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39 Years

PROPOSED PARKING LOT EXPANSION
600 MARCH ROAD

Stormwater Management Report

STORMWATER MANAGEMENT REPORT

NOKIA
PARKING LOT EXPANSION
600 MARCH ROAD

Prepared by:

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

November 7, 2023

Ref: R-2023-143
Novatech File No. 121334

November 7, 2023

Nokia
600 March Road
Ottawa, Ontario
K2K 2T6

Attention: Margaret Wolodarski

Re: Stormwater Management Report
NOKIA - Parking Lot Expansion
600 March Road, Ottawa, ON
Novatech File No.: 121334

Enclosed is a copy of the 'Stormwater Management Report' for the proposed temporary parking lot expansion of the existing Nokia property at 600 March Road in the City of Ottawa. This report addresses the approach to storm drainage and stormwater management, and it is being 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 | Land Development & Public-Sector Engineering

cc: Eric Surprenant (City of Ottawa)
Erik Cunnington (Colliers)

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1.0 INTRODUCTION

The Nokia Ottawa Office has recently severed their 10.453 ha property into two parcels; the retained property (5.183 ha), as outlined in RED in Figure 1 below, and the existing parking lots to the south, which will be re-developed as the new Nokia campus (5.270 ha, post road widening). As part of the proposed re-development, Nokia has retained Novatech to complete the site servicing, grading, and stormwater management design for the proposed parking lot expansion adjacent to their existing office building. Additional parking is required to meet the employees needs as the large existing parking lots to the south will be re-developed as part of the new Nokia campus. This report is being submitted in support of a Site Plan Control application for the proposed parking lot expansion only.

1.1 Location and Site Description

The subject site is located within the Kanata Research Park (KRP) and consists of the northern portion of the Nokia property located at 600 March Road. The area to be redeveloped around the existing building consists of drive aisles and small parking lots surrounded by landscaped areas. The site to be re-developed covers an approximate area of 2.298 hectares (of the total 5.183 ha) within the retained portion of the Nokia property. The subject site is generally surrounded by other commercial properties. The legal description of the subject site is designated as Block 6 and Part of Block 1 Registered Plan 4M-642 and Parts of Lot 9 Concession 4, Geographic Township of March, City of Ottawa.

Figure 1: Aerial view of the site

1.2 Pre-Consultation Information

A pre-consultation meeting was held with the City of Ottawa on April 21, 2023, at which time the client was advised of the general submission requirements. Subsequent meetings were held with City of Ottawa staff to further discuss the approach to storm drainage and stormwater management. 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 not anticipated to be required for the proposed parking lot expansion of an existing office building. Refer to **Appendix A** for a summary of the correspondence related to the proposed development.

1.3 Proposed Development

The proposed development is to expand the existing parking lot adjacent to the building to accommodate the parking needs of the Nokia employees. This is a direct result of the recent severance of the previously larger (10.453 ha) Nokia property, as the existing parking lots to the south will be re-developed as part of the new Nokia campus (to be filed under a separate SPC Application with the City of Ottawa). The proposed parking lot expansion is temporary, as the intent is to re-develop this property in the future to accommodate a large mixed-use development. The proposed parking lot will be serviced by the municipal storm sewer in Legget Drive. Where possible, existing trees and vegetation will be maintained on site, within the limits of the area to be re-developed.

1.4 Reference Material

The following design guidelines have been used to establish the stormwater management requirements for the proposed development:

- Ottawa Sewer Design Guidelines (2012) and Technical Bulletins (2010-present)
- Ministry of the Environment Design Guidelines for Sewage Works (2008)
- MOE Stormwater Management Planning and Design Manual (2003)
- Ontario Provincial Standards

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

[1] KRP Stormwater Drainage Brief, prepared by Novatech in June 1987.

[2] Shirley's Brook and Watts Creek Subwatershed Study, prepared by Dillon Consulting Ltd. in 1999.

[3] KRP Stormwater Management Plan (Report No. 93063, revised April 2000), prepared by Novatech in October 1999.

[4] KRP Stormwater Drainage Brief, prepared by Novatech on December 11, 2000.

[5] Geotechnical Investigation and Hydrogeological Assessment – 600 March Road, Kanata, Ontario (Project No.: 12566614), prepared by GHD on June 16, 2023.

1.5 Storm Drainage and Stormwater Management

Under current conditions, storm drainage from the area to be re-developed either sheet drains towards on-site catchbasins that flow through pipes located below the building and/or sheet drains uncontrolled towards Legget Drive. As described in the previous KRP SWM Reports[1,3,4], stormwater quality control measures are currently being provided by the downstream stormwater management facilities (SWMF) located just west of Shirley's Brook, on the 349 Terry Fox Drive property and on the 525 Legget Drive property behind the Brookstreet Hotel.

Under post-development conditions, the proposed parking lot will be serviced by a new on-site storm sewer system and new on-site SWM pond located near the southeast corner of the property. Site flows from the new paved parking lots and adjacent landscaped areas will be controlled prior to being directed to the municipal storm sewer in Legget Drive. Due to the existing topography, runoff from a small portion of the landscaped boulevard along March Road will sheet drain onto the subject site and has been accounted for in the SWM design for the area to be re-developed. The existing downstream SWMF will continue to provide stormwater quality control measures for the subject site, other private properties as well as a portion of the Legget Drive and

Terry Fox Drive municipal right-of-way. The approach for the stormwater management design for the subject site is discussed in the subsequent sections of the report.

1.5.1 Stormwater Management Criteria and Objectives

The stormwater management (SWM) criteria have been provided during pre-consultation meetings with the City of Ottawa. The SWM criteria and objectives are as follows and apply only to the portion of the site to be re-developed:

- Provide a dual drainage system (i.e., minor system and emergency overland flow route for events exceeding the 100-year design storm).
- Control post-development storm flows, up to an including the 100-year design event, to the maximum allowable release rate calculated using the Rational Method, with a runoff coefficient equivalent to existing conditions, but in no case greater than C=0.5, a time of concentration no less than 10 minutes and a 5-year rainfall intensity from City of Ottawa IDF curves.
- Ensure that a maximum of 0.35m of surface ponding will occur on the paved surfaces (i.e., private drive aisles or parking lots) during the 100-year storm event.
- Ensure that the surface ponding limits do not touch any part of the building envelope and remain below the lowest building opening during the stress test event (100-year + 20%).
- Target a stormwater quality control equivalent to an 'Enhanced' Level of Protection (i.e., minimum 80% TSS removal) for the portion of the site to be re-developed.
- Provide guidelines to ensure that site preparation and construction is in accordance with the current Best Management Practices for Erosion a Sediment Control.

No further stormwater management control measures are required for the portion of the site that remains unchanged.

Refer to **Appendix A** for correspondence from the City of Ottawa.

1.5.2 Allowable Release Rate

The allowable release rates from the 2.298 ha portion of the site to be re-developed and the two offsite tributary areas (OS-1 and OS-2), along the March Road boulevard, have been calculated using the Rational Method and are summarized in **Table 1**.

Table 1: **Allowable Release Rates Summary Table**

Description	C_{w5}	Time of Concentration (min)	Area (ha)	5-Yr Allowable Release Rate (L/s)
Portion of Site to be Re-developed (2.298 ha)	0.44	20	2.298	196.1
OS-1 (0.087 ha)	0.22	20	0.087	3.7
OS-2 (0.069 ha)	0.20	20	0.069	2.7
Total (2.454 ha)	**0.42**	**-**	**2.454**	**202.5**

Refer to **Appendix C** for detailed calculations.

1.5.3 Post-Development Conditions

Stormwater runoff from the portion of the site to be re-developed, including the paved parking lots, adjacent landscaped areas, and small SWMF near the southeast property corner, will be attenuated by inlet control devices (ICDs) installed within the new storm sewer system, prior to being directed to the municipal storm sewer in Legget Drive. Refer to the enclosed Post-Development Stormwater Management Plan (121334-SWM) for sub-catchment areas.

1.5.3.1 Area A-1 – Controlled Flow from Main Parking Lot (Including OS-1 & OS-2)

The post-development flow from this sub-catchment area will be attenuated by an ICD installed in the outlet pipe of STM MH 112. Stormwater runoff from this sub-catchment area will be temporarily stored underground within the storm sewer system and on the parking lot surface prior to being discharged into the downstream storm sewer system.

Table 1.1 summarizes the post-development design flow from this sub-catchment area as well as the ICD specifications, the anticipated ponding elevations, storage volumes required and storage volume provided for the 5-year and the 100-year design events.

Table 1.1: Stormwater Flows, ICD & Surface Storage

Design Event	Controlled Site Flows from Area A-1 (Incl. Areas OS-1 & OS-2)					
	ICD Type	Peak Flow	Ponding Elevation	~Average Flow (50% Qpeak)**	Storage Vol. Required*	Max Storage Available
2-Year	167mm dia. Orifice Plug Type ICD	94.4 L/s	81.21 m	47.2 L/s	156.6 m³	1,001.1 m³
5-Year		94.6 L/s	81.23 m	47.3 L/s	242.2 m³	
100-Year		97.6 L/s	81.38 m	48.8 L/s	582.1 m³	

*Storage volumes are based on the 50% Qpeak flow rates, which generally represents the average flow.
**Represents rounded values.

Refer to **Appendix C** for detailed SWM calculations.

As indicated in the table above, this sub-catchment area will provide sufficient storage for the 2-year, 5-year and 100-year design events. Per City of Ottawa Design Guidelines, the site grading design will ensure that surface ponding depths will not touch the building envelope or lowest building openings during the 100-year+20% stress test. During larger storm events, stormwater within the paved lots will cascade towards (lower) downstream catchments areas and ultimately overflow towards Legget Drive, therefore generally maintaining existing drainage patterns.

Deviation from Ottawa Sewer Design Guidelines

The following outlines a deviation from the current Ottawa Sewer Design Guidelines (Technical Bulletin PIEDTB-2016-01 Section 8.3.11.1, first bullet), specifically related to no surface ponding allowed within the private parking lots and drive aisles during the 2-year storm event.

As discussed with City staff, several factors played a role in the design of the temporary parking lot, and thus the proposed on-site storm sewer system and SWM design:

- The shallow depth of the 375mm dia. (receiving) storm sewer in Legget Drive, limits the pipe size and slope of the proposed on-site storm sewer system, which in turn limits both the conveyance capacity of the system and thus potential storage available underground.
- The topography of the existing site and adjacent Right-of-Ways (i.e., >2.7m drop from March Road to Legget Drive), affects the grading of the proposed parking lot expansion

and thus the layout of the catchbasins and storm sewer system, further limiting the potential storage available on the surface and more importantly underground.

- The length of the proposed on-site storm sewer required to drain the new parking lot starting from a shallow receiving sewer in Legget Drive, results in minimal cover on-site and the need for thermal insulation along most of the sewer pipe segments.
- Retrofitting an existing parking lot to meet current City standards, for which the original parking lot was not designed.
- Keeping in mind that this is a temporary parking lot, thus trying to keep construction costs to a minimum.

Considering the factors listed above, we concluded that temporary 'nuisance' surface ponding within the new parking lot during frequent (i.e., 2-year) rainstorm events is less of a concern than potentially surcharging the downstream municipal storm sewer system. As a result, we are intentionally over-controlling post-development flow as part of the on-site SWM design. Based on correspondence from the City, over-controlling site flows from the new parking lot should alleviate any negative impacts on the City's municipal storm sewer system.

As a result, a deviation from the Ottawa Sewer Design Guidelines is being requested, specifically related to no surface ponding allowed within the private parking lots and drive aisles during the 2-year storm event.

1.5.3.2 Area A-2 – Controlled Flow from South Parking Lot and SWM Pond

The post-development flow from this sub-catchment area will be attenuated by an ICD installed in the outlet pipe of STM MH 116. Stormwater runoff from this sub-catchment area will be temporarily stored within the proposed dry pond prior to being discharged into the downstream storm sewer system then conveyed to the municipal storm sewer in Legget Drive.

Table 1.2 summarizes the post-development design flow from this sub-catchment area as well as the ICD specifications, the anticipated ponding elevations, storage volumes required and storage volume provided for the 2-year, 5-year and the 100-year design events.

Table 1.2: Stormwater Flows, ICD & Surface Storage

Design Event	Controlled Site Flows from Area A-1 (Pond)					
	ICD Type	Peak Flow	Ponding Elevation	~Average Flow (50% Qpeak)**	Storage Vol. Required*	Max Storage Available
2-Year	118mm dia. Orifice Plug Type ICD	20.4 L/s	78.76 m	10.2 L/s	87.3 m³	406.3 m³
5-Year		23.3 L/s	78.90 m	11.7 L/s	124.1 m³	
100-Year		30.1 L/s	79.30 m	15.1 L/s	268.7 m³	

*Storage volumes are based on the 50% Qpeak flow rates, which generally represents the average flow.
**Represents rounded values.

Refer to **Appendix C** for detailed SWM calculations.

As indicated in the table above, this sub-catchment area will provide sufficient storage for the 2-year, 5-year, 100-year, as well as the 100-year + 20% design events. During larger storm events, stormwater within the SWM pond would overflow towards the Legget Drive municipal Right-of-Way.

1.5.3.3 Summary of Post- Development Flows

Table 1.3 compares the post-development site flows from the proposed parking lot expansion area to the total uncontrolled pre-development flows (including flows from OS-1 & OS-2) and the maximum allowable release rate.

Table 1.3: Stormwater Flow Comparison Table

Design Event	Uncontrolled Flows (L/s)	Allowable Release Rate (L/s)	Drainage Areas A-1 to A-2 (Incl. OS-1 & OS-2)			
			Post-Development Conditions			
			A-1 (Incl. OS-1 & OS-2) Flow (L/s)	A-2 Flow (L/s)	Total Flow (L/s)	Reduction in Flow (L/s or %)*
2-Yr	150.0	202.5	94.4	20.4	**114.8**	35.2 or 23%
5-Yr	202.5		94.6	23.3	**117.9**	84.6 or 42%
100-Yr	399.7		97.6	30.1	**127.7**	272.0 or 68%

*Reduced flow compared to pre-development uncontrolled conditions.

As indicated above, the 2-year, 5-year and 100-year post-development flows will be over-controlled when compared to the allowable release rate specified by the City of Ottawa. Furthermore, this represents a significant reduction in total site flow rate when compared to the respective pre-development conditions for the portion of the site to be re-developed. Refer to **Appendix C** for detailed SWM calculations. As indicated above, over-controlling the post-development site flows should alleviate any negative impacts the temporary parking lot will have on the City's municipal storm sewer system.

Maintenance and Monitoring of the Storm Sewer and Stormwater Management Systems

It is recommended that the client implement a maintenance and monitoring program for both the on-site storm sewers and the stormwater management systems: The storm drainage system should be inspected routinely (at least annually); the ICDs should be inspected to ensure they are free of debris.

1.5.3.4 Stormwater Quality Control

Based on correspondence from the City of Ottawa, it is recommended that surface parking lots and drive aisles within the portion of the site to be re-developed meet an 'Enhanced' Level of Protection (i.e.: 80% TSS removal) as an appropriate water quality target. Landscaped areas are considered clean for the purposes of water quality and aquatic habitat protection. As described in the previous KRP SWM Reports, stormwater quality control measures are currently being provided by the downstream stormwater management facility (SWMF) located just west of Shirley's Brook, on the 349 Terry Fox Drive property. Stormwater runoff from the proposed parking lot expansion will continue to be directed to the same municipal storm sewer in Legget Drive, which directs flows to this existing SWMF. Due to the temporary nature of the proposed parking lot expansion, no additional water quality treatment is being proposed on-site, other than what is currently being provided by the downstream SWMF.

When the subject site is redeveloped as future mixed-use lands, a full re-design of the on-site SWM system, including both quantity and quality control measures, will need to be implemented.

2.0 SITE GRADING

The topography of the existing site generally slopes from west to east. The existing grades drop by approximately 5.0m from west to east along Terry Fox Drive, while also dropping by 0.8m from north to south along March Road. Since the parking lot modifications are being proposed on the west and south sides of the existing building, the main challenge will be the 3.0m drop from west to east on the south side of the building.

The proposed grading design will need to tie into existing elevations around the perimeter of the site as well as around the existing building. The intent is to maintain as many of the existing trees as possible around the perimeter of the site, which have the best chance of surviving in the future, while accommodating the parking needs of the Nokia employees. Based on the proposed grading design, most of the existing landscaped berms located on the west side of the property will need to be flattened and the grade lowered to accommodate the proposed parking lot expansion. The western portion of the main parking lot will slope from west to east (i.e., maximum 3:1 terracing) to make up the grade difference, which means that surface ponding will only be possible closer to the building. The parking lot on the south side of the building will slope towards the proposed stormwater management pond located within the southeast corner of the property. Due to the existing topography of the site, the emergency overflow route will continue to be towards Legget Drive. The proposed grading design will also ensure that the south property line is the high point to ensure no surface runoff is directed to the severed lands to the south. Refer to the enclosed Grading and ESC Plan (121334-GR) for details.

3.0 GEOTECHNICAL INVESTIGATIONS

GHD prepared a Geotechnical Investigation and Hydrogeological Assessment Report for the entirety of the 600 March Road property. Although much of the information is related to the new Nokia Campus development on the severed portion of the site, the report also includes information related to the proposed parking lot expansion. Refer to the Geotechnical Report[5] described in Section 1.4 of the report, for subsurface conditions, construction recommendations and geotechnical inspection requirements.

4.0 EROSION AND SEDIMENT CONTROL

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

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

The temporary erosion and sediment control measures will be implemented prior to construction and will remain in place during all phases of construction. Regular inspection and maintenance of the erosion control measures will be undertaken.

5.0 CONCLUSION

This report has been prepared in support of a Site Plan Control application for the proposed temporary parking lot expansion at 600 March Road. The conclusions are as follows:

- The proposed stormwater design (i.e., stormwater quantity control measures), will ultimately reduce peak flows into the municipal sewer in Legget Drive.
    - Post-development flow from sub-catchment area A-1, and A-2 will be controlled by inlet control devices (ICDs) installed within the on-site storm sewer system.
    - The total post-development flow from the subject site will be approximately 114.8 L/s during the 2-year event, 117.9 L/s during the 5-year event and 127.7 L/s during the 100-year event, over-controlled when compared to the allowable release rate (202.5 L/s) specified by the City of Ottawa. The post-development conditions also represent a significant reduction when compared to the respective pre-development conditions.
    - Over-controlling the post-development site flows should alleviate any negative impacts the temporary parking lot will have on the City's municipal storm sewer system.
    - Stormwater quality control measures will continue to be provided by the downstream stormwater management facility (SWMF) located just west of Shirley's Brook, on the 349 Terry Fox Drive property.
    - Regular inspection and maintenance of the storm sewer system, including the inlet control devices and SWM pond is recommended to ensure that the storm drainage system is clean and operational.
- Erosion and sediment controls will be provided both during construction and on a permanent basis.

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

NOVATECH

Prepared by:

Zarak Ali, E.I.T.
Land Development

Reviewed by:

François Thauvette, P. Eng.
Senior Project Manager – Land Development

APPENDIX A

Project Correspondence

Pre-Application Consultation
Site Plan Control

570 March Road Meeting Date: 2023.04.21

Owner:	Nokia Canada Inc.	**Ward:**	4 – Kanata North
Applicant:	Colliers Strategy & Consulting	**Councillor:**	Cathy Curry

Proposal Summary: Once construction on the new Nokia campus starts, the existing campus will lose the majority of its parking. Nokia's Network Infrastructure Business still needs to continue to operate from the existing campus until they move to the new campus in October 2027. The purpose of the Site Plan Application is to add additional parking stalls to the existing campus lands to accommodate employees parking needs.

Attendees:	**Internal**	**External**
	Krishon Walker, Planner	Aaron Clodd, Colliers
	Julie Candow, Infrastructure Project Manager	Greg Winters, Novatech
		James Ireland, Novatech
	Nancy Young, Planning Forester	Francois Thauvette, Novatech
		Ryan James, Novatech

Meeting Notes

Planning Comments (Provided by Krishon Walker)

- The site is located within the City's Suburban Transect as outlined on Schedule A – Transect Policy Areas of the Official Plan, is designated Kanata North Economic District on Schedule B5 – Suburban (West) Transect of the Official Plan (the Plan) and is along the March Road Mainstreet Corridor. The Kanata North Economic District is one of two Special Economic Districts identified in the Plan and is intended to support the City's economic development and growth.
- The site is currently zoned as Mixed-Use Centre Zone, Urban Exception 2816, Holding Provision (MC[2816]-h). Please ensure that your proposal complies with all applicable provisions under the Zoning By-law (specifically Part 4 of the Zoning By-law).

Feel free to contact Krishon Walker at Krishon.Walker@ottawa.ca for follow-up questions.

Engineering Comments (Provided by Julie Candow)

Please note the following information regarding the engineering design submission for the above noted site:

- The Stormwater Management Criteria, for the subject site, is to be based on the following:
  a. Please refer to following background reports:
     a. Shirley's Brook and Watts Creek Subwatershed Study, prepared by Dillon Consulting Ltd., 1999
     b. Kanata Research Park, Storm Water Management Report, prepared by Novatech, dated June 1987

c. Stormwater Management Plan, Kanata Research Park, City of Kanata, prepared by Novatech, dated April 2000
d. Kanata Research Park Subdivision Design Brief, prepared by Novatech, dated August 2000

The stormwater management criteria shall be in accordance with the minor and major system storm allocations presented in the above mentioned reports.

b. If the capacity of the receiving storm sewer is in question, over-controlling may be required, in which case flows to the storm sewer in excess of the 5-year storm release rate, up to and including the 100-year storm event, must be detained on site. In such a case the pre-development condition will be determined using the smaller of a runoff coefficient of 0.5 or the actual existing site runoff coefficient.
c. The stormwater management area for the site can be limited to the area of the site that is to be redeveloped. The area's of the site that are to remain in existing conditions do not require further stormwater management.
d. An enhanced level of water quality treatment (80% TSS Removal) is required for the portion of the site that is to be redeveloped.
e. The treatment level in the north cell of stormwater management pond in SWM Facility No. 1 should be confirmed. Otherwise, stormwater quality control shall be achieved onsite.
f. Please provide within the SWM Report the legal agreements related to the private SWM Facility No. 1 outlet located to the east on KRP lands.

Feel free to contact Julie Candow at Julie.Candow@ottawa.ca for follow-up questions.

Forestry Comments (Provided by Nancy Young)

- Section 4.8.2 of the New Official Plan provides strong direction to maintain the urban forest canopy and its ecosystem services during intensification noting when considering the impacts on individual trees, planning and development decisions, including Committee of Adjustment decisions, shall give priority to the retention and protection of large, healthy trees over replacement plantings and compensation. Applications must address the cumulative impacts on the urban forest, over time and space, with the goal of 40% urban forest canopy cover in mind. Further, that the City and the Committee of Adjustment may refuse a development application where it deems the loss of a tree(s) avoidable.
- The City has adopted a suite of High Performance Development Standards to improve the climate change resiliency of new developments. While these are not yet being fully implemented, it is recommended to provide the following details on the Landscape Plan:
  - For parking lots, provide 1 new tree for every 5 parking spaces to help cool the landscape of the site.
  - Confirm sufficient Soil volumes to support canopy cover on site ($30m^3$ for street trees)
  - Proposed species must not include invasive species and target a minimum of 50% native species
- A TCR is required for this proposal, with the proposed parking locations overlaid on the tree layer, to assess and design around major tree impacts.
  - The TCR should also include an approximation of the anticipated road widening and concept site plans if available

- The TCR will be used to identify specific trees and groupings of trees that are a high priority for retention, and those that are more likely retainable through both the parking and building design.
- Trees along the March, Terry Fox, and Legget frontages are the highest priority to retain as screening for the site, through both stages of development.

- Parking (especially temporary) is not generally an acceptable reason to remove protected trees. All options to reduce the number of temporary parking spaces must be considered (e.g. leasing space in existing parking lots, transit, shuttles, working from home, etc).
- As discussed in the meeting, while a Landscape Plan is generally required for each site plan, given the temporary nature of this situation, I think we will need to make a modified arrangement. If there are any areas of tree retention that could be bolstered with planting at this stage, we can look at that, but I don't think it is in anyone's best interest to plant temporary trees unless they could be transplanted later. The Landscape Plan for the eventual build will need to address all planting for the site, working toward the 40% canopy cover target from the Official Plan.

TCR requirements:

- The TCR must list all trees on site, as well as off-site trees if the CRZ extends into the developed area, by species, diameter and health condition.
  a. Please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)
- If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained.
- All retained trees must be shown, and all retained trees within the area impacted by the development process must be protected as per City guidelines available at Tree Protection Specification or by searching Ottawa.ca.
- The location of tree protection fencing must be shown on the plan.
- The City encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.

LP tree planting requirements:

- The Official Plan requires that "On urban properties subject to site plan control or community planning permits, development shall create tree planting areas within the site and in the adjacent boulevard, as applicable, that meet the soil volume requirements in any applicable City standards or best management practices or in accordance with the recommendation of a Landscape Architect;"
- Minimum Setbacks
  - Maintain 1.5m from sidewalk or MUP/cycle track or water service laterals.
  - Maintain 2.5m from curb
  - Coniferous species require a minimum 4.5m setback from curb, sidewalk or MUP/cycle track/pathway.

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

- Tree specifications
  - Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
  - Maximize the use of large deciduous species wherever possible to maximize future canopy coverage
  - Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and include watering and warranty as described in the specification (can be provided by Forestry Services).
  - Plant native trees whenever possible
  - No root barriers, dead-man anchor systems, or planters are permitted.
  - No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)
- Hard surface planting
  - Curb style planter is highly recommended
  - No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
  - Trees are to be planted at grade
- Soil Volume
  - Please document on the LP that adequate soil volumes can be met:

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

- Sensitive Marine Clay
  - Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines
- Tree Canopy
  - The landscape plan shall show how the proposed tree planting will replace and increase canopy cover on the site over time, to support the City's 40% urban forest canopy cover target.
- At a site level, efforts shall be made to provide as much canopy cover as possible, through tree planting and tree retention, with an aim of 40% canopy cover at 40 years, as appropriate. Indicate on the plan the projected future canopy cover at 40 years for the site.

Feel free to contact Nancy Young at Nancy.Young@ottawa.ca for follow-up questions.

Application Submission Information

Application Type**: Standard Non Rural**

Site plan control application approval timelines vary based on the development complexity, scale, the quality of the submission and public consultation process if applicable. The legislated timeline under the Planning Act is 60 days. For more information on standard processing timelines, please visit: https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/development-application-forms#site-plan-control

Prior to submitting a formal application, it is recommended that you pre-consult with the Ward Councillor, Cathy Curry.

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

To request City of Ottawa plan(s) or report information please contact the City of Ottawa Information Centre: InformationCentre@ottawa.ca or (613) 580-2424 ext. 44455

Application Submission Requirements

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

Please provide electronic copies (PDF) of all plans and studies required. Hard copies are not required at this time.

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

APPLICANT'S STUDY AND PLAN IDENTIFICATION LIST

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

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

S/A	ENGINEERING		S/A
S	1. Site Servicing Plan	2. Site Servicing Study / Assessment of Adequacy of Public Services	
S	3. Grade Control and Drainage Plan	4. Geotechnical Study / Slope Stability Study	S
	5. Composite Utility Plan	6. Groundwater Impact Study	
	7. Servicing Options Report	8. Wellhead Protection Study	
	9. Transportation Impact Assessment (TIA)	10. Erosion and Sediment Control Plan / Brief	S
S	11. Storm water Management Report / Brief	12. Hydro geological and Terrain Analysis	
	13. Hydraulic Water main Analysis	14. Noise / Vibration Study	
	15. Roadway Modification Functional Design	16. Confederation Line Proximity Study	

S/A	PLANNING / DESIGN / SURVEY		S/A
	17. Draft Plan of Subdivision	18. Plan Showing Layout of Parking Garage	
	19. Draft Plan of Condominium	20. Planning Rationale	S
S	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	27. Landscape Plan	28. Archaeological Resource Assessment Requirements: **S** (site plan) **A** (subdivision, condo)	
S	29. Survey Plan	30. Shadow Analysis	
	31. Architectural Building Elevation Drawings (dimensioned)	32. Design Brief (includes the Design Review Panel Submission Requirements)	
	33. Wind Analysis		

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

S/A	ADDITIONAL REQUIREMENTS		S/A
S	44. Applicant's Public Consultation Strategy (may be provided as part of the Planning Rationale)	45. Site Lighting Plan	
A	46. Site Lighting Certification Letter	47.	

Meeting Date: 2023.04.21

Application Type: *Site Plan Control*

File Lead (Assigned Planner): Krishon Walker

Infrastructure Approvals Project Manager: Julie Candow

Site Address (Municipal Address): 570 March Road

Preliminary Assessment: 1☐ 2☐ 3☐ 4☐ 5

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

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

Francois Thauvette

From: Walker, Krishon <krishon.walker@ottawa.ca>
Sent: Thursday, October 12, 2023 4:23 PM
To: Cunnington, Erik
Cc: Ryan James; James Ireland; Francois Thauvette; Angela Taggart; kirby@kerryhill.ca; Surprenant, Eric; Young, Nancy
Subject: 600 March Road (Parking Lot Expansion)

Hi Erik,

Please see the notes from our meeting yesterday below:

Planning

I did not have an opportunity to mention this yesterday but Cash-In-Lieu of Conveyance of Parkland will be required in accordance with the Parkland Dedication By-law No. 2022-280.

Engineering

- Nuisance ponding increases the risk of ICD being removed and in turn surcharging City system. Underground storage is to be looked at exhaustively in combination to dry pond proposed.
- Assessment of residual capacity of Leggett sewer system is to be carried out by Novatech with assessment of HGLs and impact on Legget Sewer.
- Also, normally only one sewer connection is allowed per property.
- This would technically be deviations from our standards but we can work with consultant on these items.

As it relates to the Geotechnical study, if it looked at conditions here, that should be acceptable for pavement structure.

In addition to the material submitted, we will require the Stormwater management Study to be provided.

Feel free to contact Eric Surprenant for follow-up questions.

Forestry

TCR and General comments

- The Tree Conservation Plan has been provided with this submission. Slight modifications have been made to adjust the parking lot layout to retain a small number of trees along the March Rd frontage and additional trees adjacent to the existing building. Further information is required to assess the overall canopy cover impacts of this design (including tree planting opportunities), and whether further alterations could allow for the retention of more of the trees identified as a high priority on site.

- Section 4.8.2 of New Official Plan provides strong direction to maintain the urban forest canopy and its ecosystem services during intensification noting when considering the impacts on individual trees, planning and development decisions, including Committee of Adjustment decisions, shall give priority to the retention and protection of large, healthy trees over replacement plantings and compensation. Applications must address the cumulative impacts on the urban forest, over time and space, with the goal of 40% urban forest canopy cover in mind. Further, that the City and the Committee of Adjustment may refuse a development application where it deems the loss of a tree(s) avoidable. Site plan control applications must create tree planting areas within the site and in the adjacent boulevard, meeting the City's soil volume requirements and planting standards.

- Trees along the March, Terry Fox, and Legget frontages are the highest priority to retain as screening for the site, through all stages of development.

- Temporary uses (parking, staging, etc.) are not generally an acceptable reason to remove protected trees. Ensure that plans, including for construction use, account for the retention of as many existing trees as possible.

- Please continue to explore options to further reduce parking spaces or pull the parking closer to the building to allow for retention of more of those trees around the perimeter of the site with a reasonable chance of retention through the future site plan.

- The TCR must meet the requirements laid out in Schedule E of the Tree Protection By-law. Please provide further detail on the following within the TCR:

    - Canopy cover assessment and comparison
    - Confirmation that the proposed tree protection fencing location is measured as 10xdbh as a radius from the trunk of each tree
    - Mitigation recommendations where excavation is proposed within the CRZ of any protected tree
    - Installation of retaining/toe walls and parking islands in close proximity to protected trees without impacting tree stability or survival
    - Discussion of options considered to design parking to minimize tree impacts
    - A summary table of trees to be removed, retained and planted

Landscape Plan comments

- A Landscape Plan is required with this application. To support the City's urban forest canopy cover target, efforts shall be made to provide as much canopy cover as possible at a site level, through tree planting and tree retention. The Landscape Plan shall show how the proposed tree planting and retention will contribute to the City's overall canopy cover over time by doing a projection of the future canopy cover for the site to 40 years. The calculations for the canopy cover projection must be shown on the plan.

- Since our first meeting, the City has adopted the new Landscape Plan Terms of Reference. Please ensure that the conceptual landscape plan addresses the high level aspects of these requirements (in particular, the section below, related to canopy cover projection). Future landscape plans must address all of the components within this document.

- The site plan is mostly hard surface. Along with the canopy cover targets, please demonstrate how urban heat islands will be addressed. Best Management Practices include provision of one tree for every 5 parking spaces within parking lot areas.

- The Official Plan designates March Rd as a Scenic Entry Route and provides direction to maintain or enhance the views from these roadways through provision of landscaping (including a double row of trees) as screening from parking lots and outdoor storage. The Landscape, Site plan and TCR will need to address how this landscape screening will be provided, accounting for retention of existing trees and any potential road widening.

- The Official Plan section 4.8.2, sub 3 provides the following direction related to tree planting related to site plans:

    - a) Preserve and provide space for mature, healthy trees on private and public property, including the provision of adequate volumes of high-quality soil as recommended by a Landscape Architect;
    - b) On urban properties subject to site plan control or community planning permits, development shall create tree planting areas within the site and in the adjacent boulevard, as applicable, that meet the soil volume requirements in any applicable City standards or best management practices or in accordance with the recommendation of a Landscape Architect;

- Understanding that most planting on this site will be temporary, prior to the development of the lot, the priority areas for tree planting are around the perimeter of the site, including the Right of Ways.

- The planting plan should prioritize large-growing native species to increase the canopy cover on site. Along the March Rd frontage, where screening is a high priority, conifers or trees with low, dense branching should be considered.

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

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

Feel free to contact Nancy Young for follow-up questions.

Let me know if you have any questions.

Best Regards,
Krishon Walker, MCIP, RPP, PMP
Planner II | Urbaniste II
Economic Development Services | Services de développement économique

Planning, Real Estate and Economic Development | Direction générale de la planification, de l’immobilier et du développement économique

City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West / 110 avenue Laurier Ouest
Ottawa, Ontario, K1P 1J1
☎ 613.580.2424 ext./poste 24161

My pronouns are he/him

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Francois Thauvette

From: Surprenant, Eric <Eric.Surprenant@ottawa.ca>
Sent: Friday, October 13, 2023 10:09 AM
To: Francois Thauvette
Cc: Walker, Krishon; Cunnington, Erik; James Ireland; Greg Winters
Subject: Re: 600 March Road - Parking Lot Expansion (121334)

Hello François,
Thanks for reaching out. I can agree that for a temporary parking lot we can be flexible on a few fronts. Please ensure that your rational is well presented in the Stormwater Management study, the overcontrol of the site does address the concern and therefore we will not ask that you analyse the Leggett Sewer.

As for the more frequent ponding occurring in Nokia's "temporary" parking as I noted please also provide full rational in the Stormwater Management report.
Hopefully this addresses your concerns.
Let me know if you have any further questions.
Thanks,

Eric Surprenant, CET
Sr, Project Manager, Infrastructure Projects, West
Planning, Real Estate & Economic Development
613 580-2424 ext.: 27794

Absence Alert:

From: Francois Thauvette <f.thauvette@novatech-eng.com>
Sent: October 12, 2023 15:13
To: Surprenant, Eric <Eric.Surprenant@ottawa.ca>
Cc: Walker, Krishon <krishon.walker@ottawa.ca>; Cunnington, Erik <Erik.Cunnington@colliers.com>; James Ireland <j.ireland@novatech-eng.com>; Greg Winters <g.winters@novatech-eng.com>
Subject: RE: 600 March Road - Parking Lot Expansion (121334)

Hi Eric,
In our Teams call yesterday, you mentioned that the City 'might' be looking for an analysis of the City's downstream storm sewer system. Unfortunately, you left before the end of the meeting, so we never finished the conversation. Is an analysis necessary if we intend to over-control post-development flows from the new temporary parking lot by approximately 74 L/s less than the allowable release rate specified by the City? We assume that since we are over-controlling post-development flows, there would be no negative impact on the City's sewer system. Based on the current design, the 100-year post-development peak storm flows will be controlled to approximately 128 L/s (based on the capacity of the on-site storm sewer) vs. a Q allowable of ~202 L/s. As discussed, we cannot upsize the on-site storm sewer nor can we increase its slope as the receiving sewer in Legget Drive is a (shallow) 375mm dia. pipe and we are already struggling with cover.

An analysis of the municipal storm sewer system was never included in our scope of work as this is typically done by the City's SWM modelling group and we are significantly over-controlling post-development flows when compared to the allowable release rate specified by the City. If necessary, we assume the City's SWM modelling group could input our post-development flows into their model to analyse the downstream sewer system. We do not have the HGL information, nor do we have the storm drainage area plan for the municipal storm sewer system in this area.
Please review and provide additional clarification (re: the analysis of the downstream storm sewer system) as part of the City's formal response.
Regards,

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

-----Original Appointment-----
From: Walker, Krishon <krishon.walker@ottawa.ca>
Sent: Tuesday, October 3, 2023 2:24 PM
To: Walker, Krishon; Cunnington, Erik; Ryan James; James Ireland; Francois Thauvette; Young, Nancy; Surprenant, Eric
Cc: Angela Taggart; kirby@kerryhill.ca
Subject: 600 March Road (Parking Lot Expansion)
When: Wednesday, October 11, 2023 1:45 PM-2:30 PM (UTC-05:00) Eastern Time (US & Canada).
Where: Microsoft Teams Meeting
Importance: High

Hello all,
I am pushing our meeting back by 15 minutes – we will meet from 1:45 pm to 2:30 pm. That should give us enough time to discuss submission package and next steps.

Best Regards,
Krishon Walker, MCIP, RPP, PMP
Planner II | Urbaniste II
Economic Development Services | Services de développement économique
Planning, Real Estate and Economic Development | Direction générale de la planification, de l'immobilier et du développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West / 110 avenue Laurier Ouest
Ottawa, Ontario, K1P 1J1
☎ 613.580.2424 ext./poste 24161
My pronouns are he/him

Microsoft Teams meeting

Join on your computer, mobile app or room device
Click here to join the meeting

Meeting ID: 233 394 456 22
Passcode: Hr5n9K
Download Teams | Join on the web

Join with a video conferencing device

teams@vc.ottawa.ca

Video Conference ID: 117 869 330 9
Alternate VTC instructions

Or call in (audio only)

+1 613-319-1080,,880618839# Canada, Ottawa-Hull

Phone Conference ID: 880 618 839#
Find a local number | Reset PIN

Learn More | Meeting options

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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.)

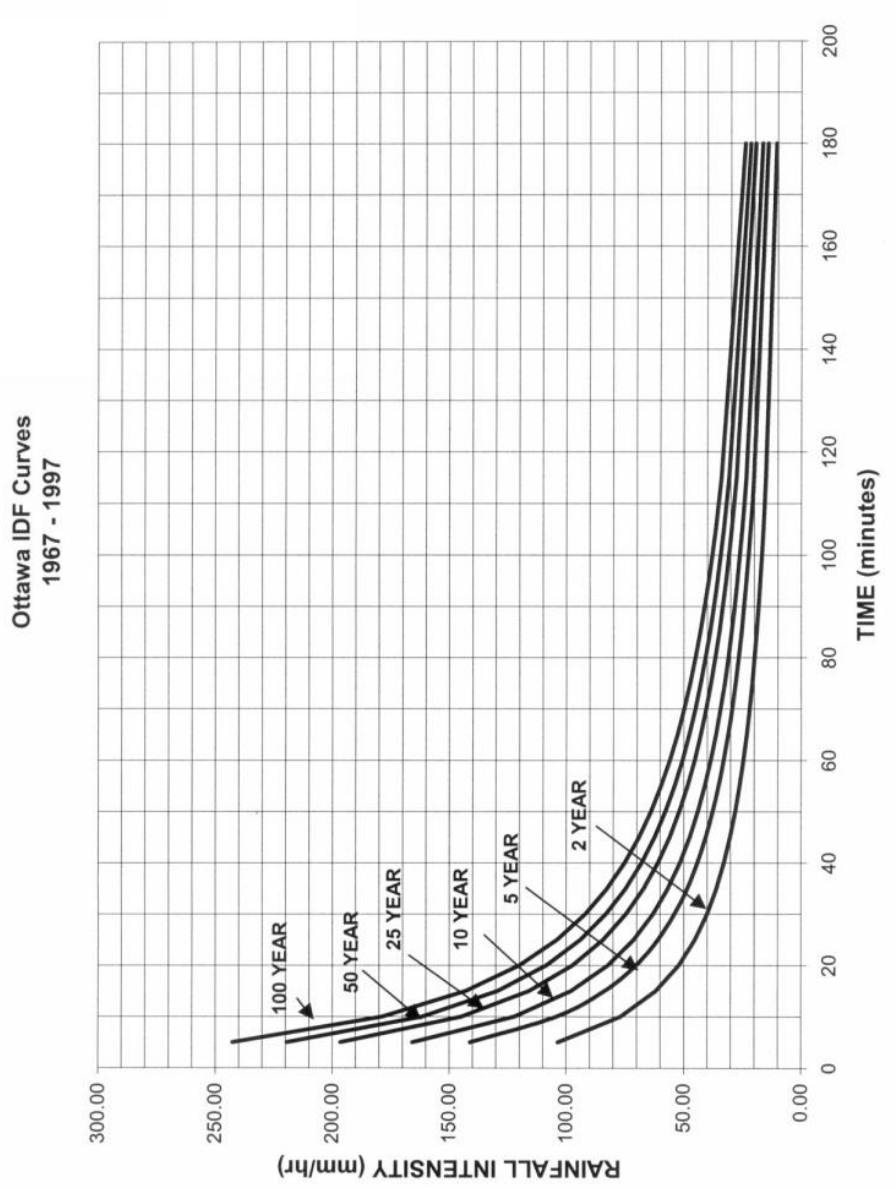
4.6 Conclusion Checklist

- ☒ 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

IDF Curves, SWM Calculations

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



NOVATECH
Engineers, Planners & Landscape Architects

Proposed Parking Lot
600 March Road

Pre - Development Stormwater Flows												
Description	Area (ha)	A_{imperv} (ha) C=0.9	A_{gravel} (ha) C=0.7	$A_{pervious}$ (ha) C=0.2	Weighted C_{w5}	Weighted C_{w100}	2-Year Flow (L/s)	5-Year Flow (L/s)	100-Year Flow (L/s)	Allowable C_{w5}	Allowable Flows 5-year (L/s)	
Subject Site to be Developed	2.298	0.778	0.000	1.520	0.44	0.50	145.3	196.1	386.1	0.44	**196.1**	T_c = 20mins
Offsite Tributary Area OS-1	0.087	0.002	0.000	0.085	0.22	0.27	2.7	3.7	7.8	0.22	**3.7**	T_c = 20mins
Offsite Tributary Area OS-2	0.069	0.000	0.000	0.069	0.20	0.25	2.0	2.7	5.8	0.20	**2.7**	T_c = 20mins
Total	2.454	0.780	0.000	1.674	0.42	0.49	150.0	202.5	399.7	0.42	**202.5**	

$Q_{cap375mm\ dia.\ @\ 0.5\%}$=129L/s

Post - Development Stormwater Flows																
Area	Description	Area (ha)	A_{imp} (ha) C=0.9	A_{perv} (ha) C=0.2	C_5	C_{100}	Uncontrolled Flow (L/s)			Controlled Flow (L/s)			Storage Required (m^3)			Storage Available (m^3)
							2-year	5-year	100-year	2-year	5-year	100-year	2-year	5-year	100-year	
A-1	Controlled Flow (Incl. OS-1 and OS-2 Flows)	1.720	1.231	0.489	0.70	0.79	-	-	-	94.4	94.6	97.6	156.6	242.2	582.1	1001.1
A-2	Controlled Flow (Pond)	0.765	0.501	0.264	0.66	0.74	-	-	-	20.4	23.3	30.1	87.3	124.1	268.7	406.3
Totals :		2.485	-	-	-	-	**0.0**	**0.0**	**0.0**	**114.8**	**117.9**	**127.7**	**243.9**	**366.3**	**850.8**	**1407.4**
							Total On-Site Stormwater Flows			**114.8**	**117.9**	**127.7**				

Project #: 121334
Project Name: 600 March Road
Location: Ottawa

Date Prepared: 11/3/2023

Proposed Parking Lot — Storage Calculations Using Average
Novatech Project No. 121334 — Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-1 + OS-1 Controlled Site Flows + Offsite Areas 1 & 2

OTTAWA IDF CURVE — Qpeak = 94.4 L/s
Area = 1.720 ha — Qavg = 47.2 L/s
C = 0.70 — Vol(max) = 156.6 m3
(Vol calculated for Qallow-avg)

Time	Intensity	Q	Qnet	Vol
(min)	(mm/hr)	(L/s)	(L/s)	(m3)
5	103.57	347.16	299.96	89.99
10	76.81	257.44	210.24	126.14
15	61.77	207.03	159.83	143.85
20	52.03	174.40	127.20	152.64
25	45.17	151.39	104.19	156.29
30	40.04	134.22	87.02	156.63
35	36.06	120.87	73.67	154.70
40	32.86	110.16	62.96	151.09
45	30.24	101.36	54.16	146.23
50	28.04	93.99	46.79	140.37
55	26.17	87.72	40.52	133.71
60	24.56	82.31	35.11	126.41
65	23.15	77.60	30.40	118.56
70	21.91	73.45	26.25	110.24
75	20.81	69.76	22.56	101.53
90	18.14	60.81	13.61	73.51
105	16.13	54.08	6.88	43.33
120	14.56	48.81	1.61	11.59
135	13.30	44.57	-2.63	-21.34
150	12.25	41.07	-6.13	-55.21

Proposed Parking Lot — Storage Calculations Using Average
Novatech Project No. 121334 — Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-1 + OS-1 Controlled Site Flows + Offsite Areas 1 & 2

OTTAWA IDF CURVE — Qpeak = 94.6 L/s
Area = 1.720 ha — Qavg = 47.3 L/s
C = 0.70 — Vol(max) = 242.2 m3
(Vol calculated for Qallow-avg)

Time	Intensity	Q	Qnet	Vol
(min)	(mm/hr)	(L/s)	(L/s)	(m3)
5	141.18	473.21	425.91	127.77
10	104.19	349.24	301.94	181.16
15	83.56	280.07	232.77	209.49
20	70.25	235.47	188.17	225.81
25	60.90	204.11	156.81	235.22
30	53.93	180.76	133.46	240.22
35	48.52	162.62	115.32	242.18
40	44.18	148.10	100.80	241.92
45	40.63	136.18	88.88	239.98
50	37.65	126.21	78.91	236.72
55	35.12	117.73	70.43	232.41
60	32.94	110.42	63.12	227.24
65	31.04	104.05	56.75	221.34
70	29.37	98.45	51.15	214.83
75	27.89	93.48	46.18	207.80
90	24.29	81.41	34.11	184.20
105	21.58	72.34	25.04	157.76
120	19.47	65.25	17.95	129.26
135	17.76	59.55	12.25	99.19
150	16.36	54.84	7.54	67.89

Structures	Size (mm)	Area (m²)	T/G	Inv IN	Inv OUT	Structures	Size (mm)	Area (m²)	T/G	Inv IN	Inv OUT
STMMH 112	1200	1.13	81.30		78.56	CBMH 106	1200	1.13	81.10	79.08	79.05
CBMH 110	1200	1.13	81.10		78.66	CBMH 104	1200	1.13	81.15	79.17	79.14
CBMH 108	1200	1.13	81.10	78.89	78.88	CBMH 102	1200	1.13	81.15		79.34
STMMH 120	1200	1.13	81.25		78.76	CBMH 100	1200	1.13	81.15	79.57	79.56

PI = 3.1415927
PIPE I.D.= 375 (PVC Pipe)
U/G Storage Pipe Volume
End Area 0.110 (m²)
Total Length 345.0 (m)
Pipe Volume 38.1 (m³)

Area A-1: Storage Table

Elevation	System Depth	STMMH 112 Volume	CBMH 110 Volume	CBMH 108 Volume	STMMH 120 Volume	CBMH 106 Volume	CBMH 104 Volume	CBMH 102 Volume	CBMH 100 Volume	Pipe Volume	Underground Storage Combined Volume	Surface Storage																		Total Storage		
												CB 01		CBMH 100		CBMH 102		CB 02		CBMH 104		CBMH 106		CB 03		CBMH 108		CBMH 110		CB 04		CB 05		Ponding Volume	Total Volume	Design Head
(m)	(m)	(m³)	(m³)	(m³)	(m³)	(m³)	(m³)	(m³)	(m³)	(m³)	(m³)	Area (m²)	Volume (m³)	Area (m²)	Volume (m³)	Area (m²)	Volume (m³)	Area (m²)	Volume (m³)	Area (m²)	Volume (m³)	Area (m²)	Volume (m³)	Area (m²)	Volume (m³)	Area (m²)	Volume (m³)	Area (m²)	Volume (m³)	Area (m²)	Volume (m³)	Area (m²)	Volume (m³)	(m³)	(m³)	
78.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-
78.60	0.04	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	5.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.0	-0.35
78.80	0.24	0.27	0.16	0.00	0.05	0.00	0.00	0.00	0.00	0.00	10.00	10.48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.5	-0.15
79.00	0.44	0.50	0.38	0.14	0.27	0.00	0.00	0.00	0.00	0.00	15.00	16.29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16.3	0.05
79.20	0.64	0.72	0.61	0.36	0.50	0.17	0.07	0.00	0.00	0.00	20.00	22.43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22.4	0.25
79.40	0.84	0.95	0.84	0.59	0.72	0.40	0.29	0.07	0.00	0.00	25.00	28.86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28.9	0.45
79.60	1.04	1.18	1.06	0.81	0.95	0.62	0.52	0.29	0.05	30.00	35.49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35.5	0.65
79.80	1.24	1.40	1.29	1.04	1.18	0.85	0.75	0.52	0.27	38.10	45.39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45.4	0.85
80.00	1.44	1.63	1.52	1.27	1.40	1.07	0.97	0.75	0.50	38.10	47.20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47.2	1.05
80.20	1.64	1.85	1.74	1.49	1.63	1.30	1.20	0.97	0.72	38.10	49.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49.0	1.25
80.40	1.84	2.08	1.97	1.72	1.85	1.53	1.43	1.20	0.95	38.10	50.82	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50.8	1.45
80.60	2.04	2.31	2.19	1.95	2.08	1.75	1.65	1.43	1.18	38.10	52.63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52.6	1.65
80.80	2.24	2.53	2.42	2.17	2.31	1.98	1.88	1.65	1.40	38.10	54.44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	54.4	1.85
81.00	2.44	2.76	2.65	2.40	2.53	2.21	2.10	1.88	1.63	38.10	56.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56.3	2.05
81.10	2.54	2.87	2.76	2.51	2.65	2.32	2.22	1.99	1.74	39.10	58.16	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0.0	58.16	2.15
81.15	2.59	2.93	2.76	2.51	2.70	2.32	2.27	2.05	1.80	40.10	59.44	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0	12.4	0.3	22.2	0.6	39.9	1.0	30.3	0.8	30.3	0.8	21.5	0.5	3.9	63.35	2.20
81.20	2.64	2.99	2.76	2.51	2.76	2.32	2.27	2.05	1.80	38.10	57.55	15.5	0.4	15.4	0.4	23.6	0.6	20.7	0.5	23.1	0.6	36.6	1.5	74.8	3.0	135.6	5.4	104.1	4.1	97.5	4.0	66.7	2.7	23.2	80.72	2.25
81.40	2.84	3.10	2.76	2.51	2.85	2.32	2.27	2.05	1.80	38.10	57.76	302.1	32.1	278.9	29.6	445.5	47.5	466.8	49.3	411.2	44.0	256.4	39.8	562.7	86.7	949.9	113.9	712.7	85.8	853.2	83.0	394.4	48.9	831.1	689.46	2.45
81.45	2.89	3.16	2.76	2.51	2.85	2.32	2.27	2.05	1.80	38.10	57.76	439.0	50.7	378.9	46.0	591.2	73.4	660.7	77.5	547.4	68.0	352.2	46.3	659.2	97.5	1129.7	163.9	827.8	124.3	812.05	123.2	477.3	70.6	943.4	1001.14	2.50

*CBs were not used to calculate underground storage as their volume capacity is negligible

Proposed Parking Lot — Storage Calculations Using Average
Novatech Project No. 121334 — Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-1 + OS-1 Controlled Site Flows + Offsite Areas 1 & 2

OTTAWA IDF CURVE — Qpeak = 97.6 L/s
Area = 1.720 ha — Qavg = 48.8 L/s
C = 0.79 — Vol(max) = 582.1 m3
(Vol calculated for Qallow-avg)

Time	Intensity	Q	Qnet	Vol
(min)	(mm/hr)	(L/s)	(L/s)	(m3)
5	242.70	913.06	864.26	259.28
10	178.56	671.75	622.95	373.77
15	142.89	537.57	488.77	439.90
20	119.95	451.26	402.46	482.95
25	103.85	390.68	341.88	512.81
30	91.87	345.61	296.81	534.26
35	82.58	310.66	261.86	549.91
40	75.15	282.70	233.90	561.36
45	69.05	259.77	210.97	569.62
50	63.95	240.60	191.80	575.39
55	59.62	224.31	175.51	579.17
60	55.89	210.28	161.48	581.32
65	52.65	198.06	149.26	582.11
70	49.79	187.31	138.51	581.74
75	47.26	177.76	128.96	580.40
90	41.11	154.66	105.86	571.65
105	36.50	137.30	88.50	557.58
120	32.89	123.75	74.95	539.65
135	30.00	112.85	64.05	518.80
150	27.61	103.87	55.07	495.65

Proposed Parking Lot — Storage Calculations Using Average
Novatech Project No. 121334 — Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:100 YR + 20% IDF Increase
AREA A-1 + OS-1 Controlled Site Flows + Offsite Areas 1 & 2

OTTAWA IDF CURVE — Qpeak = 97.6 L/s
Area = 1.720 ha — Qavg = 48.8 L/s
C = 0.79 — Vol(max) = 740.4 m3
(Vol calculated for Qallow-avg)

Time	Intensity	Q	Qnet	Vol
(min)	(mm/hr)	(L/s)	(L/s)	(m3)
5	291.24	1095.67	1046.87	314.06
10	214.27	806.09	757.29	454.38
15	171.47	645.09	596.29	536.66
20	143.94	541.51	492.71	591.25
25	124.62	468.81	420.01	630.02
30	110.24	414.73	365.93	658.68
35	99.09	372.80	324.00	680.39
40	90.17	339.24	290.44	697.05
45	82.86	311.72	262.92	709.90
50	76.74	288.72	239.92	719.75
55	71.55	269.17	220.37	727.21
60	67.07	252.33	203.53	732.72
65	63.18	237.67	188.87	736.59
70	59.75	224.77	175.97	739.08
75	56.71	213.33	164.53	740.40
90	49.33	185.59	136.79	738.68
105	43.80	164.77	115.97	730.58
120	39.47	148.50	99.70	717.85
135	36.00	135.42	86.62	701.62
150	33.13	124.65	75.85	682.62

Plug Type ICD w/ 167mm Dia. Orifice

1:100 Yr
Flow (L/s) = 97.6
Head (m) = 2.63
Elevation (m) = **81.38**
Outlet Pipe Dia.(mm) = 375
Volume (m3) = 582.1

1:5 Yr
Flow (L/s) = 94.6
Head (m) = 2.46
Elevation (m) = **81.23**
Outlet Pipe Dia.(mm) = 375
Volume (m3) = 242.2

1:2 Yr
Flow (L/s) = 94.4
Head (m) = 2.46
Elevation (m) = **81.21**
Outlet Pipe Dia.(mm) = 375
Volume (m3) = 156.6

Orifice Size - 1:100 yr Flow Check
Q=0.62xAx(2xg)^0.5

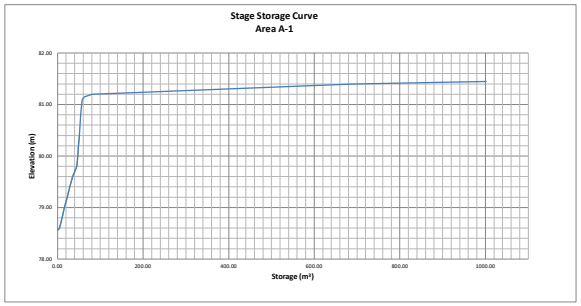
	1:100 yr	Flow Check
Q (m³/s) =	0.0976	**0.0976**
g (m/s²) =	9.81	9.81
h (m) =	**2.63**	2.63
A (m²) =	**0.021904651**	**0.02190**
D (m) =	**0.16750933**	**0.16750**
D (mm) =	**167**	167.0

1:5 yr Flow Check

	1:5 yr
Q (m³/s) =	0.0946
g (m/s²) =	9.81
h (m) =	**2.46**
A (m²) =	**0.02190**
D (m) =	**0.167**
D (mm) =	**167**

1:2 yr Flow Check

	1:2 yr
Q (m³/s) =	0.0944
g (m/s²) =	9.81
h (m) =	**2.46**
A (m²) =	**0.02190**
D (m) =	**0.167**
D (mm) =	**167**



Proposed Parking Lot — Storage Calculations Using Average
Novatech Project No. 121334 — Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-2 Controlled Site Flows (Pond)

OTTAWA IDF CURVE — Qpeak = 20.4 L/s
Area = 0.765 ha — Qavg = 10.2 L/s
C = 0.66 — Vol(max) = 87.3 m3
(Vol calculated for Qallow-avg)

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	145.03	134.83	40.45
10	76.81	107.55	97.35	58.41
15	61.77	86.49	76.29	68.66
20	52.03	72.86	62.66	75.19
25	45.17	63.25	53.05	79.57
30	40.04	56.07	45.87	82.57
35	36.06	50.49	40.29	84.62
40	32.86	46.02	35.82	85.97
45	30.24	42.34	32.14	86.79
50	28.04	39.27	29.07	87.20
55	26.17	36.65	26.45	87.27
60	24.56	34.39	24.19	87.08
65	23.15	32.42	22.22	86.65
70	21.91	30.68	20.48	86.03
75	20.81	29.14	18.94	85.25
90	18.14	25.41	15.21	82.11
105	16.13	22.59	12.39	78.07
120	14.56	20.39	10.19	73.37
135	13.30	18.62	8.42	68.18
150	12.25	17.16	6.96	62.60

Proposed Parking Lot — Storage Calculations Using Average
Novatech Project No. 121334 — Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-2 Controlled Site Flows (Pond)

OTTAWA IDF CURVE — Qpeak = 23.3 L/s
Area = 0.765 ha — Qavg = 11.7 L/s
C = 0.66 — Vol(max) = 124.1 m3
(Vol calculated for Qallow-avg)

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	197.69	186.04	55.81
10	104.19	145.90	134.25	80.55
15	83.56	117.00	105.35	94.82
20	70.25	98.37	86.72	104.07
25	60.90	85.27	73.62	110.43
30	53.93	75.51	63.86	114.96
35	48.52	67.94	56.29	118.21
40	44.18	61.87	50.22	120.53
45	40.63	56.89	45.24	122.15
50	37.65	52.73	41.08	123.23
55	35.12	49.18	37.53	123.86
60	32.94	46.13	34.48	124.13
65	31.04	43.47	31.82	124.10
70	29.37	41.13	29.48	123.81
75	27.89	39.05	27.40	123.31
90	24.29	34.01	22.36	120.75
105	21.58	30.22	18.57	117.00
120	19.47	27.26	15.61	112.39
135	17.76	24.88	13.23	107.13
150	16.36	22.91	11.26	101.35

Proposed Parking Lot — Storage Calculations Using Average
Novatech Project No. 121334 — Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-2 Controlled Site Flows (Pond)

OTTAWA IDF CURVE — Qpeak = 30.1 L/s
Area = 0.765 ha — Qavg = 15.1 L/s
C = 0.74 — Vol(max) = 268.7 m3
(Vol calculated for Qallow-avg)

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	382.56	367.51	110.25
10	178.56	281.46	266.41	159.84
15	142.89	225.24	210.19	189.17
20	119.95	189.07	174.02	208.83
25	103.85	163.69	148.64	222.96
30	91.87	144.81	129.76	233.56
35	82.58	130.17	115.12	241.74
40	75.15	118.45	103.40	248.16
45	69.05	108.84	93.79	253.24
50	63.95	100.81	85.76	257.27
55	59.62	93.98	78.93	260.48
60	55.89	88.10	73.05	263.00
65	52.65	82.98	67.93	264.94
70	49.79	78.48	63.43	266.41
75	47.26	74.49	59.44	267.47
90	41.11	64.80	49.75	268.66
105	36.50	57.53	42.48	267.62
120	32.89	51.85	36.80	264.97
135	30.00	47.28	32.23	261.09
150	27.61	43.52	28.47	256.24

Proposed Parking Lot — Storage Calculations Using Average
Novatech Project No. 121334 — Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:100 YR + 20% IDF Increase
AREA A-2 Controlled Site Flows (Pond)

OTTAWA IDF CURVE — Qpeak = 30.1 L/s
Area = 0.765 ha — Qavg = 15.1 L/s
C = 0.74 — Vol(max) = 340.1 m3
(Vol calculated for Qallow-avg)

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	459.08	444.03	133.21
10	214.27	337.75	322.70	193.62
15	171.47	270.29	255.24	229.71
20	143.94	226.89	211.84	254.21
25	124.62	196.43	181.38	272.07
30	110.24	173.77	158.72	285.70
35	99.09	156.20	141.15	296.41
40	90.17	142.14	127.09	305.01
45	82.86	130.61	115.56	312.01
50	76.74	120.97	105.92	317.76
55	71.55	112.78	97.73	322.51
60	67.07	105.73	90.68	326.43
65	63.18	99.58	84.53	329.67
70	59.75	94.18	79.13	332.34
75	56.71	89.38	74.33	334.50
90	49.33	77.76	62.71	338.64
105	43.80	69.04	53.99	340.11
120	39.47	62.22	47.17	339.63
135	36.00	56.74	41.69	337.69
150	33.13	52.23	37.18	334.58

Structures	Size (mm)	Area (m^2)	T/G	Inv IN	Inv OUT
STMMH 116	1200	1.13	79.73	78.12	78.11

Area A-2: Storage Table

Elevation (m)	System Depth (m)	STMMH 116 Underground Volume (m^3)	Surface Storage: Pond Area (m^2)	Surface Storage: Pond Volume (m^3)	Total Storage: Total Volume (m^3)	Design Head
78.11	0.00	0.00	0	0	**0.00**	-
78.20	0.09	0.10	0.0	0.0	**0.10**	-0.10
78.35	0.24	0.27	90.4	0.0	**0.27**	0.05
78.40	0.29	0.33	180.9	6.8	**7.11**	0.10
78.60	0.49	0.55	220.1	46.9	**47.44**	0.30
78.80	0.69	0.78	266.3	95.5	**96.31**	0.50
79.00	0.89	1.01	319.4	154.1	**155.10**	0.70
79.20	1.09	1.23	379.5	224.0	**225.22**	0.90
79.35	1.24	1.40	431.1	284.8	**286.18**	1.05
79.40	1.29	1.46	449.2	306.8	**308.24**	1.10
79.60	1.49	1.69	528.4	404.5	**406.22**	1.30
79.65	1.54	1.74	-	404.5	**406.28**	1.35

Plug Type ICD w/ 118mm Dia. Orifice

1:100 Yr
Flow (L/s) = 30.1
Head (m) = 1.00
Elevation (m) = **79.30**
Outlet Pipe Dia.(mm) = 375
Volume (m3) = 268.7

1:5 Yr
Flow (L/s) = 23.3
Head (m) = 0.60
Elevation (m) = **78.90**
Outlet Pipe Dia.(mm) = 375
Volume (m3) = 124.1

1:2 Yr
Flow (L/s) = 20.4
Head (m) = 0.46
Elevation (m) = **78.76**
Outlet Pipe Dia.(mm) = 375
Volume (m3) = 87.3

Orifice Size - 1:100 yr Flow Check

Q=0.62xAx(2gh)^0.5

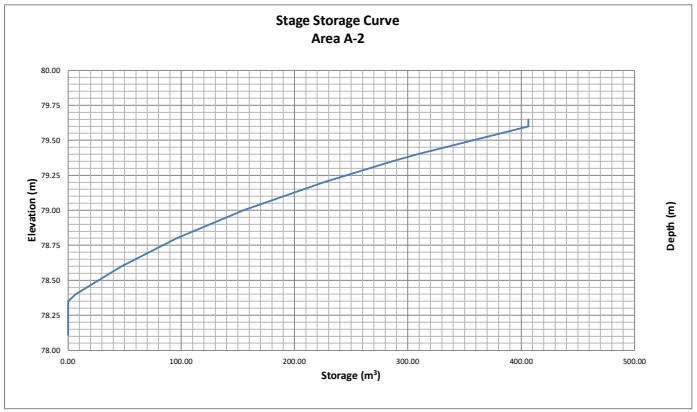
	1:100 yr	Flow Check
Q (m^3/s) =	0.0301	**0.0301**
g (m/s^2) =	9.81	9.81
h (m) =	**1.00**	1.00
A (m^2) =	**0.010946697**	**0.01094**
D (m) =	**0.118058325**	**0.11800**
D (mm) =	**118**	118.0

1:5 yr Flow Check

	1:5 yr
Q (m^3/s) =	0.0233
g (m/s^2) =	9.81
h (m) =	**0.60**
A (m^2) =	**0.01094**
D (m) =	**0.118**
D (mm) =	**118**

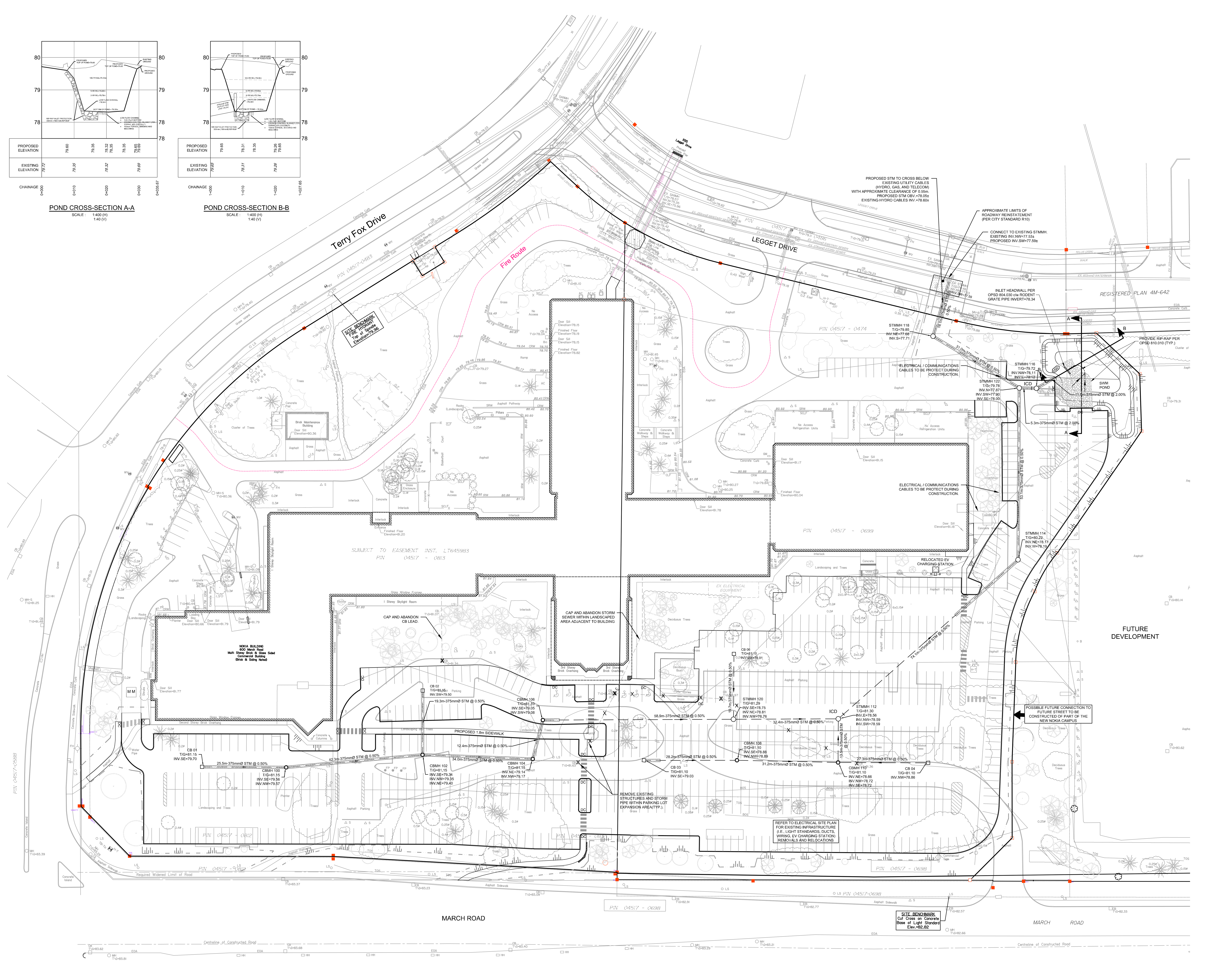
1:2 yr Flow Check

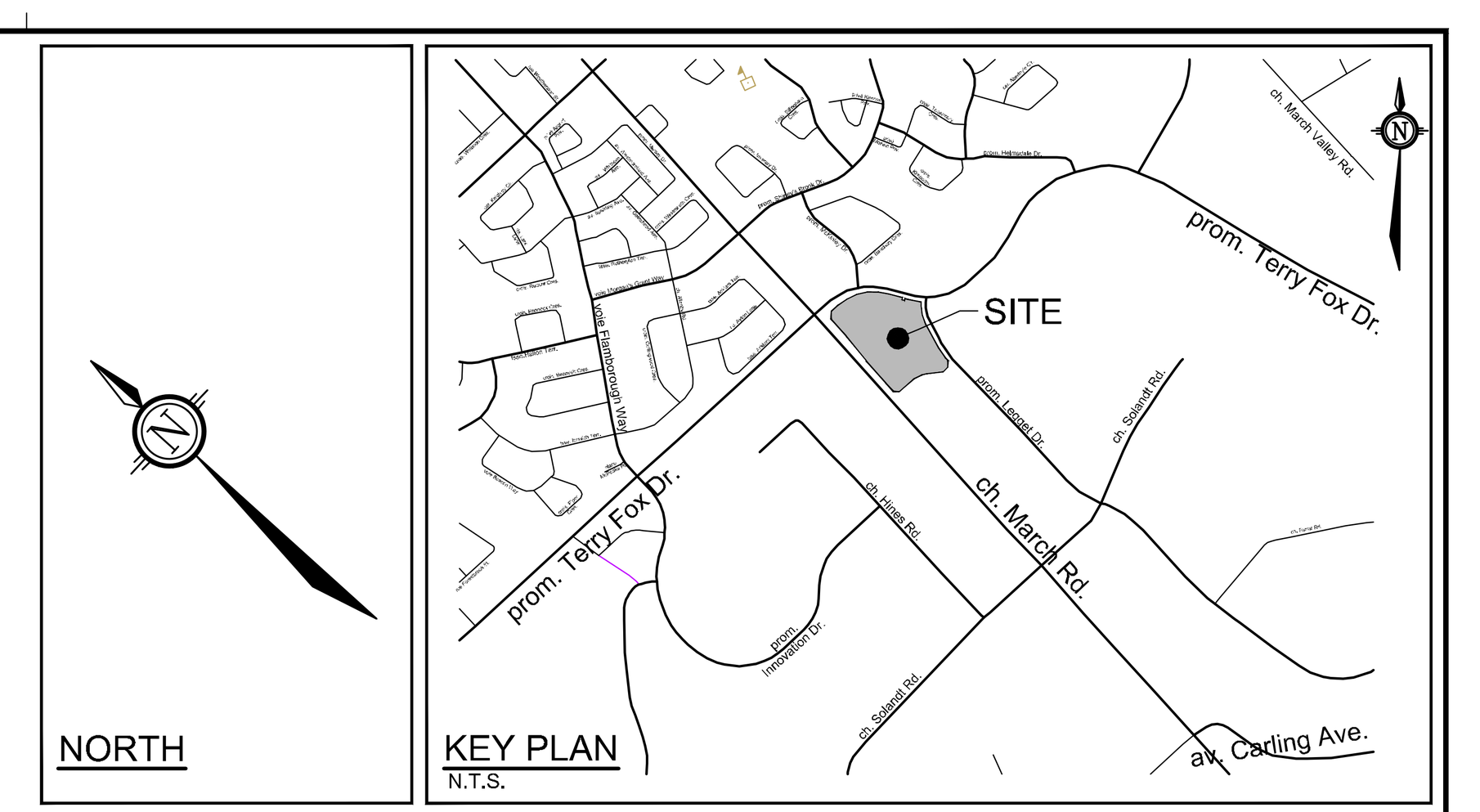
	1:2 yr
Q (m^3/s) =	0.0204
g (m/s^2) =	9.81
h (m) =	**0.46**
A (m^2) =	**0.01094**
D (m) =	**0.118**
D (mm) =	**118**

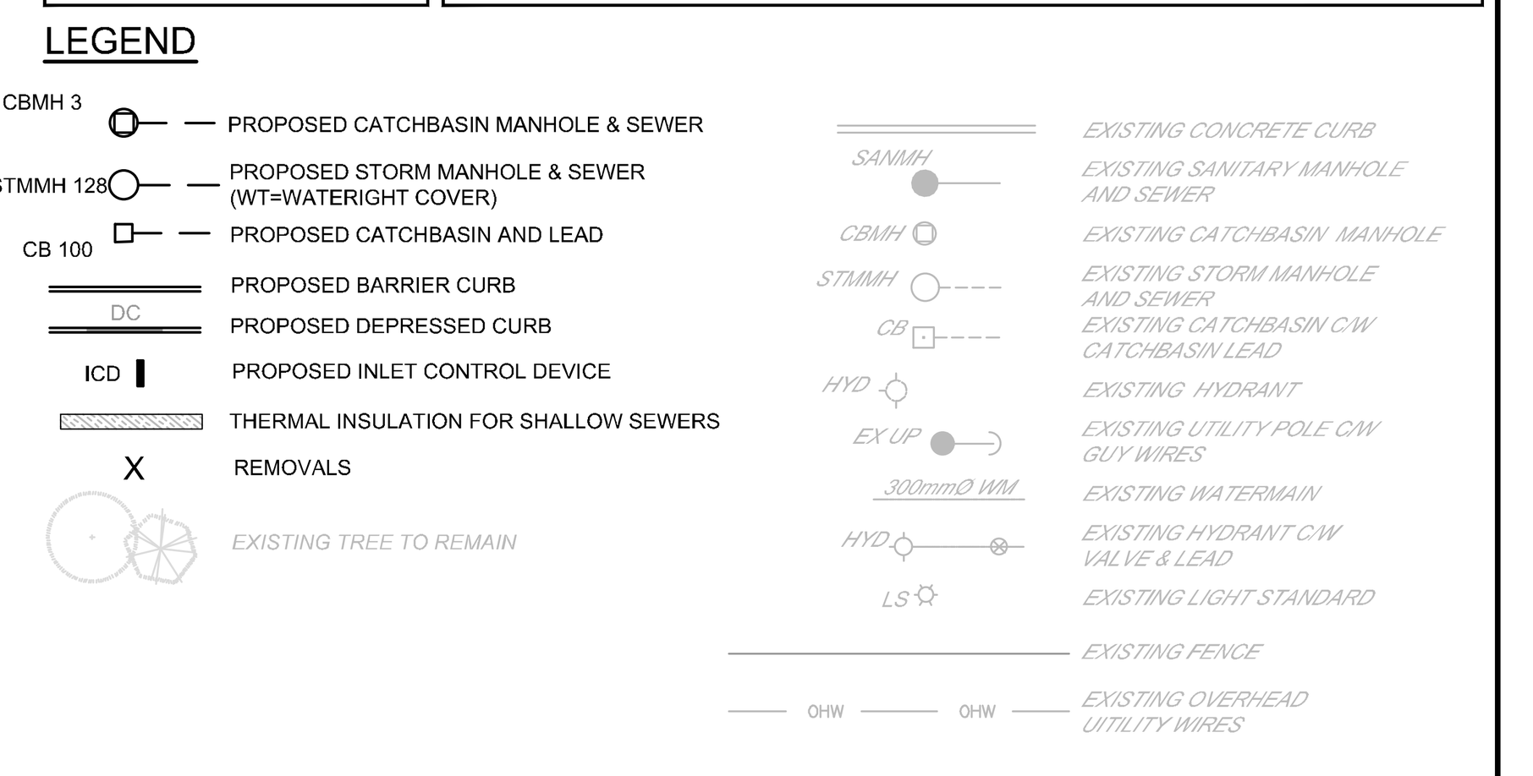


APPENDIX D

Engineering Drawings







GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
7. ALL ELEVATIONS ARE GEODETIC.
8. REFER TO THE GEOTECHNICAL INVESTIGATION AND HYDROGEOLOGICAL ASSESSMENT - 600 MARCH ROAD - (REPORT NO. 12606873-RPT-1), PREPARED BY GHD ON JUNE 16, 2023., FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS, AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
9. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS.
10. REFER TO STORMWATER MANAGEMENT REPORT(R-2023-143) PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD.
11. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
12. PROVIDE LINE/PARKING PAINTING.
13. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL 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, VALVE AND HYDRANT LOCATIONS, T/WM ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC.

SEWER NOTES:

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

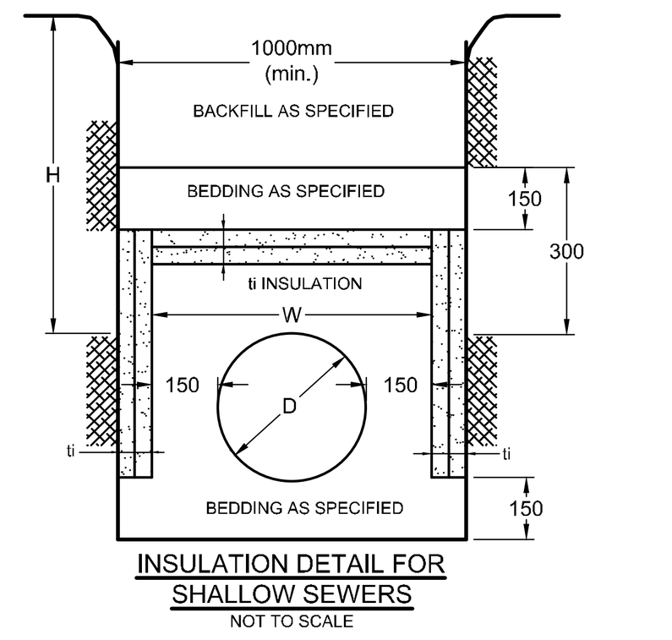
ITEM	SPEC. No.	REFERENCE
CATCHBASIN (600x600mm)	705.010	OPSD
STORM / SANITARY MANHOLE (1200mmØ)	701.010	OPSD
CB, FRAME & COVER	400.020	OPSD
STORM / SANITARY MH FRAME & COVER	401.010	OPSD
WATERTIGHT MH FRAME AND COVER	401.030	OPSD
SEWER TRENCH	S6	CITY OF OTTAWA

STORM SEWER PVC DR 35
CATCHBASIN LEAD PVC DR 35

3. ALL STORM AND SANITARY SERVICE LATERALS SHALL BE EQUIPPED WITH BACKFLOW PREVENTION DEVICES AS PER THE CITY OF OTTAWA STANDARD DETAILS S14 AND S14.1 OR S14.2.
4. INSULATE ALL PIPES (SAN/STM) THAT HAVE LESS THAN 1.8m COVER WITH HI-40 INSULATION PER INSULATION DETAIL FOR SHALLOW SEWERS. PROVIDE 150mm CLEARANCE BETWEEN PIPE AND INSULATION.
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. 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.
8. THE OWNER SHALL REQUIRE THAT THE SITE SERVICING CONTRACTOR PERFORM FIELD TESTS FOR QUALITY CONTROL OF ALL SANITARY SEWERS. LEAKAGE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH OPSS 410.07.16, 410.07.16.04 AND 407.07.24. DYE TESTING IS TO BE COMPLETED ON ALL SANITARY SERVICES TO CONFIRM PROPER CONNECTION TO THE SANITARY SEWER MAIN. THE FIELD TESTS SHALL BE PERFORMED IN THE PRESENCE OF A CERTIFIED PROFESSIONAL ENGINEER WHO SHALL SUBMIT A CERTIFIED COPY OF THE TEST RESULTS.
6. ALL STORM MANHOLES AND CATCHBASIN MANHOLES ARE TO HAVE 300mm SUMPS UNLESS OTHERWISE INDICATED. ALL CATCHBASINS ARE TO HAVE 600mm SUMPS UNLESS OTHERWISE INDICATED.
7. ALL CATCHBASINS, MANHOLES AND/OR CATCHBASIN MANHOLES THAT ARE TO HAVE ICD'S INSTALLED WITHIN THEM ARE TO HAVE 600mm SUMPS.
8. ALL WEEPING TILE CONNECTIONS TO BE MADE TO THE PROPOSED STORM SEWER SYSTEM DOWNSTREAM OF ANY INLET CONTROL DEVICES.
9. CONTRACTOR 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.

BENCHMARK NOTES:

1. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM.
2. IT IS THE RESPONSIBILITY OF THE USER OF THIS INFORMATION TO VERIFY THAT THE JOB BENCHMARK HAS NOT BEEN ALTERED OR DISTURBED AND THAT IT'S RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION SHOWN ON THIS DRAWING.
3. BENCHMARK WAS PROVIDED ON THE TOPOGRAPHIC PLAN OF SURVEY OF BLOCK 6 AND PART OF BLOCK 1 REGISTERED PLAN 4M-642 AND PART OF LOTS 8 AND 9 CONCESSION 4, GEOGRAPHIC TOWNSHIP OF MARCH, CITY OF OTTAWA, SURVEYED BY ANNIS, O'SULLIVAN AND VOLEBEKK LTD.



INSULATION DETAIL FOR SHALLOW SEWERS
NOT TO SCALE

INSULATION NOTES:

1. THE THICKNESS OF SEWER INSULATION SHALL BE THE EQUIVALENT OF 25mm FOR EVERY 300mm REDUCTION IN THE REQUIRED DEPTH OF COVER LESS THAN 1500mm (SEE TABLE)

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)

INLET CONTROL DEVICE DATA TABLE: AREA A-1 (INCL. AREAS OS-1 & OS-2)

DESIGN EVENT	ICD TYPE (PLUG TYPE)	OUTLET STRUCTURE	DIAMETER OF OUTLET PIPE (mm)	PEAK DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m^3)	AVAILABLE STORAGE
1:2 YR	167mm DIA. ORIFICE PLUG TYPE ICD	STMMH 112 1200mmØ	375mmØ PVC	94.4	2.46	81.21	156.6	1001.1 m^3
1:5 YR				94.6	2.48	81.23	242.2	
1:100 YR				97.6	2.63	81.38	582.1	

INLET CONTROL DEVICE DATA TABLE: AREA A-2 (POND)

DESIGN EVENT	ICD TYPE (PLUG TYPE)	OUTLET STRUCTURE	DIAMETER OF OUTLET PIPE (mm)	PEAK DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m^3)	AVAILABLE STORAGE
1:2 YR	118mm DIA. ORIFICE PLUG TYPE ICD	STMMH 116 1200mmØ	375mmØ PVC	20.4	0.46	78.76	87.3	406.3 m^3
1:5 YR				23.3	0.60	78.90	124.1	
1:100 YR				30.1	1.00	79.30	268.7	

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.

OWNER INFORMATION
NOKIA c/o COLLIERS
181 BAY STREET, SUITE 1400
TORONTO, ONTARIO, M5J 2V1

ERIK CUNNINGTON
PHONE: (416) 920-0155
EMAIL: erik.cunnington@colliers.com

No.	REVISION	DATE	BY
2.	ISSUED FOR SPC APPROVAL	NOV 7/23	FST
1.	PRELIMINARY PLANS ISSUED TO CITY	OCT 02/23	FST

SCALE
1:400

DESIGN	CHECKED	DRAWN	CHECKED	APPROVED
ZA	FST	ZA	FST	FST

FOR REVIEW ONLY

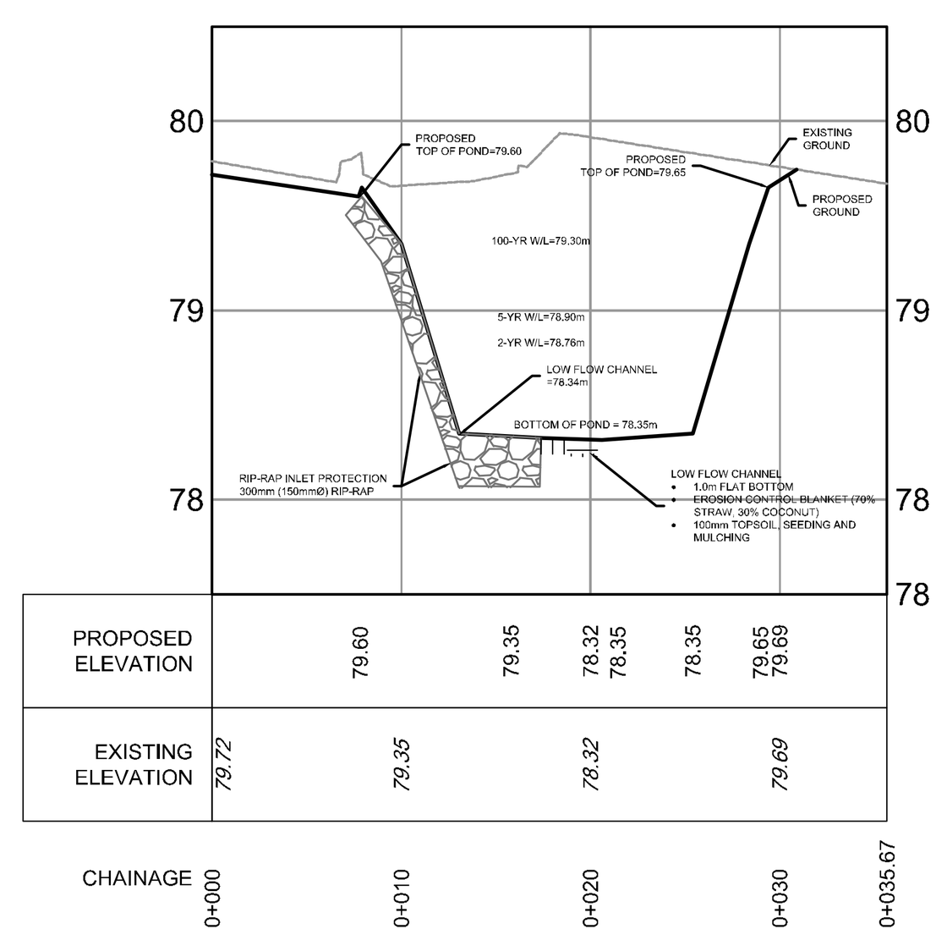
LICENSED PROFESSIONAL ENGINEER
F.S. THAUVETTE
100041399
November 7, 2023
PROVINCE OF ONTARIO

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

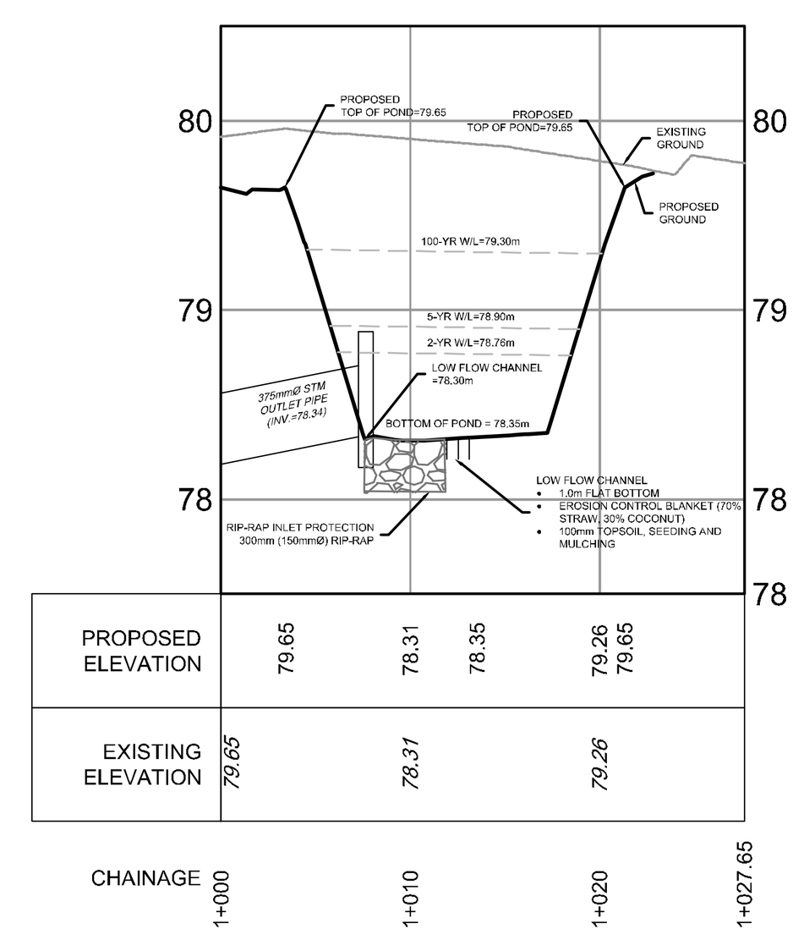
LOCATION
CITY OF OTTAWA
600 MARCH ROAD - NOKIA PARKING LOT EXPANSION

DRAWING NAME
GENERAL PLAN OF SERVICES

PROJECT No. 121334
REV: REV # 2
DRAWING No. 121334-GP



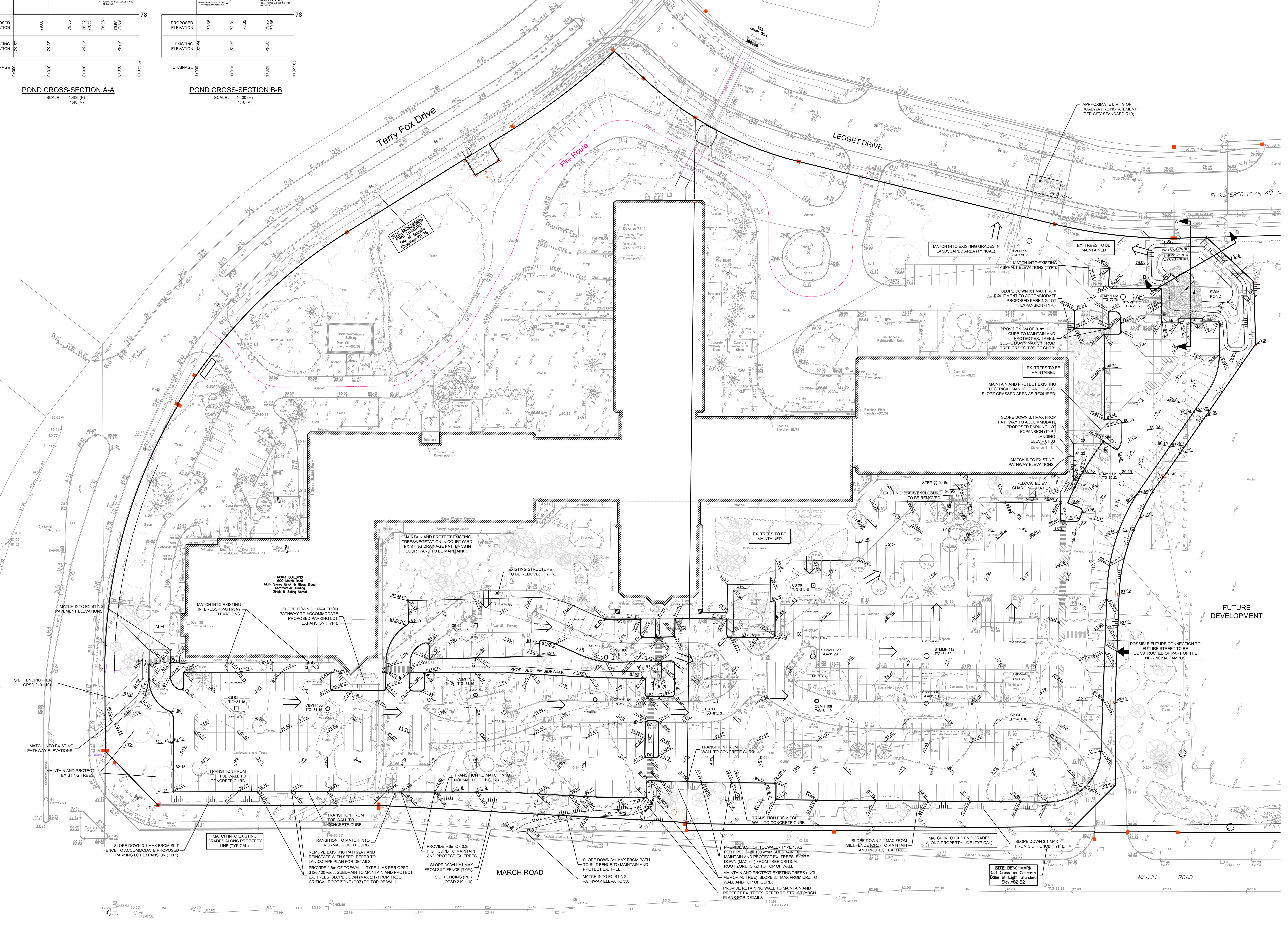
POND CROSS-SECTION A-A
SCALE : 1:400 (H) 1:40 (V)

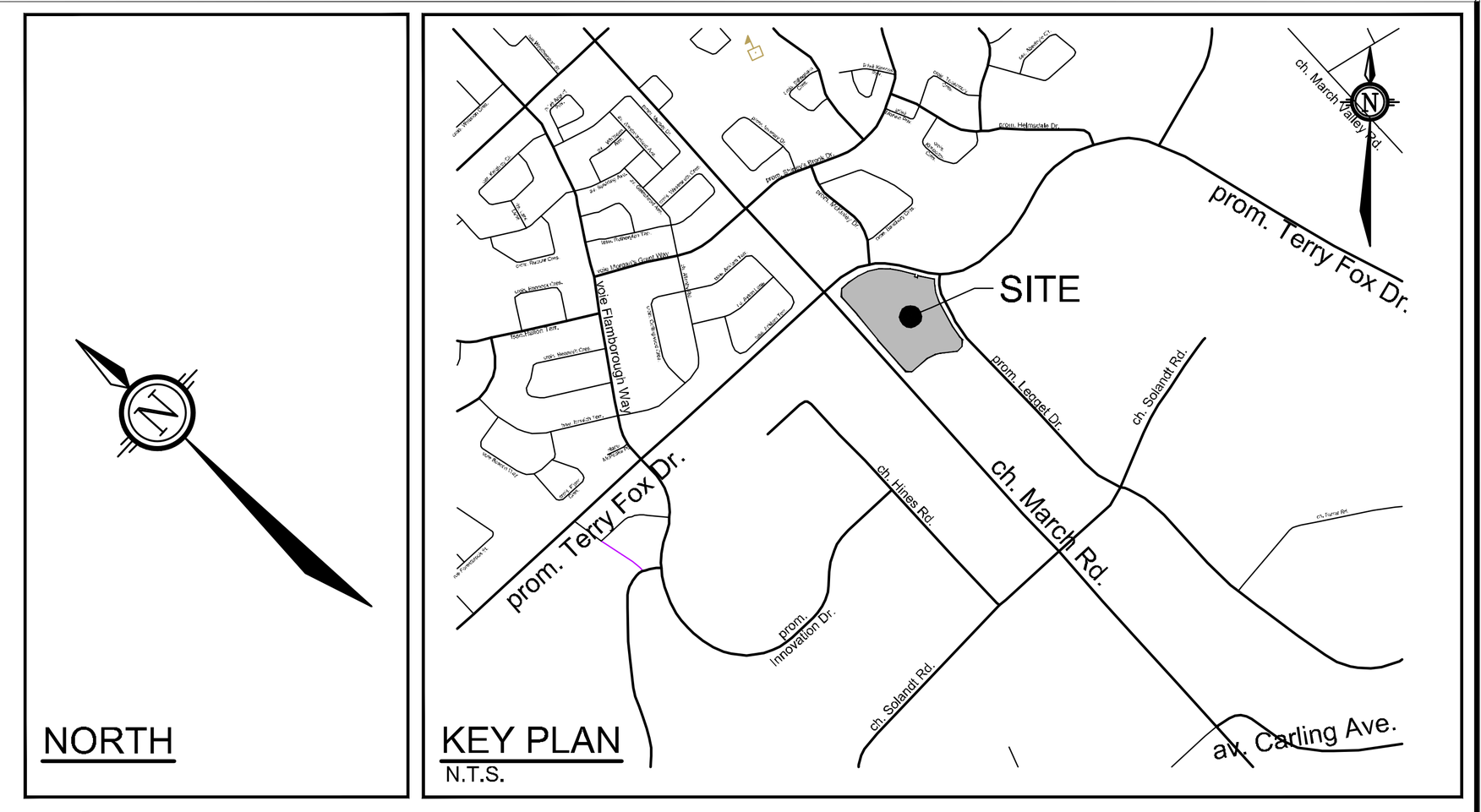


POND CROSS-SECTION B-B
SCALE : 1:400 (H) 1:40 (V)

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	Silt Fence		OPSD 219.110	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Consultant	Developer's Contractor	N/A
	Filter Fabric	Location as Indicated in ESC Note #3	Erosion and Sediment Control Notes	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Consultant	Developer's Contractor	N/A
	Mud Mat	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





NORTH

KEY PLAN
N.T.S.

LEGEND

79.60 / 79.85	PROPOSED ELEVATION / EXISTING ELEVATION
× 79.85	EXISTING ELEVATION
2.0%	GRADE AND DIRECTION
	MAXIMUM 3:1 SIDESLOPE
	EMERGENCY OVERLAND FLOW ROUTE
CBMH 3	PROPOSED CATCHBASIN MANHOLE
STM MH 1	PROPOSED STORM MANHOLE
CB	PROPOSED CATCHBASIN
	PROPOSED BARRIER CURB (PER SC1.1)
DC	PROPOSED DEPRESSED CURB (PER SC1.1)
X	REMOVALS
	EXISTING TREE TO REMAIN
	PROPOSED TOE WALL (PER OPSD 3120.100)
	PROPOSED RETAINING WALL
	PROPOSED BUILDING ENTRANCE
	PROPOSED SILT FENCING (OPSD 219.110)
M M	PROPOSED MUD MAT / CONSTRUCTION ENTRANCE
1:2 YR / 1:5 YR / 1:100 YR	APPROXIMATE PONDING LIMITS
	EXISTING CONCRETE CURB
SANMH	EXISTING SANITARY MANHOLE
CBMH	EXISTING CATCHBASIN MANHOLE
STMMH	EXISTING STORM MANHOLE
CB	EXISTING CATCHBASIN
HYD / WV	EXISTING HYDRANT & VALVE
	EXISTING TREES / VEGETATION
EX UP	EXISTING UTILITY POLE C/W GUY WIRES
	EXISTING FENCE
	EXISTING LIGHT STANDARD

GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
7. ALL ELEVATIONS ARE GEODETIC.
8. REFER TO THE GEOTECHNICAL INVESTIGATION AND HYDROGEOLOGICAL ASSESSMENT - 600 MARCH ROAD - (REPORT NO. 12606873-RPT-1), PREPARED BY GHD ON JUNE 16, 2023., 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 SURFACE AREAS AND DIMENSIONS.
10. REFER TO STORMWATER MANAGEMENT REPORT (R-2023-143) PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD.
11. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
12. PROVIDE LINE/PARKING PAINTING.

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 98% 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). MOUNTABLE CURBS ARE TO BE PER CITY OF OTTAWA STANDARD (SC1.3).
9. REFER TO LANDSCAPE PLAN FOR PLANTING AND OTHER LANDSCAPE FEATURE DETAILS.
10. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GRADING PLAN INDICATING AS-BUILT ELEVATIONS OF ALL DESIGN GRADES SHOWN ON THIS PLAN.

EROSION AND SEDIMENT CONTROL NOTES :

1. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
2. 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.
3. EROSION AND SEDIMENT CONTROL MEASURES WILL BE IMPLEMENTED DURING CONSTRUCTION IN ACCORDANCE WITH THE "GUIDELINES ON EROSION AND SEDIMENT CONTROL FOR URBAN CONSTRUCTION SITES" (GOVERNMENT OF ONTARIO, MAY 1987). THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR MEETING ALL REGULATORY AGENCY REQUIREMENTS.
4. TO PREVENT SURFACE EROSION FROM ENTERING ANY STORM SEWER SYSTEM DURING CONSTRUCTION, FILTER CLOTH WILL BE PLACED UNDER GRATES OF NEARBY CATCHBASINS AND STRUCTURES. A LIGHT DUTY SILT FENCE BARRIER WILL ALSO BE INSTALLED AROUND THE CONSTRUCTION AREA (WHERE APPLICABLE). THESE CONTROL MEASURES WILL REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE.
5. TO LIMIT EROSION: MINIMIZE THE AMOUNT OF EXPOSED SOILS AT ANY GIVEN TIME, RE-VEGETATE EXPOSED AREAS AND SLOPES AS SOON AS POSSIBLE AND PROTECT EXPOSED SLOPES WITH NATURAL OR SYNTHETIC MULCHES.
6. FOR MATERIAL STOCKPILING: MINIMIZE THE AMOUNT OF EXPOSED MATERIALS AT ANY GIVEN TIME; APPLY TEMPORARY SEEDING, TARPS, COMPACTION AND/OR SURFACE ROUGHENING AS REQUIRED TO STABILIZE STOCKPILED MATERIALS THAT WILL NOT BE USED WITHIN 14 DAYS.
7. 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.
8. 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.
9. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
10. ROADWAYS ARE TO BE SWEPT AS REQUIRED OR AS DIRECTED BY THE ENGINEER AND/OR THE MUNICIPALITY.
11. THE CONTRACTOR SHALL ENSURE PROPER DUST CONTROL IS PROVIDED WITH THE APPLICATION OF WATER (AND IF REQUIRED, CALCIUM CHLORIDE) DURING DRY PERIODS. MONITOR DUST LEVELS DURING SITE PREPARATION/EXCAVATION, AND CONSTRUCTION ACTIVITIES, AND WHEN DUST LEVELS BECOME VISUALLY APPARENT SPRAY WATER TO MINIMIZE THE RELEASE OF DUST FROM GRAVEL, PAVED AREAS AND EXPOSED SOILS. USE CHEMICAL DUST SUPPRESSANTS ONLY WHERE NECESSARY ON PROBLEM AREAS.

BENCHMARK NOTES:

1. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM.
2. IT IS THE RESPONSIBILITY OF THE USER OF THIS INFORMATION TO VERIFY THAT THE JOB BENCHMARK HAS NOT BEEN ALTERED OR DISTURBED AND THAT IT'S RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION SHOWN ON THIS DRAWING.
3. BENCHMARK WAS PROVIDED ON THE TOPOGRAPHIC PLAN OF SURVEY OF BLOCK 6 AND PART OF BLOCK 1 REGISTERED PLAN 4M-642 AND PART OF LOTS 8 AND 9 CONCESSION 4, GEOGRAPHIC TOWNSHIP OF MARCH, CITY OF OTTAWA, SURVEYED BY ANNIS, O'SULLIVAN AND VOLEBEKK LTD.

PAVEMENT STRUCTURES:

LIGHT DUTY (CAR PARKINGS PAVEMENT)
50mm HL3 or SUPERPAVE 12.5
150mm GRANULAR "A"
250mm GRANULAR "B" TYPE II

HEAVY DUTY (ACCESS ROADS)
40mm HL3 or SUPERPAVE 12.5
50mm HL3 oR SUPERPAVE 19.0
150mm GRANULAR "A"
500mm GRANULAR "B" TYPE II

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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OWNER INFORMATION
NOKIA c/o COLLIERS
181 BAY STREET, SUITE 1400
TORONTO, ONTARIO, M5J 2V1

ERIK CUNNINGTON
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No.	REVISION	DATE	BY
2.	ISSUED FOR SPC APPROVAL	NOV 7/23	FST
1.	PRELIMINARY PLANS ISSUED TO CITY	OCT 02/23	FST

SCALE 1:400

DESIGN	ZA
CHECKED	FST
DRAWN	ZA
CHECKED	FST
APPROVED	FST

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER F.S. THAUVETTE 100041399 November 7, 2023 PROVINCE OF ONTARIO

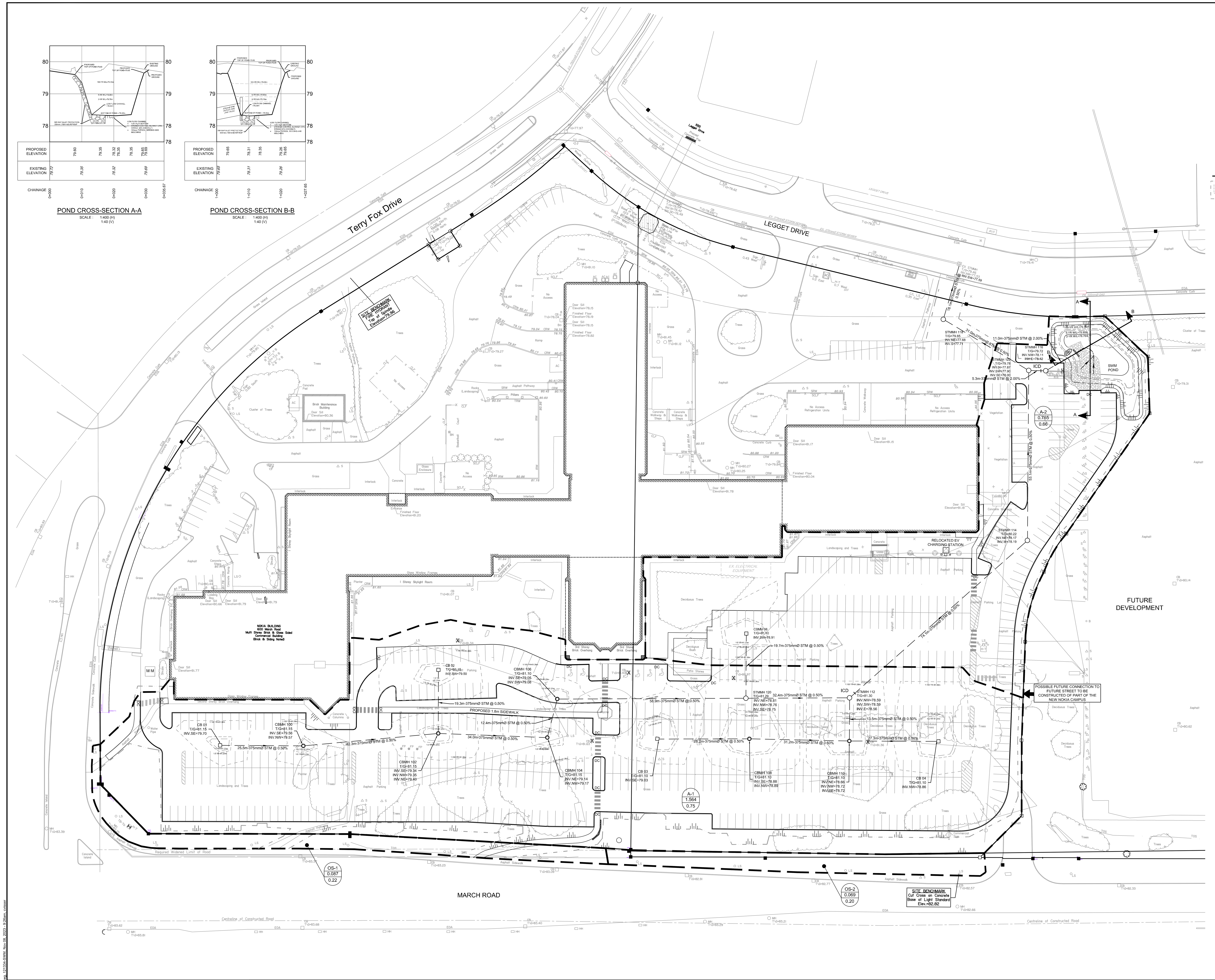
NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

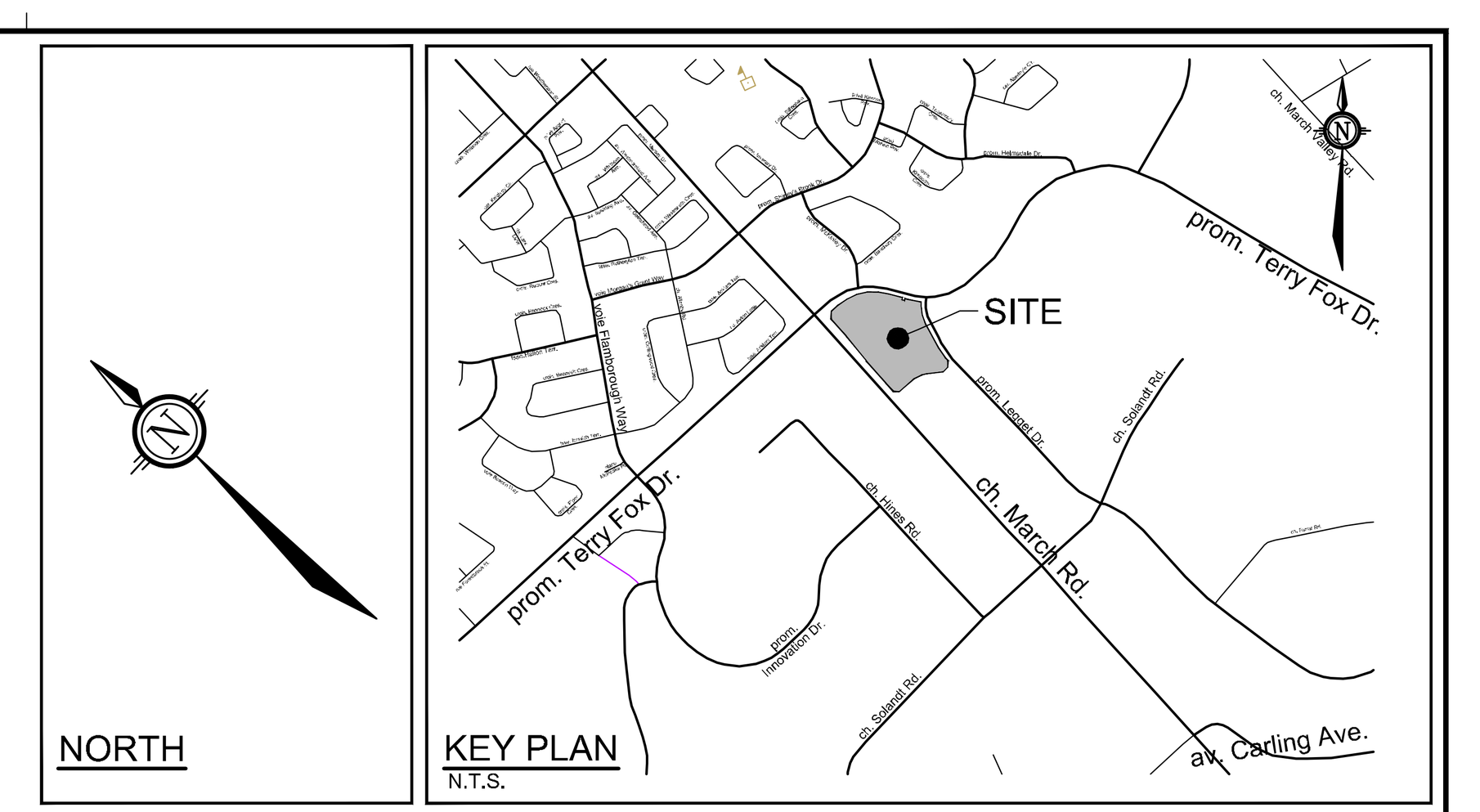
LOCATION
CITY OF OTTAWA
600 MARCH ROAD - NOKIA PARKING LOT EXPANSION

DRAWING NAME
GRADING PLAN AND EROSION & SEDIMENT CONTROL PLAN

PROJECT No. 121334
REV # 2
DRAWING No. 121334-GR

PLANA0.DWG - 1189mmx841mm





LEGEND

- PROPOSED BARRIER CURB
- DC — PROPOSED DEPRESSED CURB
- DRAINAGE AREA LIMITS
- 1:2 YR / 1:5 YR / 1:100 YR — APPROXIMATE PONDING LIMITS
- A-2 — POST-DEVELOPMENT AREA ID
- 0.129 — POST-DEVELOPMENT DRAINAGE AREA (ha)
- 0.82 — 1:5 YEAR WEIGHTED RUNOFF COEFICIENT
- CBMH — PROPOSED CATCHBASIN MANHOLE
- CB — PROPOSED CATCHBASIN
- PROPOSED STORM SEWER AND FLOW DIRECTION
- ICD — PROPOSED INLET CONTROL DEVICE
- EMERGENCY OVERLAND FLOW ROUTE
- PROPOSED BUILDING ENTRANCE / EXIT
- MAXIMUM 3:1 SIDESLOPE
- FFE — FINISHED FLOOR ELEVATION
- USF — UNDERSIDE OF FOOTING ELEVATION
- STM MH — EXISTING STORM MH & SEWER
- CB — EXISTING CATCHBASIN C/W CATCHBASIN LEAD
- EXISTING CONCRETE CURB
- V&VB — EXISTING VALVE & VALVE BOX
- SP — EXISTING SERVICE POST
- HYD — EXISTING HYDRANT
- CBMH — EXISTING CATCHBASIN
- CB — EXISTING CATCHBASIN MH
- EX UP — EXISTING UTILITY POLE C/W GUY WIRES

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. 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.
7. 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.
8. ALL ELEVATIONS ARE GEODETIC.
9. REFER TO THE GEOTECHNICAL INVESTIGATION AND HYDROGEOLOGICAL ASSESSMENT - 600 MARCH ROAD - (REPORT NO. 12606873-RPT-1), PREPARED BY GHD ON JUNE 16, 2023., 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.
10. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS.
11. REFER TO THE STORMWATER MANAGEMENT REPORT (R-2023-143) PREPARED BY NOVATECH.
12. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).

BENCHMARK NOTES:

1. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM.
2. IT IS THE RESPONSIBILITY OF THE USER OF THIS INFORMATION TO VERIFY THAT THE JOB BENCHMARK HAS NOT BEEN ALTERED OR DISTURBED AND THAT IT'S RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION SHOWN ON THIS DRAWING.
3. BENCHMARK WAS PROVIDED ON SURVEYOR'S REAL PROPERTY REPORT PART 1, PLAN OF PART OF LOT 5, CONCESSION 2 (OTTAWA FRONT) GEOGRAPHIC TOWNSHIP OF GLOUCESTER, CITY OF OTTAWWA, SURVEYED BY ANNIS, O'SULLIVAN AND VOLEBEKK LTD.

INLET CONTROL DEVICE DATA TABLE: AREA A-1 (INCL. AREAS OS-1 & OS-2)

DESIGN EVENT	ICD TYPE (PLUG TYPE)	OUTLET STRUCTURE	DIAMETER OF OUTLET PIPE (mm)	PEAK DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m^3)	AVAILABLE STORAGE
1:2 YR	167mm DIA. ORIFICE PLUG TYPE ICD	STMMH 112 1200mmØ	375mmØ PVC	94.4	2.46	81.21	156.6	1001.1 m^3
1:5 YR				94.6	2.48	81.23	242.2	
1:100 YR				97.6	2.63	81.38	582.1	

INLET CONTROL DEVICE DATA TABLE: AREA A-2 (POND)

DESIGN EVENT	ICD TYPE (PLUG TYPE)	OUTLET STRUCTURE	DIAMETER OF OUTLET PIPE (mm)	PEAK DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m^3)	AVAILABLE STORAGE
1:2 YR	118mm DIA. ORIFICE PLUG TYPE ICD	STMMH 116 1200mmØ	375mmØ PVC	20.4	0.46	78.76	87.3	406.3 m^3
1:5 YR				23.3	0.60	78.90	124.1	
1:100 YR				30.1	1.00	79.30	268.7	

NOTE:
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No.	REVISION	DATE	BY
2.	ISSUED FOR SPC APPROVAL	NOV 7/23	FST
1.	PRELIMINARY PLANS ISSUED TO CITY	OCT 02/23	FST

SCALE 1:400

DESIGN ZA · CHECKED FST · DRAWN ZA · CHECKED FST · APPROVED FST

FOR REVIEW ONLY

F.S. THAUVETTE 100041396 November 7, 2023 — LICENSED PROFESSIONAL ENGINEER, PROVINCE OF ONTARIO

NOVATECH
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LOCATION
CITY OF OTTAWA
600 MARCH ROAD - NOKIA PARKING LOT EXPANSION

DRAWING NAME
POST-DEVELOPMENT STORMWATER MANAGEMENT PLAN

PROJECT No. 121334
REV # 2
DRAWING No. 121334-SWM