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39 Years

100 Argyle Avenue

Development Servicing Study and Stormwater Management Report

PROPOSED 12-STOREY RESIDENTIAL DEVELOPMENT
100 ARGYLE AVENUE

DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT

Prepared by:

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

August 13, 2021
Revised: December 21, 2021

Ref: R-2021-100
Novatech File No. 118116

December 21, 2021

100 Argyle Corporation
c/o Colonnade BridgePort
Suite 200, 16 Concourse Gate
Ottawa, ON
K2E 7S8

Attention: Mr. Stephen Martin

Dear Mr. Martin:

Re: Development Servicing Study and Stormwater Management Report
Proposed 12-Storey Residential Development
100 Argyle Avenue Ottawa, ON
City File No.: D07-12-21-0130
Novatech File No.: 118116

Enclosed is a copy of the revised 'Development Servicing Study and Stormwater Management Report' for the proposed 12-storey residential development located at 100 Argyle Avenue, in the City of Ottawa. This report addresses the approach to site servicing and stormwater management and is submitted in support of a Site Plan Control application.

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

Yours truly,

NOVATECH

François Thauvette, P. Eng.
Senior Project Manager

cc: Jhamb Nishant (City of Ottawa)
Kevin Reid (RLA)

Suite 200, 240 Michael Cowpland Drive, Ottawa ON K2M 1P6 Tel: 613.254.9643 Fax: 613.254.5867 www.novatech-eng.com

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1.0 INTRODUCTION

The new 12-storey residential building is being proposed by 100 Argyle Corporation and Novatech has been retained to complete the site servicing and stormwater management design for this project. This report addresses the approach to servicing and stormwater management and is being submitted in support of a Site Plan Control application.

1.1 Site Description and Location

The subject site is located at 100 Argyle Avenue, between Metcalfe Street and Elgin Street in the City of Ottawa. The site is approximately 0.156 hectares in size and currently occupied by a 3-storey building with a variety of office uses. There are street level parking lots on the east and south sides of the building. A shared laneway located on the west side of the building currently provides access to the neighbouring property's rear parking lot. The site is bordered by Argyle Avenue and the Canadian Museum of Nature to the north, an existing office and residential buildings to the west and the Ottawa Police Services building to the south and east. The legal description of the site is Lot 3 and Part of Lot 4, Registered Plan 30, City of Ottawa.

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

Image Source: geoOttawa (City of Ottawa)

1.2 Pre-Consultation Information

A pre-consultation meeting was held with the City of Ottawa on January 31, 2018, 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) is anticipated to

be required because the storm flows from this site are being directed into a combined sewer in Argyle Avenue. A pre-consultation meeting has not been held with the MECP.

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

Refer to **Appendix A** for a summary of the correspondence related to the proposed development.

1.3 Proposed Development

The proposed development will consist of a new 12-storey residential building. The building will be serviced by extending new laterals to the municipal combined sewer and watermain in Argyle Avenue. Access to the underground parking levels will be provided off Argyle Avenue. The shared laneway on the west side of the building will be maintained while a new loading driveway is being proposed on the east side of the building.

1.4 Reference Material

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

[1] Assessment of Adequacy of Existing Municipal Services Report (Ref. No. R-2018-089), prepared by Novatech on November 12, 2018.

[2] The Geotechnical Investigation Report (Ref. No. PG4458-1, Rev. 2), prepared by Paterson Group Inc. on June 21, 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. As discussed with the City of Ottawa, the total allowable flow from the subject site being directed to the combined sewer in Argyle Avenue is to include:

- Peak sanitary sewage flows
- Ground water flows (less than 15,000 L/day) per section 6.5 of the Geotech Report[2]
- Peak stormwater flows

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

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

The City of Ottawa Servicing Study Guidelines for Development Applications requires that a Development Servicing Study Checklist be included to confirm that each applicable item is

deemed complete and ready for review by City of Ottawa Infrastructure Approvals. A completed checklist is enclosed in **Appendix B** of the report.

2.1 Sanitary Sewage

The proposed residential development will be serviced by a new 250mm dia. sanitary sewer connected to the existing 525mm dia. combined sewer in Argyle Avenue. Approximately 150m downstream of the site at the intersection of Elgin Street and Argyle Avenue, the combined sewer connects into the 1500mm dia. Arlington-Isabella-Cartier trunk sewer.

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

Residential Use

- Residential Units (Studio or 1-Bedroom): 1.4 people per unit
- Residential Units (2-Bedroom): 2.1 people per unit
- Average Daily Residential Sewage Flow: 280 L/person/day
- Residential Peaking Factor = 3.74 (Harmon Equation)
- Infiltration Allowance: 0.33 L/s/ha x 0.156 ha site = 0.05 L/s

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

Table 1: Theoretical Post-Development Sanitary Flows

Residential Use	Unit Count	Design Population	Average Flow (L/s)*	Peaking Factor	Peak Flow (L/s)*
Studio / 1-Bedroom	112	157	0.51	3.74	1.90
2-Bedroom	11	23	0.07	3.74	0.28
Infiltration Allowance	-	-	-	-	0.05
Total	**123**	**180**	**0.58**	-	**2.23**

*Represents rounded values

As indicated in the table above, the peak sanitary flow to the combined sewer in Argyle Avenue was calculated to be approximately 2.23 L/s. Refer to **Appendix C** for a copy of the theoretical sanitary flow calculations.

A 250mm dia. sanitary gravity sewer at a minimum slope of 1.0% has a full flow conveyance capacity of 62.0 L/s and will have enough capacity to convey the theoretical sanitary flows for the proposed development.

2.2 Water for Domestic Use and Firefighting

The proposed residential development will be serviced by redundant 150mm dia. water services connected to the existing 200mm dia. DI watermain in Argyle Avenue. The water services have been sized to provide the required domestic water demand and fire flow. Shut-off valves will be

provided on the proposed water services near the exterior face of the building. The water meter will be located within the water entry room, with a remote meter also on the exterior face of the building.

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

- Residential Units (Studio or 1 Bedroom): 1.4 people per unit
- Residential Units (2 Bedroom): 2.1 people per unit
- Average Daily Residential Water Demand: 350 L/person/day (City Water Table 4.2)
- Maximum Day Demand Peaking Factor = 2.5 x Avg. Day Demand (City Water Table 4.2)
- Peak Hour Demand Peaking Factor = 2.2 x Max. Day Demand (City Water Table 4.2)

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

Table 2: Theoretical Water Demand for the Proposed Development

Residential Use	Unit Count	Design Population	Average Day Demand (L/s)*	Max. Day Demand (L/s)*	Peak Hour Demand (L/s)*
Studio / 1-Bedroom	112	157	0.64	1.59	3.50
2-Bedroom	11	23	0.09	0.23	0.51
Total	**123**	**180**	**0.73**	**1.82**	**4.01**

*Represents rounded values

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

- Normal operating pressures are to range between 345 kPa (50 psi) and 483 kPa (70 psi) under Max Day demands
- Minimum system pressures are to be 276 kPa (40 psi) under Peak Hour demands
- Minimum system pressures are to be 140 kPa (20 psi) under Max Day + Fire Flow demands

Preliminary domestic water demands, and fire flow requirements were provided to the City of Ottawa. These values were used to generate the municipal watermain network boundary conditions. **Table 2.1** below summarizes the watermain boundary conditions and the results of the hydraulic analysis related to the domestic demands. It is anticipated that a booster pump will be required to increase pressure to the upper floors of the building.

Table 2.1 : Hydraulic Boundary Condition Provided by the City

Municipal Watermain Boundary Condition	Boundary Condition	Domestic Demand (L/s)	Normal Operating Pressure Range (psi)	Design Pressure (psi)*
Minimum HGL (Peak Hour Demand)	106.6 m	4.0	40 psi (min.)	51.8
Maximum HGL (Max Day Demand)	115.2 m	1.8	50-70 psi	64.0
Max Day + Fire Flow HGL	88.4 m	300 + 1.8	20 psi (min.)	25.9

*Based on a street elevation of 70.17m at the service connection location.

As indicated above, the existing municipal watermain should provide adequate system pressures, within the normal operating pressure ranges specified by the City of Ottawa.

2.2.1 Water Supply for Firefighting

The proposed building will be fully sprinklered and supplied with a fire department (siamese) connection. The siamese connection will be located on the north side of the building, within 45m of the existing municipal fire hydrant directly across the street, on the north side of Argyle Avenue.

The Fire Underwriters Survey (FUS) was used to estimate fire flow requirements for the proposed building. Based on information provided by the architect, a 12-storey, sprinklered building, constructed using non-combustible materials was used in the calculations.

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

Table 2.2: Fire Flow Requirements for the Proposed Development

Type of Uses	Fire Flow Demand USGPM (L/s)
Proposed Residential Building	4,756 USGPM (300 L/s)

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

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) contractor 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.

As discussed with the City of Ottawa during the design process, a multi-hydrant approach to firefighting is anticipated. There are 5 Class AA (blue bonnet) hydrants within 75m-150m of the on-site building, including:

- a Class AA (blue bonnet) municipal hydrant located on Argyle Avenue across the street from the NW corner of the site (<75m of the subject site).

- a Class AA (blue bonnet) municipal hydrant one east of the site, on the north side of Argyle Avenue (<75m of the subject site).
- a Class AA (blue bonnet) municipal hydrant on the NW corner of Metcalfe Street and Argyle Avenue (<150m of the subject site).
- a Class AA (blue bonnet) on the east side of Metcalfe Street (<150m of the subject site).
- a Class AA (blue bonnet) hydrant on the west side of Elgin Street in front of the Ottawa Police Services building (<150m of the subject site).

Based on the City of Ottawa Technical Bulletin ISTB-2018-02, Class AA (blue bonnet) hydrants within 75m of the building should provide a minimum capacity 95 L/s each (at a pressure of 20 PSI) while hydrants between 75m and 150m should provide at least 63 L/s (at a pressure of 20 PSI). The combined maximum flow from these hydrants will exceed the Max Day + Fire Flow requirement (300 L/s) of the proposed development. This multi-hydrant approach to firefighting is in accordance with the City of Ottawa Technical Bulletin ISTB-2018-02.

Refer to **Appendix D** for a sketch showing the existing fire hydrant locations, City ID numbers and the dimensions confirming the appropriate site coverage for fire-fighting purposes.

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

2.3 Storm Drainage and Stormwater Management

The proposed storm outlet for the site to be developed is the existing 525mm dia. concrete combined sewer in Argyle Avenue, which in turn flows into the 1500mm dia. Arlington-Isabella-Cartier trunk sewer. Since the post-development flows are being directed to a combined sewer, the total site allowable flow will be a combination of the peak sanitary flows, anticipated groundwater flows and the total stormwater flow components.

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

2.3.1 Stormwater Management Criteria and Objectives

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

- Control the post-development flows from the site to the allocated release rate (i.e.: allowable 2-year release rate specified by the City of Ottawa minus the peak sanitary and ground water flow components). Control post-development flows from the site being developed, for all storms up to and including the 100-year design event.
- Minimize the impact on the existing municipal combined sewer system by reducing the post-development storm flows from the site when compared to current conditions.
- Provide guidelines to ensure that site preparation and construction is in accordance with the current Best Management Practices for Erosion and Sediment Control.

2.3.2 Pre-Development Conditions and Allowable Release Rate

The uncontrolled pre-development flows from the 0.156 ha site to be developed were calculated using the Rational Method to be 39.5 L/s during the 5-year design event and 75.2 L/s during the 100-year design event. Refer to **Appendix E** for detailed calculations. There are currently no water quantity or water quality control measures being provided on site.

As specified by the City of Ottawa, the allowable release rate from the site (including the sanitary and groundwater flow components) was calculated using the Rational Method, to be approximately 13.3 L/s, based on a 10-minute time of concentration, the rainfall intensity using a 2-year return period (City of Ottawa IDF Curves) and a runoff coefficient of 0.40.

T_c = 10 min C =0.40
I_{2yr} = 76.81 mm/hr A = 0.156 ha

Q_{allow} = 2.78 CIA
= 2.78 x 0.40 x 76.81 x 0.156
= 13.3 L/s

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

- The peak sanitary flow from **Table 1** above was calculated to be 2.2 L/s.
- The anticipated groundwater corresponds to a maximum flow rate of approximately 0.2 L/s (based on the geotechnical estimate of less than 15,000 L/day/).
- The remaining site flow allocated for stormwater management is therefore 10.9 L/s (13.3 L/s – 2.2 L/s peak sanitary flow - 0.2 L/s groundwater flow).

2.3.3 Post-Development Conditions

The proposed site will be serviced by connecting to the existing 525mm dia. combined sewer in Argyle Avenue. Stormwater runoff from the new building roof, lower roof terraces, main entrance and ground level loading areas will be directing to an internal stormwater storage tank and controlled prior to being discharged into the municipal combined sewer. Runoff from a portion of the front yard will sheet drain uncontrolled towards existing catchbasins within the municipal right-of-way. Refer to plan 118116-SWM for the relevant drainage area I.D.s and runoff coefficients.

2.3.3.1 Areas A-1: Uncontrolled Direct Runoff

The runoff from this sub-catchment area will flow overland towards the roadway catch basins in Argyle Avenue. The uncontrolled post-development flows from sub-catchment area A-1 were calculated using the Rational Method to be approximately 3.2 L/s during the 5-year design event and 6.1 L/s during the 100-year design event. Refer to **Appendix E** for detailed calculations.

2.3.3.2 Area A-2: Controlled Building Flows

Stormwater runoff from this sub-catchment area will be captured by the deck drains as well as the building roof / terrace drains and 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 existing combined sewer in Argyle Avenue. A pump (designed by the mechanical consultant) is required to control flow from the tank to a maximum rate of 4.4 L/s

(69.7 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 3 summarizes the post-development stormwater design flows and storage volumes for the 2-year, the 5-year, and the 100-year design events.

Table 3: 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	4.4 L/s	17.7 m^3	> 82 m^3
1:5 Year		27.2 m^3	
1:100 Year		64.3 m^3	
1:100 Year + 20% IDF increase		81.6 m^3	

Stormwater storage requirements in excess of the 100-year+20% design event will overflow to the surface via the lids of the proposed deck drains in the east access drive aisle towards Argyle Avenue. The emergency overland flow route is shown on plan 118116-GR.

As indicated in the table above, the internal stormwater storage tank will provide adequate storage for all storms up to and including the 100-year+20% design event. Refer to **Appendix E** for detailed calculations.

2.3.3.3 Stormwater Flow Summary

Table 3.1 provides a summary of the total post-development flows from the site to be developed and compares them to the uncontrolled pre-development flows and allocated flow for the stormwater component.

Table 3.1: Stormwater Flows Comparison Table

Design Event	Pre-Development Conditions		Post-Development Conditions		
	Uncontrolled Flow (L/s)	Allocated Release Rate (L/s)	A-1 Flow (L/s)	A-2 Flow (L/s)	Total Stormwater Flow (L/s)
5-Yr	39.5	10.9	3.2	4.4	7.6
100-Yr	75.2		6.1	4.4	10.5

A 250mm dia. storm service at a minimum slope of 1.0% has a full flow conveyance capacity of 62.0 L/s and will have enough capacity to convey the theoretical storm flows for the proposed development.

2.3.4 Summary of Total Flow to Municipal Combined Sewer

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

Table 3.2 provides a summary of the total post-development flows from the site to be developed and compares them to the uncontrolled pre-development flows and allowable release rate specified by the City of Ottawa.

Table 3.2: Site Flows Summary and Comparison Table

Design Event	Pre-Development Conditions		Post-Development Conditions				
	Uncontrolled Storm Flow (L/s)	Allowable Release Rate (L/s)	Sanitary Flow (L/s)	Ground Water Flow (L/s)	Storm Flow (L/s)	Total Flow (L/s)	Reduction in Flow (L/s or %)*
5-Yr	39.5	13.3	2.2	0.2	7.6	10.0	29.5 or 75%
100-Yr	75.2				10.5	12.9	62.3 or 83%

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

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

2.3.5 Stormwater Quality Control

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

3.0 SITE GRADING

The existing site is relatively flat, with elevations varying from approximately 70.40m at the northwest property corner down to approximately 70.20m at both the southwestern and southeastern property corners and approximately 70.17m at the north eastern corner of the property. The existing site generally slopes in the north-eastern direction, from the existing building face towards the existing right-of-way. The remainder of the existing site is a paved parking area and generally drains towards the south-west corner of the site. The finished floor elevation (FFE) of the proposed residential building will be set at an elevation of 70.50m to tie into the existing adjacent site elevations and the municipal sidewalk along the south side of Argyle Avenue. The grades around the perimeter of the site will be maintained. Refer to the enclosed Grading and Erosion & Sediment Control Plan (118116-GR) for details.

4.0 GEOTECHNICAL INVESTIGATIONS

A Geotechnical Investigation Report has been prepared by Paterson Group Inc. for the proposed project. Refer to the Geotechnical Report[2] for subsurface conditions, construction recommendations and geotechnical inspection requirements.

5.0 EROSION AND SEDIMENT CONTROL

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

- Filter bags and/or Filter socks will be placed under the grates or at the curb inlet openings of nearby catchbasin structures and will remain in place until vegetation has been established and construction is completed.
- Silt fencing will be placed per OPSS 577 and OPSD 219.110 along the surrounding construction limits.
- Mud mats will be installed at the site construction entrances.
- 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 Site Plan Control application for the proposed residential development located at 100 Argyle Avenue.

The conclusions are as follows:

- The proposed 12-storey residential building will be serviced by extending new laterals to the municipal combined sewer while redundant water services will be extended from the existing municipal watermain in Argyle Avenue.
- The building will be sprinklered and supplied with a fire department siamese connection. The siamese connection will be located within 45m of the existing municipal fire hydrant immediately across the street on the north side of Argyle Avenue.
- The site flows from sub-catchment area A-1 will be uncontrolled to the adjacent municipal right-of-way. The flows from sub-catchment area A-2 will be directed to an internal SWM tank and controlled prior to being discharged into the municipal combined sewer system in Argyle Avenue.
- The total post-development flow from the site will be approximately 10.0 L/s during the 5-year design event and 12.9 L/s during the 100-year event. The combined flows are less than the allowable combined release rate of 13.3 L/s. Furthermore, post-development flows will be significantly reduced when compared to current conditions.

- Regular inspection and maintenance of the building service, test port, deck drains, internal SWM storage system, pumps and back-up power supply 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:

Desmond Mills, E.I.T.
B. Eng.

Reviewed by:

François Thauvette, P. Eng.
Senior Project Manager

APPENDIX A

Correspondence

Francois Thauvette

From: Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Sent: Tuesday, August 28, 2018 8:51 AM
To: Francois Thauvette
Cc: Lydia Bolam; Wessel, Shawn; Mottalib, Abdul
Subject: RE: 100 Argyle Ave - Boundary Conditions Request

Hi Francois,

Please see revised SWM criteria below:

Stormwater Management criteria connecting into the combined sewer system (Quantity control criteria)

- Total (storm +sanitary) allowable release rate will be 2 year pre-development rate.
- C Coefficient of runoff will need to be determined **as per existing conditions** but in no case more than 0.4
- TC =20 minutes or can be calculated ,
- TC should not be less than 10 minute, since the IDF curves become unrealistic less than 10min.
- Any storm events greater than 2 year, up to 100 year, and including 100-year storm event must be detained on site.

--

Thanks,

Abdul Mottalib, P. Eng.

From: Wessel, Shawn
Sent: August 27, 2018 3:16 PM
To: 'Francois Thauvette' <f.thauvette@novatech-eng.com>; Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Cc: Lydia Bolam <l.bolam@novatech-eng.com>
Subject: RE: 100 Argyle Ave - Boundary Conditions Request

Good afternoon Mr. Thauvette.

For this site please use the following:

Tc= 10 min.
C = 0.5 (Combined Sewer)

Please note that I am awaiting the requested boundary conditions from the Water Resources Dept. and will provide this information once obtained.

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

Thank you

Regards,

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

Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale
Planning, Infrastructure and Economic Development Department | Direction générale de la planification de l'infrastructure et du développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Ave. W. | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1
(613) 580 2424 Ext. | Poste 33017
shawn.wessel@ottawa.ca

From: Francois Thauvette <f.thauvette@novatech-eng.com>
Sent: Monday, August 27, 2018 10:23 AM
To: Wessel, Shawn <shawn.wessel@ottawa.ca>; Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Cc: Lydia Bolam <l.bolam@novatech-eng.com>
Subject: RE: 100 Argyle Ave - Boundary Conditions Request

Hi Shawn and Abdul,

In addition to the information requested in the e-mail below, can you please provide us with the stormwater management (quantity control) criteria applicable to the proposed residential development on this site?

We will contact the RVCA directly to confirm if any on-site stormwater quality controls are required. We anticipate that nothing will be required as this will be a residential development, with UG parking and more importantly, all flows will be directed to a combined sewer system.

Regards,

François Thauvette, P. Eng., Senior Project Manager | Land Development & Public Sector Engineering
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 219 | Cell: 613.276.0310 | Fax: 613.254.5867

From: Lydia Bolam
Sent: Thursday, August 23, 2018 3:47 PM
To: Wessel, Shawn <shawn.wessel@ottawa.ca>
Cc: Abdul.Mottalib@ottawa.ca; Francois Thauvette <f.thauvette@novatech-eng.com>
Subject: 100 Argyle Ave - Boundary Conditions Request

Hi Shawn,

We are working on a proposed multi-storey residential development located at 100 Argyle Avenue. We would like to request the watermain boundary conditions for the site based on the following preliminary demands.

- Average Day Demand = 1.10 L/s
- Peak Hour Demand = 6.05 L/s
- Max Daily + Fire Flow = 169.75 L/s (FUS fire flow allowance of 167 L/s)

Attached is a geoOttawa map showing the approximate proposed water service connection in purple.

Please let me know if you require any further information.

Kind regards,

Lydia Bolam, B.Eng., EIT
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext:276 | Fax: 613.254.5867

MINUTES
Pre-Application Consultation Meeting – 100 Argyle Avenue
Date: January 31, 2018
Location: Ottawa City Hall

Present:

Simon Deiaco (SD) – City of Ottawa
Christopher Moise (CM) – City of Ottawa
Richard Buchanan (RB) – City of Ottawa
Sally Coutts (SC) – City of Ottawa
Stephen Martin (SM) – Bridgeport Colonnade
Kelly Rhodenizer (KR) – Bridgeport Colonnade
Alice Nakanishi – Centretown Citizens Community Association
Paul Black (PB) – Planner, FoTenn Consultants
Jon Stewart (JS)
Kevin Reid (KR) – RLA Architecture

1.0 Introductions

1.1	Parties and roles of those attending were introduced.	Info

2.0 Confirmation NDA has been signed

2.1	Confirmed	Info

3.0 Overview of Proposal

3.1	• (KR) – site context review. KR took the group through his presentation materials. • Project proposed to retain a portion of the existing façade and relocate it closer to the street frontage. The project would be 20 storey tower sitting upon a base/podium. The project would be built as a rental tenure. 2-3 levels of underground parking are proposed. Loading would take place on-site in the rear of the lot. Access to the garage is from Argyle Street. • The site was used as a study site as part of Carleton University classes, there is an abundance of information on the area (demographics, household size etc.) • The site is in close proximity to transit. • Precedent images/ideas – Central Park, greenspace with the surrounding wall condition.	Info

	• Local context, glass addition to the museum (Padolsky). • Museum is the anchor point to the area, identifiable landmark • KR - 150 Argyle, Windsor Arms, good example of materiality and scale. • Question CM – asked about height. • KR - 4-5 storeys. • JS – historical façade of the building, based on as-found drawings. Asked to look at if the building was to remain, what efforts would be needed, as well what would happen if the façade had to be moved. Identified a plan to retain in place or dismantle, and restore. Have also identified damaged components and repairs needed. • Q – CM does the stone stop? • JS – stops and transfers into brick. • KR – this information is interesting, considering taking apart and installing/informing on a newer project. Could create a better more consolidated street wall which could reinforce the street wall. The building would have more presence on the street. Has past project experience on dismantling and relocating a building. Similar project on Bank – Central • SD – The heritage façade was braced and buried on the site, then reinstated. • KR – review of sketches – behind the heritage façade could be a grand space. Would incorporate amenity space at the second level, responding to the grade change of the museum. • Ground floor plan, loading in the rear of the site, garage door leading to underground parking. • Comment CM – The design of the looping lane looks tight, may be difficult to have large trucks make the turn. • KR – acknowledged, needs further analysis, trying to maintain space for landscaping • KR – Tower, mix of studio, 1 and 2bdrm, other variations possible to create 3 bdrm	

4.0 Preliminary Comments from City

4.1	**Planning: Simon Deiaco** SD – Schedule H – Land Use, Commercial District (note high profile at Argyle and Elgin) Schedule H1, Heritage Conservation District, Mixed Use Area – Residential Schedule H2, Mid Rise – 9, 25 storeys on the south side Schedule H3, Priority streetscape – zone 1, museum	Info

	Annex 1, Central Character Area (abuts south) Zoning: Heritage Overlay – GM5[68] F(2.0) H(18.5) – Design Priority Area, category 2 heritage building. Requires, OPA/ZBA/SP/OHA and possible consultation with the UDRP. The current policy direction for the south side of Argyle Street is nine stories (18.5m in height) and 20 storeys is a very concerning departure and increase. A planning rationale would have to be developed to argue that a significant change in policy is good land use planning to such a recently approved Secondary Plan. Staff are greatly concerned with the impacts an approval at this location would have on the surrounding policy area (mid-rise designation). The proposal would have impacts on the entire policy direction of the Secondary Plan, which must be addressed in the rationale. SD – It was noted in the presentation that the east elevation does not meet tower separation guidelines. This would need to be rationalized in the application. Can the project be designed to meet the tower separation guidelines? SD – The application may be subject to a Section 37 contribution. The application should determine if the trigger for a Section 37 contribution is triggered (25% increase in density). PB – Recognizes that OPA/ZBA/SP applications are needed to implement the proposal.	
4.2	**Urban Design: Christopher Moise** • For staff to properly assess the requested shift away from the existing planned function and policy direction of the Secondary Plan staff need see an analysis of the project as it applies to the larger area (What is the impact to the nine storey sites abutting the site if approved). • A session with the UDRP may be required.	Info
4.3	**Engineering: Sean Wessel** • The teams engineering consultant will need to contact Sean for background information.	Info
4.4	**Heritage: Sally Coutts** • SC – part V designation, needs to address the Centretown HCD plan and guidelines as part of the review and design rationale. Requries an application under the OHA. Parks Canada guidelines	Info

	speak to retaining in site where possible. If the concept is only preserving a portion of the existing building the team should be sensitive to what goes "on top". • SC – Height and heritage are integrated, and height sensitivity applies to either a 9 or 20 storey building. • KR – The notch is to be preserved, is to be a highlight of the new project. • SC - Argyle is a mixed context street, across from a national monument, bits of green, house form commercial uses. Maybe there is room for a mix of green. The Heritage Overlay regulates the placement of the building.	
4.5	**Transportation: Wally Dubyk** • N/A, not in attendance. The teams transportation engineering consultant will need to contact Wally to discuss the contents of the Transportation Study.	Info

5.0 Preliminary Comments from Community Association Representative

5.1	AN - Community may have concerns on height. Parking? Would the project provide what is required, or is there a reduction request? AN – CCCA is always looking for greenspace integrated into projects Question AN – Will these be rental units? KR – A yes, mixed of unit sizes to attract a range or residents Queston AN – What about the affordability of these units? KR – A mix of prices.	Info

6.0 Next Steps

6.1	• Staff to prepare a summary of the meeting and a list of the submission requirements.	SD

APPLICANT'S STUDY AND PLAN IDENTIFICATION LIST

Legend:

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

For information on preparing required studies and plans refer to: www.ottawa.ca/residents/planning/dev_review_procdss/guide/index_en.html.

S/A	Number of copies	ENGINEERING		S/A	Number of copies
S	5	1. Site Servicing Plan	2. Site Servicing Study	S	3
S	5	3. Grade Control and Drainage Plan	4. Geotechnical Study	S	3
		5. Composite Utility Plan	6. Groundwater Impact Study		
		7. Servicing Options Report	8. Wellhead Protection Study		
S	8	9. Transportation Impact Study	10. Erosion and Sediment Control Plan (combine with Grading Plan)	S	5
S	3	11. Storm water Management Report / Brief	12. Hydro geological and Terrain Analysis		
		13. Hydraulic Water main Analysis	14. Noise Study	S	3
		15. Roadway Modification Design Plan	16. MOE Certificate of Approval	S	

S/A	Number of copies	PLANNING / DESIGN / SURVEY		S/A	Number of copies
		17. Draft Plan of Subdivision	18. Plan Showing Layout of Parking Garage	S	3
		19. Draft Plan of Condominium	20. Planning Rationale (ZBA)	S	3
S	5	21. Site Plan	22. Minimum Distance Separation (MDS)		
		23. Concept Plan Showing Proposed Land Uses and Landscaping	24. Agrology and Soil Capability Study		
		25. Concept Plan Showing Ultimate Use of Land	26. Cultural Heritage Impact Statement	S	3
S	5	27. Landscape Plan	28. Archaeological Resource Assessment		
S	2	29. Survey Plan (copy of easement document)	30. Sun Shadow Study	S	2
S	3	31. Architectural Building Elevation Drawings (dimensioned)	32. Urban Design Review Package (TBD)	S	Available online

S/A	Number of copies	ENVIRONMENTAL		S/A	Number of copies
S	3	33. Phase 1 Environmental Site Assessment	34. Impact Assessment of Adjacent Waste Disposal/Former Landfill Site		
S	3	35. Phase 2 Environmental Site Assessment (depends on the outcome of Phase 1)	36. Assessment of Landform Features		
A		37. Record of Site Condition	38. Mineral Resource Impact Assessment		
S	5	39. Tree Conservation Report (combine with landscape plan)	40. Environmental Impact Statement / Impact Assessment of Endangered Species		
		41. Mine Hazard Study / Abandoned Pit or Quarry Study			

Meeting Date: January 31, 2018

Application Type: Site Plan / OPA / Rezoning / Heritage

File Lead: S. Deiaco

Engineer/Project Manager: TBD

Site Address: 100 Argyle

*Preliminary Assessment: 1☐ 2☐ 3☐ 4☐ 5☐

*One (1) indicates that considerable 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, City Planning 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 City.

Francois Thauvette

From: Eric Lalande <eric.lalande@rvca.ca>
Sent: Wednesday, August 11, 2021 2:08 PM
To: Francois Thauvette
Subject: RE: 100 Argyle - Re-development - RVCA Pre-Consultation

Hi Francois,

That is correct, the RVCA will rely on the downstream municipal infrastructure to handle water quality protection where it is a combined sewer.

Thank you,

Eric Lalande, MCIP, RPP
Planner, RVCA
613-692-3571 x1137

From: Francois Thauvette <f.thauvette@novatech-eng.com>
Sent: Wednesday, August 11, 2021 1:49 PM
To: Eric Lalande <eric.lalande@rvca.ca>
Cc: Steve Matthews <S.Matthews@novatech-eng.com>
Subject: 100 Argyle - Re-development - RVCA Pre-Consultation

Hi Eric,

We are working on a 12-storey residential development with underground parking located at 100 Argyle Avenue. Although the proposed re-development will include on-site stormwater quantity control measures, we assume there will be no requirement for stormwater quality control as the immediate receiver is the existing combined sewer in Argyle Avenue. This has been our experience on other projects located within a combined sewer area, in the City of Ottawa.

Please review and confirm that our assumption is correct.

Regards,

François Thauvette, P. Eng., Senior Project Manager | Land Development & Public Sector Engineering
NOVATECH Engineers, Planners & Landscape Architects
Please note that I am working from home. Email or MS Teams are the best ways to contact me.
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 219 | Cell: 613.276.0310 | 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

Theoretical Sanitary Flow Calculations

NOVATECH
Engineers, Planners & Landscape Architects

100 Argyle Avenue - Proposed Residential Development
SANITARY SEWAGE ANALYSIS

Residential	Post-Development	Units
Number of 1-Bedroom/Studio Units	112	
Number of Persons per 1-Bdrm Apartment	1.4	
Number of 2-Bedroom Units	11	
Number of Persons per 2-Bdrm Apartment	2.1	
Design Population	180	
Average Daily Flow per resident	280	L/c/day
Peak Factor (Harmon Formula)	3.74	
Peak Residential Flow	**2.18**	**L/s**
Extraneous Flow		
Site Area to be Developed	0.156	ha
Infiltration Allowance	0.33	L/s/ha
Peak Extraneous Flows	0.05	L/s
Total Peak Sanitary Flow	**2.23**	**L/s**

APPENDIX D

Water Demands, FUS Calculations, Boundary Conditions

100 Argyle Avenue - Proposed Residential Development
WATER ANALYSIS

DOMESTIC WATER DEMAND

Residential	Post-Development	Units
Number of 1-Bedroom/Studio Units	112	
Number of Persons per 1-Bdrm Apartment	1.4	
Number of 2-Bedroom Units	11	
Number of Persons per 2-Bdrm Apartment	2.1	
Design Population	180	
Average Daily Flow per resident	350	L/c/day
Average Day Demand	**0.73**	**L/s**
Maximum Day Demand (2.5 x avg. day)	**1.82**	**L/s**
Peak Hour Demand (2.2 x max. day)	**4.01**	**L/s**
TOTALS		
Average Day Demand	**0.73**	**L/s**
Maximum Day Demand	**1.82**	**L/s**
Peak Hour Demand	**4.01**	**L/s**

BOUNDAY CONDITIONS (Values provided by the City of Ottawa)

Maximum HGL = 115.2 m
Minimum HGL = 106.6 m
Max Day + Fire Flow (300 L/s) = 88.4 m

PRESSURE TESTS

To convert Head(m) to PSI: multiply by 1.42

Approx. Street Elevation (at service connection) 70.17 m

High Pressure Test = (Max HGL - Avg.Ground Elev.) x 1.42197 PSI/m > 50 PSI and < 70 PSI

High Pressure = **64.0 psi**

Low Pressure Test = (Min. HGL - Avg. Ground Elev.) x 1.42197 PSI/m > 40 PSI

Low Pressure = **51.8 psi**

Max Day + Fire Flow Test = (Max Day + Fire Flow - Avg. Ground Elev.) x 1.42197 PSI/m > 20 PSI

MD + FF Pressure= **25.9 psi**

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 118116
Project Name: 100 Argyle Avenue
Date: 7/21/2021
Input By: D.Mills
Reviewed By: F.Thauvette

Legend: Input by User; No Information or Input Required

Building Description: Proposed 12-storey residential 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)	829.7			
		Number of Floors/Storeys	12			
		Area of structure considered (m^2)			**9,956**	
	F	**Base fire flow without reductions**				**18,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**			**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**15,300**
		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%	**-6,120**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System		-10%		
				Cumulative Total	**-40%**	
5	**Exposure Surcharge (cumulative %)**				**Surcharge**	
	(3)	North Side	30.1- 45 m		5%	**8,415**
		East Side	10.1 - 20 m		15%	
		South Side	10.1 - 20 m		15%	
		West Side	3.1 - 10 m		20%	
				Cumulative Total	**55%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**18,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**300**
				or	USGPM	4,756
7	**Storage Volume**	Required Duration of Fire Flow (hours)			Hours	4
		Required Volume of Fire Flow (m^3)			m^3	4320

Francois Thauvette

From: Mark Sarasin <marks@gwal.com>
Sent: Monday, December 13, 2021 10:59 AM
To: Shane Kozminuk
Cc: Stephen Martin; Francois Thauvette; Scott Alain
Subject: Re:[EXTERNAL]100 Argyle - Water Capacity

Water main for this site should be 150mm diameter. Are they looking for storm and sanitary too?

Mark Sarasin P.Eng. Senior Associate, Mechanical Engineer

Goodkey Weedmark and Associates

1688 Woodward Drive,

Ottawa Ontario, K2C 3R8

Office: 613-727-5111, ext. 308
Mobile: 613-816-0844
Email: m.sarasin@gwal.com

-------- Original message --------
From: Shane Kozminuk <skozminuk@colonnadebridgeport.ca>
Date: Mon., Dec. 13, 2021, 10:35 a.m.
To: Mark Sarasin <marks@gwal.com>
Cc: Stephen Martin <smartin@colonnadebridgeport.ca>, "François Thauvette (f.thauvette@novatech-eng.com)" <f.thauvette@novatech-eng.com>, Scott Alain <alain@fotenn.com>
Subject: [EXTERNAL]100 Argyle - Water Capacity
Hey Mark.

As part of the 100 Argyle SPA approval, the City's Engineering department is looking for confirmation on the watermain capacity for the building and the civil team at Novatech need a little input from you. Are you able to please provide the loads for the new building so they can confirm the water service is adequate? If you need any further info from us, please let us know.

1.11. Provide location, size, slope, etc. of proposed storm service connecting from storage tank to storm service as well as mechanical deck drains.

1.12. USF is required to determine if sewer services are to be sleeved (through foundation wall or less than 300mm below USF).

1.13. Provide a sanitary sewer design sheet as per MOE Sewer Design guidelines Appendix C.

1.14. Demonstrate through calculations or correspondence from Mechanical Engineer that proposed water service is adequately sized.

1.15. All connections to trunk sewers will be reviewed by the City's Asset Management Branch. Comments (if applicable) will be forwarded when received.

el free to contact Mohammed Fawzi, Infrastructure Project Manager, for follow-up questions.

Thanks for your time.

Shane Kozminuk
Senior Development Manager | Colonnade BridgePort
16 Concourse Gate, Suite 200 | Ottawa | Ontario | K2E 7S8
P. 343.633.5134 | M. 613.315.0911 | skozminuk@colonnadebridgeport.ca

Francois Thauvette

From: Jhamb, Nishant <nishant.jhamb@ottawa.ca>
Sent: Friday, July 30, 2021 1:11 PM
To: Francois Thauvette
Subject: 118116 (100 Argyle) - Watermain Boundary Conditions Request

Hi Francois

Although the fire demand can be met, the fire demand is high – Please consider ways to reduce the fire demand.

The following are boundary conditions, HGL, for hydraulic analysis at 100 Argyle Avenue (zone 1W) assumed to be a dual connection to the 203 mm watermain on Argyle Avenue (see attached PDF for location).

Minimum HGL: 106.6 m

Maximum HGL: 115.2 m

Max Day + FF (300 L/s): 88.4 m

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

Disclaimer: The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation.

Regards
Nishant Jhamb, P.Eng
Project Manager |Gestionnaire de projet
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 23112, nishant.jhamb@ottawa.ca
Please note: Given the current pandemic, I will be working from home until further notice; reaching me by email is easiest. I will be checking my voicemail, just not as frequently as I normally would be.

From: Francois Thauvette <f.thauvette@novatech-eng.com>
Sent: July 22, 2021 1:44 PM
To: Fawzi, Mohammed <mohammed.fawzi@ottawa.ca>

Cc: Desmond Mills <d.mills@novatech-eng.com>
Subject: FW: 118116 (100 Argyle) - Watermain Boundary Conditions Request

Hi Mohammed,

We are sending this e-mail to request watermain boundary conditions for the proposed re-development of the 100 Argyle Avenue property. Please see e-mail below and attachments for details.

Regards,

François Thauvette, P. Eng., Senior Project Manager | Land Development & Public Sector Engineering
NOVATECH Engineers, Planners & Landscape Architects
Please note that I am working from home. Email or MS Teams are the best ways to contact me.
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 219 | Cell: 613.276.0310 | Fax: 613.254.5867

From: Desmond Mills <d.mills@novatech-eng.com>
Sent: Thursday, July 22, 2021 1:31 PM
To: Francois Thauvette <f.thauvette@novatech-eng.com>
Subject: 118116 (100 Argyle) - Watermain Boundary Conditions Request

Hi François,

The proposed re-development of the 100 Argyle site will include a new 12-story residential structure.

We are requesting watermain boundary conditions for the 200mm dia. PVC watermain in Argyle Avenue (as shown on geoOttawa). Due to the average demand being greater than 0.5L/s we anticipate requiring two (2) redundant water service connections and a new valve on the existing 200mm watermain, between both feeds. The anticipated water demands for the proposed development are as follows:

- Average Day Demand = 0.8 L/s
- Maximum Day Demand = 1.9 L/s
- Peak Hour Demand = 4.3 L/s
- Maximum Fire Flow Demand = 300 L/s (based on FUS calculations)

See attached calculation sheets for details.

A multi-hydrant approach to firefighting is anticipated to be required. As indicated on the geoOttawa website, there are several blue bonnet municipal hydrants within 75m-150m of the subject site that could be used for firefighting purposes. See attached Boundary Conditions Request Sketch for details.

Regards,

Desmond Mills, B.Eng., EIT
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 | Fax: 613.254.5867

From: Desmond Mills
Sent: Wednesday, July 21, 2021 1:33 PM
To: Francois Thauvette <f.thauvette@novatech-eng.com>
Subject: 118116-100 Argyle

Hi François,

The proposed re-development of the 100 Argyle site will include a new 12 story residential structure. I have attached two separate FUS to be discussed.

Please request watermain boundary conditions for the 200mm dia. PVC watermain in Coventry Road (as shown on geoOttawa). We anticipate two (2) redundant water service connections and a new valve on the existing 200mm watermain, between both feeds. The anticipated water demands for the proposed development are as follows:

- Average Day Demand = 4.3 L/s
- Maximum Day Demand = 1.9 L/s
- Peak Hour Demand = 0.8 L/s
- Maximum Fire Flow Demand Range = 217-300 L/s

See attached calculation sheets for details.

A multi-hydrant approach to firefighting is anticipated to be required. As indicated on the geoOttawa website, there are several blue bonnet municipal hydrants within 75m-150m of the subject site that could be used for firefighting purposes. See attached Boundary Conditions Request Sketch for details.

Please review and let us know if you require any additional information. We can provide an approximate breakdown of water demands for the individual buildings if required.

Regards,
Steve

Desmond Mills, B.Eng., EIT
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 | Fax: 613.254.5867

'

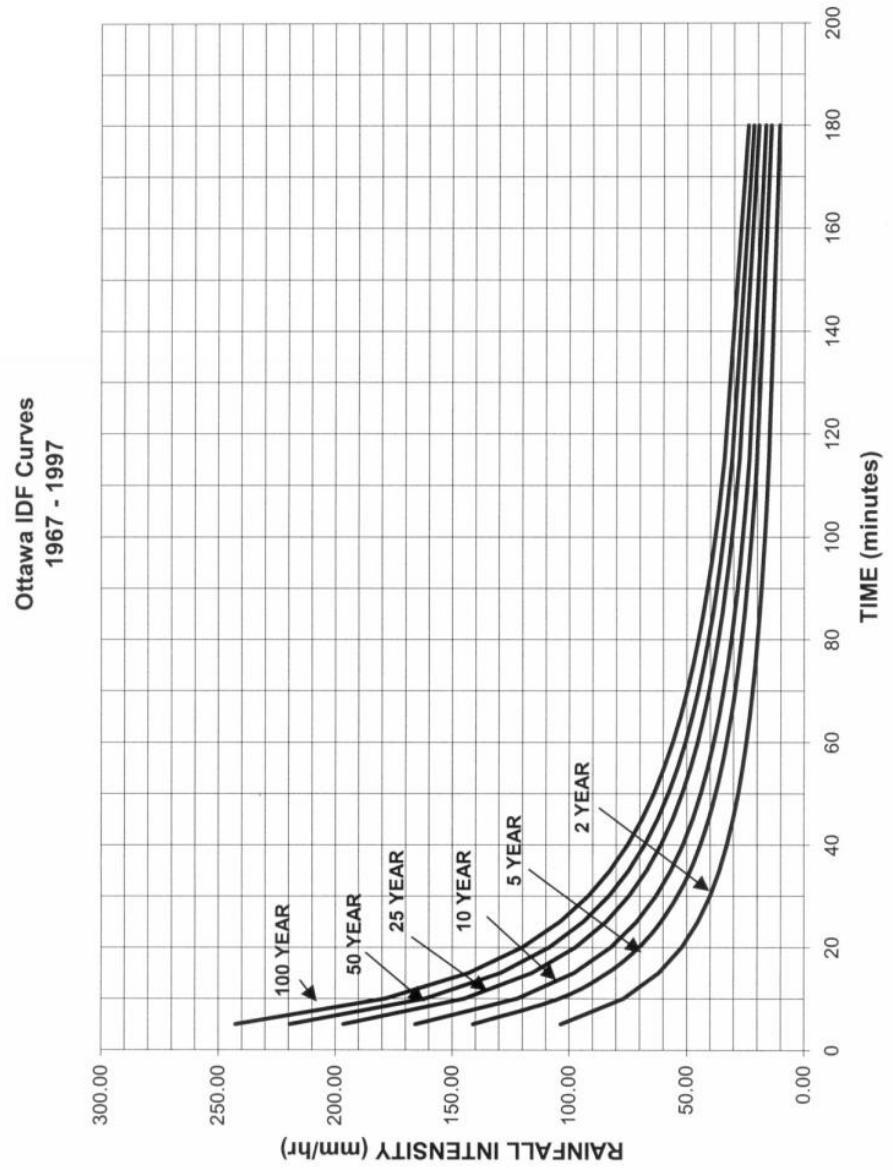
'


WATERMAIN BOUNDARY CONDITIONS SKETCH
Ex. Fire Hydrant: 368030H059
Ex. Fire Hydrant: 368030H060
Ex. Fire Hydrant: 368030H023
Ex. Fire Hydrant: 368030H372
Ex. Fire Hydrant: 368030H279
Connect to Existing 200 WM
(2x) Redundant Watermain Feeds and a New Valve Between Them.
SITE
Ex.203mm dia. DI Watermain
av. Argyle Ave.
203mmØ - DI
305mmØ - PVC
152mmØ - UCI
203mmØ - PVC
203mmØ - CI
rue Metcalfe St.
rue Catherine St.
rue Elgin St.
100
110
114
116
122
455
457
474
150

APPENDIX E

IDF Curves and SWM Calculations

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



Project #: 118116
Project Name: 100 Argyle Road
Location: Ottawa

NOVATECH
Engineers, Planners & Landscape Architects

Date Prepared: 12/20/2021

Proposed Residential Development
100 Argyle 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_w	Allowable Flow 2-year (L/s)
Site to be Re-developed	0.156	0.150	0.000	0.006	0.87	0.97	39.5	75.2	0.40	13.3

T_c = 10mins

Post - Development Site Flows												
Area	Description	Area (ha)	A_{imp} (ha) C=0.9	A_{perv} (ha) C=0.2	C_5	C_{100}	Uncontrolled Flow (L/s) 5 year	Uncontrolled Flow (L/s) 100 year	Controlled Flow (L/s) 5 year	Controlled Flow (L/s) 100 year	Storage Required (m^3) 5 year	Storage Required (m^3) 100 year
A-1	Uncontrolled Runoff to Argyle Ave.	0.013	0.012	0.001	0.85	0.94	3.2	6.1	-	-	-	-
A-2	Controlled Flow from SWM Tank	0.143	0.142	0.001	0.90	0.99	-	-	4.4	4.4	27.2	64.3
	Totals :	0.156	-	-	-	-	**3.2**	**6.1**	**4.4**	**4.4**	**27.2**	**64.3**
							Total Site Flows :		**7.6**	**10.5**		

T_c = 10mins T_c = 10mins

2.2 sanitary flows
0.2 ground water flows
12.9 **total to combined sewer**

Proposed Residential Development
Novatech Project No. 118116
REQUIRED STORAGE - 1:2 YEAR EVENT
Allowable Flow to Argyle Combined Sewer

OTTAWA IDF CURVE

Area =	0.156	ha	Qallow =	13.3	L/s
C =	0.40		Vol(max) =	0.0	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	103.57	17.97	4.64	1.39
10	76.81	13.32	0.00	0.00
15	61.77	10.71	-2.61	-2.35
20	52.03	9.03	-4.30	-5.16
25	45.17	7.84	-5.49	-8.23
30	40.04	6.95	-6.38	-11.48
35	36.06	6.26	-7.07	-14.84
40	32.86	5.70	-7.62	-18.29
45	30.24	5.25	-8.08	-21.81
50	28.04	4.86	-8.46	-25.38
55	26.17	4.54	-8.78	-28.99
60	24.56	4.26	-9.06	-32.63
65	23.15	4.02	-9.31	-36.30
70	21.91	3.80	-9.52	-39.99
75	20.81	3.61	-9.71	-43.71
80	19.83	3.44	-9.88	-47.44
85	18.94	3.29	-10.04	-51.19
90	18.14	3.15	-10.18	-54.95

Proposed Residential Development
Novatech Project No. 118116
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-1 Uncontrolled Runoff to Argyle Ave.

OTTAWA IDF CURVE

Area =	0.013	ha	Qallow =	3.2	L/s
C =	0.85		Vol(max) =	0.3	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	141.18	4.32	1.13	0.34
10	104.19	3.19	0.00	0.00
15	83.56	2.56	-0.63	-0.57
20	70.25	2.15	-1.04	-1.25
25	60.90	1.86	-1.32	-1.99
30	53.93	1.65	-1.54	-2.77
35	48.52	1.48	-1.70	-3.58
40	44.18	1.35	-1.84	-4.40
45	40.63	1.24	-1.94	-5.25
50	37.65	1.15	-2.03	-6.10
55	35.12	1.07	-2.11	-6.97
60	32.94	1.01	-2.18	-7.84
65	31.04	0.95	-2.24	-8.72
70	29.37	0.90	-2.29	-9.61
75	27.89	0.85	-2.33	-10.50
80	26.56	0.81	-2.37	-11.39
85	25.37	0.78	-2.41	-12.29
90	24.29	0.74	-2.44	-13.19

Proposed Residential Development
Novatech Project No. 118116
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-1 Uncontrolled Runoff to Argyle Ave.

OTTAWA IDF CURVE

Area =	0.013	ha	Qallow =	6.1	L/s
C =	0.94		Vol(max) =	0.3	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	242.70	8.27	2.18	0.66
10	178.56	6.08	0.00	0.00
15	142.89	4.87	-1.21	-1.09
20	119.95	4.08	-2.00	-2.40
25	103.85	3.54	-2.54	-3.82
30	91.87	3.13	-2.95	-5.31
35	82.58	2.81	-3.27	-6.86
40	75.15	2.56	-3.52	-8.45
45	69.05	2.35	-3.73	-10.07
50	63.95	2.18	-3.90	-11.71
55	59.62	2.03	-4.05	-13.37
60	55.89	1.90	-4.18	-15.04
65	52.65	1.79	-4.29	-16.72
70	49.79	1.70	-4.39	-18.42
75	47.26	1.61	-4.47	-20.12
80	44.99	1.53	-4.55	-21.83
85	42.95	1.46	-4.62	-23.55
90	41.11	1.40	-4.68	-25.28

Proposed Residential Development
Novatech Project No. 118116
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-2 Controlled Flow-Internal SWM Tank

OTTAWA IDF CURVE

Area = 0.143 ha Qallow = 4.4 L/s
C = 0.90 Vol(max) = 17.7 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	36.85	32.45	9.74
10	76.81	27.33	22.93	13.76
15	61.77	21.98	17.58	15.82
20	52.03	18.51	14.11	16.94
25	45.17	16.07	11.67	17.51
30	40.04	14.25	9.85	17.73
35	36.06	12.83	8.43	17.71
40	32.86	11.69	7.29	17.51
45	30.24	10.76	6.36	17.17
50	28.04	9.98	5.58	16.73
55	26.17	9.31	4.91	16.21
60	24.56	8.74	4.34	15.62
65	23.15	8.24	3.84	14.97
70	21.91	7.80	3.40	14.27
75	20.81	7.41	3.01	13.53
90	18.14	6.46	2.06	11.10
105	16.13	5.74	1.34	8.45
120	14.56	5.18	0.78	5.63
135	13.30	4.73	0.33	2.68
150	12.25	4.36	-0.04	-0.36

Proposed Residential Development
Novatech Project No. 118116
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R-2 Controlled Flow-Internal SWM Tank

OTTAWA IDF CURVE

Area = 0.143 ha Qallow = 4.4 L/s
C = 0.90 Vol(max) = 27.2 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	50.24	45.84	13.75
10	104.19	37.08	32.68	19.61
15	83.56	29.73	25.33	22.80
20	70.25	25.00	20.60	24.72
25	60.90	21.67	17.27	25.90
30	53.93	19.19	14.79	26.62
35	48.52	17.26	12.86	27.02
40	44.18	15.72	11.32	27.17
45	40.63	14.46	10.06	27.15
50	37.65	13.40	9.00	27.00
55	35.12	12.50	8.10	26.72
60	32.94	11.72	7.32	26.36
65	31.04	11.05	6.65	25.92
70	29.37	10.45	6.05	25.42
75	27.89	9.92	5.52	24.86
90	24.29	8.64	4.24	22.91
105	21.58	7.68	3.28	20.66
120	19.47	6.93	2.53	18.20
135	17.76	6.32	1.92	15.56
150	16.36	5.82	1.42	12.80

Proposed Residential Development
Novatech Project No. 118116
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-2 Controlled Flow-Internal SWM Tank

OTTAWA IDF CURVE

Area = 0.143 ha Qallow = 4.4 L/s
C = 0.99 Vol(max) = 64.3 m3

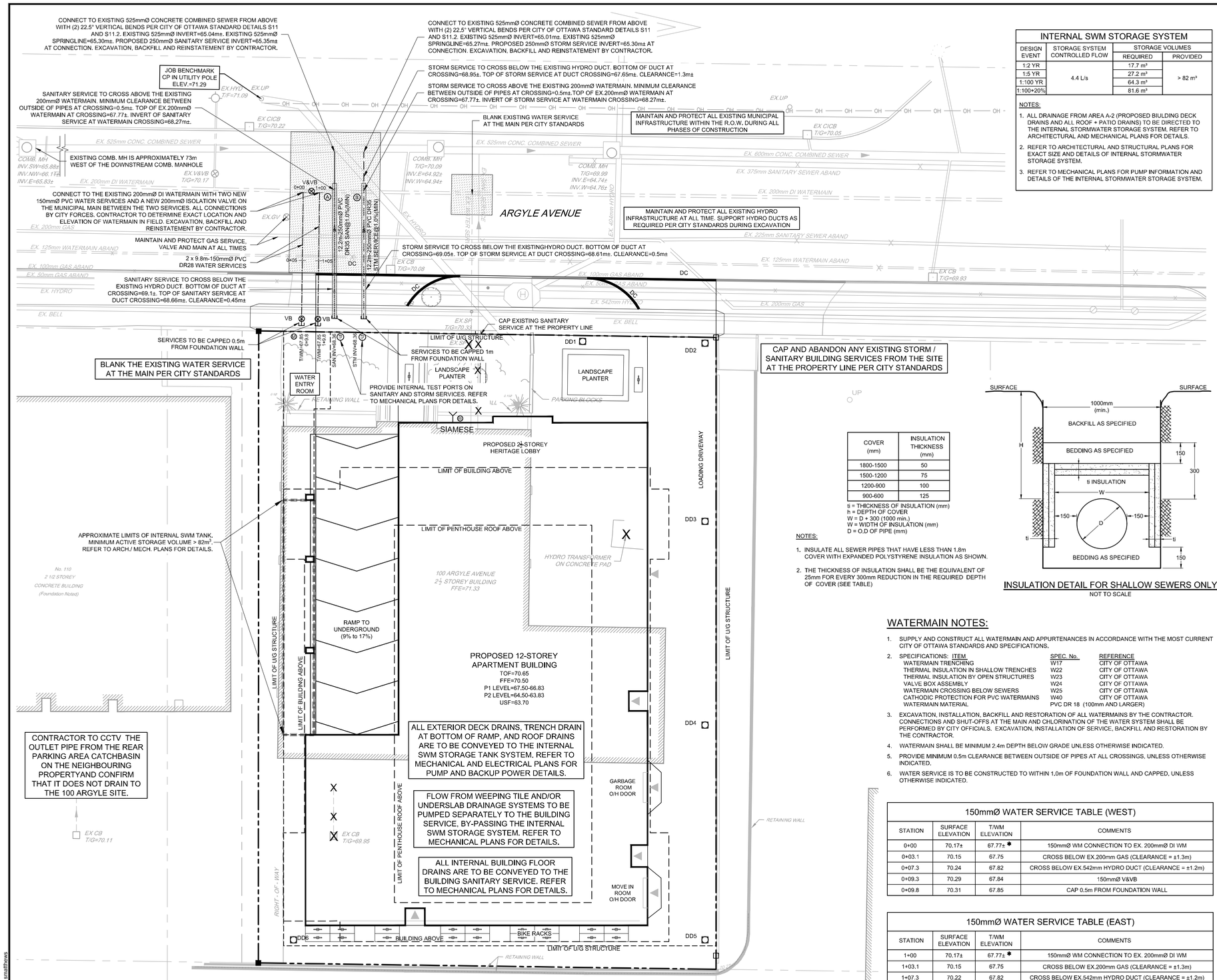
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	95.98	91.58	27.47
10	178.56	70.61	66.21	39.73
15	142.89	56.51	52.11	46.90
20	119.95	47.43	43.03	51.64
25	103.85	41.07	36.67	55.00
30	91.87	36.33	31.93	57.47
35	82.58	32.66	28.26	59.34
40	75.15	29.72	25.32	60.76
45	69.05	27.31	22.91	61.85
50	63.95	25.29	20.89	62.67
55	59.62	23.58	19.18	63.29
60	55.89	22.10	17.70	63.73
65	52.65	20.82	16.42	64.04
70	49.79	19.69	15.29	64.22
75	47.26	18.69	14.29	64.29
90	41.11	16.26	11.86	64.03
105	36.50	14.43	10.03	63.21
120	32.89	13.01	8.61	61.98
135	30.00	11.86	7.46	60.45
150	27.61	10.92	6.52	58.67

Proposed Residential Development
Novatech Project No. 118116
REQUIRED STORAGE - 1:100 YR + 20% IDF Increase
AREA A-2 Controlled Flow-Internal SWM Tank

OTTAWA IDF CURVE

Area = 0.143 ha Qallow = 4.4 L/s
C = 0.99 Vol(max) = 81.6 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	115.17	110.77	33.23
10	214.27	84.73	80.33	48.20
15	171.47	67.81	63.41	57.07
20	143.94	56.92	52.52	63.03
25	124.62	49.28	44.88	67.32
30	110.24	43.60	39.20	70.55
35	99.09	39.19	34.79	73.05
40	90.17	35.66	31.26	75.02
45	82.86	32.77	28.37	76.59
50	76.74	30.35	25.95	77.85
55	71.55	28.29	23.89	78.85
60	67.07	26.52	22.12	79.65
65	63.18	24.98	20.58	80.27
70	59.75	23.63	19.23	80.76
75	56.71	22.42	18.02	81.11
90	49.33	19.51	15.11	81.59
105	43.80	17.32	12.92	81.39
120	39.47	15.61	11.21	80.71
135	36.00	14.23	9.83	79.66
150	33.13	13.10	8.70	78.32

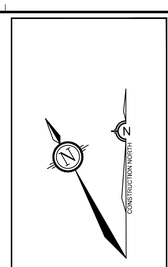


INTERNAL SWM STORAGE SYSTEM

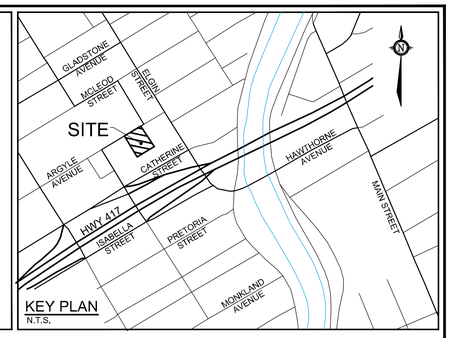
DESIGN EVENT	STORAGE SYSTEM CONTROLLED FLOW	STORAGE VOLUMES REQUIRED	STORAGE VOLUMES PROVIDED
1:2 YR	4.4 L/s	17.7 m³	> 82 m³
1:5 YR		27.2 m³	
1:100 YR		64.3 m³	
1:100+20%		81.6 m³	

NOTES:

1. ALL DRAINAGE FROM AREA A-2 (PROPOSED BIULDING DECK DRAINS AND ALL 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.



NORTH



KEY PLAN
N.T.S.

LEGEND

- PROPERTY LINE
- PROPOSED SANITARY SERVICE
- PROPOSED STORM SERVICE
- DD2 — PROPOSED MECHANICAL DECK DRAIN
- (M) (W) — PROPOSED WATER METER AND REMOTE METER
- PROPOSED BARRIER CURB
- DC — PROPOSED DEPRESSED CURB
- 150mmØ — PROPOSED WATER SERVICE AND DIAMETER
- VB — PROPOSED VALVE & VALVE BOX
- PROPOSED CAP
- PROPOSED BUILDING ENTRANCE
- X — REMOVALS
- THERMAL INSULATION FOR SHALLOW SEWERS
- PROPOSED BIKE RACK (REFER TO LANDSCAPE)
- OHW — EXISTING OVERHEAD WIRES
- EXISTING CONCRETE CURB
- SAMH — EXISTING SANITARY MANHOLE & SEWER
- CBMH — EXISTING CATCHBASIN MANHOLE
- STMH — 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

TOF	TOP OF FOUNDATION WALL ELEVATION
FFE	FINISHED FLOOR ELEVATION
P1 LEVEL	PARKING GARAGE LEVEL ELEVATION
USF	UNDERSIDE OF FOOTING ELEVATION

COVER (mm)	INSULATION THICKNESS (mm)
1800-1500	50
1500-1200	75
1200-900	100
900-600	125

ti = THICKNESS OF INSULATION (mm)
h = DEPTH OF COVER
W = D + 300 (1000 min.)
W = WIDTH OF INSULATION (mm)
D = O.D OF PIPE (mm)

NOTES:

1. INSULATE ALL SEWER PIPES THAT HAVE LESS THAN 1.8m COVER WITH EXPANDED POLYSTYRENE INSULATION AS SHOWN.
2. THE THICKNESS OF INSULATION SHALL BE THE EQUIVALENT OF 25mm FOR EVERY 300mm REDUCTION IN THE REQUIRED DEPTH OF COVER (SEE TABLE)

INSULATION DETAIL FOR SHALLOW SEWERS ONLY
NOT TO SCALE

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
VALVE BOX ASSEMBLY	W24	CITY OF OTTAWA
WATERMAIN CROSSING BELOW SEWERS	W25	CITY OF OTTAWA
CATHODIC PROTECTION FOR PVC WATERMAINS	W40	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.

150mmØ WATER SERVICE TABLE (WEST)

STATION	SURFACE ELEVATION	T/WM ELEVATION	COMMENTS
0+00	70.17±	67.77± *	150mmØ WM CONNECTION TO EX. 200mmØ DI WM
0+03.1	70.15	67.75	CROSS BELOW EX.200mm GAS (CLEARANCE = ±1.3m)
0+07.3	70.24	67.82	CROSS BELOW EX.542mm HYDRO DUCT (CLEARANCE = ±1.2m)
0+09.3	70.29	67.84	150mmØ V&VB
0+09.8	70.31	67.85	CAP 0.5m FROM FOUNDATION WALL

150mmØ WATER SERVICE TABLE (EAST)

STATION	SURFACE ELEVATION	T/WM ELEVATION	COMMENTS
1+00	70.17±	67.77± *	150mmØ WM CONNECTION TO EX. 200mmØ DI WM
1+03.1	70.15	67.75	CROSS BELOW EX.200mm GAS (CLEARANCE = ±1.3m)
1+07.3	70.22	67.82	CROSS BELOW EX.542mm HYDRO DUCT (CLEARANCE = ±1.2m)
1+09.3	70.27	67.84	150mmØ V&VB
1+09.8	70.29	67.85	CAP 0.5m FROM FOUNDATION WALL

* CONNECTIONS TO EXISTING 200mmØ DI. 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.

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 (Ref.No. PG4458-1 REVISION 2) DATED JUNE 21, 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 ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARD SURFACED AREAS AND DIMENSIONS.
10. REFER TO THE 'DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT' (R-2021-100) PREPARED BY NOVATECH.
11. 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.
2. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
EXTERIOR MECHANICAL DECK DRAIN	FD-490-F-4 (or APPROVED EQUIVALENT)	WATTS CANADA
SEWER TRENCH	S6	CITY OF OTTAWA
SANITARY / STORM SEWER	PVC DR 35	

3. THE SANITARY SERVICE LATERAL SHALL BE EQUIPPED WITH BACKFLOW PREVENTERS 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. SERVICES ARE TO BE CONSTRUCTED TO 1.0m FROM FACE OF BUILDING AT A MINIMUM SLOPE OF 1.0%.
6. 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.
7. INSULATE ALL PIPES (SAN / STM) THAT HAVE LESS THAN 1.5m COVER WITH HI-40 INSULATION PER INSULATION DETAIL FOR SHALLOW SEWERS. PROVIDE 150mm CLEARANCE BETWEEN PIPE AND INSULATION.
8. FLEXIBLE CONNECTIONS ARE REQUIRED FOR CONNECTING PIPES TO MANHOLES (FOR EXAMPLE KOR-N-SEAL, PSX: POSITIVE SEAL AND DURASEAL). THE CONCRETE CRADLE FOR THE PIPE CAN BE ELIMINATED.
9. TYPICAL STORM MANHOLES AND CATCHBASIN MANHOLES ARE TO HAVE 300mm SUMPS UNLESS OTHERWISE INDICATED.
10. THE CONTRACTOR IS TO TELEVISE (CCTV) ALL PROPOSED SEWERS, 200mmØ OR GREATER PRIOR TO BASE COURSE ASPHALT, UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH AND CLEAN ALL SEWERS & APPURTENANCES. PROVIDE A COPY OF ALL CCTV INSPECTION REPORTS TO THE ENGINEER FOR REVIEW.
11. 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.
12. 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.

CRITICAL PIPE CROSSING TABLE

CROSSING	LOWER PIPE	HIGHER PIPE	CLEARANCE	SURFACE ELEVATION
A	200mmØ T/WM=67.76	250mmØ SAN INV=68.27	± 0.5m	70.17 m
B	200mmØ T/WM=67.75	250mmØ STM INV=68.27	± 0.5m	70.17 m

* PIPE CROSSINGS WITH WATERMAINS ARE TO BE IN ACCORDANCE WITH CITY STANDARDS W25 AND W25.2 TO AVOID CONFLICTS.

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

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OTTAWA, ON K2E 7S8
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FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
F.S. THAUVETTE
100041399
DEC.21, 2021
PROVINCE OF ONTARIO

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Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY of OTTAWA
100 ARGYLE AVENUE

DRAWING NAME
GENERAL PLAN OF SERVICES

PROJECT No. 118116
REV REV # 2
DRAWING No. 118116-GP

D07-12-21-0130

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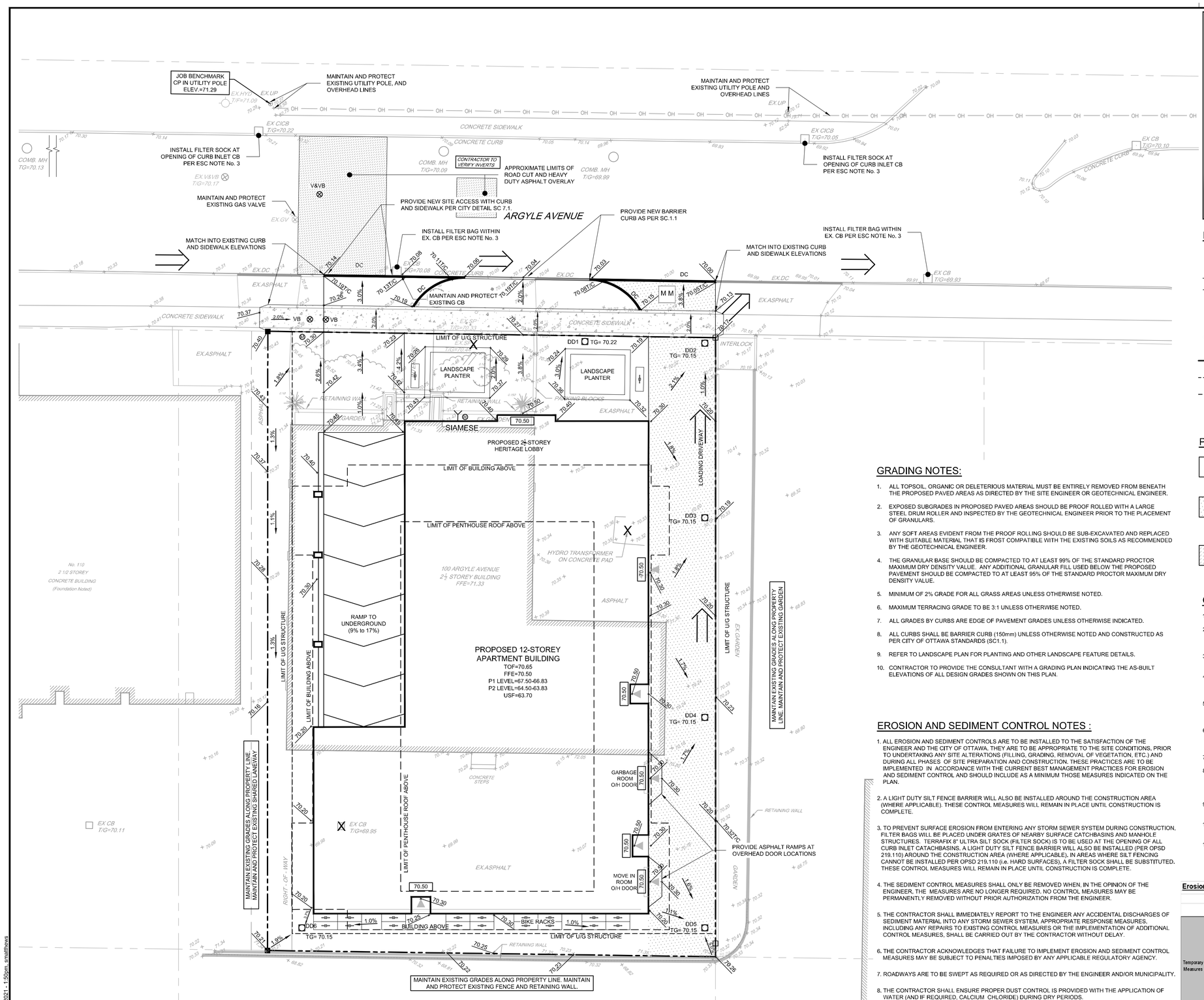

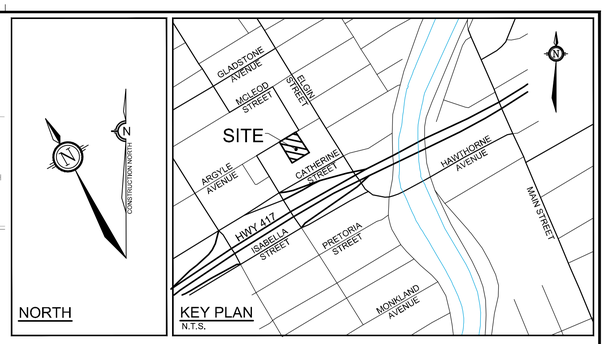

LEGEND

70.05	PROPOSED ELEVATION		EXISTING CONCRETE CURB
+ 69.90	EXISTING ELEVATION	V&VB	EXISTING VALVE & VALVE BOX
2.0%	GRADE AND DIRECTION	SP	EXISTING SERVICE POST
	MAXIMUM 3:1 SIDESLOPE	HYD	EXISTING HYDRANT
DD2	PROPOSED MECHANICAL DECK DRAIN	COMB MH	EXISTING COMBINED MH
	DIRECTION OF MAJOR SYSTEM OVERLAND FLOW	CBMH	EXISTING CATCHBASIN
	PROPERTY LINE	CB	EXISTING CATCHBASIN MH
	UNDERGROUND STRUCTURE	EX UP	EXISTING UTILITY POLE C/W GUY WIRES
	BUILDING ABOVE		EXISTING FENCE
	BUILDING ENTRANCE / EXIT	O/H WIRES	EXISTING OVERHEAD WIRES
	PROPOSED BIKE RACK (REFER TO LANDSCAPE)		

TOF	TOP OF FOUNDATION WALL ELEVATION
FFE	FINISHED FLOOR ELEVATION
P1 LEVEL	PARKING GARAGE LEVEL ELEVATION
USF	UNDERSIDE OF FOOTING ELEVATION

PAVEMENT STRUCTURE:

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

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

HEAVY DUTY PAVEMENT - ROADWAY RE-INSTATEMENT
MATCH EXISTING GRANULAR STRUCTURE OF ROADWAY
MATCH EXISTING ASPHALT THICKNESSES
NEW ASPHALT GRADE: PG 58-34

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 99% 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 THE 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. 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. TO PREVENT SURFACE EROSION FROM ENTERING ANY STORM SEWER SYSTEM DURING CONSTRUCTION, FILTER BAGS WILL BE PLACED UNDER GRATES OF NEARBY SURFACE CATCHBASINS AND MANHOLE STRUCTURES. TERRAFIX 8" ULTRA SILT SOCK (FILTER SOCK) IS TO BE USED AT THE OPENING OF ALL CURB INLET CATACHBASINS. A LIGHT DUTY SILT FENCE BARRIER WILL ALSO BE INSTALLED (PER OPSD 219.110) AROUND THE CONSTRUCTION AREA (WHERE APPLICABLE), IN AREAS WHERE SILT FENCING CANNOT BE INSTALLED PER OPSD 219.110 (i.e. HARD SURFACES), A FILTER SOCK SHALL BE SUBSTITUTED. THESE CONTROL MEASURES WILL REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE.
4. 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.
5. 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.
6. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
7. ROADWAYS ARE TO BE SWEPT AS REQUIRED OR AS DIRECTED BY THE ENGINEER AND/OR MUNICIPALITY.
8. THE CONTRACTOR SHALL ENSURE PROPER DUST CONTROL IS PROVIDED WITH THE APPLICATION OF WATER (AND IF REQUIRED, CALCIUM CHLORIDE) DURING DRY PERIODS.

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.
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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 (Ref.No. PG4458-1 REVISION 2) DATED JUNE 21, 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.
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11. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).

Erosion and Sediment Control Responsibilities:

				During Construction			After Construction Prior to Final Acceptance		After Final Acceptance
	ESC Measure	Symbol	Specification	Installation Responsibility	Inspection/Maintenance Responsibility	Inspection Frequency	Approval to Remove	Removal Responsibility	Inspection/Maintenance Responsibility
Temporary Measures	Filter Bag / Sock	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	M M	Drawing Details	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Developer's Contractor	Developer's Contractor	N/A
	Dust Control	Location as Required Around Site	Erosion and Sediment Control Notes	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Consultant	Developer's Contractor	N/A
	Stabilized Material Stockpiling	Location as Required by Contractor	Erosion and Sediment Control Notes	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Developer's Contractor	Developer's Contractor	N/A
	Sediment Basin (for flows being pumped out of excavations)	Location as Required by Contractor	---	Developer's Contractor	Developer's Contractor	After Every Rainstorm	Developer's Contractor	Developer's Contractor	N/A

NOTE:
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Website www.novatech-eng.com

LOCATION
CITY of OTTAWA
100 ARGYLE AVENUE

DRAWING NAME
GRADING AND EROSION & SEDIMENT CONTROL PLAN

PROJECT No. 118116
REV REV # 2
DRAWING No. 118116-GR

D07-12-21-0130

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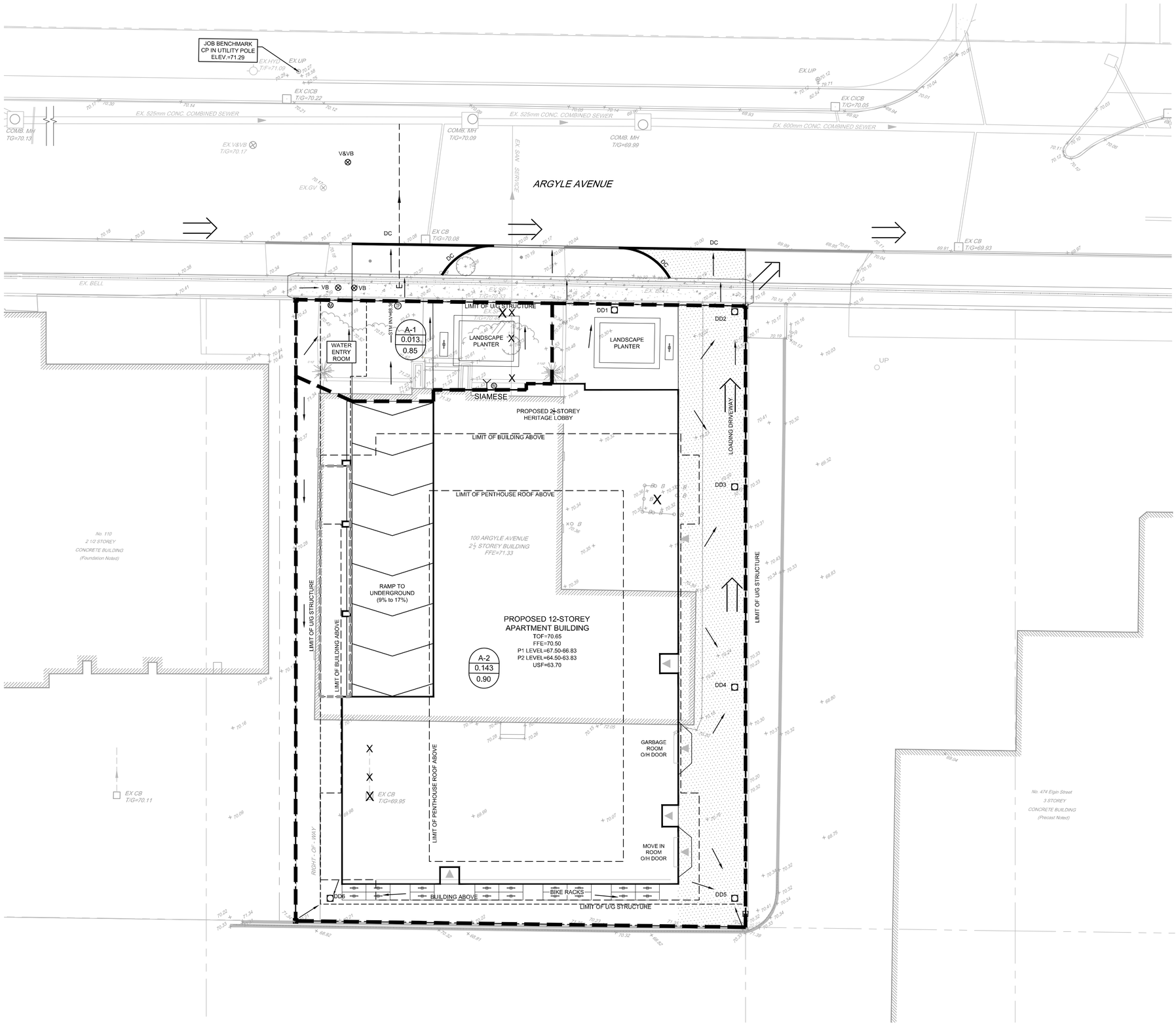

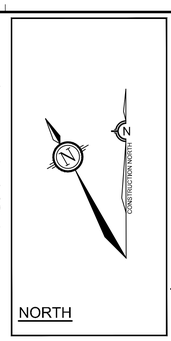

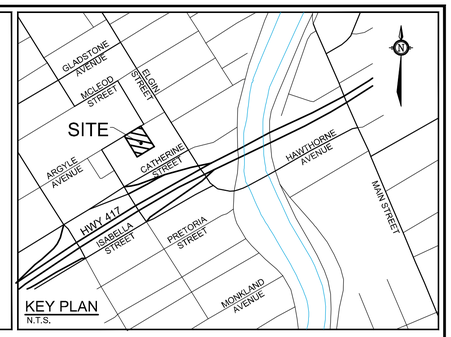

LEGEND:

- PROPOSED BARRIER CURB
- DC — PROPOSED DEPRESSED CURB
- DRAINAGE AREA LIMITS
- 1:5 YR / 1:100 YR — APPROXIMATE PONDING LIMITS
- A-1 / 0.013 / 0.85 — POST-DEVELOPMENT AREA ID; POST-DEVELOPMENT DRAINAGE AREA (ha); 1:5 YEAR WEIGHTED RUNOFF COEFICIENT
- TOF — TOP OF FOUNDATION WALL ELEVATION
- FFE — FINISHED FLOOR ELEVATION
- P1 LEVEL — PARKING GARAGE LEVEL ELEVATION
- USF — UNDERSIDE OF FOOTING ELEVATION
- DD2 — PROPOSED BUILDING DECK DRAIN
- PROPOSED STORM SEWER AND FLOW DIRECTION
- EMERGENCY OVERLAND FLOW ROUTE
- PROPOSED BUILDING ENTRANCE / EXIT
- PROPOSED BIKE RACK (REFER TO LANDSCAPE)
- STM MH — EXISTING STORM MH & SEWER
- CB — EXISTING CATCHBASIN C/W CATCHBASIN LEAD

GENERAL NOTES:

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5. COMPLETE ALL WORKS 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
6. 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.
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12. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).

INTERNAL SWM STORAGE SYSTEM

DESIGN EVENT	STORAGE SYSTEM CONTROLLED FLOW	STORAGE VOLUMES	
		REQUIRED	PROVIDED
1:2 YR	4.4 L/s	17.7 m³	> 82 m³
1:5 YR		27.2 m³	
1:100 YR		64.3 m³	
1:100+20%		81.6 m³	

NOTES:

1. ALL DRAINAGE FROM AREA A-2 (PROPOSED BIULDING DECK DRAINS AND ALL 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.

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LICENSED PROFESSIONAL ENGINEER — F.S. THAUVETTE — 100041299 — DEC.21, 2021 — PROVINCE OF ONTARIO

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LOCATION
CITY of OTTAWA
100 ARGYLE AVENUE

DRAWING NAME
STORMWATER
MANAGEMENT PLAN

PROJECT No. 118116
REV REV # 2
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D07-12-21-0130

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