

# MEMORANDUM

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**DATE:** NOVEMBER 28, 2019 **PROJECT:** 116132

**TO:** JULIE CANDOW

**FROM:** STEVE ZORGEL / MARC ST. PIERRE

**RE:** CLARIDGE / UNIFORM DEVELOPMENT (CU DEVELOPMENTS)  
SANITARY AND WATERMAIN SERVICING OPTIONS

**CC:** JOHN RIDDELL

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This memorandum provides an overview of the sanitary and watermain servicing options for servicing future and existing lands west of March Road based on comments received from the City of Ottawa in an email dated September 16, 2019.

## **SANITARY BACKGROUND**

The existing development lands consist of St. Isidore Catholic Church / Cemetery, St. Isidore School and the future lands consist of residential Block 300, future Claridge lands and residential Block 298. These lands are located between the existing homes on Murphy Court and the proposed Park & Ride.

The Kanata North Urban Expansion Area (KNUEA) Master Servicing Study (MSS) identified that the sanitary service option was to convey flows east to west, connecting into the Street 1 sewer. Refer to attached Figure 6.6.1.2a – Proposed Wastewater Infrastructure.

The existing topography slopes west to east with a drop in elevation of approximately 5.0m from Street 1, through the existing / future lands, to March Road. Directing the sanitary flows in a westerly direction results in a sanitary sewer depth of 7.0-8.5m at Street 1. This sanitary approach also forces the sanitary sewer on Street 1 to be at depths of 6.0-8.5m to the March Road connection.

Albeit, the design and construction of the sanitary sewer is achievable, there are factors to consider with the installation and maintenance of sewers depths in excess of 6.0m.

- 1) As identified in the Paterson's geotechnical reports, bedrock ranges from 0.5m to 2.0m below existing ground. Extensive rock blasting will be required;
- 2) Groundwater depth is 1.0m to 2.0m below existing ground. As identified in Paterson's Hydrogeological Investigation report, moderate to high groundwater infiltration through excavated bedrock is expected during construction of the Stormwater Management (SWM) pond. Considering that the sanitary sewer along Street 1 will be of similar pond depths, groundwater management during construction or long-term maintenance will be challenging;
- 3) Long-term maintenance / replacement of sewers with depths 7.0-8.5m within a standard road cross section will result in higher costs for the City of Ottawa.

Refer to Figure 8B – Proposed Alternative Sanitary Servicing for Future / Existing Lands for details.

As part of the draft approval design, we investigated an alternative approach to service the existing / future lands. By doing so, the objective was to construct services at a normal depth, reduce rock removal, reduce groundwater maintenance during construction and be mindful of long-term maintenance / replacement of the sewer system.

### **PREFERRED SANITARY SERVICING OPTION**

As identified in the CU Developments Planning Rationale, the lands around St. Isidore Catholic Church and St. Isidore Catholic School have been accounted for in the development of the subject lands and are shown as Blocks on the Plan of Subdivision. No road pattern has been defined as these lands will be included in future development applications. These lands will also be subject to land exchange agreements.

The preferred sanitary servicing location for the existing and future lands is to construct a sanitary sewer through St. Isidore Church lands, cemetery lands, future Claridge lands, Block 298 and the Park & Ride ultimately outletting to Street 1 adjacent to the SWM block. Refer to Figure 8A – Preferred Sanitary Servicing for Future / Existing Lands for details.

This sanitary sewer location is preferred for a couple reasons:

- 1) The depth of the sanitary sewer decreases significantly and for the most part, can be designed and constructed at a depth of about 5.0m. Sewer depths will be about 6.0m in a localized location. The sanitary sewer depths along Street 1 will also be decreased with average depths of about 4.5m;
- 2) The depth of trench rock blasting and excavation decreased significantly;
- 3) Groundwater infiltration during construction can be easily managed.

As mentioned, the sanitary sewer would be located through the future Park & Ride. In discussions with the City, it's been informed that the City's transit department will require additional time to review our preferred sewer location. Since the development of the Park & Ride is unknown and subject to lands being acquired by the City, the review of our proposal could be delayed for some period of time.

As an additional measure to the preferred sanitary service option, we propose that the sanitary sewer on Street 1, from the roundabout to the March Road trunk sewer connection, be designed and constructed to an over depth elevation. This would allow 2 things:

- 1) The over depth sewer through this reach allows connections to both the preferred option and the alternative option in the future.
- 2) Phase 1 construction can proceed while discussions continue with the City on the preferred servicing of the existing / future lands.

## **WATERMAIN BACKGROUND**

The existing development lands consist of St. Isidore Catholic Church / Cemetery, St. Isidore School and the future lands consist of residential Block 300, future Claridge lands and residential Block 298. These lands are located between the existing homes on Murphy Court and the proposed Park & Ride.

The KNUEA MSS identified a backbone watermain system to service all the KNUEA lands as recommended by Stantec's Potable Water Assessment, which included:

- 1) Extending a 400mm watermain along March Road from the existing 400mm watermain located at the intersection of Maxwell Bridge / March Road to the intersection of Street 1 (CU Developments) / March Road.
- 2) A 300mm backbone looped watermain servicing all the lands within the KNUEA ultimately connecting to the 400mm watermain extension.

Refer to excerpt from the MSS, Figure 7.1 – Proposed Watermain Infrastructure for details.

The preferred 300mm backbone watermain layout through the CU Development lands did not extend into the existing and future development lands adjacent to March Road and the 400mm watermain extension did not reach these lands. Therefore, no preliminary layout had been established and local street watermain sizing (and layout) is to be confirmed by hydraulic modelling.

It should be noted that the backbone watermain was analyzed using a fireflow of 167L/s, which is considered to be a strong flow capable of meeting typical residential construction requirements, as per the MSS and Stantec's Potable Water Assessment.

## **PREFERRED WATERMAIN SERVICING OPTION:**

As identified in the CU Developments planning rationale, the lands around St. Isidore Catholic Church and St. Isidore Catholic School have been accounted for in the development of the subject lands and are shown as Blocks on the Plan of Subdivision. No road pattern has been defined as these lands will be included in future development applications. These lands will also be subject to land exchange agreements.

The preferred watermain servicing option for the existing and future lands is to construct a 250mm watermain through two future ROWs with a loop system between St. Isidore Church lands, cemetery lands and future Claridge lands. A 250mm watermain with a loop system minimizes headlosses and provides greater pressures and the extents of the watermain system adjacent to March Road (dead ends). The loop system is in the same location as the preferred sanitary and storm layout. Refer to Figure-WM1A – Preferred Watermain Servicing for Future / Existing Lands for details.

This option provides:

- 1) A maximum fireflow of 165L/s adjacent to March Road and Murphy's Court. This fireflow is considered to be a strong flow capable of servicing most residential developments.
- 2) Fireflows greater than 167L/s adjacent to the existing St. Isidore School and 185L/s adjacent to the future Claridge lands containing medium density residential blocks. Greater

fireflows adjacent to institutional and medium residential blocks provides greater flexibility with unit types, construction material and layout in these areas.

Allowable fireflows under the preferred servicing strategy at the dead ends and medium density areas can be found on Figure-WM1A – Preferred Watermain Servicing for Future / Existing Lands.

**ALTERNATIVE WATERMAIN SERVICING OPTION:**

As mentioned, the future / existing lands will be subject to land exchanges and a road pattern is to be confirmed during future development applications. In a case where a loop system cannot be established between Block 300 and Block 298 / Existing St. Isidore School lands, an alternative servicing layout has been provided. The alternative servicing option will provide two separate dead-end watermains capable of servicing all areas of the future / existing lands, with each watermain connecting to the 300mm backbone watermain on Street 1. The first connection will be to the Street 1 / Street 2 intersection and the second connection will be at the Street 1 / Street 4 intersection. Refer to Figure-WM1B – Proposed Alternative Watermain Servicing for Future / Existing Lands for details.

Both single feed systems are approximately 300m in length and therefore headlosses are greater within these pipes under the fireflow condition. A 250mm is necessary through the existing and future lands to maintain reasonable allowable fireflows adjacent to March Road. Fireflows with a single feed system are reduced compared to the preferred servicing strategy which has a loop system through the St. Isidore lands. This option provides:

- 1) A maximum fireflow of 135L/s is achievable adjacent to March Road and Murphy's Court. Detailed fireflow calculations using actual unit type and layouts and hydraulic modelling will be necessary in this location to determine if the adequate fire protection can be provided in this location.
- 2) A maximum fireflow of 148L/s is achievable adjacent to the existing St. Isidore School and 164L/s adjacent to the future Claridge lands containing medium density residential blocks. Greater fireflows adjacent to institutional and medium residential blocks provides greater flexibility with unit types, construction material and layout in these areas. Detailed fireflow calculations using actual unit type and layouts and hydraulic modelling will be necessary in this location to determine if the adequate fire protection can be provided in these locations.

Allowable fireflows under the proposed alternate servicing strategy at the dead ends and medium density areas can be found on Figure-WM1A – Proposed Alternative Watermain Servicing for Future / Existing Lands.

## **CONCLUSIONS:**

### Sanitary

- The KNUEA MSS identified that the sanitary service option was to convey flows east to west, connecting into the Street 1 sewer.
- Extensive rock blasting, high groundwater infiltration with increased depth and long-term maintenance costs are all factors to consider with the installation and maintenance of sewers depths in excess of 6.0m.
- The preferred sanitary servicing location for the existing and future lands is to construct a sanitary sewer through St. Isidore Church lands, cemetery lands, future Claridge lands, Block 298 and the Park & Ride ultimately outletting to Street 1 SWM block.

### Watermain

- As per the MSS, the preferred 300mm backbone watermain layout through the CU Development lands did not extend into the existing and future development lands adjacent to March Road and the 400mm watermain extension did not reach these lands.
- The preferred watermain servicing option for the existing and future lands is to construct a 250mm watermain through two future ROWs with a loop system between St. Isidore Church lands, cemetery lands and future Claridge lands.
- The preferred option allows for a maximum fireflow of 165L/s adjacent to March Road and Murphy's Court, fireflows greater than 167L/s adjacent to the existing St. Isidore School and 185L/s adjacent to the future Claridge lands containing medium density residential blocks.
- The alternative servicing option will provide two separate dead-end watermains capable of servicing all areas of the future / existing lands, with each watermain connecting to the 300mm backbone watermain on Street 1.
- The alternative option provides a maximum fireflow of 135L/s is achievable adjacent to March Road and Murphy's Court, a maximum fireflow of 148L/s is achievable adjacent to the existing St. Isidore School and 164L/s adjacent to the future Claridge lands containing medium density residential blocks.

## **ATTACHMENTS:**

### Correspondence

- Email from Julie Candow, dated September 16, 2019

### Excerpts from the MSS:

- Figure No. 6.6.1.2a – Proposed Wastewater Infrastructure – Onsite
- Figure No. 7.1 – Proposed Watermain Infrastructure

### CU Development Figures:

- Figure 8A – Preferred Sanitary Servicing for Future / Existing Lands
- Figure 8B – Proposed Alternative Sanitary Servicing for Future / Existing Lands
- Figure WM1A – Preferred Watermain Servicing for Future / Existing Lands
- Figure WM1B – Proposed Alternative Servicing for Future / Existing Lands
- Figure 11 – Phasing Plan

**From:** Candow, Julie <julie.candow@ottawa.ca>  
**Sent:** Monday, September 16, 2019 3:26 PM  
**To:** Marc St.Pierre; Greg Winters  
**Cc:** Shen, Stream  
**Subject:** FW: Future Park and Ride - Kanata North - 1075 March Road

Hi Marc and Greg,

See concerns from Genya below regarding servicing through the park and ride parcel.

**Julie Candow, P.Eng.**  
Project Manager - Infrastructure Approvals

City of Ottawa  
Development Review - West Branch  
Tel: 613-580-2424 x 13850

---

**From:** Stefanoff, Genya <genya.stefanoff@ottawa.ca>  
**Sent:** July 15, 2019 2:29 PM  
**To:** Candow, Julie <julie.candow@ottawa.ca>  
**Cc:** Brouwer, Chris <Chris.Brouwer@ottawa.ca>; Baggs, Rosanna <Rosanna.Baggs@ottawa.ca>; Shen, Stream <Stream.Shen@ottawa.ca>; Washnuk, Derek <Derek.Washnuk@ottawa.ca>; Tse, Wendy <Wendy.Tse@ottawa.ca>; Conway, Darlene <Darlene.Conway@ottawa.ca>; Cooper, Ted <Ted.Cooper@ottawa.ca>  
**Subject:** RE: Future Park and Ride - Kanata North - 1075 March Road

Hi Julie,

A significant concern I have regarding future storm and sanitary services routed through the park and ride parcel is how this may encumber our future ability to develop the parcel. As you are probably aware, during the CDP planning process there was significant concern expressed by the Infrastructure Approvals group (Ted Cooper and Darlene Conway) during their review of the MSS and EMP. During the planning for Kanata North, the consultant was well aware of the shallow depth of the bedrock in the area, grading and drainage issues related to this, and potential need and cost of excavation. Comment was provided regarding the grading of the Park and Ride (and Fire Hall) sites, and overall drainage in the northwest quadrant. During the development of the MSS or EMP, the need to extend services across the Park and Ride parcel was never identified. Given the challenges the City will encounter when the park and ride site is developed due to the underlying bedrock and drainage condition, the City/OC Transpo does not want to be further encumbered by storm/sanitary services extending across the site.

On a related issue, has the park and ride park already been created through the draft approval process? Will the City be required to purchase the property in the near future? Before the City is required to take ownership of the parcel, I'd like to ensure the property is graded, seeded and left in a level condition so that Public Works can undertake seasonal maintenance using

common mowing equipment, as well, there should be no stormwater retention on the property.

Thank you,  
Genya

**Genya Stefanoff, MCIP, RPP**  
**Senior Transit Planner, Service Strategy**

City of Ottawa | OC Transpo | Transportation Services Department  
1500 St. Laurent Blvd., Ottawa, ON K1G 0Z8  
tel: 613-580-2424 ext. 52294

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**From:** Candow, Julie  
**Sent:** July 10, 2019 3:01 PM  
**To:** Stefanoff, Genya <[genya.stefanoff@ottawa.ca](mailto:genya.stefanoff@ottawa.ca)>  
**Cc:** Brouwer, Chris <[Chris.Brouwer@ottawa.ca](mailto:Chris.Brouwer@ottawa.ca)>; Baggs, Rosanna <[Rosanna.Baggs@ottawa.ca](mailto:Rosanna.Baggs@ottawa.ca)>; Shen, Stream <[Stream.Shen@ottawa.ca](mailto:Stream.Shen@ottawa.ca)>; Washnuk, Derek <[Derek.Washnuk@ottawa.ca](mailto:Derek.Washnuk@ottawa.ca)>; Tse, Wendy <[Wendy.Tse@ottawa.ca](mailto:Wendy.Tse@ottawa.ca)>  
**Subject:** RE: Future Park and Ride - Kanata North - 1075 March Road

Hi Genya,

I really appreciate your detailed response. I will inform Novatech of the requirement to maintain a viable access between March Road and the Park and Ride.

The reason why the future storm and sanitary sewers have not be routed to Street 1 is due to the shallow bedrock in the area and the significant amount of additional bedrock removal that would be required to capture drainage from the future development lands adjacent March Road. Constructing the sewers through the Park and Ride represents the 'most direct route' to provide servicing for the lands west of March Road. That said, as part of our comments to Novatech, we have asked them to demonstrate that the future development parcels west of March Road (north of the Park and Ride) could be servicing via sanitary and storm sewers on March Road, which would in turn eliminate the need for the bisecting sewers through the Park and Ride.

I will keep you in the loop for future park and ride discussions in the future.

Thanks,

**Julie Candow, P.Eng.**  
Project Manager - Infrastructure Approvals

City of Ottawa  
Development Review - West Branch  
Tel: 613-580-2424 x 13850

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**From:** Stefanoff, Genya  
**Sent:** July 10, 2019 2:44 PM  
**To:** Candow, Julie <[julie.candow@ottawa.ca](mailto:julie.candow@ottawa.ca)>  
**Cc:** Brouwer, Chris <[Chris.Brouwer@ottawa.ca](mailto:Chris.Brouwer@ottawa.ca)>; Baggs, Rosanna <[Rosanna.Baggs@ottawa.ca](mailto:Rosanna.Baggs@ottawa.ca)>; Shen, Stream <[Stream.Shen@ottawa.ca](mailto:Stream.Shen@ottawa.ca)>; Washnuk, Derek <[Derek.Washnuk@ottawa.ca](mailto:Derek.Washnuk@ottawa.ca)>; Tse, Wendy <[Wendy.Tse@ottawa.ca](mailto:Wendy.Tse@ottawa.ca)>  
**Subject:** RE: Future Park and Ride - Kanata North - 1075 March Road

Hi Julie,

I'd like to understand why the developer is proposing extending services through the park and ride parcel. Is there a reason these services cannot be extended within the right-of-way of Street 1?

During the Kanata North CDP planning process, there had been discussion at many transportation TAC meetings (which included Novatech, the consultant for the CDP) that access to/from the Park and Ride would be via Street 1 at the roundabout **and** also via March Road. Discussion had included March Road potentially being used for southbound general traffic to access the facility and specifically for transit vehicles to egress the park and ride and travel south on March Road. The Final CDP document, dated June 28, 2016, plans for access between the Park and Ride parcel and March Road, and states the following:

The park and ride parcel shown in the Land Use Plan wraps around the proposed fire hall in the northwest quadrant of the March Road intersection. This configuration provides the opportunity for an access on the collector road as well as March Road if desired.

Although construction timing of the park and ride is not known at this time, Transit wants to maintain the ability to have access to/from the park and ride parcel and March Road. Access would enhance customer access to the facility, as well as provide transit priority and route planning flexibility. Grading of the site needs to be designed and undertaken in a manner such that it doesn't preclude access between the parcel and March Road.

Thank you,  
Genya

**Genya Stefanoff, MCIP, RPP**  
**Senior Transit Planner, Service Strategy**

City of Ottawa | OC Transpo | Transportation Services Department  
1500 St. Laurent Blvd., Ottawa, ON K1G 0Z8  
tel: 613-580-2424 ext. 52294

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**From:** Candow, Julie  
**Sent:** July 09, 2019 3:21 PM  
**To:** Stefanoff, Genya <[genya.stefanoff@ottawa.ca](mailto:genya.stefanoff@ottawa.ca)>

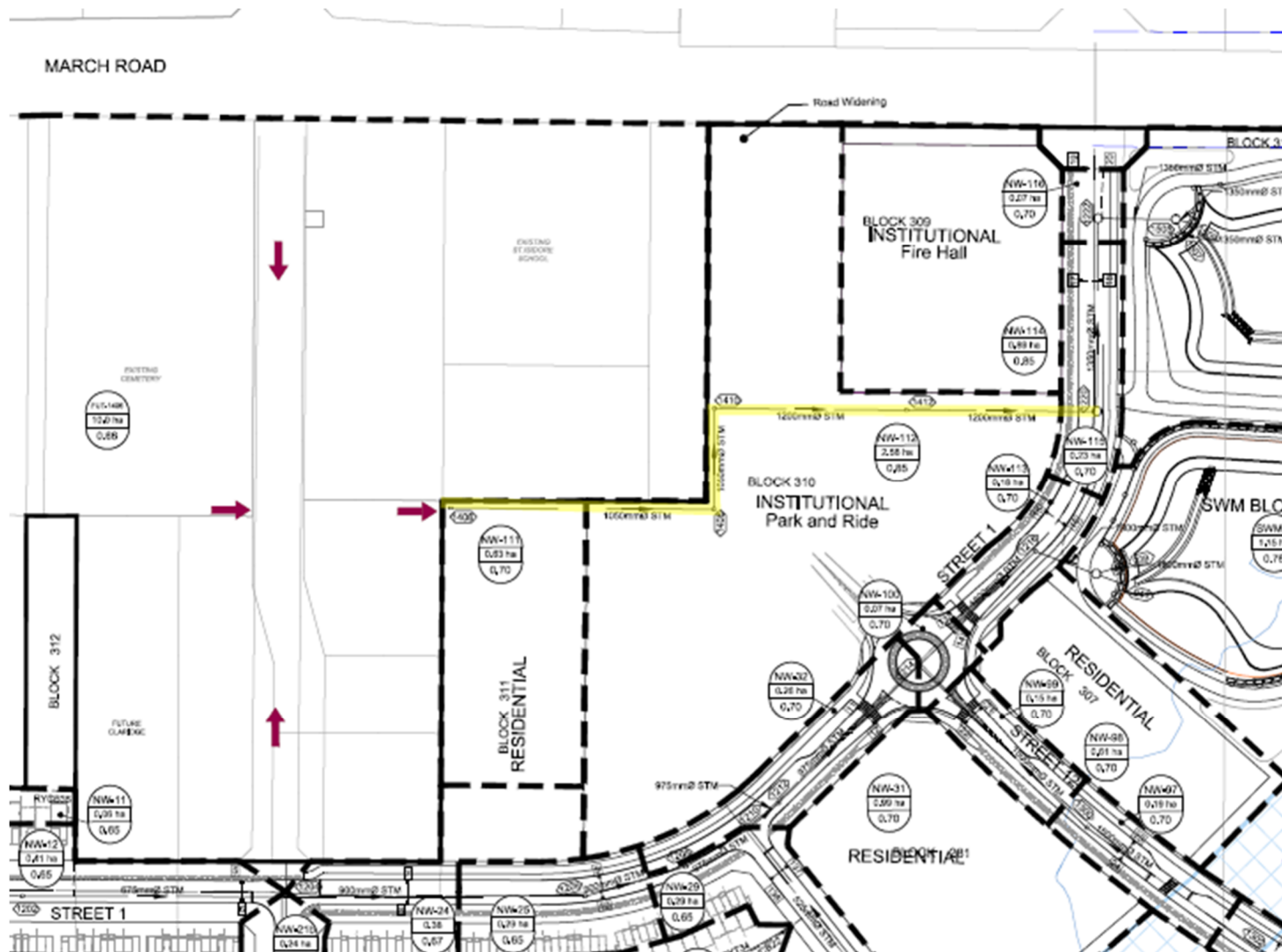


Cc: Brouwer, Chris <[Chris.Brouwer@ottawa.ca](mailto:Chris.Brouwer@ottawa.ca)>; Baggs, Rosanna <[Rosanna.Baggs@ottawa.ca](mailto:Rosanna.Baggs@ottawa.ca)>; Shen, Stream <[Stream.Shen@ottawa.ca](mailto:Stream.Shen@ottawa.ca)>

Subject: Future Park and Ride - Kanata North - 1075 March Road

Hi Genya,

I am hoping you can help me out with a couple questions I have regarding a future park and ride parcel within the Kanata North Urban Expansion Area (1075 March Road). The consultant has proposed a future storm sewer and sanitary sewer to bisect the property from the north-west corner to the south-east corner, with a connection to Street 1 (see image below for reference and attached full scale drawing).



Do you foresee any major concerns with having this infrastructure (storm and sanitary sewers) located below the park and ride parcel?

My second question is regarding access to the park and ride. The consultant has proposed that access to the park and ride would be off of Street 1, at the turning circle seen in the image above. Would there be a need/want for an access directly off of March Road? Due to grading constraints, the current design may restrict an access off of March Road due to the proposed elevations within the park and ride block and the existing grades on March Road.

Your help on this is greatly appreciated. Please give me a call should you wish to discuss further.

Thanks,

**Julie Candow, P.Eng.**

Project Manager - Infrastructure Approvals

City of Ottawa

Development Review - West Branch

Tel: 613-580-2424 x 13850

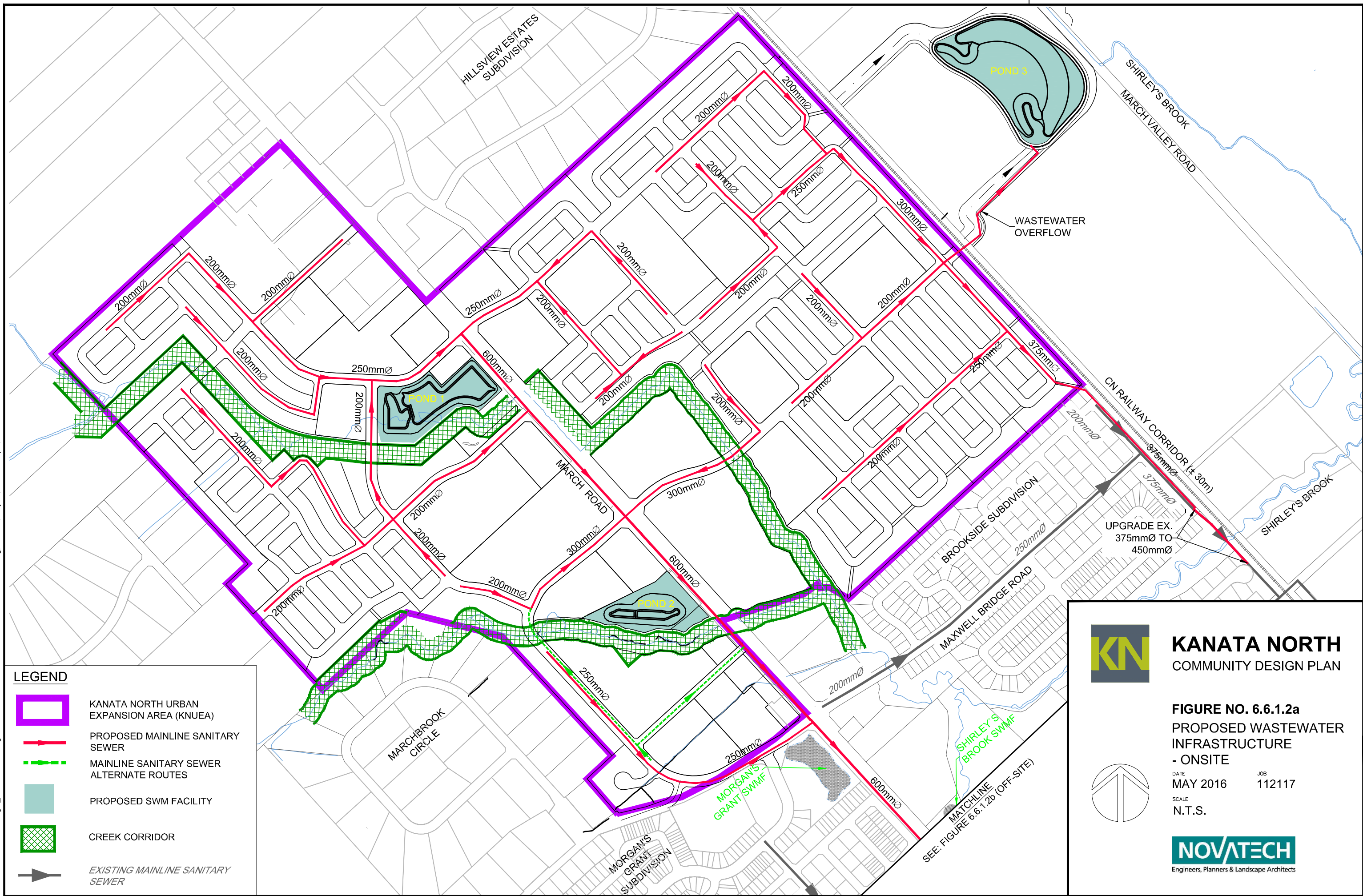
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M:\2012\11217\CAD\Design\1\_MSS\FIGURES\Figure 6.6.1.2 -PROP WASTEWATER INFRASTRUCTURE.dwg, 6.6.1.2a, May 16, 2016 - 1:26pm, mhrehorjak



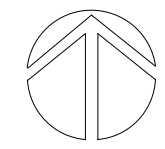
**LEGEND**

-  KANATA NORTH URBAN EXPANSION AREA (KNUEA)
-  PROPOSED MAINLINE SANITARY SEWER
-  MAINLINE SANITARY SEWER ALTERNATE ROUTES
-  PROPOSED SWM FACILITY
-  CREEK CORRIDOR
-  EXISTING MAINLINE SANITARY SEWER

**KN** **KANATA NORTH**  
COMMUNITY DESIGN PLAN

**FIGURE NO. 6.6.1.2a**  
**PROPOSED WASTEWATER INFRASTRUCTURE - ONSITE**

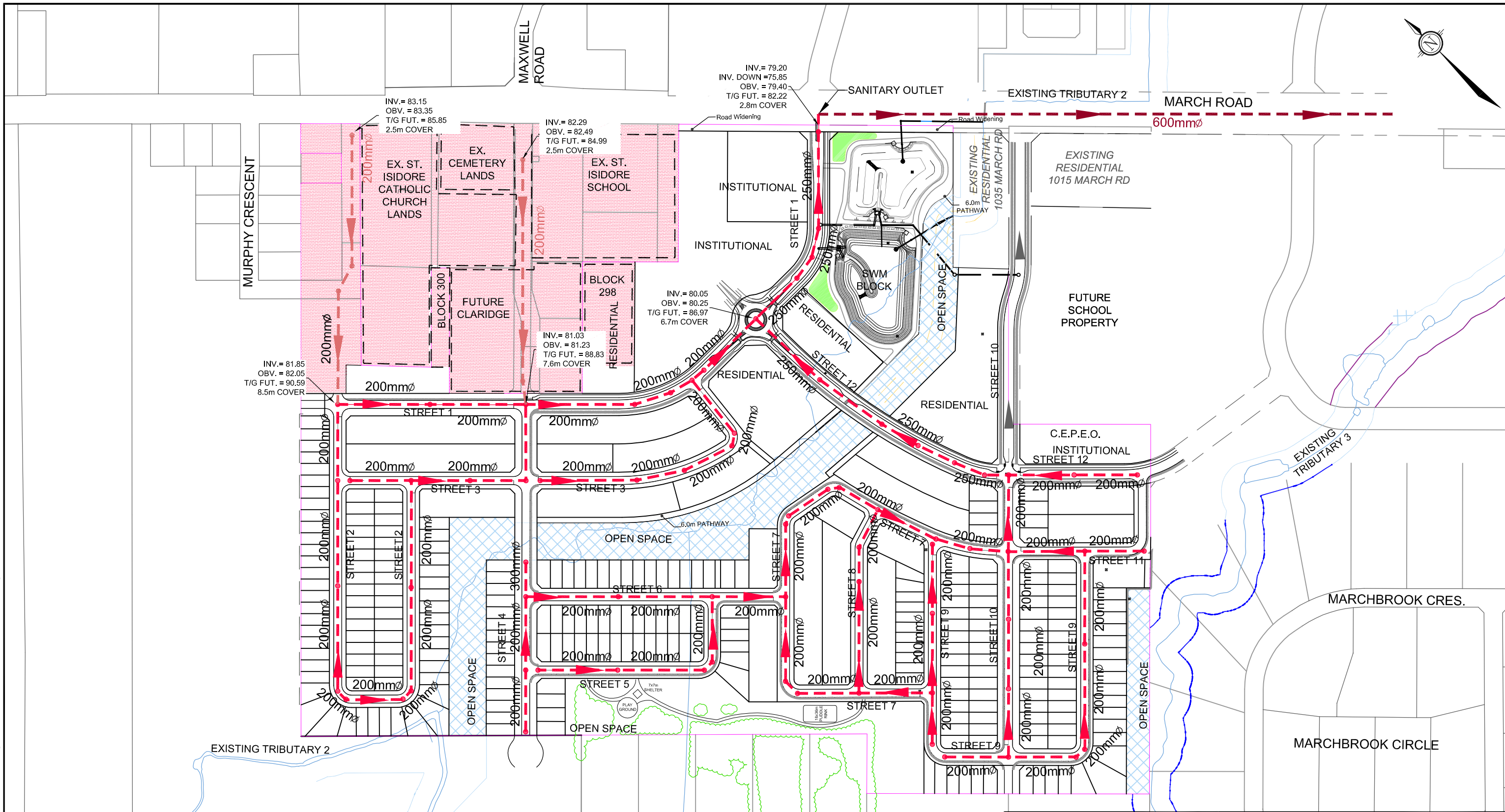
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**NOVATECH**  
Engineers, Planners & Landscape Architects

MATCHLINE  
SEE: FIGURE 6.6.1.2b (OFF-SITE)

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### LEGEND

- PROPOSED DEVELOPMENT
- - - PROPOSED SANITARY SEWER C/W FLOW DIRECTION
- - - PROPOSED FUTURE SANITARY SEWER FLOW DIRECTION
- - - PROPOSED FUTURE SANITARY SEWER STORM SEWER LAYOUT AND FLOW DIRECTION
- - - SANITARY SEWER C/W FLOW DIRECTION TO BE CONSTRUCTED AS PART OF A FRONT ENDING AGREEMENT WITH THE CITY OF OTTAWA
- EXISTING / FUTURE LANDS INCLUDED IN SANITARY SERVICING ANALYSIS
- LAND BOUNDARY FOR PROPERTIES INCLUDED IN SANITARY SERVICING ANALYSIS



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Website www.novatech-eng.com

CITY OF OTTAWA  
CU DEVELOPMENTS INC.  
1053, 1075 and 1145 MARCH ROAD

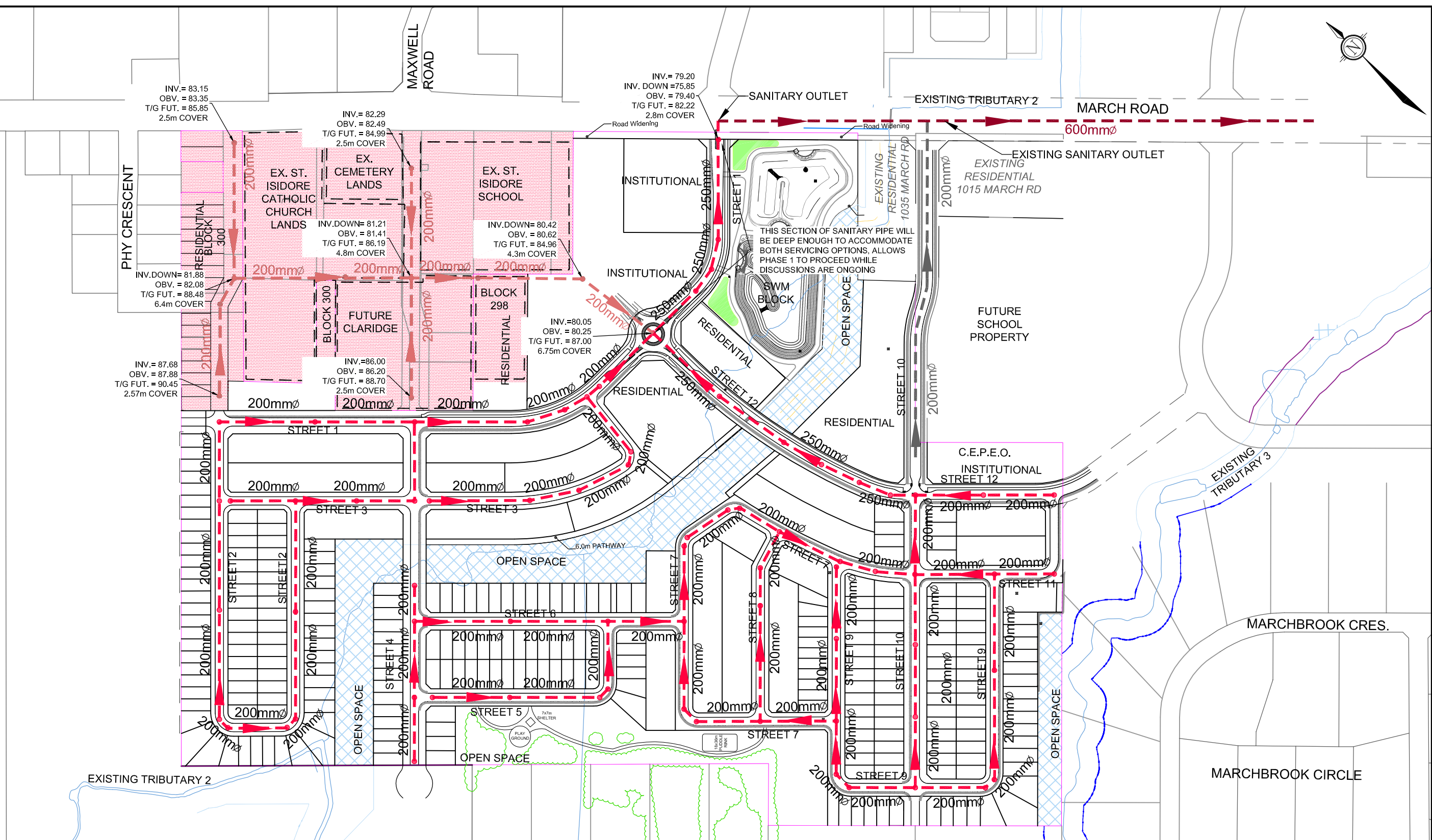
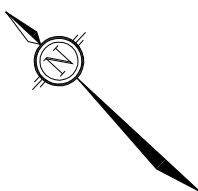
### PROPOSED ALTERNATIVE SANITARY SERVICING FOR FUTURE / EXISTING LANDS

SCALE 1 : 4000







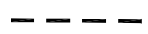
DATE NOV 2019 JOB 116132 FIGURE FIGURE 8B

CUT 11x17 DIM: 270mm x 132mm

MA:20161116132\CAD\Design\Figures\Design Brief\FIG 8 - SAN.dwg, FIGURE 8 - SAN - Memo, Nov 25, 2019 - 10:39am, szorgel



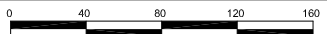
### LEGEND

-  PROPOSED DEVELOPMENT
-  PROPOSED SANITARY SEWER C/W FLOW DIRECTION
-  PROPOSED FUTURE SANITARY SEWER FLOW DIRECTION
-  PROPOSED FUTURE SANITARY SEWER STORM SEWER LAYOUT AND FLOW DIRECTION
-  SANITARY SEWER C/W FLOW DIRECTION TO BE CONSTRUCTED AS PART OF A FRONT ENDING AGREEMENT WITH THE CITY OF OTTAWA
-  EXISTING / FUTURE LANDS INCLUDED IN SANITARY SERVICING ANALYSIS
-  LAND BOUNDARY FOR PROPERTIES INCLUDED IN SANITARY SERVICING ANALYSIS

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CITY OF OTTAWA  
 CU DEVELOPMENTS INC.  
 1053, 1075 and 1145 MARCH ROAD

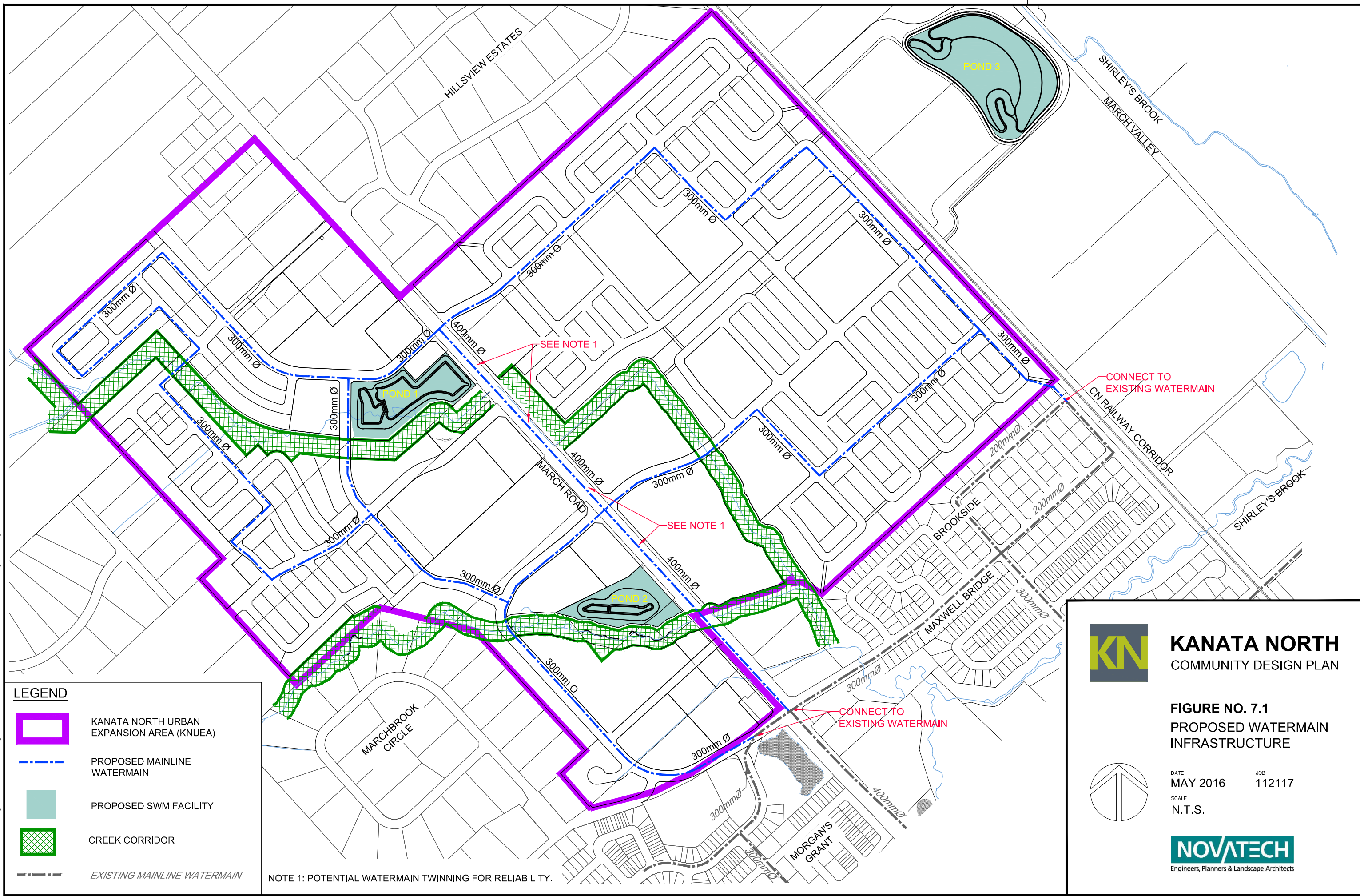
**PREFERRED SANITARY SERVICING FOR FUTURE / EXISTING LANDS**

SCALE 1 : 4000 



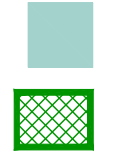


DATE NOV 2019 JOB 116132 FIGURE FIGURE 8A

CUT 11 V 17 DWG 270mm V 132mm

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**LEGEND**

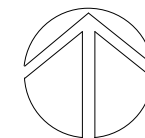
-  KANATA NORTH URBAN EXPANSION AREA (KNUA)
-  PROPOSED MAINLINE WATERMAIN
-  PROPOSED SWM FACILITY
-  CREEK CORRIDOR
-  EXISTING MAINLINE WATERMAIN

NOTE 1: POTENTIAL WATERMAIN TWINNING FOR RELIABILITY.



**KANATA NORTH**  
COMMUNITY DESIGN PLAN

**FIGURE NO. 7.1**  
PROPOSED WATERMAIN  
INFRASTRUCTURE

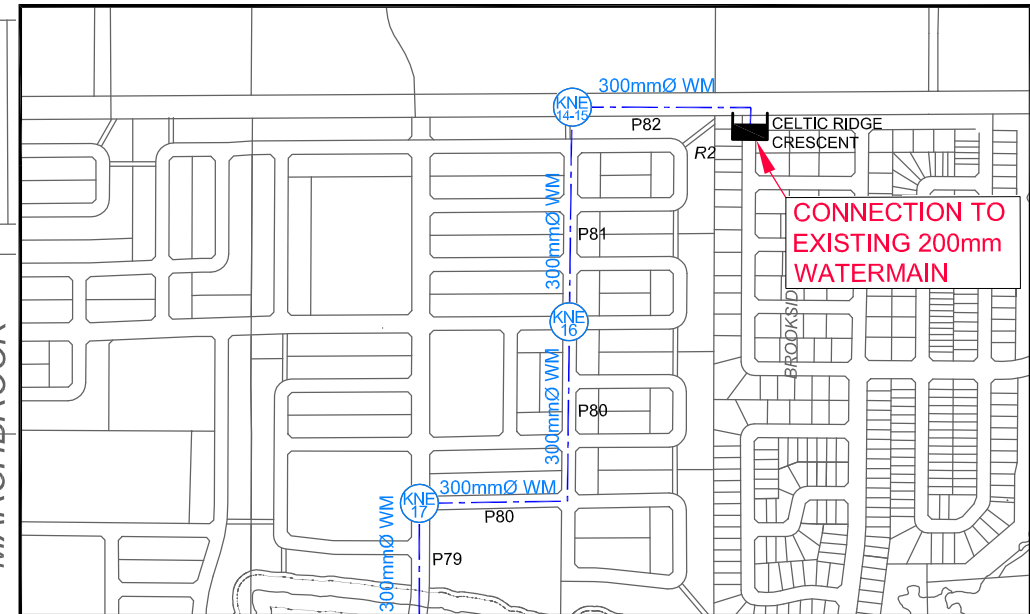
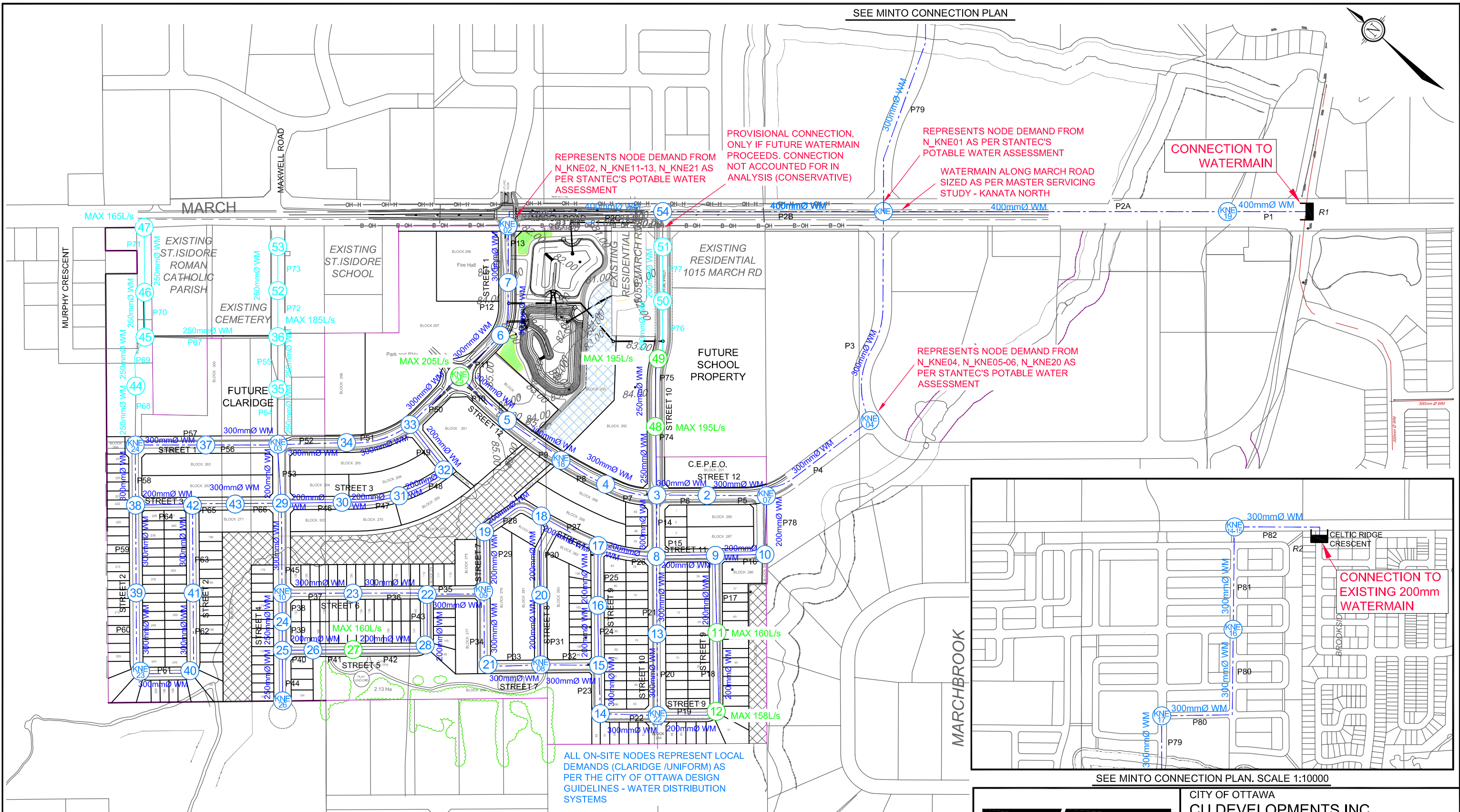


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Engineers, Planners & Landscape Architects

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**LEGEND**

- PROPERTY LINE
- P5 PROPOSED BACKBONE WATERMAIN AS PER KANATA NORTH MASTER SERVICING STUDY - COMPLETED BY NOVATECH, JUNE 28, 2016 (WATER ANALYSIS BY STANTEC)
- P5 PROPOSED LOCAL WATERMAIN AND ID NUMBER
- P5 FUTURE CONCEPTUAL WATERMAIN AND ID NUMBER
- 1 PROPOSED NODE AND ID NUMBER
- R1 EXISTING RESERVOIR AND ID NUMBER
- 1 MAX 160L/s MAXIMUM ACHIEVABLE FIREFLOW
- 1 FUTURE CONCEPTUAL NODE AND ID NUMBER

- NOTES:**
- 1) UNLESS OTHERWISE NOTED, A FIREFLOW OF 167L/s HAS BEEN ANALYSED, AS PER STANTEC'S POTABLE WATER ASSESSMENT, DATED MARCH 2016.
  - 2) HIGH DENSITY FIREFLOWS TO BE CONFIRMED AND ANALYZED AT DETAILED DESIGN / SITE PLAN APPLICATION STAGE.

**NOVATECH**  
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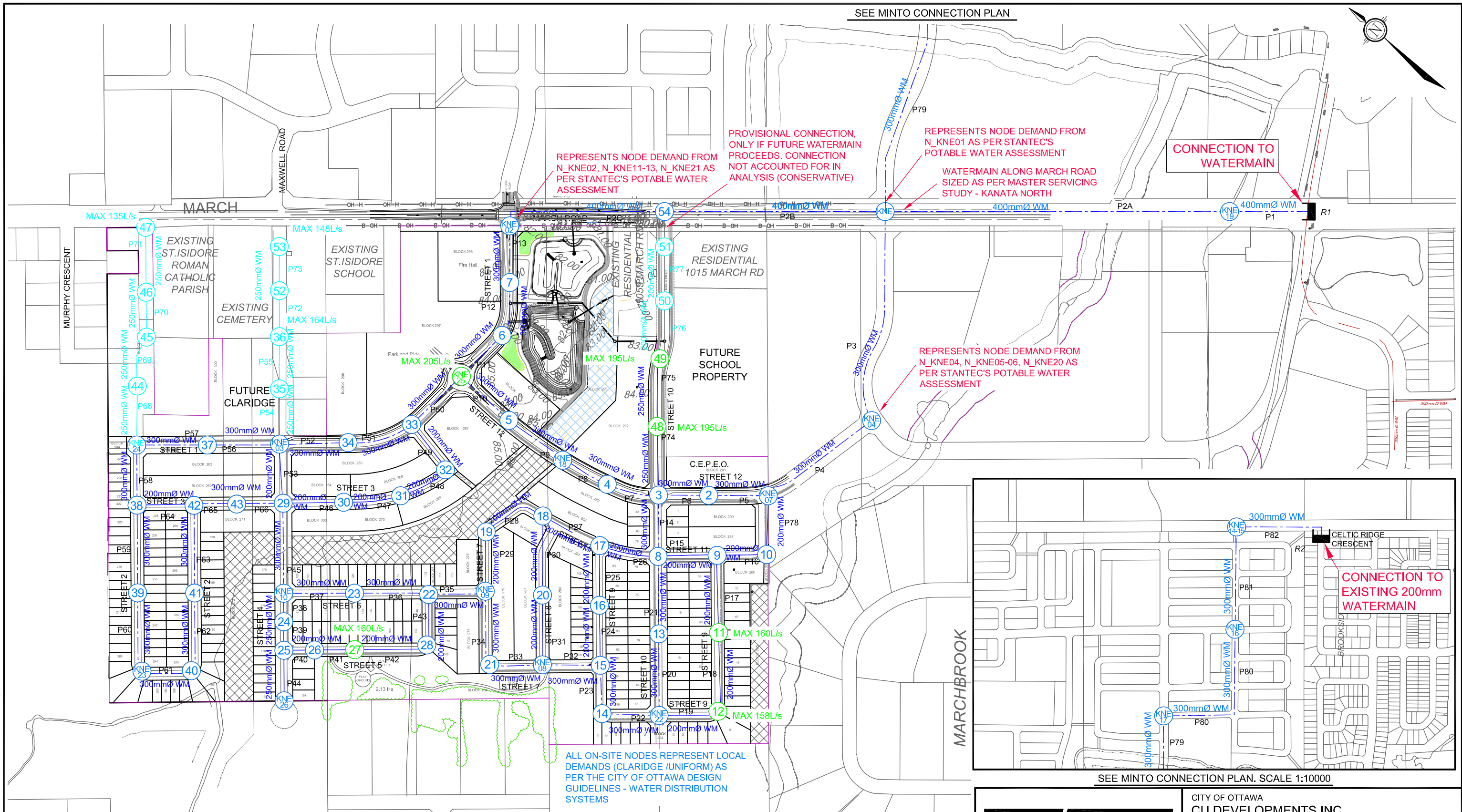
CITY OF OTTAWA  
 CU DEVELOPMENTS INC.  
 1053, 1075 and 1145 MARCH ROAD

**PREFERRED WATERMAIN  
 SERVICING FOR FUTURE / EXISTING  
 LANDS**

SCALE 1 : 5000

DATE NOV 2019 JOB 116132 FIGURE FIG-WM1A

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**LEGEND**

- PROPERTY LINE
- PROPOSED BACKBONE WATERMAIN AS PER KANATA NORTH MASTER SERVICING STUDY - COMPLETED BY NOVATECH, JUNE 28, 2016 (WATER ANALYSIS BY STANTEC)
- PROPOSED LOCAL WATERMAIN AND ID NUMBER
- FUTURE CONCEPTUAL WATERMAIN AND ID NUMBER
- PROPOSED NODE AND ID NUMBER
- EXISTING RESERVOIR AND ID NUMBER
- MAXIMUM ACHIEVABLE FIREFLOW
- FUTURE CONCEPTUAL NODE AND ID NUMBER

**NOTES:**

- 1) UNLESS OTHERWISE NOTED, A FIREFLOW OF 167L/s HAS BEEN ANALYSED, AS PER STANTEC'S POTABLE WATER ASSESSMENT, DATED MARCH 2016.
- 2) HIGH DENSITY FIREFLOWS TO BE CONFIRMED AND ANALYZED AT DETAILED DESIGN / SITE PLAN APPLICATION STAGE.



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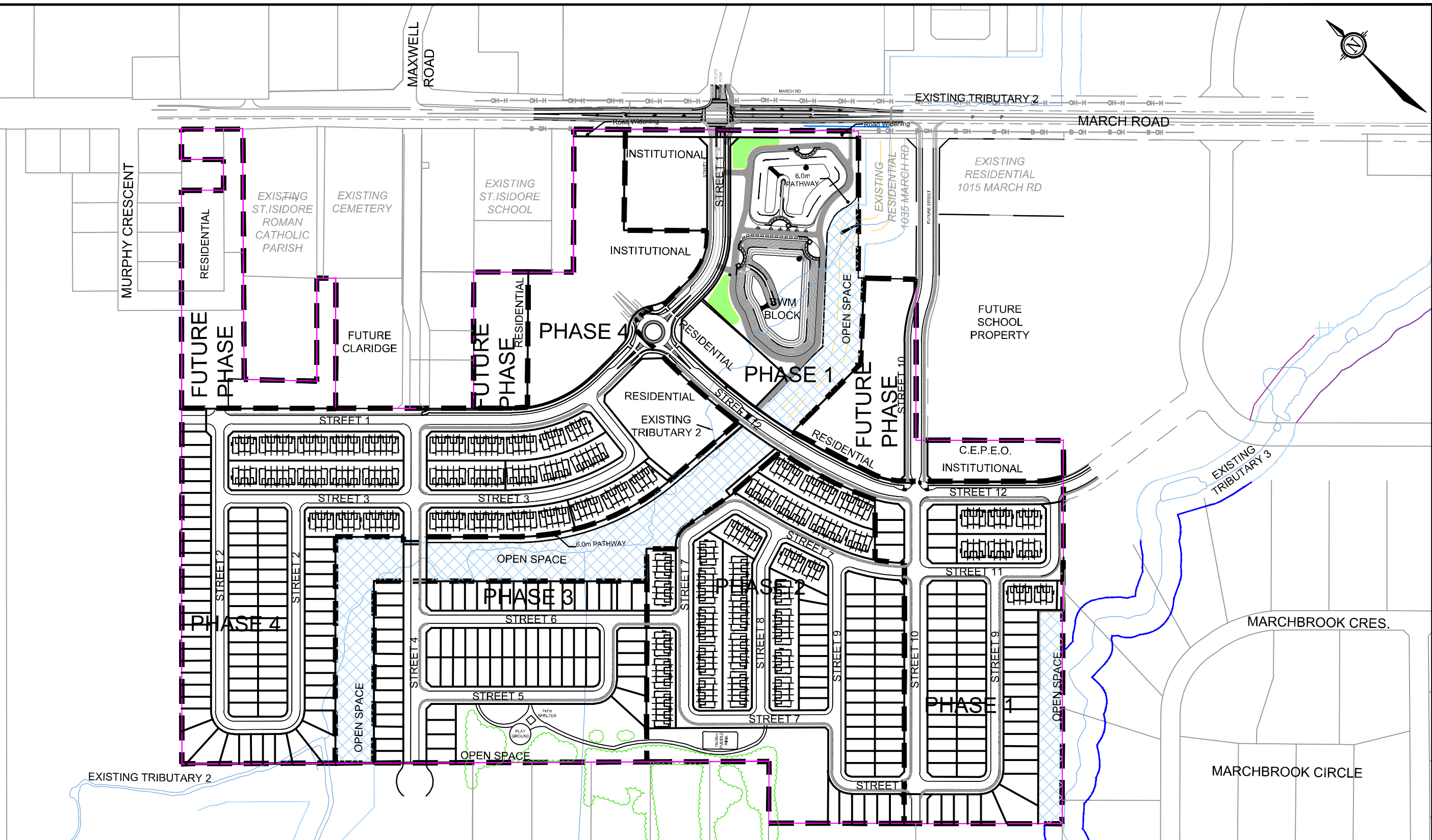
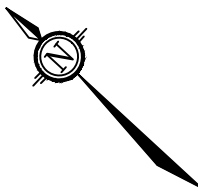
CITY OF OTTAWA  
CU DEVELOPMENTS INC.  
1053, 1075 and 1145 MARCH ROAD

**PROPOSED ALTERNATIVE WATERMAIN SERVICING FOR FUTURE / EXISTING LANDS**

SCALE 1 : 5000

DATE NOV 2019 JOB 116132 FIGURE FIG-WM1B





**LEGEND**

 PROPOSED DEVELOPMENT

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**PHASING PLAN**

SCALE 1 : 4000 

DATE NOV 2019 JOB 116132 FIGURE FIGURE 11

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