Units	4
Persons per 1bdr Unit	2.1
Total Population	28
Approximate Water Usage	280 L/c/day
Average Day Demand	0.09 L/s
Maximum Day Demand (2.5 x avg. day)	0.23 L/s
Peak Hour Demand (2.2 x avg. day)	0.50 L/s

BOUNDARY CONDITIONS

Maximum HGL =	114.9 m	
Minimum HGL =	108.7 m	
Max Day + Fire Flow =	N/A m	32 L/s @ 20 psi (City of Ottawa)

PRESSURE TESTS

AVERAGE GROUND ELEVATION 69.8 m

HIGH PRESSURE TEST = MAX HGL - AVG GROUND ELEV x 1.42197 PSI/m < 80 PSI
HIGH PRESSURE = **64.1** PSI

LOW PRESSURE TEST = MIN HGL - AVG GROUND ELEV x 1.42197 PSI/m > 40 PSI
LOW PRESSURE = **55.3** PSI

MAX DAY + FIRE FLOW TEST = MAX DAY + FIRE - AVG GROUND ELEV x 1.42197 PSI/m > 20 PSI
MAX DAY + FIRE PRESSURE = **N/A** PSI

Fire-Fighting Water Supply - OBC 2006 (A-3.2.5.7.)

Project: **522 Lower Byron Avenue**

Proj. No.: **121097**

Date: **Apr 22/22**

Reference: [Ontario Fire Marshal - OBC Fire Fighting Water Supply](#)

Building Classification: **C** OBC 3.2.2.44.

Water Supply Coefficient K: **10** A-3.2.5.7. Table 1

Building Dimensions: W (ft) **56.2** **17.1** m A = **345** m²

L (ft) **66** **20.1** m V = **3781** m³

use avg interior height H (ft) **9** **2.7** m Total Volume (above & below grade) of Building to underside of roof deck

Exterior Wall Exposure = Distance between exterior face and:
(Limiting Distance) Property Line
OBC 3.2.3.1.(3) or Centreline of Street
or Line at mid-distance to another building on same lot

North:	4.5 m	S _{side 1} =	0.50
East:	1.6 m	S _{side 2} =	0.50
South:	5.9 m	S _{side 3} =	0.41
West:	1.5 m	S _{side 4} =	0.50

A-3.2.5.7.
Figure 1

*If LD > 10 m (> 13 m for F-1), S = 0, thus an accurate measure of LD is not required.
Can enter LD = >10 or >13
If a building is separated by a firewall, S = 0 for that side (see A-3.2.5.7.3(d)).
Enter LD = firewall*

Spatial Coefficient: S_{Tot} =
1.0 + (S_{side 1} + S_{side 2} + S_{side 3} + S_{side 4}) = **2.00**

Fire Water Supply Volume Required: Q = K V S_{Tot} = **76000** L
 Q_{min} from A-3.2.5.7. Table 2 = **54000** L
 Q_{REQ} = **76000** L
 Q_{REQ} = **76** m³



COMMUNICATION

To: Stephen Matthews, Novatech, Ottawa, ON.

Date: April 26th, 2022

By: Email

From: Brody Smith

Project: Byron Apartments
522 Lower Byron Ave., Ottawa, ON.

Subject: Confirmation of Building Construction

Dear Stephen Matthews,

In Response to your request dated April 26th, 2022, please find below the additional information for the comments you requested.

Comments/Requests

1. The building classification has been determined to be OBC 3.2.2.44. Group C building proposed
2. The building will be of on-combustible construction
3. The building will be 3-storeys with a basement level of units
4. The average ceiling height of all levels including the basement apartments will be 9'
5. The building will be non-sprinklered

We trust this is satisfactory,
S. J. LAWRENCE ARCHITECT INCORPORATED

Shawn J. Lawrence, OAA, NSAA, AANB, SAA, MRAIC



6.3 Buildings Requiring On-Site Fire Protection Water Supply

- (a) Except for sprinklered buildings and as required by Sections 6.3 (c) and 6.3 (d), new buildings shall be provided with a supply of water available for fire fighting purposes not less than the quantity derived from the following formula:

$$Q = KVS_{Tot}$$

where

- Q = minimum supply of water in litres (L)
- K = water supply coefficient from Table 1
- V = total building volume in cubic metres
- S_{Tot} = total of spatial coefficient values from property line exposures on all sides, as obtained from the formula:

$$S_{Tot} = 1.0 + [(S_{Side1}) + (S_{Side2}) + (S_{Side3}) + \dots \text{etc.}]$$

where

- S_{Side} values are obtained from Figure 1, as modified by Sections 6.3 (e) and 6.3 (f) of this guideline, and
- S_{Tot} need not exceed 2.0

(see also Section 7.0 of this guideline)

- (b) Except as provided in Section 6.3 (d), water supply flow rates shall not be less than that specified in Table 2. Where the water supply is from a municipal or industrial water supply system, then the required flow rate shall be available at a minimum pressure of 140 kPa.
- (c) Except as provided in Section 6.3 (d), the minimum fire protection water supply “Q” required in Section 6.3 (a) shall not be less than what is needed to provide the minimum flow rate specified in Table 2 for a duration of 30 minutes.
- (d) In elementary and secondary schools, the water supply determined in accordance with Sections 6.3 (a) and 6.3 (b) may be reduced. The level of reduction to be applied should be at the discretion of the local jurisdictional authority and should not exceed 30%. Factors to consider should include fire department response time, fire department resources and the size and complexity of the school building (see Section 9.10 of this guideline for additional information).

**TABLE 1
WATER SUPPLY COEFFICIENT -- K**

TYPE OF CONSTRUCTION	Classification by Group or Division in Accordance with Table 3.1.2.1 of the Ontario Building Code				
	A-2 B-1 B-2 B-3 C D	A-4 F-3	A-1 A-3	E F-2	F-1
Building is of noncombustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches.	10	12	14	17	23
Building is of noncombustible construction or of heavy timber construction conforming to Article 3.1.4.6. of the OBC. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.	16	19	22	27	37
Building is of combustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches. Noncombustible construction may be used in lieu of fire-resistance rating where permitted in Subsection 3.2.2. of the OBC.	18	22	25	31	41
Building is of combustible construction. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.	23	28	32	39	53
Column 1	2	3	4	5	6

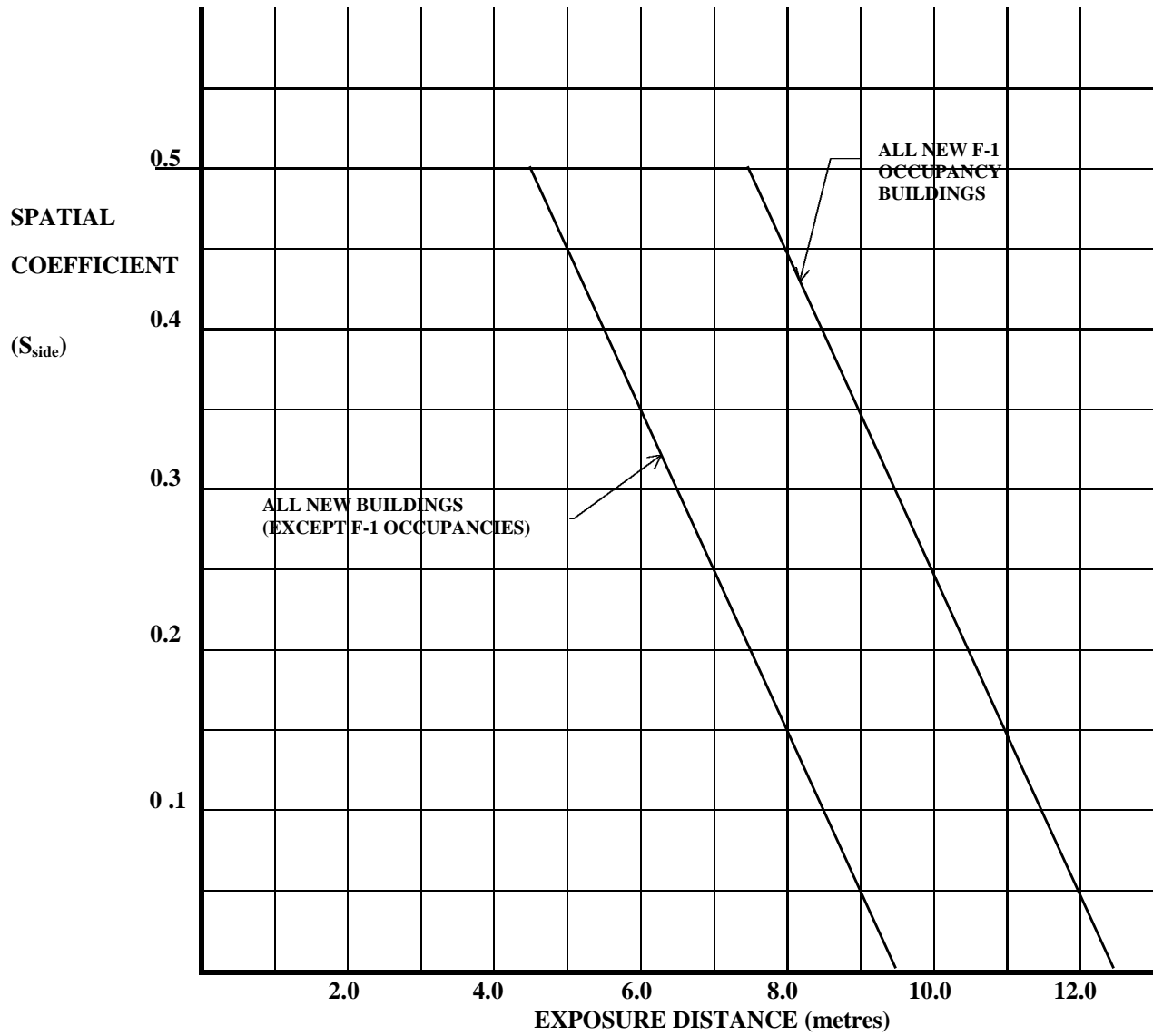
**TABLE 2
MINIMUM WATER SUPPLY FLOW RATES**

Building Code, Part 3 Buildings	Required Minimum Water Supply Flow Rate (L/min.)
One-storey building with building area not exceeding 600m ² (excluding F-1 occupancies)	1800
All other buildings	<p>2700 (If Q ≤ 108,000L)⁽¹⁾</p> <p>3600 (If Q > 108,000L and ≤ 135,000L)⁽¹⁾</p> <p>4500 (If Q > 135,000L and ≤ 162,000L)⁽¹⁾</p> <p>5400 (If Q > 162,000L and ≤ 190,000L)⁽¹⁾</p> <p>6300 (If Q > 190,000L and ≤ 270,000L)⁽¹⁾</p> <p>9000 (If Q > 270,000L)⁽¹⁾</p>

Note: ⁽¹⁾ Q=KVS_{Tot} as referenced in Section 3 (a)

FIGURE 1

SPATIAL COEFFICIENT VS EXPOSURE DISTANCE



- (e) Where a masonry wall with a minimum fire-resistance rating of 2 hours and no unprotected openings is provided as an exterior wall, the spatial coefficient “ S_{Side} ” for this side of the new building may be considered equal to 0. This exterior masonry wall shall be provided with a minimum 150 mm parapet.

Firewalls that divide a structure into two or more buildings may be given similar consideration when evaluating the exposure of the buildings to each other.

- (f) The spatial coefficient “ S_{Side} ” may be considered equal to 0 when the exposed building is on the same property and is less than 10 m² in building area.

6.4 Additions to Existing Buildings

- (a) Except as permitted in Sections 6.4 (b) and 6.4 (c), additions to existing buildings shall be provided with a fire protection water supply as required in Sections 6.3 (a) to 6.3 (f) (see Section 8.2 of this guideline for additional information).
- (b) Buildings with new additions falling into any one of the following criteria do not require an additional water supply for fire fighting:
 - (i) the expanded building complies with all the requirements of Section 6.1 (a),
 - (ii) the new addition does not exceed 100 m² in building area, or
 - (iii) the new addition exceeds 100 m² but does not exceed 400 m² in building area, contains an assembly, business and personal services, mercantile or low hazard industrial occupancy, is of noncombustible construction, does not result in a significant increase in exposure to other existing buildings, has no combustible storage or process, and is separated from the existing building by a minimum 1 hr fire-rated separation.
- (c) Where a firewall is provided between the new addition and the existing building, the fire protection water supply may be determined in accordance with Sections 6.1 (a) and 6.3 (a), using only the building volume of the new addition.

***NOTE:** Consideration should be given to designing the water supply to the more stringent requirements of the two separated buildings.*

Steve Matthews

From: Wu, John <John.Wu@ottawa.ca>
Sent: Thursday, May 5, 2022 1:50 PM
To: Steve Matthews
Subject: RE: 522 Lower Byron - Confirmation of Building Construction
Attachments: 522 Lower Byron Avenue May 2022.pdf

Here is the result:

******The following information may be passed on to the consultant, but do NOT forward this e-mail directly.******

The following are boundary conditions, HGL, for hydraulic analysis at 522 Lower Byron Avenue (zone 1W) assumed to be connected to the 152 mm watermain on Lower Byron Avenue (see attached PDF for location).

Minimum HGL: 108.7 m

Maximum HGL: 114.9 m

Available Fire flow at 20 psi: 32 L/s, assuming a ground elevation of 69.8 m

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.

John

From: Steve Matthews <S.Matthews@novatech-eng.com>
Sent: April 27, 2022 10:17 AM
To: Wu, John <John.Wu@ottawa.ca>
Subject: RE: 522 Lower Byron - Confirmation of Building Construction

CAUTION: This email originated from an External Sender. Please do not click links or open attachments unless you recognize the source.

ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.

Thanks so much John!
Take care, be safe out there and have a great week.

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: Wu, John <John.Wu@ottawa.ca>

Sent: Wednesday, April 27, 2022 9:56 AM

To: Steve Matthews <S.Matthews@novatech-eng.com>

Subject: RE: 522 Lower Byron - Confirmation of Building Construction

Ok, I will ask ISD for the boundary conditions, please be aware it takes three weeks now we got emails from their management team.

John

From: Steve Matthews <S.Matthews@novatech-eng.com>

Sent: April 27, 2022 9:53 AM

To: Wu, John <John.Wu@ottawa.ca>

Subject: FW: 522 Lower Byron - Confirmation of Building Construction

CAUTION: This email originated from an External Sender. Please do not click links or open attachments unless you recognize the source.

ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.

The architect has confirmed the K value of 10 is appropriate (the building will be non-combustible steel stud construction) and they have also provided an updated letter with the typo corrected and the K-value specified for clarity. Please see the attached letter for confirmation.

Regards,
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: Brody Smith <brody@sjlarchitect.com>

Sent: Wednesday, April 27, 2022 9:33 AM

To: Steve Matthews <S.Matthews@novatech-eng.com>

Cc: Brandon Lawrence <brandon@sjlarchitect.com>; Miro Savic <m.savic@novatech-eng.com>

Subject: RE: 522 Lower Byron - Confirmation of Building Construction

Hey Steve,

Sorry for that. Yes you're assumption that it was a typo is correct, and the letter was meant to say 'non-combustible'. Please see attached corrected letter for your review, I have also added the approval of the K-value you selected within the letter.

Please let me know if you need anything else.

Regards,

Brody Smith, **Design Technician, Dipl. Architectural Technician**
S.J. Lawrence Architect Incorporated



18 Deakin Street, Suite 205
Nepean, ON K2E 8B7
Tel: (613) 739.7770
Email: mark@sjlarchitect.com
Web: sjlarchitect.com

From: Steve Matthews <S.Matthews@novatech-eng.com>
Sent: April 27, 2022 9:15 AM
To: Brody Smith <brody@sjlarchitect.com>
Cc: Brandon Lawrence <brandon@sjlarchitect.com>; Miro Savic <m.savic@novatech-eng.com>
Subject: RE: 522 Lower Byron - Confirmation of Building Construction

Hi Brody,

Can you please just confirm with me by email what the specific water supply coefficient will be per OBC Table 1 below? I had indicated a K value of 10 since the building will be non-combustible under classification C but the City has questioned my use of this value because the letter you provided me with says 'on-combustible' (which I told them must have simply been a typo and should say non-combustible). They would like email confirmation that the K value I have used of 10 is appropriate. Please confirm with the definitions provided in the table below (excerpt from Fire Marshals Guide for water supply in Part 3 OBC).

**TABLE 1
WATER SUPPLY COEFFICIENT -- K**

TYPE OF CONSTRUCTION	Classification by Group or Division in Accordance with Table 3.1.2.1 of the Ontario Building Code				
	A-2 B-1 B-2 B-3 C D	A-4 F-3	A-1 A-3	E F-2	F-1
Building is of noncombustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches.	10	12	14	17	23
Building is of noncombustible construction or of heavy timber construction conforming to Article 3.1.4.6. of the OBC. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.	16	19	22	27	37
Building is of combustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches. Noncombustible construction may be used in lieu of fire-resistance rating where permitted in Subsection 3.2.2. of the OBC.	18	22	25	31	41
Building is of combustible construction. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.	23	28	32	39	53
Column 1	2	3	4	5	6

Sorry for the additional steps as the City appears to be reviewing this closer than usual.

Regards,
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: Brody Smith <brody@sjlarchitect.com>

Sent: Tuesday, April 26, 2022 9:36 AM

To: Steve Matthews <S.Matthews@novatech-eng.com>

Cc: Brandon Lawrence <brandon@sjlarchitect.com>

Subject: RE: 522 Lower Byron - Confirmation of Building Construction

Hey Steve,

Please see attached response for the city for your review.

Regards,

Brody Smith, Design Technician, Dipl. Architectural Technician
S.J. Lawrence Architect Incorporated



18 Deakin Street, Suite 205
Nepean, ON K2E 8B7
Tel: (613) 739.7770
Email: mark@sjlarchitect.com
Web: sjlarchitect.com

From: Brandon Lawrence <brandon@sjlarchitect.com>
Sent: April 26, 2022 8:10 AM
To: Russell Robertson <russell@sjlarchitect.com>
Cc: Brody Smith <brody@sjlarchitect.com>
Subject: Fwd: 522 Lower Byron - Confirmation of Building Construction

Hi Russell & Brody,

As per the email below, can you please write up a formal letter on our SJL form (similar to our Permot response letter) confirming the building classification (going with the non-combustible, non sprinklered option) and send it to Novatech, thank you.

B

Sent from my iPhone

Begin forwarded message:

From: Steve Matthews <S.Matthews@novatech-eng.com>
Date: April 25, 2022 at 6:26:17 PM AST
To: Brandon Lawrence <brandon@sjlarchitect.com>
Cc: Miro Savic <m.savic@novatech-eng.com>
Subject: 522 Lower Byron - Confirmation of Building Construction

Hi Brandon,

The City of Ottawa now requires that we verify building construction via. e-mail correspondence with the architect (and include the verification e-mail as supporting documentation in our DSS & SWM Report).

Please confirm the items listed below so that we can officially request the watermain boundary conditions from the City of Ottawa:

- OBC 3.2.2.44 Group C building proposed
- Non-combustible construction
- 3-Storeys with a basement level of units
- Average floor height for the residential levels, including the basement units (required in calculation of Fire Flow requirements by OBC)
- Non-sprinklered

We will also require the proposed Roof Plan showing the relative high and low points as well as scupper locations (once it is available from your offices) in order to complete the SWM design. Please note that we will require controlled flow roof drains and 6" of available storage over the entire roof area to meet

the stringent swm criteria for the City. If there are any questions or concerns please do not hesitate to call me directly.

Regards,
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

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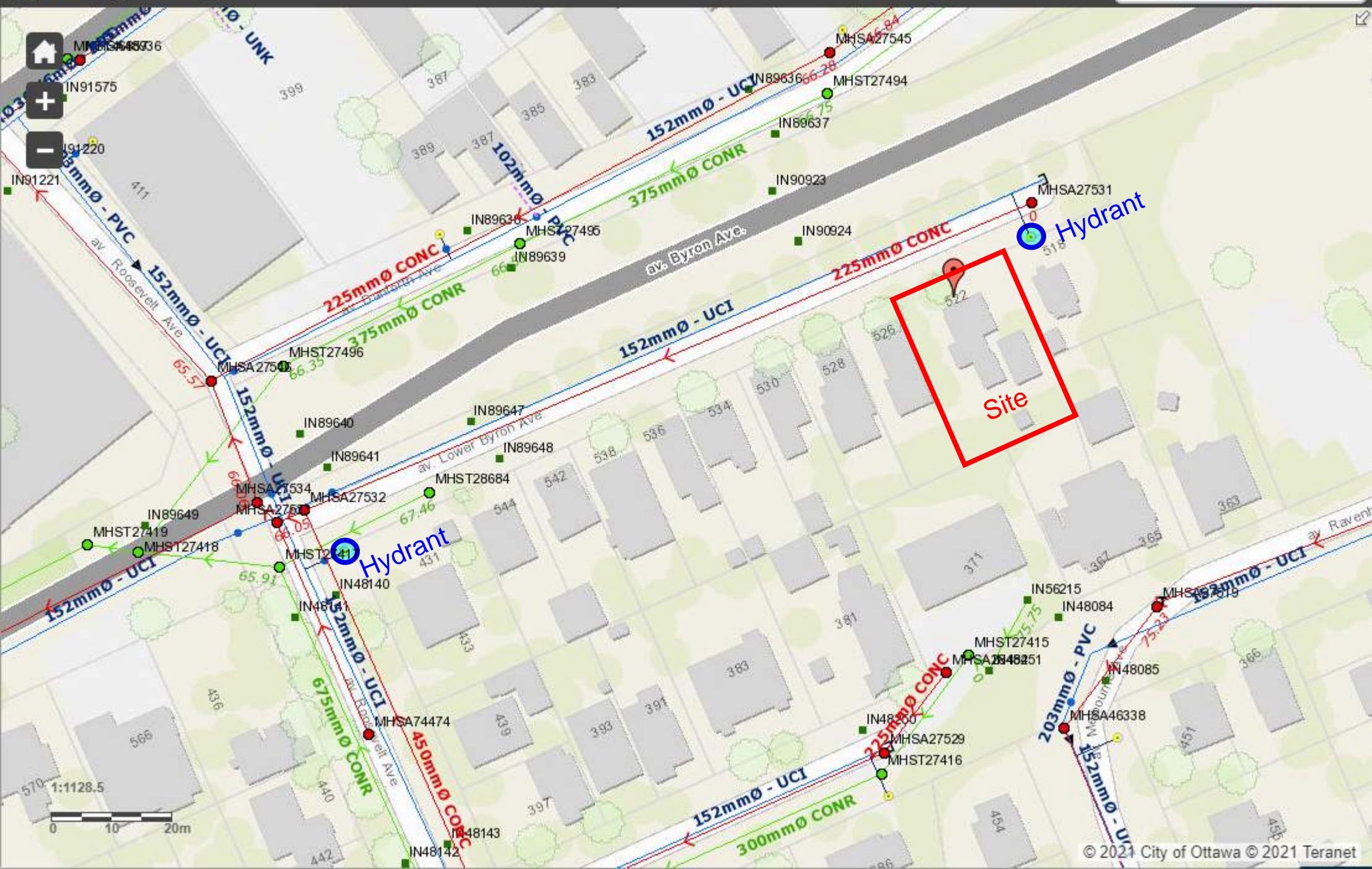
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Boundary Conditions for 522 Lower Byron Avenue



Legend

- PRIVATE
- PUBLIC

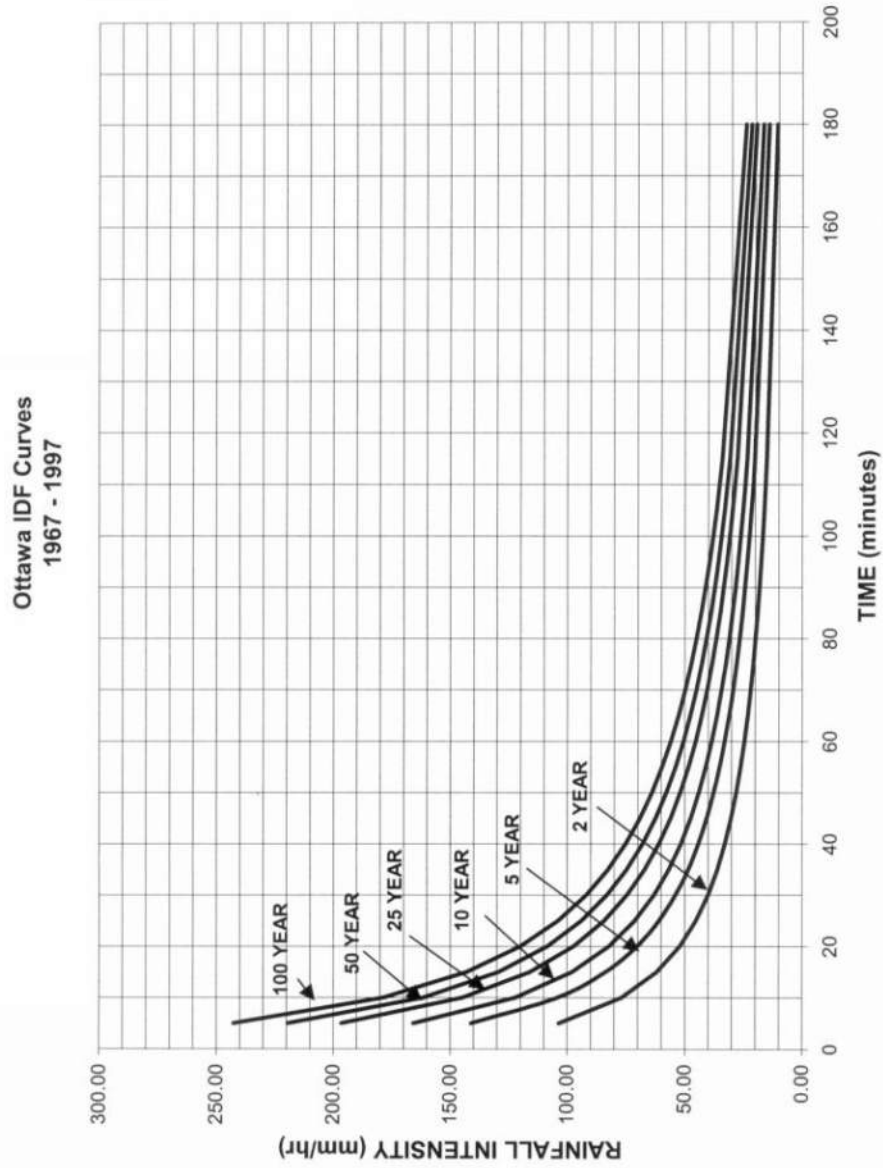


APPENDIX E

IDF Curves, SWM Calculations and Swale/Channel Flow Capacities

APPENDIX 5-A

OTTAWA INTENSITY DURATION FREQUENCY (IDF) CURVE



Proposed Residential Development 522 Lower Byron Avenue

Pre - Development Stormwater Flows												
Description	Area (ha)	$A_{imperv} (ha)$ C=0.9	$A_{gravel} (ha)$ C=0.6	$A_{pervious} (ha)$ C=0.2	Weighted C_{ws}	Weighted C_{w100}	1:2 Year Flow (L/s)	1:5 Year Flow (L/s)	1:100 Year Flow (L/s)	Allowable C_w	Target Allowable	
											5-year Site (L/s)	Roof Only (L/s)
Off-Site Tributary Area OS-1	0.219	0.093	0.000	0.126	0.50	0.57	23.3	31.5	61.8	0.50	---	---
Off-Site Tributary Area OS-2	0.043	0.025	0.000	0.018	0.61	0.69	5.6	7.6	14.6	0.61	---	---
EX-1 Eastern Portion of Existing Site	0.030	0.013	0.000	0.017	0.50	0.58	3.2	4.4	8.6	---	---	---
EX-2 Western Portion of Existing Site	0.031	0.005	0.000	0.026	0.31	0.37	2.1	2.8	5.7	---	---	---
Total Site to be Re-Developed	0.061	0.019	0.000	0.042	0.42	0.48	5.4	7.4	14.6	0.42	7.4	4.1

Summed Area Check = 0.323

$T_c = 10mins$

Required 100-yr Q_{cap} East Ditch = +/- 70 L/s
 Required 100-yr Q_{cap} West Ditch = +/- 25 L/s

Post - Development Stormwater Flows																
Area	Description	Area (ha)	$A_{imp} (ha)$ C=0.9	$A_{perv} (ha)$ C=0.2	C_s	C_{100}	Uncontrolled Flow (L/s)			Controlled Flow (L/s)			Storage Required (m ³)			Storage Provided (m ³)
							2-year	5-year	100-year	2-year	5-year	100-year	2-year	5-year	100-year	
OS-1	OS-1 Conveyed through Site via. East Ditch	0.219	0.093	0.126	0.50	0.57	23.3	31.5	61.8	-	-	-	-	-	-	-
OS-2	OS-2 Conveyed through Site via. West Ditch	0.043	0.025	0.018	0.61	0.69	5.6	7.6	14.6	-	-	-	-	-	-	-
A-1	Direct Runoff to Lower Byron	0.027	0.011	0.016	0.49	0.56	2.8	3.8	7.4	-	-	-	-	-	-	-
R-1	Controlled Flow Roof Drains	0.034	0.034	0.000	0.90	1.00				1.3	1.3	1.3	3.8	6.0	14.4	15.4
Totals :		0.323	-	-	-	-	2.8	3.8	7.4	1.3	1.3	1.3	3.8	6.0	14.4	15.4
Total On-Site Stormwater Flows :										4.1	5.1	8.7				

$T_c = 10mins$

Proposed Residential Development					
Novatech Project No. 121097					
Uncontrolled Runoff - 1:2 YEAR EVENT					
AREA OS-1 Un-Controlled Runoff to East Ditch					
OTTAWA IDF CURVE					
Area =		0.219	ha	Qallow =	23.3 L/s
C =		0.50		Vol(max) =	0.0 m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	103.57	31.36	8.10	2.43	
10	76.81	23.25	0.00	0.00	
15	61.77	18.70	-4.55	-4.10	
20	52.03	15.75	-7.50	-9.00	
25	45.17	13.67	-9.58	-14.37	
30	40.04	12.12	-11.13	-20.03	
35	36.06	10.92	-12.34	-25.90	
40	32.86	9.95	-13.30	-31.93	
45	30.24	9.15	-14.10	-38.06	
50	28.04	8.49	-14.76	-44.29	
55	26.17	7.92	-15.33	-50.59	
60	24.56	7.43	-15.82	-56.94	
65	23.15	7.01	-16.24	-63.35	
70	21.91	6.63	-16.62	-69.80	
75	20.81	6.30	-16.95	-76.28	
90	18.14	5.49	-17.76	-95.90	
105	16.13	4.88	-18.37	-115.72	
120	14.56	4.41	-18.84	-135.67	
135	13.30	4.03	-19.23	-155.74	
150	12.25	3.71	-19.54	-175.89	

Proposed Residential Development					
Novatech Project No. 121097					
Uncontrolled Runoff - 1:5 YEAR EVENT					
AREA OS-1 Un-Controlled Runoff to East Ditch					
OTTAWA IDF CURVE					
Area =		0.219	ha	Qallow =	31.5 L/s
C =		0.50		Vol(max) =	0.0 m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	141.18	42.74	11.20	3.36	
10	104.19	31.54	0.00	0.00	
15	83.56	25.30	-6.25	-5.62	
20	70.25	21.27	-10.28	-12.33	
25	60.90	18.44	-13.11	-19.66	
30	53.93	16.33	-15.22	-27.39	
35	48.52	14.69	-16.86	-35.40	
40	44.18	13.38	-18.17	-43.60	
45	40.63	12.30	-19.24	-51.96	
50	37.65	11.40	-20.14	-60.43	
55	35.12	10.63	-20.91	-69.00	
60	32.94	9.97	-21.57	-77.65	
65	31.04	9.40	-22.15	-86.37	
70	29.37	8.89	-22.65	-95.14	
75	27.89	8.44	-23.10	-103.95	
90	24.29	7.35	-24.19	-130.63	
105	21.58	6.53	-25.01	-157.56	
120	19.47	5.89	-25.65	-184.68	
135	17.76	5.38	-26.17	-211.94	
150	16.36	4.95	-26.59	-239.31	

Proposed Residential Development					
Novatech Project No. 121097					
Uncontrolled Runoff - 1:100 YEAR EVENT					
AREA OS-1 Un-Controlled Runoff to East Ditch					
OTTAWA IDF CURVE					
Area =		0.219	ha	Qallow =	61.8 L/s
C =		0.57		Vol(max) =	0.0 m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	242.70	84.00	22.20	6.66	
10	178.56	61.80	0.00	0.00	
15	142.89	49.46	-12.34	-11.11	
20	119.95	41.52	-20.29	-24.34	
25	103.85	35.94	-25.86	-38.79	
30	91.87	31.80	-30.00	-54.01	
35	82.58	28.58	-33.22	-69.76	
40	75.15	26.01	-35.79	-85.90	
45	69.05	23.90	-37.90	-102.34	
50	63.95	22.14	-39.67	-119.00	
55	59.62	20.64	-41.16	-135.84	
60	55.89	19.35	-42.46	-152.84	
65	52.65	18.22	-43.58	-169.96	
70	49.79	17.23	-44.57	-187.19	
75	47.26	16.36	-45.45	-204.50	
90	41.11	14.23	-47.57	-256.89	
105	36.50	12.63	-49.17	-309.76	
120	32.89	11.39	-50.42	-362.99	
135	30.00	10.38	-51.42	-416.49	
150	27.61	9.56	-52.24	-470.20	

Proposed Residential Development					
Novatech Project No. 121097					
Uncontrolled Runoff - 1:100 YR + 20% IDF Increase					
AREA OS-1 Un-Controlled Runoff to East Ditch					
OTTAWA IDF CURVE					
Area =		0.219	ha	Qallow =	74.2 L/s
C =		0.57		Vol(max) =	0.0 m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	291.24	100.80	26.64	7.99	
10	214.27	74.16	0.00	0.00	
15	171.47	59.35	-14.81	-13.33	
20	143.94	49.82	-24.34	-29.21	
25	124.62	43.13	-31.03	-46.55	
30	110.24	38.16	-36.01	-64.81	
35	99.09	34.30	-39.86	-83.71	
40	90.17	31.21	-42.95	-103.08	
45	82.86	28.68	-45.48	-122.80	
50	76.74	26.56	-47.60	-142.80	
55	71.55	24.76	-49.40	-163.01	
60	67.07	23.21	-50.95	-183.41	
65	63.18	21.87	-52.30	-203.95	
70	59.75	20.68	-53.48	-224.62	
75	56.71	19.63	-54.53	-245.41	
90	49.33	17.07	-57.09	-308.27	
105	43.80	15.16	-59.00	-371.72	
120	39.47	13.66	-60.50	-435.59	
135	36.00	12.46	-61.70	-499.79	
150	33.13	11.47	-62.69	-564.24	

Proposed Residential Development				
Novatech Project No. 121097				
Uncontrolled Runoff - 1:2 YEAR EVENT				
AREA OS-2 Un-Controlled Runoff to West Ditch				
OTTAWA IDF CURVE				
Area = 0.043 ha		Qallow = 5.6 L/s		
C = 0.61		Vol(max) = 0.0 m3		
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	7.51	1.94	0.58
10	76.81	5.57	0.00	0.00
15	61.77	4.48	-1.09	-0.98
20	52.03	3.78	-1.80	-2.16
25	45.17	3.28	-2.30	-3.44
30	40.04	2.91	-2.67	-4.80
35	36.06	2.62	-2.96	-6.21
40	32.86	2.38	-3.19	-7.65
45	30.24	2.19	-3.38	-9.12
50	28.04	2.03	-3.54	-10.61
55	26.17	1.90	-3.67	-12.12
60	24.56	1.78	-3.79	-13.65
65	23.15	1.68	-3.89	-15.18
70	21.91	1.59	-3.98	-16.73
75	20.81	1.51	-4.06	-18.28
90	18.14	1.32	-4.26	-22.98
105	16.13	1.17	-4.40	-27.73
120	14.56	1.06	-4.52	-32.52
135	13.30	0.96	-4.61	-37.33
150	12.25	0.89	-4.68	-42.15

Proposed Residential Development				
Novatech Project No. 121097				
Uncontrolled Runoff - 1:5 YEAR EVENT				
AREA OS-2 Un-Controlled Runoff to West Ditch				
OTTAWA IDF CURVE				
Area = 0.043 ha		Qallow = 7.6 L/s		
C = 0.61		Vol(max) = 0.0 m3		
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	10.24	2.68	0.81
10	104.19	7.56	0.00	0.00
15	83.56	6.06	-1.50	-1.35
20	70.25	5.10	-2.46	-2.96
25	60.90	4.42	-3.14	-4.71
30	53.93	3.91	-3.65	-6.56
35	48.52	3.52	-4.04	-8.48
40	44.18	3.21	-4.35	-10.45
45	40.63	2.95	-4.61	-12.45
50	37.65	2.73	-4.83	-14.48
55	35.12	2.55	-5.01	-16.54
60	32.94	2.39	-5.17	-18.61
65	31.04	2.25	-5.31	-20.70
70	29.37	2.13	-5.43	-22.80
75	27.89	2.02	-5.54	-24.91
90	24.29	1.76	-5.80	-31.31
105	21.58	1.57	-5.99	-37.76
120	19.47	1.41	-6.15	-44.26
135	17.76	1.29	-6.27	-50.80
150	16.36	1.19	-6.37	-57.36

Proposed Residential Development				
Novatech Project No. 121097				
Uncontrolled Runoff - 1:100 YEAR EVENT				
AREA OS-2 Un-Controlled Runoff to West Ditch				
OTTAWA IDF CURVE				
Area = 0.043 ha		Qallow = 14.6 L/s		
C = 0.69		Vol(max) = 0.0 m3		
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	19.90	5.26	1.58
10	178.56	14.64	0.00	0.00
15	142.89	11.72	-2.92	-2.63
20	119.95	9.84	-4.81	-5.77
25	103.85	8.52	-6.13	-9.19
30	91.87	7.53	-7.11	-12.80
35	82.58	6.77	-7.87	-16.53
40	75.15	6.16	-8.48	-20.35
45	69.05	5.66	-8.98	-24.25
50	63.95	5.24	-9.40	-28.20
55	59.62	4.89	-9.75	-32.19
60	55.89	4.58	-10.06	-36.21
65	52.65	4.32	-10.33	-40.27
70	49.79	4.08	-10.56	-44.35
75	47.26	3.88	-10.77	-48.46
90	41.11	3.37	-11.27	-60.87
105	36.50	2.99	-11.65	-73.40
120	32.89	2.70	-11.95	-86.01
135	30.00	2.46	-12.18	-98.69
150	27.61	2.26	-12.38	-111.41

Proposed Residential Development				
Novatech Project No. 121097				
Uncontrolled Runoff - 1:100 YR + 20% IDF Increase				
AREA OS-2 Un-Controlled Runoff to West Ditch				
OTTAWA IDF CURVE				
Area = 0.043 ha		Qallow = 17.6 L/s		
C = 0.69		Vol(max) = 0.0 m3		
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	23.88	6.31	1.89
10	214.27	17.57	0.00	0.00
15	171.47	14.06	-3.51	-3.16
20	143.94	11.80	-5.77	-6.92
25	124.62	10.22	-7.35	-11.03
30	110.24	9.04	-8.53	-15.36
35	99.09	8.13	-9.45	-19.84
40	90.17	7.40	-10.18	-24.43
45	82.86	6.80	-10.78	-29.10
50	76.74	6.29	-11.28	-33.84
55	71.55	5.87	-11.70	-38.63
60	67.07	5.50	-12.07	-43.46
65	63.18	5.18	-12.39	-48.33
70	59.75	4.90	-12.67	-53.22
75	56.71	4.65	-12.92	-58.15
90	49.33	4.05	-13.53	-73.04
105	43.80	3.59	-13.98	-88.08
120	39.47	3.24	-14.34	-103.21
135	36.00	2.95	-14.62	-118.42
150	33.13	2.72	-14.86	-133.70

Proposed Residential Development				
Novatech Project No. 121097				
Uncontrolled Runoff - 1:2 YEAR EVENT				
AREA A-1 Un-Controlled Runoff to Lower Byron				
OTTAWA IDF CURVE				
Area = 0.027 ha		Qallow = 2.8 L/s		
C = 0.49		Vol(max) = 0.0 m3		
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	3.77	0.97	0.29
10	76.81	2.80	0.00	0.00
15	61.77	2.25	-0.55	-0.49
20	52.03	1.89	-0.90	-1.08
25	45.17	1.64	-1.15	-1.73
30	40.04	1.46	-1.34	-2.41
35	36.06	1.31	-1.48	-3.12
40	32.86	1.20	-1.60	-3.84
45	30.24	1.10	-1.70	-4.58
50	28.04	1.02	-1.78	-5.33
55	26.17	0.95	-1.84	-6.09
60	24.56	0.89	-1.90	-6.85
65	23.15	0.84	-1.95	-7.62
70	21.91	0.80	-2.00	-8.40
75	20.81	0.76	-2.04	-9.18
90	18.14	0.66	-2.14	-11.54
105	16.13	0.59	-2.21	-13.92
120	14.56	0.53	-2.27	-16.32
135	13.30	0.48	-2.31	-18.73
150	12.25	0.45	-2.35	-21.16

Proposed Residential Development				
Novatech Project No. 121097				
Uncontrolled Runoff - 1:5 YEAR EVENT				
AREA A-1 Un-Controlled Runoff to Lower Byron				
OTTAWA IDF CURVE				
Area = 0.027 ha		Qallow = 3.8 L/s		
C = 0.49		Vol(max) = 0.0 m3		
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.14	1.35	0.40
10	104.19	3.79	0.00	0.00
15	83.56	3.04	-0.75	-0.68
20	70.25	2.56	-1.24	-1.48
25	60.90	2.22	-1.58	-2.37
30	53.93	1.96	-1.83	-3.30
35	48.52	1.77	-2.03	-4.26
40	44.18	1.61	-2.19	-5.24
45	40.63	1.48	-2.31	-6.25
50	37.65	1.37	-2.42	-7.27
55	35.12	1.28	-2.52	-8.30
60	32.94	1.20	-2.59	-9.34
65	31.04	1.13	-2.66	-10.39
70	29.37	1.07	-2.72	-11.44
75	27.89	1.02	-2.78	-12.50
90	24.29	0.88	-2.91	-15.71
105	21.58	0.79	-3.01	-18.95
120	19.47	0.71	-3.09	-22.22
135	17.76	0.65	-3.15	-25.50
150	16.36	0.60	-3.20	-28.79

Proposed Residential Development				
Novatech Project No. 121097				
Uncontrolled Runoff - 1:100 YEAR EVENT				
AREA A-1 Un-Controlled Runoff to Lower Byron				
OTTAWA IDF CURVE				
Area = 0.027 ha		Qallow = 7.4 L/s		
C = 0.56		Vol(max) = 0.0 m3		
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.12	2.67	0.80
10	178.56	7.45	0.00	0.00
15	142.89	5.96	-1.49	-1.34
20	119.95	5.00	-2.44	-2.93
25	103.85	4.33	-3.12	-4.67
30	91.87	3.83	-3.62	-6.51
35	82.58	3.44	-4.00	-8.41
40	75.15	3.13	-4.31	-10.35
45	69.05	2.88	-4.57	-12.33
50	63.95	2.67	-4.78	-14.34
55	59.62	2.49	-4.96	-16.37
60	55.89	2.33	-5.12	-18.41
65	52.65	2.20	-5.25	-20.48
70	49.79	2.08	-5.37	-22.55
75	47.26	1.97	-5.48	-24.64
90	41.11	1.71	-5.73	-30.95
105	36.50	1.52	-5.92	-37.32
120	32.89	1.37	-6.07	-43.73
135	30.00	1.25	-6.20	-50.18
150	27.61	1.15	-6.29	-56.65

Proposed Residential Development				
Novatech Project No. 121097				
Uncontrolled Runoff - 1:100 YR + 20% IDF Increase				
AREA A-1 Un-Controlled Runoff to Lower Byron				
OTTAWA IDF CURVE				
Area = 0.027 ha		Qallow = 8.9 L/s		
C = 0.56		Vol(max) = 0.0 m3		
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	12.14	3.21	0.96
10	214.27	8.94	0.00	0.00
15	171.47	7.15	-1.78	-1.61
20	143.94	6.00	-2.93	-3.52
25	124.62	5.20	-3.74	-5.61
30	110.24	4.60	-4.34	-7.81
35	99.09	4.13	-4.80	-10.09
40	90.17	3.76	-5.17	-12.42
45	82.86	3.46	-5.48	-14.80
50	76.74	3.20	-5.73	-17.20
55	71.55	2.98	-5.95	-19.64
60	67.07	2.80	-6.14	-22.10
65	63.18	2.63	-6.30	-24.57
70	59.75	2.49	-6.44	-27.06
75	56.71	2.36	-6.57	-29.57
90	49.33	2.06	-6.88	-37.14
105	43.80	1.83	-7.11	-44.79
120	39.47	1.65	-7.29	-52.48
135	36.00	1.50	-7.43	-60.22
150	33.13	1.38	-7.55	-67.98

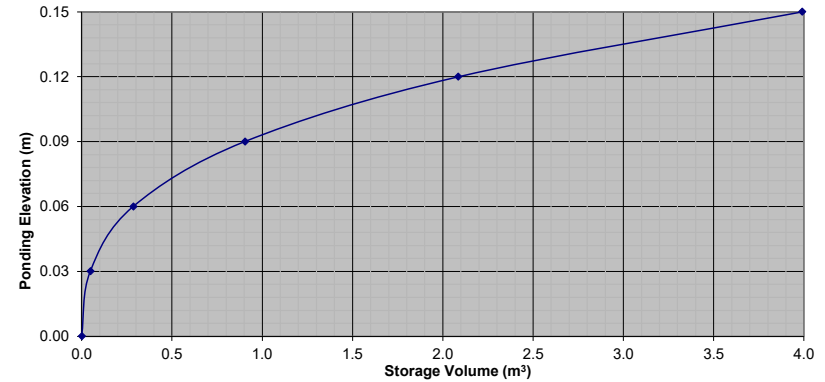
Proposed Residential Development					
Novatech Project No. 121097					
REQUIRED STORAGE - 1:2 YEAR EVENT					
AREA R-1			Controlled Roof Drain #1		
OTTAWA IDF CURVE					
Area =	0.009	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	1.0	m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	103.57	2.33	2.01	0.60	
10	76.81	1.73	1.41	0.85	
15	61.77	1.39	1.07	0.96	
20	52.03	1.17	0.85	1.02	
25	45.17	1.02	0.70	1.05	
30	40.04	0.90	0.58	1.05	
35	36.06	0.81	0.49	1.03	
40	32.86	0.74	0.42	1.01	
45	30.24	0.68	0.36	0.97	
50	28.04	0.63	0.31	0.93	
55	26.17	0.59	0.27	0.89	
60	24.56	0.55	0.23	0.84	
65	23.15	0.52	0.20	0.79	
70	21.91	0.49	0.17	0.73	
75	20.81	0.47	0.15	0.67	
90	18.14	0.41	0.09	0.48	
105	16.13	0.36	0.04	0.27	
120	14.56	0.33	0.01	0.06	

Proposed Residential Development					
Novatech Project No. 121097					
REQUIRED STORAGE - 1:5 YEAR EVENT					
AREA R-1			Controlled Roof Drain #1		
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	3.18	2.86	0.86	
10	104.19	2.35	2.03	1.22	
15	83.56	1.88	1.56	1.41	
20	70.25	1.58	1.26	1.51	
25	60.90	1.37	1.05	1.58	
30	53.93	1.21	0.89	1.61	
35	48.52	1.09	0.77	1.62	
40	44.18	0.99	0.67	1.62	
45	40.63	0.91	0.59	1.61	
50	37.65	0.85	0.53	1.58	
55	35.12	0.79	0.47	1.55	
60	32.94	0.74	0.42	1.52	
65	31.04	0.70	0.38	1.48	
70	29.37	0.66	0.34	1.43	
75	27.89	0.63	0.31	1.39	
90	24.29	0.55	0.23	1.23	
105	21.58	0.49	0.17	1.05	
120	19.47	0.44	0.12	0.85	

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	1.0	4.0
1:5 Year	0.32	0.32	11	1.6	4.0
1:100 Year	0.32	0.32	15	3.9	4.0

Roof Drain Storage Table for Area RD 1		
Elevation	Area RD 1	Total Volume
m	m ²	m ³
0.00	0	0
0.03	3.17	0.0
0.06	12.69	0.3
0.09	28.55	0.9
0.12	50.13	2.1
0.15	76.88	4.0

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



Proposed Residential Development					
Novatech Project No. 121097					
REQUIRED STORAGE - 1:100 YEAR EVENT					
AREA R-1			Controlled Roof Drain #1		
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	6.07	5.75	1.73	
10	178.56	4.47	4.15	2.49	
15	142.89	3.58	3.26	2.93	
20	119.95	3.00	2.68	3.22	
25	103.85	2.60	2.28	3.42	
30	91.87	2.30	1.98	3.56	
35	82.58	2.07	1.75	3.67	
40	75.15	1.88	1.56	3.74	
45	69.05	1.73	1.41	3.80	
50	63.95	1.60	1.28	3.84	
55	59.62	1.49	1.17	3.87	
60	55.89	1.40	1.08	3.88	
65	52.65	1.32	1.00	3.89	
70	49.79	1.25	0.93	3.89	
75	47.26	1.18	0.86	3.88	
90	41.11	1.03	0.71	3.83	
105	36.50	0.91	0.59	3.74	
120	32.89	0.82	0.50	3.62	

Proposed Residential Development					
Novatech Project No. 121097					
REQUIRED STORAGE - 1:100 YEAR + 20%					
AREA R-1			Controlled Roof Drain #1		
OTTAWA IDF CURVE					
Area =	0.009	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	291.24	7.29	6.97	2.09	
10	214.27	5.36	5.04	3.02	
15	171.47	4.29	3.97	3.57	
20	143.94	3.60	3.28	3.94	
25	124.62	3.12	2.80	4.20	
30	110.24	2.76	2.44	4.39	
35	99.09	2.48	2.16	4.53	
40	90.17	2.26	1.94	4.65	
45	82.86	2.07	1.75	4.73	
50	76.74	1.92	1.60	4.80	
55	71.55	1.79	1.47	4.85	
60	67.07	1.68	1.36	4.89	
65	63.18	1.58	1.26	4.92	
70	59.75	1.49	1.17	4.93	
75	56.71	1.42	1.10	4.94	
90	49.33	1.23	0.91	4.94	
105	43.80	1.10	0.78	4.89	
120	39.47	0.99	0.67	4.81	

Proposed Residential Development					
Novatech Project No. 121097					
REQUIRED STORAGE - 1:2 YEAR EVENT					
AREA R-1		Controlled Roof Drain #2			
OTTAWA IDF CURVE					
Area =	0.008	ha	Qallow =	0.32	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	2.07	1.75	0.53	
10	76.81	1.54	1.22	0.73	
15	61.77	1.24	0.92	0.82	
20	52.03	1.04	0.72	0.87	
25	45.17	0.90	0.58	0.88	
30	40.04	0.80	0.48	0.87	
35	36.06	0.72	0.40	0.84	
40	32.86	0.66	0.34	0.81	
45	30.24	0.61	0.29	0.77	
50	28.04	0.56	0.24	0.72	
55	26.17	0.52	0.20	0.67	
60	24.56	0.49	0.17	0.62	
65	23.15	0.46	0.14	0.56	
70	21.91	0.44	0.12	0.50	
75	20.81	0.42	0.10	0.43	
90	18.14	0.36	0.04	0.23	
105	16.13	0.32	0.00	0.02	
120	14.56	0.29	-0.03	-0.21	

Proposed Residential Development					
Novatech Project No. 121097					
REQUIRED STORAGE - 1:5 YEAR EVENT					
AREA R-1		Controlled Roof Drain #2			
OTTAWA IDF CURVE					
Area =	0.008	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	141.18	2.83	2.51	0.75	
10	104.19	2.09	1.77	1.06	
15	83.56	1.67	1.35	1.22	
20	70.25	1.41	1.09	1.30	
25	60.90	1.22	0.90	1.35	
30	53.93	1.08	0.76	1.37	
35	48.52	0.97	0.65	1.37	
40	44.18	0.88	0.56	1.35	
45	40.63	0.81	0.49	1.33	
50	37.65	0.75	0.43	1.30	
55	35.12	0.70	0.38	1.26	
60	32.94	0.66	0.34	1.22	
65	31.04	0.62	0.30	1.18	
70	29.37	0.59	0.27	1.13	
75	27.89	0.56	0.24	1.07	
90	24.29	0.49	0.17	0.90	
105	21.58	0.43	0.11	0.71	
120	19.47	0.39	0.07	0.50	

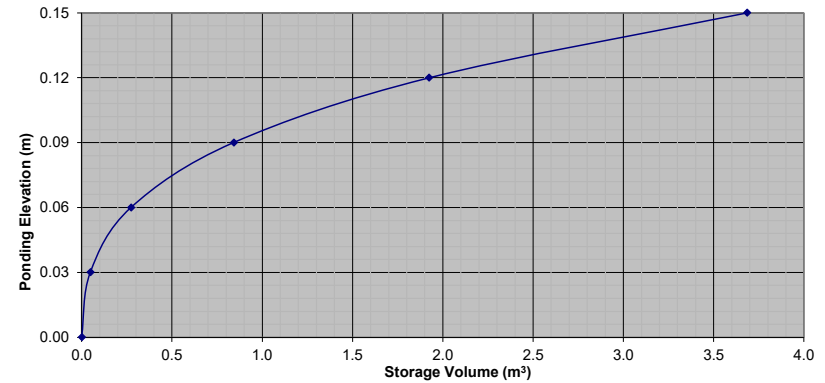
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed					
Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m ³)	
				Required	Provided
1:2 Year	0.32	0.32	9	0.9	3.7
1:5 Year	0.32	0.32	11	1.4	3.7
1:100 Year	0.32	0.32	14	3.3	3.7

Roof Drain Storage Table for Area RD 2		
Elevation	Area RD 2	Total Volume
m	m ²	m ³
0.00	0	0
0.03	3.2	0.0
0.06	11.83	0.3
0.09	26.08	0.8
0.12	45.97	1.9
0.15	71.48	3.7

Proposed Residential Development					
Novatech Project No. 121097					
REQUIRED STORAGE - 1:100 YEAR EVENT					
AREA R-1		Controlled Roof Drain #2			
OTTAWA IDF CURVE					
Area =	0.008	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	3.3	m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	242.70	5.40	5.08	1.52	
10	178.56	3.97	3.65	2.19	
15	142.89	3.18	2.86	2.57	
20	119.95	2.67	2.35	2.82	
25	103.85	2.31	1.99	2.98	
30	91.87	2.04	1.72	3.10	
35	82.58	1.84	1.52	3.18	
40	75.15	1.67	1.35	3.24	
45	69.05	1.54	1.22	3.28	
50	63.95	1.42	1.10	3.31	
55	59.62	1.33	1.01	3.32	
60	55.89	1.24	0.92	3.32	
65	52.65	1.17	0.85	3.32	
70	49.79	1.11	0.79	3.31	
75	47.26	1.05	0.73	3.29	
90	41.11	0.91	0.59	3.21	
105	36.50	0.81	0.49	3.10	
120	32.89	0.73	0.41	2.96	

Proposed Residential Development					
Novatech Project No. 121097					
REQUIRED STORAGE - 1:100 YEAR + 20%					
AREA R-1		Controlled Roof Drain #2			
OTTAWA IDF CURVE					
Area =	0.008	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	4.2	m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	291.24	6.48	6.16	1.85	
10	214.27	4.77	4.45	2.67	
15	171.47	3.81	3.49	3.14	
20	143.94	3.20	2.88	3.46	
25	124.62	2.77	2.45	3.68	
30	110.24	2.45	2.13	3.84	
35	99.09	2.20	1.88	3.96	
40	90.17	2.01	1.69	4.05	
45	82.86	1.84	1.52	4.11	
50	76.74	1.71	1.39	4.16	
55	71.55	1.59	1.27	4.20	
60	67.07	1.49	1.17	4.22	
65	63.18	1.41	1.09	4.23	
70	59.75	1.33	1.01	4.24	
75	56.71	1.26	0.94	4.24	
90	49.33	1.10	0.78	4.20	
105	43.80	0.97	0.65	4.12	
120	39.47	0.88	0.56	4.02	

Stage Storage Curve: Area R-1
Controlled Roof Drain #2



Proposed Residential Development					
Novatech Project No. 121097					
REQUIRED STORAGE - 1:2 YEAR EVENT					
AREA R-1			Controlled Roof Drain #3		
OTTAWA IDF CURVE					
Area = 0.009 ha		Qallow = 0.32 L/s			
C = 0.90		Vol(max) = 1.0 m3			
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)	
5	103.57	2.33	2.01	0.60	
10	76.81	1.73	1.41	0.85	
15	61.77	1.39	1.07	0.96	
20	52.03	1.17	0.85	1.02	
25	45.17	1.02	0.70	1.05	
30	40.04	0.90	0.58	1.05	
35	36.06	0.81	0.49	1.03	
40	32.86	0.74	0.42	1.01	
45	30.24	0.68	0.36	0.97	
50	28.04	0.63	0.31	0.93	
55	26.17	0.59	0.27	0.89	
60	24.56	0.55	0.23	0.84	
65	23.15	0.52	0.20	0.79	
70	21.91	0.49	0.17	0.73	
75	20.81	0.47	0.15	0.67	
90	18.14	0.41	0.09	0.48	
105	16.13	0.36	0.04	0.27	
120	14.56	0.33	0.01	0.06	

Proposed Residential Development					
Novatech Project No. 121097					
REQUIRED STORAGE - 1:5 YEAR EVENT					
AREA R-1			Controlled Roof Drain #3		
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	3.18	2.86	0.86	
10	104.19	2.35	2.03	1.22	
15	83.56	1.88	1.56	1.41	
20	70.25	1.58	1.26	1.51	
25	60.90	1.37	1.05	1.58	
30	53.93	1.21	0.89	1.61	
35	48.52	1.09	0.77	1.62	
40	44.18	0.99	0.67	1.62	
45	40.63	0.91	0.59	1.61	
50	37.65	0.85	0.53	1.58	
55	35.12	0.79	0.47	1.55	
60	32.94	0.74	0.42	1.52	
65	31.04	0.70	0.38	1.48	
70	29.37	0.66	0.34	1.43	
75	27.89	0.63	0.31	1.39	
90	24.29	0.55	0.23	1.23	
105	21.58	0.49	0.17	1.05	
120	19.47	0.44	0.12	0.85	

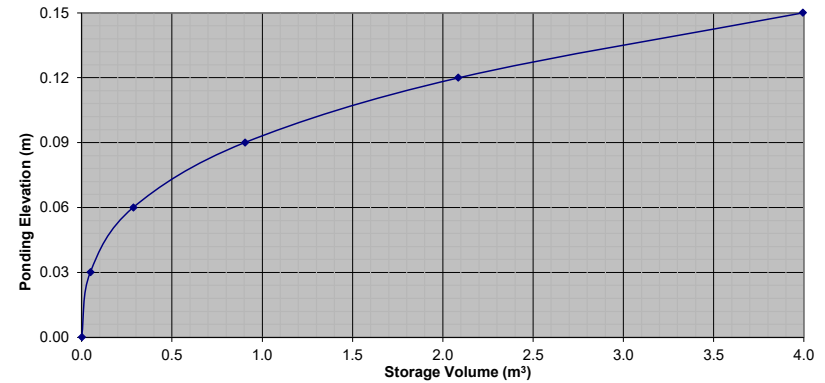
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed					
Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m ³)	
				Required	Provided
1:2 Year	0.32	0.32	9	1.0	2.1
1:5 Year	0.32	0.32	11	1.6	4.0
1:100 Year	0.32	0.32	15	3.9	4.0

Roof Drain Storage Table for Area RD 3		
Elevation	Area RD 3	Total Volume
m	m ²	m ³
0.00	0	0
0.03	3.17	0.0
0.06	12.69	0.3
0.09	28.55	0.9
0.12	50.18	2.1
0.15	77.02	4.0

Proposed Residential Development					
Novatech Project No. 121097					
REQUIRED STORAGE - 1:100 YEAR EVENT					
AREA R-1			Controlled Roof Drain #3		
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	6.07	5.75	1.73	
10	178.56	4.47	4.15	2.49	
15	142.89	3.58	3.26	2.93	
20	119.95	3.00	2.68	3.22	
25	103.85	2.60	2.28	3.42	
30	91.87	2.30	1.98	3.56	
35	82.58	2.07	1.75	3.67	
40	75.15	1.88	1.56	3.74	
45	69.05	1.73	1.41	3.80	
50	63.95	1.60	1.28	3.84	
55	59.62	1.49	1.17	3.87	
60	55.89	1.40	1.08	3.88	
65	52.65	1.32	1.00	3.89	
70	49.79	1.25	0.93	3.89	
75	47.26	1.18	0.86	3.88	
90	41.11	1.03	0.71	3.83	
105	36.50	0.91	0.59	3.74	
120	32.89	0.82	0.50	3.62	

Proposed Residential Development					
Novatech Project No. 121097					
REQUIRED STORAGE - 1:100 YEAR + 20%					
AREA R-1			Controlled Roof Drain #3		
OTTAWA IDF CURVE					
Area = 0.009 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	291.24	7.29	6.97	2.09	
10	214.27	5.36	5.04	3.02	
15	171.47	4.29	3.97	3.57	
20	143.94	3.60	3.28	3.94	
25	124.62	3.12	2.80	4.20	
30	110.24	2.76	2.44	4.39	
35	99.09	2.48	2.16	4.53	
40	90.17	2.26	1.94	4.65	
45	82.86	2.07	1.75	4.73	
50	76.74	1.92	1.60	4.80	
55	71.55	1.79	1.47	4.85	
60	67.07	1.68	1.36	4.89	
65	63.18	1.58	1.26	4.92	
70	59.75	1.49	1.17	4.93	
75	56.71	1.42	1.10	4.94	
90	49.33	1.23	0.91	4.94	
105	43.80	1.10	0.78	4.89	
120	39.47	0.99	0.67	4.81	

Stage Storage Curve: Area R-1
Controlled Roof Drain #3



Proposed Residential Development					
Novatech Project No. 121097					
REQUIRED STORAGE - 1:2 YEAR EVENT					
AREA R-1		Controlled Roof Drain #4			
OTTAWA IDF CURVE					
Area =	0.008	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	0.9	m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)	
5	103.57	2.07	1.75	0.53	
10	76.81	1.54	1.22	0.73	
15	61.77	1.24	0.92	0.82	
20	52.03	1.04	0.72	0.87	
25	45.17	0.90	0.58	0.88	
30	40.04	0.80	0.48	0.87	
35	36.06	0.72	0.40	0.84	
40	32.86	0.66	0.34	0.81	
45	30.24	0.61	0.29	0.77	
50	28.04	0.56	0.24	0.72	
55	26.17	0.52	0.20	0.67	
60	24.56	0.49	0.17	0.62	
65	23.15	0.46	0.14	0.56	
70	21.91	0.44	0.12	0.50	
75	20.81	0.42	0.10	0.43	
90	18.14	0.36	0.04	0.23	
105	16.13	0.32	0.00	0.02	
120	14.56	0.29	-0.03	-0.21	

Proposed Residential Development					
Novatech Project No. 121097					
REQUIRED STORAGE - 1:5 YEAR EVENT					
AREA R-1		Controlled Roof Drain #4			
OTTAWA IDF CURVE					
Area =	0.008	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	1.4	m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)	
5	141.18	2.83	2.51	0.75	
10	104.19	2.09	1.77	1.06	
15	83.56	1.67	1.35	1.22	
20	70.25	1.41	1.09	1.30	
25	60.90	1.22	0.90	1.35	
30	53.93	1.08	0.76	1.37	
35	48.52	0.97	0.65	1.37	
40	44.18	0.88	0.56	1.35	
45	40.63	0.81	0.49	1.33	
50	37.65	0.75	0.43	1.30	
55	35.12	0.70	0.38	1.26	
60	32.94	0.66	0.34	1.22	
65	31.04	0.62	0.30	1.18	
70	29.37	0.59	0.27	1.13	
75	27.89	0.56	0.24	1.07	
90	24.29	0.49	0.17	0.90	
105	21.58	0.43	0.11	0.71	
120	19.47	0.39	0.07	0.50	

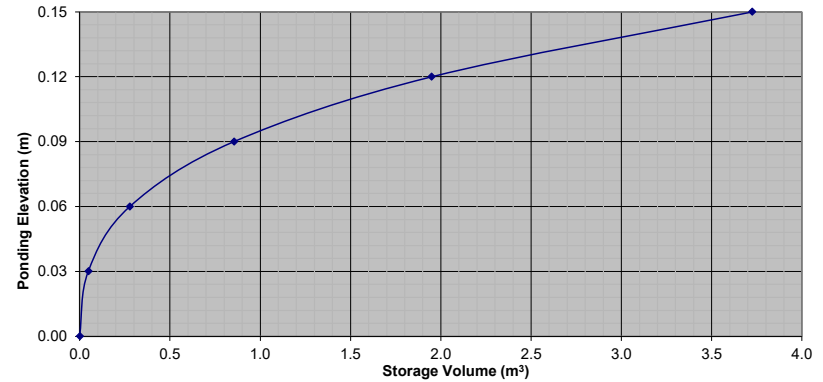
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed					
Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m ³)	
				Required	Provided
1:2 Year	0.32	0.32	9	0.9	1.9
1:5 Year	0.32	0.32	11	1.4	3.7
1:100 Year	0.32	0.32	14	3.3	3.7

Roof Drain Storage Table for Area RD 4		
Elevation	Area RD 4	Total Volume
m	m ²	m ³
0.00	0	0
0.03	3.2	0.0
0.06	12.08	0.3
0.09	26.44	0.9
0.12	46.42	1.9
0.15	72.03	3.7

Proposed Residential Development					
Novatech Project No. 121097					
REQUIRED STORAGE - 1:100 YEAR EVENT					
AREA R-1		Controlled Roof Drain #4			
OTTAWA IDF CURVE					
Area =	0.008	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	3.3	m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)	
5	242.70	5.40	5.08	1.52	
10	178.56	3.97	3.65	2.19	
15	142.89	3.18	2.86	2.57	
20	119.95	2.67	2.35	2.82	
25	103.85	2.31	1.99	2.98	
30	91.87	2.04	1.72	3.10	
35	82.58	1.84	1.52	3.18	
40	75.15	1.67	1.35	3.24	
45	69.05	1.54	1.22	3.28	
50	63.95	1.42	1.10	3.31	
55	59.62	1.33	1.01	3.32	
60	55.89	1.24	0.92	3.32	
65	52.65	1.17	0.85	3.32	
70	49.79	1.11	0.79	3.31	
75	47.26	1.05	0.73	3.29	
90	41.11	0.91	0.59	3.21	
105	36.50	0.81	0.49	3.10	
120	32.89	0.73	0.41	2.96	

Proposed Residential Development					
Novatech Project No. 121097					
REQUIRED STORAGE - 1:100 YEAR + 20%					
AREA R-1		Controlled Roof Drain #4			
OTTAWA IDF CURVE					
Area =	0.008	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	4.2	m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)	
5	291.24	6.48	6.16	1.85	
10	214.27	4.77	4.45	2.67	
15	171.47	3.81	3.49	3.14	
20	143.94	3.20	2.88	3.46	
25	124.62	2.77	2.45	3.68	
30	110.24	2.45	2.13	3.84	
35	99.09	2.20	1.88	3.96	
40	90.17	2.01	1.69	4.05	
45	82.86	1.84	1.52	4.11	
50	76.74	1.71	1.39	4.16	
55	71.55	1.59	1.27	4.20	
60	67.07	1.49	1.17	4.22	
65	63.18	1.41	1.09	4.23	
70	59.75	1.33	1.01	4.24	
75	56.71	1.26	0.94	4.24	
90	49.33	1.10	0.78	4.20	
105	43.80	0.97	0.65	4.12	
120	39.47	0.88	0.56	4.02	

Stage Storage Curve: Area R-1
Controlled Roof Drain #4

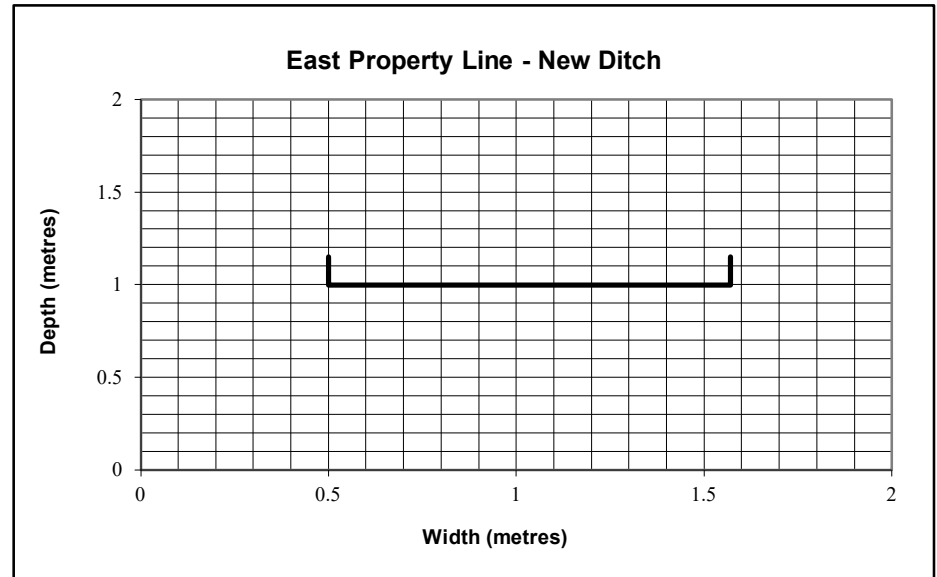


Location : 522 Lower Byron Avenue

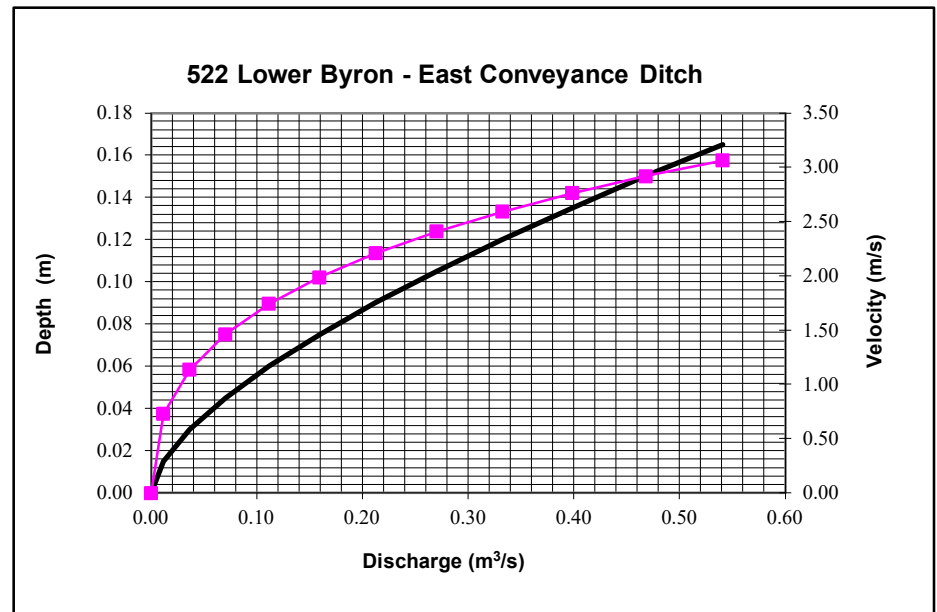
Description: East Property Line Conveyance Ditch

Dimensions: Bottom width = 1.07 m
 Right Side slopes = 0.0 :1
 Left Side slopes = 0.0 :1

Slope = 2.50%
 Mannings n = 0.013
 Average depth = 0.15 m



Depth (m)	Area (m ²)	Hydraulic Radius (m)	Velocity (m/s)	Flow (m ³ /s)
0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.01	0.73	0.01
0.03	0.03	0.03	1.14	0.04
0.05	0.05	0.04	1.46	0.07
0.06	0.06	0.05	1.74	0.11
0.08	0.08	0.07	1.99	0.16
0.09	0.10	0.08	2.21	0.21
0.11	0.11	0.09	2.41	0.27
0.12	0.13	0.10	2.59	0.33
0.14	0.14	0.11	2.76	0.40
0.15	0.16	0.12	2.92	0.47
0.17	0.18	0.13	3.06	0.54
0.18	0.19	0.13	3.20	0.62

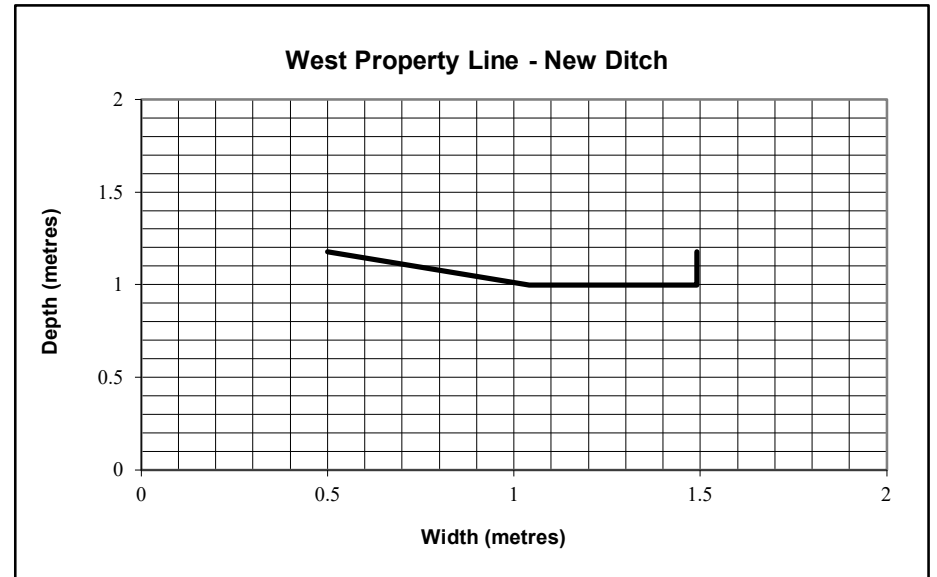


Location : 522 Lower Byron Avenue

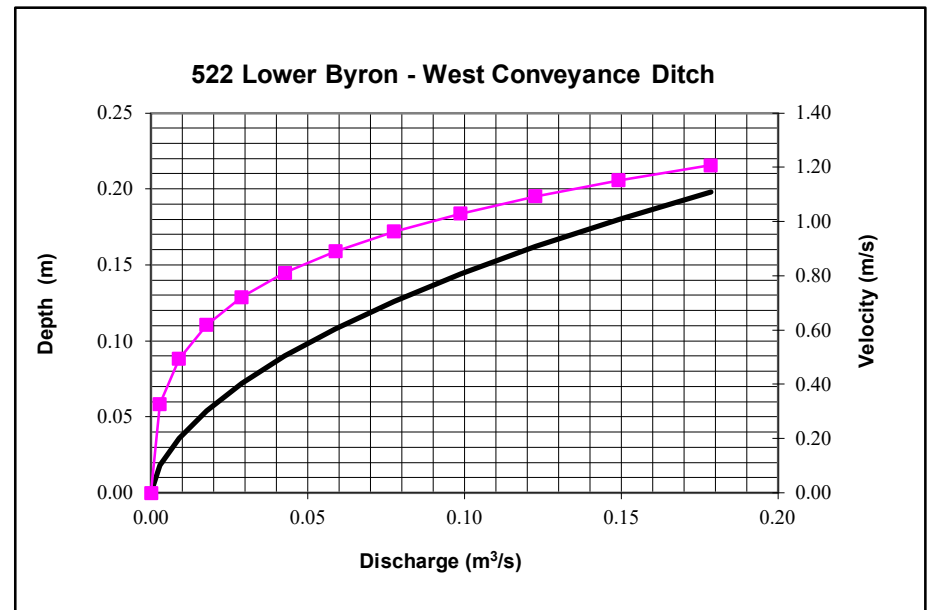
Description: West Property Line Conveyance Ditch

Dimensions: Bottom width = 0.45 m
 Right Side slopes = 3.0 :1
 Left Side slopes = 0.0 :1

Slope = 1.87%
 Mannings n = 0.027
 Average depth = 0.18 m



Depth (m)	Area (m ²)	Hydraulic Radius (m)	Velocity (m/s)	Flow (m ³ /s)
0.00	0.00	0.00	0.00	0.00
0.02	0.01	0.02	0.33	0.00
0.04	0.02	0.03	0.49	0.01
0.05	0.03	0.04	0.62	0.02
0.07	0.04	0.05	0.72	0.03
0.09	0.05	0.06	0.81	0.04
0.11	0.07	0.07	0.89	0.06
0.13	0.08	0.08	0.96	0.08
0.14	0.10	0.09	1.03	0.10
0.16	0.11	0.10	1.09	0.12
0.18	0.13	0.11	1.15	0.15
0.20	0.15	0.12	1.21	0.18



APPENDIX F

Control Flow Road Drain Information



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

**Adjustable Flow Control
 for Roof Drains**

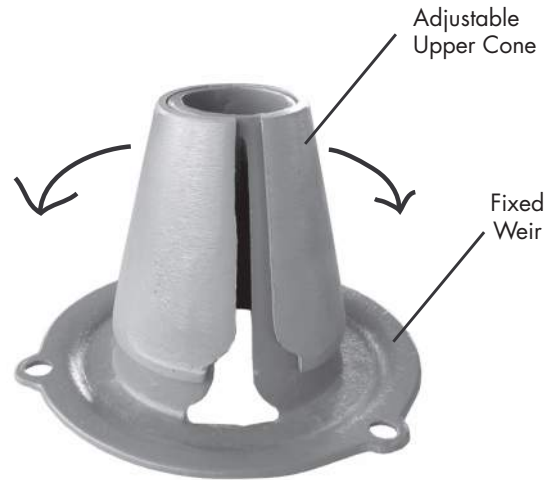
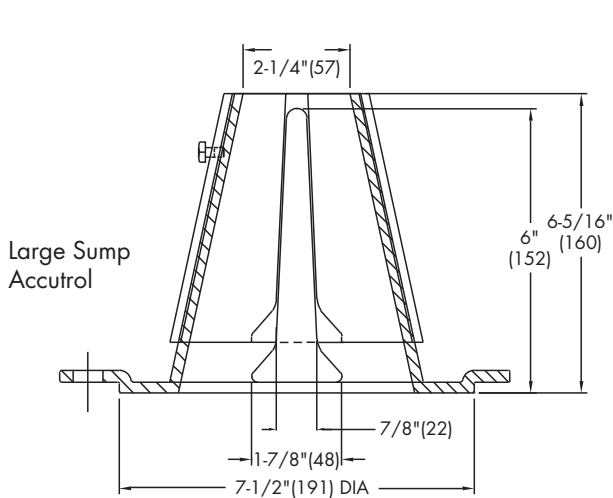
ADJUSTABLE ACCUTROL (for Large Sump Roof Drains only)

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 _____

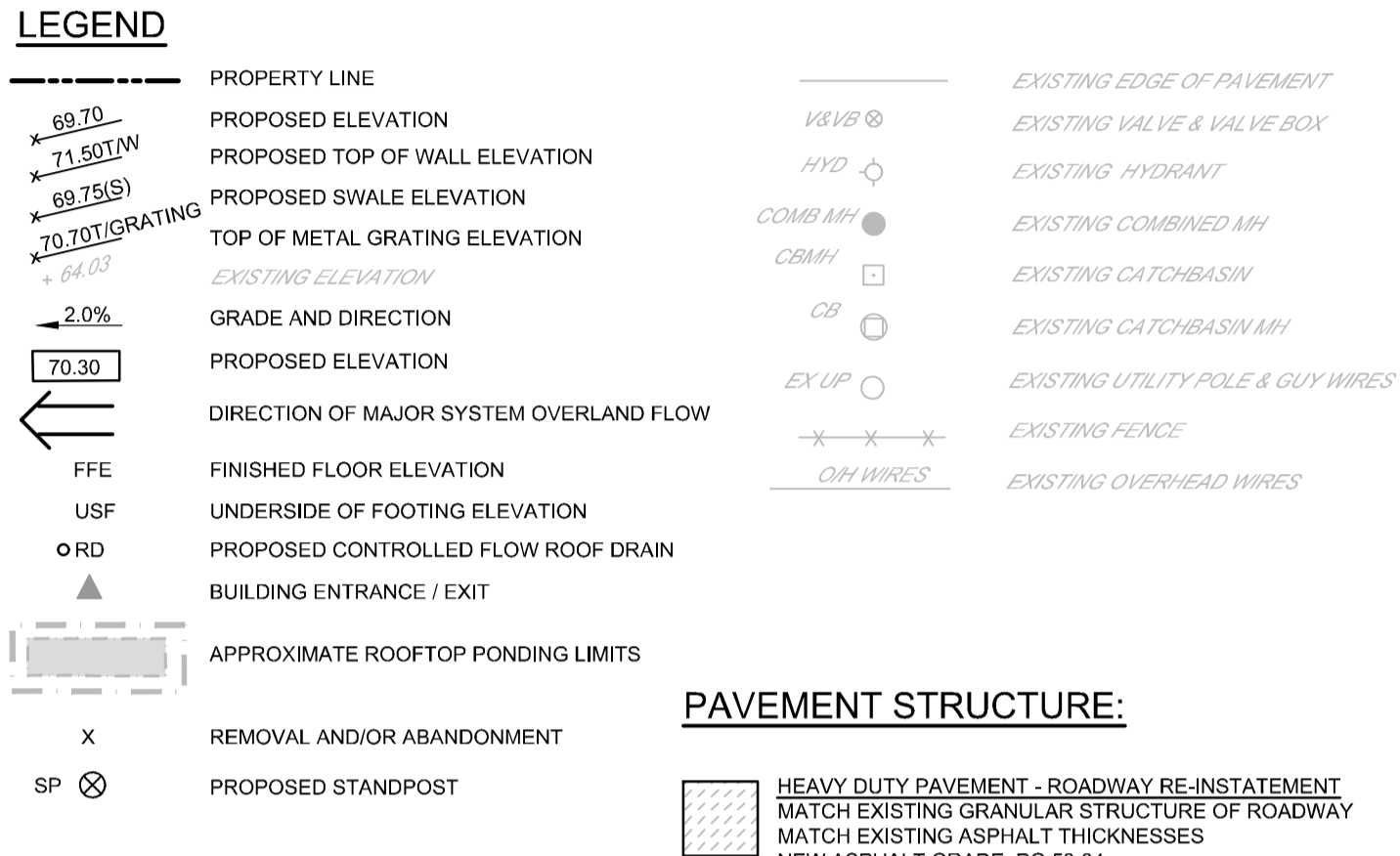
Contractor _____
 Contractor's P.O. No. _____
 Representative _____

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
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Latin America: Tel: (52) 81-1001-8600 • Fax: (52) 81-8000-7091 • Watts.com



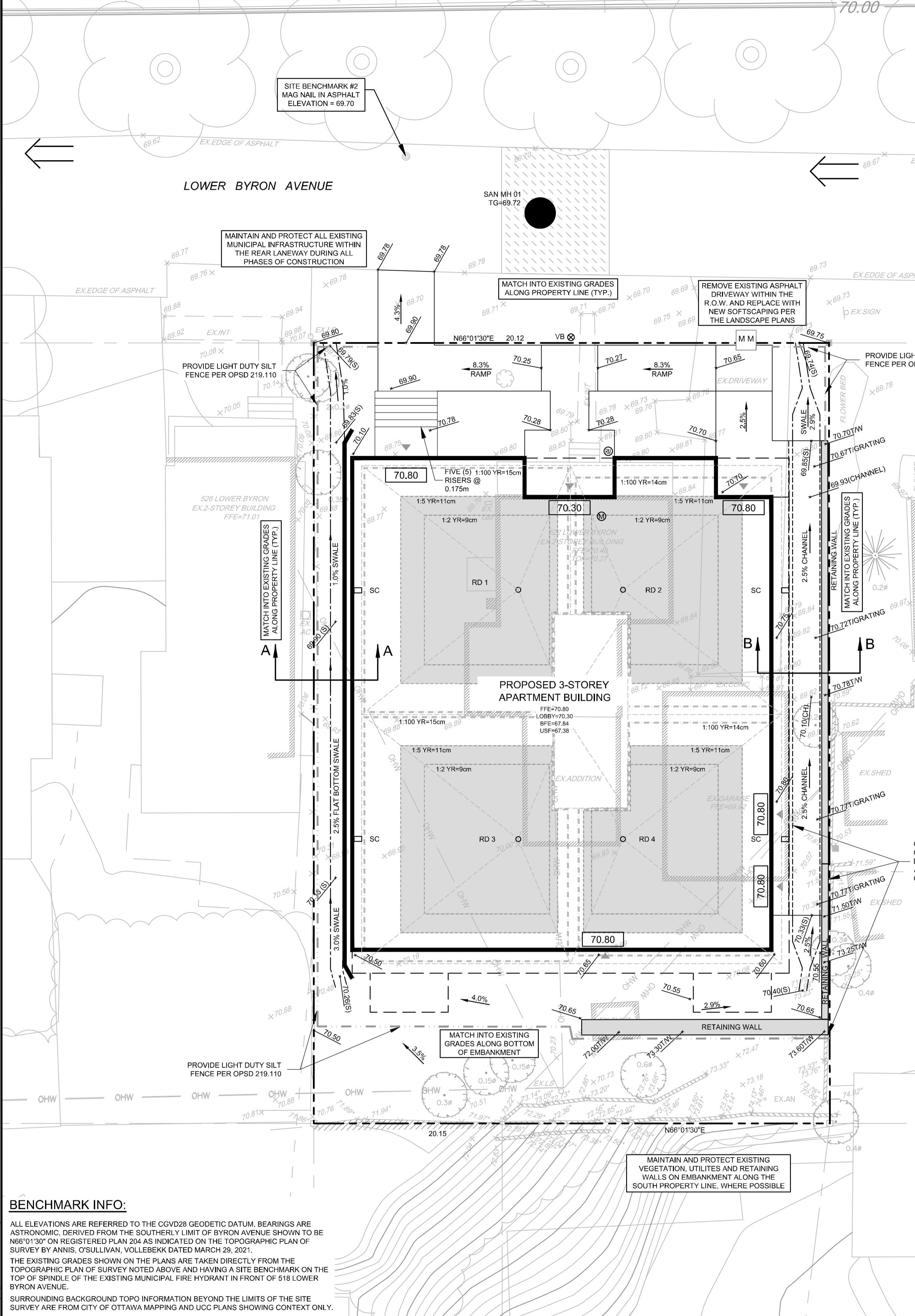
Erosion and Sediment Control Responsibilities:			During Construction		After Construction Prior to Final Acceptance		After Final Acceptance	
ESC Measure	Symbol	Specification	Installation Responsibility	Inspection/Maintenance Responsibility	Inspection Frequency	Approval to Remove	Removal Responsibility	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	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	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Consultant	Developer's Contractor	N/A
Stabilized Material Stockpiling	---	Location as Required by Contractor	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



- 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 REPORT (PATERSON REPORT NUMBER PG5981-1), DATED OCTOBER 1, 2021, PREPARED BY PATERSON GROUP, FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS, AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO VIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
 - REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS.
 - REFER TO DEVELOPMENT SERVICING AND STORMWATER MANAGEMENT REPORT (R-2022-089) 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 95% 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.

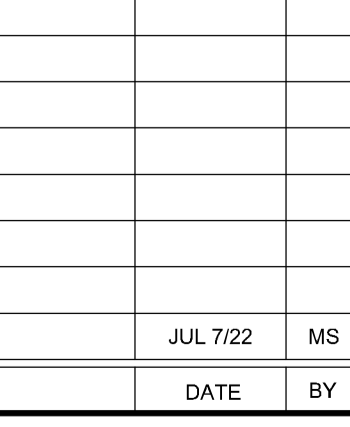
- EROSION AND SEDIMENT CONTROL NOTES:**
- ALL EROSION AND SEDIMENT CONTROLS ARE TO BE INSTALLED TO THE SATISFACTION OF THE ENGINEER AND THE CITY OF OTTAWA. THEY ARE TO BE APPROPRIATE TO THE SITE CONDITIONS, PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.) AND 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 CLOTH 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.



BENCHMARK INFO:
 ALL ELEVATIONS ARE REFERRED TO THE CGVD28 GEODETIC DATUM. BEARINGS ARE ASTROMONOMIC, DERIVED FROM THE SOUTHERLY LIMIT OF BYRON AVENUE SHOWN TO BE N66°01'30" ON REGISTERED PLAN 204 AS INDICATED ON THE TOPOGRAPHIC PLAN OF SURVEY BY ANNIS, O'SULLIVAN, VOLLEBECK DATED MARCH 29, 2021.
 THE EXISTING GRADES SHOWN ON THE PLANS ARE TAKEN DIRECTLY FROM THE TOPOGRAPHIC PLAN OF SURVEY NOTED ABOVE AND HAVING A SITE BENCHMARK ON THE TOP OF SPINDLE OF THE EXISTING MUNICIPAL FIRE HYDRANT IN FRONT OF 518 LOWER BYRON AVENUE.
 SURROUNDING BACKGROUND TOPO INFORMATION BEYOND THE LIMITS OF THE SITE SURVEY ARE FROM CITY OF OTTAWA MAPPING AND UCC PLANS SHOWING CONTEXT ONLY.

OWNER INFORMATION
 SERCO REALTY GROUP
 9 CAPELLA COURT, UNIT 200,
 OTTAWA, ONTARIO, K2E 8A7
 CONTACT: LOREDANA PORCARI
 TELEPHONE: (613) 226-2221
 EMAIL: l.porcari@sercorealty.com

No.	REVISION	DATE	BY
1	ISSUED FOR SITE PLAN APPROVAL	JUL 7/22	MS



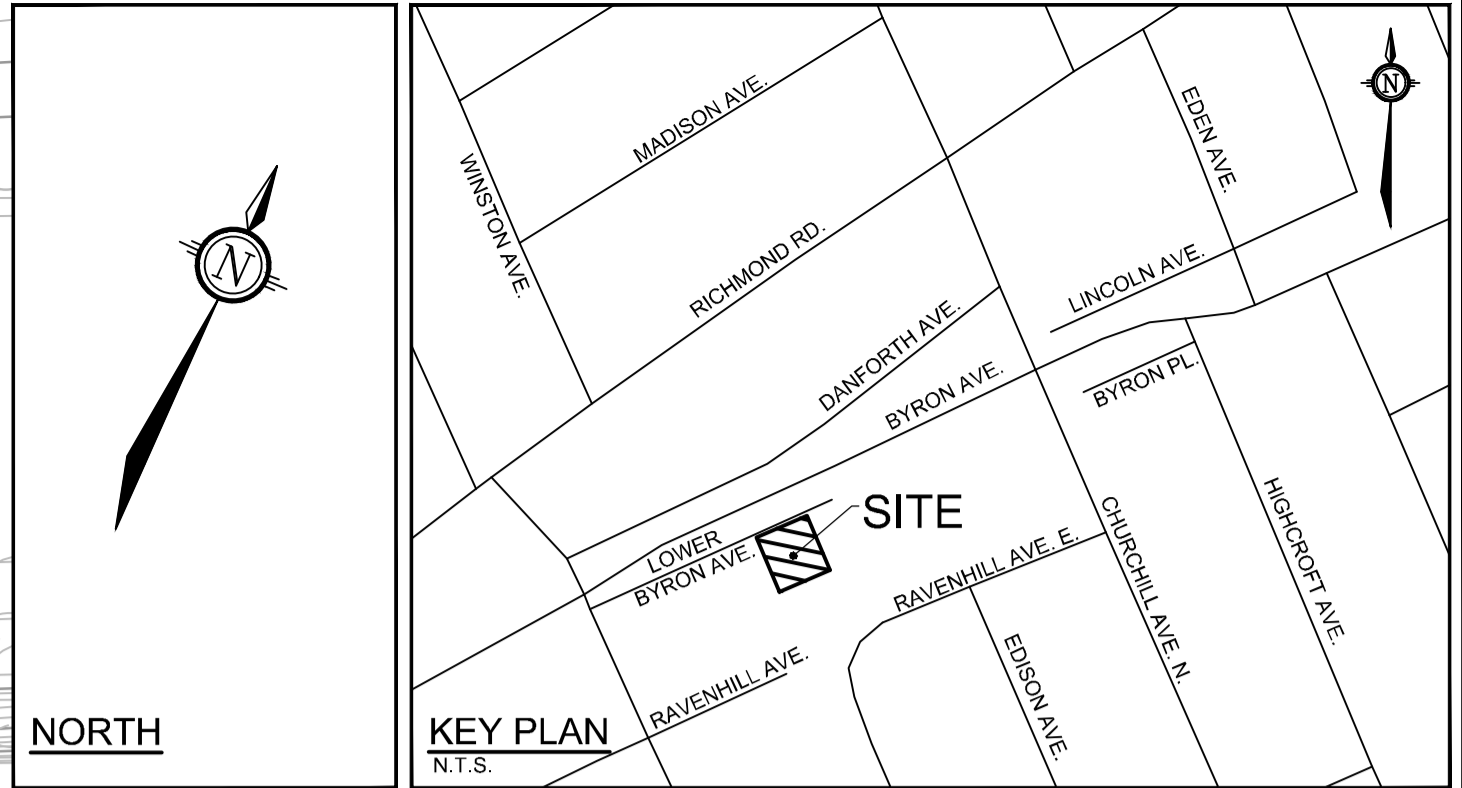
DESIGN	SM
CHECKED	MS
DRAWN	SM / DM
CHECKED	SM
APPROVED	MS

FOR REVIEW ONLY

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

LOCATION CITY OF OTTAWA 522 LOWER BYRON AVENUE	PROJECT No. 121097
DRAWING NAME GRADING AND EROSION & SEDIMENT CONTROL PLAN	REV #1 REV
	DRAWING No. 121097-GR

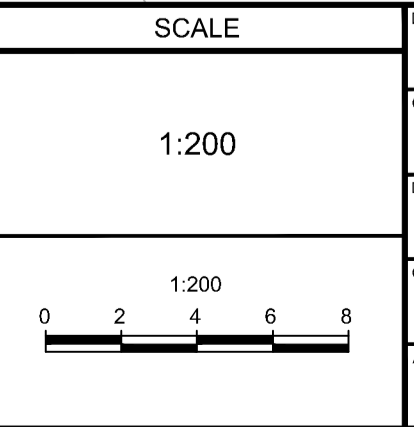
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NOTE:
 THE POSITION OF ALL POLE LINES, CONDUITS,
 WATERMANS, SEWERS AND OTHER
 UNDERGROUND AND OVERGROUND UTILITIES AND
 STRUCTURES IS NOT NECESSARILY SHOWN ON
 THE CONTRACT DRAWINGS, AND WHERE SHOWN,
 THE ACCURACY OF THE POSITION OF SUCH
 UTILITIES 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
 SERCO REALTY GROUP
 9 CAPELLA COURT, UNIT 200,
 OTTAWA, ONTARIO, K2E 8A7
 CONTACT: LOREDANA PORCARI
 TELEPHONE: (613) 226-2221
 EMAIL: l.porcari@sercorealty.com

No.	REVISION	DATE	BY
1	ISSUED FOR SITE PLAN APPROVAL	JUL 7/22	MS



DESIGN	SM
CHECKED	MS
DRAWN	SM / DM
CHECKED	SM
APPROVED	MS

FOR REVIEW ONLY



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

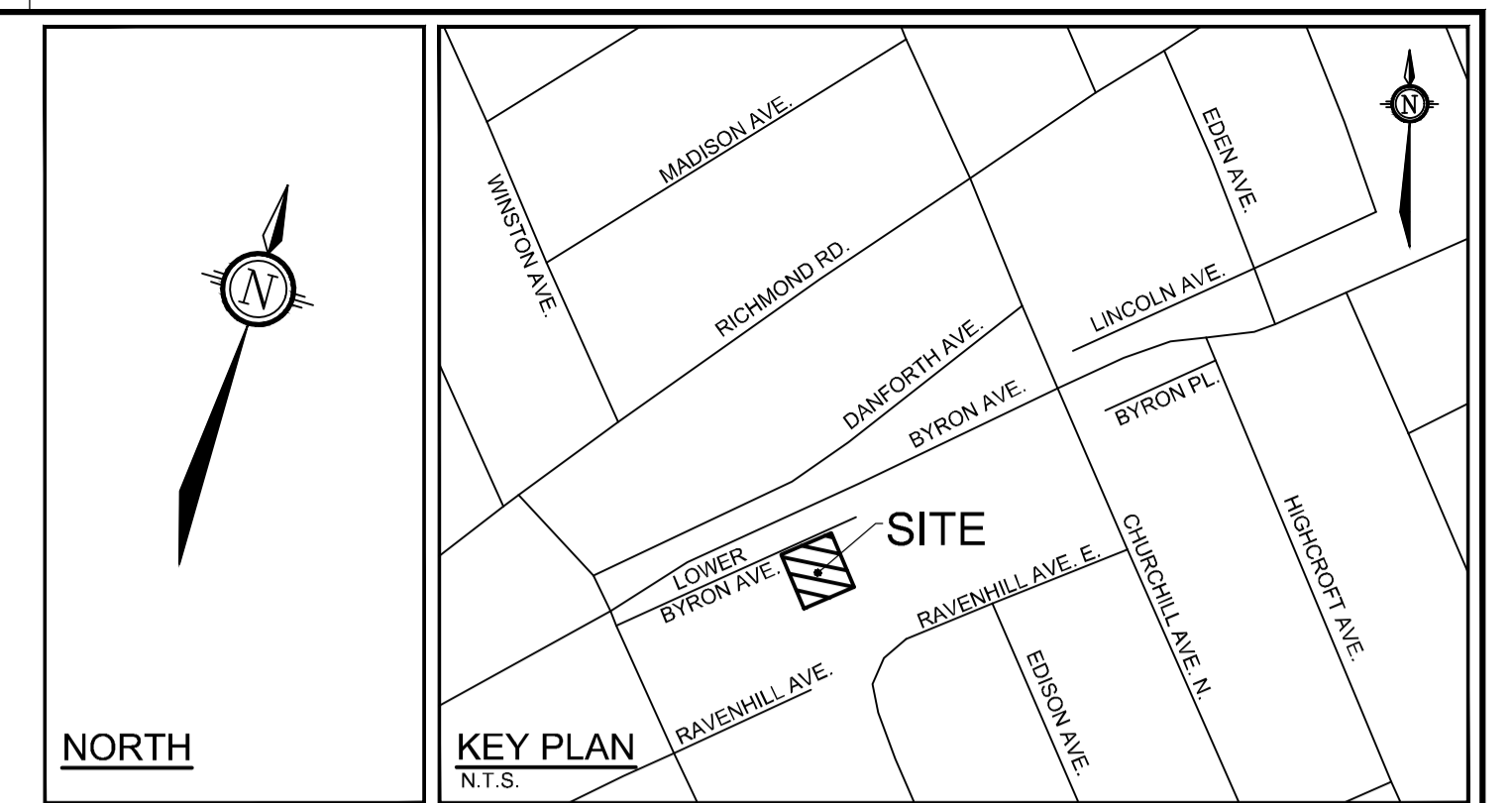
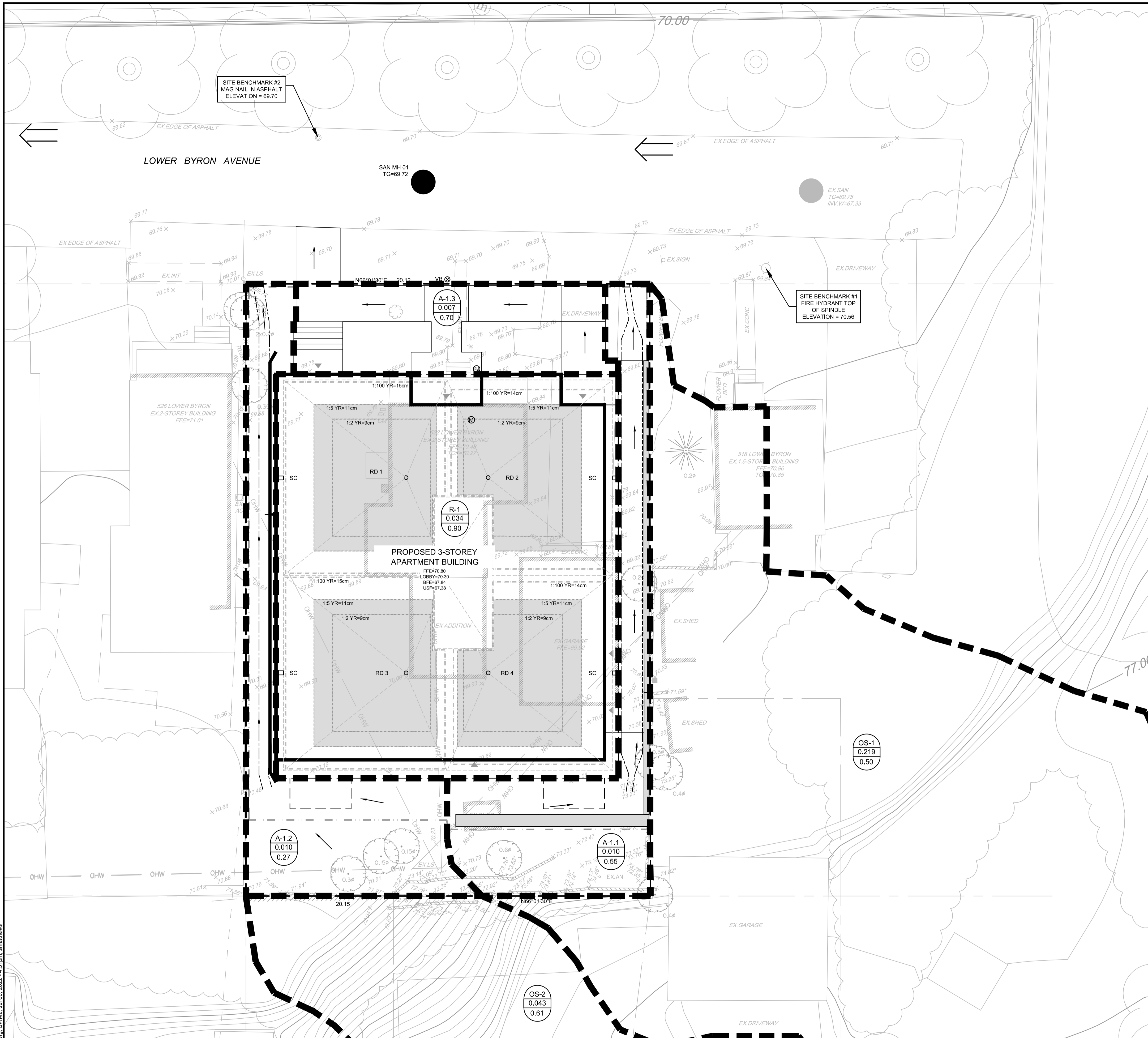
LOCATION
 CITY OF OTTAWA
 522 LOWER BYRON AVENUE

DRAWING NAME
**PRE-DEVELOPMENT
 STORMWATER
 MANAGEMENT PLAN**

PROJECT No.	REV	REV #
121097		

DRAWING No. 121097-SWM1

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LEGEND

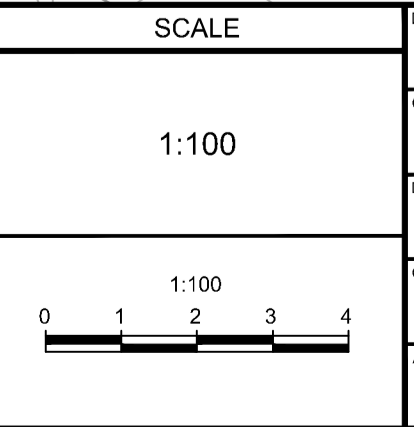
	PROPOSED BARRIER CURB		EXISTING STORM MH & SEWER
	PROPOSED DEPRESSED CURB		EXISTING CATCHBASIN / CW CATCHBASIN LEAD
	DRAINAGE AREA LIMITS		
	APPROXIMATE PONDING LIMITS		
	POST-DEVELOPMENT AREA ID		
	POST-DEVELOPMENT DRAINAGE AREA (ha)		
	1.5 YEAR WEIGHTED RUNOFF COEFFICIENT		
	FINISHED FLOOR ELEVATION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

- 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 REPORT (PATERSON REPORT NUMBER PG5981-1), DATED OCTOBER 1, 2021, PREPARED BY PATERSON GROUP, 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 HARDSURFACE AREAS AND DIMENSIONS.
 - REFER TO DEVELOPMENT SERVICING AND STORMWATER MANAGEMENT REPORT (R-2022-089) 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).
 - PROVIDE LINE/PARKING PAINTING.

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.

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LOCATION
 CITY OF OTTAWA
 522 LOWER BYRON AVENUE

DRAWING NAME
**POST-DEVELOPMENT
 STORMWATER
 MANAGEMENT PLAN**

PROJECT No. 121097
 REV # 1
 DRAWING No. 121097-SWM2

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