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39 Years

54, 56 & 60 Bayswater Avenue

Development Servicing and Stormwater Management Report

Engineering excellence. Planning progress. Liveable landscapes.

PROPOSED RESIDENTIAL DEVELOPMENT
54, 56 & 60 BAYSWATER

DEVELOPMENT SERVICING AND STORMWATER MANAGEMENT REPORT

Prepared by:

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

June 16, 2021
Revised**: November 19, 2021**

Ref: R-2021-007
Novatech File No. 120169

November 19, 2021

Centennial Developments Corporation
35 Kenilworth Avenue
Ottawa, Ontario
K1Y 3X9

Attention: Mr. Blair Hulaj

Dear Sir:

Re: Development Servicing and Stormwater Management Report
Proposed 6-Storey Residential Development
54, 56 & 60 Bayswater Avenue, Ottawa, ON
Novatech File No: 120169

Enclosed is a copy of the revised 'Development Servicing and Stormwater Management Report' for the proposed 6-storey residential development located at 54, 56 &60 Bayswater Avenue, in the City of Ottawa. This report addresses the approach to site servicing and stormwater management and is submitted in support of a 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

M Savic

Miroslav Savic, P. Eng.
Senior Project Manager

cc: Mohammed Fawzi (City of Ottawa)
Amanda Lawrence (S.J. Architect Inc.)

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1.0 INTRODUCTION

The new 6-storey residential development is being proposed by Centennial Developments Corporation and Novatech has been retained to complete the site servicing and stormwater management design 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 zoning by-law amendment and site plan control application.

1.2 Site Description and Location

The subject site is approximately 0.120 hectares in size and currently consists several detached homes with site access off both Bayswater Avenue and the rear lane. The subject site is located immediately south the existing residential high-rise tower on the south-west corner of Bayswater Avenue and Somerset Street West in the Hintonburg neighbourhood of Ottawa. Residential lots abut the property in all directions. The description of the subject site is designated as Part of both Lot 6 and Lot 7, Block Q, West Bayswater Avenue, Registered Plan 73, 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 January 6th, 2021 at which time the client was advised of the general submission requirements.

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 are will discharge into a municipal storm sewer that is not a combined sewer.

The subject site is located within the jurisdiction of the Rideau Valley Conservation Authority (RVCA). Based on preliminary feedback from the RVCA, surface parking lots and drive aisles typically require an 'Enhanced' Level of Protection (i.e. 80% TSS removal). Landscaped areas and roof tops are considered clean for the purposes of water quality and aquatic habitat protection. In this case, since parking will be provided underground and the limited surface parking area adjacent to the existing rear laneway will be covered, an Oil-Grit Separator (OGS) unit for on-site stormwater quality control will not be required. Refer to **Appendix A** for correspondence from the RVCA and City of Ottawa related to the proposed development.

1.4 Proposed Development

The proposed development will consist of a new 6-storey residential development replacing the pre-existing structures. The proposed 6-storey development will be serviced by extending new on-site service laterals to the existing watermain, sanitary and storm sewer systems in Bayswater Avenue. 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 rear parking spaces and garages along the rear lane on the west side of the building will be removed and replaced with rear yard amenity space, landscaping and surface parking with a proposed carport roof.

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.: PG5645-1), prepared by Paterson Group Inc. dated February 24th, 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 the report.

2.1 Sanitary Sewage

The existing residential properties on-site all outlet to the existing 300mm dia. municipal sewer in Bayswater Avenue. The proposed residential apartment building will be serviced by connecting to the existing 300mm dia. concrete sewer with a new 'doghouse' maintenance hole.

A new 200mm dia. sanitary lateral will be extended to the proposed building near the north-east corner of the site and a monitoring manhole will be placed on-site near the property line along the Bayswater frontage.

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 (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
- 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 0.74 L/s. Refer to **Appendix C** for detailed calculations.

A 200mm dia. sanitary gravity sewer at a minimum slope of 1.0% has a full flow conveyance capacity of 34.2 L/s and will have enough capacity to convey the theoretical sanitary flows for the proposed addition. Furthermore, the existing 300mm dia. municipal sanitary sewer is also at a steeper slope of 2.5% with a full flow conveyance capacity of approximately 159.5 L/s and the system should have sufficient capacity to convey the sanitary flows from the site.

2.2 Water

The proposed development will be serviced by connecting the proposed 150mm dia. water services the existing 203mm dia. municipal watermain in Bayswater Avenue. The water services have been sized to provide the required domestic water demand and fire flow. 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: 350 L/person/day
- 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.**

Table 2.1: Domestic Water Demands

Average Day Demand	Maximum Day Demand	Peak Hour Demand
0.26 L/s	0.64 L/s	1.4 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:

- Maximum system pressure is not to exceed 552 kPa (80 psi)
- 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)	107.8 m	1.4	40 psi (min.)	63.0
Maximum HGL (Avg Day Demand)	114.2 m	0.26	80 psi (max.)	72.1
Max Day + Fire Flow HGL	105 m	133 + 0.64	20 psi (min.)	59.0

* Based on an average ground elevation of 63.5m. Design pressure = (HGL – watermain elevation) x 1.42197 PSI/m

As indicated above, the existing municipal watermains should provide adequate system pressures to the proposed development. It is anticipated that a booster pump will be required to increase pressure to the upper floors of the building.

2.2.2 Water Supply for Fire-Fighting

The proposed building will be fully sprinklered and supplied with a fire department (siamese) connection. The siamese connection will be located near the main entrance of the proposed building, within 45m of the existing municipal fire hydrant in Bayswater Avenue.

The Fire Underwriters Survey (FUS) was used to estimate fire flow requirements for the proposed building. The fire flow calculations have been based on the information provided by the architect. The proposed building will have 6-storeys, a sprinkler system and will be constructed using non-combustible materials.

Table 2.3 summarizes the fire flow requirements for the proposed building, based on FUS calculations.

Table 2.3: Fire Flow Requirements for the Proposed Development

Type of Use	Fire Flow Demand
New Residential Apartment Building	8,000 L/min (133 L/s)

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

The fire flow requirements include both sprinkler system and hose allowances in accordance with the OBC and NFPA 13. The sprinkler systems will be designed by the fire protection (sprinkler) engineer as this process involves detailed hydraulic calculations based on building layout, pipe runs, head losses, fire pump requirements, etc. Fire flow requirements calculated using the FUS method tend to generate higher values when compared to flows being calculated using the OBC and NFPA.

A multi-hydrant approach to fire-fighting is anticipated to be required. There are two Class AA, blue bonnet municipal hydrants within 75m of the proposed development (both municipal hydrants are in the east boulevard of Bayswater Avenue (one approximately 50m from the north-east corner of the proposed building and another approximately 34m from the proposed siamese connection near the south-east building corner. Based on *Table 1 Maximum flow to be considered from a given hydrant* in *Appendix I* of *Technical Bulletin ISTB-2018-02*, the combined flows from the three hydrants are summarized below in **Table 2.4**.

Table 2.4: Combined Hydrant Flow Summary

Municipal Fire Hydrants < 75m from Building	Combined Fire Flow
2 x 5,700 L/min	11,400 L/min

The combined maximum flow from these hydrants will exceed the Max Day + Fire Flow requirement (8,000 L/min) of the proposed development. The existing municipal watermain network should therefore have adequate fire water supply for the proposed development.

2.3 Storm Drainage and Stormwater Management

The current residential properties on-site all outlet to the existing 375mm dia. municipal sewer in Bayswater Avenue. The proposed residential apartment building will be serviced by connecting to the existing 375mm dia. concrete sewer with a new 'doghouse' maintenance hole. A new 250mm dia. storm lateral will be extended to the proposed building near the north-east corner of the site and a monitoring manhole will be placed on-site near the property line along the Bayswater frontage.

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 and within an internal SWM storage tank to provided quantity control for the proposed building flows.
- 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 municipal sewer in Bayswater 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 entire site is approximately 0.12 ha in size and is comprised of three (3) existing residential dwellings. The existing properties primarily sheet drain uncontrolled to the Bayswater Avenue roadway catchbasins and down the hill to the north (identified as area EX-1 on the Pre-development Drainage Area Plan in **Appendix E**). The parking areas and existing garages on the west side of the three properties are all tributary to the existing rear laneway that drains uncontrolled along the asphalt laneway and then north towards Somerset Street West (identified as EX-2). There is currently no stormwater quantity or quality control measures on-site. There is also a small portion of the neighbouring rooftops and rear-yards that currently drains through the subject site uncontrolled to Bayswater Avenue (identified as OS-1). Off-site tributary flows will be conveyed overland through the subject site via. a vegetated swale along the south property line 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 0.12 ha portion of the site to be developed were calculated using the Rational Method to be 19.5 L/s during the 1:5-year design event and 38.0 L/s during the 1:100-year design event. Refer to **Appendix E** for detailed calculations. There are currently no water quality control measures being provided on site.

As specified by the City of Ottawa, the target allowable release rate from the site was calculated using the Rational Method, to be approximately 17.4 L/s, based on a 10-min. rainfall intensity, using a 5-year return period (City of Ottawa IDF Curves) and a runoff coefficient of 0.50.

T_c = 10 min C =0.50
I_{5yr} = 104.2 mm/hr A = 0.120 ha

Q_{allow} = 2.78 CIA
= 2.78 x 0.50 x 104.2 x 0.120
= 17.4 L/s

2.3.3 Post-Development Conditions

The proposed site will be serviced by connecting to the existing 375mm dia. concrete storm sewer in Bayswater Avenue near the north-east 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. In addition to this, stormwater runoff from

the lower roof terraces, an intermediate level amenity area and the vehicle parking ramp to the underground parking level will be directing to an internal stormwater storage tank system and controlled prior to being discharged into the new building service via. a mechanical pumping system. Refer to plan 120169-SWM for drainage areas and details.

2.3.3.1 Area A-1: Uncontrolled Direct Runoff to Bayswater Avenue

The combined uncontrolled post-development flow from this sub-catchment area was calculated using the Rational Method to be approximately 7.1 L/s during the 5-year design event and 14.0 L/s during the 100-year design event. As discussed with the RVCA representative, it will not be possible to control or treat stormwater flows from this area due to the proximity of the adjacent residential homes and the nature of the existing rear-yard grading to the asphalt laneway. To mitigate flows to the asphalt laneway a carport roof will be installed above the rear-lane parking stalls. The downspout from the carport roof will be directed to an on-site vegetated swale that outlets to a grassed area along the Bayswater frontage. Refer to **Appendix E** for SWM calculations.

2.3.3.2 Area B-2: Controlled Flow from Internal SWM Tank

Stormwater runoff from this sub-catchment area will be captured by the lower roof terraces, an intermediate level amenity area and the vehicle parking ramp to the underground parking level prior to being directed to an internal stormwater storage tank. Stormwater collected within the storage tank will be pumped up to the proposed storm service and released into the building service which in turn outlets to the municipal sewer in Bayswater Avenue. A pump (designed by the mechanical consultant) is required to control flow from the tank to a maximum rate of 1.89 L/s (30 USGPM), which corresponds to the maximum flow allocated for this catchment area. A "stand-by" pump will be provided for emergency and/or maintenance purposes. An emergency back-up power supply will also be provided. The storm service will be equipped with a backflow prevention device to protect the building from any potential sewer back-ups.

Table 2.5 summarizes the post-development stormwater design flows and storage volumes for both the 5-year and 100-year design events.

Table 2.5: Internal Stormwater Storage Tank and Pumped Flow

Design Event	Post-Development Conditions		
	Pumped Design Flow (L/s)	Volume Required (m^3)	Volume Provided (m^3)
1:2 Year	1.89 L/s	0.4 m^3	> 4.0 m^3
1:5 Year	1.89 L/s	0.9 m^3	
1:100 Year	1.89 L/s	2.9 m^3	
1:100 Year + 20% IDF increase	1.89 L/s	4.0 m^3	

As indicated in the table above, the internal stormwater storage tank will provide adequate storage for both the 5-year and 100-year design events, including an increased volume due to a 20% increase in rainfall intensity. Refer to **Appendix E** for detailed calculations.

2.3.3.3 Area R-3: Controlled Flow - Upper Building Roof

The post-development flow from this sub-catchment area will be attenuated by six (6) individual Watts adjustable 'Accutrol' control flow roof drains (model number RD-100-A-ADJ) prior to being directed to the proposed storm service, by-passing the internal SWM storage tank.

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 (0.012 ha)	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.11	0.15	2.4	5.7	6.0
RD-2 (0.011 ha)	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.11	0.15	2.2	5.1	5.2
RD-3 (0.010 ha)	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.11	0.15	1.9	4.5	4.5
RD-4 (0.004 ha)	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.11	0.15	0.5	1.3	1.3
RD-5 (0.009 ha)	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.10	0.14	1.6	3.9	4.5
RD-6 (0.007 ha)	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.10	0.14	1.1	2.8	3.5
Total Roof (0.053 ha)	**6**	**-**	**1.92**	**1.92**	**-**	**-**	**9.7**	**23.3**	**25.0**

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)	Target Allowable Flow (L/s)	A-1 Flow (L/s)	B-2 Flow (L/s)	R-3 Flow (L/s)	Total Flow (L/s)	Reduction in Flow (L/s or %)*
5-Yr	19.5	17.4	7.1	1.9	1.9	10.9	8.6 or 44%
100-Yr	38.0		14.0	1.9	1.9	17.8	20.2 or 53%

*Reduced flow compared to uncontrolled pre-development conditions.

During the 5-year post-development design event, flow from the subject site will be less than the target allowable flow of 17.4 L/s, specified by the City of Ottawa. During the 100-year design event, the total site flow will slightly exceed the desired release rate by approximately 0.4 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

As stated above, the subject site is located within the jurisdiction of the Rideau Valley Conservation Authority (RVCA). Based on preliminary feedback from the RVCA, landscaped areas and roof tops are considered clean for the purposes of water quality and aquatic habitat protection. In this case, since parking will be provided underground and surface parking areas will be covered with a carport roof, an OGS unit for on-site stormwater quality control will not be required. The downspout from the carport roof will be directed to an on-site vegetated swale that runs the entire length of the property and outlets to a grassed area along the Bayswater frontage. The proposed vegetation will absorb some of the water from the landscaped areas and the swale draining these areas will provide some level of quality control to the runoff being conveyed through the grassed swale and vegetated areas. The tributary area to the vegetated drainage swale is comprised completely of building/carport roof areas and residential amenity spaces and these landscaped areas and roof tops are already considered clean for the purposes of water quality and aquatic habitat protection. Refer to **Appendix A** for correspondence from the RVCA and City of Ottawa.

3.0 SITE GRADING

The area of the existing site to be developed is comprised of three residential dwellings with steps down to the frontage along Bayswater Avenue. The existing site generally slopes from south to north with elevations varying from approximately 64.05m to 63.15m along the north property line. There is an existing rear laneway to allow for vehicular access and parking along the west property line. The rear laneway also slopes from south to north and the existing grades vary from approximately 64.50m down to 63.90m at the north property line. 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 to the Bayswater Avenue right-of-way.

The finished floor elevation (FFE) of the proposed residential apartment building will be set at an elevation of 64.50m in order to match into the perimeter grades. 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 a portion of the site that requires exposing the foundation wall of the new building to accommodate the proposed drainage swale to the Bayswater Avenue right-of-way. Refer to the enclosed Grading and Erosion & Sediment Control Plan (120169-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 Bayswater Avenue right-of-way to the east, or directly to the rear laneway on the west side of the property. The floor elevation of the new building addition (64.50m) will be a minimum of 0.30m above the major system overflow points. The emergency overland flow route spill elevation from the rear yard is 63.94m, as indicated on plan 120169-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 64.35m, 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 Report[1] 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 zoning by-law amendment and site plan control application for the proposed residential development located at 54, 56 and 60 Bayswater Avenue in the City of Ottawa.

The conclusions are as follows:

- The proposed 6-storey residential apartment building will be serviced by extending new laterals to the existing municipal sewers and watermain in Bayswater Avenue. The site is currently serviced by multiple connections to the same municipal infrastructure.
- The building will be sprinklered and supplied with a fire department siamese connection. The new building siamese connection will be located within 45m of the existing municipal fire hydrant on the east side of Bayswater Avenue.
- The site flows from sub-catchment area A-1 will continue to drain off-site uncontrolled to the municipal right-of-way in Bayswater Avenue (including flows from OS-1), while flows from sub-catchment areas B-2 and R-3 will be controlled and conveyed municipal storm sewer system.
- The total post-development site flows will be controlled to a maximum release rate of 10.9 L/s during the 5-year storm event, which is less than the target allowable release rate of 17.4 L/s specified by the City. Given the site conditions and minimal opportunities to control flows from the residential rear-yards, the desired release rate of 17.4 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 17.8 L/s, which represents a significant reduction when compared to the pre-development flow of 38.0 L/s.
- As discussed with the RVCA, an OGS unit for on-site stormwater quality control will not be required, as site runoff is essentially deemed clean for the purpose of protecting surface water and aquatic habitat. The proposed outlet swale from the rear yard amenity area, landscaped areas and the carport roof will have an additional level of quality treatment from absorption by the plantings and draining through the vegetated swale.
- Regular inspection and maintenance of the building services, roof drains as well as the on-site SWM storage system including the structure sumps + pumps 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

Pre-Application Consultation Meeting Minutes

54, 56 and 60 Bayswater Avenue

PC2020-0341

January 6, 2021

Applicant Team

- Taylor West – Novatech (Applicant / Planning Consultant)
- Murray Chown – Novatech (Planning Consultant)
- Steve and Denise Hulag – Owners
- Amanda Lawrence (Architect) S.J. Architect Inc.
- Brandon Lawrence (Architect) S.J. Architect Inc.

Hintonburg Community Association

- Linda Hoad
- Jay Baltz

City of Ottawa

- Andrew McCreight, Planner, File Lead
- Mohammed Fawzi, Engineering
- Cody Oram, Engineering
- Randolph Wang, Urban Design
- Josiane Gervais, Transportation (did not attend, but forwarded comments).
- Shukufa Sultonmamad, Planning Student

MEETING NOTES

Applicant Team – Project Overview / Description

- Property context is important. LRT proximity and scale of development surrounding the site. Tall apartment at Somerset and Baywater, larger mid-rise across the street.
- Team discussed on numerous occasions the scale and right fit for the street.
- Proposal overview
    - Rear lane access along north side.
    - Garage room located to allow chute from each floor
    - Ground units with entrances to street and main entrance

- Ground floor bicycle room
- Rear cantilever area over surface parking.
- 8 units per floor, 2 on ground along Bayswater (38 units total)
- Design provides for transition to low-rise context on south side.
- Roof terrace provided for outdoor amenity and design will be setback from roof edge.
- Red brick for similar material with surrounding and massing transition to the south. Client looking for industrial look.
- Direction provided to client and architect from with respect tothe massing transition. Looking to respect the provisions of the new R4 in terms of articulation and building entrance and balconies. Intended to respect current zoning (except height). As-of-right with exception of additional two floors to north of building and number of units.
- Total units – 38 units.
- Context is reasonable for these rezoning.

Questions to clarify above

- RW – first three lots, but what is context further south with low-rise infill and singles etc.
- JB – rest of block on that side is low-rise, some are multi-unit. Some new long-semi etc. Across street is similar except the 6-7 storey apt. that predates zoning.
- LH – was there any landscaping in the proposal?
    - MC – landscape buffer large between rear lane and parking and all of front yard. These details are not yet shown on the plans.

Comments from related disciplines

Josiane (Transportation)

Note: comments read by Andrew

- As per the TIA Screening Form and the concept plan presented, a TIA is not required for this site. Should any major changes be made to the site plan at the time of application, this requirement may be revised.
- If a reduction in required parking is sought, please submit *Module 4.2: Parking* and *Module 4.5: Transportation Demand Management* (as outlined in the TIA guidelines) to justify the reduction in parking and to outline TDM measures that will be put in place for the site.
- Define how many parking stalls are for visitors versus for residents.
- The single access to the lane at the back of the property is supported.
- Provide a pedestrian pathway to the main entrance from the Bayswater sidewalk.
- Site is within 400m of Bayview Station.
- On site plan:

- Show all details of the roads abutting the site up to and including the opposite curb; include such items as pavement markings, accesses and/or sidewalks.
- Turning movement diagrams required for all accesses showing the largest vehicle to access/egress the site.
- Turning movement diagrams required for internal movements (loading areas, garbage).
- Show all curb radii measurements; ensure that all curb radii are reduced as much as possible
- Show lane/aisle widths.
- Grey out any area that will not be impacted by this application.

- The City suggests development on private property be in accordance with the City's Accessibility Design Standards, you are encouraged to follow the Site Plan Checklist (attached).
- Note that AODA requirements apply to the visitor parking portion of the site.

Cody / Mo (Engineering)

- Mature tree in ROW – manage services around this.
- STWM for rear parking lots and rear lane. Will be difficult to control and run drain to Bayswater or flow from site.
- Geotech. Look at potential impact to adjacent structures and properties.
- More details comments to be provided with email follow

Andrew (Planning)

- Site plan and zoning application submitted concurrently?
  - Yes. Plan and Study list will reflect this.
- Current Zoning is R4UB – 12 units (min lot area 450 sq.m). It was appreciated and noted about the intent of maintaining the recent R4 zoning provisions, but some key initiatives seem to be omitted in the proposal such as:
  - RY soft landscaping 50% min.
  - FY landscaping and parking prohibitors.
  - Windows and façade articulation, front balconies (this might comply)
  - 25% of units 2-bedroom or more. Based on the plan provided, it would appear that only 5 of the 38 units are 2+ bedrooms. To maintain the "R4" intent, at least 9-10 units would need to be 2+ bedrooms or reduce the overall number of units to meet the 25%.
- The current zoning permits a maximum height of 11m. This is relevant to the conversation of built form transition and assessing the existing and planned function south of this site.

- The initial concept of bicycle parking is encouraging with a dedicated bicycle room on the ground floor. Explore further opportunities to locate visitor bicycle parking, stacked bicycle parking systems and a way to achieve at least a 1:1 ratio on residential bicycle parking.
- Waste Management will require a minimum 2.2m wide path for collection. Does collection occur from the rear lane?
    - JB – Yes it does. Thanks.
    - Therefore, review the size of the ground floor garage room to ensure it is large enough for the number of bins required with City Collection. Additionally, account for green bin collection and show hose bib location.
    - Please Review the waste management guidelines to determine room size, number and type of bins required.
- The rear yard surface parking lot is not supported in its current form or size. There needs to be significant improvement with the rear yard design to allow for enough soft landscaping and additional at-grade outdoor amenity area opportunities.
- The common amenity areas, at the moment, seem to only include the rooftop terrace and potentially the rear yard (not currently shown in design). Explore opportunities to include common indoor amenity areas as well.
- Randolph will elaborate on built form transition, but **IF** the Department is going to consider this rezoning to a 6-storey height, the built form transition, massing and urban design will be very important in the discussion. Explore further how the building transitions to the low-rise context to the south, what the expression is at street level and the additional height is introduced on the street. The current proposal is a good start, but some improvements need to be made and further analyzed.
- What is the parking strategy for this development? Answer: based on zoning. This location can support an active transit development with a focus on walking, cycling and public transit, especially considering the proximity to Rapid transit and the traditional mainstreet. A reduction in residential parking is encouraged and supported by the OP. A revised proposal should remove the rear surface parking lot and explore a more appropriate way to incorporate provided parking (residential and visitor). In the submission, include the list of Transit Demand Strategies and explain how this development is encouraging active transit modes.
- The preliminary concept of active frontage with ground floor units, main entrance and landscaping is a supportable notion. Further refine the design and landscaping details to show the public realm relationship.
- Protect Street Trees and look for opportunities for rear yard tree planting.
- New Urban Tree by-law
    - Proper rear yard can protect/replace existing on site

- Consider the new Draft OP – Neighbourhood / Transforming Neighbourhood designations and be mindful of potential changes or “in effect” relative to application submission. Comments from this pre-con are based on current OP.

Randolph (Urban Design)

Meeting notes

- Importance of street trees and opportunity for rear yard tree canopy.
- Rear lane buffer could have landscaping, but first comment about maintaining the 50% (min.) landscaping is important
- Encourage better site planning for amenity and active transit.
- Built form transition. Further consider appropriate location of datum line 3-4 storeys. Appreciate “ghosting” analysis, but further explore existing and planned function. Some existing are new infill development and not likely to change in short to medium term. Maybe a 2-storey datum is more appropriate. This needs to be reviewed further and should be evident in the submission material.
- Carry the datum line across entire front of site, not just south side of building.
- Appreciate intent of ground floor entrances and street rythem. Is there a benefit to switch main lobby entrance to north side of building and keep res pattern south with ground units.
- Material comments and intent is appreciated.
- Some reservation about architectural approach or the industrial style approach. Further study – this may not be most appropriate style in this location. This location is consistent of housing form. Most of this is on the design of the window fabric. Small and vertical versus the proposed large windows.
- Front yard – in keeping with zoning. Study street pattern and align setback. May be correct but study to show this in context.
- Design Brief will be required.

Post-Meeting Comments

- Urban design appreciates some sensitivities illustrated in the proposed conceptual design, including the building step back, the ground-oriented units, and the building materials. However, further investigations are required to assess the appropriateness of these ideas based on a deeper understanding of the context.

- Site Plan and landscaping

    - One of the key characteristics of Bayswater is the presence of a continuous tree canopy. Please make sure the existing mature trees in the front are protected and new street trees can be introduced so that the tree canopy can be retained and expanded.

- Backyard tree canopy is another common theme is the neighbourhood. The proposed site plan includes an approximately 3.8m landscape buffer between the laneway and the surface parking. Unfortunately, the existing hydro poles will prevent the planting of canopy trees. Please explore site plan options in the backyard so that the landscape area may be better related to the building to support outdoor amenities and the growth of canopy trees. The site is approximately 400m away from two LRT (planned and future) stations. Urban design will support parking reduction in exchange for a greener backyard.

- Massing articulation
    - Subject to further detailed contextual analysis indicated above, it appears that it will be more appropriate to establish a datum line on top of the 2nd floor rather than the 4th floor.
    - The datum line should across the entire building façade to respect the predominantly low-rise context of the street. There is no need for the design to reflect the 1970s apartment building context.
    - Considerations should be given to providing a building setback on top of the 2nd floor to further enhance the predominant low-rise scale of the street as demonstrated in some of the recent developments, for example, 66 and 68 Bayswater.
    - Consideration should be given to switching the main entrance of the apartment and the entrance of ground level 2-bedroom unit on the north side so that the two ground-oriented units can be situated side by side rather than being divided by the main entrance. In addition, considerations should be given to designing these two ground-oriented units as two separate 2-storey volumes rather than a consolidated volume to reflect and respect the architecture rhythm of the street.
    - Please be mindful of the overlooking concerns on the proposed 5th floor rooftop terrace.

- Architecture style
    - The industrial style that is being pursued is not appropriate for the context.
    - The development should respect Bayswater as a residential street through a style and associated details that can enhance this character. The applicant is strongly encouraged to study the historic buildings as well as some of the successful recent contemporary development for inspiration.

Comments from Community Group

Jay Baltz / Linda Hoad (Hintonburg Community Association)

- Thanks for overview, and city staff comments.
- Our major issue is going to be height. The existing high-rise pre-dates modern zoning.
- Our TM street is zoned for 6-storeys.
- The new R4 establishes a 10m height limit. Pushing this height into the newly formed R4 zone is going to be a major issue. Keep this height on the mainstreets etc.
- Isn't an OPA required? I thought limit was to 4-storey, but I will leave this to the planning experts
- The wellington west study established the TM zone line where 6-storeys was supposed to end.
- Landscaping
    - Paving entire rear yard in a non-starter
    - Keep landscaping for tree planting. Hydro in rear, so tree along "strip" is not an option for a good tree canopy
- Lot size – I think amalgamated property exceeds the new R4 maximum lot width (38m) and lot area (107 sq.m) requirements. Is this too much of a consolidation.
- Transition to the south is good start, but don't use top as a terrace as it will result an overlook issue.
- Opposed in current form. Height and width of building is a concern.
    - MC – made submissions to City on R4 and about this property specifically. We did not appeal, as we knew we would be in for an application. We have gone to great lengths to try and respect new R4 approach and intent.
- Linda – Garbage chutes may not be allowed anymore. Not encouraged, results in poor waste management.
    - Agree to make sure room is large enough. Green bins should be required and leave room for them.
- Rear yard landscaping is important as discussed.
- 4th storey step should be at least the width of the last lot. Current stepback does not seem to be enough
- Proposal should be respecting new R4 by-law
- Rental or Condo?
    - Planned for rental.
- What happens to existing units between approval and building. Don't want to have them sit there vacant.
    - Owner - Appreciate that and have no intention to have vacant. Keep rented until ready to start construction.
    - We also, in speaking to tenants, want to provide as much parking as possible in design.

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 here:

S/A	Number of copies	ENGINEERING		S/A	Number of copies
S	3	1. Site Servicing Plan	2. Site Servicing Study	S	3
S	3	3. Grade Control and Drainage Plan	4. Geotechnical Study	S	3
	2	5. Composite Utility Plan	6. Groundwater Impact Study		3
	3	7. Servicing Options Report	8. Wellhead Protection Study		3
S	3	9. Transportation Impact Assessment – See Email – TDM checklist /modules	10.Erosion and Sediment Control Plan	S	3
S	3	11.Storm water Management Report	12.Hydro geological and Terrain Analysis		3
	3	13.Water Main Protection and Contingency Plan (see email)	14.Noise Study	S	3
	PDF only	15.Roadway Modification Functional Design *Depends on square extension	16.LRT Proximity Study		3

S/A	Number of copies	PLANNING / DESIGN / SURVEY		S/A	Number of copies
	15	17.Draft Plan of Subdivision	18.Plan Showing Layout of Parking Garage		2
	5	19.Draft Plan of Condominium	20.Planning Rationale	S	3
S	3	21.Site Plan	22.Minimum Distance Separation (MDS)		3
	15	23.Concept Plan Showing Proposed Land Uses and Landscaping	24.Agrology and Soil Capability Study		3
	3	25.Concept Plan Showing Ultimate Use of Land	26.Cultural Heritage Impact Statement	S	3
S	3	27.Landscape Plan	28.Archaeological Resource Assessment Requirements: **S** (site plan) **A** (subdivision, condo)		3
S	2	29.Survey Plan	30.Shadow Analysis		
S	3	31.Architectural Building Elevation Drawings (dimensioned)	32.Design Brief	S	2
	3	33.Wind Analysis			

S/A	Number of copies	ENVIRONMENTAL		S/A	Number of copies
S	3	34.Phase 1 Environmental Site Assessment	35.Impact Assessment of Adjacent Waste Disposal/Former Landfill Site		3
A	3	36.Phase 2 Environmental Site Assessment (depends on the outcome of Phase 1)	37.Assessment of Landform Features		3
		38.Record of Site Condition (condition of SP approval)	39.Mineral Resource Impact Assessment		3
S	3	40.Tree Conservation Report	41.Environmental Impact Statement		3
	3	42.Mine Hazard Study / Abandoned Pit or Quarry Study	43.Integrated Environmental Review (Draft, as part of Planning Rationale)		3

S/A	Number of copies	ADDITIONAL REQUIREMENTS		S/A	Number of copies
S	1	44. Applicant's Public Consultation Strategy (may be provided as part of the Planning Rationale)	45.Site Lighting Plan and Certification Letter		3

Meeting Date: January 6, 2021 Application Type: *Zoning / Site Plan*

File Lead (Assigned Planner): Andrew McCreight Infrastructure Approvals Project Manager: Mohammed Fawzi

Site Address (Municipal Address): 54,56, 60 Bayswater *Preliminary Assessment: 1☐ 2☐ 3☐ 4☐ 5

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

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

Site Plan Pre- Application Consultation Notes

Date: January 06, 2021
Site Location: 54, 56, 60 Bayswater Avenue
Type of Development: ☒ **Residential (**☐ **townhomes,** ☐ **stacked,** ☐ **singles,** ☒ **apartments),** ☐ **Office Space,** ☐ **Commercial,** ☐ **Retail,** ☐ **Institutional,** ☐ **Industrial, Other:** N/A
Owner/Agent: Novatech (Attn: Taylor West)
Project Manager: Cody Oram
Assigned Planner: Andrew McCreight

Infrastructure

Water

Existing public services:

- Bayswater Avenue: 200mm DI Watermain (Installed 1990)

Watermain Frontage Fees to be paid ($190.00 per metre) ☐ **Yes** ☒ **No**

- If daily demand exceeds 50 m^3/day, redundant servicing in the form of two water services separated by an isolation valve will be required.

Boundary conditions:

Civil consultant must request boundary conditions from the City's assigned Project Manager prior to first submission.

- Water boundary condition requests must include the location of the service(s) and the expected loads required by the proposed developments. Please provide all the following information:
  - Location of service(s)
  - Type of development and the amount of fire flow required (as per FUS, 1999).

- Average daily demand: ___ l/s.
- Maximum daily demand: ___l/s.
- Maximum hourly daily demand: ___ l/s.

- Fire protection (Fire demand, Hydrant Locations)
- A water meter sizing questionnaire [water card] will have to be completed prior to receiving a water permit (water card will be provided post approval)

Sanitary and Storm Sewer

Existing public services:

- Dalhousie Street
  - Storm – 375 mm Conc. (Installed 1990)
  - Sanitary – 250 mm Conc. (Installed 1990)

Is a monitoring manhole required on private property? ☐ **Yes** ☒ **No**

- The Environmental Site Assessment (ESA) may provide recommendations where site contamination may be present. The recommendations from the ESA need to be coordinated with the servicing report to ensure compliance with the Sewer Use By-Law.

Stormwater Management

Quantity Control:

- Allowable Run-off Coefficient (C): 0.50 or existing, whichever is less
- Time of concentration (Tc): Tc = 10 min
- Allowable flowrate: Control the 100-year post development storm events to the 5-year predevelopment storm event calculated using the coefficients above.

Phase I and Phase II ESA:

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

Noise and Vibration Study:

- Noise Study is required – property fronts a collector road (Baywaster Avenue) and 78m from arterial road (Somerset Street)

Required Studies

- Servicing and Stormwater Management Report
- Geotechnical Study
- Phase I ESA
- Phase II ESA (depends on outcome of Phase I)
- Noise Study

Required Plans

- Site Servicing Plan
- Grade Control and Drainage Plan
- Erosion and Sediment Control Plan (Can be combined with grading plan)

General Service Design Comments

- Connections across another premise, easement, or private roadway are not permitted without a registered easement for the portion of the services.
- Where service length is greater than 30 m between the building and the first maintenance hole / connection, a cleanout is required.
- The City of Ottawa Standard Detail Drawings should be referenced where possible for all work within the Public Right-of-Way.
- The upstream and downstream manhole top of grate and invert elevations are required for all new sewer connections.
- Services crossing the existing watermain or sewers need to clearly provide the obvert/invert elevations to demonstration minimum separation distances. A watermain crossing table may be provided.

Other

Are there are Capital Works Projects scheduled that will impact the application? ☒ **Yes** ☐ **No**

- Road Resurfacing targeted start 2-3 years.

References and Resources

- As per section 53 of the Professional Engineers Act, O. Reg 941/40, R.S.O. 1990, all documents prepared by engineers must be signed and dated on the seal.
- All required plans are to be submitted on standard size sheets, utilizing a reasonable and appropriate metric scale as per City of Ottawa Servicing and Grading Plan Requirements: title blocks are to be placed on the right of the sheets and not along the bottom. Engineering plans may be combined, but the Site Plans must be provided separately. Plans shall include the survey monument used to confirm datum. Information shall be provided to enable a non-surveyor to locate the survey monument presented by the consultant.
- All required plans & reports are to be provided in *.pdf format (at application submission and for any, and all, re-submissions). Remember to flatten the digital plans and remove design software layer information, non-flattened plans will be returned to the consultant.
- Please find relevant City of Ottawa Links to Preparing Studies and Plans below: https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans#standards-policies-and-guidelines
- To request City of Ottawa plan(s) or report information please contact the City of Ottawa Information Centre:
  InformationCentre@ottawa.ca<mailto:InformationCentre@ottawa.ca>
  (613) 580-2424 ext. 44455

- geoOttawa
  https://maps.ottawa.ca/geoOttawaBeta/

Miro Savic

From: Jamie Batchelor <jamie.batchelor@rvca.ca>
Sent: Wednesday, April 21, 2021 3:17 PM
To: Miro Savic
Cc: Steve Matthews; Murray Chown
Subject: RE: 54/56/60 Bayswater Avenue - RVCA Pre-Consultation

Good Afternoon Miro,

With a carport roof being proposed, and the water being directed to a grassed area, we would ask that you provide an opinion that some water quality treatment is being achieved within the grassed area in accordance with the MOE Design Manual. Because you are only proposing one parking space above the threshold where we request water quality treatment, and given the additional proposed measures (carport roof), we would not require you to specifically guarantee a water quality target provided you can substantiate that some additional water quality treatment will be achieved in the grassed area. If you have any questions do not hesitate to contact me.

Jamie Batchelor, MCIP, RPP
Planner, ext. 1191
Jamie.batchelor@rvca.ca

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

From: Miro Savic <m.savic@novatech-eng.com>
Sent: Wednesday, April 21, 2021 2:24 PM
To: Jamie Batchelor <jamie.batchelor@rvca.ca>
Cc: Steve Matthews <S.Matthews@novatech-eng.com>; Murray Chown <m.Chown@novatech-eng.com>
Subject: RE: 54/56/60 Bayswater Avenue - RVCA Pre-Consultation

Hi Jamie,

Further to my email below, the client has offer to construct an open carport roof above the surface parking to help with the water quality concerns. The drainage from the roof would be directed to grassed area via a downspout.
Please let us know what you think.

We are available to meet on Teams if you want to discuss.

Regards,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265 | Fax: 613.254.5867

From: Miro Savic
Sent: Monday, April 12, 2021 11:17 AM
To: 'Jamie Batchelor' <jamie.batchelor@rvca.ca>
Cc: Steve Matthews <S.Matthews@novatech-eng.com>; Murray Chown <m.Chown@novatech-eng.com>
Subject: RE: 54/56/60 Bayswater Avenue - RVCA Pre-Consultation

Hi Jamie,

The site plan has evolved and the current proposal plan has only 7 surface parking spaces. The remaining parking spaces are provided underground. Refer to the attached site plan.

The surface parking is provided off of the back lane matching the existing conditions and is consistent with what's currently happening on other properties along the back lane. See images from google street view below.

Do we still need to provide the water quality control for the proposed 7 parking spaces? This would be challenging since there is no storm sewer within the back lane. The OGS unit would have to be connected to the Bayswater storm sewer with a pipe running under the building which is something we would want to avoid. Our preference is to sheet drain the proposed parking spaces towards the back lane matching the existing drainage conditions along the back lane. This seems to be more sensible solution as opposed to redirecting the drainage under the building to Bayswater storm sewer.

Can you please review and let us know your thoughts.

Thank you,
Miro


Ottawa, Ontario
Google
Street View
Google

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265 | Fax: 613.254.5867

From: Jamie Batchelor <jamie.batchelor@rvca.ca>
Sent: Monday, February 8, 2021 9:09 PM
To: Miro Savic <m.savic@novatech-eng.com>
Cc: Steve Matthews <S.Matthews@novatech-eng.com>; Murray Chown <m.Chown@novatech-eng.com>
Subject: RE: 54/56/60 Bayswater Avenue - RVCA Pre-Consultation

Hi Miro,

The existing storm sewers outlet to the Ottawa River less than 1km without an end of pipe stormwater management treatment facility. Based on the conceptual plan provided, and the number of surface parking spaces provided, we would require onsite water quality control of 'enhanced' (80% TSS removal).

If somehow the scope of the project evolves to the point that no surface parking is provided (e.g. only underground parking proposed), then the RVCA would not require additional onsite water quality control as landscaped areas and rooftop drainage is considered clean for the purposes of water quality and aquatic habitat protection.

Jamie Batchelor, MCIP, RPP
Planner, ext. 1191
Jamie.batchelor@rvca.ca

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

From: Miro Savic <m.savic@novatech-eng.com>
Sent: Friday, February 5, 2021 12:33 PM
To: Jamie Batchelor <jamie.batchelor@rvca.ca>
Cc: Steve Matthews <S.Matthews@novatech-eng.com>; Murray Chown <m.Chown@novatech-eng.com>
Subject: 54/56/60 Bayswater Avenue - RVCA Pre-Consultation

Hi Jamie,

We are working on servicing and stormwater management design for a residential development located at 54/56/60 Bayswater Avenue in the City of Ottawa. The proposed development will consist of a new 6-storey apartment building replacing the existing single family homes. Refer to the attached concept site plan. Please note that the site plan is still under development and the surface parking currently shown on the plan may be replaced with an underground parking garage.

The storm drainage from the site will be directed to the existing 375mm diameter storm sewer in Bayswater Avenue. The stormwater quantity control will be provided by controlling the post development flows from the site up to and including 100-year design event to a target 5-year release rate specified by the City of Ottawa.

Can you please confirm whether the storm water quality control is required for the proposed development and if so provide the required level of protection.

Regards,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265 | Fax: 613.254.5867

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 defendable 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 feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.
- ☒ 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

54/56/60 BAYSWATER AVENUE
SANITARY FLOW

6-STOREY APPARTMET BUILDING

Number of 1 Beadroom Units	25	
Persons per 1bdr Unit	1.4	
Number of 2 Beadroom Units	13	
Persons per 1bdr Unit	2.1	
Total Population	63	
Average Daily Flow	280	L/c/day
Peak Factor (Harmon Formula)	3.43	
Peak Sanitary Flow	**0.70**	**L/s**
Site Area	0.12	ha
Infiltration Allowance	0.33	L/s/ha
Peak Extraneous Flows	**0.04**	**L/s**
Total Peak Sanitary Flow	**0.74**	**L/s**

APPENDIX D

Water Demands, FUS Calculations and City of Ottawa Boundary Conditions

54/56/60 BAYSWATER AVENUE
WATER ANALYSIS

WATER DEMND

Number of 1 Beadroom Units	25	
Persons per 1bdr Unit	1.4	
Number of 2 Beadroom Units	13	
Persons per 1bdr Unit	2.1	
Total Population	63	
Average Day Demand	350	L/c/day
Average Day Demand	0.26	L/s
Maximum Day Demand (2.5 x avg. day)	0.64	L/s
Peak Hour Demand (2.2 x avg. day)	1.40	L/s

BOUNDAY CONDITIONS

Maximum HGL =	114.2	m
Minimum HGL =	107.8	m
Max Day + Fire Flow =	105	m

PRESSURE TESTS

AVERAGE GROUND ELEVATION 63.5 m

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

HIGH PRESSURE = **72.1** PSI

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

LOW PRESSURE = **63.0** PSI

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

MAX DAY + FIRE PRESSURE = **59.0** PSI

Miro Savic

From: Fawzi, Mohammed <mohammed.fawzi@ottawa.ca>
Sent: Monday, January 25, 2021 9:38 AM
To: Steve Matthews; Miro Savic
Subject: RE: 54/56/60 Bayswater Avenue - Boundary Conditions
Attachments: 54_56_60 Bayswater Avenue January 2021.pdf

Good Morning,

The following are boundary conditions, HGL, for hydraulic analysis at 54-56-60 Bayswater (zone 1W) assumed to be connected to the 203mm Bayswater Avenue (see attached PDF for location).

Minimum HGL = 107.8m

Maximum HGL = 114.2m

Max Day + Fire (133 L/s) = 105.0m

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.

Thank you.

Best Regards,

Mohammed Fawzi, E.I.T.
Engineering Intern
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique
Development Review - Central Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 20120, Mohammed.Fawzi@ottawa.ca

From: Oram, Cody <Cody.Oram@ottawa.ca>
Sent: January 13, 2021 3:13 PM
To: Fawzi, Mohammed <mohammed.fawzi@ottawa.ca>
Cc: Steve Matthews <S.Matthews@novatech-eng.com>; Miro Savic <m.savic@novatech-eng.com>
Subject: RE: 54/56/60 Bayswater Avenue - Boundary Conditions

Hi Mo,
Can you process the boundary condition request below?
Thank you,

Cody

From: Miro Savic <m.savic@novatech-eng.com>
Sent: January 13, 2021 2:48 PM
To: Oram, Cody <Cody.Oram@ottawa.ca>
Cc: Steve Matthews <S.Matthews@novatech-eng.com>
Subject: 54/56/60 Bayswater Avenue - Boundary Conditions

Hi Cody,

I'm writing to request watermain boundary conditions for the proposed residential development at 54/56/60 Bayswater Avenue.

The water service is proposed to be connected to the existing 203mm watermain in Bayswater Avenue at the approximate location shown on the attached sketch. The fire protection is expected to be provided from the closest municipal fire hydrant in Bayswater avenue near the site.

The water demands are calculated as follows:

- Average Day Demand = 0.26 L/s
- Maximum Day Demand = 0.64 L/s
- Peak Hour Demand = 1.40 L/s
- Fire Flow = 133 L/s (8,000 L/min)

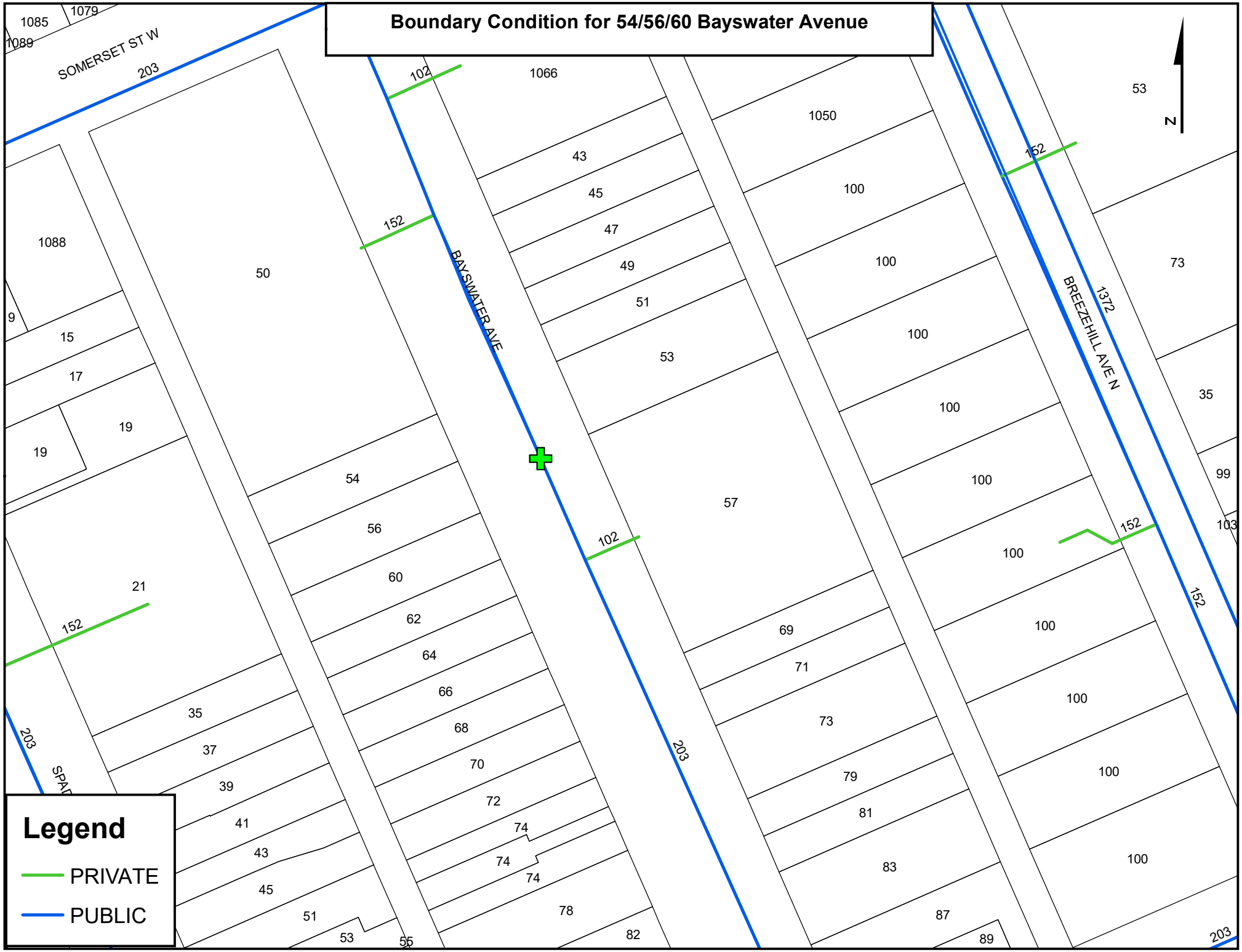
The fire flow is estimated using the Fire Underwriter's Survey (FUS) based on a fully sprinklered 6-storey apartment building constructed from non-combustible materials.

Regards,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265 | Fax: 613.254.5867

'

'


Boundary Condition for 54/56/60 Bayswater Avenue
SOMERSET ST W
BAYSWATER AVE
BREEZEHILL AVE N
1372
203
102
152
1085
1079
1089
1088
1066
1050
53
50
43
45
47
49
51
100
73
9
15
17
19
54
56
60
62
64
66
68
70
72
74
57
69
71
79
81
83
87
89
35
99
103
21
37
39
41
43
45
51
55
78
82
N
Legend
PRIVATE
PUBLIC

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 120169
Project Name: 54/56/60 Bayswater Avneue
Date: 1/12/2021
Input By: Miroslav Savic
Reviewed By: Steve Matthews

Legend: Input by User; No Information or Input Required

Building Description: 6-Storey Appartment Building
Non-combustible construction

Step			Input		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction C	Wood frame		1.5	0.8	
		Ordinary construction		1		
		Non-combustible construction	Yes	0.8		
		Modified Fire resistive construction (2 hrs)		0.6		
		Fire resistive construction (> 3 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	381			
		Number of Floors/Storeys	6			
		Area of structure considered (m^2)			**2,286**	
	F	**Base fire flow without reductions**				**8,000**
		F = 220 C (A)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**			**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**6,800**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**			**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	**-2,720**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	No	-10%		
				Cumulative Total	**-40%**	
5	**Exposure Surcharge (cumulative %)**				**Surcharge**	
	(3)	North Side	10.1 - 20 m		15%	**3,740**
		East Side	30.1- 45 m		5%	
		South Side	0 - 3 m		25%	
		West Side	20.1 - 30 m		10%	
				Cumulative Total	**55%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**8,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**133**
				or	USGPM	2,114
7	**Storage Volume**	Required Duration of Fire Flow (hours)			Hours	2
		Required Volume of Fire Flow (m^3)			m^3	960

Steve Matthews

From: Brandon Lawrence <brandon@sjlarchitect.com>
Sent: Thursday, November 18, 2021 10:24 AM
To: Steve Matthews
Cc: Miro Savic; Russell Robertson
Subject: RE: 54/56/6o Bayswater - Confirmation of Building Construction for FUS Calculations

Hi Steve,

You're assumptions are correct, please see response below in blue.

Regards,

Brandon Lawrence, Architect, B.AS, M.Arch, OAA, MRAIC
S.J. Lawrence Architect Incorporated

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

From: Steve Matthews <S.Matthews@novatech-eng.com>
Sent: Wednesday, November 17, 2021 4:22 PM
To: Brandon Lawrence <brandon@sjlarchitect.com>
Cc: Miro Savic <m.savic@novatech-eng.com>
Subject: 54/56/6o Bayswater - Confirmation of Building Construction for FUS Calculations

Hi Brandon,

The City of Ottawa has asked that we verify building construction via. e-mail correspondence now (and include the verification e-mail as supporting documentation in our DS & SWM Report).
Please confirm the building assumptions that were made in the FUS fire flow requirement calculations are accurate for the **type of construction**, **occupancy type** and **sprinkler protection**.

Based on previous discussions regarding this project we used the following information for our FUS calculations:

- **Non-Combustible** Construction. Yes, the structure will be concrete c/w metal stud infill.
- Occupancy Hazard of **Limited Combustible** (based on a residential building use with an underground parking garage). Correct, Group C Occupancy.
- Adequately Designed **Sprinkler System** (per NFPA 13 with a municipal water supply and not being fully supervised). Yes, the entire building will be sprinklered.

If there are any questions or concerns please do not hesitate to call me directly.

Regards,
Steve

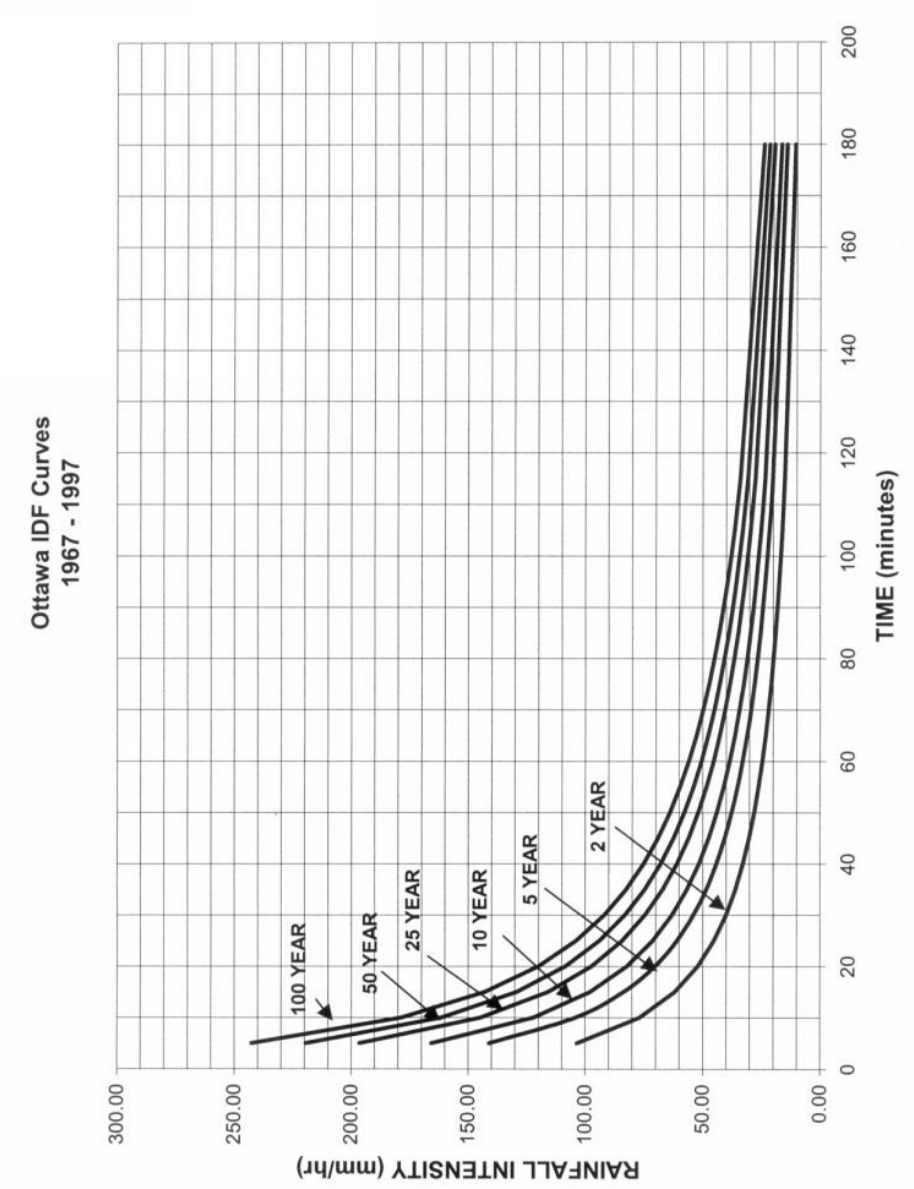
Stephen Matthews, B.A.(Env), Senior Design Technologist

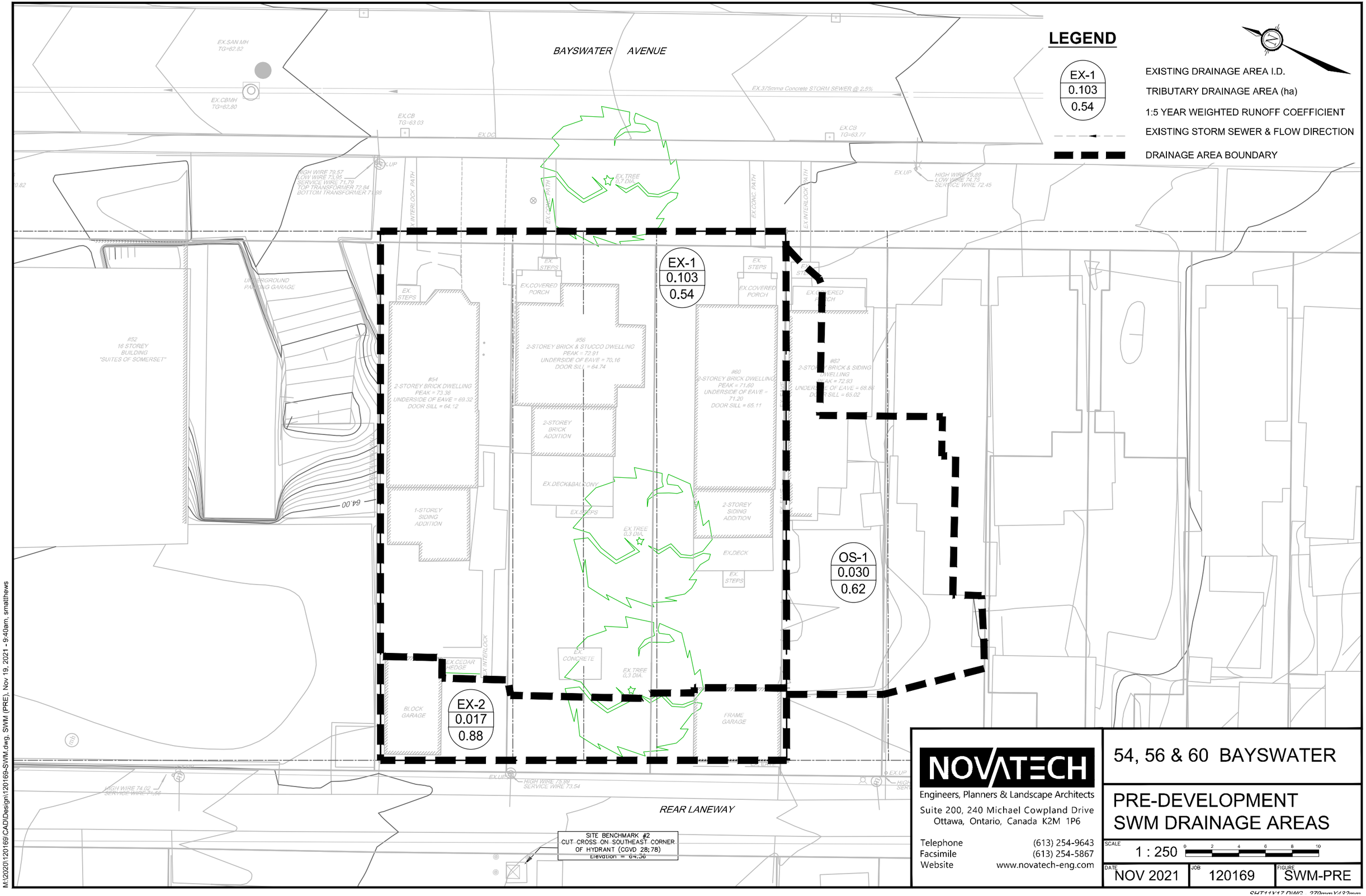
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 223 | Fax: 613.254.5867

APPENDIX E

IDF Curves, Pre-Development Drainage Area Plan and SWM Calculations

APPENDIX 5-A OTTAWA INTENSITY DURATION FREQUENCY (IDF) CURVE





LEGEND

EX-1 / 0.103 / 0.54 — EXISTING DRAINAGE AREA I.D.

TRIBUTARY DRAINAGE AREA (ha)

1:5 YEAR WEIGHTED RUNOFF COEFFICIENT

EXISTING STORM SEWER & FLOW DIRECTION

DRAINAGE AREA BOUNDARY

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

54, 56 & 60 BAYSWATER

PRE-DEVELOPMENT SWM DRAINAGE AREAS

SCALE 1 : 250 (0 2 4 6 8 10)

DATE NOV 2021 | JOB 120169 | FIGURE SWM-PRE

SHT11X17 DWG - 279mmX432mm

M:\2020\120169\CADD\design\120169-SWM.dwg, SWM (PRE), Nov 19, 2021 - 9:40am, smatthews

Project #: 120169
Project Name: Bayswater
Location: Ottawa

Date Prepared: November 2021

Proposed Residential Development
54, 56 and 60 Bayswater Avenue

Pre - Development Site Flows										
Description	Area (ha)	$A_{impervious}$ (ha) C=0.9	A_{gravel} (ha) C=0.6	$A_{pervious}$ (ha) C=0.2	Weighted C_{w5}	Weighted C_{w100}	1:5 Year Flow (L/s)	1:100 Year Flow (L/s)	Allowable C_{value}	Target Allowable 5 year (L/s)
OS-1	0.030	0.018	0.000	0.012	0.62	0.70	5.4	10.4	-	-
Site Area	0.120	0.062	0.000	0.058	0.56	0.64	19.5	38.0	0.50	17.4

Off-Site tributary flows from OS-1 will by-pass the site uncontrolled via. the south drainage swale similar to current conditions. T_c = 10mins

Post - Development : Site Flows if the areas were left Uncontrolled								
Area	Description	Area (ha)	A_{imp} (ha) C=0.9	A_{perv} (ha) C=0.2	C_5	C_{100}	Uncontrolled Flow (L/s) 5 year	Uncontrolled Flow (L/s) 100 year
A-1	Direct Runoff from Site	0.054	0.020	0.034	0.46	0.52	7.1	14.0
B-2	Controlled Internal SWM Tank	0.013	0.013	0.000	0.90	1.00	3.4	6.5
R-3	Controlled Flow Roof Drains	0.053	0.053	0.000	0.90	1.00	13.8	26.3
	Summed Area Check:	0.120					T_c = 10mins	T_c = 10mins

Post - Development : Total Flows for Controlled Site + Uncontrolled Runoff						
Area	Description	Peak Design Flow (L/s) 5 year	Peak Design Flow (L/s) 100 year	Storage Required (m^3) 5 year	Storage Required (m^3) 100 year	Provided (m^3)
A-1	Direct Runoff from Site	7.1	14.0	-	-	-
B-2	Controlled Internal SWM Tank	1.9	1.9	0.9	2.9	> 4.0
R-3	Controlled Flow Roof Drains	1.9	1.9	9.7	23.1	25.1
	Totals :	**10.9**	**17.8**	**10.6**	**26.1**	**29.1**
	Over Controlled:	6.5	-0.4			

Proposed 6-Storey Residential Building
Novatech Project No. 120169
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA OS-1 Off-Site Runoff by-passed through site

OTTAWA IDF CURVE

Area =	0.030	ha	Qallow =	5.4	L/s
C =	0.62		Vol(max) =	0.0	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	141.18	7.30	1.91	0.57
10	104.19	5.39	0.00	0.00
15	83.56	4.32	-1.07	-0.96
20	70.25	3.63	-1.76	-2.11
25	60.90	3.15	-2.24	-3.36
30	53.93	2.79	-2.60	-4.68
35	48.52	2.51	-2.88	-6.05
40	44.18	2.28	-3.10	-7.45
45	40.63	2.10	-3.29	-8.87
50	37.65	1.95	-3.44	-10.32
55	35.12	1.82	-3.57	-11.79
60	32.94	1.70	-3.68	-13.26
65	31.04	1.61	-3.78	-14.75
70	29.37	1.52	-3.87	-16.25
75	27.89	1.44	-3.95	-17.76
80	26.56	1.37	-4.01	-19.27
85	25.37	1.31	-4.08	-20.79
90	24.29	1.26	-4.13	-22.31

Proposed 6-Storey Residential Building
Novatech Project No. 120169
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA OS-1 Off-Site Runoff by-passed through site

OTTAWA IDF CURVE

Area =	0.030	ha	Qallow =	10.4	L/s
C =	0.70		Vol(max) =	0.0	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	242.70	14.17	3.74	1.12
10	178.56	10.42	0.00	0.00
15	142.89	8.34	-2.08	-1.87
20	119.95	7.00	-3.42	-4.11
25	103.85	6.06	-4.36	-6.54
30	91.87	5.36	-5.06	-9.11
35	82.58	4.82	-5.60	-11.77
40	75.15	4.39	-6.04	-14.49
45	69.05	4.03	-6.39	-17.26
50	63.95	3.73	-6.69	-20.07
55	59.62	3.48	-6.94	-22.91
60	55.89	3.26	-7.16	-25.78
65	52.65	3.07	-7.35	-28.67
70	49.79	2.91	-7.52	-31.57
75	47.26	2.76	-7.67	-34.49
80	44.99	2.63	-7.80	-37.43
85	42.95	2.51	-7.92	-40.37
90	41.11	2.40	-8.02	-43.33

Proposed 6-Storey Residential Building
Novatech Project No. 120169
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-1 Direct Runoff from Site

OTTAWA IDF CURVE

Area =	0.054	ha	Qallow =	7.1	L/s
C =	0.46		Vol(max) =	0.0	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	141.18	9.61	2.52	0.76
10	104.19	7.09	0.00	0.00
15	83.56	5.69	-1.40	-1.26
20	70.25	4.78	-2.31	-2.77
25	60.90	4.14	-2.95	-4.42
30	53.93	3.67	-3.42	-6.16
35	48.52	3.30	-3.79	-7.96
40	44.18	3.01	-4.08	-9.80
45	40.63	2.76	-4.33	-11.68
50	37.65	2.56	-4.53	-13.58
55	35.12	2.39	-4.70	-15.51
60	32.94	2.24	-4.85	-17.46
65	31.04	2.11	-4.98	-19.41
70	29.37	2.00	-5.09	-21.39
75	27.89	1.90	-5.19	-23.37
80	26.56	1.81	-5.28	-25.36
85	25.37	1.73	-5.36	-27.36
90	24.29	1.65	-5.44	-29.36

Proposed 6-Storey Residential Building
Novatech Project No. 120169
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-1 Direct Runoff from Site

OTTAWA IDF CURVE

Area =	0.054	ha	Qallow =	14.0	L/s
C =	0.52		Vol(max) =	0.0	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	242.70	18.99	5.02	1.51
10	178.56	13.97	0.00	0.00
15	142.89	11.18	-2.79	-2.51
20	119.95	9.39	-4.59	-5.50
25	103.85	8.13	-5.85	-8.77
30	91.87	7.19	-6.78	-12.21
35	82.58	6.46	-7.51	-15.77
40	75.15	5.88	-8.09	-19.42
45	69.05	5.40	-8.57	-23.14
50	63.95	5.00	-8.97	-26.91
55	59.62	4.67	-9.31	-30.71
60	55.89	4.37	-9.60	-34.56
65	52.65	4.12	-9.85	-38.43
70	49.79	3.90	-10.08	-42.32
75	47.26	3.70	-10.28	-46.24
80	44.99	3.52	-10.45	-50.17
85	42.95	3.36	-10.61	-54.12
90	41.11	3.22	-10.76	-58.08

Proposed 6-Storey Residential Building
Novatech Project No. 120169
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA B-2 Controlled Internal SWM Tank

OTTAWA IDF CURVE

Area = 0.013 ha Qallow = 1.89 L/s
C = 0.90 Vol(max) = 0.4 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	3.37	1.48	0.44
10	76.81	2.50	0.61	0.36
15	61.77	2.01	0.12	0.11
20	52.03	1.69	-0.20	-0.24
25	45.17	1.47	-0.42	-0.63
30	40.04	1.30	-0.59	-1.06
35	36.06	1.17	-0.72	-1.51
40	32.86	1.07	-0.82	-1.97
45	30.24	0.98	-0.91	-2.45
50	28.04	0.91	-0.98	-2.93
55	26.17	0.85	-1.04	-3.43
60	24.56	0.80	-1.09	-3.93
65	23.15	0.75	-1.14	-4.43
70	21.91	0.71	-1.18	-4.94
75	20.81	0.68	-1.21	-5.46
90	18.14	0.59	-1.30	-7.02
105	16.13	0.52	-1.37	-8.60
120	14.56	0.47	-1.42	-10.20
135	13.30	0.43	-1.46	-11.81
150	12.25	0.40	-1.49	-13.42

Proposed 6-Storey Residential Building
Novatech Project No. 120169
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA B-2 Controlled Internal SWM Tank

OTTAWA IDF CURVE

Area = 0.013 ha Qallow = 1.89 L/s
C = 0.90 Vol(max) = 0.9 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	4.59	2.70	0.81
10	104.19	3.39	1.50	0.90
15	83.56	2.72	0.83	0.75
20	70.25	2.28	0.39	0.47
25	60.90	1.98	0.09	0.14
30	53.93	1.75	-0.14	-0.24
35	48.52	1.58	-0.31	-0.66
40	44.18	1.44	-0.45	-1.09
45	40.63	1.32	-0.57	-1.53
50	37.65	1.22	-0.67	-2.00
55	35.12	1.14	-0.75	-2.47
60	32.94	1.07	-0.82	-2.95
65	31.04	1.01	-0.88	-3.43
70	29.37	0.96	-0.93	-3.93
75	27.89	0.91	-0.98	-4.42
90	24.29	0.79	-1.10	-5.94
105	21.58	0.70	-1.19	-7.48
120	19.47	0.63	-1.26	-9.05
135	17.76	0.58	-1.31	-10.63
150	16.36	0.53	-1.36	-12.22

Proposed 6-Storey Residential Building
Novatech Project No. 120169
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA B-2 Controlled Internal SWM Tank

OTTAWA IDF CURVE

Area = 0.013 ha Qallow = 1.89 L/s
C = 1.00 Vol(max) = 2.9 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	8.77	6.88	2.06
10	178.56	6.45	4.56	2.74
15	142.89	5.16	3.27	2.95
20	119.95	4.34	2.45	2.93
25	103.85	3.75	1.86	2.79
30	91.87	3.32	1.43	2.57
35	82.58	2.98	1.09	2.30
40	75.15	2.72	0.83	1.98
45	69.05	2.50	0.61	1.63
50	63.95	2.31	0.42	1.26
55	59.62	2.15	0.26	0.87
60	55.89	2.02	0.13	0.47
65	52.65	1.90	0.01	0.05
70	49.79	1.80	-0.09	-0.38
75	47.26	1.71	-0.18	-0.82
90	41.11	1.49	-0.40	-2.18
105	36.50	1.32	-0.57	-3.60
120	32.89	1.19	-0.70	-5.05
135	30.00	1.08	-0.81	-6.53
150	27.61	1.00	-0.89	-8.03

Proposed 6-Storey Residential Building
Novatech Project No. 120169
REQUIRED STORAGE - 1:100 YR + 20% IDF Increase
AREA B-2 Controlled Internal SWM Tank

OTTAWA IDF CURVE

Area = 0.013 ha Qallow = 1.89 L/s
C = 1.00 Vol(max) = 4.0 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	10.53	8.64	2.59
10	214.27	7.74	5.85	3.51
15	171.47	6.20	4.31	3.88
20	143.94	5.20	3.31	3.97
25	124.62	4.50	2.61	3.92
30	110.24	3.98	2.09	3.77
35	99.09	3.58	1.69	3.55
40	90.17	3.26	1.37	3.29
45	82.86	2.99	1.10	2.98
50	76.74	2.77	0.88	2.65
55	71.55	2.59	0.70	2.30
60	67.07	2.42	0.53	1.92
65	63.18	2.28	0.39	1.53
70	59.75	2.16	0.27	1.13
75	56.71	2.05	0.16	0.72
90	49.33	1.78	-0.11	-0.58
105	43.80	1.58	-0.31	-1.94
120	39.47	1.43	-0.46	-3.34
135	36.00	1.30	-0.59	-4.77
150	33.13	1.20	-0.69	-6.23

Proposed 6-Storey Residential Building
Novatech Project No. 120169
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R-3 **Controlled Roof Drain #1**

OTTAWA IDF CURVE

Area =	0.012	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.4	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	4.24	3.92	1.18
10	104.19	3.13	2.81	1.68
15	83.56	2.51	2.19	1.97
20	70.25	2.11	1.79	2.15
25	60.90	1.83	1.51	2.26
30	53.93	1.62	1.30	2.34
35	48.52	1.46	1.14	2.39
40	44.18	1.33	1.01	2.42
45	40.63	1.22	0.90	2.43
50	37.65	1.13	0.81	2.43
55	35.12	1.05	0.73	2.42
60	32.94	0.99	0.67	2.41
65	31.04	0.93	0.61	2.39
70	29.37	0.88	0.56	2.36
75	27.89	0.84	0.52	2.33
90	24.29	0.73	0.41	2.21
105	21.58	0.65	0.33	2.07
120	19.47	0.58	0.26	1.90

Proposed 6-Storey Residential Building
Novatech Project No. 120169
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R-3 **Controlled Roof Drain #1**

OTTAWA IDF CURVE

Area =	0.012	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	5.7	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	8.10	7.78	2.33
10	178.56	5.96	5.64	3.38
15	142.89	4.77	4.45	4.00
20	119.95	4.00	3.68	4.42
25	103.85	3.46	3.14	4.72
30	91.87	3.06	2.74	4.94
35	82.58	2.75	2.43	5.11
40	75.15	2.51	2.19	5.25
45	69.05	2.30	1.98	5.36
50	63.95	2.13	1.81	5.44
55	59.62	1.99	1.67	5.51
60	55.89	1.86	1.54	5.56
65	52.65	1.76	1.44	5.60
70	49.79	1.66	1.34	5.63
75	47.26	1.58	1.26	5.65
90	41.11	1.37	1.05	5.68
105	36.50	1.22	0.90	5.65
120	32.89	1.10	0.78	5.60

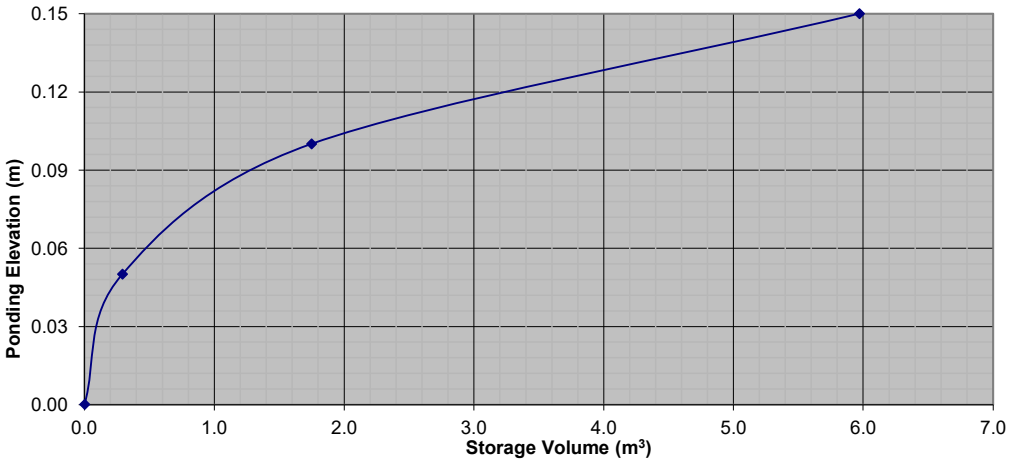
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:5 Year	0.32	0.32	11	2.4	6.0
1:100 Year	0.32	0.32	15	5.7	6.0

Roof Drain Storage Table for Area RD 1

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	11.65	0.3
0.10	46.61	1.7
0.15	122.24	6.0

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



Proposed 6-Storey Residential Building
Novatech Project No. 120169
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R-3 **Controlled Roof Drain #2**

OTTAWA IDF CURVE

Area =	0.011	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.2	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	3.89	3.57	1.07
10	104.19	2.87	2.55	1.53
15	83.56	2.30	1.98	1.78
20	70.25	1.93	1.61	1.94
25	60.90	1.68	1.36	2.03
30	53.93	1.48	1.16	2.10
35	48.52	1.34	1.02	2.13
40	44.18	1.22	0.90	2.15
45	40.63	1.12	0.80	2.16
50	37.65	1.04	0.72	2.15
55	35.12	0.97	0.65	2.13
60	32.94	0.91	0.59	2.11
65	31.04	0.85	0.53	2.08
70	29.37	0.81	0.49	2.05
75	27.89	0.77	0.45	2.01
90	24.29	0.67	0.35	1.88
105	21.58	0.59	0.27	1.73
120	19.47	0.54	0.22	1.55

Proposed 6-Storey Residential Building
Novatech Project No. 120169
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R-3 **Controlled Roof Drain #2**

OTTAWA IDF CURVE

Area =	0.011	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	5.1	m3

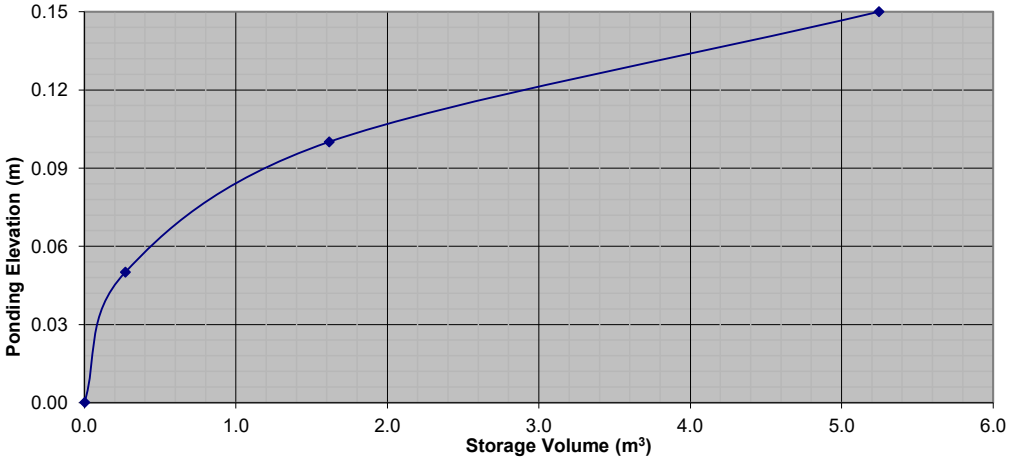
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	7.42	7.10	2.13
10	178.56	5.46	5.14	3.08
15	142.89	4.37	4.05	3.64
20	119.95	3.67	3.35	4.02
25	103.85	3.18	2.86	4.28
30	91.87	2.81	2.49	4.48
35	82.58	2.53	2.21	4.63
40	75.15	2.30	1.98	4.75
45	69.05	2.11	1.79	4.84
50	63.95	1.96	1.64	4.91
55	59.62	1.82	1.50	4.96
60	55.89	1.71	1.39	5.00
65	52.65	1.61	1.29	5.03
70	49.79	1.52	1.20	5.05
75	47.26	1.45	1.13	5.06
90	41.11	1.26	0.94	5.06
105	36.50	1.12	0.80	5.02
120	32.89	1.01	0.69	4.94

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**
1:5 Year	0.32	0.32	11	2.2	5.2
1:100 Year	0.32	0.32	15	5.1	5.2

Roof Drain Storage Table for Area RD 2

Elevation	Area RD 2	Total Volume
m	m^2	m^3
0.00	0	0
0.05	10.76	0.3
0.10	43.05	1.6
0.15	102.24	5.2

Stage Storage Curve: Area R-3
Controlled Roof Drain #2



Proposed 6-Storey Residential Building
Novatech Project No. 120169
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R-3 **Controlled Roof Drain #3**

OTTAWA IDF CURVE

Area =	0.010	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	1.9	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	3.53	3.21	0.96
10	104.19	2.61	2.29	1.37
15	83.56	2.09	1.77	1.59
20	70.25	1.76	1.44	1.73
25	60.90	1.52	1.20	1.81
30	53.93	1.35	1.03	1.85
35	48.52	1.21	0.89	1.88
40	44.18	1.11	0.79	1.89
45	40.63	1.02	0.70	1.88
50	37.65	0.94	0.62	1.87
55	35.12	0.88	0.56	1.84
60	32.94	0.82	0.50	1.82
65	31.04	0.78	0.46	1.78
70	29.37	0.73	0.41	1.74
75	27.89	0.70	0.38	1.70
90	24.29	0.61	0.29	1.55
105	21.58	0.54	0.22	1.39
120	19.47	0.49	0.17	1.20

Proposed 6-Storey Residential Building
Novatech Project No. 120169
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R-3 **Controlled Roof Drain #3**

OTTAWA IDF CURVE

Area =	0.010	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	4.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	6.75	6.43	1.93
10	178.56	4.96	4.64	2.79
15	142.89	3.97	3.65	3.29
20	119.95	3.33	3.01	3.62
25	103.85	2.89	2.57	3.85
30	91.87	2.55	2.23	4.02
35	82.58	2.30	1.98	4.15
40	75.15	2.09	1.77	4.25
45	69.05	1.92	1.60	4.32
50	63.95	1.78	1.46	4.37
55	59.62	1.66	1.34	4.41
60	55.89	1.55	1.23	4.44
65	52.65	1.46	1.14	4.46
70	49.79	1.38	1.06	4.47
75	47.26	1.31	0.99	4.47
90	41.11	1.14	0.82	4.44
105	36.50	1.01	0.69	4.38
120	32.89	0.91	0.59	4.28

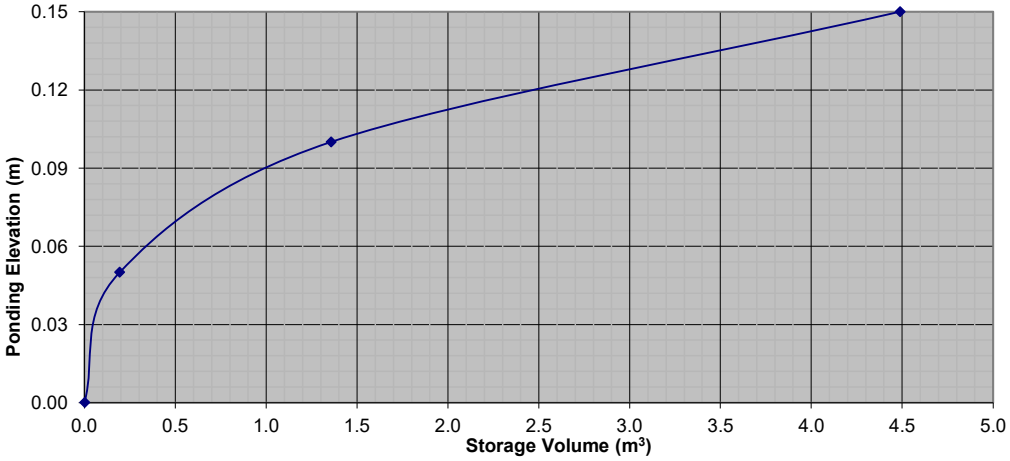
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:5 Year	0.32	0.32	11	1.9	4.5
1:100 Year	0.32	0.32	15	4.5	4.5

Roof Drain Storage Table for Area RD 3

Elevation	Area RD 3	Total Volume
m	m^2	m^3
0.00	0	0
0.05	7.72	0.2
0.10	38.86	1.4
0.15	86.36	4.5

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



Proposed 6-Storey Residential Building
Novatech Project No. 120169
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R-3 **Controlled Roof Drain #4**

OTTAWA IDF CURVE

Area =	0.004	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	0.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	1.41	1.09	0.33
10	104.19	1.04	0.72	0.43
15	83.56	0.84	0.52	0.46
20	70.25	0.70	0.38	0.46
25	60.90	0.61	0.29	0.43
30	53.93	0.54	0.22	0.40
35	48.52	0.49	0.17	0.35
40	44.18	0.44	0.12	0.29
45	40.63	0.41	0.09	0.23
50	37.65	0.38	0.06	0.17
55	35.12	0.35	0.03	0.10
60	32.94	0.33	0.01	0.03
65	31.04	0.31	-0.01	-0.04
70	29.37	0.29	-0.03	-0.11
75	27.89	0.28	-0.04	-0.18
90	24.29	0.24	-0.08	-0.42
105	21.58	0.22	-0.10	-0.66
120	19.47	0.19	-0.13	-0.90

Proposed 6-Storey Residential Building
Novatech Project No. 120169
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R-3 **Controlled Roof Drain #4**

OTTAWA IDF CURVE

Area =	0.004	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	1.3	m3

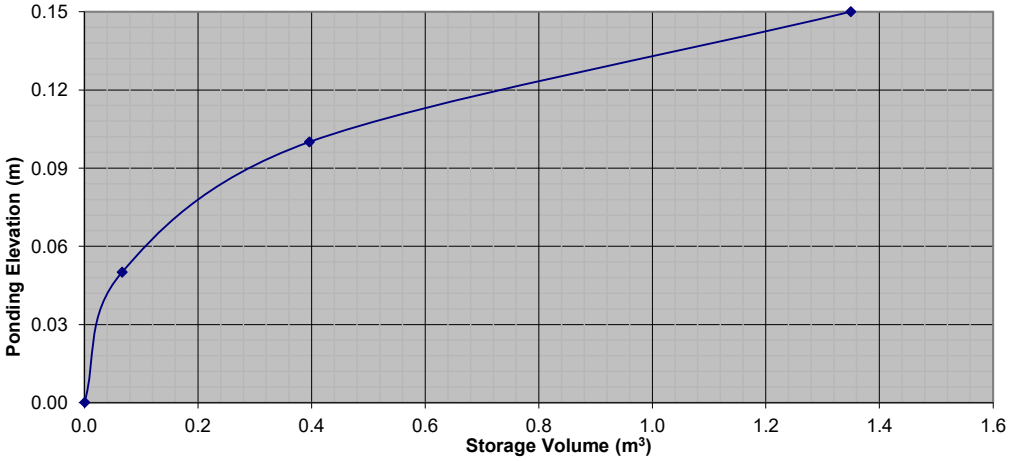
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	2.70	2.38	0.71
10	178.56	1.99	1.67	1.00
15	142.89	1.59	1.27	1.14
20	119.95	1.33	1.01	1.22
25	103.85	1.15	0.83	1.25
30	91.87	1.02	0.70	1.26
35	82.58	0.92	0.60	1.26
40	75.15	0.84	0.52	1.24
45	69.05	0.77	0.45	1.21
50	63.95	0.71	0.39	1.17
55	59.62	0.66	0.34	1.13
60	55.89	0.62	0.30	1.09
65	52.65	0.59	0.27	1.04
70	49.79	0.55	0.23	0.98
75	47.26	0.53	0.21	0.92
90	41.11	0.46	0.14	0.74
105	36.50	0.41	0.09	0.54
120	32.89	0.37	0.05	0.33

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**
1:5 Year	0.32	0.32	11	0.5	1.3
1:100 Year	0.32	0.32	15	1.3	1.3

Roof Drain Storage Table for Area RD 4

Elevation	Area RD 4	Total Volume
m	m^2	m^3
0.00	0	0
0.05	2.64	0.1
0.10	10.56	0.4
0.15	27.57	1.3

Stage Storage Curve: Area R-3
Controlled Roof Drain #4



Proposed 6-Storey Residential Building
Novatech Project No. 120169
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R-3 **Controlled Roof Drain #5**

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

Proposed 6-Storey Residential Building
Novatech Project No. 120169
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R-3 **Controlled Roof Drain #5**

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

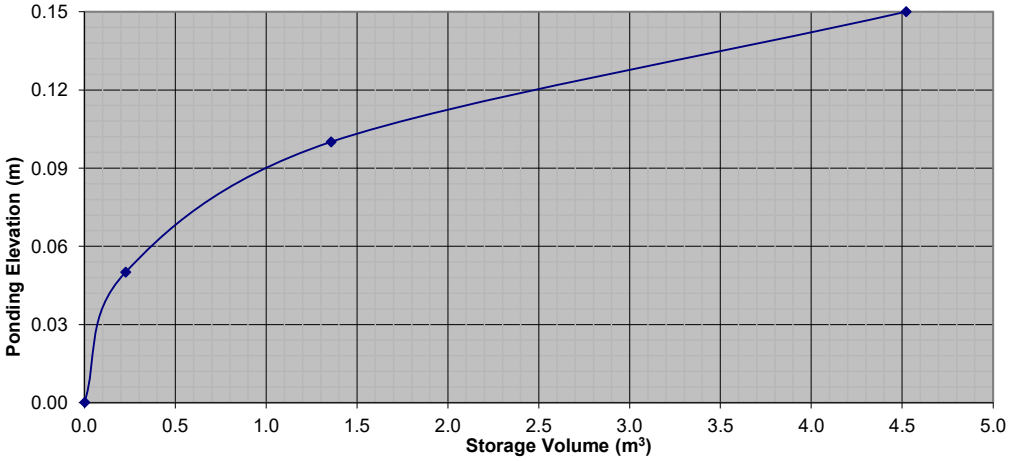
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:5 Year	0.32	0.32	10	1.6	4.5
1:100 Year	0.32	0.32	14	3.9	4.5

Roof Drain Storage Table for Area RD 5

Elevation	Area RD 5	Total Volume
m	m^2	m^3
0.00	0	0
0.05	9.04	0.2
0.10	36.18	1.4
0.15	90.42	4.5

Stage Storage Curve: Area R-3
Controlled Roof Drain #5



Proposed 6-Storey Residential Building
Novatech Project No. 120169
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R-3 **Controlled Roof Drain #6**

OTTAWA IDF CURVE

Area =	0.007	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	1.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	2.47	2.15	0.65
10	104.19	1.82	1.50	0.90
15	83.56	1.46	1.14	1.03
20	70.25	1.23	0.91	1.09
25	60.90	1.07	0.75	1.12
30	53.93	0.94	0.62	1.12
35	48.52	0.85	0.53	1.11
40	44.18	0.77	0.45	1.09
45	40.63	0.71	0.39	1.06
50	37.65	0.66	0.34	1.02
55	35.12	0.62	0.30	0.97
60	32.94	0.58	0.26	0.93
65	31.04	0.54	0.22	0.87
70	29.37	0.51	0.19	0.82
75	27.89	0.49	0.17	0.76
90	24.29	0.43	0.11	0.57
105	21.58	0.38	0.06	0.37
120	19.47	0.34	0.02	0.15

Proposed 6-Storey Residential Building
Novatech Project No. 120169
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R-3 **Controlled Roof Drain #6**

OTTAWA IDF CURVE

Area =	0.007	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	2.8	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	4.72	4.40	1.32
10	178.56	3.47	3.15	1.89
15	142.89	2.78	2.46	2.21
20	119.95	2.33	2.01	2.42
25	103.85	2.02	1.70	2.55
30	91.87	1.79	1.47	2.64
35	82.58	1.61	1.29	2.70
40	75.15	1.46	1.14	2.74
45	69.05	1.34	1.02	2.76
50	63.95	1.24	0.92	2.77
55	59.62	1.16	0.84	2.77
60	55.89	1.09	0.77	2.76
65	52.65	1.02	0.70	2.75
70	49.79	0.97	0.65	2.73
75	47.26	0.92	0.60	2.70
90	41.11	0.80	0.48	2.59
105	36.50	0.71	0.39	2.46
120	32.89	0.64	0.32	2.30

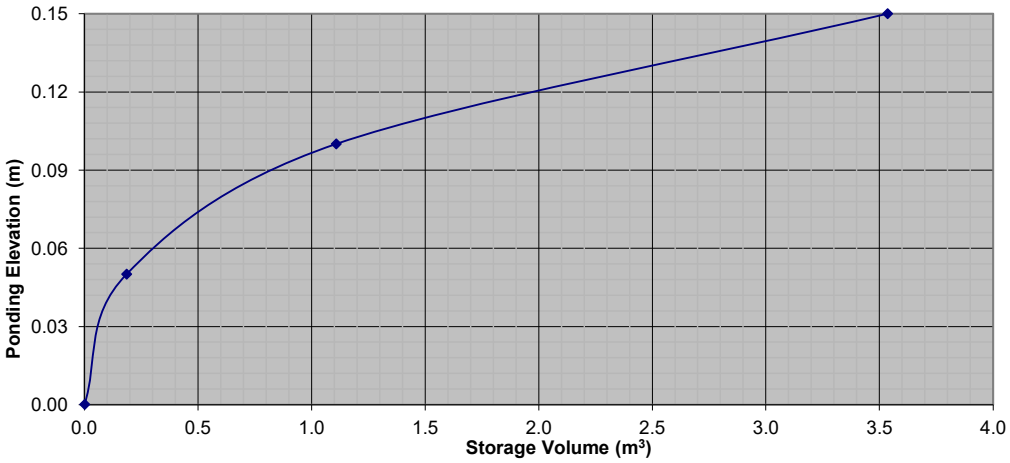
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:5 Year	0.32	0.32	10	1.1	3.5
1:100 Year	0.32	0.32	14	2.8	3.5

Roof Drain Storage Table for Area RD 6

Elevation	Area RD 6	Total Volume
m	m^2	m^3
0.00	0	0
0.05	7.39	0.2
0.10	29.55	1.1
0.15	67.55	3.5

Stage Storage Curve: Area R-3
Controlled Roof Drain #6



APPENDIX F

Control Flow Rood Drain Information

WATTS®	Adjustable Accutrol Weir Tag: RD-100-A-ADJ	Adjustable Flow Control for Roof Drains

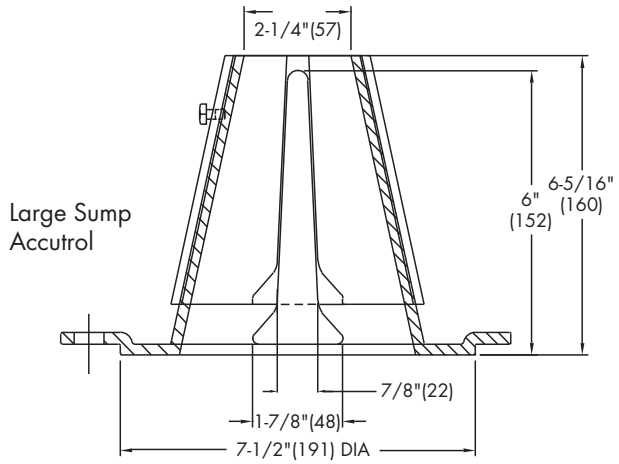
ADJUSTABLE ACCUTROL (for Large Sump Roof Drains only)

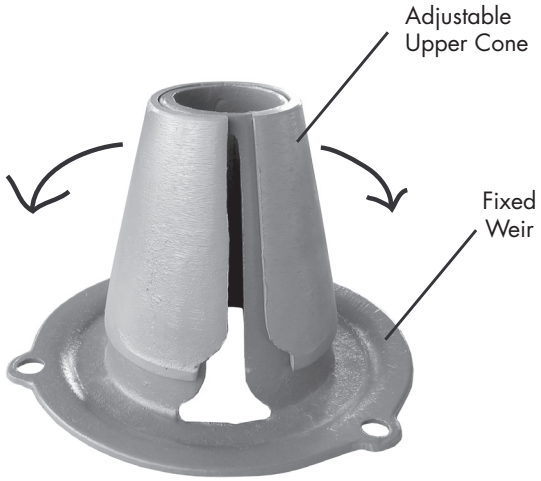
For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the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

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

Engineer _____ Representative _____

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

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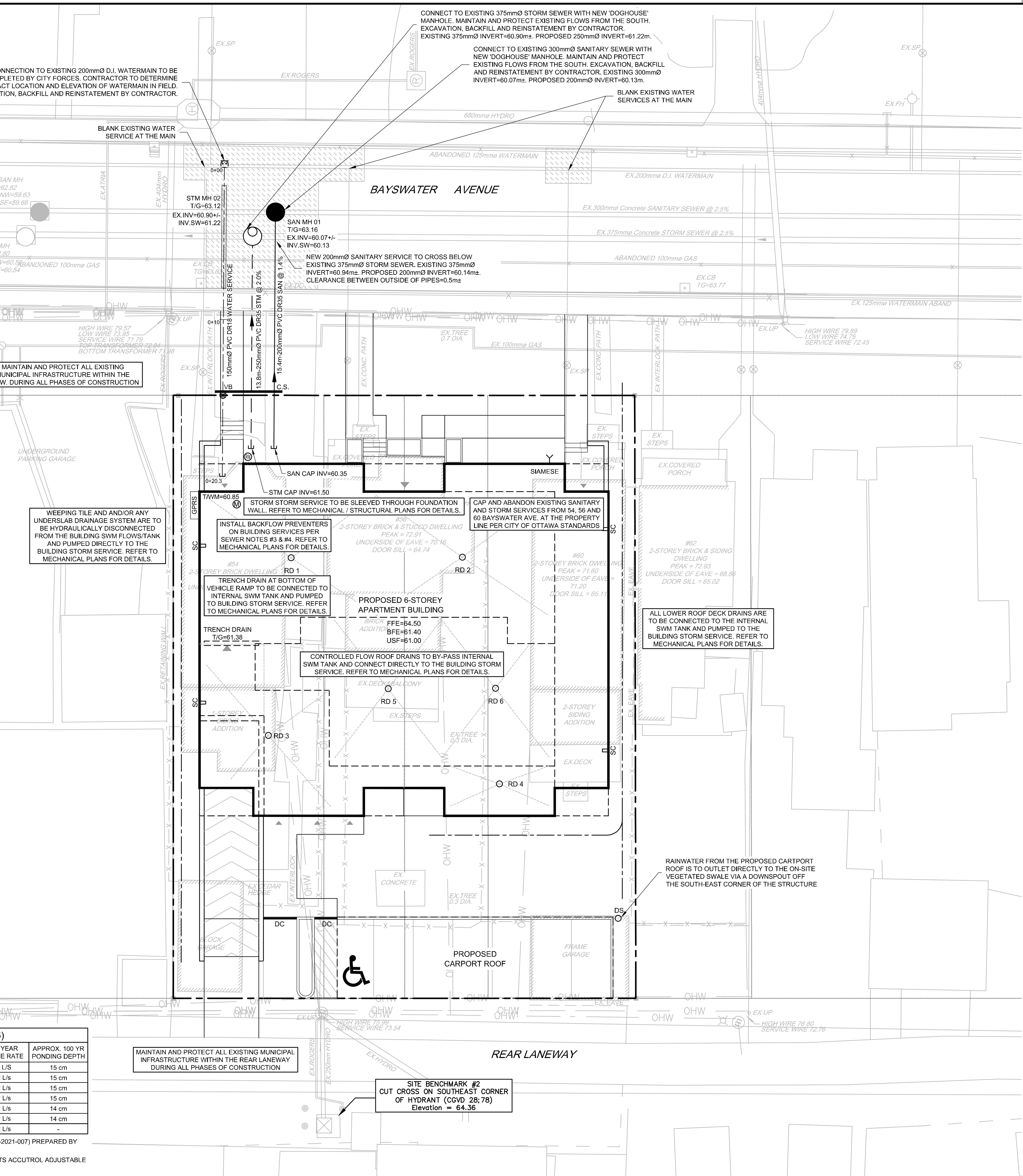
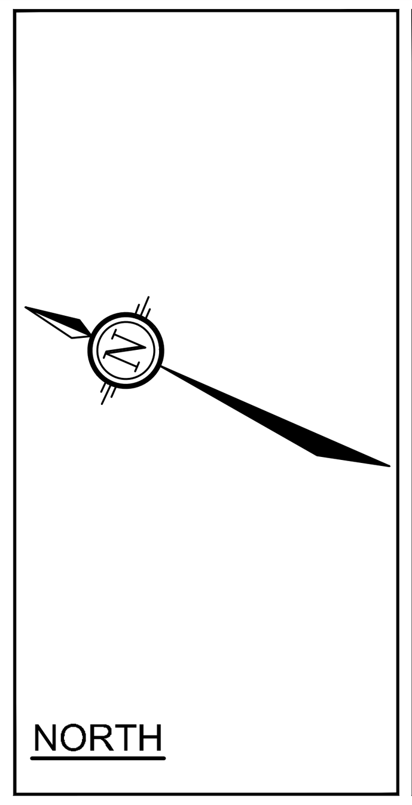
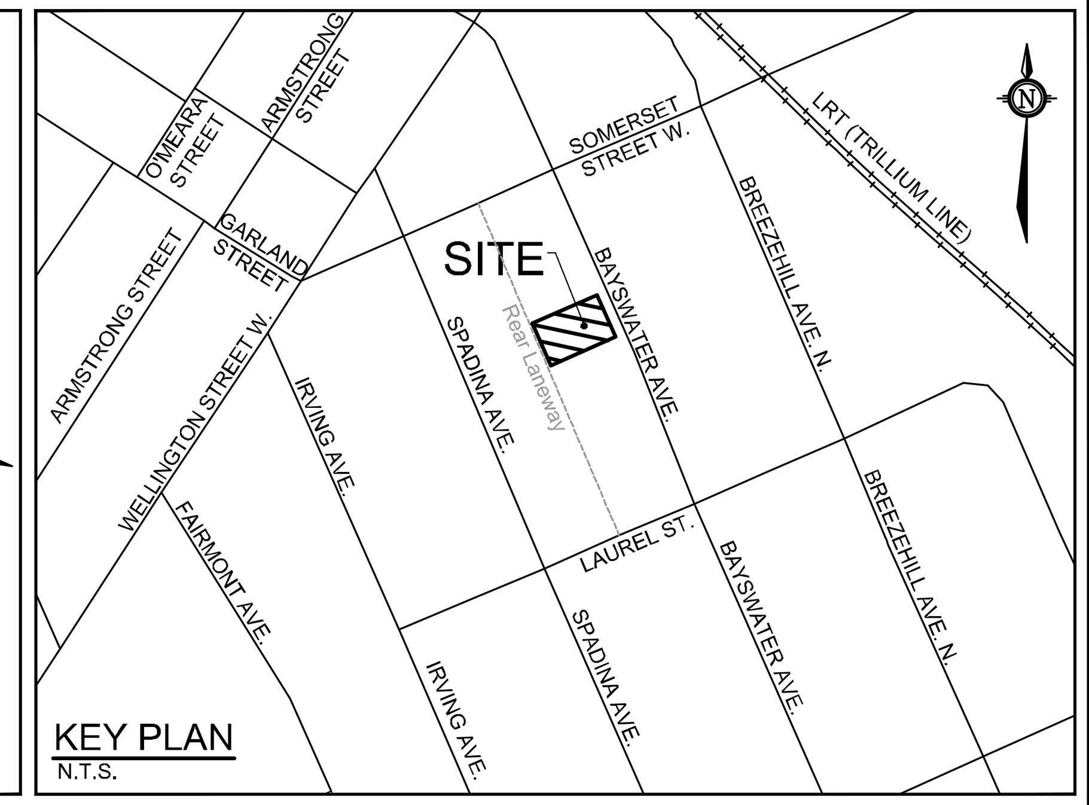

CONNECT TO EXISTING 375mmØ STORM SEWER WITH NEW 'DOGHOUSE' MANHOLE. MAINTAIN AND PROTECT EXISTING FLOWS FROM THE SOUTH. EXCAVATION, BACKFILL AND REINSTATEMENT BY CONTRACTOR. EXISTING 375mmØ INVERT=60.90m±. PROPOSED 250mmØ INVERT=61.22m.
CONNECT TO EXISTING 300mmØ SANITARY SEWER WITH NEW 'DOGHOUSE' MANHOLE. MAINTAIN AND PROTECT EXISTING FLOWS FROM THE SOUTH. EXCAVATION, BACKFILL AND REINSTATEMENT BY CONTRACTOR. EXISTING 300mmØ INVERT=60.07m±. PROPOSED 200mmØ INVERT=60.13m.
CONNECTION TO EXISTING 200mmØ D.I. WATERMAIN TO BE COMPLETED BY CITY FORCES. CONTRACTOR TO DETERMINE EXACT LOCATION AND ELEVATION OF WATERMAIN IN FIELD. EXCAVATION, BACKFILL AND REINSTATEMENT BY CONTRACTOR.
BLANK EXISTING WATER SERVICES AT THE MAIN
BLANK EXISTING WATER SERVICE AT THE MAIN
BAYSWATER AVENUE
STM MH 02
T/G=63.12
EX.INV=60.90+/-
INV.SW=61.22
SAN MH 01
T/G=63.16
EX.INV=60.07+/-
INV.SW=60.13
NEW 200mmØ SANITARY SERVICE TO CROSS BELOW EXISTING 375mmØ STORM SEWER, EXISTING 375mmØ INVERT=60.94m±. PROPOSED 200mmØ INVERT=60.14m±. CLEARANCE BETWEEN OUTSIDE OF PIPES=0.5m±
150mmØ PVC DR18 WATER SERVICE
13.8m-250mmØ PVC DR35 STM @ 2.0%
15.4m-200mmØ PVC DR35 SAN @ 1.4%
MAINTAIN AND PROTECT ALL EXISTING MUNICIPAL INFRASTRUCTURE WITHIN THE R.O.W. DURING ALL PHASES OF CONSTRUCTION
WEEPING TILE AND/OR ANY UNDERSLAB DRAINAGE SYSTEM ARE TO BE HYDRAULICALLY DISCONNECTED FROM THE BUILDING SWM FLOWS/TANK AND PUMPED DIRECTLY TO THE BUILDING STORM SERVICE. REFER TO MECHANICAL PLANS FOR DETAILS.
SAN CAP INV=60.35
STM CAP INV=61.50
T/WM=60.85
STORM STORM SERVICE TO BE SLEEVED THROUGH FOUNDATION WALL. REFER TO MECHANICAL / STRUCTURAL PLANS FOR DETAILS.
CAP AND ABANDON EXISTING SANITARY AND STORM SERVICES FROM 54, 56 AND 60 BAYSWATER AVE. AT THE PROPERTY LINE PER CITY OF OTTAWA STANDARDS
INSTALL BACKFLOW PREVENTERS ON BUILDING SERVICES PER SEWER NOTES #3 & #4. REFER TO MECHANICAL PLANS FOR DETAILS.
TRENCH DRAIN AT BOTTOM OF VEHICLE RAMP TO BE CONNECTED TO INTERNAL SWM TANK AND PUMPED TO BUILDING STORM SERVICE. REFER TO MECHANICAL PLANS FOR DETAILS.
TRENCH DRAIN
T/G=61.38
PROPOSED 6-STOREY APARTMENT BUILDING
FFE=64.50
BFE=61.40
USF=61.00
CONTROLLED FLOW ROOF DRAINS TO BY-PASS INTERNAL SWM TANK AND CONNECT DIRECTLY TO THE BUILDING STORM SERVICE. REFER TO MECHANICAL PLANS FOR DETAILS.
ALL LOWER ROOF DECK DRAINS ARE TO BE CONNECTED TO THE INTERNAL SWM TANK AND PUMPED TO THE BUILDING STORM SERVICE. REFER TO MECHANICAL PLANS FOR DETAILS.
RD 1
RD 2
RD 3
RD 4
RD 5
RD 6
SIAMESE
RAINWATER FROM THE PROPOSED CARTPORT ROOF IS TO OUTLET DIRECTLY TO THE ON-SITE VEGETATED SWALE VIA A DOWNSPOUT OFF THE SOUTH-EAST CORNER OF THE STRUCTURE
PROPOSED CARPORT ROOF
REAR LANEWAY
MAINTAIN AND PROTECT ALL EXISTING MUNICIPAL INFRASTRUCTURE WITHIN THE REAR LANEWAY DURING ALL PHASES OF CONSTRUCTION
SITE BENCHMARK #2
CUT CROSS ON SOUTHEAST CORNER OF HYDRANT (CGVD 28;78)
Elevation = 64.36





LEGEND:

	PROPERTY LINE
RD	PROPOSED CONTROLLED FLOW ROOF DRAIN
	PROPOSED WATER METER AND REMOTE METER
	PROPOSED BARRIER CURB
DC	PROPOSED DEPRESSED CURB
	PROPOSED BUILDING ENTRANCE
	PROPOSED WATER SERVICE
	PROPOSED STORM SERVICE
	PROPOSED SANITARY SERVICE
V&VB	PROPOSED VALVE AND VALVE BOX
FFE	FINISHED FLOOR ELEVATION
T/FND	TOP OF FOUNDATION WALL ELEVATION
USF	UNDERSIDE OF FOOTING ELEVATION
X	REMOVAL AND/OR ABANDONMENT
C.S.	CLAY SEAL SEEPAGE BARRIER (PER GEOTECH REPORT)
	WATERMAIN CAP
	PROPOSED FENCE AND GATE
OHW	EXISTING OVERHEAD WIRES
	EXISTING CONCRETE CURB
SANMH	EXISTING SANITARY MANHOLE & SEWER
CBMH	EXISTING CATCHBASIN MANHOLE
STMMH	EXISTING STORM MANHOLE & SEWER
CB	EXISTING CATCHBASIN C/W CATCHBASIN LEAD
HYD V&VB	EXISTING HYDRANT & VALVE
	EXISTING TREES / VEGETATION
EX.UP	EXISTING UTILITY POLE
	EXISTING FENCE
300mmØ WM	EXISTING WATERMAIN
HYD	EXISTING HYDRANT C/W VALVE & LEAD

GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. 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.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. 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.
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF MUNICIPAL AUTHORITIES.
6. 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.
7. ALL ELEVATIONS ARE GEODETIC.
8. REFER TO GEOTECHNICAL INVESTIGATION REPORT (PATERSON REPORT NUMBER PG5645-1), DATED FEBRUARY 24, 2021, PREPARED BY PATERSON GROUP INC., FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
9. REFER TO MECHANICAL PLAN FOR ROOF DRAIN INFORMATION.
10. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARD SURFACED AREAS AND DIMENSIONS.
11. REFER TO THE 'DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT' (R-2021-007) PREPARED BY NOVATECH.
12. SAW CUT AND KEYGRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE-IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).

SEWER NOTES:

1. SUPPLY AND CONSTRUCT ALL SEWERS AND APPURTENANCES IN ACCORDANCE WITH THE MOST CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS USING THE CURRENT GUIDELINES, BYLAWS AND STANDARDS INCLUDING MATERIALS OF CONSTRUCTION, DISINFECTION AND ALL RELEVANT REFERENCES TO OPSS, OPSD & AWWA GUIDELINES - ALL CURRENT VERSIONS AND 'AS AMENDED'.
2. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
STORM / SANITARY MANHOLE (1200mmØ)	701.010	OPSD
STORM MANHOLE FRAME AND COVER	401.010 - TYPE "B"	OPSD
SANITARY MANHOLE FRAME AND COVER	401.010 - TYPE "A"	OPSD
STORM SERVICE	PVC DR 35	
SANITARY SERVICE	PVC DR 35	
SEWER TRENCH - BEDDING (GRANULAR 'A') COVER (GRANULAR 'A' OR GRANULAR 'B' TYPE I WITH MAXIMUM PARTICLE SIZE=25mm)		

3. THE SANITARY SERVICE LATERAL SHALL BE EQUIPPED WITH A BACKFLOW PREVENTER WITHIN THE BUILDING FOOTPRINT AS PER CITY OF OTTAWA STANDARD DETAILS S14.1 OR S14.2. REFER TO MECHANICAL PLANS FOR DETAILS.
4. THE STORM SERVICE LATERAL SHALL BE EQUIPPED WITH A BACKFLOW PREVENTER WITHIN THE BUILDING FOOTPRINT AS PER CITY OF OTTAWA STANDARD DETAILS S14. REFER TO MECHANICAL PLANS FOR DETAILS.
5. PIPE BEDDING, COVER AND BACKFILL ARE TO BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. THE USE OF CLEAR CRUSHED STONE AS A BEDDING LAYER SHALL NOT BE PERMITTED.
6. INSULATE ALL SEWER PIPES THAT HAVE LESS THAN 1.5m COVER WITH UP TO 125mm THICK HI-40 RIGID INSULATION.
7. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL APPLICABLE SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN. AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/G ELEVATIONS, STRUCTURE LOCATIONS AND ANY ALIGNMENT CHANGES, ETC.
8. THE OWNER SHALL REQUIRE THAT THE SITE SERVICING CONTRACTOR PERFORM FIELD TESTS FOR QUALITY CONTROL OF ALL SANITARY SEWERS. LEAKAGE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH OPSS 410.07.16, 410.07.16.04 AND 407.07.24. DYE TESTING IS TO BE COMPLETED ON ALL SANITARY SERVICES TO CONFIRM PROPER CONNECTION TO THE SANITARY SEWER MAIN. THE FIELD TESTS SHALL BE PERFORMED IN THE PRESENCE OF A CERTIFIED PROFESSIONAL ENGINEER WHO SHALL SUBMIT A CERTIFIED COPY OF THE TEST RESULTS.

WATERMAIN NOTES:

1. SUPPLY AND CONSTRUCT ALL WATERMAIN AND APPURTENANCES IN ACCORDANCE WITH THE MOST CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS.
2. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
WATERMAIN TRENCHING	W17	CITY OF OTTAWA
THERMAL INSULATION IN SHALLOW TRENCHES	W22	CITY OF OTTAWA
THERMAL INSULATION BY OPEN STRUCTURES	W23	CITY OF OTTAWA
WATERMAIN CROSSING BELOW SEWERS	W25	CITY OF OTTAWA
WATERMAIN MATERIAL	PVC DR 18 (100mm AND LARGER)	

3. EXCAVATION, INSTALLATION, BACKFILL AND RESTORATION OF ALL WATERMAINS BY THE CONTRACTOR. CONNECTIONS AND SHUT-OFFS AT THE MAIN AND CHLORINATION OF THE WATER SYSTEM SHALL BE PERFORMED BY CITY OFFICIALS. EXCAVATION, INSTALLATION OF SERVICE, BACKFILL AND RESTORATION BY THE CONTRACTOR.
4. WATERMAIN SHALL BE MINIMUM 2.4m DEPTH BELOW GRADE UNLESS OTHERWISE INDICATED.
5. PROVIDE MINIMUM 0.5m CLEARANCE BETWEEN OUTSIDE OF PIPES AT ALL CROSSINGS, UNLESS OTHERWISE INDICATED.
6. WATER SERVICE IS TO BE CONSTRUCTED TO WITHIN 1.0m OF FOUNDATION WALL AND CAPPED, UNLESS OTHERWISE INDICATED.

INTERNAL SWM STORAGE SYSTEM

DESIGN EVENT	STORAGE SYSTEM CONTROLLED FLOW	STORAGE VOLUMES	
		REQUIRED	PROVIDED
1:2 YR	1.89 L/s	0.4 m³	> 4.0 m³
1:5 YR	1.89 L/s	0.9 m³	
1:100 YR	1.89 L/s	2.4 m³	
1:100+20%	1.89 L/s	4.0 m³	

NOTES:

1. ALL DRAINAGE FROM AREA B-2 (PROPOSED TRENCH DRAIN AND ALL LOWER ROOF + PATIO DRAINS) TO BE DIRECTED TO THE INTERNAL STORMWATER STORAGE SYSTEM. REFER TO ARCHITECTURAL AND MECHANICAL PLANS FOR DETAILS.
2. REFER TO ARCHITECTURAL AND STRUCTURAL PLANS FOR EXACT SIZE AND DETAILS OF INTERNAL STORMWATER STORAGE SYSTEM.
3. REFER TO MECHANICAL PLANS FOR PUMP INFORMATION AND DETAILS OF THE INTERNAL STORMWATER STORAGE SYSTEM.

PROPOSED 150mmØ WATER SERVICE TABLE

STATION	SURFACE ELEVATION	T/WM ELEVATION	COMMENTS
0+00	63.09±	60.78± ✱✱✱	150mmØ WM CONNECTION TO EX. WM (ROLL TEE)
0+02.4	63.10	61.80 ✱✱	22.5° VERTICAL BEND
0+02.9	63.10	61.80 ✱✱	CROSS ABOVE 300mmØ SAN (±1.3m CLEARANCE)
0+03.5	63.11	61.80 ✱✱	INSULATE IN PROXIMITY TO OPEN STRUCTURES
0+04.5	63.11	61.80 ✱✱	CROSS ABOVE 375mmØ STM (±0.3m CLEARANCE)
0+05.1	63.11	61.80 ✱✱	22.5° VERTICAL BEND
0+06.1	63.10	61.39 ✱✱	CROSS BELOW ABAND.GAS (>0.5m CLEARANCE)
0+07.6	63.08	60.85 ✱✱	22.5° VERTICAL BEND
0+08.2	63.20	60.85	CROSS BELOW ABAND.WM (>0.5m CLEARANCE)
0+11.7	63.35	60.85	CROSS BELOW 100mmØ GAS (±1.4m CLEARANCE)
0+15.0	63.47	60.85	PROPERTY LINE / 150mmØ V&VB
0+15.1	63.48	60.85	- - -
0+20.3	64.50	60.85	CAP 1.0m FROM FOUNDATION WALL ✱✱✱

✱ CONNECTION TO EXISTING 200mmØ WATERMAIN. EXACT ELEVATIONS TO BE FIELD DETERMINED.

✱✱ PROVIDE THERMAL INSULATION AS PER CITY OF OTTAWA DETAIL W22 IN SHALLOW TRENCHES AND/OR CITY OF OTTAWA DETAIL W23 ADJACENT TO OPEN STRUCTURES.

ROOF DRAIN TABLE: AREA R-3 (ROOF DRAINS 1-6)

AREA ID *	ROOF DRAIN No. (WATTS MODEL)	WEIR SETTING	1:5 YEAR RELEASE RATE	APPROX. 5 YR PONDING DEPTH	1:100 YEAR RELEASE RATE	APPROX. 100 YR PONDING DEPTH
R-3	RD 1 (RD-100-A-ADJ)	CLOSED	0.32 L/S	11 cm	0.32 L/S	15 cm
R-3	RD 2 (RD-100-A-ADJ)	CLOSED	0.32 L/S	11 cm	0.32 L/s	15 cm
R-3	RD 3 (RD-100-A-ADJ)	CLOSED	0.32 L/s	11 cm	0.32 L/s	15 cm
R-3	RD 4 (RD-100-A-ADJ)	CLOSED	0.32 L/s	11 cm	0.32 L/s	15 cm
R-3	RD 5 (RD-100-A-ADJ)	CLOSED	0.32 L/s	10 cm	0.32 L/s	14 cm
R-3	RD 6 (RD-100-A-ADJ)	CLOSED	0.32 L/s	10 cm	0.32 L/s	14 cm
TOTALS	-	-	1.92 L/s	-	1.92 L/s	-

* REFER TO THE 'DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT' (R-2021-007) PREPARED BY NOVATECH FOR DRAINAGE AREA IDENTIFIERS AND STORMWATER MANAGEMENT DETAILS.

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Phone: 613-979-1135
email: blair@centennialdev.com

No.	REVISION	DATE	BY
2	REVISED PER CITY COMMENTS	NOV 19/21	MS
1	ISSUED FOR SITE PLAN APPROVAL	JUN 16/21	MS

SCALE 1:150

DESIGN	SM
CHECKED	MS
DRAWN	DM
CHECKED	SM
APPROVED	MS

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER M. SAVIC 100102651 11/19/21 PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
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Facsimile (613) 254-5867
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LOCATION
CITY OF OTTAWA
54, 56 & 60 BAYSWATER AVENUE

DRAWING NAME
GENERAL PLAN OF SERVICES

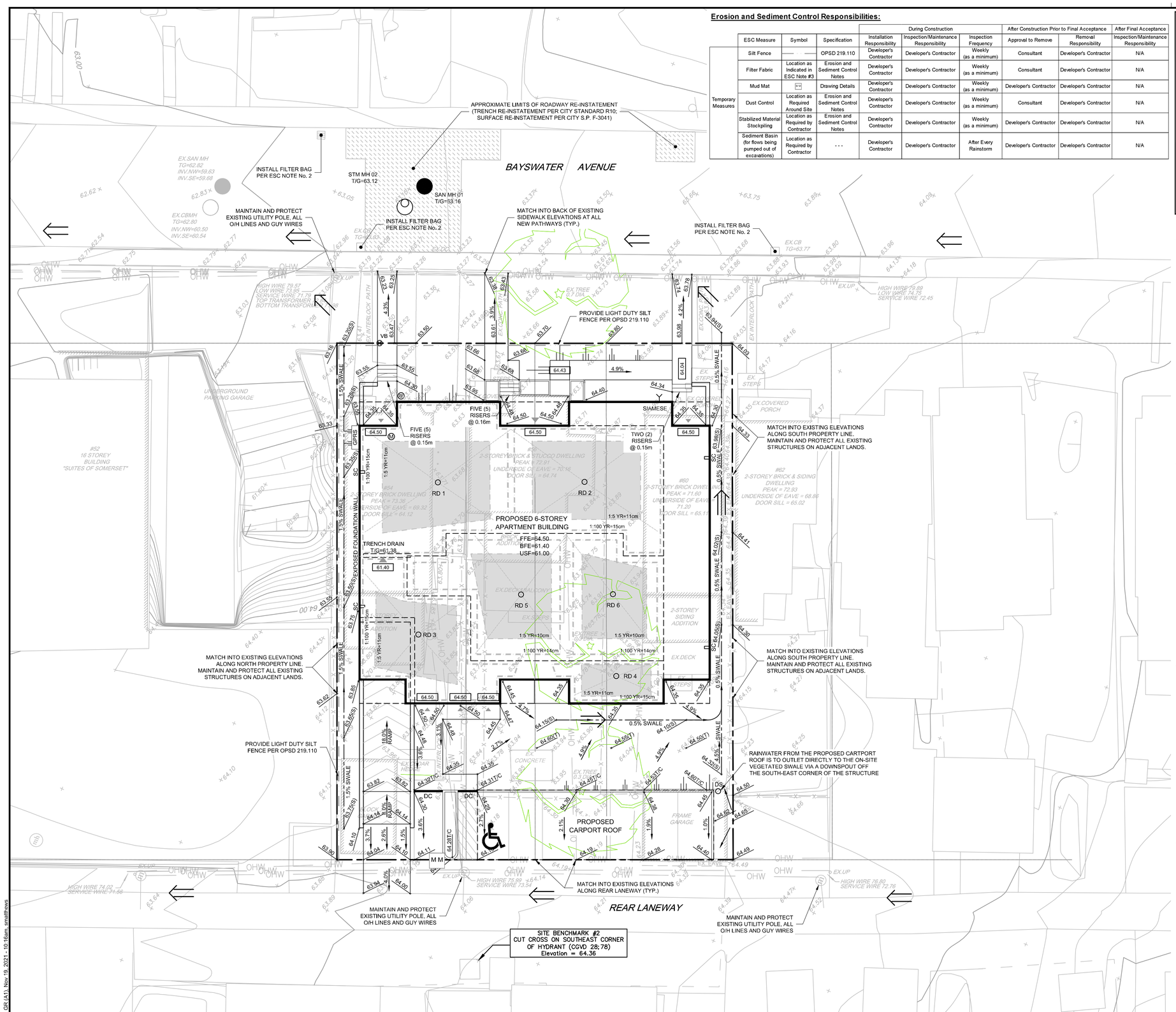
PROJECT No. 120169
REV # 2
DRAWING No. 120169-GP

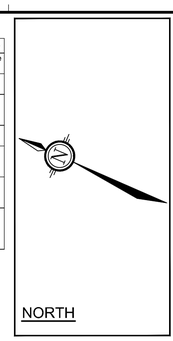
D02-02-21-0058 / D07-12-21-0090

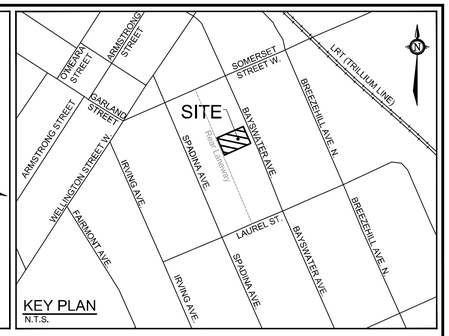
PLAN #18529

Erosion and Sediment Control Responsibilities:

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







LEGEND

- PROPERTY LINE
- PROPOSED ELEVATION
- EXISTING ELEVATION
- GRADE AND DIRECTION
- PROPOSED ELEVATION
- DIRECTION OF MAJOR SYSTEM OVERLAND FLOW
- FFE FINISHED FLOOR ELEVATION
- USF UNDERSIDE OF FOOTING ELEVATION
- RD PROPOSED CONTROLLED FLOW ROOF DRAIN
- SC PROPOSED ROOFTOP SCUPPER LOCATION
- BUILDING ENTRANCE / EXIT
- APPROXIMATE PONDING LIMITS
- X REMOVAL AND/OR ABANDONMENT
- V&VB PROPOSED VALVE AND VALVE BOX
- PROPOSED STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- EXISTING EDGE OF PAVEMENT
- V&VB EXISTING VALVE & VALVE BOX
- HYD EXISTING HYDRANT
- COMB MH EXISTING COMBINED MH
- CBMH EXISTING CATCHBASIN
- CB EXISTING CATCHBASIN MH
- EX.UP EXISTING UTILITY POLE & GUY WIRES
- EXISTING FENCE
- O/H WIRES EXISTING OVERHEAD WIRES

PAVEMENT STRUCTURE:

LIGHT DUTY PAVEMENT
50mm HL-3 or SUPERPAVE 12.5
150mm GRANULAR "A"
300mm GRANULAR "B" TYPE II
ASPHALT GRADE PG 58-34

HEAVY DUTY PAVEMENT
40mm HL-3 or SUPERPAVE 12.5
50mm HL-8 or SUPERPAVE 19.0
150mm GRANULAR "A"
450mm GRANULAR "B" TYPE II
ASPHALT GRADE PG 58-34

GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. 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.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. 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.
5. 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.
6. 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.
7. ALL ELEVATIONS ARE GEODETIC.
8. REFER TO GEOTECHNICAL REPORT (PATTERSON REPORT NUMBER PG5645-1), DATED FEBRUARY 24, 2021, PREPARED BY PATTERSON GROUP INC., FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS, AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
9. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS.
10. REFER TO DEVELOPMENT SERVICING STUDY & STORMWATER MANAGEMENT REPORT(R-2021-007) PREPARED BY NOVATECH.
11. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).

GRADING NOTES:

1. 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.
2. 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.
3. 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.
4. 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.
5. MINIMUM OF 2% GRADE FOR ALL GRASS AREAS UNLESS OTHERWISE NOTED.
6. MAXIMUM TERRACING GRADE TO BE 3:1 UNLESS OTHERWISE NOTED.
7. ALL GRADES BY CURBS ARE EDGE OF PAVEMENT GRADES UNLESS OTHERWISE INDICATED.
8. ALL CURBS SHALL BE BARRIER CURB (150mm) UNLESS OTHERWISE NOTED AND CONSTRUCTED AS PER CITY OF OTTAWA STANDARDS (SC1.1).
9. REFER TO LANDSCAPE PLAN FOR PLANTING AND OTHER LANDSCAPE FEATURE DETAILS.
10. 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 :

1. 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.
2. TO PREVENT SURFACE EROSION FROM ENTERING ANY STORM SEWER SYSTEM DURING CONSTRUCTION, FILTER BAGS WILL BE PLACED UNDER GRATES OF NEARBY CATCHBASINS AND STRUCTURES. A LIGHT DUTY SILT FENCE BARRIER WILL ALSO BE INSTALLED AROUND THE CONSTRUCTION AREA (WHERE APPLICABLE). THESE CONTROL MEASURES WILL REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE.
3. 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.
4. 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.
5. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
6. ROADWAYS ARE TO BE SWEPT AS REQUIRED OR AS DIRECTED BY THE ENGINEER AND/OR MUNICIPALITY.
7. THE CONTRACTOR SHALL ENSURE PROPER DUST CONTROL IS PROVIDED WITH THE APPLICATION OF WATER (AND IF REQUIRED, CALCIUM CHLORIDE) DURING DRY PERIODS.

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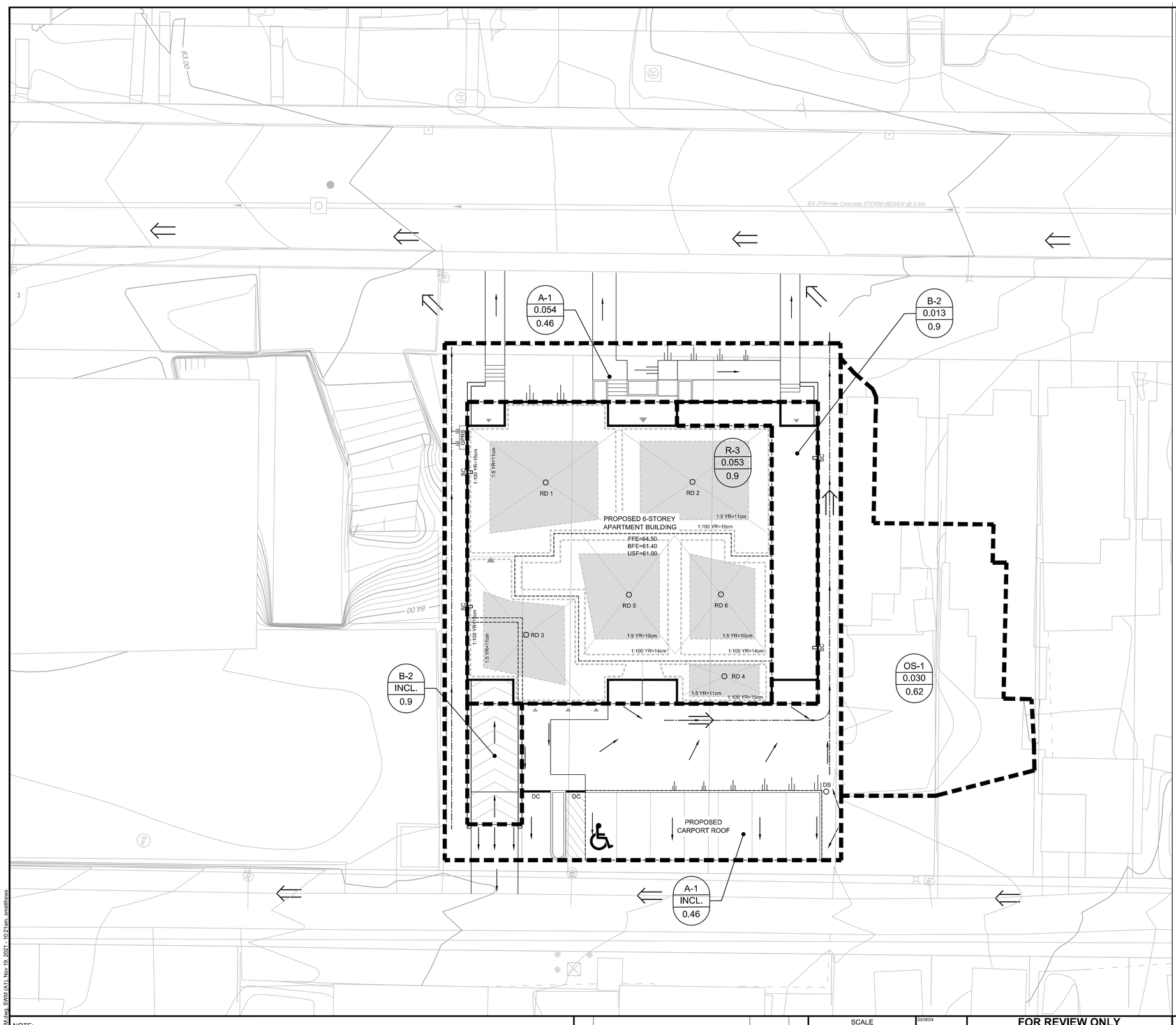
54, 56 & 60 BAYSWATER AVENUE

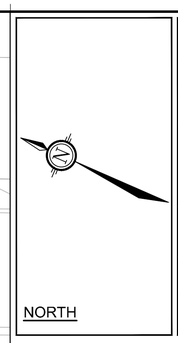
DRAWING NAME
GRADING AND EROSION & SEDIMENT CONTROL PLAN

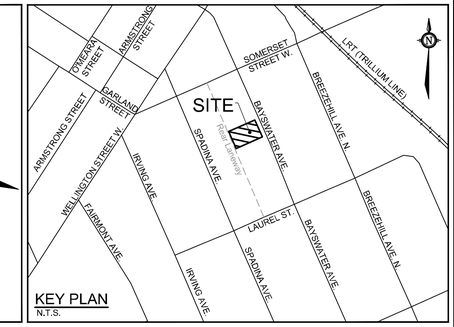
PROJECT No. 120169
REV REV # 2
DRAWING No. 120169-GR

D02-02-21-0058 / D07-12-21-0090

PLAN #18529







LEGEND

- PROPOSED BARRIER CURB
- DC — PROPOSED DEPRESSED CURB
- DRAINAGE AREA LIMITS
- 1:5 YR / 1:100 YR — APPROXIMATE PONDING LIMITS
- A-1 / 0.054 / 0.46 — POST-DEVELOPMENT AREA ID; POST-DEVELOPMENT DRAINAGE AREA (ha); 1:5 YEAR WEIGHTED RUNOFF COEFICIENT
- FFE — FINISHED FLOOR ELEVATION
- T/FND — TOP OF FOUNDATION WALL ELEVATION
- USF — UNDERSIDE OF FOOTING ELEVATION
- RD — PROPOSED CONTROLLED FLOW ROOF DRAIN
- SC — PROPOSED ROOFTOP SCUPPER LOCATION
- PROPOSED STORM SEWER AND FLOW DIRECTION
- EMERGENCY OVERLAND FLOW ROUTE
- PROPOSED BUILDING ENTRANCE / EXIT
- STM MH — EXISTING STORM MH & SEWER
- CB — EXISTING CATCHBASIN C/W CATCHBASIN LEAD

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12. PROVIDE LINE/PARKING PAINTING.

INTERNAL SWM STORAGE SYSTEM

DESIGN EVENT	STORAGE SYSTEM CONTROLLED FLOW	STORAGE VOLUMES	
		REQUIRED	PROVIDED
1:2 YR	1.89 L/s	0.4 m³	> 4.0 m³
1:5 YR	1.89 L/s	0.9 m³	
1:100 YR	1.89 L/s	2.4 m³	
1:100+20%	1.89 L/s	4.0 m³	

NOTES:

1. ALL DRAINAGE FROM AREA B-2 (PROPOSED TRENCH DRAIN AND ALL LOWER ROOF + PATIO DRAINS) TO BE DIRECTED TO THE INTERNAL STORMWATER STORAGE SYSTEM. REFER TO ARCHITECTURAL AND MECHANICAL PLANS FOR DETAILS.
2. REFER TO ARCHITECTURAL AND STRUCTURAL PLANS FOR EXACT SIZE AND DETAILS OF INTERNAL STORMWATER STORAGE SYSTEM.
3. REFER TO MECHANICAL PLANS FOR PUMP INFORMATION AND DETAILS OF THE INTERNAL STORMWATER STORAGE SYSTEM.

ROOF DRAIN TABLE: AREA R-3 (ROOF DRAINS 1-6)

AREA ID *	ROOF DRAIN No. (WATTS MODEL)	WEIR SETTING	1:5 YEAR RELEASE RATE	APPROX. 5 YR PONDING DEPTH	1:100 YEAR RELEASE RATE	APPROX. 100 YR PONDING DEPTH
R-3	RD 1 (RD-100-A-ADJ)	CLOSED	0.32 L/S	11 cm	0.32 L/S	15 cm
R-3	RD 2 (RD-100-A-ADJ)	CLOSED	0.32 L/S	11 cm	0.32 L/s	15 cm
R-3	RD 3 (RD-100-A-ADJ)	CLOSED	0.32 L/s	11 cm	0.32 L/s	15 cm
R-3	RD 4 (RD-100-A-ADJ)	CLOSED	0.32 L/s	11 cm	0.32 L/s	15 cm
R-3	RD 5 (RD-100-A-ADJ)	CLOSED	0.32 L/s	10 cm	0.32 L/s	14 cm
R-3	RD 6 (RD-100-A-ADJ)	CLOSED	0.32 L/s	10 cm	0.32 L/s	14 cm
TOTALS	-	-	1.92 L/s	-	1.92 L/s	-

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