david schaeffer engineering ltd

120 Iber Road, Suite 103
Ottawa, Ontario K2S 1E9
Tel. (613)836-0856
Fax (613) 836-7183
www.DSEL.ca

FUNCTIONAL SERVICING REPORT

FOR

MINTO COMMUNITIES – CANADA & 2559688 ONTARIO INC. KANATA NORTH

CITY OF OTTAWA

PROJECT NO.: 17-982

JAN 2019 – 1ST SUBMISSION

FUNCTIONAL SERVICING REPORT
FOR
MINTO COMMUNITIES – CANADA & 2559688 ONTARIO INC.
KANATA NORTH

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

FUNCTIONAL SERVICING REPORT
FOR
MINTO COMMUNITIES – CANADA & 2559688 ONTARIO INC.
KANATA NORTH

JAN 2019 – 1ST SUBMISSION

CITY OF OTTAWA
PROJECT NO.: 17-982

1.0 INTRODUCTION

Minto Communities – Canada have retained David Schaeffer Engineering Ltd. (DSEL) to prepare a Functional Servicing Report (FSR) in support of their application for draft plan approval.

Minto Communities – Canada is proposing a residential development on 936 March Road (PIN 04527-1004) within the Kanata North Urban Expansion Area (KNUEA). The FSR study area encompasses lands owned by Minto Communities – Canada and 2559688 Ontario Inc., which are subject to development permit and zoning by-law amendment applications. The study area measures approximately 56 ha and is located north of the existing Brookside Subdivision, east of March Road and west of a former CN railway corridor. The subject area can be seen in ***Figure 1***.

The proposed draft plan of subdivision contemplates approximately 455 single detached units and 401 executive townhomes. The study area also contemplates a school site, neighborhood parks, a woodlot, a stormwater management pond block and two commercial mixed-use blocks fronting existing March Road. The roads are proposed to consist of 26 m wide Right-of-Way (ROW) collector roads, as well as 24 m wide ROW and 16.5 m wide ROW local roads. The proposed concept plan can be seen in ***Appendix A*** and ***Figure 2***. Corresponding development stats can be seen in ***Table 1*** below.

Table 1: Development Statistic Projections Derived from Concept Plan

Land Use	Total Area (ha)	Projected Residential Units	Residential Population per Unit *	Projected Population *
Residential & Roads	34.09	455 Singles	3.4	1547
		401 Towns	2.7	1083
Commercial Mixed Use	9.35			
School	2.51			
Storm Pond	4.48			
Parks	2.35			
Open Space	0.14			
Creek Buffer	0.35			
Woodlot	2.40			
Total	**55.67**	**856**		**2630**

** NOTE: Population projections may differ from population estimates used in background Transportation Studies, Planning Rationale, and other studies. Population projection and residential population per unit values are based on Ministry of Environment and Climate Change guidelines for servicing demand calculations. Local Roads included in Block estimates above.*

The FSR study area and surrounding lands are governed by the broader *Kanata North Community Design Plan* (CDP) *(City of Ottawa, June 28, 2016)* and the Kanata North Master Servicing Study (*MSS*) *(City of Ottawa, June 28 2016)*. The study area is considered as part of the southeast quadrant of the KNUEA within the *MSS*. The design plan and preliminary serviceability report were completed in order to prepare a preferred servicing strategy and cohesive development concept for the core KNUEA (181 ha total area). The reports identify existing infrastructure and environmental constraints, describe the neighbourhood-level trunk services that will service all properties within the study area, establish targets for future site-specific stormwater management plans, and identify required infrastructure upgrades to support the proposed development of the KNUEA.

The proposed draft plan is in conformance with the demonstration plan for the study area, prepared as part of the *MSS,* with the exception of minor alterations to the draft plan's road alignment and to land use locations within the study area.

This FSR is provided to demonstrate conformance with the design criteria of the City of Ottawa, the *MSS* and other background studies, and general industry practice. This FSR has also been prepared in accordance with the City of Ottawa's Servicing Study Guidelines for Development Applications, as demonstrated by the checklist included in ***Appendix A***.

1.1 Existing Conditions

Under existing conditions, the study area is predominantly occupied by agricultural uses. A forested area exists in the northeast corner of the study area. The lands to the west, north and east are also predominantly occupied by agricultural uses.

The existing elevations within the study area generally range from 79m to 70m. There is a ridge approximately 8 m in height located in the middle of the study area that runs in the north south direction. The soil profile in the area consists of topsoil, stiff silty clay underlain by glacial till and bedrock. The *MSS* indicates that the maximum permissible grade raise for the study area is up to 3.0 m. Similarly, the site geotechnical report recommends a permissible grade raise restriction of 3 m. Additional geotechnical details can be found within the *Geotechnical Investigation – Proposed Residential Development 936 March Road* (July 31, 2018, Paterson Group).

The proposed development is located within the jurisdiction of the Mississippi Valley Conservation Authority (MVCA). The study area is located within the Shirley's Brook sub-watershed.

The western portion of the study area drains to Shirley's Brook to the south via adjacent existing drainage channels. The eastern portion of the study area drains into Shirley's Brooke via existing drainage channels to the east. See ***Appendix B*** for details.

1.2 Required Permits / Approvals

The City of Ottawa must approve detailed engineering design drawings and reports prior to construction of the municipal infrastructure identified in this report. This is expected to occur as part of the approval process for *Planning Act* development applications.

The following additional approvals and permits listed in ***Table 2*** could be expected to be required prior to construction of the municipal infrastructure detailed herein. Please note that other permits and approvals may be required, as detailed in the other studies submitted as part of the *Planning Act* development applications (e.g. *Tree Conservation Report, Environmental Impact Statement, Phase 1 Environmental Site Assessment, etc.).*

Table 2: Anticipated Permit/Approval Requirements

Agency	Permit/Approval Required	Trigger	Remarks
MVCA	Permit under Ontario Regulation 153/06, MVCA's Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation	Construction of new pond and alterations of existing watercourse.	Proposed stormwater management strategy is to have flows directed to new stormwater management pond per the *MSS*. Existing watercourses through the site may be altered as part of development.
MOECP	Environmental Compliance Approval	Construction of new sanitary, storm sewers, and stormwater management works.	The MOECP is expected to review the stormwater collection system, wastewater collection system and stormwater management works by transfer of review submission.
MOECP	Permit to Take Water	Construction of proposed land uses (e.g. basements for residential homes) and services.	Pumping of groundwater or surface water may be required during construction, given site conditions, proposed land uses, and on-site/off-site municipal infrastructure (Paterson Group, July 2018).
City of Ottawa	MOE Form 1 – Record of Watermains Authorized as a Future Alteration.	Construction of watermains.	The City of Ottawa is expected to review the watermains on behalf of the MOE through the Form 1 – Record of Watermains Authorized as a Future Alteration.
City of Ottawa	Commence Work Notification (CWN)	Construction of new sanitary and storm sewer throughout the subdivision.	The City of Ottawa will issue a commence work notification for construction of the sanitary and storm sewers once an ECA is issued by the MOECP.
City of Ottawa / Private Landowners	Permission/license to access/occupation and/or legal property instruments.	Construction of servicing infrastructure (e.g. storm sewer, overland flow route) beyond the FSR study area.	Construction activities and permanent infrastructure beyond the FSR study area may trigger legal agreements.

1.3 Summary of Pre-Consultation

1.3.1 City of Ottawa, July 11th, 2018

A formal Pre-Application Consultation with City of Ottawa staff occurred July 11th, 2018. The purpose of the meeting was to discuss the proposed development, review technical considerations and identify/confirm the studies required to accompany the submission of a Plan of Subdivision application. A copy of the Pre-Application Consultation meeting notes can be found in ***Appendix A***.

2.0 GUIDELINES, PREVIOUS STUDIES, AND REPORTS

2.1 Existing Studies, Guidelines, and Reports

The following documents informed the preparation of this FSR report:

- Ottawa Sewer Design Guidelines, City of Ottawa, *SDG002,* October 2012. *(Sewer Design Guidelines)*
    - Technical Bulletin ISDTB-2014-01, Revisions to Ottawa Design Guidelines – Sewer, City of Ottawa, February 5, 2014. *(ISDTB-2014-01)*
    - Technical Bulletin PIEDTB-2016-01, Revisions to Ottawa Design Guidelines – Sewer, City of Ottawa, September 6, 2016. *(PIEDTB-2016-01)*
    - Technical Bulletin ISTB-2018-01, Revisions to Ottawa Design Guidelines – Sewer, City of Ottawa, March 21, 2018. *(ISTB-2018-01)*
- Ottawa Design Guidelines – Water Distribution, City of Ottawa, July 2010. *(Water Supply Guidelines)*
    - Technical Bulletin ISD-2010-2, City of Ottawa, December 15, 2010. *(ISDTB-2010-2)*
    - Technical Bulletin ISDTB-2014-02, City of Ottawa, May 27, 2014. *(ISDTB-2014-02)*
    - Technical Bulleting ISTB-2018-02, City of Ottawa, March 21, 2018. *(ISTB-2018-02)*
- Design Guidelines for Sewage Works, Ministry of the Environment, 2008. *(MOE* Design Guidelines*)*
- Stormwater Planning and Design Manual, Ministry of the Environment, March 2003. *(*SWMP Design Manual)
- Erosion & Sediment Control Guidelines for Urban Construction, Greater Golden Horseshoe Area Conservation Authorities, December 2006. *(E&S Guidelines)*
- Ontario Building Code Compendium, Ministry of Municipal Affairs and Housing Building Development Branch, 2012 and as updated from time to time. *(OBC)*
- Mississippi-Rideau Source Water Protection Plan, MVCA & RVCA, August 2014.
- Kanata North Community Design Plan, Novatech, June 28, 2016. *(CDP)*
- Kanata North Master Servicing Study, Novatech, June 28, 2016. *(MSS)*
- Kanata North Environmental Management Plan, Novatech, June 28, 2016. *(EMP)*
- Kanata North Transportation Master Plan, Novatech, June 28, 2016. *(TMP)*
- Geotechnical Investigation – Proposed Residential Development 936 March Road, Paterson Group, July 31, 2018.
- Briarridge Sanitary Pumping Station Pre-Design Report, Cumming Cockburn, March 2001

3.0 WATER SUPPLY SERVICING

3.1 Existing Water Supply Services

The study area lies within the existing City of Ottawa 2Ww pressure zone. Existing 200mm and 300mm diameter trunk watermains exist within the residential subdivision to the south of the study area. These watermains are connected to existing 400mm diameter watermains within Klondike Road and March Road.

3.2 Water Supply Servicing Design

Water supply servicing and hydraulic analysis for the study area were contemplated as part of the *MSS*. The preferred design concept indicated by the *MSS*, for servicing of the study area, consists of connecting to the existing 200mm diameter watermain within Celtic Ridge Crescent and a proposed extension of the 400mm diameter watermain within March Road.

The proposed development will be serviced internally by a trunk 300mm diameter watermain and a network of local watermains to be designed in accordance with the *Water Supply Guidelines*, as summarized in ***Table 3*** below. Potable water will be supplied to the study area through pressurized local watermains on each street, connecting to the trunk 300mm diameter watermain. The proposed watermain network can be seen in ***Figure 5***.

Table 3: Water Supply Design Criteria

Design Parameter	Value
Residential Single Family	3.4 P/unit
Residential Semi-detached	2.7 P/unit
Residential Townhouse/Back-to-Back	2.1 P/unit
Residential Apartment (High Density)	1.8 P/unit
Residential Average Daily Demand	350 L/d/P
Residential Maximum Daily Demand **	2.5 x Average Daily *
Residential Maximum Hourly **	5.5 x Average Daily *
Minimum Watermain Size	150mm diameter
Minimum Depth of Cover	2.4m from top of watermain
During normal operating conditions desired operating pressure is within	350kPa and 480kPa
During normal operating conditions pressure must not drop below	275kPa
During normal operating conditions pressure must not exceed	552kPa
During fire flow operating pressure must not drop below	140kPa

Daily average based on Appendix 4-A from **Water Supply Guidelines. Table updated to reflect ISD-2010-2.*
*** Residential Max. Daily and Max. Hourly peaking factors per MOE Guidelines for Drinking-Water Systems Table 3-3 for 0 to 500 persons. City Guidelines used for populations greater than 500 persons.*

Consistent with the *MSS*, the study area will be serviced entirely from the Zone 2Ww pressure zone and site grading is planned to not exceed 93m to maintain minimum pressures greater than 275kpa. Per the *MSS*, services where the grade is below 74m will likely require pressure reducing valves to keep maximum pressure below 552kpa.

Through the detailed design of the study area, a complete hydraulic analysis will be prepared for the water distribution network to confirm that water supply is available within the required pressure range under the anticipated demands during average day, peak hour and fire flow conditions prior to full buildout of the KNUEA. Depending on the status of other developments in the KNUEA, an interim condition or agreements for off-site works may be required to provide a looped network of watermains within the KNUEA. In circumstances where infrastructure may be required outside of the study area, land owner agreements will be put in place to facilitate cost sharing and access when necessary.

3.3 Water Supply Conclusion

Consistent with the *MSS*, potable water will be delivered to the proposed study area via a trunk 300mm diameter watermain running through the study area connecting to the existing watermain within Celtic Ridge Crescent and the proposed extension of the March Road watermain. Potable water will be supplied to the study area through pressurized local watermains on each street, connecting to the trunk 300mm diameter watermain.

A complete hydraulic analysis will be prepared at the time of detailed design. The watermain network will be sized to meet maximum hour and maximum day plus fire flow demands and conform to all relevant City Standards and policies and take into consideration the various draft plan configurations.

In circumstances where infrastructure may be required outside of the study area, there will be agreements in place facilitating cost sharing and access when necessary.

4.0 WASTEWATER SERVICING

4.1 Existing Wastewater Services

The existing residential subdivision to the south of the study area is serviced by the sanitary sewer network that conveys wastewater to the Briar Ridge Pump Station (BRPS), located south of Klondike Road and east of the former CN railway corridor. The BRPS discharges into the East March Trunk sanitary sewer. Two pumps are currently operating in the BRPS and a third is to be added when necessary per the *Briarridge Sanitary Pumping Station Pre-Design Report* (Cumming Cockburn, March 2001). BRPS upgrades are included in the *Infrastructure Master Plan* (City of Ottawa, 2013) (pg 219) and the *City of Ottawa 2014 Development Charges Background Study* (October 27, 2017) (pg B-22, item 10.5074) with anticipated timing for construction between 2019 – 2031. The KNUEA owners' group is in the process of coordinating with the City to ensure that the BRPS upgrades are appropriately budgeted and scheduled to accommodate the buildout of the study area.

4.2 Wastewater Design

The wastewater servicing strategy for the study area was considered within the *MSS*, with a portion of the study area draining to the south and the remaining portion draining to the west.

Per the *MSS*, the eastern portion of the study area is to have its wastewater drain into existing sanitary infrastructure to the south of the study area before being conveyed to the Briar Ridge Pump Station. The Briar Ridge Pump Station then directs flows towards the East March Trunk sanitary sewer.

The remaining portion of the study area is to have its wastewater drain to a proposed 600mm diameter sanitary sewer within March Road before being conveyed to the proposed upsized sanitary sewers in Shirley's Brooke Drive and ultimately into the East March Trunk sanitary sewer, as identified in the *MSS*.

Figure 4 illustrates the proposed trunk sanitary sewer network. Consistent with the *MSS*, the study area's wastewater servicing is split between the existing sanitary sewers draining south toward the BRPS and the proposed March Road sanitary sewer. The proposed location of the drainage split is the Shirley's Brooke Tributary 2 corridor, with all lands east of the split draining south. See ***Figure 4*** and ***Appendix C*** for sanitary drainage area information.

The proposed development will be serviced by a network of gravity sewers, designed in accordance with the wastewater design parameters from ISTB-2018-01 and the Sewer Design Guidelines, summarized in ***Table 4***. These design parameters represent a flow reduction from the outdated wastewater design parameters used during the *MSS* design.

Table 4: Wastewater Design Criteria

Design Parameter	Value
Residential - Single Family	3.4p/unit
Residential – Townhome/ Semi	2.7p/unit
Residential Townhouse/Back-to-Back	2.1 P/unit
Residential Apartment (High Density)	1.8 P/unit
Average Daily Demand	280 L/d/per
Peaking Factor	Harmon's Peaking Factor, where K=0.8
Commercial / Institutional Flows	28,000 L/gross ha/day
Commercial / Institutional Peak Factor	1.5 if contribution >20%, otherwise 1.0
Light Industrial Flows	35,000 L/gross ha/day
Industrial Peaking Factor	Per Figure in Appendix 4-B, City of Ottawa Guidelines
Infiltration and Inflow Allowance	0.33 L/s/gross ha for all areas
Park Peaking Factor	1.0
Sanitary sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} AR^{2/3} S^{1/2}$
Minimum Sewer Size	200mm diameter
Minimum Manning's 'n'	0.013
Minimum Depth of Cover	2.5m from crown of sewer to grade
Minimum Full Flowing Velocity	0.6m/s
Maximum Full Flowing Velocity	3.0m/s
Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines, October 2012, Technical Bulletins, and recent residential subdivision in City of Ottawa.	

No deviations from the *MSS* wastewater servicing strategy are proposed, aside from the use of the latest wastewater design parameters and the minor changes to the drainage split. Per the *MSS*, the total anticipated peak flow conveyed through the study area to the existing BRPS sanitary infrastructure south of the study area is 66.49 L/s, see ***Appendix B***. Using the design parameters set out in ***Table 4***, a preliminary sanitary analysis was undertaken using the draft plan along with external drainage areas from the *MSS*. As the exact alignment of residential homes in the subject area are not known at the time of this FSR, population densities that conservatively represent the current population projection were applied to the proposed residential areas. A calculated peak flow of 57.91 L/s is anticipated to discharge to the existing sanitary sewer network to the south (87% of the peak flow anticipated in the *MSS*).

The commercial mixed use blocks west of Shirley's Brooke Tributary 2 will drain towards the proposed 600mm diameter trunk sanitary sewer within March Road. The peak total flow will be lower than anticipated in the *MSS*, based on the City of Ottawa Sewer Design Guidelines' latest wastewater parameters and the reduced tributary area due to the drainage split change. In circumstances where infrastructure may be required outside of the study area, there will be agreements in place facilitating cost sharing and access when/where necessary.

4.3 Wastewater Servicing Conclusions

A network of local gravity sewers is proposed within the study area to convey flow to existing and proposed offsite sanitary sewers, in accordance with the *MSS*. The majority of the study area is intended to have its wastewater drain into the existing BRPS sanitary infrastructure to the south of the study area and ultimately to the Briar Ridge Pump Station. The remaining portion of the study area is to have its wastewater drain to the proposed sanitary sewer within March Road before ultimately being conveyed into the East March Trunk sanitary sewer.

The sewers are to be designed in conformance with all relevant City of Ottawa and MOECC Guidelines and Policies. Per ISTB-2018-01, the City's current design parameters represent a flow reduction from the outdated standards used within the *MSS*.

5.0 STORMWATER MANAGEMENT

5.1 Existing Stormwater Drainage

The study area is located within the Shirley's Brooke sub-watershed. Under existing conditions the western portion of the study area drains into Shirley's Brooke via Shirley's Brooke Tributary 2. The eastern portion of the study area drains into Shirley's Brooke to the east via existing drainage channels. See ***Appendix B*** for the existing drainage patterns for the study area.

5.2 Stormwater Management Strategy

The overall stormwater management strategy for the study area was considered within the *MSS*. Both the minor and major systems are to be directed towards the proposed stormwater management (SWM) Pond 3 to be situated in the northeast corner of the study area.

Figure 3 illustrates the proposed trunk storm sewer network. The trunk storm sewers, ranging in diameter from 600mm to 2100mm, collects stormwater runoff from the study area and portions of March Road. The storm sewer network ultimately drains towards SWM Pond 3 to the east. Local storm sewers will provide service to all roads and development blocks within the study area.

The study area will be serviced by a storm sewer designed in accordance with the amendment to the storm sewer and stormwater management elements of *PIETB-2016-01*. As such, the minor storm system is proposed to be designed for the following minimum rates of capture, deviating from the *MSS*:

- 2-year event for local streets;
- 5-year event for collector roads; and
- 10-year event for arterial roads.

Inlet control devices (ICD) will be employed to ensure that storm flows entering the minor system are limited to the flows described above. No additional deviations from the *MSS*'s stormwater management strategy are anticipated at this stage. ***Table 5*** summarizes the standards that will be employed in the detailed design of the trunk and local storm sewers.

Table 5: Storm Sewer Design Criteria

Design Parameter	Value
Minor System Design Return Period	2-Year (Local Streets), 5-Year (Collector Streets), 10-Year (Arterial Streets) – PIEDTB-2016-01
Major System Design Return Period	100-Year
Intensity Duration Frequency Curve (IDF) 2-year storm event: A = 723.951, B = 6.199, C = 0.810 5-year storm event: A = 998.071, B = 6.053, C = 0.814	$i = \frac{A}{(t_c + B)^C}$
Minimum Time of Concentration	10 minutes
Rational Method	$Q = CiA$
Runoff coefficient for paved and roof areas	0.90
Runoff coefficient for landscaped areas	0.20
Storm sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} AR^{2/3} S^{1/2}$
Minimum Sewer Size	250 mm diameter
Minimum Manning's 'n'	0.013
Service Lateral Size	100mm dia PVC SDR 28 with a minimum slope of 1.0%.
Minimum Depth of Cover	1.7m from crown of sewer to grade *(based on recent residential subdivisions in City of Ottawa)*
Minimum Full Flowing Velocity	0.8 m/s
Maximum Full Flowing Velocity	6.0 m/s
Clearance from 100-Year Hydraulic Grade Line to Building Opening	0.30 m
Max. Allowable Flow Depth on Municipal Roads	35 cm above gutter (PIEDTB-2016-01)
Extent of Major System	To be contained within the municipal right-of-way or adjacent to the right-of-way provided that the water level must not touch any part of the building envelope and must remain below the lowest building opening during the stress test event (100-year + 20%) and 15cm vertical clearance is maintained between spill elevation on the street and the ground elevation at the nearest building envelope (PIEDTB-2016-01)
Stormwater Management Model	DDSWMM (release 2.1), SWMHYMO (v. 5.02) and XPSWMM (v. 10)
Model Parameters	Fo = 76.2 mm/hr, Fc = 13.2 mm/hr, DCAY = 4.14/hr, D.Stor.Imp. = 1.57 mm, D.Stor.Per. = 4.67 mm
Imperviousness	Based on runoff coefficient (C) where Percent Imperviousness = (C - 0.2) / 0.7 x 100%.
Design Storms	Chicago 3-hour Design Storms and 24-hour SCS Type II Design Storms. Maximum intensity averaged over 10 minutes.
Historical Events	July 1st, 1979, August 4th, 1988 and August 8th, 1996
Climate Change Street Test	20% increase in the 100-year, 3-hour Chicago storm
Extracted from City of Ottawa Sewer Design Guidelines, October 2012, as amended by PIEDTB-2016-01, *and based on recently approved residential subdivision designs in City of Ottawa.*	

Preliminary sizing of the storm sewer network is provided in ***Appendix D***, based on rational method calculations and the design parameters set out in ***Table 5***. Conservative runoff coefficients were applied based on the coefficients used within the *MSS,* see ***Appendix B*** for details. A peak rational method flow of 5600 L/s was anticipated to outlet into the drainage swale towards Pond 3. At the time of detailed design, a detailed hydraulic gradeline (HGL) analysis will be completed for the proposed system based on the 100-year 3-hour Chicago and 24-hour SCS design storms. The possibility to downsize the trunk storm infrastructure and detailed runoff coefficients will be also be analyzed.

Consistent with the *MSS*, the major system drainage is proposed to be directed towards and along the local and collector roads, ultimately draining into SWM Pond 3 to the east. The proposed conceptual grading plan can be seen in ***Drawing 1***. The *MSS* and the *Geotechnical Investigation – Proposed Residential Development 936 March Road* (July 31, 2018, Paterson Group) both report a preliminary grade raise restriction of up to 3m. The conceptual grading plan does not propose any grades exceeding the 3m restriction. The major system and minor system are both conveyed to SWM Pond 3 via a drainage swale adjacent to the woodlot east of the former CN railway corridor.

5.3 Floodplain Mapping

An existing drainage channel, a tributary of Shirley's Brooke (refered to as Tributary 2 in the MSS), runs through the study area. According to the *EMP*, within the study area, the drainage channel has sufficient capacity to confine the 100-year peak flow within the top of bank and existing channel corridor. Existing floodplain limits from the *EMP* and *MSS* can be seen in ***Appendix B***. The draft plan includes a 40 m wide corridor and an additional 6 m buffer to respect the existing drainage channel and the 35m meander belt width identified within the *EMP*. Consistent with the *MSS*, culverts will be installed under the proposed road crossing to convey the 100-year peak flow without stormwater overtopping the proposed road. The culvert(s) will be sized at the time of detailed design.

5.4 Proposed Outlet – Stormwater Management (SWM) Pond 3

Consistent with the *MSS*, the proposed outlet for both the minor and major systems from the proposed development is Pond 3. Pond 3 is to be situated east of the study area, west of March Valley Road and ultimately drains towards the east into Shirley's Brook. A conceptual pond footprint is shown in ***Figure 6***. Note that per the *MSS*, Pond 3 is ultimately meant to service stormwater runoff from both the study area and the lands to the north. The proposed Pond 3 illustrated in ***Figure 6*** is only designed to service the subject lands, and will need to be expanded into a future block within the property to the north to accommodate ultimate development drainage from those lands.

Pond 3 is intended to be constructed within a 6 ha block, provide Enhanced Protection quality control (80% TSS removal), and operate at a permanent pool elevation of 65.50m, consistent with the preliminary Pond 3 design presented in the *EMP and MSS*. It is noted that this preliminary pond outlet and permanent pool elevation are approximately 0.9m above the 2-year water level in Shirley's Brook, providing flexibility to lower the operating levels within the pond upon detailed design to best suit the proposed development conditions. The preliminary design for the pond anticipates a 100-year event water level of 67.00m with 40,900m^3 of active storage. Additional pond design details can be seen in ***Appendix E***.

East of the former CN railway corridor, the study area's stormwater infrastructure will outlet into a 5m wide drainage swale with 3:1 side slopes to convey flow along the woodlot to Pond 3. See ***Figure 6*** for details.

5.5 Stormwater Servicing Conclusions

Consistent with the *MSS*, a network of local gravity sewers is proposed within the study area to capture stormwater and convey the flows to the proposed trunk storm sewer network. The trunk storm sewer network is to outlet into a proposed drainage swale which will then convey flows to the proposed SWM Pond 3. Flows not captured in the sewer network are to be directed towards SWM Pond 3 via the proposed roadways and the proposed drainage swale.

The storm sewer network and stormwater management facility designs are to be designed in conformance with all relevant City of Ottawa and MOECC Guidelines, and standard City of Ottawa Modelling techniques.

6.0 UTILITIES

Utility services were consulted as part of the *MSS* process to provide information regarding their existing infrastructure, initial plans for servicing the KNUEA, and identify any known constraints.

Hydro Ottawa is reported to have overhead infrastructure running through the KNUEA on the east side of March Road. Per the *MSS*, the existing infrastructure on March Road will need to be upgraded in order to service the KNUEA.

Enbridge Gas is reported to have service extended off the 6” high-pressure gas main within the west side of March Road near the study area.

Bell and Rogers are reported to have services up to the intersection of March Road and Old Carp Road, southwest of the study area. Service to the KNUEA would extend off this location. Per the *MSS*, Rogers’ existing infrastructure would require upgrading to service the KNUEA.

DSEL has begun coordination with the utility services to confirm the servicing plan for the study area.

7.0 EROSION AND SEDIMENT CONTROL

Soil erosion occurs naturally and is a function of soil type, climate and topography. The extent of erosion losses is exaggerated during construction where vegetation has been removed and the top layer of soil becomes agitated.

Prior to topsoil stripping, earthworks or underground construction, erosion and sediment controls will be implemented and will be maintained throughout construction.

Silt fence will be installed around the perimeter of the active part of the site and will be cleaned and maintained throughout construction. Silt fence will remain in place until the working areas have been stabilized and re-vegetated.

Catchbasins will have catchbasin inserts installed during construction to protect from silt entering the storm sewer system.

Specifically, the following recommendations to the Contractor will be included in contract documents.

- Limit extent of exposed soils at any given time.
- Re-vegetate exposed areas as soon as possible.
- Minimize the area to be cleared and grubbed.
- Protect exposed slopes with plastic or synthetic mulches.
- Install silt fence to prevent sediment from exiting the construction area and entering existing ditches/stormwater systems.
- Install mud mat at the construction access in order to prevent mud tracking onto adjacent roads.
- No refueling or cleaning of equipment near existing watercourses.
- Provide sediment traps and basins during dewatering.
- Install catchbasin inserts.
- Plan construction at proper time to avoid flooding.

The Contractor will, at every rainfall, complete inspections and guarantee proper performance. The inspection is to include:

- Verification that water is not flowing under silt barriers.
- Clean and change inserts at catch basins.

8.0 CONCLUSIONS AND RECOMMENDATIONS

The overall municipal servicing strategy for the study area was contemplated as part of the *Kanata North Community Design Plan (City of Ottawa, June 28, 2016)* and the Kanata North Master Servicing Study *(City of Ottawa, June 28 2016)*.

This *Functional Servicing Study* (FSR) (DSEL, January 2019) provides details on the planned on-site and off-site municipal services for the subject property and demonstrates that adequate municipal infrastructure capacity is expected to be available for the planned development of the study area.

Prior to detailed design of the infrastructure presented in this report, this FSR will require approval under the *Planning Act* as supporting information for the development applications. Project-specific approvals are also expected to be required for the infrastructure presented in this report from the City of Ottawa, Ministry of Environment and Climate Change, and Mississippi Valley Conservation Authority.

Prepared by,
David Schaeffer Engineering Ltd.

Per: Braden Kaminski, E.I.T.

Reviewed by,
David Schaeffer Engineering Ltd.

LICENSED PROFESSIONAL ENGINEER
R. M. WINGATE
100069090
Jan 11/19
PROVINCE OF ONTARIO

Per: Matt Wingate, P.Eng

z:\projects\17-982_minto_kanata-north\b_design\b3_reports\b3-2_servicing (dsel)\2019-01-11_982_fsr\2019-01-11_982_fsr.docx

Appendix A

Development Study Checklist, Draft Plan of Subdivision, Record of Pre-Consultation, Record of City Comments

DEVELOPMENT SERVICING STUDY CHECKLIST

4.1 General Content		
☐	Executive Summary (for larger reports only).	N/A
☐	Date and revision number of the report.	Title Page
☐	Location map and plan showing municipal address, boundary, and layout of proposed development.	Figure 1
☐	Plan showing the site and location of all existing services.	Figures 1/4/5/6
☐	Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	Section 1.0 & Section 2.0
☐	Summary of Pre-consultation Meetings with City and other approval agencies.	Section 1.3 & Appendix A
☐	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.	All sections
☐	Statement of objectives and servicing criteria.	Section 1.0 & Section 3.2, Section 4.2, and Section 5.2
☐	Identification of existing and proposed infrastructure available in the immediate area.	Sections 3.1, Section 4.1, and Section 5.1
☐	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).	Sections 1.1 & 1.2
☐	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.	Drawing 1
☐	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.	To be addressed in at detailed design.
☐	Proposed phasing of the development, if applicable.	N/A. Depends on landowner preferred timing
☐	Reference to geotechnical studies and recommendations concerning servicing.	Section 1.1 & Section 2.1
☐	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	All Figures

4.2 Development Servicing Report: Water		
☐	Confirm consistency with Master Servicing Study, if available	Section 3.2
☐	Availability of public infrastructure to service proposed development	MSS & Section 3.2
☐	Identification of system constraints	MSS & Section 3.2
☐	Identify boundary conditions	Detailed hydraulic assessment N/A for FSR

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☐	Confirmation of adequate domestic supply and pressure	MSS. Detailed hydraulic assessment N/A for FSR.
☐	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.	MSS. Detailed hydraulic assessment N/A for FSR.
☐	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.	Detailed hydraulic assessment N/A for FSR.
☐	Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design	Detailed hydraulic assessment N/A for FSR.
☐	Address reliability requirements such as appropriate location of shut-off valves	Detailed hydraulic assessment N/A for FSR.
☐	Check on the necessity of a pressure zone boundary modification	MSS.
☐	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	MSS. Detailed hydraulic assessment N/A for FSR.
☐	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.	MSS, Section 3.2 & Figure 5. Detailed hydraulic assessment N/A for FSR.
☐	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.	MSS.
☐	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Section 3.2
☐	Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	Detailed hydraulic assessment N/A for FSR.

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).	Section 4.2
☐	Confirm consistency with Master Servicing Study and/or justifications for deviations.	Section 4.2
☐	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.	MSS
☐	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	MSS & Section 4.2
☐	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)	MSS, Section 4.2, Figure 4, Appendix C
☐	Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	Appendix C
☐	Description of proposed sewer network including sewers, pumping stations, and forcemains.	MSS, Section 4.2, Appendix C & Figure 4

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☐	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).	MSS
☐	Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	MSS, Section 4.2
☐	Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	MSS
☐	Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	MSS
☐	Special considerations such as contamination, corrosive environment etc.	MSS

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)	Section 1.1 & Section 5.2
☐	Analysis of available capacity in existing public infrastructure.	MSS & Section 5.4
☐	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Figure 3
☐	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.	MSS & Section 5.4
☐	Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	MSS & Section 5.4
☐	Description of the stormwater management concept with facility locations and descriptions with references and supporting information	Section 5.2, Section 5.4 & Figure 6
☐	Set-back from private sewage disposal systems.	N/A
☐	Watercourse and hazard lands setbacks.	MSS, Section 5.3
☐	Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	Record of consultation forthcoming.
☐	Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	MSS, Section 5.2, Section 5.3 & Section 5.4
☐	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).	MSS. Detailed modelling N/A for FSR.
☐	Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	MSS. Detailed assessment N/A for FSR.
☐	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.	MSS. Detailed modelling N/A for FSR.
☐	Any proposed diversion of drainage catchment areas from one outlet to another.	N/A
☐	Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Section 5.2, Appendix D & Figure 3

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☐	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.	N/A
☐	Identification of potential impacts to receiving watercourses	MSS
☐	Identification of municipal drains and related approval requirements.	N/A
☐	Descriptions of how the conveyance and storage capacity will be achieved for the development.	N/A at FSR level, future work described in Section 5.2 & Section 5.4
☐	100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	Section 5.3 & Drawing 1
☐	Inclusion of hydraulic analysis including hydraulic grade line elevations.	N/A at FSR level, future work described in Section 5.2 & Section 5.5
☐	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 7.0
☐	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.	MSS, Section 5.3
☐	Identification of fill constraints related to floodplain and geotechnical investigation.	Section 1.1

4.5 Approval and Permit Requirements: Checklist

☐	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 ct. 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.	Section 1.2
☐	Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	Section 1.2
☐	Changes to Municipal Drains.	N/A
☐	Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	Section 1.2

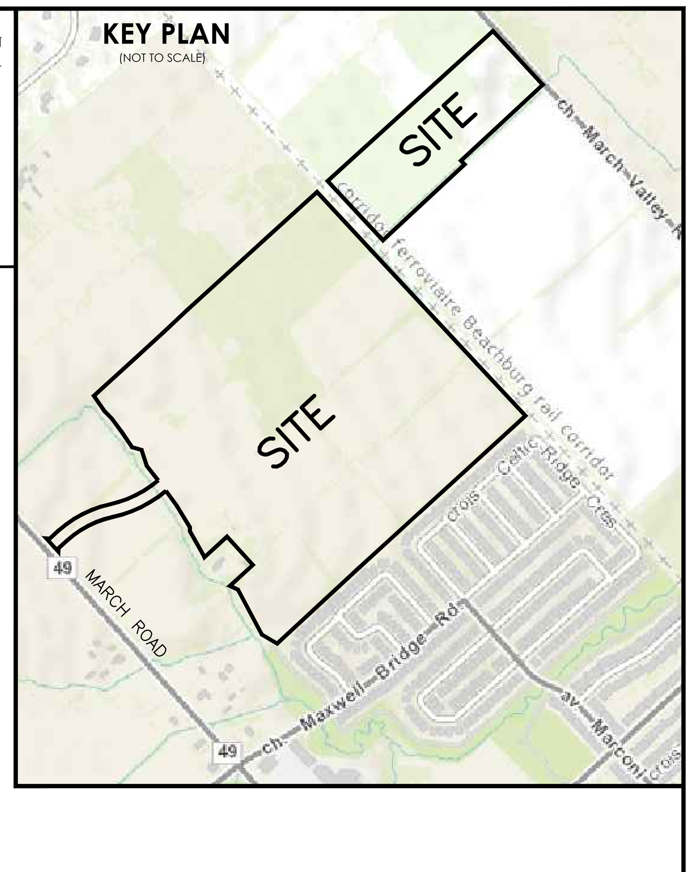
4.6 Conclusion Checklist

☐	Clearly stated conclusions and recommendations	Section 8.0
☐	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.	N/A – first submission
☐	All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	Section 8.0

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

SUBJECT TO THE CONDITIONS, IF ANY, SET FORTH IN OUR LETTER DATED ______________________20____ THIS DRAFT PLAN IS APPROVED BY THE CITY OF OTTAWA UNDER SECTION 51 OF THE PLANNING ACT. THIS____DAY OF______________,20___.

ADAM BROWN, MANAGER
DEVELOPMENT REVIEW- RURAL
PLANNING, INFRASTRUCTURE AND ECONOMIC DEVELOPMENT DEPARTMENT, CITY OF OTTAWA



DRAFT PLAN OF SUBDIVISION

PART OF LOT 12
CONCESSION 4
(GEOGRAPHIC TOWNSHIP OF MARCH)
CITY OF OTTAWA

Scale 1:1250

20 0 20 40 60 80 METRES

METRIC CONVERSION

DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

GRID SCALE CONVERSION

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99992

BEARING NOTE

BEARINGS ARE DERIVED FROM PLAN 4R-XXXXX PREPARED BY OTHERS.

INFORMATION: REQUIRED UNDER SECTION 51 (17) OF THE PLANNING ACT R.S.O. 1990

a. SEE PLAN
b. SEE PLAN
c. SEE PLAN
d. SEE PROPOSED LAND USE SCHEDULE (ABOVE)
e. SEE PLAN
f. SEE PLAN
g. SEE PLAN
h. CITY WATER AVAILABLE
i. SEE SOIL REPORT
j. SEE TOPOGRAPHICAL INFORMATION
k. ALL CITY SERVICES AVAILABLE
l. NO EASEMENTS REGISTERED ON TITLE

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE SUBJECT LANDS AND THEIR RELATIONSHIP TO ADJOINING LANDS HAVE BEEN ACCURATELY AND CORRECTLY SHOWN.

DATE

BRIAN J. WEBSTER
ONTARIO LAND SURVEYOR

NOTE:
THE PLAN DATA IS COMPILED FROM OFFICE RECORDS OF STANTEC GEOMATICS LTD. AND HAS NOT BEEN VERIFIED BY FIELD MEASUREMENTS. ALL DISTANCES ARE APPROXIMATE, TO BE VERIFIED BY FINAL REGISTERED PLAN(S).

Stantec Geomatics Ltd.
CANADA LANDS SURVEYORS
ONTARIO LAND SURVEYORS
1331 CLYDE AVENUE, SUITE 400
OTTAWA, ONTARIO, K2C 3G4
TEL. 613.722.4420 FAX. 613.722.2799
stantec.com

DRAWN: CEC	CHECKED: *	PM: FP	PROJECT No.: 161613877-131

Braden Kaminski

From: Beth Henderson <BHenderson@minto.com>
Sent: Monday, July 16, 2018 4:04 PM
To: Emilie Coyle; Paul Black; Miguel Tremblay - FoTenn Urban Planners & Designers (tremblay@fotenn.com); Steve Pichette; McKinley Environmental; Matt Wingate; Christopher Gordon (gogogordons.chris@rogers.com); Dave Gilbert (dgilbert@patersongroup.ca); Mark D'Arcy; 'Karyn Munch'; 'Ben Mortimer'; 'Webster, Brian'
Subject: FW: Pre-Consultation Follow-up: 936 March Road
Attachments: 936 March.pdf; Plan & Study List.pdf

Hi All
Please find attached and below the comments from the city from our pre consultation meeting last Wednesday July 11th 20118.
Thanks
Beth

Beth Henderson
Senior Land Development Manager
MINTO COMMUNITIES - CANADA
200-180 Kent St, Ottawa, ON K1P 0B6
T 613.782.2311
A division of The Minto Group

From: McCreight, Laurel [mailto:Laurel.McCreight@ottawa.ca]
Sent: Friday, July 13, 2018 12:05 PM
To: Emilie Coyle <coyle@fotenn.com>
Cc: Beth Henderson <BHenderson@minto.com>
Subject: Pre-Consultation Follow-up: 936 March Road

Hi Emilie,

Please refer to the below regarding the Pre-Consultation Meeting held on Wednesday Jull 11th, 2018 for the property at 936 March Road for a proposed plan of subdivision. I have also attached the Plans & Study List.

General

- Proposal to develop a subdivision containing approximately 800 units, 396 being single-family dwellings and 400 being townhomes
- Two blocks have been severed, under an application to Committee of Adjustment, fronting onto March Road and retained by the current property owner for future commercial development
- The proposed subdivision will consist of a park block and school block along with the residential blocks
- The current proposal is generally consistent with the council approved Kanata North Community Design Plan
- The subject property currently contains an existing farmhouse that is being retained along with its access
- The western portion of the property contains a 40-metre creek corridor.
- The applicants are proposing a Zoning By-law Amendment for both the commercial and subdivision portions
- The commercial portion is proposing to be rezoned from Rural Countryside (RU) to General Mixed Use (GM)

Planning/Urban Design

- The property is subject to the Kanata North Community Design Plan (CDP)
- The subject property is currently zoned Rural Countryside (RU) with the intent of rezoning the property
- There is a concern regarding the applicant's proposal of rezoning RU to GM without a Master Plan for the remaining commercial blocks
    - A concept plan will be required to demonstrate layout of the site
- Please be aware of the gateway features in the CDP
    - There are currently two labelled potential community gateways where the CDP has a maximum of two
    - Potential neighbourhood gateway also identified
- Please provide more linkages throughout the site in the northwest corner towards the creek
- Consider realigning Block 42 to align the pathway to the street
    - It is understood that there is an easement on title for this existing access and it may be difficult to move the location
    - Please describe if this can / cannot be accommodated in the Planning Rationale
- The attached image also illustrates other linkages that are recommended
- The ideal layout would have the back-to-back townhomes block along the collector to allow for a multi-use pathway (MUP) and to ensure driveways do not interfere
- Please provide a similar form of housing located in the existing residential neighbourhood to the south (along the southern property line)
- A mixture of product type dispersed throughout the subdivision is encouraged
- There is a 6-metre MUP around the retained dwelling
- A right-of-way of 1.8 metres is preferable for tree planting along the MUP
- The hedge row in Block 34, the southern portion, is to be enhanced and retained
- Please note the woodlot is to be conveyed to the City as part of the natural heritage system and is to be shown separately on the plans from the stormwater management pond (two separate blocks)
- Discussion regarding the rail corridor
    - The corridor may be acquired, but there are no guarantees, depends on whether the City has the funds and how much of the corridor is actually being sold
    - At minimum, we should be protecting for the potential and access will need to be provided across the corridor for the SWM connection
- Please be aware of the location of clay soils and their relation to tree planting

Engineering

- Master Servicing Study to be followed
- Please incorporate LIDs where possible

Transportation

- Follow Traffic Impact Assessment Guidelines – Full Traffic Impact Assessment will be required.

    - Start this process as soon as possible
    - The application will not be deemed complete until the submission of the draft step 1-4, including the functional draft RMA package (if applicable) and/or monitoring report (if applicable)
- ROW protection on March Road between Urban Area Limit and Terry Fox Drive is 44.5m even (Note: An additional 5.0 m on the Greenbelt side may be required to construct a rural cross section)
- Noise Feasibility Impact Studies required prior to DPA and Detailed Noise Impact Assessment required prior to registration, for the following:
    - Road
    - Rail (if applicable)

<u>Environmental / Forestry</u>
- The Environmental Management Plan (EMP) and CDP will provide direction for the development
- When filling up the corridor limits, be cognizant of the transitions as there are regulations about drainage into the corridor
    - No retaining walls or rear yard drainage
- There are perched culverts along the rail ditch, if there is the opportunity to fix the culverts, the EMP suggests it be done
- Please be advised of the coordination that will have to take place for the obtaining of a turtle permit
    - A Ministry of Natural Resources permit may be required
- There is a high presence of butternut trees on the subject property with majority surrounding the existing dwelling that is being retained
- Further butternut planting is supported along the woodlot
- A tree permit is required prior to any tree removal on site
- A Tree Conservation Report will need to be submitted for review as part of the Plan of Subdivision submission requirements (can be combined with the EIS)

<u>Parks</u>
- Please provide further connectivity throughout the proposal from the streets to the park block
- It is anticipated the park may be suitable for more active uses

<u>Mississippi Valley Conservation Authority</u>
- The stormwater management pond at the bottom of the inlet is to be constructed as soon as possible and completed as part of the development
- Some temporary sediment ponds may be required for construction
- Be sure to implement the MSS.
- Current regulation mapping extends beyond the established corridor primarily into the proposed commercial block but there is spillage into the eastern side of the property
    - This results in the way of MNR however does not incorporate stormwater management controls until developed
- The flood limit anticipates full build up, upstream, with no stormwater management
- Flood plain mapping will be reduced to incorporate the stormwater management pond upon its completion
    - There is confidence it will be reduced to 40-metres
- There is currently an issue in the interim for crossing
    - If it is temporary, pre-servicing permits will be required
    - This will include a hydraulic-pumping analysis
    - The crossing on the map would have to look at flows and flooding
- The floodwater is currently over topping by 0.3metres
- Please show the reduced spill area on pond 2

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

Regards,
Laurel

Laurel McCreight MCIP, RPP
Planner
Development Review West
Urbaniste
Examen des demandes d'aménagement ouest

City of Ottawa | Ville d'Ottawa
613.580.2424 ext./poste 16587
ottawa.ca/planning / ottawa.ca/urbanisme

ABSENCE ALERT - I will be away from July 20 to August 8

'

'

Appendix B

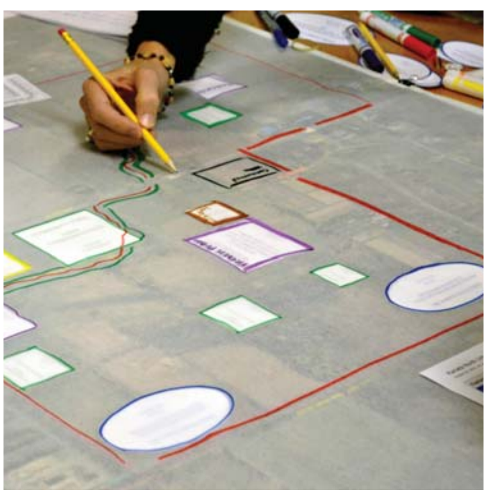
Excerpts from the MSS (Novatech, June 2016)

KANATA NORTH
COMMUNITY DESIGN PLAN

MASTER SERVICING STUDY

REPORT

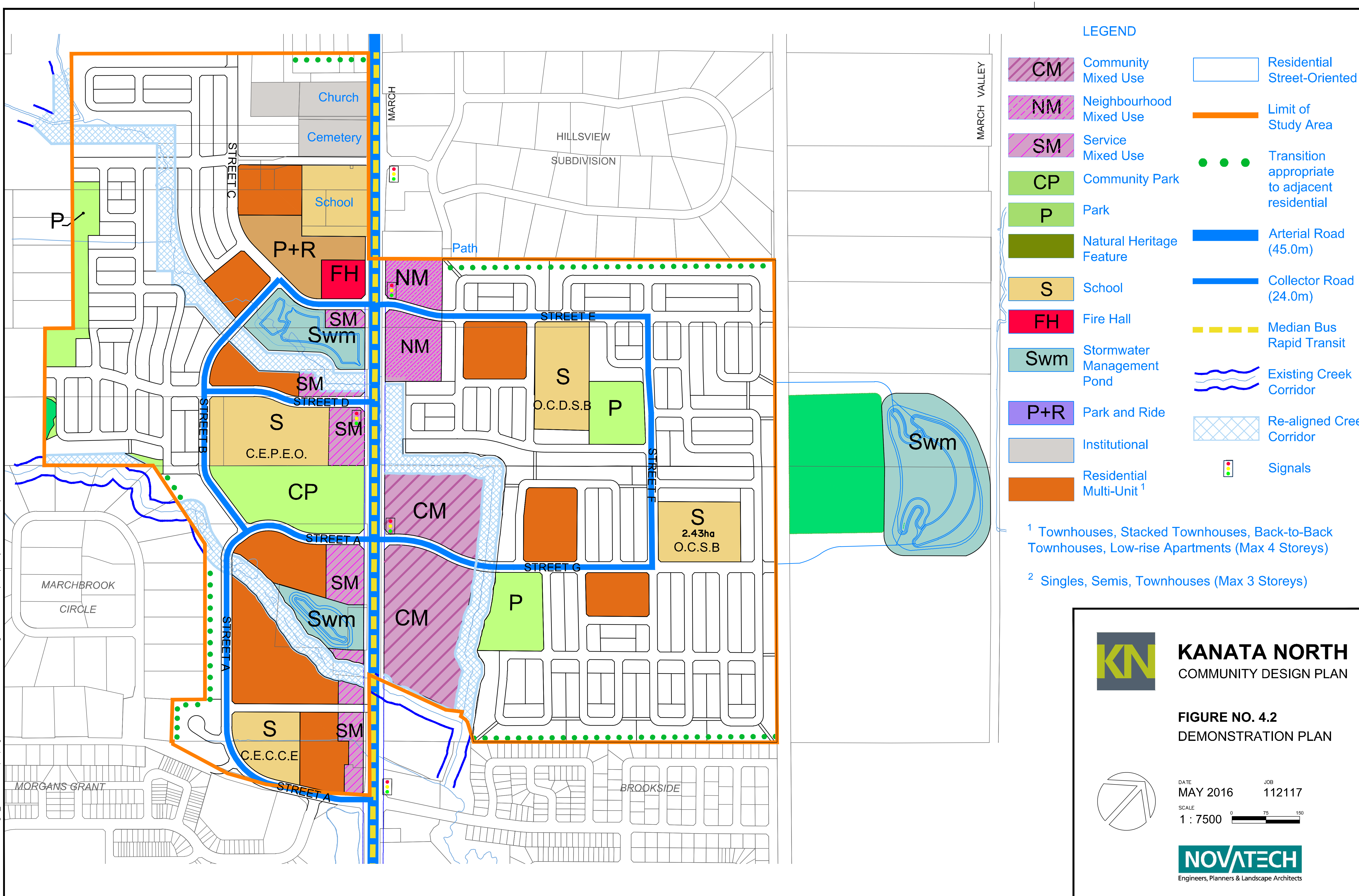





FINAL
JUNE 28, 2016

Ottawa

NOVATECH
Engineers, Planners & Landscape Architects

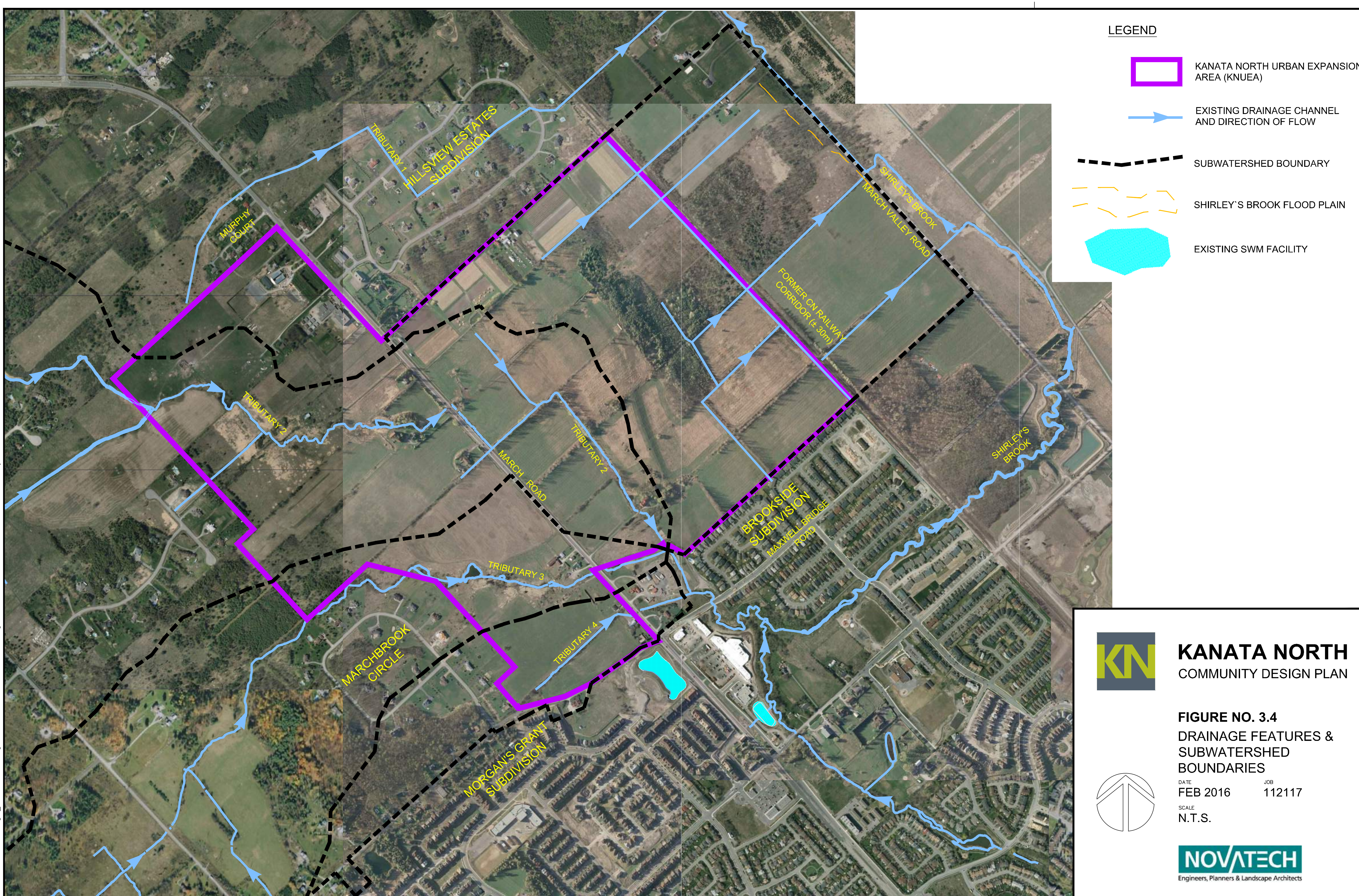


KANATA NORTH
COMMUNITY DESIGN PLAN

FIGURE NO. 4.2
DEMONSTRATION PLAN

DATE MAY 2016
JOB 112117
SCALE 1 : 7500

NOVATECH
Engineers, Planners & Landscape Architects



KN

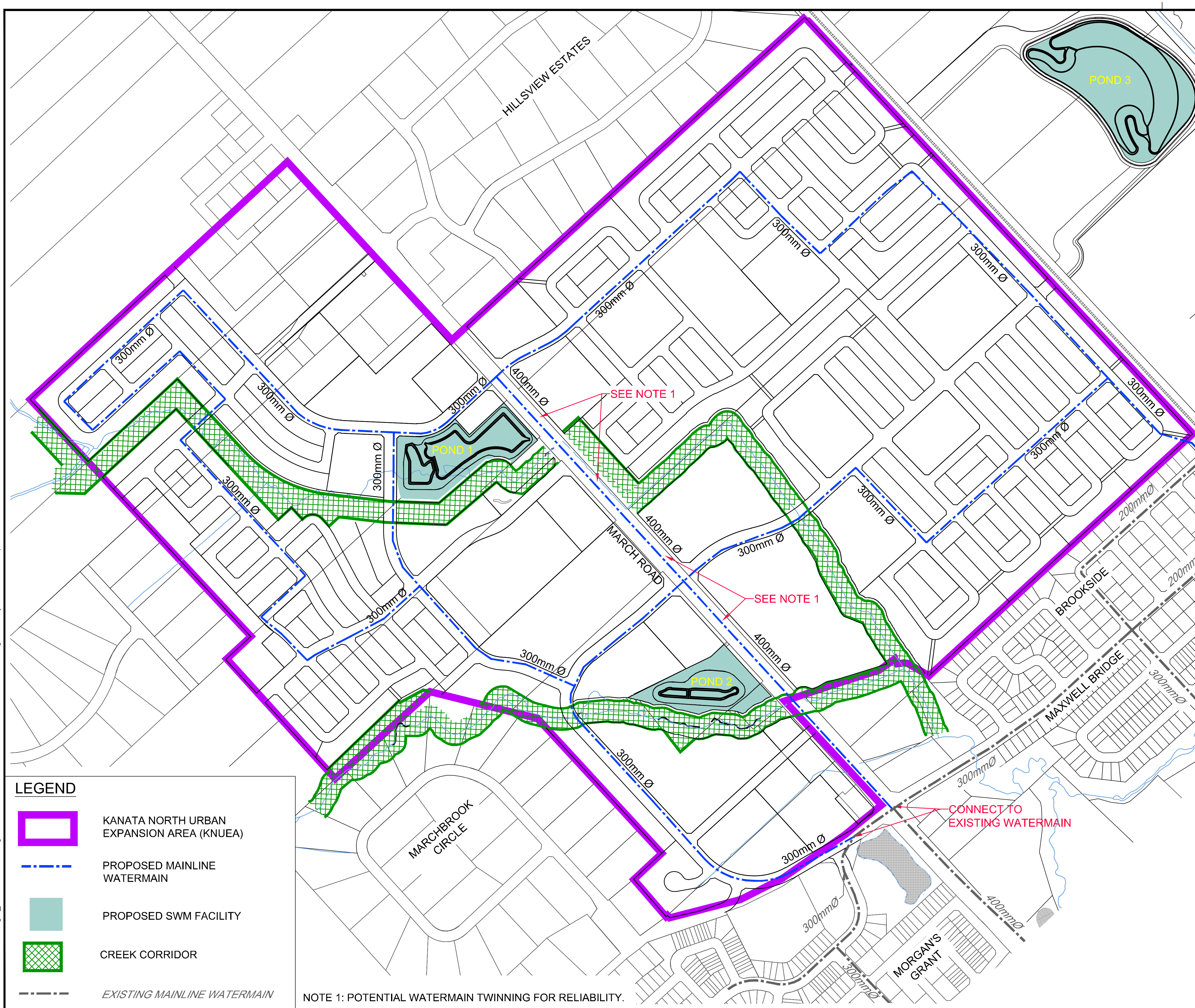
KANATA NORTH
COMMUNITY DESIGN PLAN

FIGURE NO. 3.4
DRAINAGE FEATURES & SUBWATERSHED BOUNDARIES

DATE FEB 2016 | JOB 112117
SCALE N.T.S.

NOVATECH
Engineers, Planners & Landscape Architects

M:\2012\112117\CAD\Design_MSS\FIGURES\Figure 3.4 - DRAINAGE FEATURES.dwg, DRAINAGE FEAT, Feb 23, 2016 - 11:38am, lseely



KN

KANATA NORTH

COMMUNITY DESIGN PLAN

FIGURE NO. 7.1

PROPOSED WATERMAIN INFRASTRUCTURE

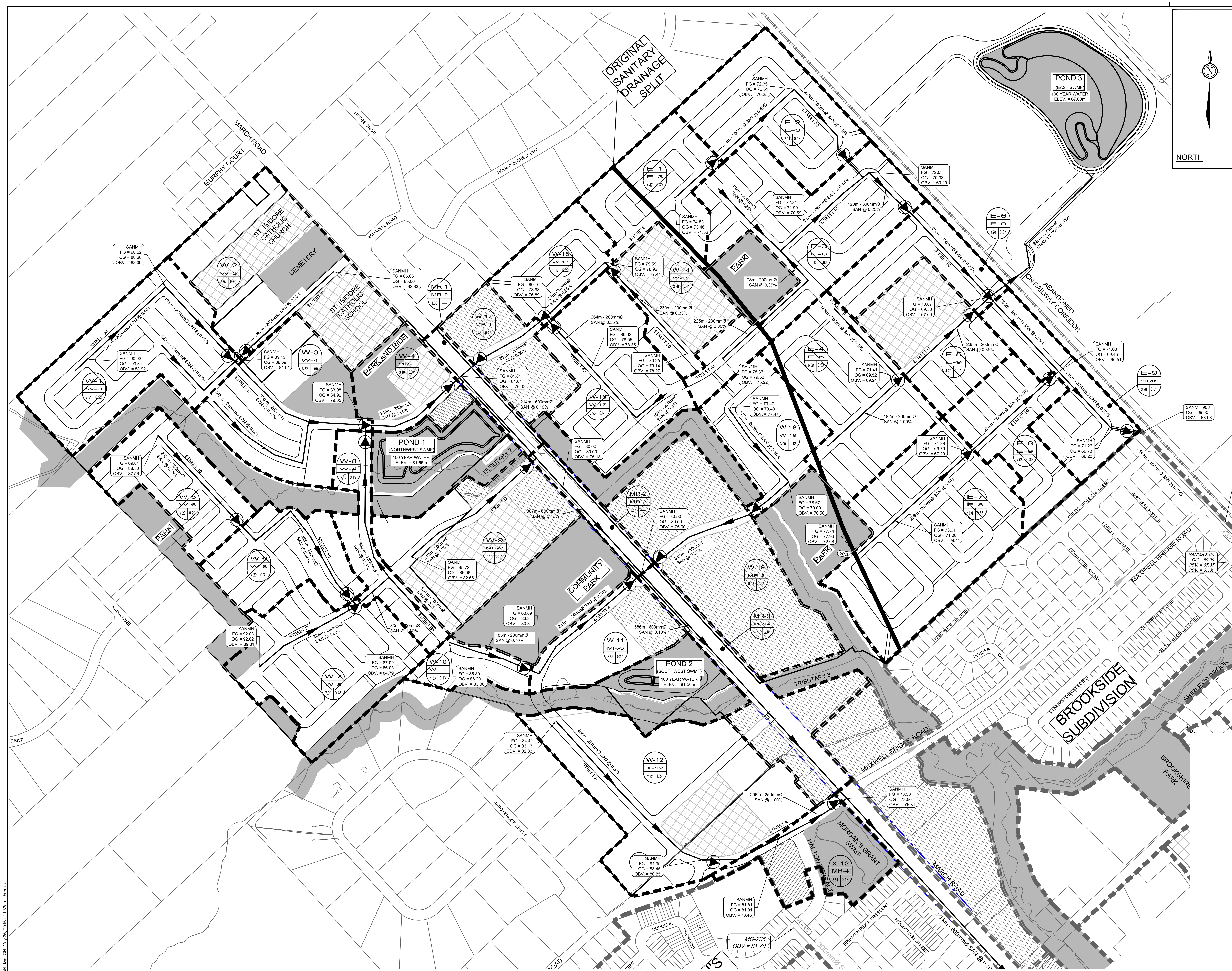
DATE	JOB
MAY 2016	112117

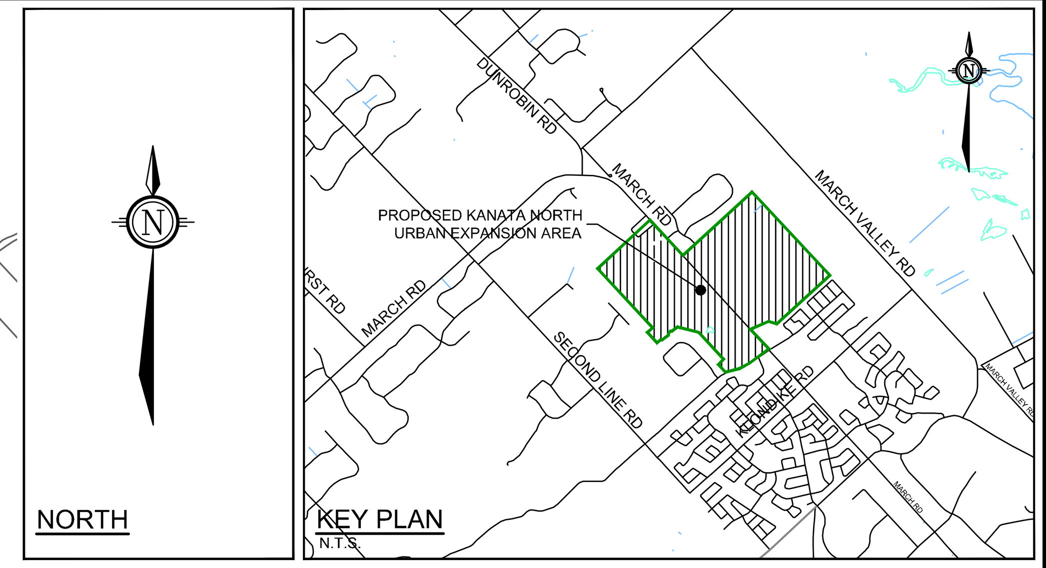
SCALE

N.T.S.

NOVATECH

Engineers, Planners & Landscape Architects





LEGEND

- AREA ID
- OUTLET AREA
- EQUIVALENT POPULATION (THOUSANDS) *PLUS ADDITIONAL NON-RESIDENTIAL FLOW
- AREA IN HECTARES
- PROPOSED DRAINAGE AREA
- EXISTING DRAINAGE AREA
- FLOW OUTLET
- SAN ID
- PRELIMINARY FINISHED GROUND ELEVATION
- ORIGINAL GROUND ELEVATION
- PRELIMINARY OBVERT ELEVATION
- PROPOSED SANITARY SEWER & FLOW DIRECTION
- EXISING SANITARY SEWER & FLOW DIRECTION
- LANDS TO BE SERVICED AND NOT PART OF STUDY AREA
- LANDS WHICH DO NOT GENERATE SANITARY FLOWS
- INSTIUTIONAL LANDS
- COMMERCIAL LANDS

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.

No.	REVISION	DATE	BY
3.	ISSUED WITH DRAFT MASTER SERVICING STUDY	MAY 20/16	JLS
2.	ISSUED WITH DRAFT MASTER SERVICING STUDY	APR 4/16	JLS
1.	ISSUED WITH DRAFT MASTER SERVICING STUDY	FEB 26/16	JLS

SCALE 1:3000

1:3000
0 30 60 90 120

DESIGN ARM / TB
CHECKED ARM
DRAWN TB
CHECKED CJR
APPROVED JLS

FOR REVIEW ONLY

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

LOCATION
KANATA NORTH URBAN EXPANSION AREA
COMMUNITY DESIGN PLAN

DRAWING NAME
ONSITE SANITARY
DRAINAGE AREA PLAN

PROJECT No. 112117-04
REV REV # 3
DRAWING No. 112117-SAN1

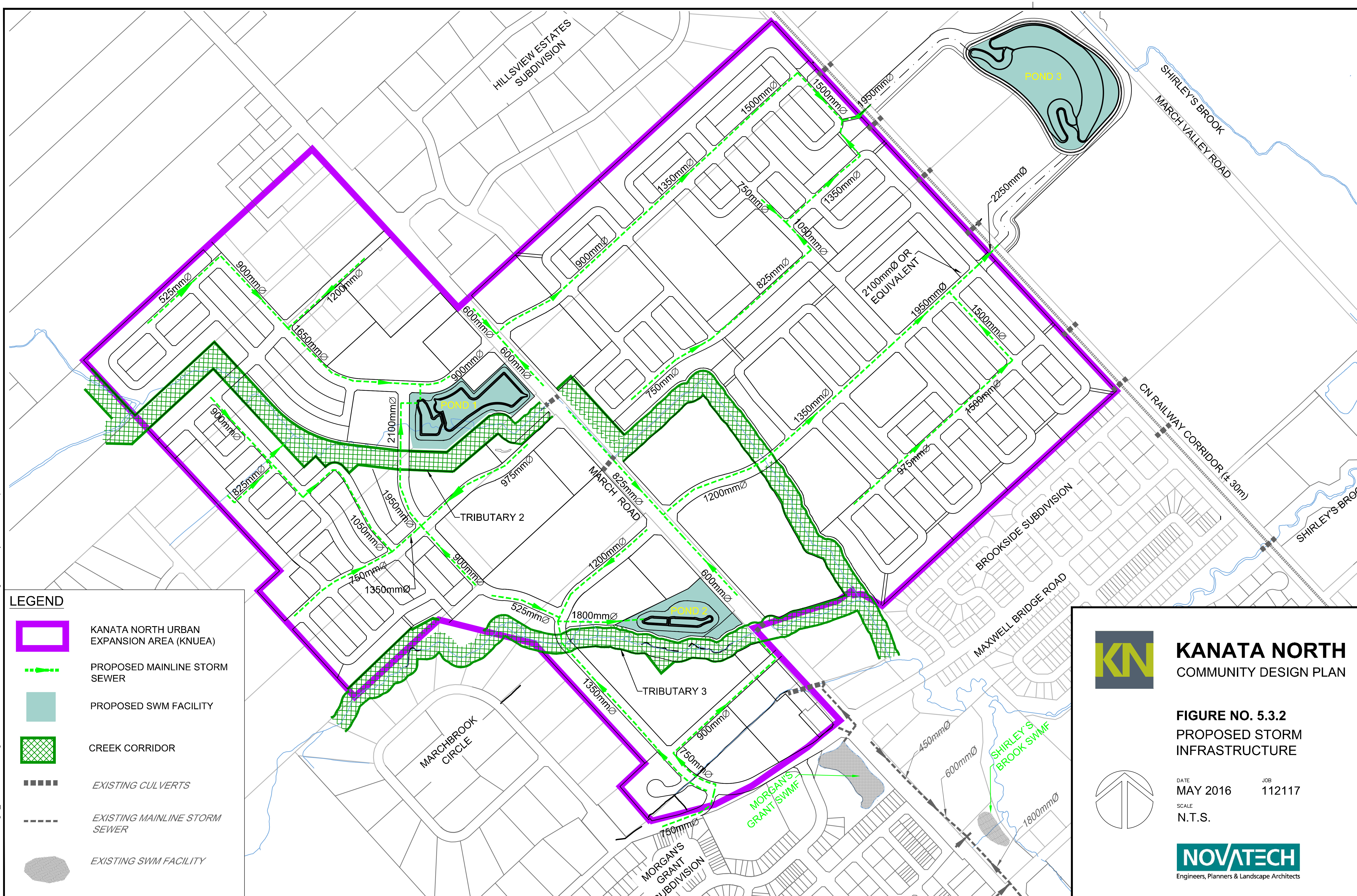
KANATA NORTH URBAN EXPANSION AREA
COMMUNITY DESIGN PLAN

TABLE C-6b:
SANITARY SEWER DESIGN SHEET

NOVATECH
Engineers, Planners & Landscape Architects

LOCATION				RESIDENTIAL AREA AND POPULATION										ICI								INFILTRATION				FLOW	PIPE					
									Cumulative					IND			COMM		INST													
Street	From Node	To Node	Total Area (ha)	Dwellings SFH 3.4 pers/ea	Dwellings SD/TH 2.7 pers/ea	Density (Net ha) Low[3] 101 pers/ha	Density (Net ha) High[4] 161 per/ha	Pop.	Residential Area (ha)	Residential Pop. New	Residential Pop. Exist	Peak Factor	Peak Flow (l/s)	Area (ha)	Accu. Area (ha)	Peak Factor	Area (ha)	Accu. Area (ha)	Area (ha)	Accu. Area (ha)	Peak Flow (l/s)	Total Area (ha)	Accu. Area New (ha)	Accu. Area Exist	Infiltration Flow (l/s)	Total Flow (l/s)	Dia Act (mm)	Dia Nom (mm)	Slope (%)	Velocity (Full) (m/s)	Capacity (Full) (l/s)	Ratio Q/Qfull (%)
EAST KNCDP																																
E-1	E-1	E-3	4.47			3.00		303.0	3.00	**303**		4.00	4.9								0.0	4.47	4.47		1.3	6.2	203	200	0.40	0.67	21.6	28%
E-2	E-2	E-3	5.91			4.29		433.3	7.29	**736**		3.88	11.6								0.0	5.91	10.38		2.9	14.5	203	200	0.35	0.62	20.2	72%
E-3	E-3	E-6	9.42			6.51		657.5	13.80	**1394**		3.70	20.9								0.0	9.42	19.80		5.5	26.4	254	250	0.40	0.77	39.2	67%
E-4	E-4	E-5	6.89			3.12	1.36	534.1	3.12	**534**		3.96	8.6								0.0	6.89	6.89		1.9	10.5	203	200	1.00	1.05	34.2	31%
E-5	E-5	E-9	4.70			1.46		147.5	4.58	**682**		3.90	10.8						**2.29**	2.29	2.0	4.70	11.59		3.2	16.0	203	200	0.35	0.62	20.2	79%
E-6	E-6	E-9	3.28			2.32		234.3	16.12	**1628**		3.65	24.1								0.0	3.28	23.08		6.5	30.6	305	300	0.25	0.69	50.4	61%
E-7	E-7	E-8	10.04			7.21		728.2	7.21	**728**		3.88	11.5								0.0	10.04	10.04		2.8	14.3	203	200	0.40	0.67	21.6	66%
E-8	E-8	E-9	4.05			2.94		296.9	10.15	**1025**		3.79	15.8								0.0	4.05	14.09		3.9	19.7	254	250	0.30	0.67	33.9	58%
E-9	E-9	*MH 209*	3.98			3.06		309.1	33.91	**3644**		3.37	49.7							2.29	2.0	3.98	52.74		14.8	66.5	381	375	0.22	0.75	85.7	78%
Total Flows From East KNUEA			**52.74**					**3644**	**33.91**	**3644**		**3.37**	**49.7**							**2.29**	**1.99**		**52.74**		**14.77**	**66.49**						
*X-1 (Brookside Subdivision)**		*MH 209*	*32.80*					*2216.1*	*26.04*		*2216*	*3.55*	*18.2*				*6.76*	*6.76*			*2.3*	*32.80*		*32.80*	*11.5*	*32.0*						
				*Population from Novatech #103106 Sanitary Sewer Design Sheet																												
	MH 209	*MH 208*						*0.0*	*59.95*	**3644**	*2216*	*3.18*	*63.3*					*6.76*		*2.29*	*7.9*	*0.00*	**52.74**	*32.80*	*26.2*	*97.4*	457	450	0.20	0.81	132.9	73%
	MH 208	*MH 207*						*0.0*	*59.95*	**3644**	*2216*	*3.18*	*63.3*					*6.76*		*2.29*	*7.9*	*0.00*	**52.74**	*32.80*	*26.2*	*97.4*	457	450	0.20	0.81	132.9	73%
X-2 (Brookside Subdivision)	*MH 207*	*MH 206*	*3.12*		*44*			*118.8*	*63.07*	**3644**	*2335*	*3.17*	*64.0*					*6.76*		*2.29*	*7.9*	*3.12*	**52.74**	*35.92*	*27.3*	*99.2*	*457*	*450*	*0.20*	*0.81*	*132.9*	*75%*
*X-3 (Brookside Subdivision)***	*MH 206*	*MH 205*	*9.81*		*244*			*658.8*	*72.88*	**3644**	*2994*	*3.13*	*67.9*					*6.76*		*2.29*	*7.9*	*9.81*	**52.74**	*45.73*	*30.8*	*106.5*	*457*	*450*	*0.21*	*0.83*	*136.2*	*78%*
				**244 TH units = 107 Units from Novatech #103106 Sanitary Sewer Design Sheet, plus future 137 units North of Klondike and West of Marconi (5.67ha @ 65pers/ha)																												
X-13 (Future Industrial Lands)	Future	*MH 205*	20.99											15.85	15.85	3.6					13.2	20.99	**20.99**		5.9	19.1						
Briar Ridge Pump Station Access Road	*MH 205*	*MH 204*							*72.88*	**3644**	*2994*	*3.13*	*67.9*		*15.85*	*3.6*		*6.76*		*2.29*	*21.1*	*0.00*	**73.73**	*45.73*	*36.6*	*125.6*	*457*	*450*	*0.20*	*0.81*	*132.9*	*94%*
Briar Ridge Pump Station Access Road	*MH 204*	*MH 203*							*72.88*	**3644**	*2994*	*3.13*	*67.9*		*15.85*	*3.6*		*6.76*		*2.29*	*21.1*	*0.00*	**73.73**	*45.73*	*36.6*	*125.6*	*457*	*450*	*0.20*	*0.81*	*132.9*	*94%*
Briar Ridge Pump Station Access Road	*MH 203*	*MH 202*							*72.88*	**3644**	*2994*	*3.13*	*67.9*		*15.85*	*3.6*		*6.76*		*2.29*	*21.1*	*0.00*	**73.73**	*45.73*	*36.6*	*125.6*	*457*	*450*	*0.25*	*0.91*	*148.6*	*85%*
Briar Ridge Pump Station Access Road	*MH 202*	*MH 201A*							*72.88*	**3644**	*2994*	*3.13*	*67.9*		*15.85*	*3.6*		*6.76*		*2.29*	*21.1*	*0.00*	**73.73**	*45.73*	*36.6*	*125.6*	*457*	*450*	*0.26*	*0.92*	*151.6*	*83%*
Briar Ridge Pump Station Access Road	*MH 201A*	*MH 201*							*72.88*	**3644**	*2994*	*3.13*	*67.9*		*15.85*	*3.6*		*6.76*		*2.29*	*21.1*	*0.00*	**73.73**	*45.73*	*36.6*	*125.6*	*457*	*450*	*0.25*	*0.91*	*148.6*	*85%*
Briar Ridge Pump Station Access Road	*MH 201*	*MH 200*							*72.88*	**3644**	*2994*	*3.13*	*67.9*		*15.85*	*3.6*		*6.76*		*2.29*	*21.1*	*0.00*	**73.73**	*45.73*	*36.6*	*125.6*	*457*	*450*	*0.25*	*0.91*	*148.6*	*85%*
Briar Ridge Pump Station Access Road	*MH 200*	*EXMH1*							*72.88*	**3644**	*2994*	*3.13*	*67.9*		*15.85*	*3.6*		*6.76*		*2.29*	*21.1*	*0.00*	**73.73**	*45.73*	*36.6*	*125.6*	*457*	*450*	*0.23*	*0.87*	*142.5*	*88%*
RIDDELL VILLAGE (X-4)***		*EXMH1*	*42.42*					*3100*			*3100*	*3.43*	*24.6*						*2.96*	*2.96*	*1.0*	*42.42*		*42.42*	*14.8*	*40.5*						
				***Population from Novatech #103106 Sanitary Sewer Design Sheet																												
	EXMH1	*EXMH2*							72.88	**3644**	*6094*	*2.97*	*85.6*		*15.85*	*3.6*		*6.76*		*5.25*	*23.6*	*0.00*	**73.73**	*88.15*	*51.5*	*160.8*	*457*	*450*	*0.30*	*0.99*	*162.8*	*99%*
	EXMH2	*EXMH4*							72.88	**3644**	*6094*	*2.97*	*85.6*		*15.85*	*3.6*		*6.76*		*5.25*	*23.6*	*0.00*	**73.73**	*88.15*	*51.5*	*160.8*	*457*	*450*	*0.30*	*0.99*	*162.8*	*99%*
X-14 (Future Industrial Lands east of Marshes Golf Course)	*EXMH4*	*EXMH5*	19.23						72.88	**3644**	*6094*	*2.97*	*85.6*	*19.23*	*35.08*	*3.1*		*6.76*		*5.25*	*35.6*	*19.23*	**92.96**	*88.15*	*56.9*	*178.1*	*457*	*450*	*0.44*	*1.20*	*197.2*	*90%*
	EXMH5	*PS*							72.88	**3644**	*6094*	*2.97*	*85.6*		*35.08*	*3.1*		*6.76*		*5.25*	*35.6*	*0.00*	**92.96**	*88.15*	*56.9*	*178.1*	*457*	*450*	*0.40*	*1.14*	*188.0*	*95%*
Briar Ridge Pump Station									72.88	**3644**	*6094*	2.97	85.6		35.08	3.1		*6.76*		5.25	35.6	0.00	**92.96**	*88.15*	56.9	178.1						
WEST KNUEA / MARCH ROAD																																
W-1	W-1	W-3	7.51			5.14		519.1	5.14	**519**		3.97	8.3								0.0	7.51	7.51		2.1	10.4	203	200	0.40	0.67	21.6	48%
													0.0																			
W-2	W-2	W-3	8.94			2.36		238.4	2.36	**238**		4.00	3.9						**4.32**	4.32	3.8	8.94	8.94		2.5	10.1	203	200	0.35	0.62	20.2	50%
													0.0																			
W-3	W-3	W-4	6.52			1.97	2.16	546.7	11.63	**1304**		3.72	19.7								0.0	6.52	22.97		6.4	26.1	254	250	0.70	1.02	51.9	50%
W-5	W-5	W-6	4.20			2.74		276.7	2.74	**277**		4.00	4.5								0.0	4.20	4.20		1.2	5.7	203	200	0.35	0.62	20.2	28%
W-6	W-6	W-8	4.29			3.04		307.0	5.78	**584**		3.94	9.3								0.0	4.29	8.49		2.4	11.7	203	200	0.35	0.62	20.2	58%
													0.0																			
W-7	W-7	W-8	7.39			4.24		428.2	4.24	**428**		4.00	6.9								0.0	7.39	7.39		2.1	9.0	203	200	1.60	1.33	43.2	21%
W-8	W-8	W-9	2.85			1.02	0.55	191.6	11.59	**1204**		3.75	18.3								0.0	2.85	18.73		5.2	23.5	254	250	0.35	0.72	36.7	64%
W-4	W-4	MR-1	3.10					0.0	23.22	**2508**		3.51	35.6				**0.35**	0.35	**0.83**	5.15	4.8	3.10	26.07		7.3	47.7	254	250	1.00	1.22	62.0	77%
													0.0																			
W-14	W-14	W-15	3.79			0.36		36.4	0.36	**36**		4.00	0.6						**2.89**	2.89	2.5	3.79	3.79		1.1	4.2	203	200	0.35	0.62	20.2	21%
W-15	W-15	W-17	3.17			2.20		222.2	2.56	**259**		4.00	4.2								0.0	3.17	6.96		1.9	6.1	203	200	0.35	0.62	20.2	30%

M:\2012\112117\DATA\Calculations\Sewer Calcs\SAN\SAN Design.xlsx



KN

KANATA NORTH
COMMUNITY DESIGN PLAN

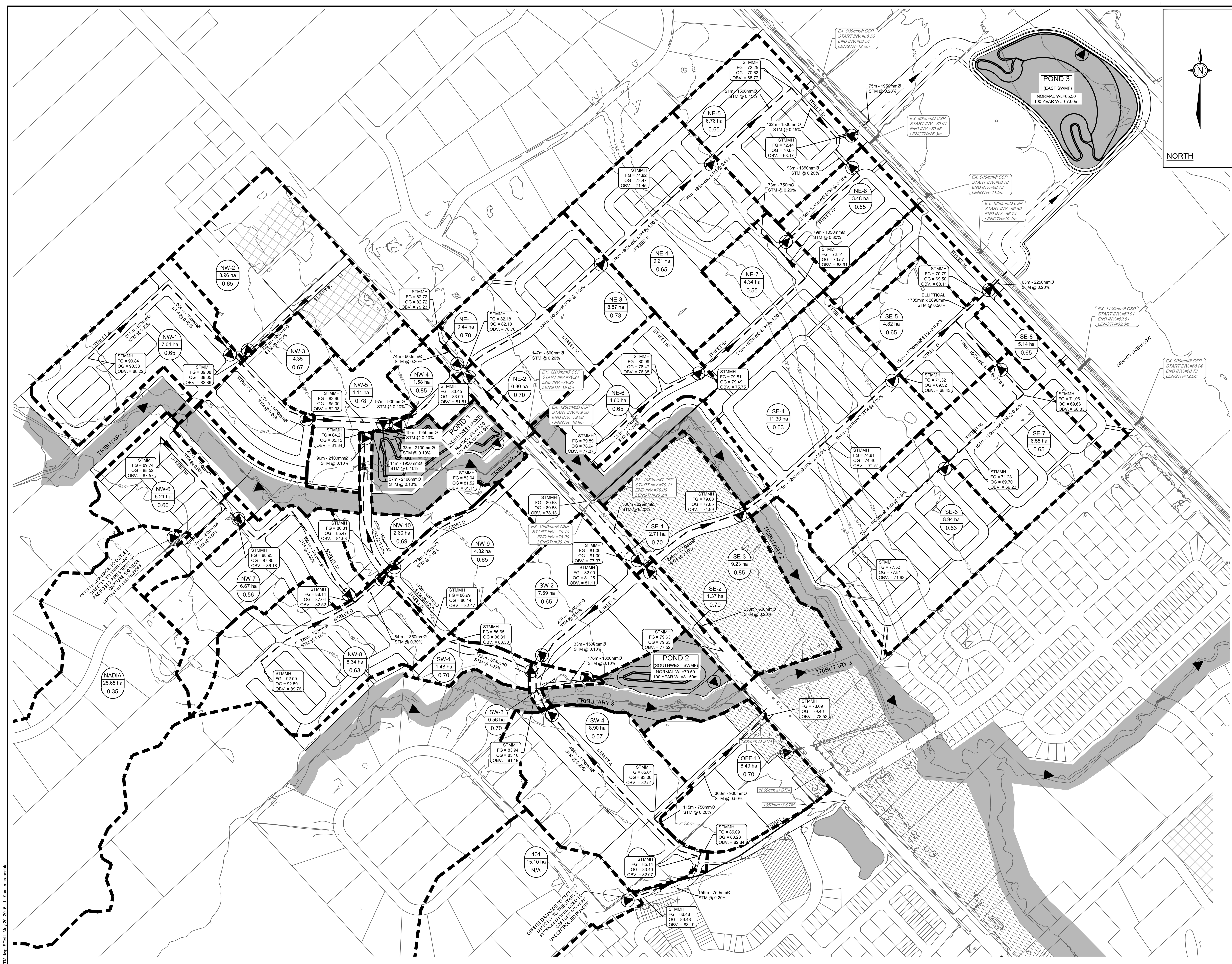
FIGURE NO. 5.3.2
PROPOSED STORM INFRASTRUCTURE

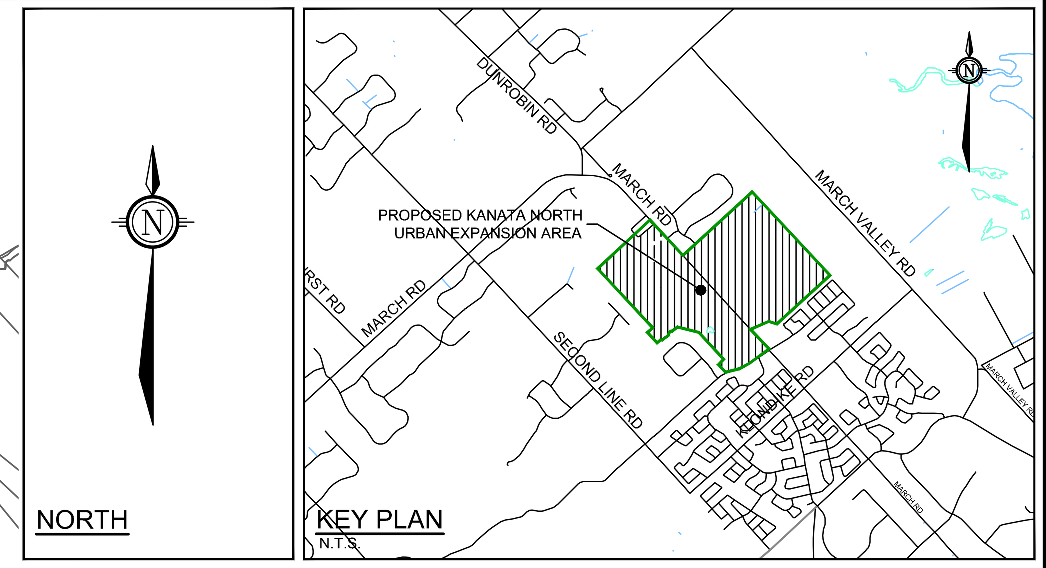
DATE MAY 2016
JOB 112117
SCALE N.T.S.

NOVATECH
Engineers, Planners & Landscape Architects

M:\2012\112117\CAD\Design_MSS\FIGURES\Figure 5.3.2-PROP STORM INFRASTRUCTURE.dwg, FIG 5, May 18, 2016 - 3:15pm, mhrehoriak

SHT11x17.DWG - 279mmx432mm





KEY PLAN

N.T.S.

LEGEND

- A-10 — AREA ID
- 1.14 ha — AREA IN HECTARES
- 0.40 — RUNOFF COEFFICIENT
- DRAINAGE AREA
- DRAINAGE AREA OUTLET
- STMMH — STM ID
- FG = 71.69 — FINISHED GROUND ELEVATION
- OG = 69.52 — ORIGINAL GROUND ELEVATION
- OBV. = 68.22 — OBVERT ELEVATION
- CREEK CORRIDOR
- PROPOSED OUTLET DITCH
- PROPOSED STORM SEWER & FLOW DIRECTION
- *EXISTING STORM SEWER & FLOW DIRECTION*

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.

No.	REVISION	DATE	BY
3.	ISSUED WITH DRAFT MASTER SERVICING STUDY	MAY 20/16	JLS
2.	ISSUED WITH DRAFT MASTER SERVICING STUDY	APR 4/16	JLS
1.	ISSUED WITH DRAFT MASTER SERVICING STUDY	FEB 26/16	JLS

SCALE 1:3000

1:3000 — 0 30 60 90 120

DESIGN: ARM / TB
CHECKED: ARM
DRAWN: TB
CHECKED: CJR
APPROVED: JLS

FOR REVIEW ONLY

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

LOCATION
KANATA NORTH URBAN EXPANSION AREA
COMMUNITY DESIGN PLAN

DRAWING NAME
STORM DRAINAGE AREA PLAN
MINOR SYSTEM DRAINAGE

PROJECT No. 112117-04
REV: REV # 3
DRAWING No. 112117-STM1

PLANB1.DWG - 1000mmx707mm

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.

No.	REVISION	DATE	BY
3.	ISSUED WITH DRAFT MASTER SERVICING STUDY	MAY 20/16	JLS
2.	ISSUED WITH DRAFT MASTER SERVICING STUDY	APR 4/16	JLS
1.	ISSUED WITH DRAFT MASTER SERVICING STUDY	FEB 26/16	JLS

SCALE 1:3000

1:3000 — 0 30 60 90 120

DESIGN: ARM / TB
CHECKED: ARM
DRAWN: TB
CHECKED: CJR
APPROVED: JLS

FOR REVIEW ONLY

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

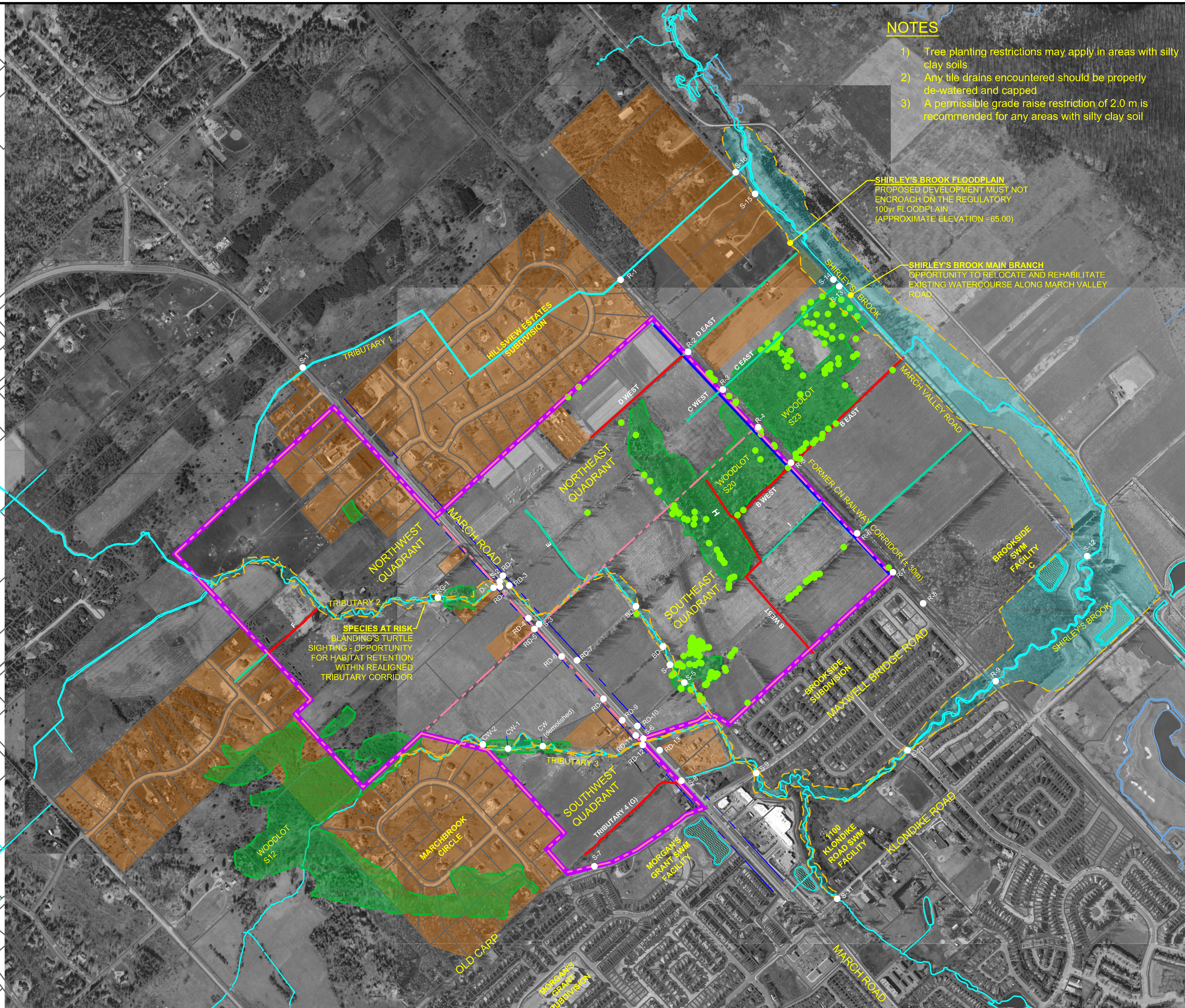
LOCATION
KANATA NORTH URBAN EXPANSION AREA
COMMUNITY DESIGN PLAN

DRAWING NAME
PRELIMINARY GRADING PLAN

PROJECT No. 112117-00
REV: REV # 3
DRAWING No. 112117-PGR

M:\2012\112117\CAD\Design_MSS\112117 - PRELIM GR.dwg, PRELIM GR, May 18, 2016 - 4:04pm, Brooks

PLANB1.DWG - 1000mmx707mm



LEGEND - GENERAL

KANATA NORTH URBAN EXPANSION AREA (KNUEA)

DRAINAGE CHANNEL

STUDY AREA QUADRANT BOUNDARY

LEGEND - CONSTRAINTS

FLOODPLAIN BOUNDARY (APPROXIMATE - MVCA/ AECOM)

ADJACENT AREAS SERVICED BY WELLS

HYDRAULIC STRUCTURE ID

• BD	BEAVER DAM
• CW	CONCRETE WEIR
• D	DRIVEWAY CULVERT
• R	RAILWAY CULVERT
• RD	ROADWAY CULVERT
• RG	ROCK GABIAN BASKET
• S	SHIRLEY'S BROOK CULVERT

HEADWATER DRAINAGE CHANNEL TO BE COMPENSATED

HEADWATER DRAINAGE CHANNEL NOT REQUIRING COMPENSATION OR MITIGATION

A DRAINAGE CHANNEL ID

LEGEND - FEATURES

EXISTING SWM FACILITY

WOODED AREA

BUTTERNUT LOCATIONS (EXAMPLES)

KANATA NORTH

COMMUNITY DESIGN PLAN

FIGURE NO. 3.5

EXISTING ENVIRONMENTAL INVENTORY

DATE APR 2016

JOB 112117

SCALE AS SHOWN

NOVATECH
Engineers, Planners & Landscape Architects

M:\2012\112117\CAD\Design_EMP\112117-ENV.dwg, Fig 3.5 (AERIAL), Apr 05, 2016 - 9:44am, tbrooks

SHT11X17.DWG - 279mmX432mm

Appendix C

Sanitary Servicing Design

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DSEL
david schaeffer engineering ltd

SANITARY SERVICING APPENDIX
MINTO KANATA NORTH

PROJECT No. :	17-982
SCALE:	1:2000
DATE:	January 2019
DRAWING No.	3

SANITARY SEWER CALCULATION SHEET

Ottawa

Manning's n=0.013

LOCATION: STREET	FROM M.H.	TO M.H.	RESIDENTIAL AREA AND POPULATION: AREA (ha)	UNITS	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	COMM AREA (ha)	COMM ACCU. AREA (ha)	INSTIT AREA (ha)	INSTIT ACCU. AREA (ha)	PARK AREA (ha)	PARK ACCU. AREA (ha)	C+I+I PEAK FLOW (l/s)	INFILTRATION TOTAL AREA (ha)	INFILTRATION ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	PIPE DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
Trunk 202																											
	53A	57A	2.07		138	2.07	138	3.36	1.50		0.00		0.00	2.11	2.11	0.34	4.18	4.18	1.38	3.22	67.5	250	0.25	29.73	0.11	0.61	0.39
	57A	64A	2.10		138	4.17	276	3.27	2.93		0.00		0.00		2.11	0.34	2.10	6.28	2.07	5.34	68.5	250	0.25	29.73	0.18	0.61	0.46
	64A	68A	3.46		225	7.63	501	3.18	5.16		0.00		0.00		2.11	0.34	3.46	9.74	3.21	8.72	68.5	250	0.25	29.73	0.29	0.61	0.53
			0.31		21	7.94	522				0.00		0.00	0.40	2.51		0.71	10.45									
	68A	76A	1.12		125	9.06	647	3.13	6.57		0.00		0.00		2.51	0.41	1.12	11.57	3.82	10.79	79.0	250	0.25	29.73	0.36	0.61	0.56
			0.39		43	9.45	690				0.00		0.00		2.51		0.39	11.96									
	76A	84A	2.73		182	12.18	872	3.07	8.68		0.00		0.00		2.51	0.41	2.73	14.69	4.85	13.93	126.5	250	0.25	29.73	0.47	0.61	0.60
			0.26		17	12.44	889				0.00		0.00		2.51		0.26	14.95									
	84A	85A	3.04		338	15.48	1227	2.99	11.90		0.00		0.00		2.51	0.41	3.04	17.99	5.94	18.24	68.5	300	0.25	48.35	0.38	0.68	0.64
To Trunk 200, Pipe 85A - 86A						15.48	1227				0.00		0.00		2.51			17.99									
Trunk 201																											
	18A	19A	1.32		86	1.32	86	3.41	0.95		0.00		0.00		0.00	0.00	1.32	1.32	0.44	1.39	121.0	200	0.65	26.44	0.05	0.84	0.44
			0.25		17	1.57	103				0.00		0.00		0.00		0.25	1.57									
			1.10		122	2.67	225				0.00		0.00		0.00		1.10	2.67									
	19A	22A	1.75		117	4.42	342	3.24	3.59		0.00		0.00		0.00	0.00	1.75	4.42	1.46	5.05	68.5	250	0.25	29.73	0.17	0.61	0.45
			0.48		32	4.90	374				0.00		0.00		0.00		0.48	4.90									
	22A	23A	1.22		135	6.12	509	3.18	5.24		0.00		0.00		0.00	0.00	1.22	6.12	2.02	7.26	92.5	300	0.25	48.35	0.15	0.68	0.49
	23A	24A	0.53		35	6.65	544	3.16	5.58		0.00	2.51	2.51		0.00	1.22	3.04	9.16	3.02	9.82	109.0	300	0.25	48.35	0.20	0.68	0.54
	24A	25A	0.90		59	7.55	603	3.14	6.15		0.00		2.51		0.00	1.22	0.90	10.06	3.32	10.69	105.5	300	0.25	48.35	0.22	0.68	0.55
	25A	41A	0.62		41	8.17	644	3.13	6.54		0.00		2.51		0.00	1.22	0.62	10.68	3.52	11.28	89.5	300	0.25	48.35	0.23	0.68	0.55
To Trunk 200, Pipe 41A - 44A						8.17	644				0.00		2.51		0.00			10.68									
Trunk 200																											
			0.08		6	0.08	6				0.00		0.00		0.00		0.08	0.08									
	30A	31A	21.32		1390	21.40	1396	2.96	13.40		0.00		0.00		0.00	0.00	21.32	21.40	7.06	20.46	34.5	300	0.25	48.35	0.42	0.68	0.65
			1.37		90	22.77	1486				0.00		0.00		0.00		1.37	22.77									
	31A	36A	1.54		170	24.31	1656	2.92	15.66		0.00		0.00		0.00	0.00	1.54	24.31	8.02	23.68	68.5	300	0.25	48.35	0.49	0.68	0.68
	36A	37A	1.95		130	26.26	1786	2.90	16.78		0.00		0.00		0.00	0.00	1.95	26.26	8.67	25.44	68.5	300	0.25	48.35	0.53	0.68	0.69
	37A	38A	0.62		41	26.88	1827	2.89	17.13		0.00		0.00		0.00	0.00	0.62	26.88	8.87	26.00	102.5	300	0.25	48.35	0.54	0.68	0.70
	38A	39A	0.58		38	27.46	1865	2.89	17.45		0.00		0.00		0.00	0.00	0.58	27.46	9.06	26.51	84.5	300	0.25	48.35	0.55	0.68	0.70
	39A	40A	0.18		12	27.64	1877	2.89	17.55		0.00		0.00		0.00	0.00	0.18	27.64	9.12	26.67	11.0	300	0.25	48.35	0.55	0.68	0.70
	40A	41A	0.28		19	27.92	1896	2.88	17.71		0.00		0.00		0.00	0.00	0.28	27.92	9.21	26.93	64.5	300	0.25	48.35	0.56	0.68	0.70
Contribution From Trunk 201, Pipe 25A - 41A						8.17	644				0.00		2.51		0.00		10.68	38.60									
	41A	44A	0.29		19	36.38	2559	2.80	23.22		0.00		2.51		0.00	1.22	0.29	38.89	12.83	37.28	72.5	300	0.25	48.35	0.77	0.68	0.75
	44A	85A	1.60		106	37.98	2665	2.79	24.08		0.00		2.51		0.00	1.22	1.60	40.49	13.36	38.66	68.5	300	0.25	48.35	0.80	0.68	0.76
Contribution From Trunk 202, Pipe 84A - 85A						15.48	1227				0.00		0.00		2.51		17.99	58.48									
	85A	86A	0.56		62	54.02	3954	2.67	34.22		0.00		2.51		2.51	1.63	0.56	59.04	19.48	55.33	84.5	375	0.22	82.24	0.67	0.74	0.80
	86A	90A	0.77		85	54.79	4039	2.66	34.87		0.00		2.51		2.51	1.63	0.77	59.81	19.74	56.23	99.5	375	0.22	82.24	0.68	0.74	0.80
	90A	91A	1.43		159	56.22	4198	2.65	36.07		0.00		2.51		2.51	1.63	1.43	61.24	20.21	57.91	47.0	375	0.22	82.24	0.70	0.74	0.80
	91A	92A				56.22	4198	2.65	36.07		0.00		2.51		2.51	1.63	0.00	61.24	20.21	57.91	59.0	375	0.22	82.24	0.70	0.74	0.80

LICENSED PROFESSIONAL ENGINEER
W. LIU
100167932
Jan 10, 201
PROVINCE OF ONTARIO

DESIGN PARAMETERS

Park Flow =	9300	L/ha/da
Average Daily Flow =	280	l/p/day
Comm/Inst Flow =	28000	L/ha/da
Industrial Flow =	35000	L/ha/da
Max Res. Peak Factor =	4.00	
Commercial/Inst./Park Peak Factor =	1.50	

Industrial Peak Factor = as per MOE Graph
Extraneous Flow = 0.330 L/s/ha
Minimum Velocity = 0.600 m/s
Manning's n = (Conc) 0.013 (Pvc) 0.013
Townhouse coeff= 2.7 (110 p/ha)
Single house coeff= 3.4 (65 p/ha)

Designed: W.L.
Checked: K.M.
Dwg. Reference: Sanitary Drainage Plan, Dwgs. No.

PROJECT: Minto Kanata North
LOCATION: City of Ottawa
File Ref: 17-982
Date: January, 2019
Sheet No 1 of 1

982_SAN_DesignSheet_FSR1.xlsx

Appendix D

Stormwater Servicing Design

DSEL
david schaeffer engineering ltd

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

STORM SERVICING APPENDIX
MINTO KANATA NORTH

PROJECT No. :	17-982
SCALE:	1:2000
DATE:	January 2019
DRAWING No.	2

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Ottawa

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Manning 0.013 Arterial Roads Return Frequency = 10 years

	LOCATION		AREA (Ha)																FLOW						SEWER DATA								
			2 YEAR				5 YEAR				10 YEAR				100 YEAR																		
Location	From Node	To Node	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	Time of Conc. (min)	Intensity 2 Year (mm/h)	Intensity 5 Year (mm/h)	Intensity 10 Year (mm/h)	Intensity 100 Year (mm/h)	Peak Flow Q (l/s)	DIA. (mm) (actual)	DIA. (mm) (nominal)	TYPE	SLOPE (%)	LENGTH (m)	CAPACITY (l/s)	VELOCITY (m/s)	TIME OF FLOW (min)	RATIO Q/Q full
Trunk 101																																	
					0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00			0.00	0.00	13.16														
					0.00	0.00	0.25	0.65	0.45	0.45			0.00	0.00			0.00	0.00															
			0.98	0.65	1.77	1.77			0.00	0.45			0.00	0.00			0.00	0.00															
	86	91	1.49	0.70	2.90	4.67			0.00	0.45			0.00	0.00			0.00	0.00	13.16	66.49	90.02	105.46	154.06	351	825	825	CONC	0.15	74.5	555.9418	1.0400	1.1939	0.632
					0.00	4.67	0.00	0.00	0.00	0.45			0.00	0.00			0.00	0.00	14.75														
					0.00	4.67	0.32	0.65	0.58	1.03			0.00	0.00			0.00	0.00															
	91	92	1.61	0.65	2.91	7.58			0.00	1.03			0.00	0.00			0.00	0.00	14.75	62.36	84.36	98.80	144.29	560	825	825	CONC	0.45	62.5	962.9195	1.8013	0.5783	0.581
	92	93	0.62	0.65	1.12	8.70			0.00	1.03			0.00	0.00			0.00	0.00	15.33	61.00	82.50	96.61	141.07	616	975	975	CONC	0.15	103.5	867.9562	1.1625	1.4839	0.709
	93	94	0.60	0.65	1.08	9.78			0.00	1.03			0.00	0.00			0.00	0.00	16.82	57.79	78.12	91.46	133.51	646	975	975	CONC	0.15	87.5	867.9562	1.1625	1.2545	0.744
	94	95	0.16	0.65	0.29	10.07			0.00	1.03			0.00	0.00			0.00	0.00	18.07	55.36	74.79	87.55	127.78	635	975	975	CONC	0.15	13.5	867.9562	1.1625	0.1935	0.731
	95	96	0.18	0.65	0.33	10.40			0.00	1.03			0.00	0.00			0.00	0.00	18.26	55.00	74.31	86.98	126.94	649	975	975	CONC	0.95	68.5	2184.3085	2.9256	0.3902	0.297
To Trunk 100, Pipe 96 - 97						10.40				1.03				0.00				0.00	18.65														
Trunk 102																																	
					0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00			0.00	0.00	13.62														
			0.51	0.65	0.92	0.92			0.00	0.00			0.00	0.00			0.00	0.00															
			1.02	0.40	1.13	2.06			0.00	0.00			0.00	0.00			0.00	0.00															
	52	53	1.23	0.65	2.22	4.28			0.00	0.00			0.00	0.00			0.00	0.00	13.62	65.24	88.31	103.44	151.10	279	600	600	CONC	3.60	67.0	1165.0050	4.1204	0.2710	0.240
					0.00	4.28	0.00	0.00	0.00	0.00			0.00	0.00			0.00	0.00	15.22														
	53	58	3.50	0.65	6.32	10.60			0.00	0.00			0.00	0.00			0.00	0.00	15.22	61.26	82.86	97.04	141.70	650	900	900	CONC	0.25	62.5	905.1556	1.4228	0.7321	0.718
					0.00	10.60	0.00	0.00	0.00	0.00			0.00	0.00			0.00	0.00	13.77														
	58	62	2.08	0.65	3.76	14.36			0.00	0.00			0.00	0.00			0.00	0.00	15.95	59.62	80.61	94.39	137.81	856	975	975	CONC	0.30	74.5	1227.4754	1.6440	0.7553	0.697
					0.00	14.36	0.00	0.00	0.00	0.00			0.00	0.00			0.00	0.00	12.87														
			0.45	0.65	0.81	15.17			0.00	0.00			0.00	0.00			0.00	0.00															
			0.40	0.40	0.44	15.62			0.00	0.00			0.00	0.00			0.00	0.00															
	62	63	1.24	0.70	2.41	18.03			0.00	0.00			0.00	0.00			0.00	0.00	16.70	58.02	78.43	91.82	134.04	1046	1050	1050	CONC	0.25	73.0	1365.3626	1.5768	0.7716	0.766
	63	64	0.54	0.65	0.98	19.01			0.00	0.00			0.00	0.00			0.00	0.00	17.48	56.48	76.33	89.35	130.42	1074	1050	1050	CONC	0.30	66.0	1495.6798	1.7273	0.6368	0.718
	64	72	0.57	0.65	1.03	20.04			0.00	0.00			0.00	0.00			0.00	0.00	18.11	55.28	74.69	87.42	127.59	1108	1050	1050	CONC	0.30	66.0	1495.6798	1.7273	0.6368	0.741
					0.00	20.04	0.00	0.00	0.00	0.00			0.00	0.00			0.00	0.00	14.62														
			0.66	0.65	1.19	21.23			0.00	0.00			0.00	0.00			0.00	0.00															
	72	78	2.77	0.70	5.39	26.62			0.00	0.00			0.00	0.00			0.00	0.00	18.75	54.13	73.12	85.58	124.90	1441	1050	1050	CONC	1.15	68.5	2928.3765	3.3819	0.3376	0.492
					0.00	26.62	0.00	0.00	0.00	0.00			0.00	0.00			0.00	0.00	16.49														
	78	81	2.63	0.70	5.12	31.74			0.00	0.00			0.00	0.00			0.00	0.00	19.09	53.55	72.32	84.64	123.52	1700	1500	1500	CONC	0.15	68.5	2737.7609	1.5493	0.7369	0.621
					0.00	31.74	0.00	0.00	0.00	0.00			0.00	0.00			0.00	0.00	12.35														
	81	96	1.07	0.65	1.93	33.67			0.00	0.00			0.00	0.00			0.00	0.00	19.82	52.32	70.64	82.67	120.62	1762	1500	1500	CONC	0.15	66.5	2737.7609	1.5493	0.7154	0.643
To Trunk 100, Pipe 96 - 97						33.67				0.00				0.00				0.00	20.54														
Trunk 100																																	
					0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00			0.00	0.00	14.99														
					0.00	0.00	0.15	0.85	0.35	0.35			0.00	0.00			0.00	0.00															
					0.00	0.00			0.00	0.35	1.39	0.85	3.28	3.28			0.00	0.00															
	10	11			0.00	0.00			0.00	0.35	2.47	0.65	4.46	7.75			0.00	0.00	14.99	61.79	83.59	97.89	142.95	788	1050	1050	CONC	0.15	80.5	1057.6053	1.2214	1.0985	0.745
	11	12			0.00	0.00	0.14	0.85	0.33	0.69			0.00	7.75			0.00	0.00	16.09	59.31	80.20	93.90	137.10	782	1050	1050	CONC	0.15	54.5	1057.6053	1.2214	0.7437	0.740
	12	13			0.00	0.00	0.15	0.85	0.35	1.04			0.00	7.75			0.00	0.00	16.83	57.76	78.07	91.40	133.43	789	1050	1050	CONC	0.15	56.5	1057.6053	1.2214	0.7710	0.746
					0.00	0.00	0.12	0.85	0.28	1.32			0.00	7.75			0.00	0.00															
					0.00	0.00	3.67	0.85	8.67	10.00			0.00	7.75			0.00	0.00															
	13	14			0.00	0.00	5.68	0.85	13.42	23.42			0.00	7.75			0.00	0.00	17.60	56.24	75.99	88.96	129.85	2469	1350	1350	CONC	0.40	58.5	3375.6694	2.3583	0.4134	0.731
	14	15			0.00	0.00	0.74	0.65	1.34	24.75			0.00	7.75			0.00	0.00	18.02	55.46	74.93	87.71	128.01	2534	1350	1350	CONC	0.45	118.0	3580.4381	2.5014	0.7862	0.708
	15	25			0.00	0.00	0.19	0.65	0.34	25.10			0.00	7.75			0.00	0.00	18.80	54.04	72.99	85.43	124.68	2494	1350	1350	CONC	2.15	41.0	7826.1677	5.4675	0.1250	0.319
					0.00	0.00	0.00	0.00	0.00	25.10			0.00	7.75			0.00	0.00	15.01														
			0.24	0.65	0.43	0.43			0.00	25.10			0.00	7.75			0.00	0.00															
					0.00	0.43	0.28	0.65	0.51	25.60			0.00	7.75			0.00	0.00															
			0.70	0.70	1.36	1.80			0.00	25.60			0.00	7.75			0.00	0.00															
	25	28	1.44	0.65	2.60	4.40			0.00	25.60			0.00	7.75			[illegible]	0.00	18.93	53.82	72.70	85.08	124.16	2757	1350	1350	CONC	2.15	62.5	7826.1677	5.4675	0.1905	0.352

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

LICENSED PROFESSIONAL ENGINEER
W. LIU
100167932
Jan 10, 20[illegible]
PROVINCE OF ONTARIO

Designed: W.L.	PROJECT:	Minto Kanata North	
Checked: K.M.	LOCATION:	City of Ottawa	
Dwg. Reference:	File Ref: 17-982	Date: January, 2019	Sheet No. SHEET 1 OF 2

982_STM_DesignSheet_FSR1.xlsx

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Ottawa

Manning 0.013

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Arterial Roads Return Frequency = 10 years

Location	From Node	To Node	2 YEAR AREA (Ha)	2 YEAR R	2 YEAR Indiv. 2.78 AC	2 YEAR Accum. 2.78 AC	5 YEAR AREA (Ha)	5 YEAR R	5 YEAR Indiv. 2.78 AC	5 YEAR Accum. 2.78 AC	10 YEAR AREA (Ha)	10 YEAR R	10 YEAR Indiv. 2.78 AC	10 YEAR Accum. 2.78 AC	100 YEAR AREA (Ha)	100 YEAR R	100 YEAR Indiv. 2.78 AC	100 YEAR Accum. 2.78 AC	Time of Conc. (min)	Intensity 2 Year (mm/h)	Intensity 5 Year (mm/h)	Intensity 10 Year (mm/h)	Intensity 100 Year (mm/h)	Peak Flow Q (l/s)	DIA. (mm) (actual)	DIA. (mm) (nominal)	TYPE	SLOPE (%)	LENGTH (m)	CAPACITY (l/s)	VELOCITY (m/s)	TIME OF FLOW (min)	RATIO Q/Q full
					0.00	4.40	0.00	0.00	0.00	25.60			0.00	7.75			0.00	0.00	11.39														
					0.00	4.40	0.61	0.65	1.10	26.71			0.00	7.75			0.00	0.00															
	28	29	1.45	0.70	2.82	7.22			0.00	26.71			0.00	7.75			0.00	0.00	19.12	53.49	72.25	84.56	123.39	2971	1350	1350	CONC	0.60	94.0	4134.3338	2.8883	0.5424	0.719
					0.00	7.22	0.66	0.65	1.19	27.90			0.00	7.75			0.00	0.00															
	29	36	2.51	0.65	4.54	11.76			0.00	27.90			0.00	7.75			0.00	0.00	19.66	52.58	71.00	83.10	121.25	3243	1500	1500	CONC	0.35	107.5	4181.9989	2.3665	0.7571	0.775
					0.00	11.76	0.00	0.00	0.00	27.90			0.00	7.75			0.00	0.00	15.45														
					0.00	11.76	0.97	0.65	1.75	29.65			0.00	7.75			0.00	0.00															
	36	37	1.38	0.65	2.49	14.25			0.00	29.65			0.00	7.75			0.00	0.00	20.42	51.37	69.35	81.15	118.39	3417	1650	1650	CONC	0.25	107.0	4557.2242	2.1313	0.8367	0.750
	37	96			0.00	14.25	0.85	0.65	1.54	31.19			0.00	7.75			0.00	0.00	21.25	50.10	67.61	79.11	115.41	3435	1650	1650	CONC	0.25	94.0	4557.2242	2.1313	0.7351	0.754
Contribution From Trunk 102, Pipe 81 - 96						33.67				0.00				0.00				0.00	20.54														
Contribution From Trunk 101, Pipe 95 - 96						10.40				1.03				0.00				0.00	18.65														
	96	HW			0.00	58.32	0.07	0.65	0.13	32.34			0.00	7.75			0.00	0.00	21.99	49.04	66.17	77.41	112.92	5600	2100	2100	CONC	0.20	64.0	7754.2474	2.2388	0.4765	0.722

LICENSED PROFESSIONAL ENGINEER
W. LIU
100167932
Jan 10, 2019
PROVINCE OF ONTARIO

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

Designed: W.L.	PROJECT:	Minto Kanata North	
Checked: K.M.	LOCATION:	City of Ottawa	
Dwg. Reference:	File Ref: 17-982	Date: January, 2019	Sheet No. SHEET 2 OF 2

982_STM_DesignSheet_FSR1.xlsx

Appendix E

SWM Pond 3 Design

Permanent Pool Volume

Table 3.2 SWM Manual 2003

Storage Volume (m3/ha) for
Impervious Level (%)

				Actual			
Level	SWMP Type	35	55	**66**	70		85
Enhanced	Wet Pond	140	190	215.7	225	108.3	250

Note: Required Volume has been minused 40m3/ha for extended volume.

	Area			
P/P Volume required:	**59.5**	175.7	**10452**	m3
Quality Volume required:		40	**2380**	m3

From Pond 3 Design, EMP (Page 85)

SWM Pond Block		11.8	ha
Drainage Area		95.6	ha
Imperviousness		68	%
Quality Control			
	PP	17,688	m3
	Ext.Det.	3824	m3
Quantity Control			
	100yr allowable flow	1.045	m3/s

Stage	Elev (m)	Volume (m3)	Active Storage (m3)	Relese Rate (l/s)
Bottom	64.50	-		-
NWL	65.50	17,914		-
Ext.Det.	65.75	25,499	7,585	190
2 yr	66.25	46,999	29,085	220
5 yr	66.50	58,710	40,796	402
100 yr	67.00	83,785	65,871	1,045

Estimated Interim Pond 3

SWM Pond Block		6	ha
Drainage Area		59.5	ha
Imperviousness		66	%
Quality Control			
	PP	**10,452**	m3
	Ext.Det.	**2,380**	m3
Quantity Control			
	100yr allowable flow	1.045	m3/s

Stage	Elev (m)	Volume (m3)	Active Storage (m3)	Relese Rate (l/s)
Bottom	64.50	-		-
NWL	65.50	10,452		-
Ext.Det.	65.75	12,832	2,300	118
2 yr	66.25	29,251	18,100	137
5 yr	66.50	36,540	25,300	250
100 yr	67.00	52,147	40,900	650

Date: Jan, 2019
File: 17-982

Minto Kanata North
OTTAWA
Calculation of Pond 3 Forebay Size

Settling Criteria

From the SWMP Manual, the required length for settling is as follows:

$$L_{min} = \left(\frac{r\,Q_p}{V_s} \right)^{0.5}$$

where:
r = length to width ratio
Q_p = peak outflow during design quality storm
V_s = settling velocity

Input:
r = 8.0
Q_p = 0.118 m^3/s
V_s = 0.0003 m/s

L_{min} = 56.2 m

Dispersion Criteria

From the SWMP Manual, the required length for dispersion is as follows:

$$L_{min} = \frac{8\,Q}{d\,V_f}$$

where:
Q = Maximum inflow (10 YR)
d = depth of permanent pool
V_f = desired final velocity

Input:
Q = 7.70 m^3/s (10 YR estimated)
d = 1.5 m
Vf = 0.5 m/s

L_{min} = 82.1 m

The minimum forebay length is determined by the larger of the settling or dispersion criteria.

Minimum Length of Forebay Required 82.1 m

Minimum Length of Forebay Provided 150.0 m

Date:
File:

Minto Kanata North
OTTAWA
Calculation of Pond 3 Forebay Size

Minimum Forebay Deep Zone Bottom Width

Minimum Bottom Width = $\frac{\text{Dispersion Length}}{8}$

Dispersion Length = 82 m

= 10.3 m

Forebay Bottom width provided = 12 metres

Q 10yr to pond : 7.700 m^3/s

Cross sectional area of forebay:	btm width	12	m
	depth	1.00	m
	slope	4	:1
	depth	0.50	m
	slope	4	:1
	Avarage Width of Forebay	24.0	m

Forebay velocity = 0.32 m/s < 0.5 OK

Date: January, 2019
File: 17-982

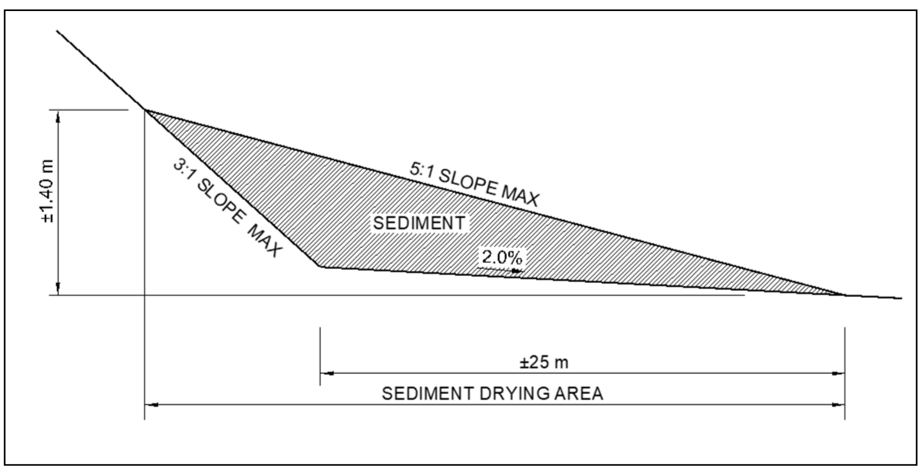
Minto Kanata North
City of Ottawa
SWM Pond 3
Sediment Management Area

As per Table 6.3 in the MOE SWMP Manual, the annual sediment loading for this catchments will be 2.56 m^3/ha

Table 6.3 Annual Sediment Loadings			
Catchement Imperviousness	Annual Loading (kg/ha)	Wet Density (kg/m^3)	Annual Loading (m^3/ha)
35%	770	1230	0.6
55%	2300	1230	1.9
70%	3495	1230	2.8
85%	4680	1230	3.8

Interpolate for Catchement Imperviousness of 66% - Annual Loading = 2.56 m^3/ha
Total Drainage Area = 59.5 ha

Sediment Drying Volume = min 5 yrs accumulation x annual loading x drainage area
Sediment Drying Volume = (5)*(2.68)* 59.5
= 762 m^3



Provided Sediment Drying Area Capacity = 927 m^3

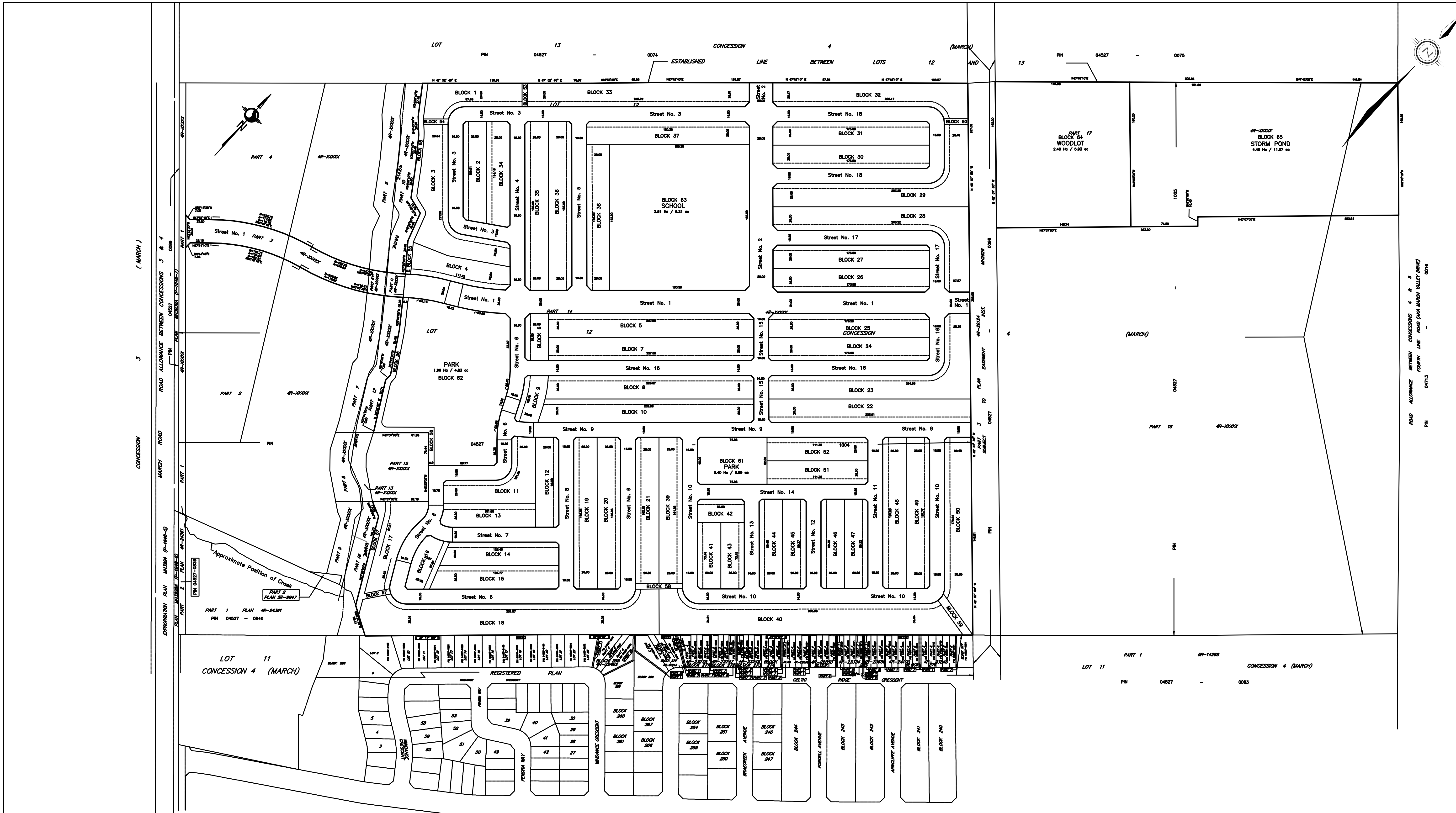
BaseArea= 1650 m^2

FIGURES

LEGEND

SITE BOUNDARY

MINTO KANATA NORTH	SITE LOCATION	DATE: January 2019
		SCALE: 1:15,000
DSEL david schaeffer engineering ltd	120 Iber Road, Unit 203 Stittsville, ON K2S 1E9 TEL: (613) 836-0856 FAX: (613) 836-7183 www.DSEL.ca	PROJECT No.: 17-982
		FIGURE: 1

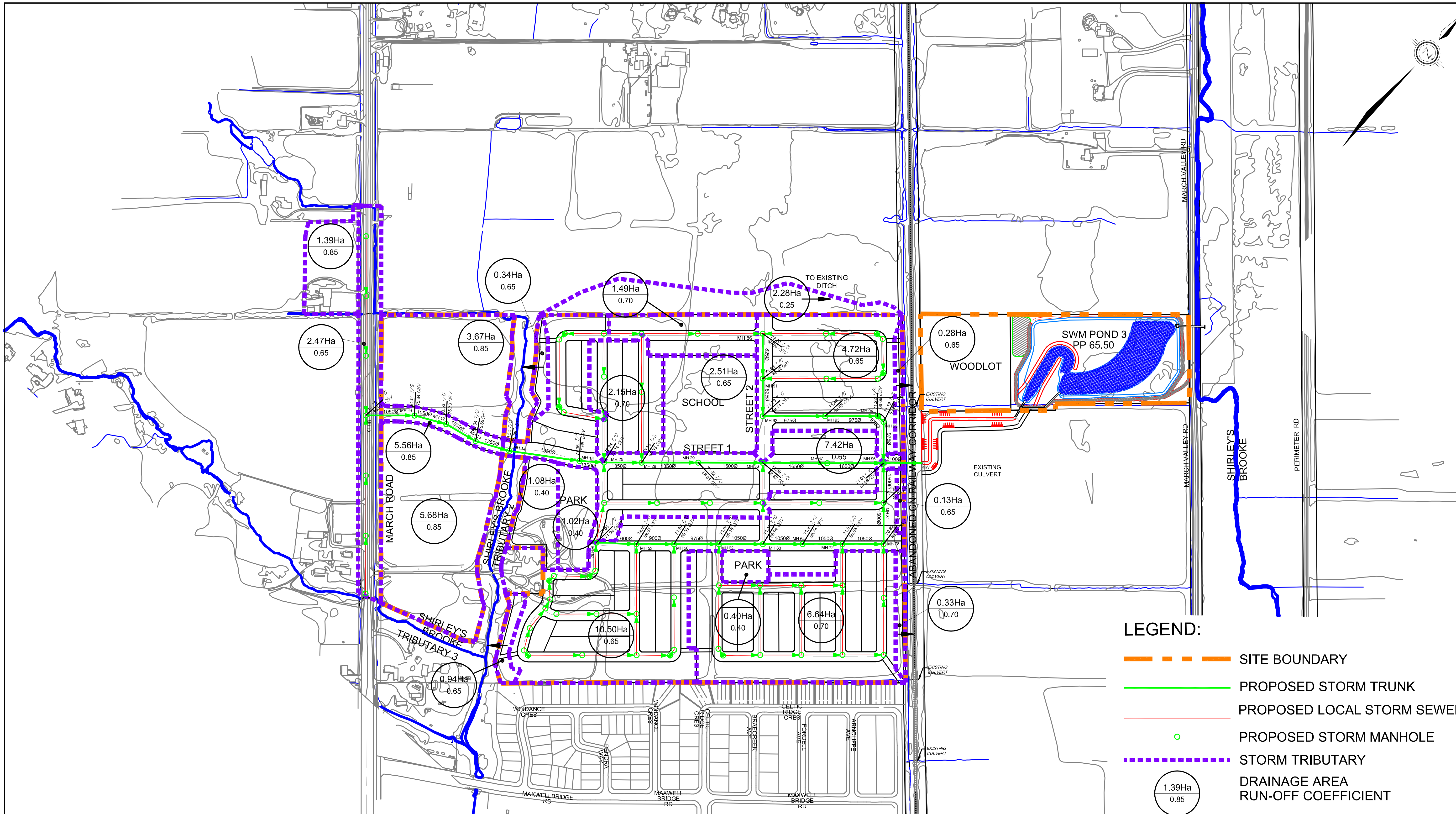


DSEL
david schaeffer engineering ltd

120 Iber Road, Unit 203
Stittsville, ON K2S 1E9
TEL: (613) 836-0856
FAX: (613) 836-7183
www.DSEL.ca

CONCEPT PLAN
MINTO KANATA NORTH

PROJECT No.:	17-982
SCALE:	1:4000
DATE:	January 2019
FIGURE:	2



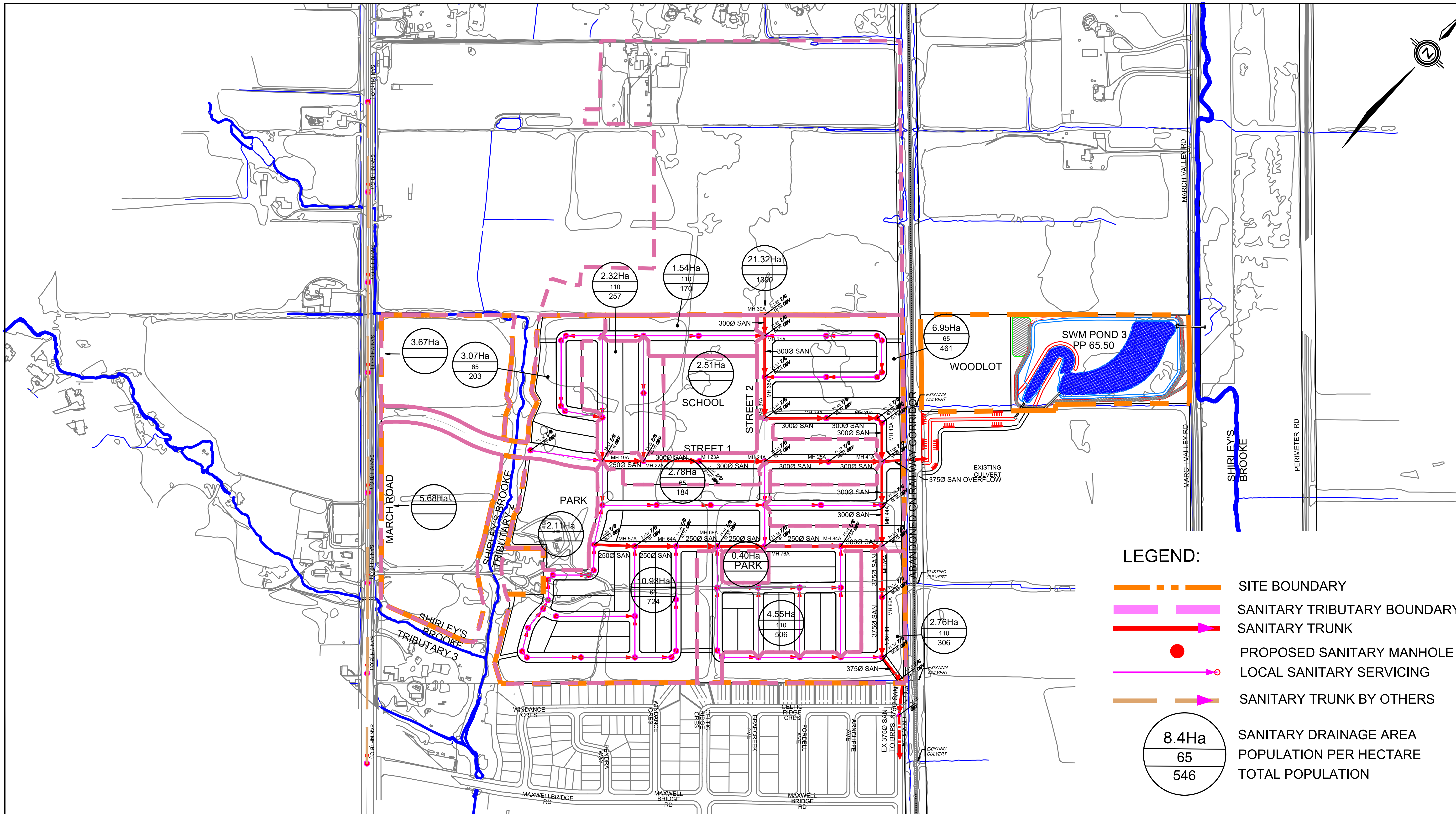
david schaeffer engineering ltd

120 Iber Road, Unit 203
Stittsville, ON K2S 1E9
TEL: (613) 836-0856
FAX: (613) 836-7183
www.DSEL.ca

STORM SERVICING PLAN

MINTO KANATA NORTH

PROJECT No.:	17-982
SCALE:	1:6000
DATE:	January 2019
FIGURE:	3

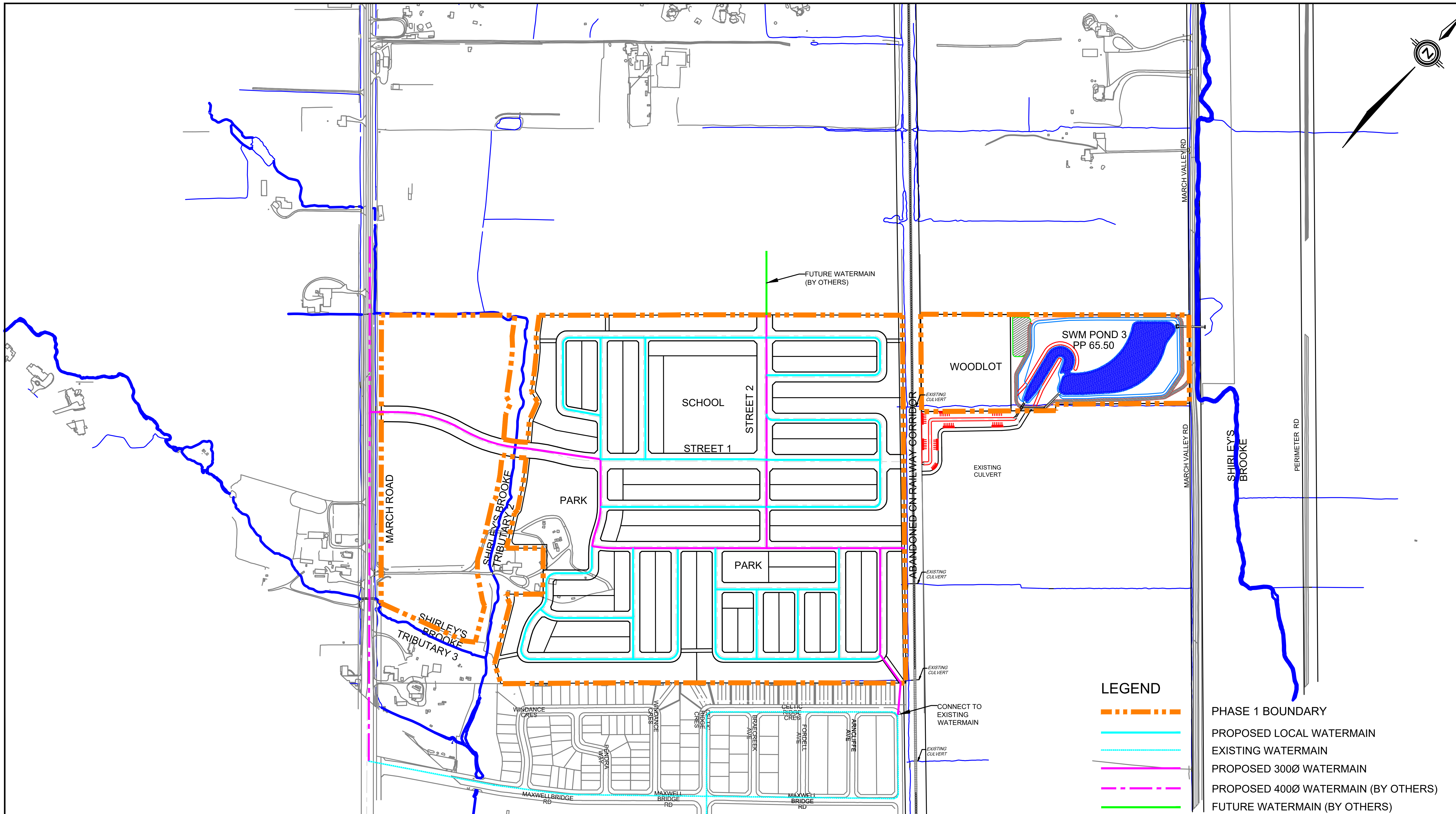


120 Iber Road, Unit 203
Stittsville, ON K2S 1E9
TEL: (613) 836-0856
FAX: (613) 836-7183
www.DSEL.ca

DSEL
david schaeffer engineering ltd

SANITARY SERVICING PLAN
MINTO KANATA NORTH

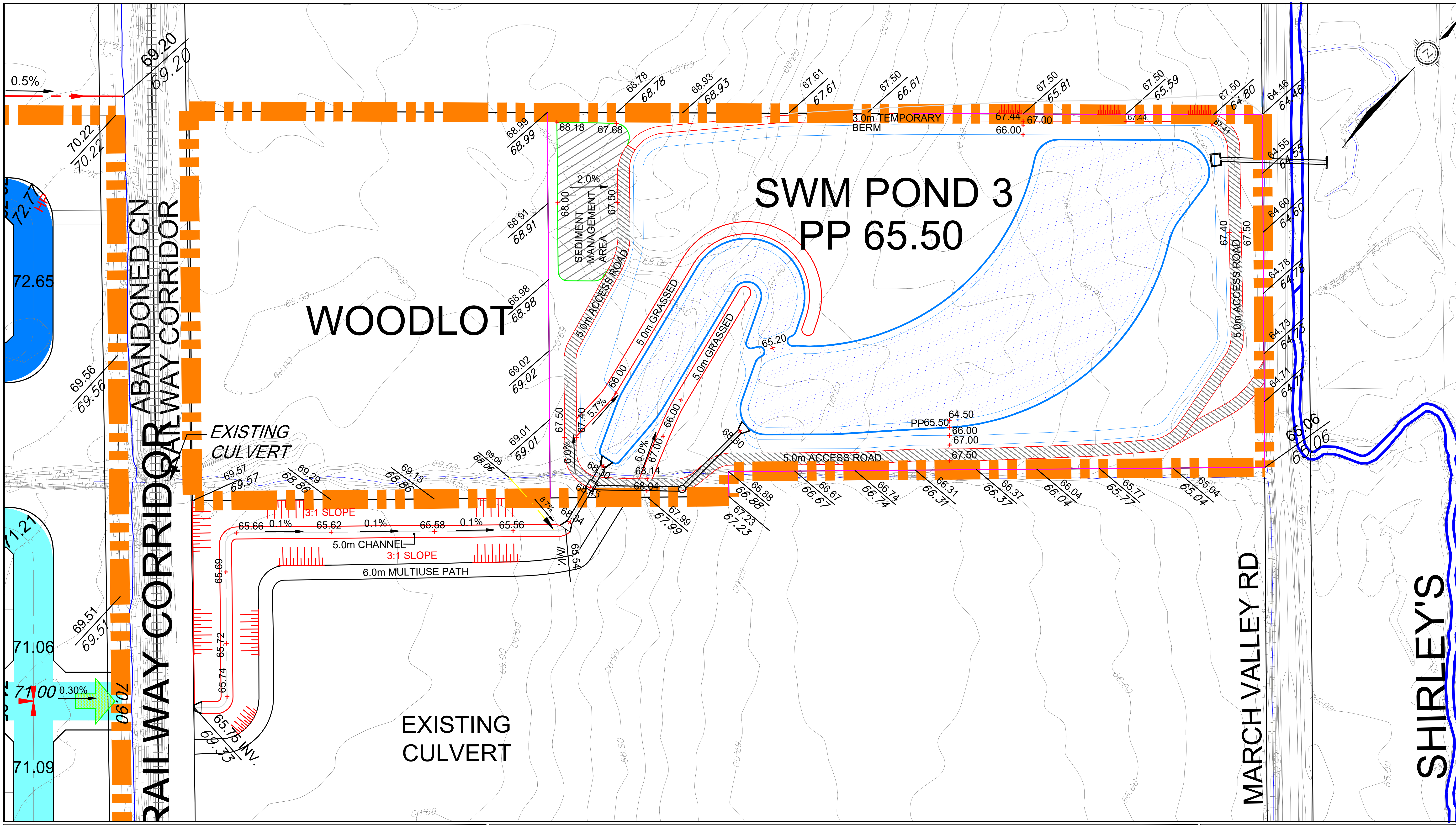
PROJECT No.:	17-982
SCALE:	1:6000
DATE:	January 2019
FIGURE:	4



DSEL
david schaeffer engineering ltd
120 Iber Road, Unit 203
Stittsville, ON K2S 1E9
TEL: (613) 836-0856
FAX: (613) 836-7183
www.DSEL.ca

WATERMAIN SERVICING PLAN
MINTO KANATA NORTH

PROJECT No.:	17-982
SCALE:	1:6000
DATE:	January 2019
FIGURE:	5



DSEL
david schaeffer engineering ltd
120 Iber Road, Unit 203
Stittsville, ON K2S 1E9
TEL: (613) 836-0856
FAX: (613) 836-7183
www.DSEL.ca

SWM POND
MINTO KANATA NORTH

PROJECT No.:	17-982
SCALE:	1:1500
DATE:	January 2019
FIGURE:	6

DSEL
david schaeffer engineering ltd

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

CONCEPTUAL GRADING PLAN
MINTO KANATA NORTH

PROJECT No. :	17-982
SCALE:	1:2000
DATE:	January 2019
DRAWING No.	1